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Technical Report Overview

Report: 2021 Chronic Toxicity Program - Elk Valley Testing to Satisfy Permit Requirements

Overview: This report presents the results of quarterly and semi-annual chronic toxicity tests undertaken in 2021 for Teck's steelmaking coal mining operations in the Elk Valley. This report interprets results by evaluating correspondence between water chemistry and laboratory toxicological responses and identifies recommendations for revision or augmentation of planned future programs.

This report was prepared for Teck by Golder Associates Ltd. and relies on laboratory testing completed by Nautilus Environmental.

For More Information

If you have questions regarding this report, please:

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Future studies will be made available at **teck.com/elkvalley.**

Report was re-issued.
Original report submitted: April 29, 2022.
Amended report submitted: September 1, 2022.
Report re-issued with missing bench sheets from Q2 and Q4 lab reports. Pages 1935 and 2369 were added to the revised report.

REPORT

2021 Chronic Toxicity Program
Elk Valley Testing to Satisfy Permit Requirements

Interpretive Report

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Reference No. 21500229-004-R-Rev1-1000

1 September 2022

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Abbreviations

%	percent
~	approximately
<	less than
>	greater than
≥	greater than or equal to
=	equals
±	plus or minus
°C	degrees Celsius
∑TU	sum of toxic units
µg/L	micrograms per litre
AMP	Adaptive Management Plan
ANOVA	analysis of variance
AWTF	active water treatment facility
BC	British Columbia
BC ENV	British Columbia Ministry of Environment and Climate Change
$CaCO_3$	calcium carbonate
CCME	Canadian Council of Ministers of the Environment
C. dubia	*Ceriodaphnia dubia* (water flea)
CETIS™	Comprehensive Environmental Toxicity Information System
CM_MC1	Reference site on Michel Creek upstream of Operations (EMS E258175)
CM_MC2	Test site on Michel Creek upstream of Andy Goode Creek (EMS E58937)
CMm	Coal Mountain mine
CN	control normalized
Cu	copper
CV	coefficient of variation
DOC	dissolved organic carbon
e.g.	for example
EC_X	concentration resulting in x percent adverse effect for a dichotomous endpoint (e.g., normality)
EDTA	ethylene diamine tetraacetic acid
EMA	*Environmental Management Act*
EMC	Environmental Monitoring Committee
EMS	Environmental Monitoring Station
EV_HC1	Test site on Harmer Spillway at Elk Valley Operations (EMS E102682)
EV_MC2	Test site on Michel Creek at Highway 3 Bridge (EMS E300091)
EVWQP	Elk Valley Water Quality Plan
FR_FR4	Test site on Fording River downstream of Swift Creek
FR_FRABCH	Test site on Fording River upstream of Chauncey Creek

FR_FRCP1	Test site on Fording River downstream of Cataract Creek (EMS E300071)
FR_UFR1	Reference site on Fording River upstream of Henretta Creek (EMS E216777)
g/L	grams per litre
GH_ER2	Reference site on Elk River upstream of Greenhills Operations (EMS 200389)
GH_ERC	Test site on Elk River downstream of Thompson Creek (EMS E300090)
GH_FR1	Test site on upper Fording River downstream of Josephine Falls [Order Station FR4] (EMS 200378)
Golder	Golder Associates Ltd.
H. azteca	*Hyalella azteca* (freshwater amphipod)
HQ	hazard quotient
ID	Identification
i.e.	that is
IC_X	concentration resulting in x percent inhibition for a non-dichotomous endpoint (e.g., growth)
km	kilometre
KU	key uncertainty
LAEMP	local aquatic effects monitoring program
LC_DCDS	Test site on LCO Dry Creek downstream of sedimentation ponds
LCO	Line Creek Operations
LC_LCDSSLCC	Test site on Line Creek downstream of South Line Creek (EMS E297110)
LC_LC3	Test site on Line Creek downstream West Line Creek and AWTF outfall
LC_LC5	Test site on Fording River downstream of Line Creek
LC_SLC	Reference site on South Line Creek West Side of Main Rock Drain
LC_X	concentration resulting in x percent lethality
mg	milligram
mg/L	milligrams per litre
MIT	multi-ion toxicity
mL	millilitre
mm	millimetre
MoE	British Columbia Ministry of Environment (now ENV)
MQ	management question
n	sample size
N	nitrogen
NaBr	sodium bromide
NaCl	sodium chloride
Nautilus	Nautilus Environmental
NO_3	nitrate
NR	normal range
NTU	Nephelometric Turbidity Units
O. mykiss	*Oncorhynchus mykiss* (rainbow trout)
PCA	principal component analysis

PC	principal component
P. promelas	*Pimephales promelas* (fathead minnow)
P. subcapitata	*Pseudokirchneriella subcapitata* (green algae)
Q1	quarter 1 (January–March)
Q2	quarter 2 (April–June)
Q3	quarter 3 (July–September)
Q4	quarter 4 (October–December)
QA/QC	quality assurance/quality control
RAEMP	Regional Aquatic Effects Monitoring Program
Ref	reference
RG_MIDAG	Test site on Michel Creek downstream of Andy Goode Creek
SD	standard deviation
SPO	Site Performance Objective
TDS	total dissolved solids
Teck	Teck Coal Limited
the Permit	Permit #107517 issued under the *Environmental Management Act*
TIE	toxicity identification evaluation
TKN	total Kjeldahl nitrogen
TOC	total organic carbon
TSS	total suspended solids
TU	toxic units
UFR	upper Fording River
US EPA	United States Environmental Protection Agency
WCT	westslope cutthroat trout (*Oncorhynchus clarki lewisi*)
WQ	water quality
WQG	water quality guideline

Technical Summary

Golder Associates Ltd. (Golder) was retained by Teck Coal Limited (Teck) to prepare this interpretive report on quarterly and semi-annual chronic toxicity tests undertaken in 2021 for Teck's coal mining operations in the Elk Valley. To inform Management Questions identified in the Adaptive Management Plan (AMP), and to support implementation of the Elk Valley Water Quality Plan (EVWQP), this report presents and interprets the results from 2021 chronic toxicity testing and identifies recommendations for revision or augmentation of planned future programs. The 2021 chronic toxicity testing program included quarterly testing with a cladoceran (*Ceriodaphnia dubia*) and a unicellular green alga (*Pseudokirchneriella subcapitata*) and semi-annual testing with an amphipod (*Hyalella azteca*; Q2 and Q4), early-life stage rainbow trout (*Oncorhynchus mykiss*; Q2 and Q4), and early-life stage fathead minnows (*Pimephales promelas*; Q1 and Q3).

To help answer Management Questions, the analysis of chronic toxicity data consisted of five steps:

- Reviewed data quality to confirm that results met acceptability criteria.
- Standardized the data to help discern toxicological responses from other sources of variability.
- Considered the size of response in each test and how it compared to responses in tests of reference waters (not influenced by mining) to categorize each result as "no adverse response", "possible adverse response", or "likely adverse response".
- Evaluated the correspondence between test responses and indicators of mine-related water quality. This evaluation included statistical assessment of patterns and specialized laboratory tests (toxicity identification evaluations) designed to identify causes of toxicity.
- Compared 2021 test results to previous years (2015 to 2020) to identify potential patterns in toxicity responses and provide insight into potential causation.

The following bullets summarize key findings from the 2021 interpretive report.

- **Data Quality**—The data generally met acceptability criteria and were fit for the intended purpose. In the few cases where data quality was suspect, actions were taken to process and interpret the data to avoid improper influence on findings. For example:
  - There were atypical findings observed for algae in Q1 and Q4. Many of the test sites had mean cell yield that was affected systematically (reduced growth) across the batch, despite the tested sites having different water quality profiles. These unusual findings did not warrant outright rejection as invalid test outcomes, but instead were identified as a source of increased uncertainty for this endpoint relative to previous years.
  - There were atypical findings for amphipod dry weight in Q3 where high inter-reference variability resulted in the identification of potential adverse responses for several test sites. Most adverse responses for this endpoint did not match previous tests, nor did findings associate strongly with water quality. These unusual findings did not warrant outright rejection as invalid test outcomes, but instead were identified as a source of increased uncertainty for this endpoint relative to previous years.

- There were atypical findings for Q1 fathead minnow tests for two reference sites (i.e., Elk River and Michel Creek). Results from these reference waters were excluded from statistical analysis because had anomalously low survival relative to the historical dataset, and only results from the remaining two references were used to categorize site water responses. Exclusion of these references made the identification of adverse responses more likely in test site waters but was adopted as a conservative screening approach.
- Where there was evidence of microbes in fathead minnow and rainbow trout tests, the results were flagged as being potentially confounded. The potential for confounding of test endpoints was partially controlled through administration of copper, which prevented large disruptions to the test endpoint performance, but did not eliminate presence of microbes entirely. Comparisons of results for replicates with and without evidence of microbe presence indicated potential for a small downward bias in survival and viability of tested fish. Per direction from the EMC, tests with microbes were included in statistical analyses and compared to water quality guidelines and benchmarks.

- **Initial Categorization**—The 2021 quarterly (quarters named as Q1, Q2, Q3, and Q4) test results categorized as “no adverse response”, “possible adverse response”, or “likely adverse response” are illustrated on Figure TS-1 and summarized by station at the end of this technical summary (Figure TS-2):
  - For all species, most tests were categorized as exhibiting no adverse response. Likely adverse responses, where observed, were most common for water flea reproduction and least common for rainbow trout and fathead minnow (one adverse response for survival for both fish species).
  - The number of samples with likely adverse responses was low across all quarters, ranging from three (Q2 and Q4) to four (Q1 and Q3). A higher proportion of samples had possible adverse effects in Q1, Q3, and Q4, although most of these tests were linked to atypical results for algal cell yield (Q1 and Q4) and amphipod dry weight (Q3), as indicated above.
  - The proportion of samples exhibiting adverse effects for fathead minnow and rainbow trout endpoints was low—the introduction of copper to control the prevalence and confounding effects of microbes has greatly improved the reliability of that test endpoint relative to early rounds of testing.
  - Stations FR_FRCP1 (Fording River below Cataract Creek), CM_MC2 (Michel Creek below Corbin Creek), and LC_DCDS (Dry Creek downstream of sedimentation ponds) exhibited the highest frequency of possible or likely adverse responses. This pattern is consistent with other recent years of testing.
  - The addition of FR_FRABCH and integration of the Line Creek and regional monitoring programs has improved the spatial characterization of sampling in the mainstem Fording and Elk rivers. The results from 2021 provide evidence that several stations of the mainstem Fording River downstream of FR_FRCP1 (i.e., FR_FRABCH, GH_FR1, and LC_LC5) have lower frequency and magnitude of chronic toxicity.
- **Causation Assessment**—The constituents identified as potential causes of toxicity in 2021 tests with adverse effects are summarized in Figure TS-2. Key findings were:
  - Nickel showed the greatest evidence of contributing to observed effects, it was identified as a causal factor for all adverse responses in water flea tests and approximately one half of adverse responses in amphipod tests.

  - In the Fording River (FR_FRCP1) and its tributary Dry Creek, nickel was identified in the greatest number of tests as having the greatest evidence of causing the observed effects to crustaceans (i.e., water flea reproduction and amphipod growth at FR_FRCP1 and LC_DCDS). The magnitude of toxicity observed at FR_FRCP1 in 2021 was lower than in other recent years, possibly reflecting the lower concentrations of major ions (i.e., TDS components and sulphate) measured in site water which have previously been identified as casual factors. The influence of nickel in the Fording River is spatially limited as nickel has not been identified as a contributing factor to observed effects to crustaceans at any stations downstream of FR_FRCP1.
  - At CM_MC2 in Michel Creek, nickel was the only constituent identified as a causal factor for adverse responses observed to crustaceans (i.e., water flea reproduction and amphipod survival and growth). This interpretation is consistent with previous years of water quality and toxicity monitoring. The influence of nickel in Michel Creek is limited spatially, as the crustacean tests at the downstream station (RG_MIDAG) showed improvement relative to CM_MC2.

- High inter-reference variability was identified in Q3 for amphipods and in Q1 for fathead minnow. The variability observed among references for these species increased uncertainty with respect to whether identified responses were representative of an adverse response to test water, or alternatively were a reflection of the background variance in test organism performance due to factors other than water quality.
- Other identified potentially contributing factors were microbes (in one fathead minnow test [Q1] and one rainbow trout test [Q4]) and nitrate (one rainbow trout test [Q4]).

- **Temporal Assessment**—The broad findings of this program were similar to 2020, with most stations exhibiting a low proportion of significant toxicity outcomes, water flea remaining a sensitive indicator for influence of mine-related constituents, and the greatest frequency of mine-related responses observed in the Upper Fording River (FR_FRCP1), in Dry Creek (LC_DCDS), and Michel Creek (CM_MC2). Key findings from the 2021 program, when compared to findings from previous years, are as follows:
  - At FR_FRCP1, there was a trend over time with more frequent and larger responses for water fleas observed from the beginning of monitoring in 2015 until Q1 of 2018. Since that time, although responses still occurred, fewer and smaller magnitude responses for water fleas have been observed. Teck has initiated several actions to better understand and manage water quality in the upper Fording River, including the Swift-Cataract Diversion, and associated improvements in water quality have been observed, including reduction of sulphate and total dissolved solids (TDS). Where toxicological responses at FR_FRCP1 have been historically observed, they appear to be linked to sulphate, TDS, and nickel, although nickel was the only constituent identified as a suspected causal factor in 2021.
  - At LC_DCDS, nitrate was identified as potentially causing observed effects in some tests with water fleas, amphipods, and rainbow trout between 2018 and 2021; this corresponded with an observed increase in nitrate in these years compared to concentrations in previous years. In addition, nickel was identified as potentially causing observed effects in some tests with water fleas and amphipods in 2021 but had not been identified in previous years at this station. Teck has initiated several actions under the AMP Response framework, and submitted the Nitrogen Source Control Plan Annual Report which encompasses water management and blasting practices at LCO related to nitrogen management. In addition, Teck also has initiated the conveyance and supplementation project in LCO Dry Creek which

is intended to improve water quality in Dry Creek in the earliest timeframe possible (pending approval, scheduled to be operational in Q1 2023). Longer-term mitigation to manage water quality in Dry Creek, incorporating water treatment, is being developed by Teck for operation in 2026.

- At CM_MC2, responses to nickel-sensitive crustaceans have been observed in historical testing, and this continued in 2021. However, the frequency and magnitude of toxicity has decreased in recent years (2019 to 2021) relative to 2017 and 2018. There was a pattern of nickel being identified as a potential or likely cause of observed effects in most of these tests. Spatially, nickel concentrations decreased from upstream to downstream in Michel Creek. At the station further downstream on Michel Creek (RG_MIDAG), nickel concentrations were lower relative to CM_MC2 (e.g., average nickel concentration of 5 µg/L at RG_MIDAG compared to 17 µg/L at CM_MC2, for H. azteca tests in 2021) and adverse test responses to crustaceans were reduced. Teck has initiated several actions under the Adaptive Management Plan response framework to better understand and manage water quality in Michel Creek. These actions include:
  - Expanding monitoring at CMm.
  - Initiating studies to support the development of site-specific effects benchmarks for nickel in the Elk Valley.
  - Modifying pit dewatering activities at CMm to minimize the effect of 34 pit pumping on downstream concentrations of nickel and other mine-influenced constituents.
  - Developing nickel tank and non-tank-based removal technology.
  - Evaluating mitigation options for nickel at CMm.
- At other stations, there was no apparent consistent pattern of responses and no clear evidence of causal factors. The elevated incidence of adverse effects to amphipods in Q3 and algae in Q1 and Q4 did not occur in a concentration-dependent manner, are inconsistent with previous patterns, and appear to be related to high inter-reference variability (amphipods) or the systematic depression of responses across varying water chemistries (algae).

Categories for 2021 test results are summarized by test site in Figure TS-2, with a narrative summary for each test site (ordered upstream to downstream) in the bullets below.

- **FR_FRCP1**—This location is on the Fording River downstream of Cataract Creek. Possible and/or likely adverse responses were observed for water flea reproduction (Q1, Q3 and Q4), algal cell yield (Q1), amphipod dry weight (Q3), rainbow trout (Q4) and fathead minnow (Q1). Analysis of correlations between test responses and water quality indicated:
  - Water flea reproduction—nickel was identified as a potential contributor to the observed responses.
  - Algal cell yield—this test was associated with elevated levels of uncertainty due to the systematic depression of cell yield observed in this quarter across test sites despite dissimilar water quality profiles. No water quality constituent could be identified as potentially contributing to the observed response.
  - Amphipod dry weight—this test was associated with elevated levels of uncertainty, as high inter-reference variability was observed in this quarter. No water quality constituent could be identified as potentially contributing to the observed response.

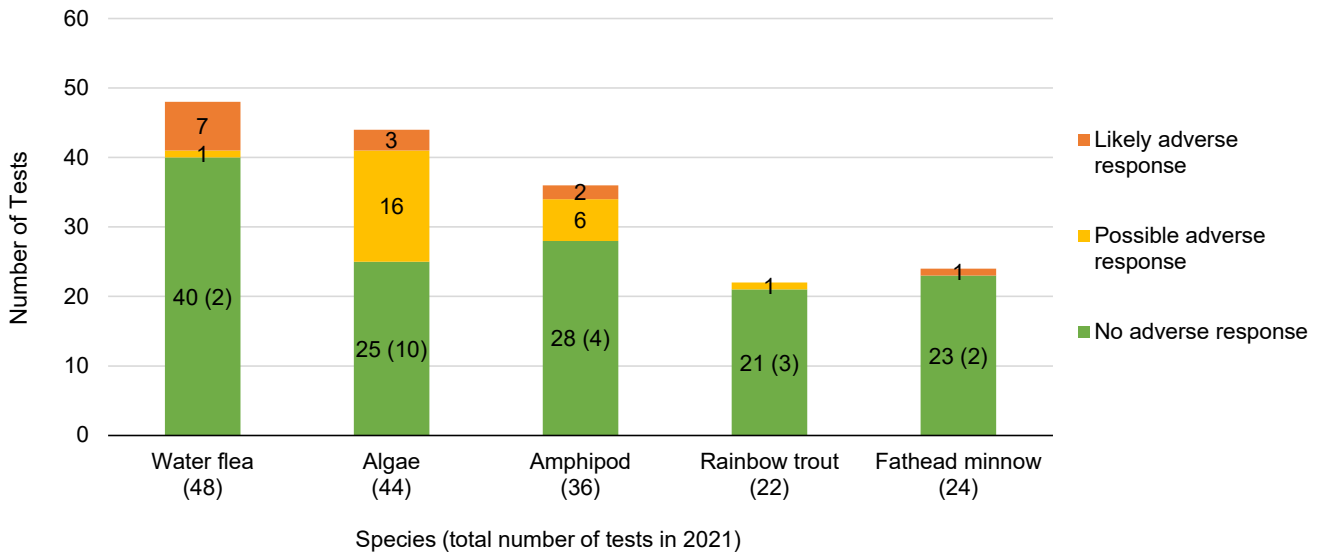
  - Rainbow trout survival—nitrate was identified as potentially contributing to the observed effects in Q4, although there was also evidence of microbial growth in this test.
  - Fathead minnow survival—this test was associated with elevated levels of uncertainty, as high inter-reference variability was observed in this quarter. No water quality constituent could be identified as potentially contributing to the observed responses.

- **FR_FRABCH**—This station, which is approximately 5 km downstream of FR_FRCP1, was added to the program in Q4 2018 to better represent mainstem Fording River water quality and reduce the confounding influence of mid-winter Cataract Creek flows at FR_FRCP1. This station was adopted as the new Fording River Compliance Point in 2021. Possible adverse responses were observed for algal cell yield (Q1) and amphipod dry weight (Q3); however, these responses were observed in tests with elevated uncertainty. The Q1 2021 algal test was associated with an increased uncertainty due to a systematic depression of cell yield observed across test sites despite variability in water chemistries. The Q3 amphipod test also exhibited elevated uncertainty, as high inter-reference variability unrelated to water quality was observed in this quarter. No water quality constituent was identified as potentially contributing to the observed responses.
- **GH_FR1**—This station is on the Fording River downstream of Greenhills Creek. Possible adverse responses were observed for algal cell yield (Q2) and amphipod dry weight (Q3). The Q3 amphipod test exhibited elevated uncertainty, as high inter-reference variability unrelated to water quality was observed in this quarter. No water quality constituent was identified as potentially contributing to the observed responses.
- **LC_LC5**—This station is on the Fording River downstream of Line Creek. Likely or possible adverse responses were observed for algal cell yield (Q1, Q2, and Q4) and amphipod dry weight (Q3); however, these responses were observed in tests with elevated uncertainty. The Q1 and Q4 2021 tests for algal cell yield were associated with an increased uncertainty due to systematic depression of cell yield observed across test sites despite variability in water chemistries. The Q3 amphipod test also exhibited elevated uncertainty, as high inter-reference variability unrelated to water quality was observed in this quarter. No water quality constituent was identified as potentially contributing to the observed responses.
- **LC_DCDS**—This station is on Dry Creek downstream of the sedimentation ponds. Likely or possible adverse responses were observed for water flea reproduction (Q3 and Q4), algal cell yield (Q1 and Q3), and amphipod dry weight (Q4). The Q1 2021 test for algal cell yield was associated with elevated uncertainty due to systematic depression of cell yield observed across test sites despite variability in water chemistries; no water quality constituents were identified as potentially contributing to the observed responses in algal tests. Nickel and nitrate were identified as potential causal factors in the observed responses in crustaceans in most tests with adverse effects after Q4 2018 This is likely due to the observed increase in nitrate and nickel concentrations compared to previous years.
- **GH_ERC**—This station is in the Elk River upstream of the Fording River confluence. Possible adverse responses were observed for algal cell yield (Q3 and Q4) and amphipod dry weight (Q4). The Q4 2021 test for algal cell yield was associated with elevated uncertainty due to the similar magnitude of adverse responses despite variability across water chemistries. No water quality constituent was identified as potentially contributing to the observed responses.

- **EV_HC1**—This station is in Harmer Creek, which flows into Grave Creek and then into the Elk River downstream of Sparwood. Possible adverse responses were observed for algal cell yield in Q3 and Q4; however, Q4 2021 algal cell yield was associated with elevated uncertainty due to systematic depression of cell yield observed across test sites despite variability in water chemistries. No water quality constituent was identified as potentially contributing to the observed responses.
- **CM_MC2**—This station is on Michel Creek downstream of Corbin Creek. Possible adverse responses were observed for algal cell yield in Q1 and Q4; however, results were associated with elevated uncertainty due to systematic depression of cell yield observed across test sites despite variability in water chemistries. No water quality constituent was identified as potentially contributing to the observed responses in algal tests. Likely adverse responses were observed for water fleas (Q1 and Q4) and amphipods (Q2 and Q3). These two crustacean species are known to be sensitive to dissolved nickel exposure, and multiple lines of evidence have implicated nickel as contributing to adverse responses at this sampling location.
- **RG_MIDAG**— This station, which is approximately 2 km downstream of CM_MC2, is not a permit location but was added to the program to characterize the spatial extent of effects observed in previous CM_MC2 testing. No adverse responses were observed in any quarter for any endpoint.
- **EV_MC2**—This station is located on Michel Creek downstream of Bodie Creek. Possible adverse responses were observed for algae cell yield in Q1 and Q4; however, results were associated with elevated uncertainty due to systematic depression of cell yield observed across test sites despite variability in water chemistries. No water quality constituent was identified as potentially contributing to the observed response.
- **LC_LC3**—This station is in Line Creek downstream of West Line Creek and immediately downstream of the active water treatment facility outfall. Possible adverse responses were observed in Q4 for water flea reproduction and in Q1 for algal cell yield. A likely adverse response was observed in Q2 for algal cell yield. Nickel was identified as a potential contributor to the observed response on water flea reproduction. No water quality constituent was identified as potentially contributing to observed responses in algal tests; Q1 2021 algal cell yield was associated with elevated uncertainty due to systematic depression of cell yield observed across test sites despite variability in water chemistries.
- **LC_LCDSSLCC**—This station is in Line Creek downstream of South Line Creek. A possible adverse response was observed for algal yield in Q4; however, Q4 2021 algal cell yield was associated with elevated uncertainty due to systematic depression of cell yield observed across test sites despite variability in water chemistries. No water quality constituent was identified as potentially contributing to the observed response.

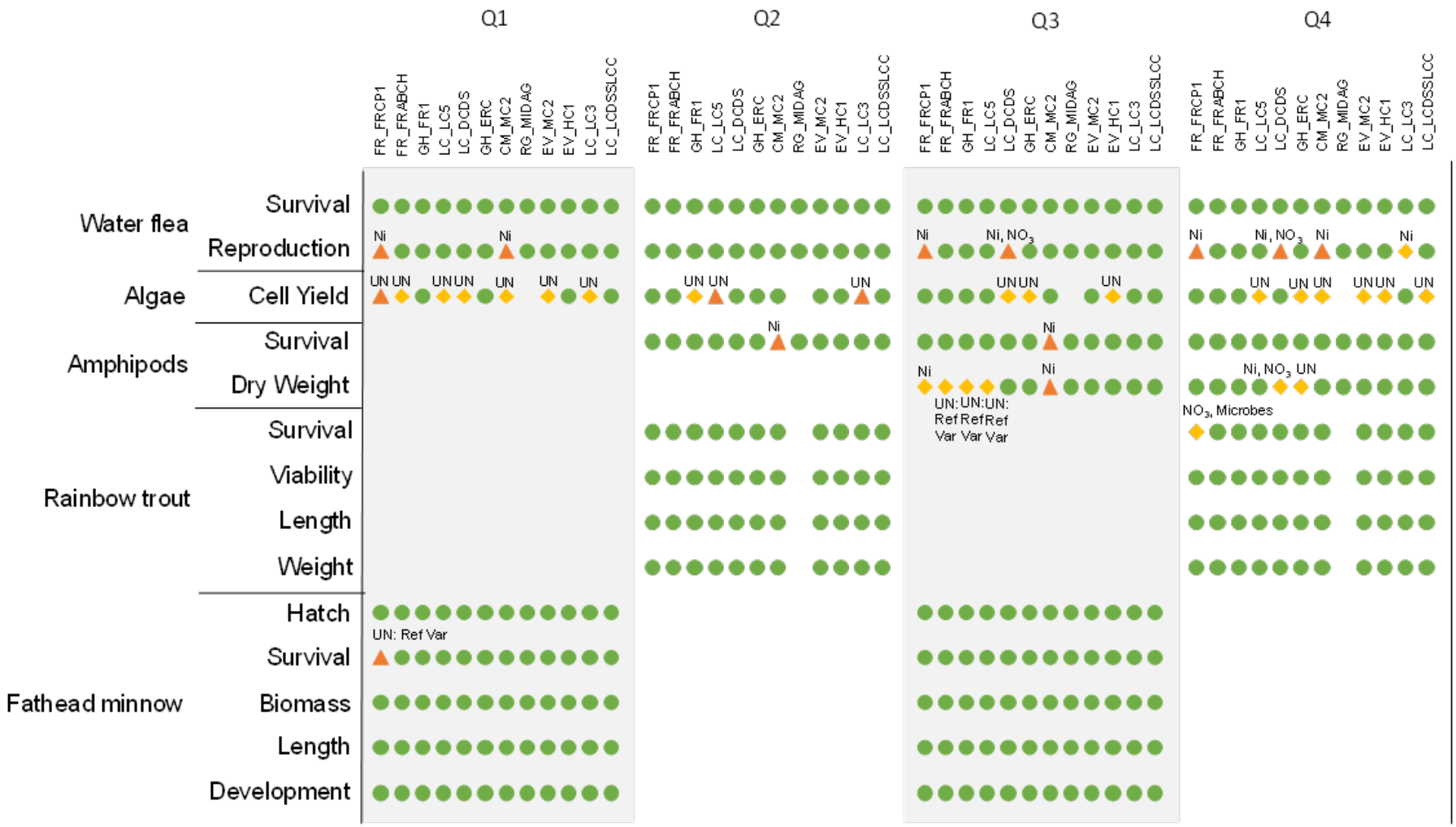
Recommendations from the 2021 testing program include minor refinements to test procedures to reduce confounding factors (i.e., factors that obscure responses to mine-related substances), continuing the recently expanded reference water testing to support interpretation of test water responses, and revisiting the potential contribution of nickel in historical test results using the site-specific benchmarks expected in 2022.

Figure TS-1: Summary of 2021 test results by species.



Note: Results are categorized in Section 3.3.1. The number of tests in each category is provided in bar labels. Values in parentheses are the number of tests with endpoint(s) significantly lower than one or more reference but categorized as no adverse response according to the decision framework in Figure 2.3-1.

Figure TS-2: Summary of Constituents Identified as Potentially Contributing to Observed Responses in 2021



Note: Results were categorized using local and regional normal ranges calculated in this report, see Section 3.2.3. Due to a lab technician error in the Q2 amphipod test, the Fording River reference was re-tested in Q2 resulting in two sets of survival results for this station (see Section 3.3.1.2). Both results for the Fording River reference in Q2 were categorized as no adverse response and have been combined in this figure. All stations were re-tested in Q3. Possible and likely symbols are annotated with constituent(s) identified as potentially contributing to observed response. Ref Var = high inter-reference variability; Ni = nickel; NO_3 = nitrate; UN = unknown: no water quality constituent was identified. Toxicity Identification Evaluations were conducted to support the causation assessment for water flea and amphipod tests.

Study Limitations

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We have relied in good faith on information provided by others as noted. We assume that the information provided is factual and accurate. We accept no responsibility for any deficiency, misstatement or inaccuracy contained in this report as a result of omissions, misinterpretations or fraudulent acts of persons interviewed or contacted.

The services performed as described in this report were conducted in a manner consistent with the level of care and skill normally exercised by other members of the engineering and science professions currently practising under similar conditions, subject to the time limits and financial and physical constraints applicable to the services. The content of this report is based on information collected during our investigation, our present understanding of site conditions, the assumptions stated in this report, and our professional judgement in light of such information at the time of this report. This report provides a professional opinion and, therefore, no warranty is expressed, implied, or made as to the conclusions, advice and recommendations offered in this report. This report does not provide a legal opinion regarding compliance with applicable laws. With respect to regulatory compliance issues, regulatory statutes and the interpretation of regulatory statutes are subject to change. The findings and conclusions of this report are valid only as of the date of the report. If new information is discovered in future work, or if the assumptions stated in this report are not met, Golder Associates should be requested to re-evaluate the conclusions of this report, and to provide amendments as required.

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1.0 INTRODUCTION

Golder Associates Ltd. (Golder) is pleased to provide Teck Coal Limited (Teck) with the following interpretive report summarizing quarterly and semi-annual chronic toxicity tests undertaken in 2021 for Teck's coal mining operations in the Elk Valley. This study represents the seventh full year of the regional chronic toxicity testing and interpretation to satisfy requirements under Permit 107517 and associated regulatory approvals.

1.1 Objective

The objective of this interpretive report is to present results from the combined 2021 chronic toxicity monitoring program (Permits 107517 and 106970), interpret test results by comparing site water to reference water responses, evaluate correspondence between water chemistry and toxicological responses, and identify recommendations for revision or augmentation of planned future programs. This report is provided to Teck to meet the chronic toxicity related reporting requirements of Permit 107517 Section 8.9.

1.2 Linkages to Broader Monitoring and Management

1.2.1 2021 Chronic Toxicity Testing

Quarterly and semi-annual chronic toxicity testing was conducted in 2021 under two subprograms:

- Regional Chronic Toxicity Testing Program. This subprogram addresses Permit 107517 requirements in Section 8.9 (Appendix A). Species requiring quarterly testing include a cladoceran (*Ceriodaphnia dubia*) and a unicellular green alga (*Pseudokirchneriella subcapitata*). On a semi-annual basis, tests using an amphipod (*Hyalella azteca*; Q2 and Q4), early-life stage rainbow trout (*Oncorhynchus mykiss*; Q2 and Q4), and early-life stage fathead minnows (*Pimephales promelas*; Q1 and Q3) are also required.
- Upper Fording River Chronic Toxicity Study. This subprogram was a special study for 2021 developed in consultation with the Environmental Monitoring Committee (EMC); it addressed Permit 107517 requirements in Section 4D2.5. Testing in 2021 aligned with the study design, which was designed to evaluate the cause, extent, and magnitude of potential chronic effects in the upper Fording River. The upper Fording River study included the same test species and testing frequency as the regional program, except that green alga is not tested.

This report presents the results for the 2021 regional chronic toxicity testing program. Results for the upper Fording River chronic toxicity study are reported in Golder (2022).

1.2.2 Water Quality Adaptive Management Plan for Teck

As required in Permit 107517 Section 10, Teck has developed an Adaptive Management Plan (AMP) to support implementation of the EVWQP to achieve water quality targets including calcite targets. The purpose of the AMP (Teck 2021) is to provide confidence that human health and the environment are protected or restored where necessary, and to facilitate continuous improvement of water quality in the Elk Valley. Following an adaptive management framework, the AMP identifies six Management Questions (MQs) that will be re-evaluated at regular intervals as part of AMP updates throughout EVWQP implementation. Triggers have been identified for specific MQs, which if reached, initiate action under the AMP Response Framework. The AMP also identifies key uncertainties that need to be reduced to fill gaps in current understanding and support achievement of the EVWQP objectives.

The results presented in this report provide information relevant to two of the six MQs and many of the key uncertainties identified in the AMP. Chronic toxicity testing results, along with data collected from other programs, are being used to re-evaluate the answers to MQ2 ("Will the aquatic ecosystem be protected by meeting the long-term Site Performance Objectives [SPOs]?"). Chronic toxicity testing results are also used as a line of evidence in the RAEMP (Minnow 2021) to answer MQ5 ("Does monitoring indicate that mine-related changes in aquatic ecosystem conditions are consistent with expectations?"). Reaching an answer of "no" or "uncertain" to an MQ would lead to action under the Response Framework in the AMP, as discussed further in Section 2.2.2.

Chronic toxicity testing results also assist in reducing key uncertainty (KU) 2.1 ("How will the science-based benchmarks be validated and updated?"), KU 2.2 ("How will the integrated assessment methodology used to derive area-based SPOs be validated and updated?"), and KU 5.1 ("How will monitoring data be used to identify potentially important mine-related effects on the aquatic ecosystem?"). Progress on reducing these key uncertainties, and associated learnings, are described in Annual AMP Reports.

1.2.3 Ecological Implications of Chronic Toxicity Tests

The regional chronic toxicity testing program is one of several programs that Teck conducts to monitor and evaluate potential effects of mining operations in the Elk Valley on aquatic receptors. Chronic toxicity tests are conducted using field-collected waters, thereby providing evidence for potential effects of surface water on aquatic receptors.

As discussed at the February 2022 EMC meeting, chronic fish toxicity results are an important line of evidence in the evaluation of potential effects of mine-related water quality on fish in the receiving environment. For the upper Fording River (UFR), this linkage is particularly important given that the abundance of Westslope Cutthroat Trout *(WCT; Oncorhynchus clarkii lewisi)* adults and sub-adults declined substantially between fall 2017 and fall 2019 (EoC 2021), with population recovery efforts now underway. For Harmer Creek, this linkage is also important in recognition of the WCT recruitment failure (i.e., a negligible number of individuals added to the population) for the 2018 and 2019 spawning-year cohorts and the reduced WCT recruitment in the 2016 and 2017 cohorts (i.e., recruitment was insufficient for population replacement; Thorley et al. 2021.

Ecological implications of chronic toxicity tests with early life stages of fish (rainbow trout and fathead minnow) on fish in the receiving environment depend on several factors, including:

- Timing of chronic embryo-alevin fish tests with seasonal fish development cycles for the corresponding watercourse to identify the quarter(s) when early life stages of fish could be present.
- Spatial and temporal overlap of chronic toxicity testing with fish use information to evaluate how chronic toxicity results overlap with fish distribution.
- Relative sensitivity of embryos/alevins and other life stages. As discussed at the February 2022 EMC meeting, early life stages of fish tend to be relatively sensitive to water quality stressors relative to older life stages (Environment Canada 1998). Therefore, chronic toxicity results for early life stages of fish can be relied upon as a conservative screen for potential effects to other fish life stages; if no adverse response is observed in early life stage tests, then no adverse response would be expected for older life stages. However, because early life stages tend to be relatively sensitive to water quality relative to other fish life stages (Environment Canada 1998), and because spawning of site residents is seasonal, adverse responses for early life stage testing may not be indicative of potential effects to juveniles and adults under field conditions.

- Reliability of test results, including consideration of testing artifacts such as microbial influence. Laboratory conditions are expected to increase the likelihood of accumulation and/or transmission of microbes in chronic toxicity tests in a way that would not be expected to occur in the environment (Section 2.3.3.2).

In the UFR, Dry Creek, and Harmer Creek, WCT is the only fish species present. Early life stages of WCT could be present from mid-May to August in the UFR and Dry Creek and from mid-June to October in Harmer Creek. These windows align with the timing of the Q2 early life stage rainbow trout testing (18 May to 15 June 2021) but not other sampling quarters. Therefore, the Q2 rainbow trout results are considered the most relevant for evaluating potential effects on early life stages of the congenic WCT. In other watercourses within the chronic toxicity program (Elk River, Michel Creek, lower Fording River, Line Creek), there are two or more fish species present with different spawning windows for each species. Given the range of spawning periods observed in these other watercourses, it is possible that early life stages of fish could be present in any month. For these watercourses, the most relevant chronic embryo-alevin fish test result would depend on the species in question and the spawning window in the corresponding watercourse.

The information presented above was used in this report to provide an initial interpretation of the potential implications of the 2021 chronic toxicity results on fish in the receiving environment. A formal evaluation of potential ecological implications of chronic toxicity results will be provided in the next RAEMP report, so that the chronic toxicity results (an indirect indication of aquatic health) can be interpreted in the context of biological monitoring results (a more direct indication of aquatic health).

1.3 Incorporating Feedback from the Environmental Monitoring Committee

Technical advice was provided by EMC members on the 2021 chronic toxicity interpretive report via the February 2022 conference call. Key changes made in response to EMC advice were:

- Evaluated the strength of evidence for microbial contribution in 2021 fish tests. For the 2021 fish tests with microbial observations, responses were compared for replicates with and without microbial observations (Section 2.3.3.2).
- Discussed seasonal trends in microbial occurrences in relation to timing of copper amendments and implementation of the microbial protocol by Nautilus (Section 2.3.3.2)
- Discussed linkages between the timing of quarterly fish toxicity tests and when early life stages may be present in the receiving environment (Section 1.2.3), and the potential implications of adverse effects in chronic fish tests on WCT in the UFR (Sections 3.4, 3.5, 4.0).
- Discussed linkages between the chronic toxicity testing results and the adaptive management plan (Section 1.2.2), including supplemental testing that was conducted as part of the AMP response framework (Section 2.2.2) and actions taken in response to the framework (Section 4.0).
- *P. promelas* normal ranges were calculated with and without Q1 2021 Elk and Michel reference tests, which had anomalously low survival relative to the historical dataset (Section 3.2.3.5).

- Results in 2021 were compared to historical results to identify potential seasonal patterns (i.e., are adverse responses observed in the same quarter and test species in each year?) and to evaluate any consistencies in the concentration-response analysis (i.e., are adverse responses attributed to the same constituents in each year?) (Section 3.4). Although this approach is consistent with previous interpretative reports, the causation assessment was strengthened this year by recategorizing historical results and incorporating historical microbial observations.

1.4 Report Organization

The remaining sections of this report present the methods (Section 2.0) and results (Section 3.0) of the 2021 regional chronic toxicity testing program, including causation assessment and comparisons to previous findings. Following those base findings, an integrated summary of findings (Section 4.0), uncertainty assessment (Section 5.0), and recommendations (Section 6.0) are provided. A summary of the acute toxicity testing conducted in 2021 is presented in Appendix B.

2.0 METHODS

2.1 Field

Water samples were collected from reference locations upstream of mine-related influences and from test sites downstream of mining every quarter or semi-annually in 2021, as shown in Table 2.1-1 and Figure 2.1-1. Water samples were submitted to Nautilus Environmental (Nautilus; Burnaby, BC and Calgary, AB) for toxicity testing (Section 2.2) and to ALS Environmental (Calgary, AB or Burnaby, BC) for chemical analysis. Weekly refresh samples were collected for toxicity tests with exposure duration longer than 7 days. Water samples were submitted for chemical analysis each time samples (whether for test initiation or weekly refresh) were collected. Water collection dates are provided in Appendix B.

Rationales for inclusion of stations in Table 2.1-1 are:

- All four reference stations (FR_UFR1, GH_ER2, CM_MC1, LC_SLC) were incorporated by Teck to provide information on responses in Elk Valley waters for samples upstream of the zone of mine-related influence. The four reference locations are not specified in the Permit but are included to assist with the interpretation of responses observed in mine-influenced waters. Over the last seven years, the breadth of reference water testing has increased, as it has been demonstrated that responses (and associated variation) in reference water are helpful for understanding and interpreting site water responses.
- Eleven of twelve test sites evaluated in 2021 (i.e., all except RG_MIDAG) were included in the integrated chronic toxicity program developed from combined Permit 107517 and Permit 106960 requirements.
- RG_MIDAG is not a Permit location, but rather was incorporated in the integrated chronic toxicity testing program by Teck in 2019 to characterize the spatial extent of nickel effects to invertebrates in Michel Creek (RG_MIDAG).[1,2] This station was added following the AMP Response Framework (see Section 2.2.2 for more details).

[1] In Michel Creek, the station used to characterize the spatial extent of effects was changed from CM_MC3 in 2018 testing to RG_MIDAG in 2019 testing. As discussed at the June 2019 EMC meeting, CM_MC3 was not representative of mainstem Michel Creek in the winter due to an ice jam. Therefore, station RG_MIDAG was selected as a replacement station in consideration of safe access, consistency with the biological monitoring program, and review of aqueous nickel concentrations.

[2] Testing at RG_MIDAG has been primarily conducted with *C. dubia* and *H. azteca* to characterize the spatial extent of potential nickel effects to invertebrates. Because crustaceans are the most sensitive group of test organisms for nickel, effects to fish and algae are not expected at measured nickel concentrations at RG_MIDAG.

Table 2.1-1: Reference Locations and Tests Sites used in the 2021 Regional Quarterly and Semi-Annual Toxicity Testing

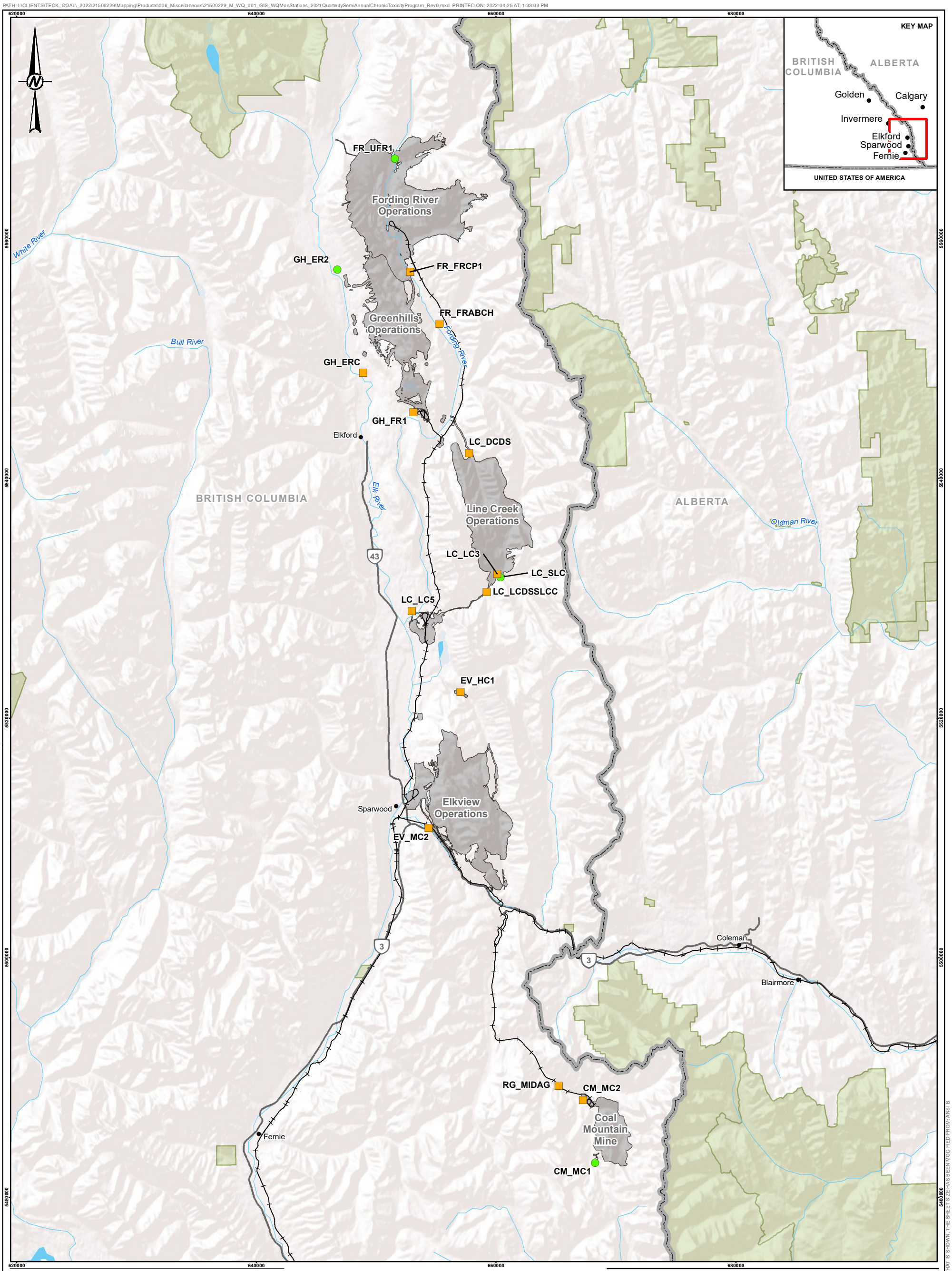
Watercourse	Reference or Test Site	Teck WQ Station ID[(a)]	EMS ID	Station Name
Fording River	Reference	FR_UFR1	E216777	Fording River upstream of Henretta Creek.
	Test Site	FR_FRCP1	E300071	Fording River downstream of Cataract Creek.
		FR_FRABCH	E223753	Fording River upstream of Chauncey Creek.
		GH_FR1	200378	Upper Fording River downstream of Greenhills Creek [Order Station FR4].
		LC_LC5	200028	Fording River downstream Line Creek [Order Station FR5].
Dry Creek	Test Site	LC_DCDS	E295210	LCO Dry Creek downstream of sedimentation ponds
Elk River	Reference	GH_ER2	200389	Elk River upstream of Greenhills Operations.
	Test Site	GH_ERC	E300090	Elk River downstream of Thompson Creek.
Michel Creek	Reference	CM_MC1	E258175	Michel Creek upstream of Operations.
	Test Site	CM_MC2	E258937	Michel Creek upstream of Andy Goode Creek.
		RG_MIDAG [(b)]	—	Michel Creek downstream of Andy Goode Creek.
		EV_MC2	E300091	Michel Creek at Highway 3 Bridge.
Harmer Creek	Test Site	EV_HC1	E102682	Harmer Spillway at Elk Valley Operations.
South Line Creek	Reference	LC_SLC	E282149	South Line Creek West Side of Main Rock Drain.
Line Creek	Test Site	LC_LC3	200337	Line Creek downstream West Line Creek and AWTF outfall.
		LC_LCDSSLCC	E297110	Line Creek downstream of South Line Creek.

Reference stations marked with grey highlight.

(a) Stations are listed from upstream to downstream for each watercourse.

(b) RG_MIDAG not part of Permit requirements as of 2021 but added to characterize spatial extent of effects in Michel Creek. No EMS ID is available for RG_MIDAG.

ID = Identification; WQ = water quality; — = no EMS ID.



LEGEND

- CITY / TOWN / COMMUNITY
- PRIMARY HIGHWAY
- RAILWAY
- WATERCOURSE
- BRITISH COLUMBIA - ALBERTA BOUNDARY
- COAL MINING OPERATION
- PROVINCIAL PARK / PROTECTED AREA
- WATERBODY

WATER QUALITY MONITORING STATIONS

- REFERENCE LOCATION
- TEST SITE LOCATION INCLUDED IN QUARTERLY AND SEMI-ANNUAL CHRONIC TOXICITY PROGRAM

0 5 10
1:300,000 KILOMETRES

REFERENCE(S)

BASE DATA OBTAINED FROM TECK COAL LIMITED AND GEOGRATIS, © DEPARTMENT OF NATURAL RESOURCES CANADA. ALL RIGHTS RESERVED.
DATUM: NAD 83 PROJECTION: UTM ZONE 11

CLIENT
TECK COAL LIMITED

PROJECT
2021 CHRONIC TOXICITY PROGRAM

TITLE
WATER QUALITY MONITORING STATIONS FOR 2021 QUARTERLY AND SEMI-ANNUAL CHRONIC TOXICITY PROGRAM

CONSULTANT
WSP GOLDER

YYYY-MM-DD	2022-04-25
DESIGNED	KM
PREPARED	DR
REVIEWED	EC
APPROVED	GL

PROJECT NO.	PHASE	REV.	FIGURE
21500229	M_WQ_001	0	2.1-1

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B
0 25mm

2.2 Laboratory

2.2.1 Quarterly and Semi-Annual Testing Program

Test organisms and procedures used in the quarterly and semi-annual testing program followed the general requirements outlined in Permit Section 8.9, with only minor refinements (developed over time with the review and endorsement of EMC). An overview of this program is provided in Table 2.2-1. Laboratory reports for each round of quarterly and semi-annual testing are provided in Appendix B, including detailed methodology, raw data, laboratory notes, quality assurance overview, and statistical significance tests, per protocol requirements.

For *C. dubia*, the Environment Canada test protocol specifies that test duration must be 7 ± 1 day, with the test being terminated on the day that at least 60% of control organisms have produced three broods. Both Golder and the toxicity testing laboratory (Nautilus Environmental) have encountered cases where a marginal achievement of the control brood criterion can introduce high uncertainty in the interpretation of the remaining test treatments. To better evaluate potential effects on brood patterns, per discussions with EMC, the 2021 tests were extended to a maximum of 8 days, regardless of the timing of controls reaching 60% with three broods. This test extension was also conducted in 2019 and 2020 testing. In the laboratory reports (Appendix B), the main body of each report contains results per Environment Canada protocol requirements; Appendix A of each laboratory report contains the raw data for both test durations. In this interpretive report, per discussions with EMC, results per standard protocol requirements were used in statistical analyses. This was done to be consistent with reporting in previous years, with comparisons between the two enumeration methods conducted separately. The methods to compare and analyze the two test durations, and corresponding evaluation of differences in timing and quantity of reproductive output, are described in Section 2.3.3, with results presented in Section 3.3.1.1.

Table 2.2-1: Summary of Quarterly and Semi-Annual Toxicity Tests

Test Species	Test Duration [days]	Endpoint(s)	Test Protocol	Number of Replicates per Test	Frequency of Testing
Water flea—*Ceriodaphnia dubia*	7 ± 1[(a)]	Survival and reproduction.	Environment Canada (2007a)	10	Quarterly
Green alga—*Pseudokirchneriella subcapitata* (formerly *Selenastrum capricornutum*, reclassified as *Raphidocelis subcapitata*)	3	Cell yield (growth inhibition).	Environment Canada (2007b)	8 (references and laboratory control); 4 (test sites)	Quarterly
Rainbow trout—*Oncorhynchus mykiss*	30	Survival, viability (which incorporates incidence of deformities), length, dry weight, behaviour[(b)].	Environment Canada (1998) embryo-alevin test	4	Semi-annual
Amphipod—*Hyalella azteca*	28	Survival and growth.	Modified from US EPA (2000), as described in Norberg-King et al. (2014)	5	Semi-annual
Fathead minnow—*Pimephales promelas*	28 days post-hatch[(c)]	Survival, hatch, length, biomass, normal development.	US EPA (1996) and ASTM (2013)	4	Semi-annual

(a) Protocol test duration is 7 ± 1 days, *C. dubia* tests were extended to maximum of 8 days in 2021 tests to evaluate potential brood effect.

(b) The behaviour endpoint is limited to documentation of unusual behaviours, rather than a quantitative endpoint. Permit 107517 also specifies hatching as an endpoint, although hatch rate is not part of the Environment Canada (1998) protocol. The survival endpoint provides an appropriate measure of successful hatch since the test is terminated shortly following hatch (Appendix B).

(c) Test duration is from <24-hour post-fertilization eggs until the organisms reach 28 days post-hatch. Total test duration is usually between 30 and 32 days (James Elphick, pers. comm.).

Table 2.2-2 summarizes the number of tests conducted in 2021 for each test species and station. Following permit requirements, quarterly (*C. dubia* and *P. subcapitata*) and semi-annual (*H. azteca*, *P. promelas*, and *O. mykiss*) chronic toxicity tests were conducted using water collected from 11 of 12 test sites listed in Table 2.1-1, plus additional testing at RG_MIDAG. Laboratory negative control water tests were also conducted for each species and test date, as specified in Appendix B.

For *H. azteca*, semi-annual testing usually occurs in Q2 and Q4. In Q2, tests were conducted as planned and survival data were recorded; however, due to a lab technician error, test organisms were disposed prior to measuring dry weight (see Section 3.1). In response to this, all stations were re-tested in Q3. The upper Fording River (UFR) chronic toxicity study stations were re-tested immediately in Q2, resulting in the Fording River reference (FR_UFR1) being tested for both endpoints (survival and growth) in both Q2 and Q3. The number of tests by station and endpoint is presented in Table 2.2-2.

For some tests, minor amendments of site waters were incorporated to improve the ability of the tests to identify mine-related responses, as distinct from spurious adverse effects caused by a natural biological agent (e.g., microbes causing fungal infections in fish) or lack of nutritional elements for laboratory organisms (e.g., low halides inhibiting crustacean development). These adjustments, which consisted of additional or trace amounts of copper or halides, were carefully designed to avoid introduction of adverse responses—the adjustments reduce variation in test responses without introducing analytical bias.

Per the 18 January 2019 amendment to Permit 107517, *P. promelas* and *O. mykiss* tests in 2021 were conducted in copper-amended water to curtail growth of microbes in site water; this test revision incorporates the outcome of previous investigations of anomalous responses (i.e., sporadic mortality phenomenon). For both fish species, waters were augmented with up to 20 µg/L copper in consideration of key toxicity-modifying factors including water hardness, pH, and dissolved organic carbon (DOC).[3]

[3] Per discussions with EMC on 30 November 2016 and subsequent approval by BC ENV (MoE 2016), non-amended *P. promelas* test results from previous sampling years (2015 and Q1 2016) are not included in the statistical analysis of quarterly test results due to their low reliability for assessing toxicant-based responses.

Table 2.2-2: Summary of Quarterly and Semi-Annual Tests Conducted in 2021[a,b]

Watercourse	Reference [c] or Test Site	Teck WQ Station ID	*C. dubia*	*P. subcapitata*	*O. mykiss* [d]	*H. azteca* [e]	*P. promelas* [d]
Fording River	Reference	FR_UFR1	Q1, Q2, Q3, Q4	Q1, Q2, Q3, Q4	Q2, Q4	Q2×2, Q3, Q4	Q1, Q3
	Test Site	FR_FRCP1	Q1, Q2, Q3, Q4	Q1, Q2, Q3, Q4	Q2, Q4	Q2, Q3, Q4	Q1, Q3
		FR_FRABCH	Q1, Q2, Q3, Q4	Q1, Q2, Q3, Q4	Q2, Q4	Q2, Q3, Q4	Q1, Q3
		GH_FR1	Q1, Q2, Q3, Q4	Q1, Q2, Q3, Q4	Q2, Q4	Q2, Q3, Q4	Q1, Q3
		LC_LC5	Q1, Q2, Q3, Q4	Q1, Q2, Q3, Q4	Q2, Q4	Q2, Q3, Q4	Q1, Q3
Dry Creek	Test Site	LC_DCDS	Q1, Q2, Q3, Q4	Q1, Q2, Q3, Q4	Q2, Q4	Q2, Q3, Q4	Q1, Q3
Elk River	Reference	GH_ER2	Q1, Q2, Q3, Q4	Q1, Q2, Q3, Q4	Q2, Q4	Q2, Q3, Q4	Q1, Q3
	Test Site	GH_ERC	Q1, Q2, Q3, Q4	Q1, Q2, Q3, Q4	Q2, Q4	Q2, Q3, Q4	Q1, Q3
Michel Creek	Reference	CM_MC1	Q1, Q2, Q3, Q4	Q1, Q2, Q3, Q4	Q2, Q4	Q2, Q3, Q4	Q1, Q3
	Test Site	CM_MC2	Q1, Q2, Q3, Q4	Q1, Q2, Q3, Q4	Q2, Q4	Q2, Q3, Q4	Q1, Q3
		RG_MIDAG [f]	Q1, Q2, Q3, Q4	—	—	Q2, Q3, Q4	Q1, Q3
		EV_MC2	Q1, Q2, Q3, Q4	Q1, Q2, Q3, Q4	Q2, Q4	Q2, Q3, Q4	Q1, Q3
Harmer Creek	Test Site	EV_HC1	Q1, Q2, Q3, Q4	Q1, Q2, Q3, Q4	Q2, Q4	Q2, Q3, Q4	Q1, Q3
South Line Creek	Reference	LC_SLC	Q1, Q2, Q3, Q4	Q1, Q2, Q3, Q4	Q2, Q4	Q2, Q3, Q4	Q1, Q3
Line Creek	Test Site	LC_LC3	Q1, Q2, Q3, Q4	Q1, Q2, Q3, Q4	Q2, Q4	Q2, Q3, Q4	Q1, Q3
		LC_LCDSSLCC	Q1, Q2, Q3, Q4	Q1, Q2, Q3, Q4	Q2, Q4	Q2, Q3, Q4	Q1, Q3
Total number of tests per species			**64**	**60**	**30**	**33 (growth) 49 (survival)**	**32**

(a) Stations are listed from upstream to downstream for each watercourse.

(b) Except where noted as "×2", one test was conducted per test species, quarter, and station (i.e., each Q in this table represents one test). Q1 = quarter 1; Q2 = quarter 2; Q3 = quarter 3; Q4 = quarter 4. "—" indicates that the test was neither conducted nor required under Permit 107517 or 106970.

(c) Reference locations (highlighted in grey) are not specified in the Permit but are included to assist with the interpretation of responses observed in mine-related influenced waters.

(d) *O. mykiss* and *P. promelas* tests were conducted using copper-amended samples (Appendix B).

(e) *H. azteca* Q2 test organisms were disposed prior to measured dry weight due to a lab technician error (see Section 3.1), and therefore the initial Q2 tests have only survival data. In response to this, tests were repeated in Q3 for all stations. Stations for the UFR chronic toxicity study (Golder 2022) were repeated immediately in Q2, resulting in FR_UFR1 being tested for both endpoints in both Q2 and Q3.

(f) RG_MIDAG is not currently part of Permit requirements but added to characterize spatial extent of effects in Michel Creek.

—: species not tested.

2.2.2 Toxicity Identification Evaluation and Linkage to Adaptive Management

Findings in chronic toxicity monitoring were reviewed in relation to MQ2 (“Will the aquatic ecosystem be protected by meeting the long-term SPOs?”) and MQ5 (“Does monitoring indicate that mine-related changes in aquatic ecosystem conditions are consistent with expectations?”) of the AMP. Unexpected findings would potentially indicate a “no” or “uncertain” answer to these questions, and therefore prompted an evaluation of potential actions under the AMP Response Framework.

For the 2021 regional chronic toxicity testing program, supplemental tests were conducted to evaluate potential cause(s) of responses observed in FR_FRCP1 tests (Section 2.2.2.1) and CM_MC2 tests (Section 2.2.2.2). Following the AMP Response Framework, Toxicity Identification Evaluations (TIEs) were conducted to investigate the potential cause of adverse responses in FR_FRCP1 tests and to further evaluate the interpretation of nickel as the suspected cause of adverse responses in CM_MC2 tests. To provide context for these supplemental studies, additional information on AMP response actions related to these findings is briefly summarized below and will be discussed further in annual reporting under the AMP.

An overview of methods for supplemental testing and context of related adaptive management responses is provided below. An overview of TIE data analysis in the context of the causation assessment is provided in Section 2.3.4,

2.2.2.1 FR_FRCP1 Adaptive Management Responses

Seasonally variable responses have been observed in previous chronic toxicity testing at FR_FRCP1 (Golder 2021a); this finding has triggered further evaluation and investigation under the AMP response framework. Water quality monitoring data show strong seasonal variation in conditions, which is now understood to reflect a seasonal pattern of subsurface flow in the Fording River. The channel bed of the UFR changes from bedrock near the Fording River Operations South Tailings Pond to alluvial sediments in downstream reaches. Due to greater permeability of alluvial sediments, a portion of the Fording River flow naturally enters subsurface in this area and travels underground for several kilometres before re-emerging as surface flow. The effect of this subsurface flow on surface hydrology (and associated water quality) is most pronounced in winter when flow in the Fording River is lowest.

The effect of subsurface flow on water quality in the UFR is to reduce the dilution available for inputs of mine-affected tributaries entering the Fording River mainstem. In particular, inputs from Cataract Creek have historically had a pronounced effect on winter water quality at FR_FRCP1, which is located approximately 525 metres downstream of the mouth of Cataract Creek. Water quality at FR_FRCP1 was reported to exceed one or more compliance limits for selenium, nitrate, and sulphate during winter low-flow conditions from 2015 until the Cataract Creek diversion was constructed in August 2019 (discussed further below). Seasonal peaks of mine-related constituents occurred between November and March of each year, reflecting the influence of Cataract Creek inputs (with low or no dilution from upstream surface flow of the Fording River during periods when a relatively large portion of the Fording River flows subsurface).

Given the current understanding of seasonal hydrology and water quality at FR_FRCP1, Teck has initiated several actions:

- First, diversion of Cataract Creek flows upstream to the Swift Creek Ponds was initiated by Teck in August 2019, prior to Q3 testing. This conveyance is ultimately intended to divert Cataract Creek water for treatment through Swift Ponds, but it also prevents discharge of surface flows from Cataract Creek into the Fording River in a reach that seasonally dries. Commencing conveyance prior to constructing the active water treatment facility (AWTF) was proposed as a short-term mitigation action to ameliorate water quality in the reach of the Fording River with low or no winter surface flow [4].
- Second, the Fording River Operations compliance location was relocated from FR_FRCP1 to FR_FRABCH, where the Fording River has returned to surface. The new location better attains the objective of a compliance location to monitor fully mixed conditions in the receiving environment downstream of FRO and captures and reflects all or most point and non-point source discharges from the mine site. FR_FRABCH is immediately upstream of the confluence with Chauncey Creek. Monitoring at this location is expected to reflect mixed Fording River conditions that are less dominated by midwinter flows of Cataract Creek water in the Fording River channel and capture subsurface flow from Kilmarnock Creek that surfaces downstream of FR_FRCP1. Station FR_FRABCH was added to the regional chronic toxicity testing program in Q4 2018, and testing continued at the station in all quarters of 2021, as a better representation of potential effects in mixed Fording River conditions.
- Third, Teck has continued TIE studies in all quarters in 2021 to better understand the potential cause(s) of toxicity at FR_FRCP1. Methods for the 2021 FR_FRCP1 TIE included (Appendix B-6):
  - Treatments were conducted with *C. dubia* and *H. azteca*, which have been shown to be sensitive to some mine-related constituents of potential concern.
  - *C. dubia* water collection dates were April 13 (Q1), May 18 (Q2), August 10 (Q3), and October 12 (Q4). *H. azteca* water samples were collected on a weekly basis between May 18 to June 8 (Q2)[5], August 10 to 31 (Q3 re-test) and October 12 to November 9 (Q4).
  - Treatments were designed to identify whether toxicity was caused by divalent metal cations (using ethylenediaminetetraacetic acid [EDTA] treatment). Treated and untreated samples were tested concurrently, so that any effect of the treatment could be discerned.
  - Results of the Fording River TIEs are discussed in Sections 3.4.1 (*C. dubia*) and 3.4.3 (*H. azteca*).
- Fourth, Teck conducted the 2021 UFR chronic toxicity study (Golder 2022) to evaluate the cause, extent, and magnitude of potential chronic effects in the UFR. This special study was implemented in parallel with the existing regional program for one year to maximize the value of additional data collected above the Swift-Cataract Diversion (FR_FR2 and FR_MULTIPLATE) and below (FR_FR4 and FR_FRRD).

[4] The portion of the Upper Fording River that is primarily subsurface flow varies based on flow conditions and is greatest in winter. In December 2018, the spatial extent of limited surface flow was approximately 2 km (i.e., surface flows reappeared near the confluence with Porter Creek), although most of the subsurface flow returned to surface several kilometres downstream (i.e., closer to Chauncey Creek).

[5] *H. azteca* Q2 test organisms were disposed prior to the measurement of dry weight due to a lab technician error (see Section 3.1). In response to this, all stations were then re-tested in Q3. The UFR chronic toxicity study stations were re-tested immediately in Q2, resulting in the Fording River reference (FR_UFR1) being re-tested in both Q2 and Q3.

2.2.2.2 CM_MC2 Adaptive Management Responses

Adverse responses have been observed in previous chronic toxicity testing at CM_MC2 (Golder 2018), with a general trend of increasing frequency and magnitude of responses in crustacean tests from 2015 to 2019. In addition, biological monitoring in 2015, 2016, 2017, 2018, and 2019 reported reduced abundance of mayflies (a sensitive benthic invertebrate taxon) at Michel Creek downstream of Corbin Creek relative to previous years and relative to upstream portions of Michel Creek. These findings triggered further evaluation and investigation under the AMP response framework.

In 2017, a TIE was initiated to investigate the cause of adverse responses observed in CM_MC2 chronic toxicity tests. Nautilus (2018) identified nickel as the likely cause of toxicity in these tests. This interpretation was supported by:

- nickel toxicity data that indicated a potential for effects on sensitive invertebrate species at concentrations near 5 µg/L, below the BC water quality guideline of 150 µg/L for high-hardness waters (≥ 180 mg/L $CaCO_3$).
- water quality data that indicated the increasing trend in chronic toxicity test responses corresponded with an increasing trend in aqueous nickel concentrations between 2015 (generally ranged from 5 to 15 µg/L) to 2017 (generally ranged from 10 to 45 µg/L; Golder 2018).

As a result of identifying nickel as a potential toxicant in CM_MC2 tests, Teck has initiated several actions:

- First, Teck has expanded monitoring at Coal Mountain Mine (CMm) to better understand and delineate potential effects. Station CM_MC3 was added to the chronic toxicity testing program in Q1 2018 and was replaced with station RG_MIDAG in 2019 (see Section 2.1 for details). RG_MIDAG is not a Permit location but was added to the program to characterize the spatial extent of potential effects in chronic toxicity tests. Biological monitoring was conducted at CMm under the RAEMP between 2015 and 2017. In 2018, monitoring under the RAEMP was expanded to include additional sites in Michel Creek. A formalized local aquatic effects monitoring program (LAEMP) for CMm was developed and implemented in 2019 based on Permit 107517 requirements.
- Second, Teck has continued TIE studies in 2021 to further support the interpretation of nickel as the cause of adverse responses in CM_MC2 crustacean tests. Methods for the 2021 Michel Creek TIE included (Appendix B-7):
  - Treatments were conducted with *C. dubia* and *H. azteca,* which have been shown to be sensitive to nickel.
  - Treatments were conducted using CM_MC2 and RG_MIDAG water. *C. dubia* water collection dates were 13 April (Q1), 18 May (Q2), 10 August (Q3), and 12 October (Q4). *H. azteca* water samples were collected on a weekly basis between 18 May to 8 June (Q2), 10 to 31 August (Q3)[6] and 12 October to 2 November (Q4).

[6] *H. azteca* Q2 test organisms were disposed prior to measured dry weight due to a lab technician error (see Section 3.1). In response to this, tests were repeated in Q3 for all stations. Therefore, Q2 tests have only survival data while Q3 and Q4 tests have both survival and dry weight data.

  - Treatments were designed to identify whether toxicity was caused by divalent metal cations (using EDTA treatment). Treated and untreated samples were tested concurrently, so that any effect of the treatment could be discerned.
  - Results of the Michel Creek TIEs are discussed in Sections 3.4.1 (*C. dubia*) and 3.4.3 (*H. azteca*).
- Third, Teck initiated studies to support the development of site-specific effects benchmarks for nickel in the Elk Valley. This work includes an ongoing series of laboratory-based toxicity studies and desktop data analyses to better understand the toxicity of nickel in Elk Valley waters, the influence of water chemistry factors on toxicity, and to what extent nickel may be contributing to observed effects in the chronic toxicity and biological monitoring programs. The outcome of this work is expected to be a set of site-specific benchmarks that will support evaluation and management of nickel at CMm and throughout the Elk Valley.
- Fourth, Teck has modified pit dewatering activities at CMm to minimize the effect of 34 pit pumping on downstream concentrations of nickel and other mine-influenced constituents. The changes in pit dewatering have reduced peak concentrations of nickel since 2019. This has been associated with a reduction in the frequency and magnitude of chronic toxicity test results in 2019, 2020 and 2021 as compared to 2017 and 2018.
- Fifth, Teck has developed nickel tank and non-tank-based removal technology.
- Sixth, Teck is evaluating mitigation options for nickel at CMm. This evaluation is proceeding in parallel to the toxicity investigation work described in the preceding bullet.

2.3 Data Analysis

Data analyses for 2021 quarterly and semi-annual tests consisted of the following five steps:

- Review and summarize quality assurance/quality control information from laboratory reports to establish that organism performance in the laboratory control water met acceptability criteria for the protocol (Section 2.3.1).
- Address key sources of variance that could affect responses observed in test waters, so that the ability to detect a true toxicological response is improved (Section 2.3.2).
- Categorize 2021 test results as no, possible, or likely adverse response, based on the response size in the test and how the response compares to the typical range observed in local and regional reference waters (Section 2.3.3).
- Conduct a causation assessment to examine potential causes of responses observed in 2021 tests categorized as possible or likely (Section 2.3.4).
- Compare 2021 test results to previous years to identify potential response patterns (i.e., were adverse responses observed in the same quarter and test species in 2021 and previous years) and potential causation patterns (i.e., were adverse responses attributed to the same constituents in 2021 and previous years?) (Section 2.3.5).

2.3.1 Quality Assurance/Quality Control

Laboratory reports for each round of quarterly and semi-annual testing include a quality assurance section (Appendix B). Quality assurance information was reviewed and summarized to establish that organism performance in the laboratory control water met acceptability criteria for the protocol as it pertains to the health histories and sensitivity of the organisms, and that no deviations from test procedures occurred that would influence the reliability of the data.

2.3.2 Sources of Variance

Responses observed in test waters are subject to several sources of variance, including:

- Variation in test organism performance (Section 2.3.2.1).
- Variation in test organism sensitivity to toxicants (Section 2.3.2.2).
- Variation in background water quality characteristics (e.g., environmental and toxicity modifying factors) and their effect on test responses (Section 2.3.2.3).
- Variation in concentrations of toxicants in test waters (Section 2.3.2.4).
- Other random inter-individual variability that manifests as experimental “noise”.

One of the objectives of the quarterly and semi-annual interpretive report is to identify toxicological responses and distinguish these responses from other sources of variance. The ability to detect a true toxicological response is improved when confounding effects of the other sources of variance are minimized. Therefore, the following sections outline the approach used to evaluate and address the first four sources of variance. Addressing the first four sources of variance is expected to substantially improve the ability to identify a true toxicological response; therefore, no methods were applied to estimate other factors contributing to experimental noise.

2.3.2.1 Organism Performance

To control for temporal variation in test organism performance (batch sensitivity) as a potential confounding factor, response data (including reference waters and test waters) were control normalized[7] before performing data analyses. Individual replicate values were control normalized for each species endpoint. The species endpoint means and standard deviations that are presented herein were calculated from the control normalized replicate values. The objective of control normalization was to use control responses to reduce or eliminate variation in test organism performance among test batches, such that the ability to detect a true toxicological response between test site waters and reference waters is improved. Control normalization was implemented for all endpoints except for *P. subcapitata* cell yield, per agreement at the 5 February 2018 conference call with the EMC. *P. subcapitata* cell yield was excluded from normalization because it is largely influenced by the variability in nutrient concentrations and ionic strength of lab water and site water.

2.3.2.2 Organism Sensitivity

To evaluate whether temporal variation in test organism sensitivity was a potential confounding factor, reference toxicant test data were summarized from laboratory reports and compared across test batches. For each test species and endpoint, effect concentrations from reference toxicant tests were expressed as a percentage of the historical mean reference toxicant effect concentration and plotted for visual examination. Values greater than 100% indicate that organisms in that batch are less sensitive relative to the historical mean, whereas values less

[7] $control\ normalized\ response = \left(\frac{site\ water\ response}{laboratory\ control\ response}\right) \times 100$

than 100% indicate organisms are more sensitive relative to the historical mean. Observations of organism sensitivity were conducted by visually assessing whether responses in reference toxicant tests varied above or below the historical mean for an extended period. Organism sensitivity was considered stable if reference toxicant results remained close to the historical mean (i.e., within 15%). Reference toxicant results that deviated farther from the historical mean were evaluated for patterns (e.g., multiple consecutive values above or below the historical mean, temporal trends in sensitivity). As discussed in Appendix B, the sensitivity of organisms used in the toxicity tests is considered appropriate if the mean response in reference toxicant tests falls within two standard deviations of historical results obtained from the laboratory.

2.3.2.3 Background Conditions (Normal Ranges)

To evaluate whether temporal or spatial variation in background water quality and its effect on test responses might be a confounding factor, normal ranges (NRs) were developed for responses in reference waters. For each endpoint, two types of NRs were calculated:

- Local NR—Local NRs were developed separately for each reference location. Each NR was inclusive of findings from multiple batches of tests (e.g., Fording River NR included all tests conducted to date with Fording River reference water).
- Regional NR—The regional NR was inclusive of findings from multiple batches and multiple reference locations (Fording River, Elk River, Michel Creek, and South Line Creek references).

NRs were developed using the combined 2015 to 2021 quarterly results from Elk River and Fording River reference sites, the 2017 to 2021 quarterly results from the Michel Creek reference site, and the 2018 to 2021 quarterly results from the South Line Creek reference site.[8] Per discussions with the EMC at the February 2018 meeting, NRs were defined as the 2.5th to 97.5th percentiles of mean test results (i.e., NRs were intended to identify results that fall at the tails of the distribution, with an overall 5% chance that a randomly selected result would fall outside the NR). Percentiles were estimated using the normal distribution function in Systat^{TM}. For some endpoints, assumptions of normality were not met (i.e., p value <0.05), indicating that a normal distribution may not be appropriate for the dataset. This generally occurred when the sample size was small or the variance in reference test results was low. Because normality was not met in all datasets, NRs in some cases may deviate slightly from the central 95% of the statistical distribution; however, NRs were still considered to be useful to characterize the typical range of responses observed in reference waters. Responses in reference waters tested between 2015 and 2021 were also plotted for visual assessment.

The approach used herein to develop local and regional NRs, as well as the NRs themselves, are based on the cumulative reliable findings to date; each year of monitoring improves the characterization of inter- and intra-station variations for reference waters. The approach and NRs developed herein are expected to undergo refinement with future chronic toxicity testing results. For example, the preliminary NRs based on low sample sizes will be recalculated for future years of monitoring and will achieve the sample sizes required for derivation of reliable NRs.

Per the recommendation in the 2020 report (Golder 2021a), the NRs developed in this year's report were used to re-assign historical test results (2015 to 2020) into narrative categories of no, possible, or likely adverse response (see Section 2.3.3 for more details). This was done to improve interpretation of historical comparisons and amend historical results that were previously classified as "no category".

[8] Reference tests with unreliable results were not included in normal range calculations, as outlined in the results (Section 3.2.3). Discussion of reliable and unreliable results was vetted through EMC prior to finalizing the normal ranges.

2.3.2.4 Variation in Concentrations of Toxicants

To evaluate variation in concentrations of toxicants in test waters, coefficients of variation (CVs) were calculated for mean water chemistry concentrations in the longer duration tests and reviewed to assess variability in weekly concentrations. The CV is a measure of relative variability, calculated as the ratio of the standard deviation to the arithmetic mean. If a concentration was below the reported detection limit, the full detection limit was used. CVs were calculated for *H. azteca*, *O. mykiss*, and *P. promelas* tests, as these are the only tests with weekly refresh samples. *C. dubia* and *P. subcapitata* tests are conducted using water collected on a single day (Section 2.1); therefore, this source of variance is not expected to be a confounding factor for these species.

2.3.3 Evaluation of 2021 Test Results

Per the recommendation in the 2020 report (Golder 2021a), the NRs developed in this year's report were used to re-assign historical test results (2015 to 2020) into narrative categories of no, possible, or likely adverse response. The historical and 2021 test results were evaluated using the following three statistical comparisons:

- **Batch-specific comparison**—Pairwise comparisons of test site responses to reference responses, with analysis limited to batch-specific findings (i.e., test site results for each quarter were compared to all references tested in that quarter). Each quarterly laboratory report includes statistical analyses using CETIS™ (Comprehensive Environmental Toxicity Information System; Tidepool Scientific Software 2013) to identify test sites with mean results statistically significant (p <0.05; herein referred to as 'significantly') lower than the mean response in associated Fording River, Elk River, Michel Creek, or South Line Creek reference waters.
- **Local reference comparison**—Mean test site responses were compared to local NRs. As described in the previous section, local NRs were inclusive of findings from multiple batches at a single reference location. Each test site was paired with the best reference match *a priori* based on geography. When available, test sites were paired with an upstream reference in the same local watershed. If an upstream reference was not available, then the test site was paired with the upstream reference on the watercourse that the tributary flows into (e.g., Dry Creek is a tributary of Fording River, so the Fording River reference was used for LC_DCDS). Pairings are provided in Table 2.3-1.
- **Regional reference comparison**—Mean test site responses were compared to regional NRs. As described in the previous section, regional NRs were inclusive of findings from multiple batches and multiple reference locations.

Table 2.3-1: Reference and Test Site Pairings used in the Local Normal Range Comparison

Test Site	Local Reference Comparison	Rationale
FR_FRCP1	Fording River (FR_UFR1)	Reference is located on the same watercourse.
FR_FRABCH[(a)]		
GH_FR1		
LC_LC5		
LC_DCDS		LCO Dry Creek is a tributary to Fording River
GH_ERC	Elk River (GH_ER2)	Reference is located on the same watercourse.
EV_HC1		Harmer Creek (via Grave Creek) is a tributary to Elk River.
CM_MC2	Michel Creek (CM_MC1)	Reference is located on the same watercourse.
RG_MIDAG[(b)]		
EV_MC2		
LC_LC3	South Line Creek (LC_SLC)	Reference is located on the same watercourse.
LC_LCDSSLCC		

(a) FR_FRABCH has been adopted as the Fording River permitted site as of March 2021.
(b) RG_MIDAG is not part of Permit requirements as of 2021 but added to characterize spatial extent of effects in Michel Creek.

Test site results were categorized as no, possible, or likely adverse response according to the methods in Figure 2.3-1. Categories for 2021 test results were presented by test species and test site. Test results were interpreted as follows:

- A test was considered to reflect **no adverse response** if the mean result was:
  - not significantly lower[9] than any reference in the batch (per statistical comparisons in laboratory reports [Appendix B]) or
  - significantly lower than one or more references in the batch but within the local NR and mean effect size[10] was less than 20%
- A test was considered to reflect a **possible adverse response** if the mean result was significantly lower than one or more references in the batch, but was:
  - within the local NR and the mean effect size was between 20 and 50% or
  - below the local NR but within the regional NR

  Tests in this category were considered to have uncertainty regarding whether the result represents an adverse response to toxicants in the test water or alternatively may reflect variance in test organism performance related to background water quality.
- A test was considered to reflect a **likely adverse response** if the mean endpoint result was significantly lower than one or more references in the batch and:
  - within the local NR but the effect size was greater than 50% or
  - below the regional NR

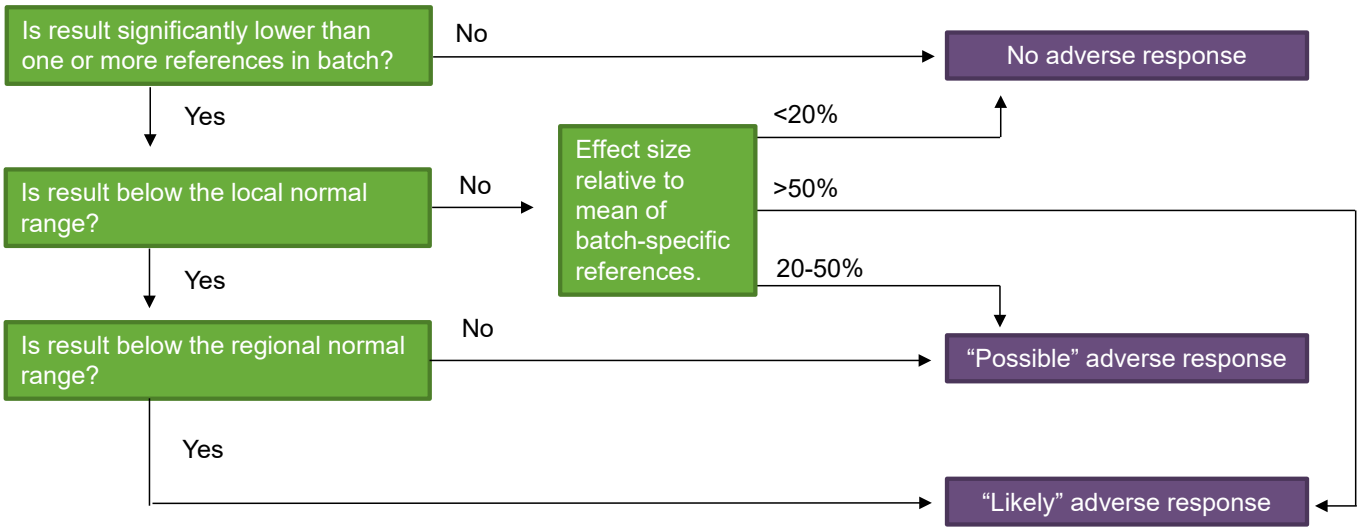
Any endpoint categorized as a possible or likely adverse response in one or more tests conducted in 2021 was carried forward to the causation assessment (Section 2.3.4). If an endpoint was carried forward, then all available tests for that endpoint were included in the concentration-response analysis (i.e., tests conducted with reference and test site waters between 2015 and 2021).

Although the statistical comparisons to NRs remain the primary basis for classification of test results, the effect size decision point recognizes that there can be different levels of test variance (and statistical power) in individual rounds of testing. The effect size decision rule helps to discern results that are statistically significant but with low magnitude of response from those that are larger in response magnitude. The use of the 50% effect size threshold provides a means of flagging larger responses, but for which the variance in NRs is wide (i.e., low statistical power to identify an adverse response).

[9] Responses are defined as “lower” when the endpoint result is smaller when expressed as the positive aspect of performance (i.e., lower survival, reduced growth, reduced reproduction). In other words, the result is lower when the adverse effect size is greater.

[10] Effect size relative to the mean of batch-specific reference results.

Figure 2.3-1: Decision framework for inclusion of endpoints and constituents in the concentration-response analysis.



Individual replicate and mean results were plotted for all endpoints. Example data plots are provided in Figure 2.3- 2 (individual replicate results) and Figure 2.3-3 (mean results) with annotation to explain how data plots were interpreted in Section 3.3. As shown on Figure 2.3-3 (mean results), local and regional NRs were shown to illustrate the normal range of test organism responses observed in reference waters tested between 2015 and 2021. Test sites were paired with a single reference for comparison to the local NR.

As discussed in Section 2.3.5, mean responses in chronic toxicity tests were plotted over time (2015 to 2021) to compare 2021 responses to previous years. The annotation on Figure 2.3-3 (mean results for 2021) also applies to how data plots were interpreted in Section 3.5 (mean results for 2015 to 2021).

Figure 2.3-2: Example data plot for individual replicate results.

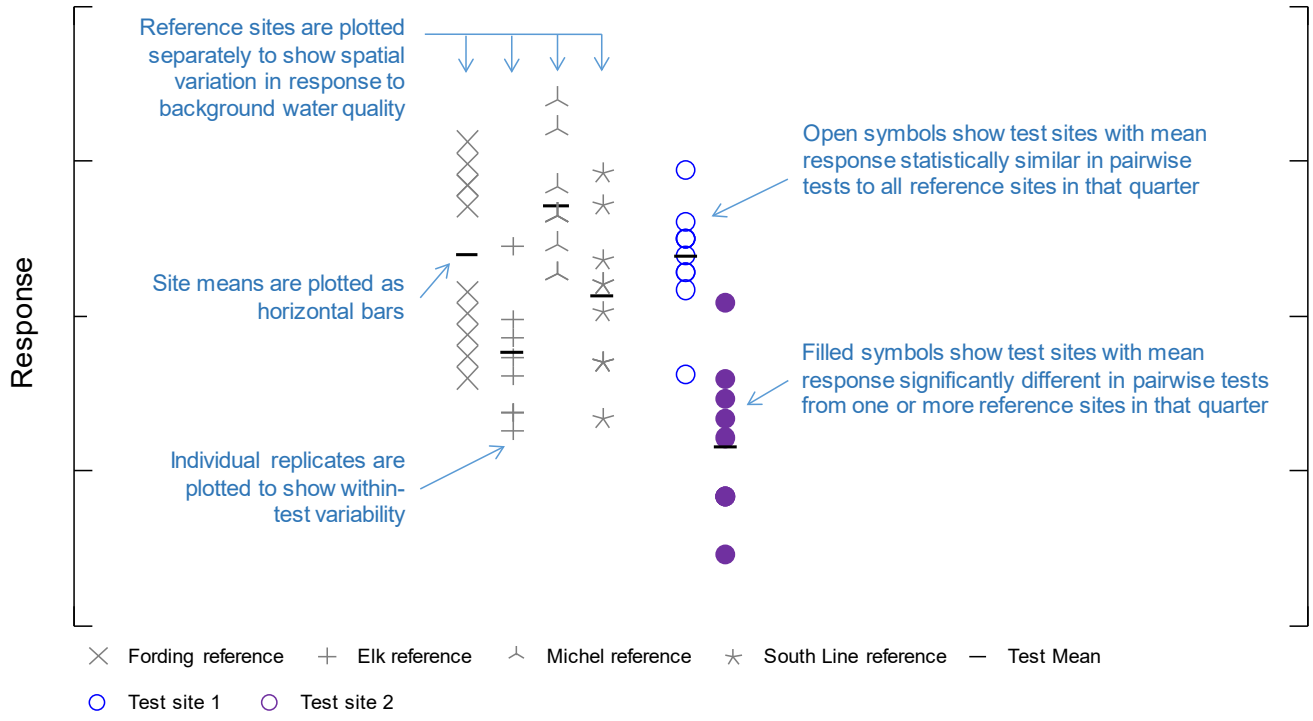
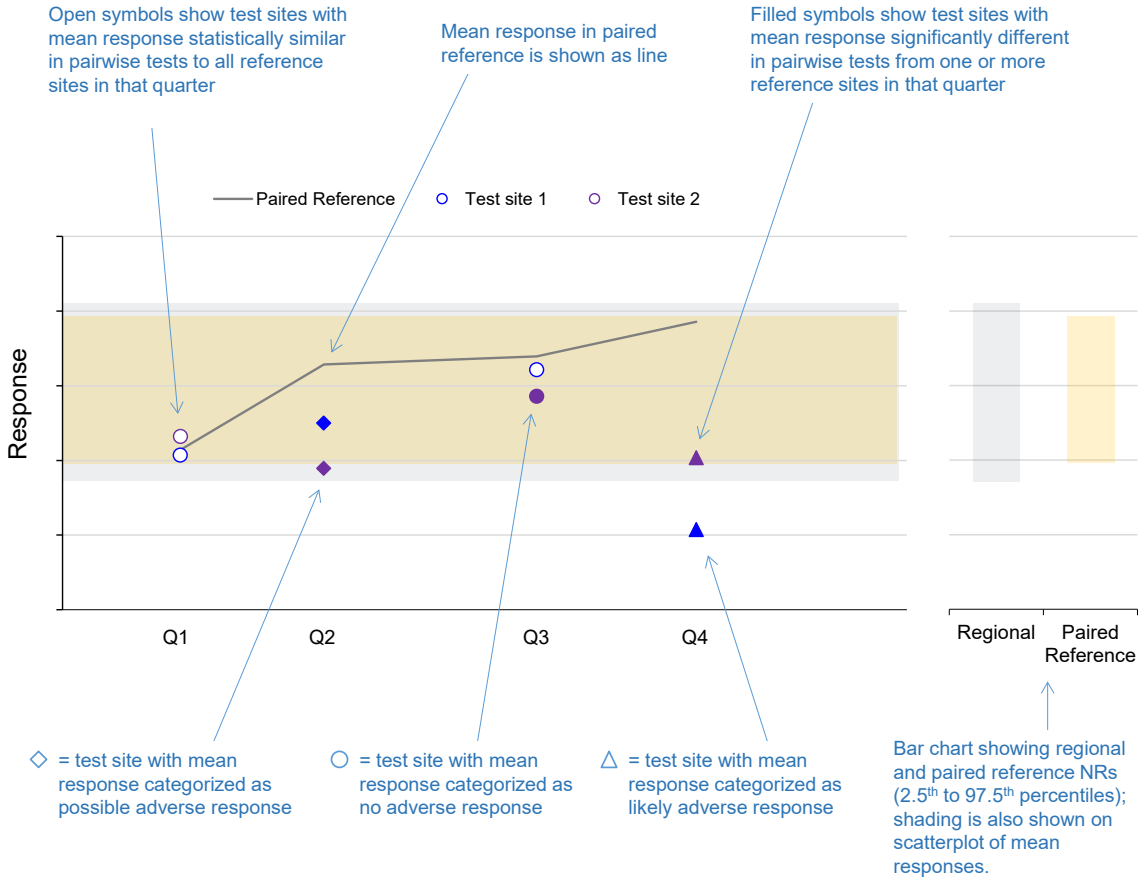


Figure 2.3-3: Example data plot for mean results.



2.3.3.1 Evaluation of *Ceriodaphnia dubia* Broods

Potential implications of the Environment Canada test protocol on *C. dubia* reproduction were discussed with the EMC at the October 2018 meeting, February 2019 conference call, May 2019 meeting, and March 2020 conference call. The *C. dubia* test protocol specifies that the test ends when ≥60% of controls produce three or more broods. This has implications for the chronic toxicity testing program, as the reproductive output in reference and/or test site waters could be biased low by tests being terminated just before the third brood in site waters is counted. The third brood accounts for approximately 50% of the reproductive output (James Elphick, pers. comm.), which means that minor differences in brood output can have a large impact on reproduction results. Furthermore, a minor delay in reproduction, either due to toxicological processes or due to random variations, can cause large variations in enumerated reproductive output. Each replicate that does not produce a third brood prior to test termination could theoretically result in a reduction of the overall reproductive output by 5% (e.g., if zero of 10 replicates have a third brood, then the reproductive output could be reduced by 50%; if two of 10 replicates have a third brood, then the reproductive output could be reduced by 40%, and so on). To evaluate the potential effects on reproductive output, 2021 *C. dubia* testing was conducted two ways based on input from the EMC:

- According to standard Environment Canada protocol (i.e., 7 ± 1 days).
- With results of the test extended to a maximum of 8 days, regardless of the timing of controls reaching 60% with three broods.

The bench sheets for each *C. dubia* reproduction test were tabulated by the laboratory. The number of neonates in the first three broods was recorded for the Environment Canada protocol test termination, and separately for the 8-day test (regardless of what day the third brood was produced). Any reproductive output from a fourth or greater brood was omitted from the data prior to statistical analysis. The proportion of adults producing three broods was also calculated separately for each of the two test variants. An analysis of variance (ANOVA) was used to identify test sites with mean results significantly lower than the batch-specific mean response in associated Fording River, Elk River, Michel Creek, or South Line Creek reference waters in the 8-day tests. The results of the ANOVAs were compared to the batch-specific comparisons conducted by the laboratory on Environment Canada protocol tests to determine if differences in conclusions occurred between the two test terminations.

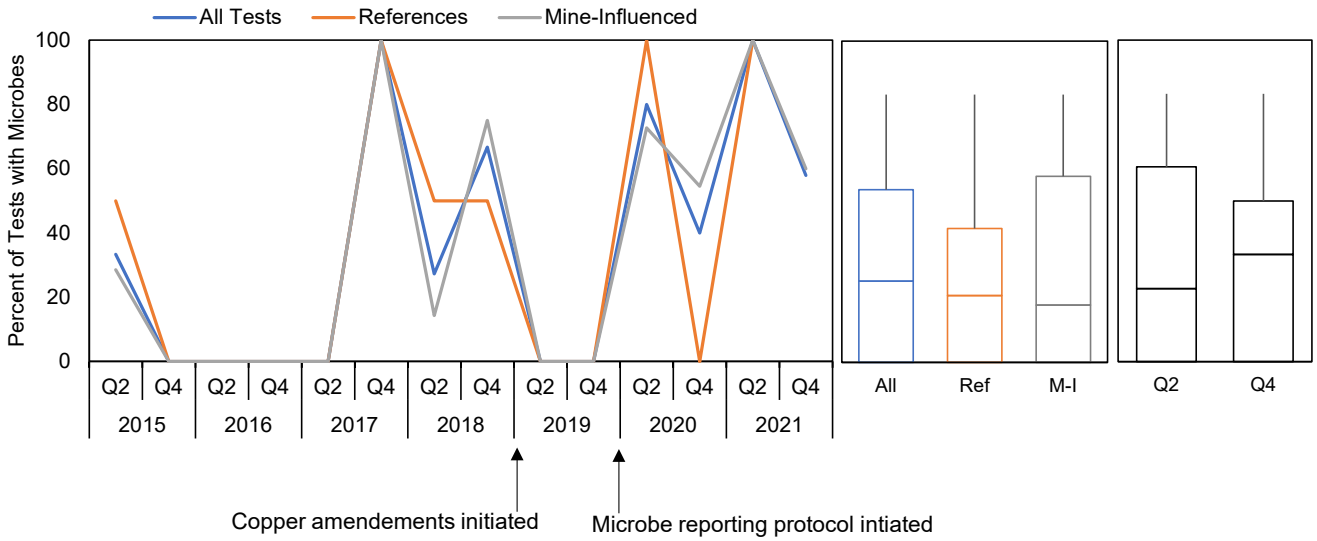
2.3.3.2 Evaluation of Potential Microbial Interferences in Fish Tests

The effects of microbes and fungus in tests with early life stages of *P. promelas* has been well documented in the literature. *P. promelas* are susceptible to adverse effects caused by fungi and/or bacteria, which is recognized as “sporadic mortality phenomenon” (Grothe and Johnson, 1996; Kszos et al., 1997; Downey et al. 2000). This phenomenon typically produces mortality starting as early as day 4 of a 7-day larval stage test, or day 6 of tests beginning with the egg stage and produces high variability in rates of survival among replicates and nonmonotonic dose responses (Downey et al. 2000). In a 32-day survival and growth test, adverse effects associated with microbial growth generally cease by day 13 of the test (Nautilus 2020a). Over the history of the regional chronic toxicity testing program, *P. promelas* tests have been identified as having effects consistent with sporadic mortality phenomenon (e.g., Golder 2021b) and measures have been adopted to reduce the confounding effect of microbes.

Golder is not aware of literature documentation of microbial-related effects to early life stages of *O. mykiss* encountered during laboratory tests. However, fungal or microbial growth has been commonly observed in site-specific testing with early life stages of *O. mykiss* in the regional chronic toxicity monitoring program (e.g., Golder 2021a) and in some cases, survival has been noted by the laboratory to be lower in microbial-affected tests relative to tests without microbial observations. Microbial or fungal growth is typically observed as a white mass of hyphae covering the surface of eggs, or loose aggregations of fungal hyphae may also be observed on the bottom of the test container (Nautilus 2020b). Figure 2.3-6 shows microbial growth observed on *O. mykiss* eggs in Q2 2021 testing.

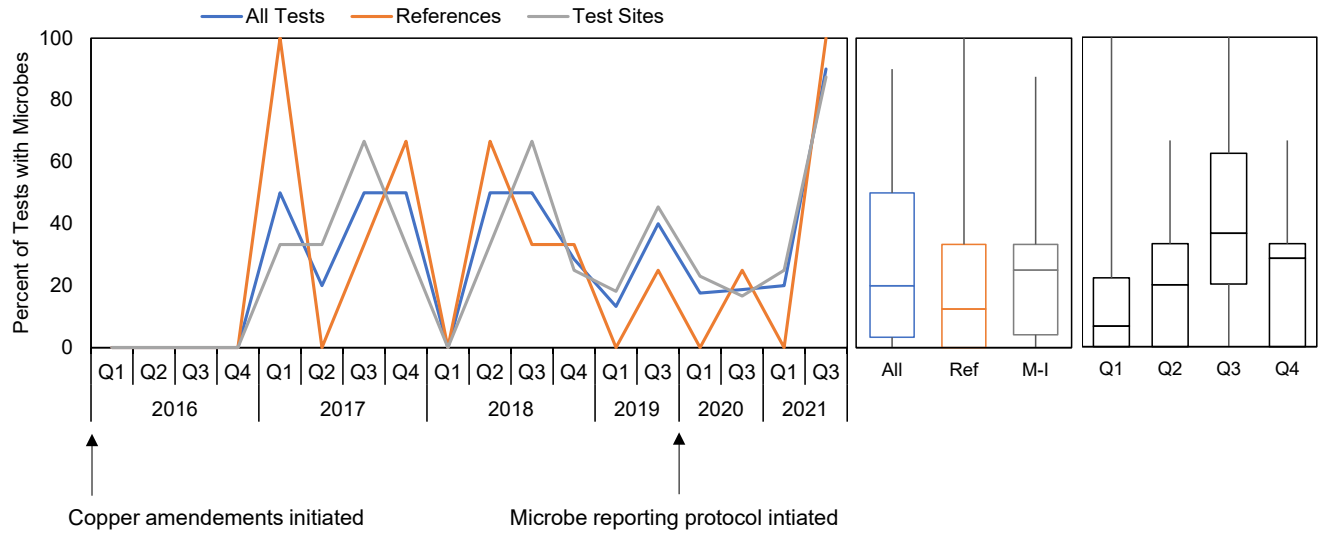
The incidence rate of microbial observations in *O. mykiss* and *P. promelas* tests has been variable from 2015 to 2021 (Figures 2.3-4; Figure 2.3 -5). For a given quarter, the percentage of tests in which microbes were documented in at least one replicate was similar for tests conducted for *O. mykiss* (0% to 100%) and *P. promelas* (0% to 90%); ranges were similar for testing conducted before and after implementation of the formal protocol to document microbial presence. For *O. mykiss*, the variability in microbial influence does not appear to be driven by seasonal influences (i.e., no pattern observed among quarters) or station type (i.e., no pattern observed between reference and test site responses). The incidence rate of microbial observations in *O. mykiss* tests was identical between reference and test site waters (36%). For *P. promelas*, no apparent pattern was identified for station type (reference versus test site); across quarters, there was a trend for a higher prevalence of microbial observations in Q3 relative to other quarters. The incidence rate of microbial observations in *P. promelas* tests was nearly identical for reference (27%) and test site (28%) waters. In aggregate, the microbial incidence rate generally shows a lack of patterns over time, which is not surprising given the sporadic nature of this phenomenon.

Figure 2.3-4: Microbial incidence rate in *O. mykiss* tests between sampling years (left panel), reference versus mine-influenced sites (centre panel), and quarters (right panel).



Notes: In the box plots in center and right panel, the top whisker indicates the maximum, the top of the box indicates the third quartile, the center indicates the median and the bottom of the box indicates the first quartile. Microbes were not documented in the bench sheets for Q4 2017; however, Nautilus concluded that observed effects were consistent with microbial growth (Nautilus 2018a).

Figure 2.3-5: Microbial incidence rate in *P. promelas* tests between sampling years (left panel), reference versus mine-influenced sites (centre panel), and quarters (right panel).



Notes: For the center and right panels, the top and bottom whiskers indicate the maximum and minimum, the top of the box indicates the third quartile, the center indicates the median and the bottom of the box indicates the first quartile. Frequency of microbes in 2015 tests are not available; however, subsequent TIE testing concluded that adverse effects in these tests were likely caused by microbiological components of these samples (Nautilus 2016).

Figure 2.3-6: Microbial growth on *O. mykiss* eggs in Q2 2021 testing (photos provided by Nautilus Environmental).

As discussed at the June 2021 EMC conference call, microbial interferences are expected to be an artifact of laboratory conditions, rather than an environmentally relevant stressor under natural field conditions, based on the rationale provided below. This rationale is summarized from a response to EMC advice received on the March 2021 EMC conference call.

- Laboratory tests have static renewal conditions (daily replacement of ~80% water, with ~20% water carried over during each water renewal), which increases the likelihood of accumulation of microbial loading in a small water volume relative to flushing under site conditions.
- Laboratory tests have several fish exposed in each container, which increases the likelihood of transmission between organisms in an individual replicate relative to unconstrained site conditions. This cross-transmission of microbes often results in strong adverse effects across individual replicates, as the response can spread rapidly in the confined test chamber. Figure 2.3-7 shows an example of a test container for one replicate in an *O. mykiss* embryo-alevin test. Figure 2.3-6 shows a small section of a test container, but the proximity between microbial-affected fish and unaffected fish (at the time of the photo) is evident.
- Laboratory tests tend to have higher temperature, which increases the likelihood of transmission relative to lower temperatures reflective of site conditions.

In summary, laboratory conditions are expected to increase the likelihood of accumulation and/or transmission of microbes within a test replicate in a way that would not be expected to occur in the environment. This is an important consideration when interpreting chronic toxicity test results because inclusion of replicates with microbial observations could introduce a negative bias (i.e., responses identified that would not be observed in the natural environment).

Potential effects of microbes in 2021 fish tests were visually assessed by comparing responses in replicates with and without microbial observations by the laboratory. For *P. promelas*, for which the timing of infection has been well documented (approximately days 5 to 13), the timing of microbial observations was also reviewed to inform the strength of evidence for microbial-related effects. Per discussions at the February 2022 EMC meeting, although several fish tests had microbes identified, these tests were carried forward and included in statistical analyses (e.g., PCA, Spearman Rank correlations).

Figure 2.3-7: Test container for single replicate in *O. mykiss* embryo-alevin testing conducted in Q2 2021 (photo provided by Nautilus Environmental).

2.3.4 Causation Assessment

A causation assessment was conducted to identify potential contributors to adverse responses observed in 2021 quarterly and semi-annual tests. The assessment was conducted for all endpoints for which one or more "possible" or "likely" adverse responses were identified in 2021.

To support this assessment, responses in chronic toxicity tests were paired with matching water chemistry data. The selection of matched (concurrent and co-located) chemistry data depended on the duration of the test, as some tests entailed collection of multiple water samples on a weekly basis with measurements of chemical constituents in each sample. Tests with *C. dubia* and *P. subcapitata* were conducted using water collected on a single day and were paired with water chemistry collected on that day. For other test species, effects data were paired with the mean concentration of the weekly submitted samples collected over the duration of the test.

The causation assessment consisted of five components:

- TIEs (when applicable).
- Comparison of water quality data against water quality guidelines (WQGs) and EVWQP benchmarks.
- Spearman rank order correlations between response and explanatory variables.
- Graphical analysis of concentration-response.
- Identification of potential contributors to adverse responses.

The first four components are used as lines of evidence to support the fifth (combined identification of potential contributors). Components are described in the following sections.

Toxicity Identification Evaluations

The TIE results (Appendices B-6 and B-7) were reviewed and summarized as to whether treatments reduced toxicity (improved response) in TIE testing (Section 2.2.2). If a treatment significantly improved the response relative to the unamended sample, the constituent group associated with that treatment was identified as a potential contributor to toxicity in the unamended sample. For example, if a response was improved in the EDTA- treated sample, then divalent metals were identified as a plausible contributor to toxicity in the unamended sample.

Water Quality Screening

Water chemistry samples collected concurrently with chronic toxicity samples (Section 2.1) were screened against the lowest level 1 EVWQP benchmarks (cadmium, nitrate[11], selenium, sulphate; Teck 2014) or long-term chronic WQGs, hereby referred to as chronic WQGs, and short-term acute WQG, hereby referred to as acute WQG (other constituents; BC ENV 2019b, 2021)[12]. For nitrate and sulphate, Teck has developed updated effect concentrations under the MQ2 project (Golder 2021b) that combines results from spiking studies conducted both before and after the EVWQP; as discussed in Golder (2021c), updated effect concentrations provide an improved understanding of effects to representative species (e.g., *C. dubia*, *O. mykiss*) relative to the EVWQP benchmarks. WQGs derived by BC ENV were used preferentially because BC ENV develops guidelines to be specifically protective of aquatic life in BC. If a WQG was not available, guidelines or probable no effect concentrations derived by the Canadian Council of Ministers of the Environment (CCME) or Environment and Climate Change Canada (ECCC) were used. As discussed in Section 2.3.2.4, CVs were calculated for the mean concentrations and reviewed to assess variability in weekly concentrations. Interpretation of screening results is provided in the last subsection (identification of potential contributors).

Spearman Rank Correlation

Spearman rank order correlations were conducted using paired response and water chemistry data from all reference and test sites.[13] Although correlation does not necessarily indicate causation, the analysis of correspondence between test results and water quality may provide insight into potential causes. The correlation analysis included reference locations and test sites; the analysis was conducted with two datasets: 1) 2015 to 2021 data (inclusive) and 2) 2021 data.

Total concentrations were used for constituents that have a chronic WQG for the total fraction (e.g., zinc) or that lack a WQG (e.g., silicon). Dissolved concentrations were used for constituents with a WQG for the dissolved fraction (e.g., cadmium). Water quality variables were $\log_{10}$ transformed prior to conducting the Spearman rank order correlations.

[11] For nitrate, the Elk River hardness-dependent benchmark equation was used to screen nitrate concentrations from the Elk River reference site, GH_ERC, EV_HC1, and EV_MC2. The Fording River hardness-dependent benchmark equation was used to screen nitrate concentrations from the remaining reference and test sites.

[12] Nickel was screened against the interim level 1 screening value (5.3 µg/L), which is based on potential effects to invertebrates.

[13] Some *P. promelas* and *O. mykiss* tests were excluded from the Spearman rank correlation due to evidence of microbial growth in tests prior to 2021, or quality assurance/quality control criteria were not met in tests, per rationale provided in annual interpretive reports.

Correlations were also conducted using responses paired with principal components (PCs) identified via principal component analysis (PCA) of water quality data, and responses paired with the sum of toxic units (∑TU). The objective of this analysis was to test whether responses could be explained by an overall indicator of mine water influence on water quality (PCA) or mixture effects (∑TU), in addition to testing individual water quality constituents. These explanatory variables are explained further in the following bullets:

- A PCA is a multivariate analysis technique used to describe patterns of inter-correlations among variables of interest. It calculates dominant components of variance from a matrix of chemical variables to reduce the multidimensional nature of the data while retaining much of the information from the original variables. The PC scores were used in the Spearman rank correlation as an overall indicator of mine water influence on water quality.[14] Water quality variables were $\log_{10}$ transformed prior to conducting the PCA in Systat™. The PCAs were conducted with two separate datasets (i.e., 2021 only, and pooled data from 2015 to 2021) to evaluate whether the relationship between test responses and PCs (i.e., indicators of overall mine influence) differed in 2021 relative to the pooled dataset. For example, if water quality differed slightly in 2021 relative to previous years, then the relationship between test responses and PCs may be different for 2021 relative to the pooled dataset. For each PC, component loadings (i.e., the water quality constituents that are strongly correlated with the PC) were reviewed to identify similarities and differences between the two datasets.
- The ∑TU is an exposure metric for mixtures. For each constituent in the mixture with a WQG, the measured concentration was divided by the chronic WQG to calculate toxic units (TUs). If a chronic WQG was not available, the short-term WQG was used. Where total and dissolved guidelines were available (i.e., iron), the total guideline was used because total concentrations were above WQGs more frequently than dissolved concentrations. For nickel, because recent studies conducted by Teck have indicated potential effects attributable to nickel at concentrations lower than the WQG, 5.3 µg/L was used in the denominator[15]. Calculated TUs for all constituents in the mixture were summed. The TUs for each mixture was calculated two ways: 1) using the WQG in the denominator (i.e., as described above) and 2) using the lowest level 1 benchmark from the EVWQP in the denominator (Teck 2014; applies to sulphate, nitrate, and dissolved cadmium). Per discussions with the EMC at the 5 February 2019 conference call, selenium was excluded from the ∑TU calculation because benchmarks reflect bioaccumulation-based exposures over long periods and not direct toxicity in standardized toxicity tests. The ∑TUs were conducted with separate datasets (i.e., 2021 only versus pooled 2015 to 2021) to evaluate whether the relationship between test responses and ∑TUs (i.e., indicators of potential mixture effects) differed in 2021 relative to the pooled dataset.

[14] The number of PCs retained for correlation analysis was determined from the inflection point of a plot of eigenvalues (the PCA "'scree plot"). The PCs were retained if they had an eigenvalue greater than 1 and were in the steep portion of the scree plot to the left of the inflection point. The PCs with eigenvalues less than 1 and/or to the right of the inflection point are relatively uninformative in terms of patterns of covariation among water quality variables.

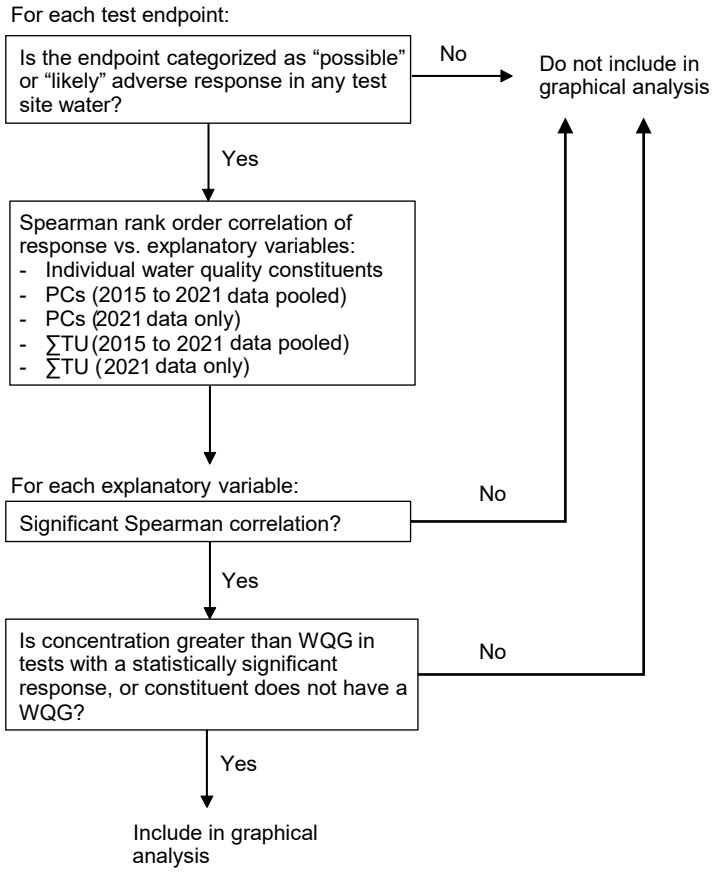
[15] Per concurrence at the March 2019 EMC meeting, the interim screening value of 5.3 µg/L was used herein. This value corresponds to the lowest level 1 screening value used in recent aquatic health assessments conducted for Teck in the Elk Valley. This value could change pending further evaluation of site-specific toxicity data.

Per discussions during the March 2020 EMC conference call, a *p* value of 0.005 was used to identify constituents that could potentially be explanatory variables in the causation assessment. Because of the large number of correlation analyses being conducted (more than 50 per endpoint), there is an inflated chance of obtaining a significant result by chance (i.e., spurious significant outcomes due to simultaneous multiple comparisons). The potential for spurious correlations is also affected by the generally high degree of covariance among water quality variables in mine-influenced water. Therefore, the statistical significance results presented herein should be interpreted as indicative of a potential relationship between test responses and water quality, not strong evidence that a relationship exists. A Spearman rank correlation coefficient of 0.4 was used herein to identify potential explanatory variables with strong correlations for discussion purposes, except for *C. dubia* where 0.6 was used to capture patterns relative to species specific results.

Graphical Analysis

Figure 2.3-8 outlines how the screening against WQGs and EVWQP benchmarks and Spearman rank correlation were used to identify explanatory variables for graphical analysis.

Figure 2.3-8: Decision framework for inclusion of endpoints and explanatory variables in the graphical analysis.



Note: Order constituents are screened against lowest level 1 EVWQP benchmarks, nickel is screened against the interim screening value of 5.3 µg/L per concordance at the March 2019 EMC meeting, and all other constituents are screened against applicable WQGs. WQG = water quality guideline; PCs = principal components; ∑TU = sum of toxic units.

For constituents with significant correlations, screening results in tests categorized as possible or likely were reviewed. Constituents with concentrations lower than the chronic WQG were not carried forward for graphical analysis.[16] If the concentration was greater than a chronic WQG or if the constituent did not have a chronic WQG, then the constituent was carried forward to the graphical analysis.

Graphical analyses (endpoint responses plotted against explanatory variables) were conducted for all constituents that had statistically significant correlations and that were either greater than a chronic WQG or did not have a chronic WQG. For constituents with hardness-dependent water quality guidelines or benchmarks, a hazard quotient was calculated and plotted to account for test specific hardness, as suggested by the EMC. The EVWQP benchmarks used in the concentration-response plots are receptor-specific, where invertebrate species are plotted using the level 1 invertebrate benchmark and fish species are plotted using the level 1 fish benchmarks. *P. subcapitata* was plotted with the lowest level 1 benchmark. The PC scores and ∑TUs with statistically significant correlations were also included in the graphical analysis as a combined indicator of exposure to mine-influenced water (PC scores) or a combined indicator of potential mixture effects (∑TUs).

For constituents that lack a chronic WQG but are commonly assessed as a component of total dissolved solids (TDS; e.g., calcium), the individual constituents were not plotted; instead, responses were plotted against the concentration of TDS. For *C. dubia*, responses were also plotted against a multi-ion toxicity (MIT) hazard quotient, calculated based on the chronic EC_{20} models developed by Mount et al. (2019).[17] The sulphate and TDS effect concentrations (site-specific) and MIT effect concentrations (literature-based) are alternative ways of characterizing effects of major ion mixtures.[18] Therefore, these are alternative ways to evaluate the contribution to toxicity from the same set of ions, calculated either from the concentration of the major anion (sulphate), cations (calcium and magnesium), or osmolarity (cations and anions that comprise TDS).

Concentration-response plots were visually examined to assess the consistency of correspondence between constituent concentrations and test responses. A consistent concentration-response relationship is visually apparent when there is broad overlap in responses measured in different tests but at similar concentrations.

Identification of Potential Contributors to Toxicity

Results from TIEs, screening against WQGs and EVWQP benchmarks, Spearman rank correlations, and graphical analysis were reviewed together for each test categorized as a possible or likely adverse effect to identify potential contributors to adverse responses.

[16] Nickel was an exception to this rule because recent studies conducted by Teck have indicated potential effects attributable to nickel at concentrations lower than the WQG.

[17] Mount et al. (2019) developed two sub-models: 1) a sub-model developed to characterize general ion toxicity, and 2) a sub-model developed to characterize calcium and magnesium specific toxicity. Because of the observed independent action between magnesium-specific and general ion toxicities, these sub-models were formulated and applied separately, and whichever indicated greater toxicity was applied for an exposure of interest (Erickson et al. 2018; Mount et al. 2019). That is, hazard quotients were calculated for both sub-models and the higher of the two values (i.e., greater effect at a given exposure) was used.

[18] The site-specific sulphate testing (and the resulting sulphate and TDS effect concentrations) has evaluated toxicity of multiple ion mixtures that include sulphate, its counter-ions, and the hardness and alkalinity conditions under which high sulphate concentrations occur in the Elk Valley. Sulphate was introduced into test solutions as calcium sulphate and magnesium sulphate in a calcium-to-magnesium ratio that is comparable to that observed in the Elk Valley. Thus, the effect concentrations from site-specific testing studies reflect effects of site-relevant ion mixtures.

For water quality, a specific constituent in a test categorized as possible or likely toxicity was considered unlikely to cause the observed effects, provided that:

- The measured concentration was lower than concentrations measured in reference tests and tests categorized as no adverse response; or
- the WQG or lowest level 1 EVWQP benchmark for the constituent (if available) was not dependent on modifying factors (e.g., hardness).[19]

Conversely, to evaluate whether the constituent could be contributing to observed effects, published toxicity data were reviewed if a constituent in a test categorized as possible or likely had a measured concentration higher than:

- Concentrations measured in reference tests and tests categorized as no adverse response and greater than WQG or lowest level 1 EVWQP.
- Concentrations measured in reference tests and tests categorized as no adverse response and where no WQG is available.

Explanatory variables (i.e., water quality variables, ∑TUs, PC scores) identified as having statistically significant Spearman rank correlations and/or exhibited consistent exposure-response relationship in the graphical analysis were discussed for tests categorized as possible or likely to determine if they potentially contributed to toxicity.

2.3.5 Comparison of 2021 Results to Previous Years

Similarities and differences between test results in the 2021 program and previous programs (2015 to 2020) were summarized, focusing on the incidence of adverse responses by season and station. The objectives for this comparison were to identify potential seasonal patterns (i.e., were adverse responses observed in the same quarter and test species in 2021 and previous years?) and potential causation patterns (i.e., were adverse responses attributed to the same constituents in 2021 and previous years?). Results were summarized by test species/endpoint and test site, as described below.

To summarize by test species and endpoint, mean responses in chronic toxicity tests were plotted against time for all endpoints. Responses were control normalized for all endpoints except *P. subcapitata* cell yield (Section 2.3.2.1). Local and regional NRs, developed using the approach described in the Section 2.3.2.3, were shown on plots to illustrate the normal range of test organism responses observed in reference waters tested in 2015 to 2021 inclusive. As was done for 2021 test results (Section 2.3.3), test sites from previous years were paired with a single reference for comparison to the local NR. Therefore, four plots were made for each endpoint. Regional NRs were shown on all plots. An example data plot is shown in Figure 2.3-3 (2021 responses) and is annotated to explain how plots were interpreted in Section 3.5 (2015 to 2021 responses). The symbols on each plot indicate whether the mean response was categorized as no (circle), possible (diamond), or likely (triangle). Per recommendations in the 2020 annual interpretive report (Golder 2021a), historical tests were re-evaluated and re-categorized using the NRs developed herein.

To summarize by test site, test categories were plotted against time for all endpoints. The symbols on each plot indicate whether the test endpoint was categorized as no (circle), possible (diamond), or likely (triangle). For tests categorized as possible or likely, symbols are annotated where a potential toxicant was identified.

[19] In cases where the measured concentration of either the dissolved or total fraction was higher than concentrations measured in reference tests and tests categorized as no adverse response, but no WQG or benchmark exists for the respective fraction, the remaining fraction for that constituent was compared to its respective WQG or benchmark.

3.0 RESULTS

3.1 Quality Assurance/Quality Control

Detailed laboratory quality assurance/quality control (QA/QC) information is provided in the Nautilus reports (Appendix B). The following bullets summarize QA/QC information for all quarterly and semi-annual tests:

- Health histories of the test organisms used in the exposures were acceptable and met requirements of the test protocols.
- Water quality constituents remained within ranges specified in the protocol throughout the tests.
- Results of reference toxicant tests fell within the acceptable range for organism performance of mean and two standard deviations based on historical results obtained by the laboratory (i.e., sensitivity of organisms used in the tests was acceptable), except for the following:
  - Q3 *P. promelas* test—The reference toxicant result for survival (LC_{50} = 3.9 g/L sodium chloride) was below the historical two standard deviation range (LC_{50} = 4.1 to 9.7 g/L sodium chloride); this is expected to occur by chance alone in 5% of cases (Appendix B-3). The laboratory investigated the health histories of *P. promelas* and concluded that all testing and culturing procedures were followed appropriately, and the Q3 results were considered by the laboratory to be acceptable.
- There were no deviations from the test methodologies, except for the following:
  - Planned modification to the *C. dubia* test duration—tests were extended to 8 days to support the evaluation of potential brood impacts on reproductive output (see details in Section 2.3.3).
  - Planned modification to the *H. azteca* method—All site waters were supplemented with 25 mg/L chloride and 0.02 mg/L bromide using sodium chloride and sodium bromide according to recommendations of the *Hyalella* Advisory Group (chaired by Chris Ingersoll, United States Geological Survey) (Norberg-King et al. 2014) because low concentrations of these halides are known to impair growth of this species (Appendix B).
  - Planned modification to the *P. promelas* and *O. mykiss* tests—Tests were conducted on copper-amended samples (up to 20 µg/L depending on site-specific toxicity-modifying factors) to reduce potential adverse effects caused by fungi and microbes that have previously been observed in Elk Valley samples (Appendix B).
  - Planned modification to the *O. mykiss* tests—Eggs were exposed using a blocked design (i.e., eggs from one fish were used for replicate A of each test concentration, eggs from the second fish for replicate B, and so on); this approach deviates from the Environment Canada test method, which indicates that the eggs should be pooled prior to testing (Appendix B). This modification is appropriate because it reduces the risk of non-viable eggs affecting the test results (Appendix B). Pooling of eggs without blocking introduces a higher risk that the test will yield a negative control failure, or have a large uncertainty related to inconsistent egg quality that is dispersed throughout the test results (Appendix B). Additionally, eggs are usually pooled from two or more suppliers to decrease the risk of poor-performing egg batches. In Q2 2021, eggs in one of the four replicates were considered non-viable (Appendix B-2). These results were excluded from statistical analyses, thereby leaving three replicates with viable eggs for analysis.

- Unplanned modification to the *C. dubia* water refresh protocol in Q4—On day 7 of the *C. dubia* test, no water replenishment or water quality was performed due to insufficient sample (Appendix B-4). Neonates were still removed, and the test tubes were fed a 3:1 ratio of algae:trout chow and Cerophyl™. This deviation is not expected to influence results of the tests.
- Unplanned modification to the *H. azteca* holding conditions in Q4—Upon arrival of the *H. azteca* organisms, the temperature of the holding water measured between 20.0 to 20.5°C (a change of greater than 3°C during transport) and the dissolved oxygen measured less than 80% (Appendix B-4). The organisms and holding water were acclimated overnight to increase the temperature (to 23 ± 1 °C) and dissolved oxygen percentage. This deviation is not expected to influence results of the tests.
- Unplanned modification to the *H. azteca* testing schedule—*H. azteca* testing was conducted in Q2 and Q4, per Permit 107517. Tests in Q2 were successfully conducted and survival was measured; however, test organisms were disposed prior to measuring dry weight due to a lab technician error. Tests were repeated in Q2 for the UFR chronic toxicity study stations (Golder 2022) and tests were repeated for all stations in Q3.

- Some tests with *P. promelas* and *O. mykiss* exhibited indications of microbial influence, despite addition of copper up to a maximum of 20 µg/L. This was recognized in advance to be a possibility because copper amendment was constrained to avoid toxicity from copper itself. The observation of microbial influence, on its own, does not invalidate a test result, but rather warrants further investigation to evaluate influence on toxicological results. Nautilus identified microbe presence per their protocol for identifying microbes in fish tests (Nautilus 2020a,b):
  - Q1 *P. promelas* tests (CM_MC2)—Microbial growth was observed on one replicate in this test, which was amended with 20 µg/L copper. Instances of microbial growth were observed during a timeframe spanning day 16 to day 18 of testing.
  - Q2 *O. mykiss* tests (all stations)—Microbial growth was observed on one or more replicates of all tests, which were amended with 20 µg/L copper. All fish with observed microbes died during the test period. Instances of microbial growth were observed during a timeframe spanning day 21 to day 29 of testing.
  - Q3 *P. promelas* tests (all stations except EV_MC2 and LC_DCDS)— Microbial growth was observed on all test organisms in one or more replicates of these tests, which were amended with 10 µg/L to 20 µg/L copper. Microbial growth was also observed in the 10 µg/L copper amended laboratory control. Instances of microbial growth were observed during a timeframe spanning day 3 to day 20 of testing.
  - Q4 *O. mykiss* tests (GH_ER2, LC_SLC, FR_FRABCH, FR_FRCP1, GH_FR1, GH_ERC, LC_DCDS, LC_LCDSSLCC)—Microbial growth was observed in one or more replicates of these tests, which were amended with 20 µg/L copper. Instances of microbial growth were observed during a timeframe spanning day 16 to day 27 of testing.

- In the *P. promelas* Q1 test, the Elk River and Michel Creek reference tests had reduced survival, biomass (Michel Creek reference only), and normal development relative to the laboratory control. The laboratory was unable to identify the reason for the poor performance. No microbial observations were reported for these tests, the laboratory control performed well for this endpoint, and the reference toxicant test produced results that were within the acceptable range of performance for *P. promelas*, albeit on the lower end of acceptability (see Section 3.2). Copper amendments in the Elk River (10 µg/L) and Michel Creek (15 µg/L) were below toxicity thresholds for the endpoints with significant reductions, indicating that copper did not contribute to the observed response.[20] Per the February 2022 EMC conference call, Q1 *P. promelas* results for Elk River and Michel Creek reference tests were excluded from statistical analyses herein (e.g., NR calculation, Spearman rank correlations). As a sensitivity analysis, NRs were calculated with and without these tests. However, the NRs that excluded these tests were used to categorize test results. Exclusion of these references made the identification of adverse responses more likely in test site waters but was adopted as a conservative screening approach.

3.2 Sources of Variance in Test Water

3.2.1 Organism Performance

Performance in the negative laboratory control varied by less than 15% between quarters for all species and endpoints, except for *P. subcapitata* cell yield (21%) and *H. azteca* dry weight (45%). For other endpoints, laboratory control performance in 2021 quarterly tests varied from 0% (*C. dubia* survival) to 9% (*P. promelas* survival). Although variability for most endpoints was small, control normalization was used to reduce the variability in test organism performance among 2021 batches.

Raw results and control normalized results (for all endpoints except *P. subcapitata* cell yield) are presented in Section 3.3. Analyses presented herein are based on control normalized results.

3.2.2 Organism Sensitivity

Reference toxicant results from quarterly reports (Appendix B) are plotted in Figure 3.2-1.

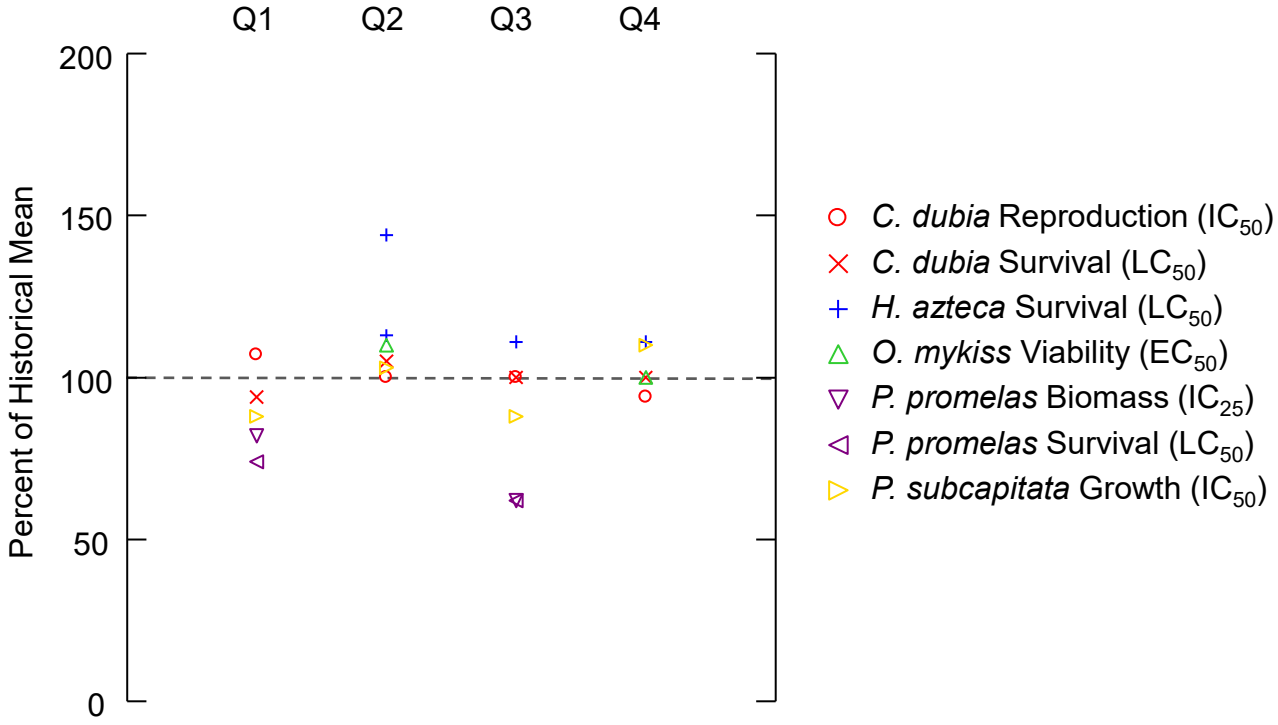
Of the 22 reference toxicant results, 17 tests fell within 15% of the historical mean, indicating that test organism sensitivity was usually stable (Figure 3.2-1). The largest positive deviation from the historical mean was observed in Q2 for *H. azteca* survival (144% of the historical mean) and the largest negative deviation was observed in Q3 for *P. promelas* survival and biomass (both endpoints 62% of the historical mean). All but one of the reference toxicant results were within two standard deviations of the historical mean (which is considered an appropriate sensitivity by the laboratory [Appendix B]); the single exception was *P. promelas* survival in the test initiated on 17 August (Q3). In this test, the LC_{50} for *P. promelas* survival was 3.9 g/L, just outside the range of two standard deviations of the historical mean (4.1–9.7 g/L) which may indicate that organisms used in this test were more sensitive than those used in historical tests. A result this extreme is expected to occur by chance alone in 5% of cases. Most endpoints were not consistently above or below the historical mean, with the exceptions of:

[20] The Brix et al. (2020) pooled, chronic multiple linear regression model for copper was used to estimate copper effect concentrations for fathead minnow by adjusting toxicity data reported in Besser et al. (2005) to sample-specific hardness, DOC, and pH (the average measured by Nautilus in the toxicity test). In the Elk River test, the copper amendment of 10 µg/L was equal to the growth maximum allowable toxicant concentration (MATC) of 10.3 µg/L and approximately two times below the no-observed effect concentration for survival of 19.9 µg/L; in this test, significant effects were observed for survival only. In the Michel Creek test, the copper amendment of 15 µg/L was below the growth MATC of 17.2 µg/L and the survival NOEC of 40 µg/L; in this test, significant effects were observed for growth and survival.

- *H. azteca* survival, which was above the historical mean in Q2, Q3, and Q4, but remained within two standard deviations.
- *P. promelas* biomass and survival, which were below the historical mean in both Q1 and Q3. Results for biomass remained within two standard deviations for both Q1 and Q3. Results for survival remained within two standard deviations for Q1. However, as discussed above, results for Q3 were below the range of two standard deviations of the historical mean (4.1–9.7 g/L).

Overall, variation in test organism sensitivity does not appear to be a confounding factor in the interpretation of toxicity testing results among test batches.

Figure 3.2-1: Reference toxicant data from 2021 laboratory reports (Appendix B).



Notes: IC_{50} = concentration resulting in 50% inhibition; IC_{25} = concentration resulting in 25% inhibition; LC_{50} = concentration resulting in 50% lethality; EC_{50} = concentration resulting in 50% effect. Dashed line indicates reference toxicant result is equal to the mean historical effect concentration.

3.2.3 Background Conditions (Normal Ranges)

As outlined in Section 2.3.2.3, local and regional NRs were developed for mean responses in reference waters. Development of NRs was intended to address potential confounding effects of background water quality and its effect on test responses. The following sections present the results of the evaluation of background conditions for each endpoint, concluding with a statement on how the reference responses may influence the interpretation of test responses.

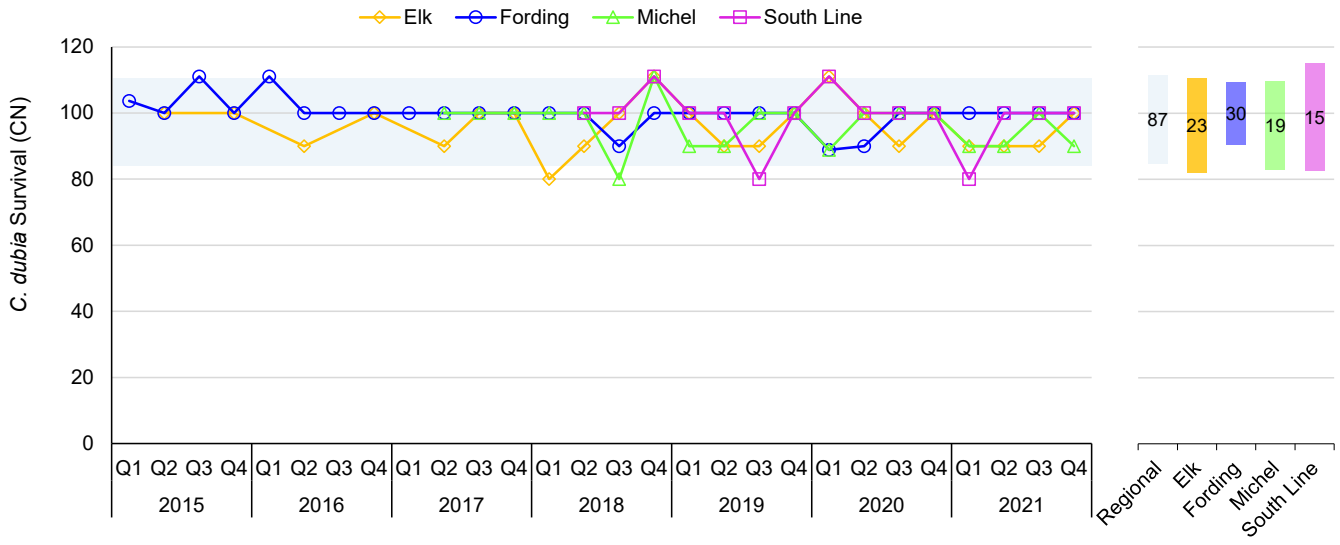
3.2.3.1 *Ceriodaphnia dubia*

Mean control normalized responses for *C. dubia* tests in reference waters are plotted in Figure 3.2-2 (survival) and Figure 3.2-3 (reproduction). Results for NRs are as follows:

- Mean survival ranged from 80% to 111% in reference tests from 2015 to 2021 (Figure 3.2-2). Mean survival was similar across references and years, which resulted in broad overlap in the regional NR (85% to 111%) and the local NRs for the Elk River (82% to 110%), Fording River (91% to 109%), Michel Creek (83% to 110%), and South Line Creek (83% to 115%).
- Mean reproduction ranged from 66% to 131% in reference tests from 2015 to 2021 (Figure 3.2-3). Mean reproduction was less variable across references in 2021 compared to previous years, except in Q1 2021 when reproduction was lower at South Line Creek compared to other references. The mean mortality in Q1 2021 was 20% which may have contributed to the reduced reproduction in the South Line Creek test. The regional NR (70% to 123%) and local NRs for the Elk River (69% to 120%), Fording River (76% to 122%), Michel Creek (67% to 130%), and South Line Creek (67% to 119%) had broad overlap.

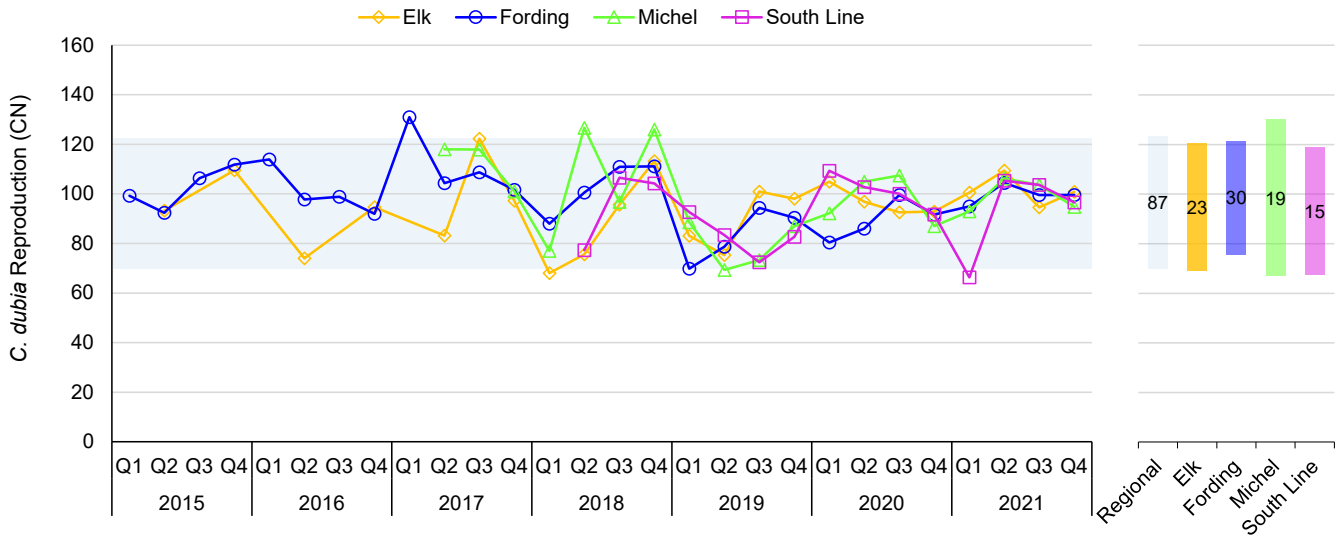
The evaluation of long-term reference responses for *C. dubia* tests indicates that, in any round of quarterly testing, one or more reference stations may yield a mean reproduction response that differs from the other reference waters. However, there was no long-term systematic difference in mean reproduction among reference stations, which is expected because the water quality at all reference stations is broadly similar. There are some fluctuations in mean reproduction over time (e.g., Q1 2019 reproduction in the Fording River reference was slightly lower than the long-term average). In aggregate, these findings indicate that comparisons to regional mean reproduction (averaged across all references) within a batch provide the most reliable basis for identifying deviations from normal reproduction.

Figure 3.2-2: Mean results for *C. dubia* survival in Elk River reference, Fording River reference, Michel Creek reference, and South Line Creek reference tests (left panel). Regional and local normal ranges (2.5th to 97.5th percentile) are shown as bars (right panel).



Notes: Blue shading on scatterplot is the regional normal range. Sample size for each normal range is provided on the bar chart. CN = control normalized.

Figure 3.2-3: Mean results for *C. dubia* reproduction in Elk River reference, Fording River reference, Michel Creek reference, and South Line Creek reference tests (left panel). Regional and local normal ranges (2.5th to 97.5th percentile) are shown as bars (right panel).



Notes: Blue shading on scatterplot is the regional normal range. Sample size for each normal range is provided on the bar chart. CN = control normalized.

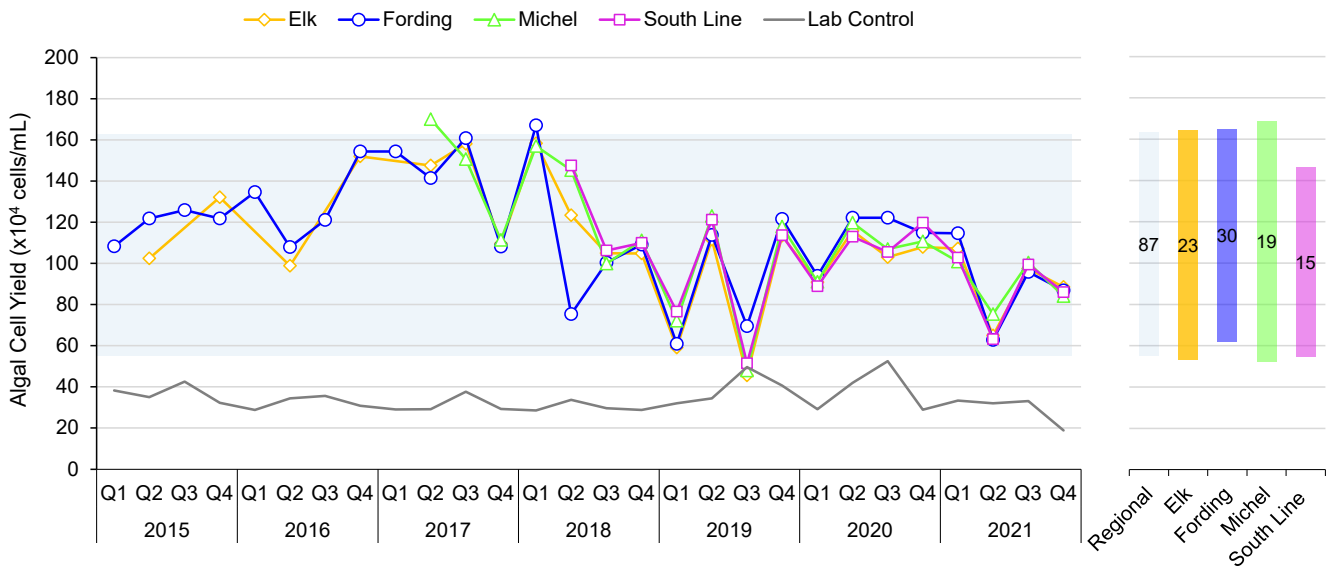
3.2.3.2 *Pseudokirchneriella subcapitata*

Mean cell yield ranged from 46 × 10^4 to 170 × 10^4 cells/mL in reference tests from 2015 to 2021 (Figure 3.2-4). Mean cell yield has been historically similar across references, except: (1) in Q2 2017 when cell yield in the Michel Creek reference was approximately 15% to 20% higher than the Elk and Fording River references; and (2) in Q2 2018 when cell yield in the Elk River, Michel Creek, and South Line Creek references were approximately 90% to 100% higher than the Fording River reference. Cell yield often varied across quarters within the same sampling year, including 2021 where cell yield was lower in Q2 compared to other quarters. This variability across quarters contributed to wide NRs for the regional NR (55 to 163 ×10^4 cells/mL) and local NRs for the Elk River (53 to 164 ×10^4 cells/mL), Fording River (62 to 165 ×10^4 cells/mL), Michel Creek (52 to 169 ×10^4 cells/mL), and South Line Creek (54 to 146 ×10^4 cells/mL).

Because cell yield is the only endpoint that is not control normalized (per discussions with EMC), mean cell yield in the negative laboratory control is shown on Figure 3.2-4. In all but one quarter (Q3 2019), cell yield in reference tests was approximately 2 to 5 times higher than cell yield in the negative laboratory control, which ranged from 19 to 53 ×10^4 cells/mL across all years. This finding is not unusual, since the higher ionic strength associated with the reference waters is expected to stimulate cell growth of this species relative to the low ionic strength associated with the laboratory control water (Appendix B).

In aggregate, these findings indicate that comparisons to regional mean cell yield (at all references) within a batch provide the most reliable basis for identifying deviations from normal cell yield.

Figure 3.2-4: Mean results for *P. subcapitata* cell yield in Elk River reference, Fording River reference, Michel Creek reference, and South Line Creek reference tests (left panel). Regional and local normal ranges (2.5th to 97.5th percentile) are shown as bars (right panel).



Notes: Blue shading on scatterplot is the regional normal range. Sample size for each normal range is provided on the bar chart.
mL = millilitre.

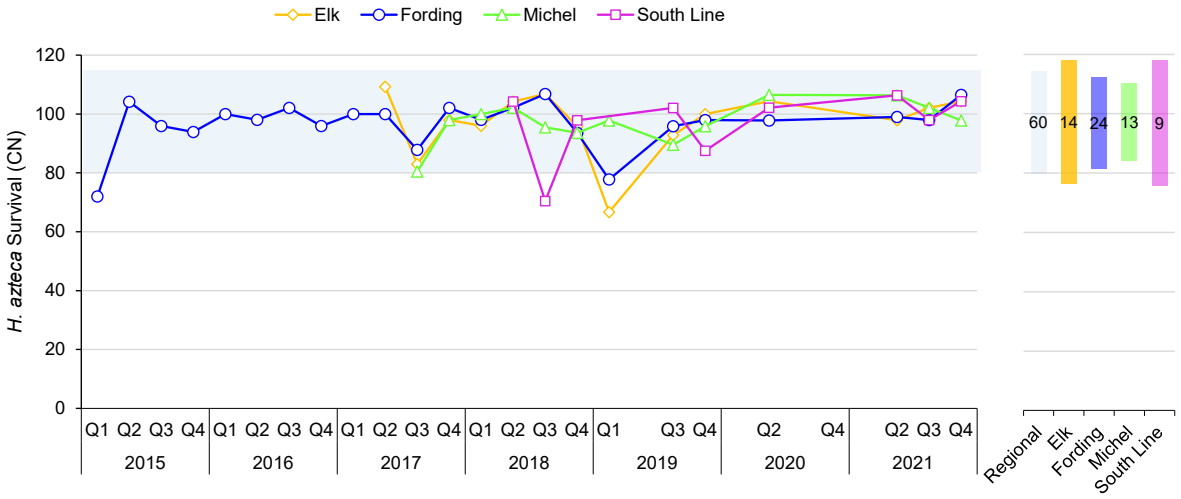
3.2.3.3 *Hyalella azteca*

Mean control normalized responses for *H. azteca* tests in reference waters are plotted in Figure 3.2-5 (survival) and Figure 3.2-6 (dry weight). Results for NRs are as follows:

- Mean survival extended from 67% to 109% in reference tests from 2015 to 2021 (Figure 3.2-5). Mean survival was similar among references except for Q3 2018 and Q1 2019 in which mean survival for Michel Creek and South Line Creek tests were lower compared to other years. This variability contributed to wider local NRs for South Line Creek (76% to 118%) and Michel Creek NR (84% to 110%) compared to Elk River (76% to 118%) and Fording River (81% to 112%). The regional NR was 80% to 114%.
- Mean dry weight extended from 56% to 180% in reference tests from 2015 to 2021 (Figure 3.2-6). Mean dry weight was variable across references tested in the same quarter. High variability in Q3 2017, Q3 and Q4 2018, Q1, Q3, Q4 2019, and Q3 2021 resulted in wide NRs for the regional NR (46% to 148%) and local NRs for the Elk River (40% to 140%), Fording River (47% to 151%), Michel Creek (54% to 150%), and South Line Creek (44% to 141%).

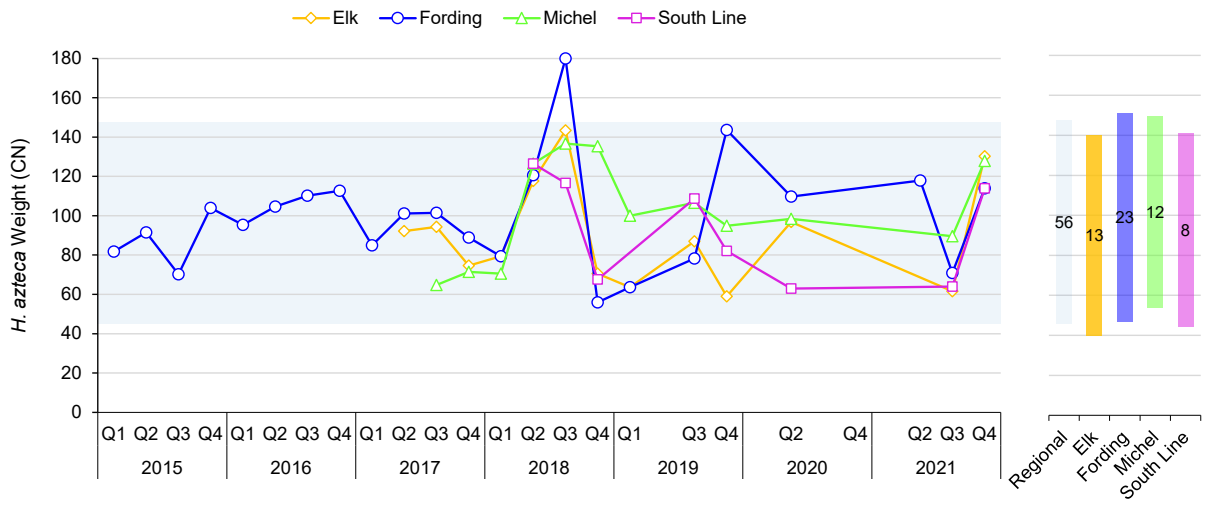
There are no long-term systematic differences between references, as reflected in the similar NRs among references, but the differences between quarters and within a quarter can be large, particularly for the dry weight endpoint. For example, in Q3 2021, mean control normalized dry weight in the Michel Creek reference (89%) was higher than the other three references (61% for GH_ER2 to 71% for FR_UFR1). As discussed in Section 3.3, this resulted in several test sites having significantly lower responses relative to the Michel reference but not the other references. Dry weight responses in 2021 were lower in Q3 compared to Q2 and Q4; however, responses remained within the range observed in previous years. In aggregate, these findings indicate that comparisons to regional mean responses (at all references) within a batch provide the most reliable basis for identifying deviations from normal *H. azteca* survival and growth.

Figure 3.2-5: Mean results for *H. azteca* survival in Elk River reference, Fording River reference, Michel Creek reference, and South Line Creek reference tests (left panel). Regional and local normal ranges (2.5th to 97.5th percentile) are shown as bars (right panel).



Notes: Blue shading on scatterplot is the regional normal range. Sample size for each normal range is provided on the bar chart.
Per agreement with the EMC at the March 2021 conference call, Q4 2020 results were excluded from the NR calculations. Due to a lab technician error, Q2 *H. azteca* tests were disposed prior to the measurement of dry weight (see Section 3.1). Tests were repeated in Q2 for the Fording River reference and then repeated for all references in Q3. Result presented for the Fording River reference is an average of the survival results for the initial Q2 test and Q2 re-test. CN = control normalized

Figure 3.2-6: Mean results for *H. azteca* weight in Elk River reference, Fording River reference, Michel Creek reference, and South Line Creek reference tests (left panel). Regional and local normal ranges (2.5th to 97.5th percentile) are shown as bars (right panel).



Notes: Blue shading on scatterplot is the regional normal range. Sample size for each normal range is provided on the bar chart.
Per agreement with the EMC at the March 2021 conference call, Q4 2020 results were excluded from the NR calculations. Due to a lab technician error, Q2 *H. azteca* tests were disposed prior to the measurement of dry weight (see Section 3.1). Tests were repeated in Q2 for the Fording River reference and then repeated for all references in Q3. Result presented for the Fording River reference is from the Q2 re-test. CN = control normalized.

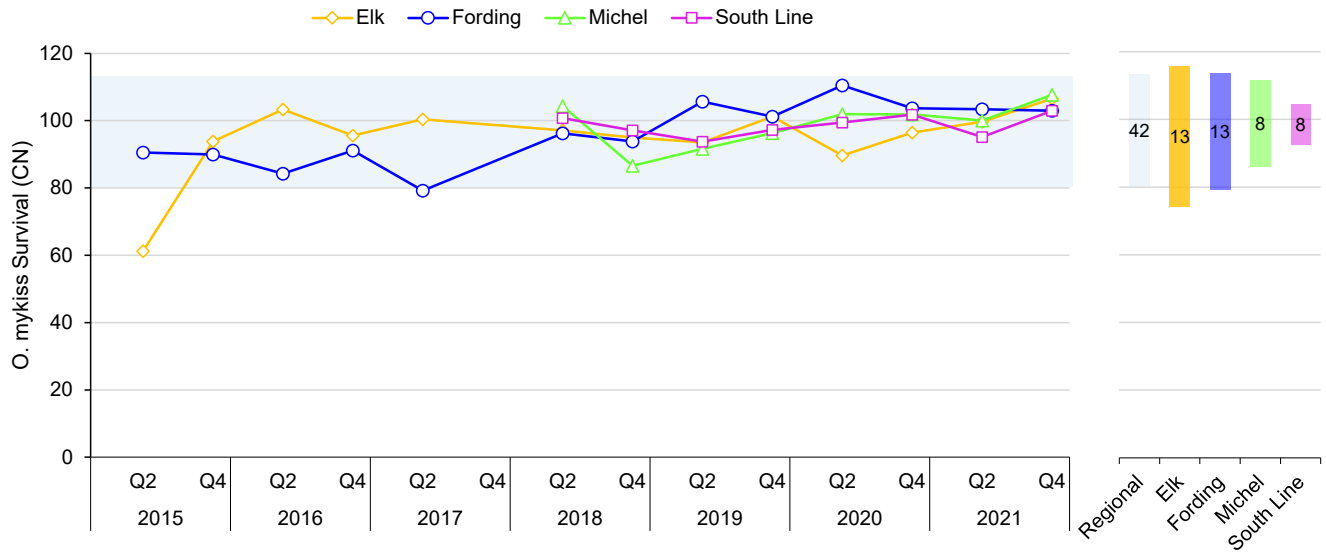
3.2.3.4 *Oncorhynchus mykiss*

Mean control normalized responses for *O. mykiss* tests in reference waters are plotted in Figure 3.2-7 (survival), Figure 3.2-8 (viability), Figure 3.2-9 (length), and Figure 3.2-10 (weight).

- Mean survival extended from 61% to 110% in reference tests from 2015 to 2021 (Figure 3.2-7). Although mean survival has previously been variable between reference waters tested in the same quarter (e.g., Q2 2015 and 2017), mean survival was similar across 2021 reference tests. It is possible that the copper amendment helped to reduce microbial toxicity in later years which would be expected to reduce the variability in responses. The regional NR (80% to 113%) and local NRs for the Elk River (74% to 116%), Fording River (79% to 114%), and Michel Creek (86% to 112%) had broad overlap. The local NR for South Line Creek (93% to 104%) is narrow compared to other local NRs; this is a result from a smaller sample size (n = 8) and the low variability of survival across the tests for South Line Creek which ranged from 94% in Q2 2019 to 103% in Q4 2021.
- Mean viability extended from 62% to 113% in reference tests from 2015 to 2021 (Figure 3.2-8). Although mean viability has previously been variable in reference waters tested in the same quarter (e.g., Q2 2015 and 2017), mean viability was similar across 2021 reference tests. The regional NR (80% to 114%) and local NRs for the Elk River (74% to 116%), Fording River (79% to 115%), and Michel Creek (84% to 113%) had broad overlap. As with the survival endpoint, the local NR for South Line Creek (93% to 105%) is narrow for this endpoint compared to other local NRs.
- Mean length extended from 92% to 110% in reference tests from 2015 to 2021 (Figure 3.2-9). Mean length was similar across references and years, which resulted in narrow NRs and a broad overlap between the regional NR (95% to 108%) and the local NRs for the Elk River (95% to 108%), Fording River (95% to 108%), Michel Creek (96% to 107%), and South Line Creek (93% to 106%).
- Mean weight extended from 93% to 119% in reference tests from 2015 to 2021 (Figure 3.2-10). Mean weight was similar across references and years, which resulted in narrow NRs and a broad overlap between the regional NR (93% to 114%) and the local NRs for the Elk River (93% to 116%), Fording River (95% to 109%), Michel Creek (96% to 112%), and South Line Creek (90% to 116%). Mean weight in Q2 2021 was higher than previously observed; however, all results had a <15% difference to their counterparts in Q2 2020.

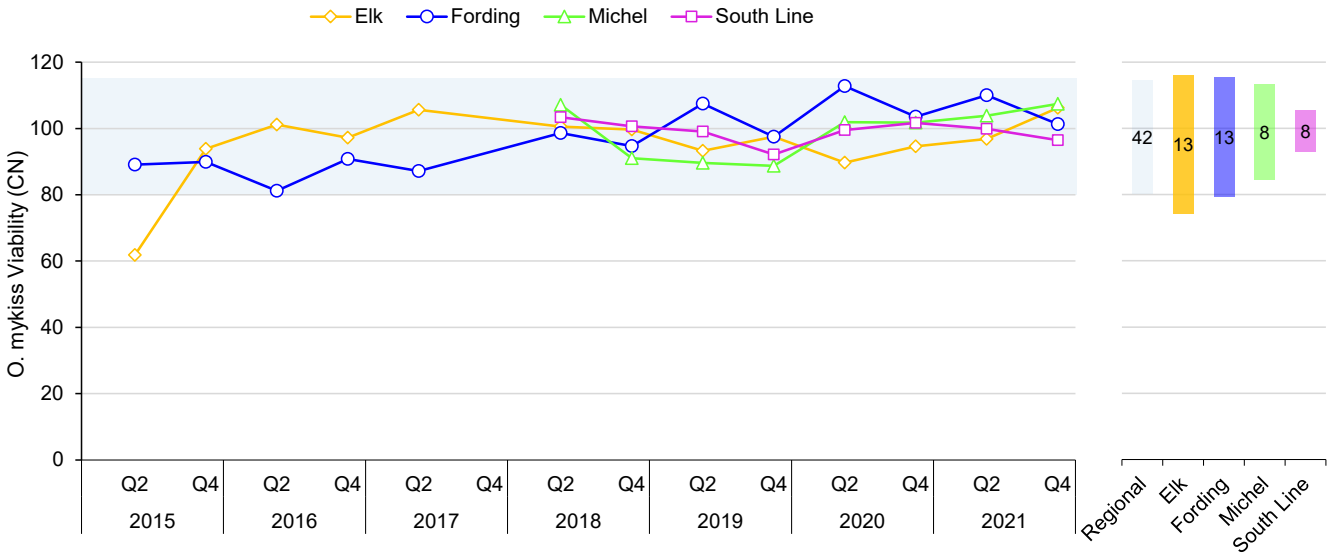
The pattern of reference responses for *O. mykiss* in 2021 indicates that the mean organism sensitivity was similar in 2021 to previous years. There were no long-term systematic differences between reference site performances over the long term, as reflected in the similar normal ranges among references. In aggregate, these findings indicate that comparisons to regional mean reproduction (at all references) within a batch provide the most reliable basis for identifying deviations from normal *O. mykiss* survival and development.

Figure 3.2-7: Mean results for *O. mykiss* survival in Elk River reference, Fording River reference, Michel Creek reference, and South Line Creek reference tests (left panel). Regional and local normal ranges (2.5th to 97.5th percentile) are shown as bars (right panel).



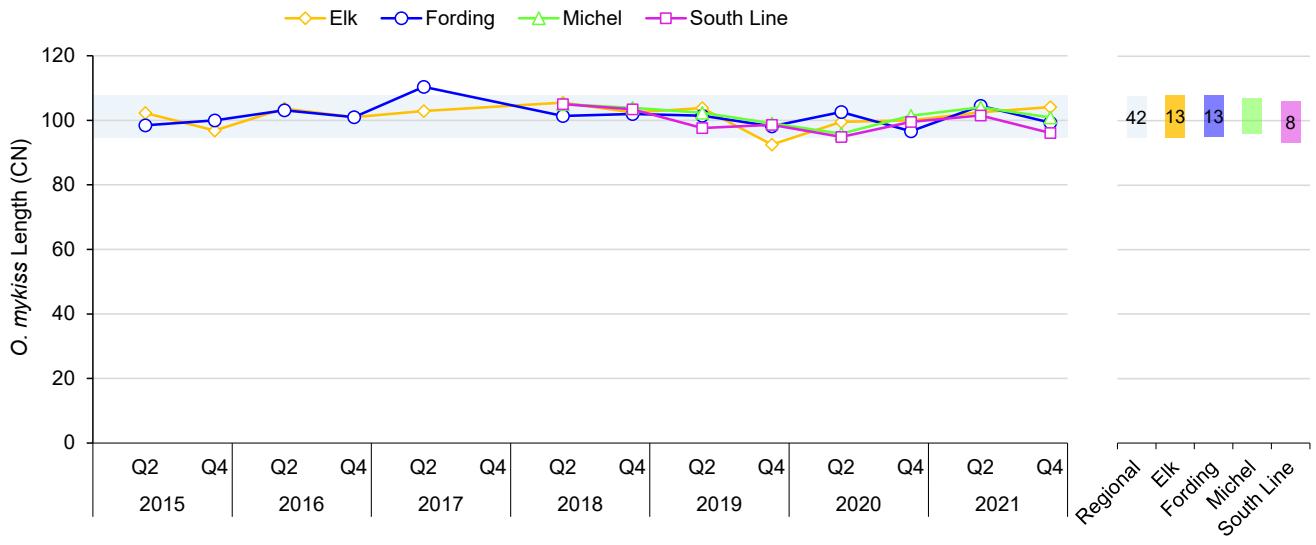
Notes: Blue shading on scatterplot is the regional normal range. The Q4 2017 tests were removed from reference envelope calculations because pronounced microbial effects were observed in these tests. Sample size for each normal range is provided on the bar chart.
CN = control normalized.

Figure 3.2-8: Mean results for *O. mykiss* viability in Elk River reference, Fording River reference, Michel Creek reference, and South Line Creek reference tests (left panel). Regional and local normal ranges (2.5th to 97.5th percentile) are shown as bars (right panel).



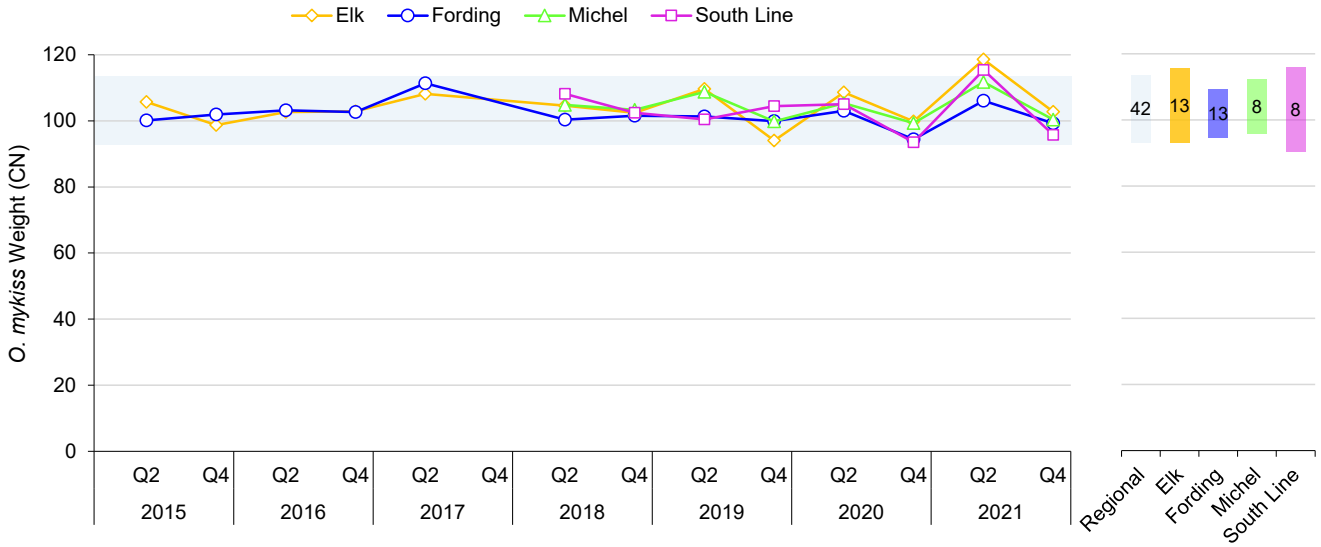
Notes: Blue shading on scatterplot is the regional normal range. The Q4 2017 tests were removed from reference envelope calculations because pronounced microbial effects were observed in these tests. Sample size for each normal range is provided on the bar chart.
CN = control normalized.

Figure 3.2-9: Mean results for *O. mykiss* length in Elk River reference, Fording River reference, Michel Creek reference, and South Line Creek reference tests (left panel). Regional and local normal ranges (2.5th to 97.5th percentile) are shown as bars (right panel).



Notes: Blue shading on scatterplot is the regional normal range. The Q4 2017 tests were removed from reference envelope calculations because pronounced microbial effects were observed in these tests. Sample size for each normal range is provided on the bar chart.
CN = control normalized.

Figure 3.2-10: Mean results for *O. mykiss* weight in Elk River reference, Fording River reference, Michel Creek reference, and South Line Creek reference tests (left panel). Regional and local normal ranges (2.5th to 97.5th percentile) are shown as bars (right panel).



Notes: Blue shading on scatterplot is the regional normal range. The Q4 2017 tests were removed from reference envelope calculations because pronounced microbial effects were observed in these tests. Sample size for each normal range is provided on the bar chart.
CN = control normalized.

3.2.3.5 *Pimephales promelas*

Mean control normalized responses for *P. promelas* tests in reference waters are plotted in Figure 3.2-11 (hatch), Figure 3.2-12 (survival), Figure 3.2-13 (biomass), Figure 3.2-14 (length), and Figure 3.2-15 (normal development).

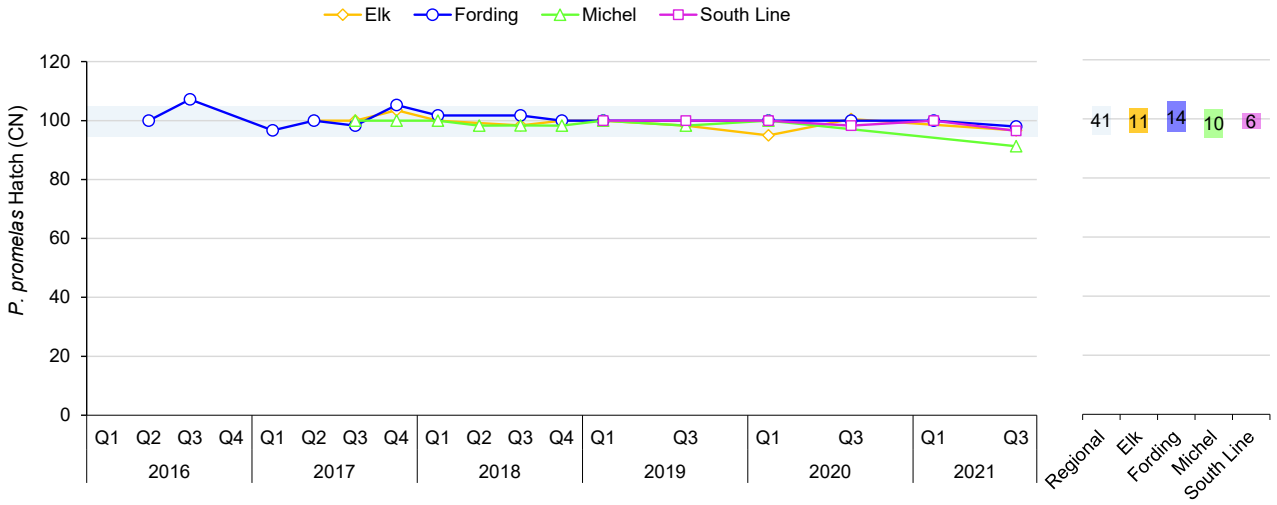
Results for NRs (excluding Q1 Elk and Michel references; see Section 3.1) are as follows[21]:

- Mean hatch extended from 91% to 107% in reference tests (Figure 3.2-11). Mean hatch was similar across references and years, which resulted in narrow NRs and a broad overlap between the regional NR (95% to 104%) and the local NRs for the Elk River (95% to 103%), Fording River (95% to 106%), Michel Creek (94% to 103%), and South Line Creek (97% to 102%).
- Mean survival extended from 60% to 121% in reference tests (Figure 3.2-12). Mean survival was often higher and less variable in the Fording River reference tests compared to the other reference, contributing to the local NRs for Elk River (65% to 111%), Michel Creek (58% to 119%), and South Line Creek (59% to 126%) extending below the Fording River NR (80% to 114%). The regional NR was 66% to 118%.
- Mean biomass extended from 54% to 130% in reference tests (Figure 3.2-13). Mean biomass was often higher and less variable in the Fording River reference tests compared to the other reference, contributing to the local NRs for Elk River (59% to 130%), Michel Creek (54% to 122%), and South Line Creek (62% to 111%) extending below the Fording NR (73% to 120%). The regional NR was 61% to 123%.
- Mean length extended from 82% to 109% in reference tests (Figure 3.2-14). Mean length was similar across references, which resulted in broad overlap in the regional NR (84% to 110%) and the local NRs for the Elk River (85% to 113%), Fording River (85% to 107%), Michel Creek (82% to 108%), and South Line Creek (88% to 109%).
- Mean normal development ranged from 94% to 108% in reference tests (Figure 3.2-15). Mean normal development was similar across references, which resulted in broad overlap in the regional NR (95% to 105%) and the local NRs for the Elk River (96% to 105%), Fording River (96% to 104%), Michel Creek (96% to 106%), and South Line Creek (93% to 107%).

The pattern of reference responses for *P. promelas* in 2021 indicates that the mean organism sensitivity was broadly similar in 2021 to previous years for *P. promelas* endpoints. There are no long-term systematic differences among reference site performances, as reflected in the similar normal ranges among references. Variation was high among references for the biomass endpoint, but with no consistent pattern among years. In aggregate, these findings indicate that comparisons to regional mean reproduction (at all references) within a batch provide the most reliable basis for identifying deviations from normal *P. promelas* survival and development.

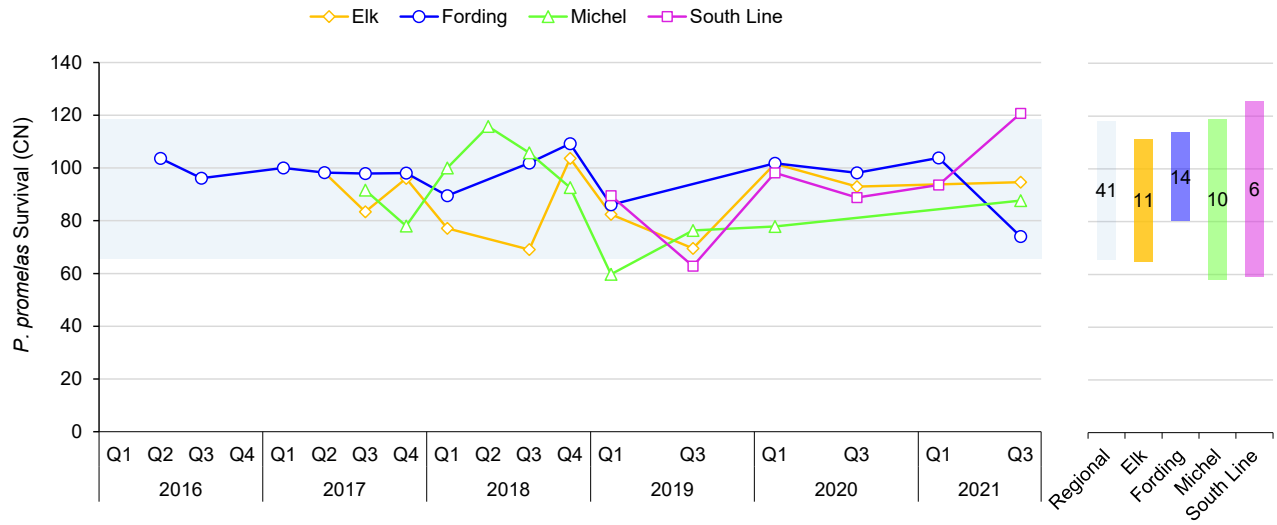
[21] Per the February 2022 EMC conference call, Q1 *P. promelas* results for Elk River and Michel Creek reference tests were excluded from the calculation of NRs due to anomalously low results. If these tests had been included, the NRs would have been as follows. Elk: 95% to 103% (hatch), 47% to 120% (survival), 51% to 131% (biomass), 85% to 113% (length), 90% to 108% (normal development). Michel: 94% to 103% (hatch), 51% to 120% (survival), 51% to 121% (biomass), 83% to 108% (length), 86% to 112% (normal development). Regional: 94% to 104% (hatch), 57% to 122% (survival), 58% to 124% (biomass), 85% to 109% (length), 91% to 109% (normal development). Inclusion of the anomalous Elk and Michel tests has the largest impact on the survival and biomass NRs compared to other endpoints. For example, the 2.5th percentile for survival for the regional NR is 66% when these tests are excluded and 57% when these tests are included.

Figure 3.2-11: Mean results for *P. promelas* hatch in Elk River reference, Fording River reference, Michel Creek reference, and South Line Creek reference tests (left panel). Regional and local normal ranges (2.5th to 97.5th percentile) are shown as bars (right panel).



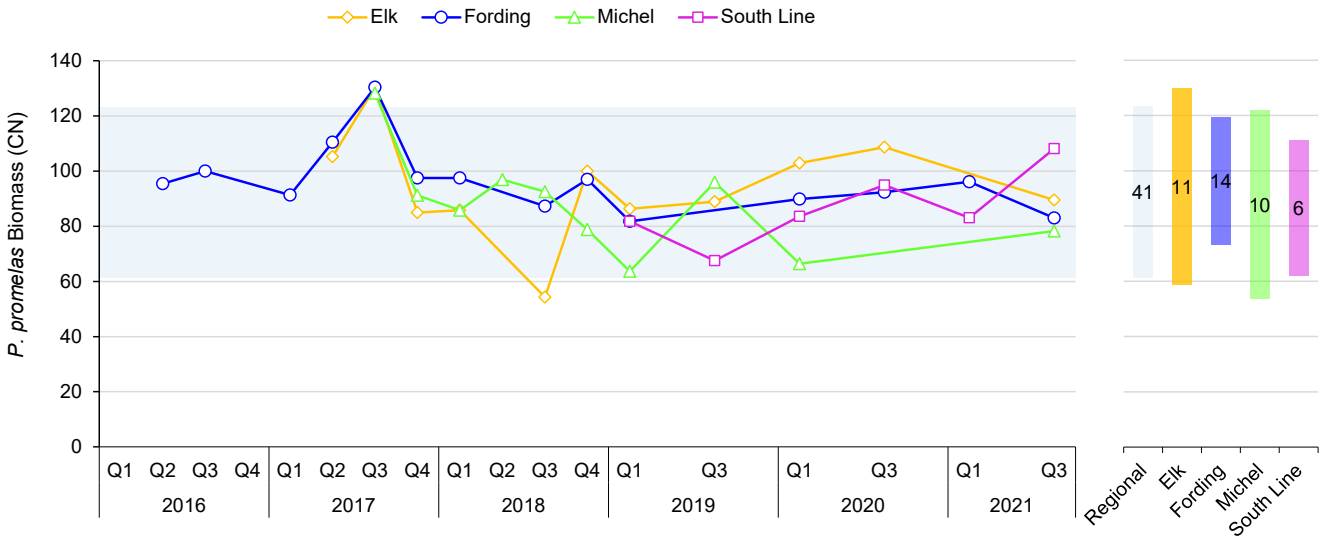
Notes: Blue shading on scatterplot is the regional normal range. The following tests were excluded from normal range calculations: Q1 2016 (test waters were not amended with copper), Q4 2016 (dissolved oxygen concentrations fell below typical levels), Q2 2018 for Fording and Elk and Q3 2019 for Fording (microbial effects were observed in these tests), Q3 2020 for Michel Creek (anomalous results), Q1 2021 for Elk and Michel Creek (anomalously low results). Sample size for each normal range is provided on the bar chart. CN = control normalized.

Figure 3.2-12: Mean results for *P. promelas* survival in Elk River reference, Fording River reference, Michel Creek reference, and South Line Creek reference tests (left panel). Regional and local normal ranges (2.5th to 97.5th percentile) are shown as bars (right panel).



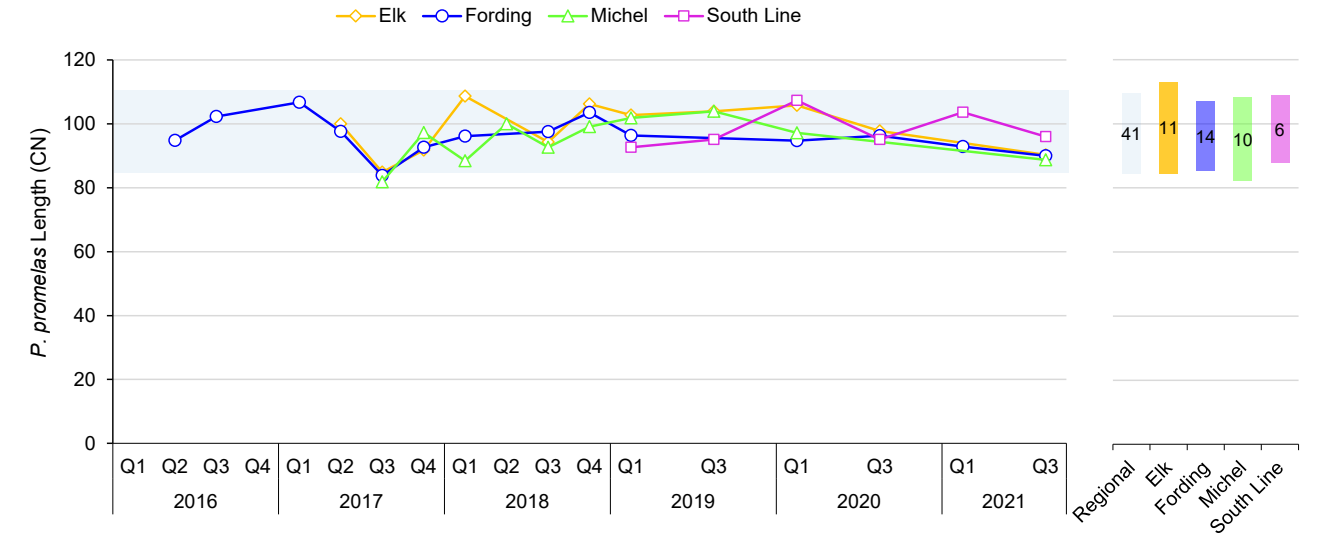
Notes: Blue shading on scatterplot is the regional normal range. The following tests were excluded from normal range calculations: Q1 2016 (test waters were not amended with copper), Q4 2016 (dissolved oxygen concentrations fell below typical levels), Q2 2018 for Fording and Elk and Q3 2019 for Fording (microbial effects were observed in these tests), Q3 2020 for Michel Creek (anomalous results), Q1 2021 for Elk and Michel Creek (anomalously low results). Sample size for each normal range is provided on the bar chart. CN = control normalized.

Figure 3.2-13: Mean results for *P. promelas* biomass in Elk River reference, Fording River reference, Michel Creek reference, and South Line Creek reference tests (left panel). Regional and local normal ranges (2.5th to 97.5th percentile) are shown as bars (right panel).



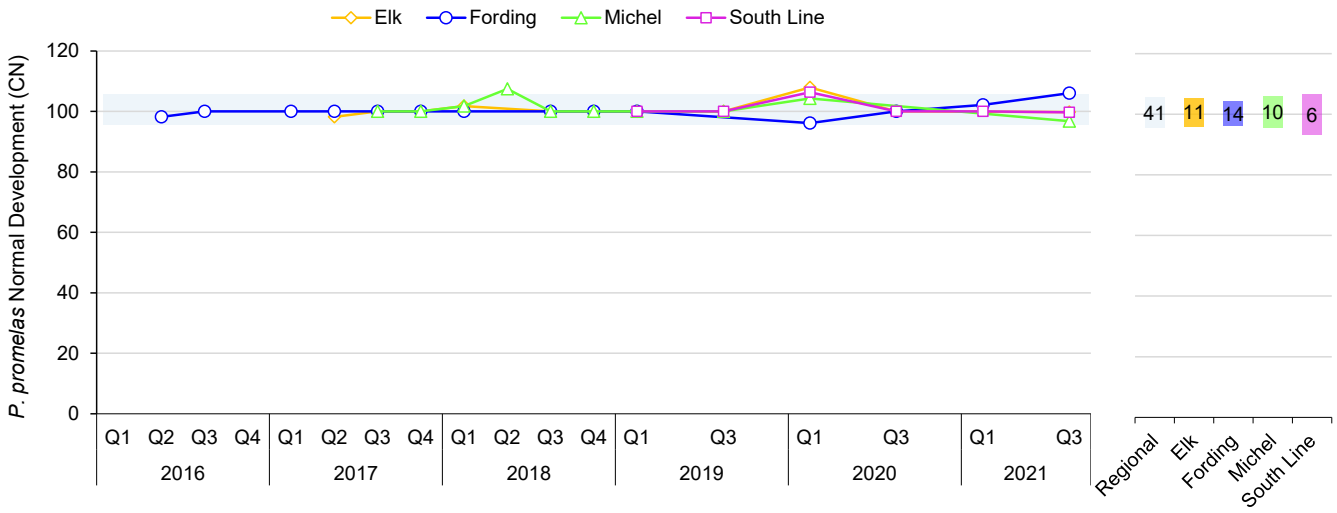
Notes: Blue shading on scatterplot is the regional normal range. The following tests were excluded from normal range calculations: Q1 2016 (test waters were not amended with copper), Q4 2016 (dissolved oxygen concentrations fell below typical levels), Q2 2018 for Fording and Elk and Q3 2019 for Fording (microbial effects were observed in these tests), Q3 2020 for Michel Creek (anomalous results), Q1 2021 for Elk and Michel Creek (anomalously low results). Sample size for each normal range is provided on the bar chart. CN = control normalized.

Figure 3.2-14: Mean results for *P. promelas* length in Elk River reference, Fording River reference, Michel Creek reference, and South Line Creek reference tests (left panel). Regional and local normal ranges (2.5th to 97.5th percentile) are shown as bars (right panel).



Notes: Blue shading on scatterplot is the regional normal range. The following tests were excluded from normal range calculations: Q1 2016 (test waters were not amended with copper), Q4 2016 (dissolved oxygen concentrations fell below typical levels), Q2 2018 for Fording and Elk and Q3 2019 for Fording (microbial effects were observed in these tests), Q3 2020 for Michel Creek (anomalous results), Q1 2021 for Elk and Michel Creek (anomalously low results). Sample size for each normal range is provided on the bar chart. CN = control normalized.

Figure 3.2-15: Mean results for *P. promelas* normal development in Elk River reference, Fording River reference, Michel Creek reference, and South Line Creek reference tests (left panel). Regional and local normal ranges (2.5th to 97.5th percentile) are shown as bars (right panel).



Notes: Blue shading on scatterplot is the regional normal range. The following tests were excluded from normal range calculations: Q1 2016 (test waters were not amended with copper), Q4 2016 (dissolved oxygen concentrations fell below typical levels), Q2 2018 for Fording and Elk and Q3 2019 for Fording (microbial effects were observed in these tests), Q3 2020 for Michel Creek (anomalous results), Q1 2021 for Elk and Michel Creek (anomalously low results). Sample size for each normal range is provided on the bar chart. CN = control normalized.

3.2.4 Variation in Concentrations of Toxicants (Coefficients of Variation)

Coefficients of variation are presented in Appendix C. CVs were below 0.25 for most constituents, indicating that variability in concentrations among weekly refresh samples is generally low. This finding is consistent with previous investigations of variance in water quality constituents, in which only minor variations have been observed over a few weeks (i.e., the duration of the longest Permit-based tests) relative to the larger seasonal variations. When constituent concentrations were greater than chronic WQGs or lowest level 1 EVWQP benchmarks in one or more weekly refresh samples, CVs were generally either below 0.25 or comparable to CVs measured at reference locations for the same quarter and test. Some exceptions were observed in 2021, listed below by species and quarter:

- P. promelas Q1—CM_MC2 (total chromium), CM_MC2, FR_FRCP1, LC_LC3, LC_LCDSSLCC, RG_MIDAG (fluoride), LC_DCDS (total nickel, and total selenium)
- H. azteca Q2—RG_MIDAG, CM_MC2 (total chromium), EV_MC2 (total beryllium, total chromium, total iron, and total nickel), EV_MC2, FR_FRCP1 (total selenium)
- *O. mykiss* Q2—CM_MC2 (total chromium), CM_MC2, EV_MC2, FR_FRABCH, FR_FRCP1 (total selenium), EV_MC2 (total beryllium, total chromium, total iron, and total nickel)
- H. azteca Q3—CM_MC2, FR_FRABCH (fluoride)
- P. promelas Q3—CM_MC2, FR_FRABCH, LC_LC3 (fluoride)
- H. azteca Q4—FR_FRABCH, LC_LC3 (fluoride), FR_FRCP1 (nitrite), GH_FR1 (total selenium)
- *O. mykiss* Q4—FR_FRABCH, GH_FR1 (fluoride), FR_FRCP1 (nitrite), GH_FR1 (total selenium)

This source of variance is not expected to affect the overall interpretation of the quarterly and semi-annual toxicity results of this study. The weekly variations reflect, in part, natural variance in water quality expected in the field, and the weekly changes were small in magnitude relative to seasonal changes in water quality. Furthermore, because weekly refresh samples were screened individually against chronic WQGs and EVWQP benchmarks (see Section 2.3.4), any constituents potentially contributing to observed responses were captured in the overall causation assessment.

3.3 Evaluation of 2021 Results

Raw results (mean and standard deviation) are presented in Table 3.3-1. Control normalized results (mean and standard deviation for all species except *P. subcapitata*) are presented in Table 3.3-2. Categories for 2021 test results (no, possible, or likely adverse response) are discussed below by test species (Section 3.3.1) and by test site (Section 3.3.2).

Table 3.3-1. Results of Quarterly and Semi-Annual Toxicity Tests—Raw Results[a]

Quarter	Location	*C. dubia*		*P. subcapitata*	*H. azteca*[b]		*P. promelas* [c,d]					*O. mykiss* [c]			
		% Survival	Reproduction (Protocol)[e]	Cell Yield [× 10^4 cells/mL]	% Survival	Dry weight [mg]	% Hatch	% Survival	Biomass [mg]	Length [mm]	% Normal Development	% Survival	% Viability	Length [mm]	Wet Weight [mg]
Q1	Laboratory control	100 ± 0	19.9 ± 7.8	33.4 ± 1.4	Not tested		100.0 ± 0.0 98.3 ± 3.3 98.3 ± 3.3 95.0 ± 6.4	90.0 ± 8.6 95.0 ± 6.4 84.9 ± 17.5 84.5 ± 17.5	2.28 ± 0.29 2.16 ± 0.19 2.42 ± 0.38 2.34 ± 0.25	10.9 ± 0.4 10.7 ± 0.2 11.1 ± 0.7 11.2 ± 0.6	100.0 ± 0.0 100.0 ± 0.0 100.0 ± 0.0 97.9 ± 4.2	Not tested			
	Pooled Batch References	90 ± 0	17.7 ± 7	106.4 ± 10.2			97 ± 5	84 ± 12	2.1 ± 0.3	10.9 ± 0.9	100 ± 0				
	Fording River reference	100 ± 0	18.9 ± 2.2	114.6 ± 7.3			95 ± 6.5	87.7 ± 6.8	2.25 ± 0.41	10.4 ± 0.9	100 ± 0				
	Elk River reference	90 ± 30	20 ± 9.4	107.2 ± 6.8			98.3 ± 3.3	**32.3 ± 11.6**	1.18 ± 0.45	10.9 ± 0.4	**75 ± 26**				
	Michel Creek reference	90 ± 30	18.5 ± 7.6	**100.9 ± 13**			98.3 ± 3.3	**47.4 ± 7**	1.6 ± 0.33	10.9 ± 0.8	**79.2 ± 17.7**				
	South Line Creek reference	80 ± 40	13.2 ± 6.9	**102.8 ± 7.8**			98.3 ± 3.3	79.4 ± 16.1	2.01 ± 0.1	11.5 ± 0.6	100 ± 0				
	FR_FRCP1	90 ± 30	***10.4 ± 5.5***	***20.2 ± 2.1***			98.3 ± 3.3	**48.9 ± 16.9**	1.7 ± 0.26	11.2 ± 0.7	95.8 ± 8.3				
	FR_FRABCH	100 ± 0	19.8 ± 4.8	***74 ± 2.2***			98.3 ± 3.3	79.5 ± 6.3	2.1 ± 0.42	10.5 ± 0.5	95 ± 10				
	GH_FR1	100 ± 0	20.3 ± 3.4	103.2 ± 14.4			91.7 ± 8.4	89.5 ± 9.1	2.28 ± 0.29	10.6 ± 0.7	94.2 ± 7.4				
	LC_LC5	100 ± 0	19.8 ± 6.5	***76.5 ± 3.9***			98.3 ± 3.3	87.9 ± 12.2	2.19 ± 0.28	11.1 ± 0.9	100 ± 0				
	LC_DCDS	90 ± 30	17.9 ± 7.2	***78.5 ± 5***			85 ± 14.8	84.6 ± 15	2.11 ± 0.17	11.2 ± 0.9	95.9 ± 4.8				
	GH_ERC	100 ± 0	16.5 ± 4.1	111.8 ± 16.7			98.3 ± 3.3	89.9 ± 3.7	2.25 ± 0.17	10.5 ± 0.2	85 ± 8.4				
	CM_MC2	100 ± 0	**11.8 ± 5.7**	***76.5 ± 5***			98.3 ± 3.3[M]	94.9 ± 3.4[M]	2.05 ± 0.31[M]	10.1 ± 0.7[M]	96.6 ± 4[M]				
	RG_MIDAG	100 ± 0	15.5 ± 5	-			98.3 ± 3.3	74.5 ± 6.6	1.9 ± 0.24	10.8 ± 0.4	95.4 ± 5.3				
	EV_MC2	100 ± 0	21.3 ± 1.6	***82.5 ± 6.8***			95.1 ± 11.6	82 ± 7.6	2 ± 0.26	10.7 ± 0.6	98.1 ± 3.9				
	EV_HC1	100 ± 0	25.9 ± 2.2	**91.2 ± 7.1**			96.7 ± 3.9	81 ± 7	2.2 ± 0.17	10.6 ± 0.3	97.9 ± 4.2				
	LC_LC3	90 ± 30	18.5 ± 7.9	***74.5 ± 9***			100 ± 0	88.3 ± 8.4	2.08 ± 0.14	10.7 ± 0.5	96.3 ± 4.4				
	LC_LCDSSLCC	100 ± 0	18.2 ± 5.5	***86 ± 3.4***			100 ± 0	88.3 ± 6.4	2.1 ± 0.21	10.7 ± 0.2	97.9 ± 4.2				
Q2	Laboratory control	100 ± 0	22.4 ± 2.1	32 ± 2.9	I: 94.0 ± 8.9 R: 96 ± 5.5	R: 0.31 ± 0.12	Not tested					92.3 ± 10.7	85.7 ± 8.4	19.9 ± 0.5	82.5 ± 12
	Pooled Batch References	100 ± 0	23.8 ± 4	66.5 ± 7.5	I: 97 ± 7 R: 92 ± 8	R: 0.37 ± 0.09						92 ± 7	88 ± 7	20.5 ± 0.4	93 ± 11
	Fording River reference	100 ± 0	23.4 ± 2.4	*62.8 ± 7.8*	I: 96.0 ± 5.5 R: 92 ± 8.4	R: 0.37 ± 0.09						95.4 ± 5.3[M]	94.3 ± 4[M]	20.8 ± 0.2[M]	87.5 ± 11.6[M]
	Elk River reference	90 ± 30	24.5 ± 5.5	*64.9 ± 5.5*	I: 92.0 ± 13.0	-						92 ± 5.3[M]	83 ± 3.5[M]	20.4 ± 0.6[M]	97.8 ± 14.4[M]
	Michel Creek reference	90 ± 30	23.8 ± 4.3	75.4 ± 4.3	I: 100.0 ± 0.0	-						92.3 ± 6.9[M]	89 ± 5.1[M]	20.7 ± 0.2[M]	92.2 ± 10.3[M]
	South Line Creek reference	100 ± 0	23.6 ± 3.9	*63.1 ± 4.5*	I: 100.0 ± 0.0	-						87.8 ± 10.2[M]	85.6 ± 10.2[M]	20.2 ± 0.5[M]	95.2 ± 8.3[M]
	FR_FRCP1	100 ± 0	23.5 ± 3.9	68.8 ± 10.5	I: 98.0 ± 4.5	-						91.1 ± 1.9[M]	88.9 ± 3.8[M]	20.3 ± 0.4[M]	96.9 ± 9.4[M]
	FR_FRABCH	100 ± 0	23.1 ± 4.4	67.5 ± 6.6	I: 96.0 ± 8.9	-						89 ± 4.7[M]	84.6 ± 7.9[M]	20.6 ± 0.4[M]	99.5 ± 12.7[M]
	GH_FR1	100 ± 0	22 ± 3.1	*61.5 ± 3.4*	I: 96.0 ± 5.5	-						**81.8 ± 14[M]**	**79.6 ± 14.9[M]**	20.6 ± 0.2[M]	98.6 ± 10.3[M]
	LC_LC5	90 ± 30	18.1 ± 8.9	*54.5 ± 5.7*	I: 100.0 ± 0.0	-						**77.4 ± 9.4[M]**	**77.4 ± 9.4[M]**	21.1 ± 0.2[M]	104.2 ± 20.4[M]
	LC_DCDS	100 ± 0	21.4 ± 6	69 ± 9.8	I: 92.0 ± 8.4	-						94.4 ± 3.8[M]	93.3 ± 5.8[M]	21.3 ± 0.5[M]	108.6 ± 13.2[M]
	GH_ERC	100 ± 0	23.4 ± 7.3	66.2 ± 6.2	I: 94.0 ± 8.9	-						90 ± 8.8[M]	88.9 ± 8.4[M]	20.9 ± 0[M]	105.4 ± 11.2[M]
	CM_MC2	100 ± 0	21.3 ± 3.1	66.2 ± 6.8	***I: 70.0 ± 12.2***	-						89.9 ± 6.7[M]	89.9 ± 6.7[M]	20.8 ± 0.5[M]	100.5 ± 18.4[M]
	RG_MIDAG	100 ± 0	23.3 ± 4	-	I: 100.0 ± 0.0	-						Not tested			
	EV_MC2	100 ± 0	19.2 ± 7.1	70 ± 6.1	I: 96.0 ± 5.5	-						92.5 ± 8.1[M]	83.8 ± 11.6[M]	20.8 ± 0.5[M]	100.7 ± 13.0[M]
	EV_HC1	100 ± 0	21 ± 2.2	*60.2 ± 3.2*	I: 100.0 ± 0.0	-						93.1 ± 12.0[M]	89.7 ± 9.2[M]	20.5 ± 0.6[M]	99.6 ± 10.6[M]
	LC_LC3	100 ± 0	22.2 ± 4.5	***47.2 ± 2.4***	I: 98.0 ± 4.5	-						90.1 ± 3[M]	86.8 ± 5.5[M]	21 ± 0.2[M]	100.6 ± 17.1[M]
	LC_LCDSSLCC	90 ± 30	19.5 ± 6.4	*55 ± 2.2*	I: 98.0 ± 4.5	-						92.3 ± 2[M]	91.2 ± 2[M]	21.1 ± 0.1[M]	111.5 ± 13[M]

Table 3.3-1. Results of Quarterly and Semi-Annual Toxicity Tests—Raw Results[a]

Quarter	Location	*C. dubia*		*P. subcapitata*	*H. azteca*[b]		*P. promelas* [c,d]					*O. mykiss* [c]			
		% Survival	Reproduction (Protocol)[e]	Cell Yield [× 10^4 cells/mL]	% Survival	Dry weight [mg]	% Hatch	% Survival	Biomass [mg]	Length [mm]	% Normal Development	% Survival	% Viability	Length [mm]	Wet Weight [mg]
Q3	Laboratory control	100 ± 0	22.2 ± 3.8	33.1 ± 3.5	96 ± 8.9	0.86 ± 0.15	98.3 ± 3.3 98.3 ± 3.3[M] 96.7 ± 3.9 95 ± 3.3	84.8 ± 8.3 83.1 ± 3.6[M] 71 ± 21.2 75.1 ± 17.2	2.63 ± 0.4 2.77 ± 0.38[M] 2.44 ± 0.28 2.61 ± 0.07	11.9 ± 0.5 12.4 ± 0.5[M] 12.4 ± 0.9 13 ± 0.2	100 ± 0 98.1 ± 3.9[M] 98.2 ± 3.6 94.1 ± 6.8	Not tested			
	Pooled Batch References	100 ± 0	22.3 ± 5	98.2 ± 9.5	96 ± 6	0.61 ± 0.13	93 ± 5	70 ± 20	2.3 ± 0.6	11.4 ± 0.6	98 ± 6				
	Fording River reference	100 ± 0	22.1 ± 3.3	95.8 ± 12.4	94 ± 8.9	0.61 ± 0.12	93.3 ± 5.4[M]	55.3 ± 23.6[M]	2.16 ± 0.85[M]	11.7 ± 0.5[M]	100 ± 0[M]				
	Elk River reference	90 ± 30	21 ± 7.7	97.4 ± 8.4	98 ± 4.5	*0.53 ± 0.11*	95 ± 6.4[M]	78.6 ± 12.9[M]	2.48 ± 0.33[M]	11.2 ± 0.2[M]	97.9 ± 4.2[M]				
	Michel Creek reference	100 ± 0	23 ± 4	100.4 ± 8.7	98 ± 4.5	0.77 ± 0.07	88.3 ± 3.3[M]	62.2 ± 18.9[M]	1.91 ± 0.53[M]	11 ± 0.6[M]	95 ± 10[M]				
	South Line Creek reference	100 ± 0	23 ± 4.3	99.4 ± 9.2	94 ± 5.5	*0.55 ± 0.05*	93.3 ± 0[M]	85.7 ± 5.8[M]	2.64 ± 0.11[M]	11.9 ± 0.5[M]	97.9 ± 4.2[M]				
	FR_FRCP1	90 ± 30	***12.7 ± 7.4***	89.8 ± 11.6	98 ± 4.5	*0.45 ± 0.14*	96.7 ± 3.9[M]	79.4 ± 15.2[M]	2.46 ± 0.3[M]	10.8 ± 0.9[M]	95.1 ± 5.7[M]				
	FR_FRABCH	100 ± 0	19.1 ± 3.4	*83.8 ± 7.2*	92 ± 11	*0.47 ± 0.11*	91.7 ± 6.4[M]	74.4 ± 7.8[M]	2.63 ± 0.26[M]	11.7 ± 0.8[M]	100 ± 0[M]				
	GH_FR1	100 ± 0	19.1 ± 3.8	87 ± 10.8	100 ± 0	*0.49 ± 0.11*	96.7 ± 6.7[M]	81.2 ± 2.3[M]	2.51 ± 0.16[M]	11 ± 0.4[M]	93.8 ± 8[M]				
	LC_LC5	100 ± 0	21.1 ± 4.3	91.2 ± 10.9	94 ± 5.5	*0.48 ± 0.08*	98.3 ± 3.3[M]	67.6 ± 18.8[M]	2.54 ± 0.22[M]	12.6 ± 1.2[M]	98.1 ± 3.9[M]				
	LC_DCDS	80 ± 40	*12.7 ± 9.4*	***68.5 ± 7.4***	100 ± 0	*0.58 ± 0.06*	100 ± 0	66.7 ± 21.1	2.46 ± 0.28	12.3 ± 0.6	94.2 ± 7.1				
	GH_ERC	100 ± 0	21.1 ± 2.1	***75 ± 7.5***	98 ± 4.5	*0.5 ± 0.07*	95 ± 6.4[M]	65.6 ± 13.5[M]	2.58 ± 0.18[M]	12.7 ± 0.3[M]	97.2 ± 5.6[M]				
	CM_MC2	90 ± 30	19.3 ± 4.4	89 ± 3.5	***38 ± 31.9***	***0.32 ± 0.1***	98.3 ± 3.3[M]	67.5 ± 24.7[M]	2.27 ± 0.18[M]	12.5 ± 0.9[M]	100 ± 0[M]				
	RG_MIDAG	100 ± 0	22.2 ± 4.4	-	94 ± 13.4	0.79 ± 0.07	96.7 ± 6.7[M]	79.2 ± 9.6[M]	2.41 ± 0.22[M]	11.1 ± 0.6[M]	91.2 ± 6.4[M]				
	EV_MC2	100 ± 0	25 ± 5.7	94.8 ± 8.1	94 ± 8.9	0.61 ± 0.09	96.7 ± 3.9	84.4 ± 9.1	2.58 ± 0.21	10.8 ± 1	92.3 ± 6.3				
	EV_HC1	90 ± 30	23.2 ± 7.3	***74.5 ± 6.2***	98 ± 4.5	0.75 ± 0.1	88.3 ± 8.4[M]	57.1 ± 33.3[M]	2.07 ± 0.27[M]	12.2 ± 1.6[M]	98.3 ± 3.3[M]				
	LC_LC3	100 ± 0	20.2 ± 2.5	***80.8 ± 5.6***	96 ± 5.5	*0.51 ± 0.06*	100 ± 0[M]	68.3 ± 11.4[M]	2.66 ± 0.2[M]	12.2 ± 0.9[M]	95.6 ± 5[M]				
	LC_LCDSSLCC	90 ± 30	20.3 ± 6.6	85.8 ± 5.0	94 ± 8.9	*0.53 ± 0.07*	96.7 ± 3.9[M]	57.3 ± 13.7[M]	2.28 ± 0.38[M]	12.1 ± 0.4[M]	97.5 ± 5[M]				
Q4	Laboratory control	100 ± 0	23 ± 3	18.8 ± 0.7	92 ± 8	0.43 ± 0.06	Not tested					83 ± 11	82 ± 12	19 ± 1.8	86 ± 9.1
	Pooled Batch References	100 ± 0	22.5 ± 6	86.3 ± 5.2	95 ± 9	0.52 ± 0.1						88 ± 7	85 ± 8	18.7 ± 0.7	85 ± 8
	Fording River reference	100 ± 0	22.9 ± 5	86.8 ± 5	98 ± 4	0.49 ± 0.06						86 ± 11	83 ± 14	18.6 ± 0.8	85 ± 11
	Elk River reference	100 ± 0	23.2 ± 6	88.5 ± 4.6	96 ± 5	0.56 ± 0.12						89 ± 6[M]	87 ± 3[M]	19.5 ± 0.3[M]	88 ± 9[M]
	Michel Creek reference	90 ± 30	21.8 ± 9	84.1 ± 5.6	90 ± 17	0.55 ± 0.06						90 ± 6	88 ± 6	18.9 ± 0.5	86 ± 6
	South Line Creek reference	100 ± 0	22.2 ± 5	86 ± 5.8	96 ± 5	0.49 ± 0.13						86 ± 5[M]	79 ± 7[M]	18 ± 0.4[M]	82 ± 8[M]
	FR_FRCP1	100 ± 0	***15.8 ± 4***	73 ± 7	*98 ± 4*	0.53 ± 0.07						***69 ± 12***[M]	*68 ± 10*[M]	19.6 ± 1.1[M]	94 ± 11[M]
	FR_FRABCH	100 ± 0	20 ± 5	***73.3 ± 3***	96 ± 5	0.62 ± 0.11						84 ± 2[M]	80 ± 3[M]	19.8 ± 0.9[M]	93 ± 12[M]
	GH_FR1	100 ± 0	20.9 ± 8	***71.3 ± 5.9***	92 ± 8	0.44 ± 0.15						*76 ± 13*[M]	*74 ± 16*[M]	20.1 ± 0.8[M]	102 ± 17[M]
	LC_LC5	100 ± 0	22.1 ± 5	***68.8 ± 5.9***	96 ± 5	0.54 ± 0.04						84 ± 9	78 ± 11	19.2 ± 1.3	86 ± 11
	LC_DCDS	100 ± 0	***13.3 ± 4***	***74.5 ± 4.9***	**76 ± 33**	*0.39 ± 0.08*						87 ± 3[M]	84 ± 6[M]	19.7 ± 1[M]	92 ± 8[M]
	GH_ERC	100 ± 0	24.7 ± 2	***65.3 ± 7.8***	90 ± 10	0.41 ± 0.02						86 ± 9[M]	81 ± 11[M]	19.9 ± 0.9[M]	98 ± 7[M]
	CM_MC2	100 ± 0	***14.5 ± 8***	***59 ± 9.2***	98 ± 4	0.57 ± 0.09						82 ± 12	82 ± 12	20.1 ± 0.5	96 ± 12
	RG_MIDAG	100 ± 0	**18.4 ± 6**	-	100 ± 0	0.5 ± 0.09						Not tested			
	EV_MC2	100 ± 0	25.2 ± 2	***65.3 ± 8.5***	96 ± 5	0.42 ± 0.06						79 ± 11	75 ± 10	18.6 ± 0.7	87 ± 9
	EV_HC1	100 ± 0	**18.7 ± 4**	***68.5 ± 5.1***	94 ± 9	0.57 ± 0.13						83 ± 10	75 ± 14	19.2 ± 1	93 ± 11
	LC_LC3	90 ± 30	**17.2 ± 7**	**75 ± 3.4**	94 ± 9	0.52 ± 0.04						94 ± 3	90 ± 4	19.8 ± 0.8	89 ± 8
	LC_LCDSSLCC	100 ± 0	21.3 ± 5	***61.5 ± 7.6***	98 ± 4	0.49 ± 0.08						84 ± 10^M	82 ± 11^M	20.3 ± 0.9^M	92 ± 10^M

Notes: (a) Results presented as survival or mean ± standard deviation. Results are from laboratory reports in Appendix B. Control normalized results are provided in Table 3.3-2.
(b) *H. azteca* tests in Q2 were successfully conducted and survival was measured; however, test organisms were disposed prior to measuring dry weight due to a lab technician error. Tests were repeated for the Fording River reference in Q2 and for all stations in Q3, resulting in two Q2 survival results for the Fording reference.
(c) Results for copper-amended samples are provided; reference site results are samples amended with 10 to 20 µg/L. Laboratory control results are provided for laboratory control + 10 to 20 µg/L copper (Cu).
(d) For *P. promelas*, the Q1 Elk River and Michel Creek references were excluded from pooled batch references due to anomalous results.
(e) Statistical analysis for *C. dubia* protocol results are completed by Nautilus and statistical analysis for *C.dubia* 8-day results are completed by Golder.
I = initial; R = retest; mg = milligrams; mL = millilitre; mm = millimetres;% = percent; ± = plus or minus.
Value = result significantly lower than one or more reference **Value** = result significantly lower than Fording River reference. *Value* = result significantly lower than Michel Creek reference. Value = test categorized as no adverse response. Value = test categorized as likely adverse response.
Value = result significantly lower than Elk River reference. *Value* = result significantly lower than South Line Creek reference Value = test categorized as possible adverse response. M= test had evidence of microbes in one or more replicates.

Table 3.3-2. Results of Quarterly and Semi-Annual Toxicity Tests—Control Normalized Results[a]

Quarter	Location	*C. dubia*		*H. azteca*[b]		*P. promelas* [c,d]					*O. mykiss* [c]			
		% Survival	Reproduction (Protocol)[e]	% Survival	Dry weight [mg]	% Hatch	% Survival	Biomass [mg]	Length [mm]	% Normal Development	% Survival	% Viability	Length [mm]	Wet Weight [mg]
Q1	Laboratory control	100 ± 0	100 ± 39	Not tested		100 ± 0 100 ± 3 100 ± 3 100 ± 7	100 ± 10 100 ± 7 100 ± 21 100 ± 21	100 ± 13 100 ± 9 100 ± 16 100 ± 10	100 ± 4 100 ± 3 100 ± 7 100 ± 6	100 ± 0 100 ± 0 100 ± 0 100 ± 4	Not tested			
	Pooled Batch References	90 ± 30	89 ± 37			100 ± 5	99 ± 14	90 ± 14	98 ± 8	101 ± 1				
	Fording River reference	100 ± 0	95 ± 11			100 ± 7	103 ± 8	96 ± 17	93 ± 8	102 ± 0				
	Elk River reference	90 ± 32	101 ± 47			100 ± 3	**34 ± 12**	55 ± 21	102 ± 3	**75 ± 26**				
	Michel Creek reference	90 ± 32	93 ± 38			100 ± 3	**56 ± 8**	66 ± 14	99 ± 7	**79 ± 18**				
	South Line Creek reference	80 ± 42	66 ± 35			100 ± 3	94 ± 19	83 ± 4	103 ± 5	100 ± 0				
	FR_FRCP1	90 ± 32	***52 ± 28***			104 ± 4	**58 ± 20**	73 ± 11	100 ± 6	98 ± 9				
	FR_FRABCH	100 ± 0	99 ± 24			104 ± 4	94 ± 7	90 ± 18	94 ± 4	97 ± 10				
	GH_FR1	100 ± 0	102 ± 17			96 ± 9	106 ± 11	97 ± 13	95 ± 6	96 ± 8				
	LC_LC5	100 ± 0	99 ± 33			104 ± 4	104 ± 14	93 ± 12	99 ± 8	102 ± 0				
	LC_DCDS	90 ± 32	90 ± 36			89 ± 16	100 ± 18	90 ± 7	100 ± 8	98 ± 5				
	GH_ERC	100 ± 0	83 ± 20			100 ± 3	95 ± 4	104 ± 8	98 ± 1	85 ± 8				
	CM_MC2	100 ± 0	**59 ± 29**			104 ± 4[M]	112 ± 4[M]	87 ± 13[M]	91 ± 6[M]	99 ± 4[M]				
	RG_MIDAG	100 ± 0	78 ± 25			100 ± 3	88 ± 8	78 ± 10	97 ± 3	95 ± 5				
	EV_MC2	100 ± 0	107 ± 8			98 ± 10	97 ± 9	84 ± 8	96 ± 5	98 ± 5				
	EV_HC1	100 ± 0	130 ± 11			102 ± 4	96 ± 8	94 ± 7	95 ± 2	100 ± 4				
	LC_LC3	90 ± 32	93 ± 40			105 ± 0	104 ± 10	89 ± 6	96 ± 4	98 ± 4				
	LC_LCDSSLCC	100 ± 0	91 ± 27			105 ± 0	104 ± 8	90 ± 9	96 ± 2	100 ± 4				
Q2	Laboratory control	100 ± 0	100 ± 9	I: 100 ± 10 R: 100 ± 6	R: 100 ± 38	Not tested					100 ± 12	100 ± 10	100 ± 3	100 ± 15
	Pooled Batch References	95 ± 22	106 ± 18	I: 103 ± 8 R: 96 ± 9	R: 118 ± 29						100 ± 7	103 ± 8	103 ± 2	113 ± 13
	Fording River reference	100 ± 0	104 ± 11	I: 102 ± 6 R: 96 ± 9	R: 118 ± 29						103 ± 6[M]	110 ± 5[M]	104 ± 1[M]	106 ± 16[M]
	Elk River reference	90 ± 32	109 ± 25	I: 98 ± 14	-						100 ± 6[M]	97 ± 4[M]	102 ± 3[M]	118 ± 17[M]
	Michel Creek reference	90 ± 32	106 ± 19	I: 106 ± 0	-						100 ± 7[M]	104 ± 6[M]	104 ± 1[M]	112 ± 12[M]
	South Line Creek reference	100 ± 0	105 ± 17	I: 106 ± 0	-						95 ± 11[M]	100 ± 12[M]	102 ± 3[M]	115 ± 10[M]
	FR_FRCP1	100 ± 0	105 ± 18	I: 104 ± 5	-						99 ± 2[M]	104 ± 4[M]	102 ± 2[M]	117 ± 11[M]
	FR_FRABCH	100 ± 0	103 ± 20	I: 102 ± 10	-						96 ± 5[M]	99 ± 9[M]	104 ± 2[M]	121 ± 15[M]
	GH_FR1	100 ± 0	98 ± 14	I: 102 ± 6	-						**89 ± 15[M]**	**93 ± 17[M]**	104 ± 1[M]	119 ± 12[M]
	LC_LC5	90 ± 32	81 ± 40	I: 106 ± 0	-						**84 ± 10[M]**	**90 ± 11[M]**	106 ± 0.8[M]	126 ± 25[M]
	LC_DCDS	100 ± 0	96 ± 27	I: 98 ± 9	-						102 ± 4[M]	109 ± 7[M]	107 ± 2[M]	132 ± 16[M]
	GH_ERC	100 ± 0	104 ± 33	I: 100 ± 10	-						98 ± 10[M]	104 ± 10[M]	105 ± 0.1[M]	128 ± 14[M]
	CM_MC2	100 ± 0	95 ± 14	***I: 74 ± 13***	-						97 ± 7[M]	105 ± 8[M]	104 ± 3[M]	122 ± 22[M]
	RG_MIDAG	100 ± 0	104 ± 18	I: 106 ± 0	-						Not tested			
	EV_MC2	100 ± 0	86 ± 32	I: 102 ± 6	-						100 ± 9[M]	98 ± 14[M]	104 ± 2[M]	122 ± 16[M]
	EV_HC1	100 ± 0	94 ± 10	I: 106 ± 0	-						101 ± 13[M]	105 ± 11[M]	103 ± 3[M]	121 ± 13[M]
	LC_LC3	100 ± 0	99 ± 20	I: 104 ± 5	-						98 ± 3[M]	101 ± 6[M]	105 ± 1[M]	122 ± 21[M]
	LC_LCDSSLCC	90 ± 32	87 ± 29	I: 104 ± 5	-						100 ± 2[M]	106 ± 2[M]	106 ± 0.4[M]	135 ± 16[M]

Table 3.3-2. Results of Quarterly and Semi-Annual Toxicity Tests—Control Normalized Results[a]

Quarter	Location	*C. dubia*		*H. azteca*[b]		*P. promelas* [c,d]					*O. mykiss* [c]			
		% Survival	Reproduction (Protocol)[e]	% Survival	Dry weight [mg]	% Hatch	% Survival	Biomass [mg]	Length [mm]	% Normal Development	% Survival	% Viability	Length [mm]	Wet Weight [mg]
Q3	Laboratory control	100 ± 0	100 ± 17	100 ± 9	100 ± 17	100 ± 3 100 ± 3^{M} 100 ± 4 100 ± 4	100 ± 10 100 ± 4^{M} 100 ± 30 100 ± 23	100 ± 15 100 ± 14^{M} 100 ± 11 100 ± 3	100 ± 4 100 ± 4^{M} 100 ± 8 100 ± 2	100 ± 0 100 ± 4^{M} 100 ± 4 100 ± 7	Not tested			
	Pooled Batch References	98 ± 16	100 ± 23	100 ± 6	71 ± 15	96 ± 5	94 ± 27	90 ± 22	91 ± 5	101 ± 6				
	Fording River reference	100 ± 0	100 ± 15	98 ± 9	71 ± 13	98 ± 6^{M}	74 ± 31^{M}	83 ± 33^{M}	90 ± 4^{M}	106 ± 0^{M}				
	Elk River reference	90 ± 32	95 ± 35	102 ± 5	*61 ± 13*	97 ± 6^{M}	95 ± 16^{M}	90 ± 12^{M}	90 ± 1^{M}	100 ± 4^{M}				
	Michel Creek reference	100 ± 0	104 ± 18	102 ± 5	89 ± 8	91 ± 3^{M}	88 ± 27^{M}	78 ± 22^{M}	88 ± 4^{M}	97 ± 10^{M}				
	South Line Creek reference	100 ± 0	104 ± 19	98 ± 6	*64 ± 6*	97 ± 0^{M}	121 ± 8^{M}	108 ± 4^{M}	96 ± 4^{M}	100 ± 4^{M}				
	FR_FRCP1	90 ± 32	***57 ± 33***	102 ± 5	*53 ± 16*	102 ± 4^{M}	106 ± 20^{M}	94 ± 11^{M}	83 ± 7^{M}	101 ± 6^{M}				
	FR_FRABCH	100 ± 0	86 ± 15	96 ± 11	*55 ± 13*	96 ± 7^{M}	99 ± 10^{M}	101 ± 10^{M}	90 ± 6^{M}	106 ± 0^{M}				
	GH_FR1	100 ± 0	86 ± 17	104 ± 0	*57 ± 13*	102 ± 7^{M}	108 ± 3^{M}	96 ± 6^{M}	84 ± 3^{M}	100 ± 8^{M}				
	LC_LC5	100 ± 0	95 ± 20	98 ± 6	*56 ± 10*	104 ± 4^{M}	90 ± 25^{M}	97 ± 9^{M}	97 ± 9^{M}	104 ± 4^{M}				
	LC_DCDS	80 ± 42	*57 ± 42*	104 ± 0	*67 ± 7*	105 ± 0	89 ± 28	94 ± 11	95 ± 4	100 ± 8				
	GH_ERC	100 ± 0	95 ± 9	102 ± 5	*58 ± 8*	97 ± 6^{M}	79 ± 16^{M}	93 ± 7^{M}	102 ± 3^{M}	99 ± 6^{M}				
	CM_MC2	90 ± 32	87 ± 20	***40 ± 33***	***38 ± 11***	104 ± 4^{M}	90 ± 33^{M}	87 ± 7^{M}	96 ± 7^{M}	106 ± 0^{M}				
	RG_MIDAG	100 ± 0	100 ± 20	98 ± 14	91 ± 8	100 ± 7^{M}	112 ± 13^{M}	99 ± 9^{M}	89 ± 5^{M}	93 ± 7^{M}				
	EV_MC2	100 ± 0	113 ± 25	98 ± 9	71 ± 11	102 ± 4	112 ± 12	99 ± 8	83 ± 8	98 ± 7				
	EV_HC1	90 ± 32	105 ± 33	102 ± 5	87 ± 12	93 ± 9^{M}	76 ± 44^{M}	79 ± 10^{M}	93 ± 13^{M}	105 ± 4^{M}				
	LC_LC3	100 ± 0	91 ± 11	100 ± 6	*59 ± 7*	105 ± 0^{M}	91 ± 15^{M}	102 ± 8^{M}	93 ± 7^{M}	102 ± 5^{M}				
	LC_LCDSSLCC	90 ± 32	91 ± 30	98 ± 9	*61 ± 8*	102 ± 4^{M}	76 ± 18^{M}	87 ± 15^{M}	93 ± 3^{M}	104 ± 5^{M}				
Q4	Laboratory control	100 ± 0	100 ± 14	100 ± 9	100 ± 15	Not tested					100 ± 14	100 ± 14	100 ± 10	100 ± 11
	Pooled Batch References	98 ± 16	98 ± 27	103 ± 10	122 ± 23						105 ± 8	103 ± 10	100 ± 4	100 ± 10
	Fording River reference	100 ± 0	100 ± 21	107 ± 5	114 ± 13						103 ± 13	102 ± 17	99 ± 4	100 ± 13
	Elk River reference	100 ± 0	101 ± 26	104 ± 6	131 ± 29						107 ± 7^{M}	107 ± 4^{M}	104 ± 2^{M}	103 ± 11^{M}
	Michel Creek reference	90 ± 32	95 ± 39	98 ± 19	130 ± 14						108 ± 7	108 ± 8	101 ± 3	100 ± 7
	South Line Creek reference	100 ± 0	97 ± 21	104 ± 6	114 ± 31						103 ± 6^{M}	96 ± 8^{M}	96 ± 2^{M}	96 ± 10^{M}
	FR_FRCP1	100 ± 0	***69 ± 19***	*107 ± 5*	124 ± 17						***83 ± 14^{M}***	*84 ± 12^{M}*	105 ± 6^{M}	110 ± 13^{M}
	FR_FRABCH	100 ± 0	87 ± 22	104 ± 6	145 ± 27						101 ± 2^{M}	98 ± 3^{M}	106 ± 5^{M}	109 ± 14^{M}
	GH_FR1	100 ± 0	91 ± 34	100 ± 9	104 ± 34						*91 ± 15^{M}*	*90 ± 19^{M}*	107 ± 4^{M}	119 ± 20^{M}
	LC_LC5	100 ± 0	96 ± 23	104 ± 6	128 ± 10						101 ± 10	95 ± 13	102 ± 7	100 ± 13
	LC_DCDS	100 ± 0	***58 ± 16***	**83 ± 36**	*92 ± 19*						105 ± 4^{M}	103 ± 7^{M}	105 ± 5^{M}	107 ± 10^{M}
	GH_ERC	100 ± 0	107 ± 9	98 ± 11	*97 ± 6*						103 ± 11^{M}	99 ± 13^{M}	106 ± 5^{M}	114 ± 9^{M}
	CM_MC2	100 ± 0	***63 ± 33***	107 ± 5	134 ± 20						99 ± 15	101 ± 15	107 ± 3	112 ± 14
	RG_MIDAG	100 ± 0	**80 ± 26**	109 ± 0	118 ± 22						Not tested			
	EV_MC2	100 ± 0	110 ± 8	104 ± 6	98 ± 14						94 ± 13	91 ± 12	99 ± 3	101 ± 11
	EV_HC1	100 ± 0	**81 ± 16**	102 ± 10	133 ± 30						100 ± 12	92 ± 17	102 ± 5	108 ± 13
	LC_LC3	90 ± 32	**75 ± 28**	102 ± 10	122 ± 9						113 ± 4	110 ± 5	106 ± 4	104 ± 9
	LC_LCDSSLCC	100 ± 0	93 ± 21	107 ± 5	115 ± 19						101 ± 12^{M}	100 ± 14^{M}	108 ± 5^{M}	107 ± 12^{M}

Notes: (a) Results presented as survival or mean ± standard deviation. Results are from laboratory reports in Appendix B. Raw results are provided in Table 3.3-1.

(b) *H. azteca* tests in Q2 were successfully conducted and survival was measured; however, test organisms were disposed prior to measuring dry weight due to a lab technician error. Tests were repeated for the Fording River reference in Q2 and for all stations in Q3, resulting in two Q2 survival results for the Fording reference.

(c) Results for copper-amended samples are provided; reference site results are samples amended with 10 to 20 µg/L. Laboratory control results are provided for laboratory control + 10 to 30 µg/L copper (Cu).

(d) For *P. promelas*, the Q1 Elk River and Michel Creek references were excluded from pooled batch references due to anomalous results.

(e) Statistical analysis for *C. dubia* protocol results are completed by Nautilus and statistical analysis for *C.dubia* 8-day results are completed by Golder.

I = initial; R = retest; mg = milligrams; mL = millilitre; mm = millimetres; % = percent; ± = plus or minus.

Value = result significantly lower than one or more references **Value** = result significantly lower than Fording River reference. *Value* = result significantly lower than Michel Creek reference. Value = test categorized as no adverse response. Value = test categorized as likely adverse response.

Value = result significantly lower than Elk River reference. *Value* = result significantly lower than South Line Creek reference. Value = test categorized as possible adverse response. M= test had evidence of microbes in one or more replicates

3.3.1 Results by Test Species

3.3.1.1 *Ceriodaphnia dubia*

Standard Permit-based Testing

Individual replicate results are provided in Figures 3.3-1 and 3.3-2. Mean test results are provided in Tables 3.3-1 and 3.3-2 and Figures 3.3-3 and 3.3-4.

There was no evidence of statistically significant adverse effects on mean *C. dubia* survival (Figure 3.3-1; Figure 3.3-3). The few individual replicates for which mortality was observed were insufficient to cause a statistically significant response. Replicate results for survival are dichotomous (either 0% or 100%) because each replicate consists of a single female. Results of other testing of Elk Valley waters, conducted with additional replication of the survival endpoint, confirmed that adult survival is a relatively insensitive test endpoint (Golder 2018); the observation of an occasional mortality to an adult female (including in reference samples) is believed to occur due to random events not associated with chemical toxicity.

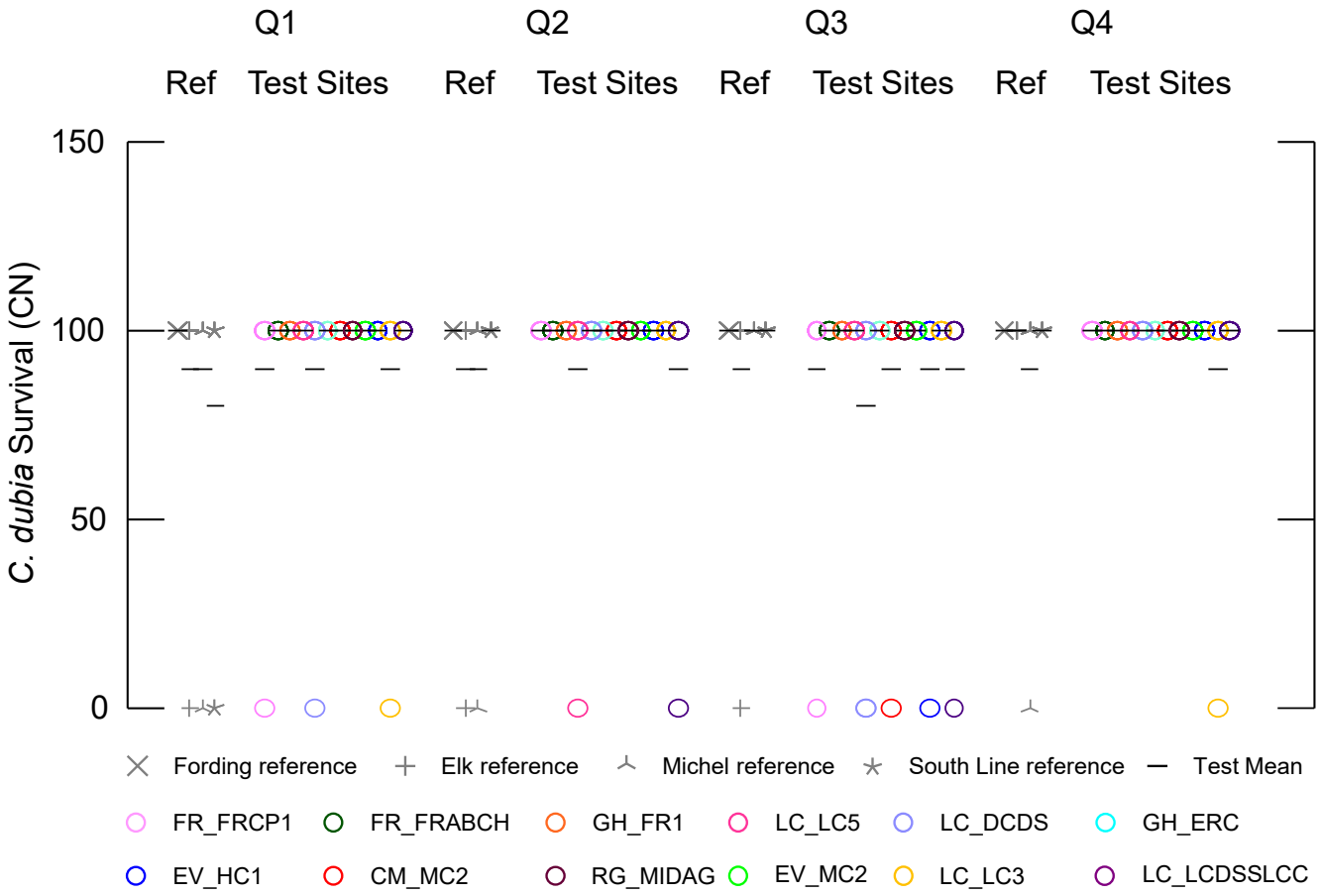
Reproduction was significantly reduced relative to one or more references in 10 of 48 tests (Figures 3.3-2; Figure 3.3-4; Table 3.3-1; Table 3.3-2), including three FR_FRCP1 tests (Q1, Q3 and Q4), two LC_DCDS tests (Q3 and Q4), two CM_MC2 tests (Q1 and Q4), one RG_MIDAG test (Q4), one EV_HC1 test (Q4), and one LC_LC3 test (Q4).

Based on the decision framework in Figure 2.3-1, *C. dubia* tests were categorized as follows:

- **No adverse response (40 of 48 tests):** Most tests were categorized as no adverse response, including 2 of the 10 tests with significantly reduced reproduction. Compared to the mean response in batch-specific references, the effect size in significant tests categorized as no adverse response ranged from 17% (EV_HC1 Q4) to 18% (RG_MIDAG Q4).
- **Possible adverse response (1 of 48 tests):** Q4 test with LC_LC3. Compared to the mean response in batch-specific references, the effect size in this test was 24%.
- **Likely adverse response (7 of 48 tests):** Q1 tests with FR_FRCP1 and CM_MC2; Q3 tests with FR_FRCP1 and LC_DCDS; Q4 tests with FR_FRCP1, LC_DCDS, and CM_MC2. Compared to the mean response in batch-specific references, the effect size in tests categorized as likely adverse response ranged from 30% (FR_FRCP1 Q4) to 43% (FR_FRCP1 and LC_DCDS Q3).

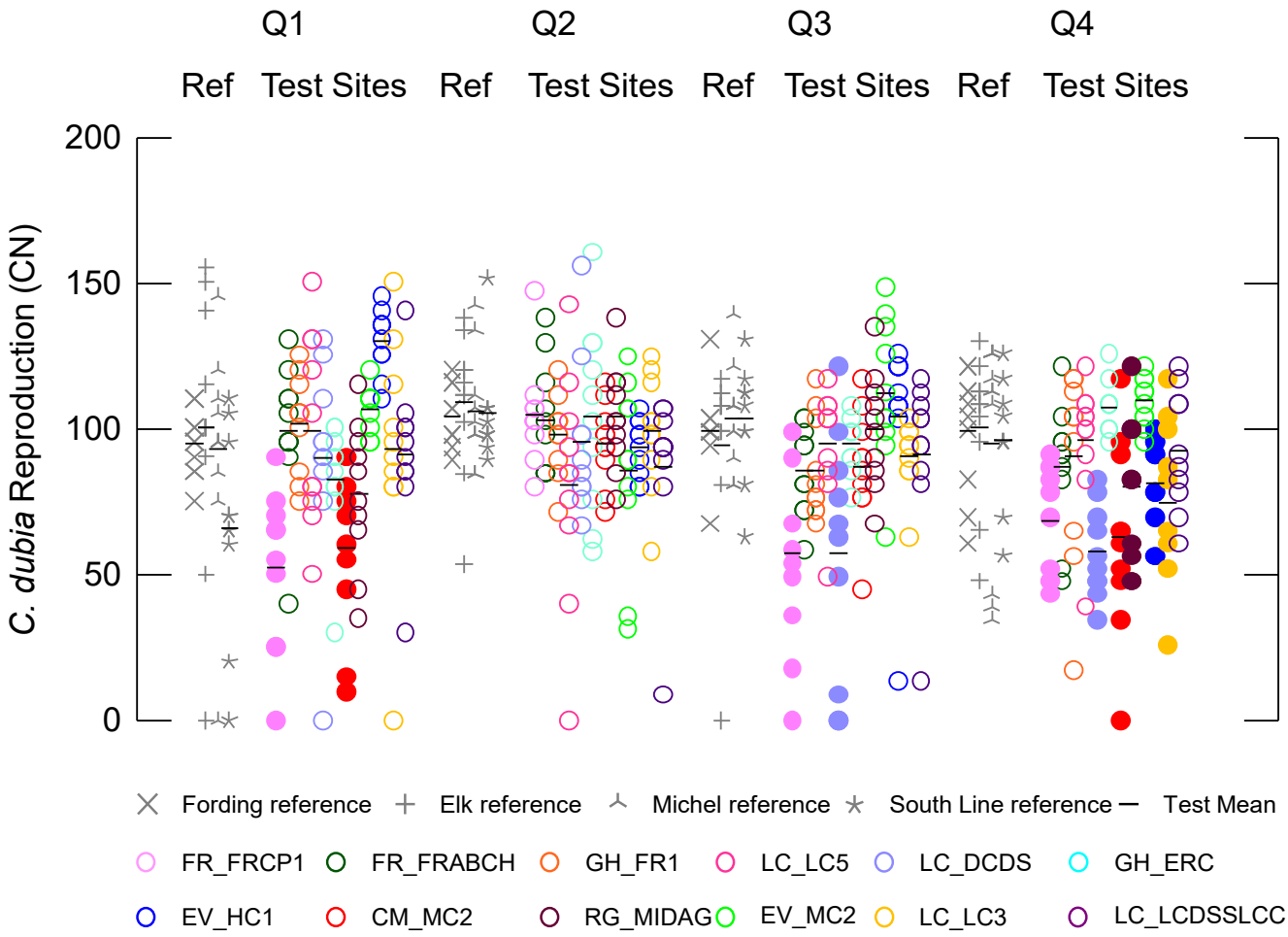
The causation assessment for *C. dubia* reproduction is presented in Section 3.4.1.

Figure 3.3-1: Individual replicate and mean results for *C. dubia* survival in reference (Ref) and test site waters.



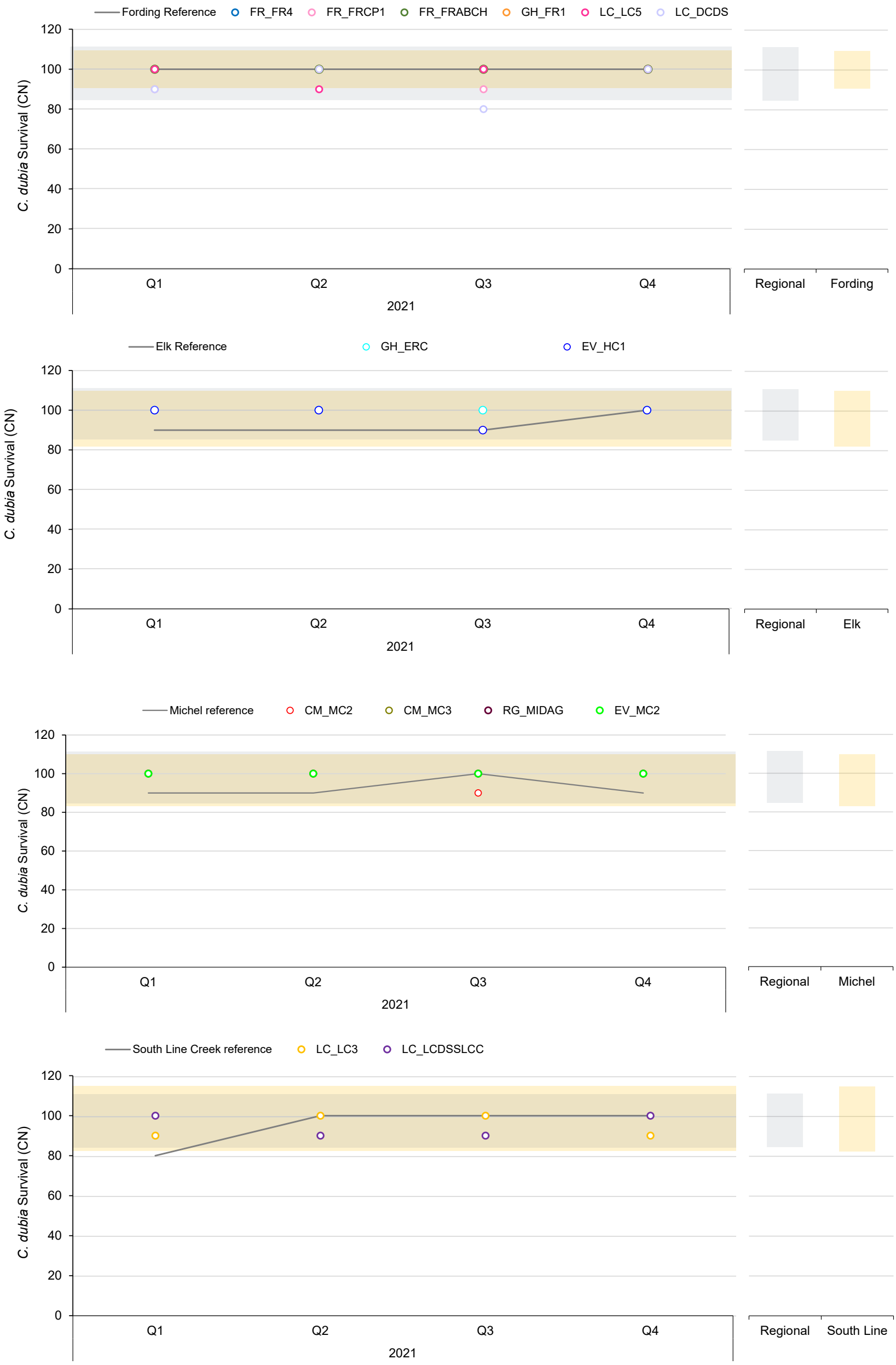
Note: See Figure 2.3-2 for description of lines and symbols. Replicate results are either 100% or 0% because there is a single adult female daphnid in each replicate. Mean results represent the combined data from ten replicates per treatment. CN = control normalized.

Figure 3.3-2: Individual replicate and mean results for *C. dubia* reproduction in reference (Ref) and test site waters.



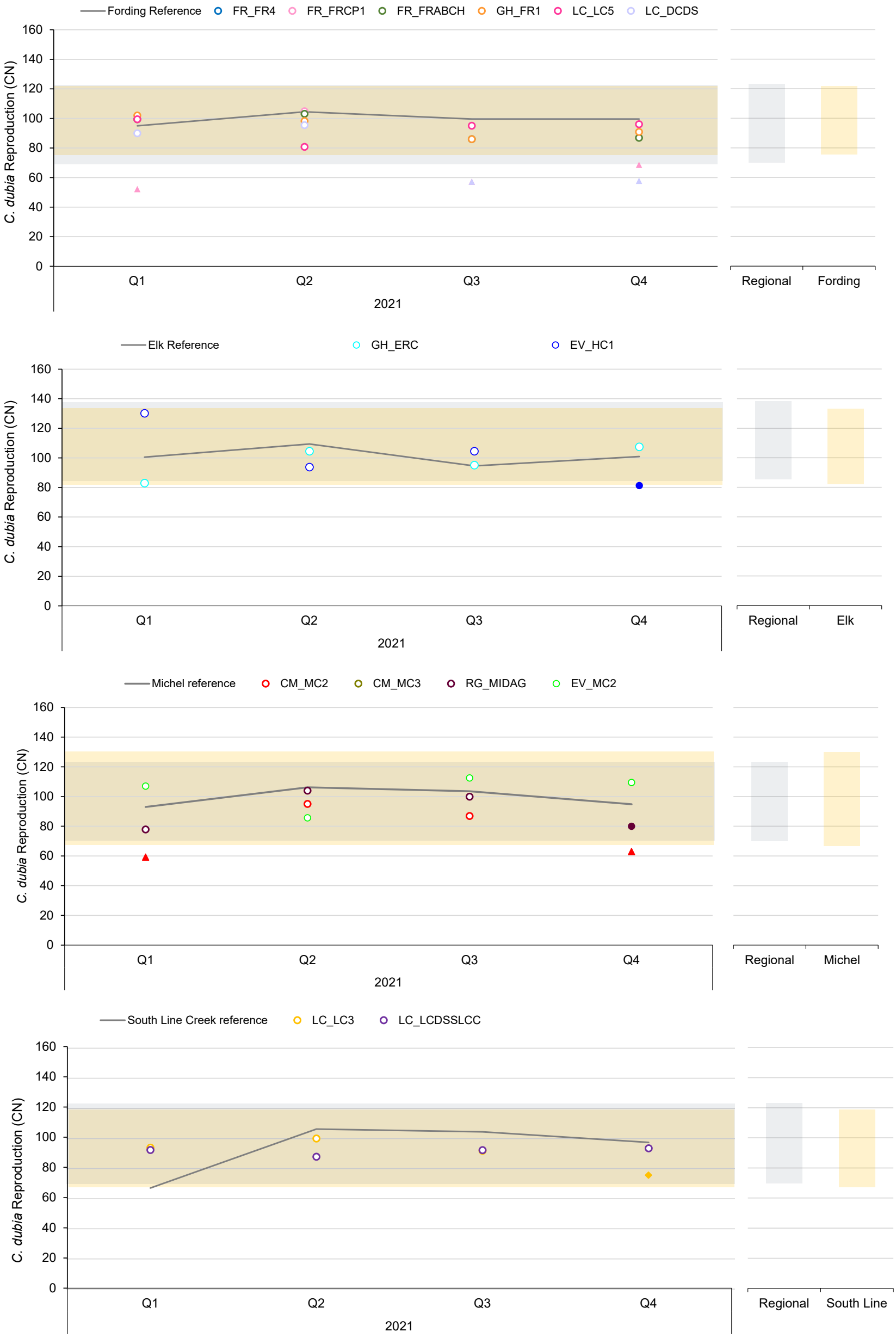
Note: See Figure 2.3-2 for description of lines and symbols. CN = control normalized.

Figure 3.3-3: Mean results for *C. dubia* survival in the Fording River reference and its paired test site waters (top left panel), the Elk River reference and its paired test site waters (second left panel), the Michel Creek reference and its paired test site waters (third left panel), and the South Line Creek and its paired test waters (bottom left panel). Regional and local normal ranges (2.5th to 97.5th percentile) are shown as bars (right panels).



Note: See Figure 2.3-3 for description of lines and symbols. Test sites were compared to their paired local NR (Section 2.3.3).CN = control normalized.

Figure 3.3-4: Mean results for *C. dubia* reproduction in the Fording River reference and its paired test site waters (top left panel), the Elk River reference and its paired test site waters (second left panel), and the Michel Creek reference and its paired test site waters (third left panel), and the South Line Creek and its paired test waters (bottom left panel). Regional and local normal ranges (2.5th to 97.5th percentile) are shown as bars (right panels).



Note: See Figure 2.3-3 for description of lines and symbols. Test sites were compared to their paired local NR (Section 2.3.3). CN = control normalized.

Consideration of *Ceriodaphnia dubia* Broods

A comparison of *C. dubia* brood output between the Environment Canada protocol tests and 8-day tests is provided in Figure 3.3-5. At a broad level, the differences between the two methods of quantifying reproductive output were not large. There was no statistical difference between the mean neonates counted using either method in 23 of 68 tests (33%) conducted across the four quarters. Of the 23 tests where a difference was observed, the percent difference of mean number of neonates in the 8-day protocol was ≤15% greater relative to the protocol test, except for two Q2 tests (22% [EV_MC2] and 42% [LC_DCDS])) and six Q4 tests (26% [FR_FRCP1], 33% [CM_MC2], 31% [RG_MIDAG], 24% [EV_HC1], 21% [LC_DCDS], and 20% [LC_LC3]).

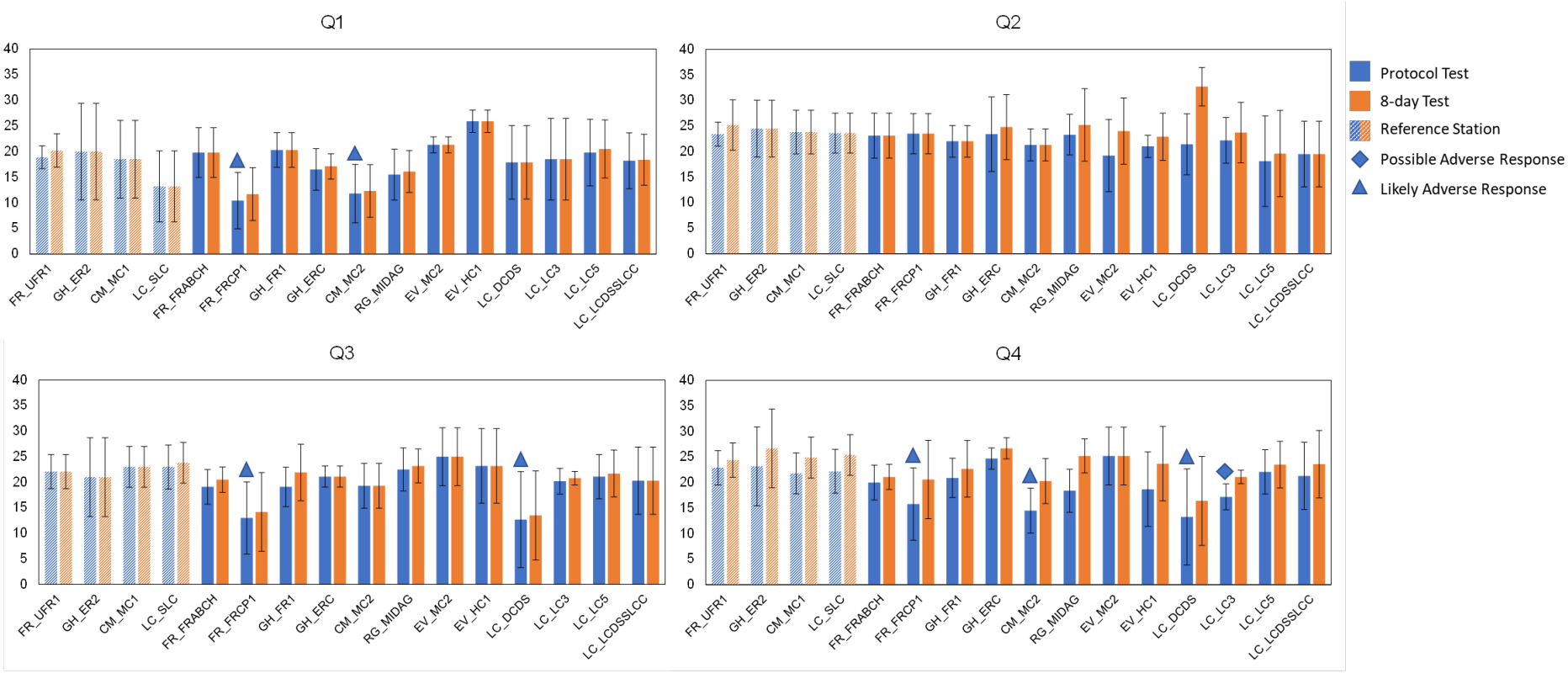
Tests that were significantly lower than one or more reference in the Environment Canada protocol test were also significantly lower than one or more reference in the 8-day test, except for the Q4 RG_MIDAG test. Reproduction for Q4 RG_MIDAG was significantly lower than the Fording and Elk reference tests in the Environment Canada protocol test but was similar to all batch-specific references in the 8-day test. The Q4 RG_MIDAG test was categorized as no adverse response, indicating that the conclusions would not have differed between the two test terminations.

The comparison of results from the Environment Canada protocol test and the 8-day tests provides the following important information:

- Termination of the test based on negative control performance can occasionally result in loss of information from a third brood, and this was most notably demonstrated in Q4 of 2021. This occurs in an unpredictable manner throughout the historical test record because the Environment Canada test duration of 6, 7, or 8 days is subject to high uncertainty (and can be arbitrary when the test is terminated in the middle of the third brood event).
- Early termination of Q4 tests in 2021 following the Environment Canada protocol (Day 6) can result in estimates of reproduction that are negatively biased when the objective is to characterize the full reproductive output from three broods. This bias may impact reference and test sites differently, as observed in Q4 2020 where the downward bias acted only on the reference site waters (Golder 2021a).

Although the reproductive output was sometimes biased low (i.e., in Q4 2021), there were no differences in the assigned effect categorization. The 2021 analysis confirmed that the samples showing reduced reproduction in the Environment Canada test were not an artifact of test termination date.

Figure 3.3-5: Mean Number of *Ceriodaphnia dubia* Neonates in Protocol and 8-day Tests in 2021.



Notes: Error bars represent the standard deviation of number of neonates.

3.3.1.2 *Pseudokirchneriella subcapitata*

Cell yield was significantly reduced relative to one or more references in 29 of 44 tests (Figure 3.3-6; Figure 3.3-7; Table 3.3-1), including all Q1 tests except GH_FR1 and GH_ERC; Q2 tests with GH_FR1, LC_LC5, EV_HC1, LC_LC3, and LC_LCDSSLCC; Q3 tests with FR_FRABCH, LC_DCDS, GH_ERC, EV_HC1, and LC_LC3; and all Q4 tests except FR_FRCP1.

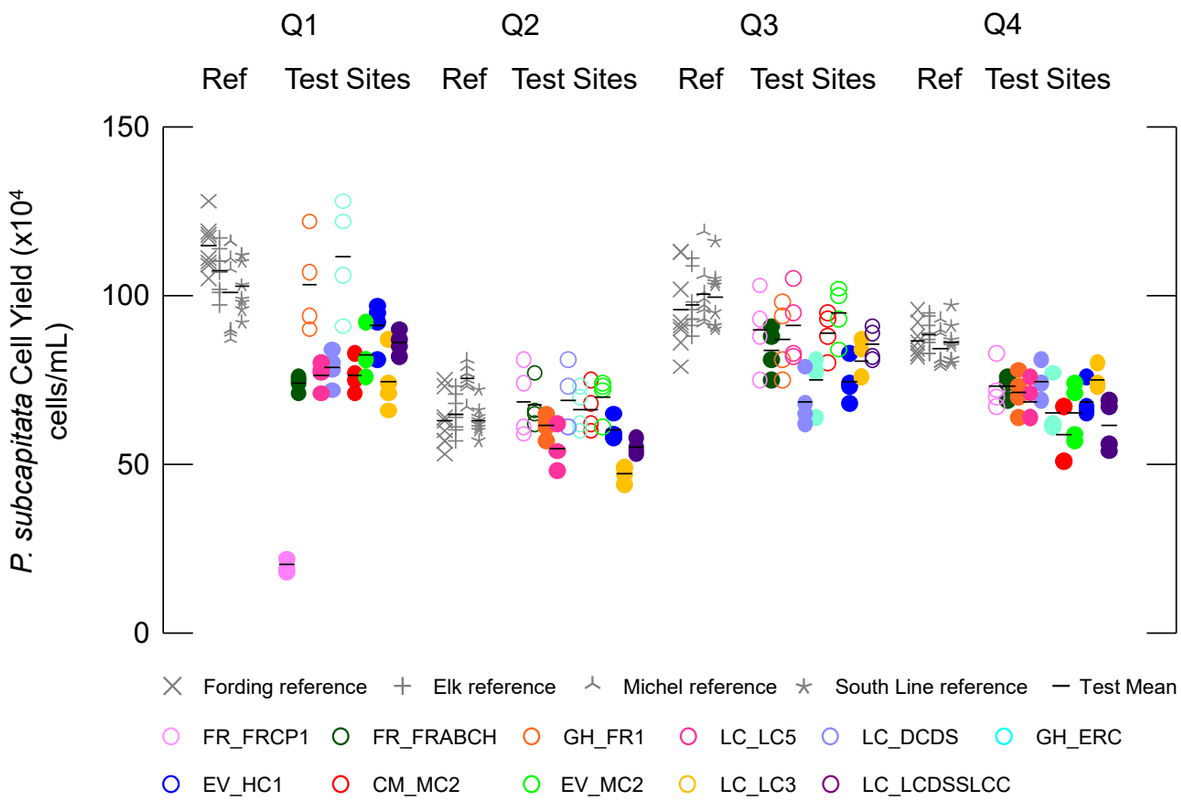
The highest frequency of significant responses was observed in Q1 and Q4. Many of the test sites had mean cell yield that was affected systematically (reduced growth) across the batch, despite the tested sites having different water quality profiles. The reason for the systematic depression is unknown. As discussed as the February 2022 EMC meeting, one potential explanation is nutrient complexation[22], which has been identified as a potential confounding factor in algal test method guidance (e.g., OECD 2019).

Based on the decision framework in Figure 2.3-1, *P. subcapitata* tests were categorized as follows:

- **No adverse response (25 of 44 tests)**: Approximately two thirds of tests were categorized as no adverse response, including 10 tests with significant results. Compared to the mean response in batch-specific references, the effect size in significant tests ranged from 9.5% (EV_HC1 Q2) to 19% (LC_LCDSSLCC Q1).
- **Possible adverse response (16 of 44 tests)**: Q1 tests with FR_FRABCH, LC_LC5, LC_DCDS, CM_MC2, EV_MC2, and LC_LC3; Q2 test with GH_FR1; Q3 tests with LC_DCDS, GH_ERC, and EV_HC1; Q4 tests with LC_LC5, GH_ERC, CM_MC2, EV_MC2, EV_HC1, and LC_LCDSSLCC. Compared to the mean response in batch-specific references, the effect size in tests categorized as possible adverse response ranged from 8% (GH_FR1 Q2) to 32% (CM_MC2 Q4).
- **Likely adverse response (3 of 44 tests)**: Q1 test with FR_FRCP1 and Q2 tests with LC_LC5 and LC_LC3. Compared to the mean response in batch-specific references, the effect size in tests categorized as likely adverse response ranged from 18% (GH_FR1 in Q2) to 81% (CM_MC2 Q4).

The causation assessment for *P. subcapitata* cell yield is presented in Section 3.4.2.

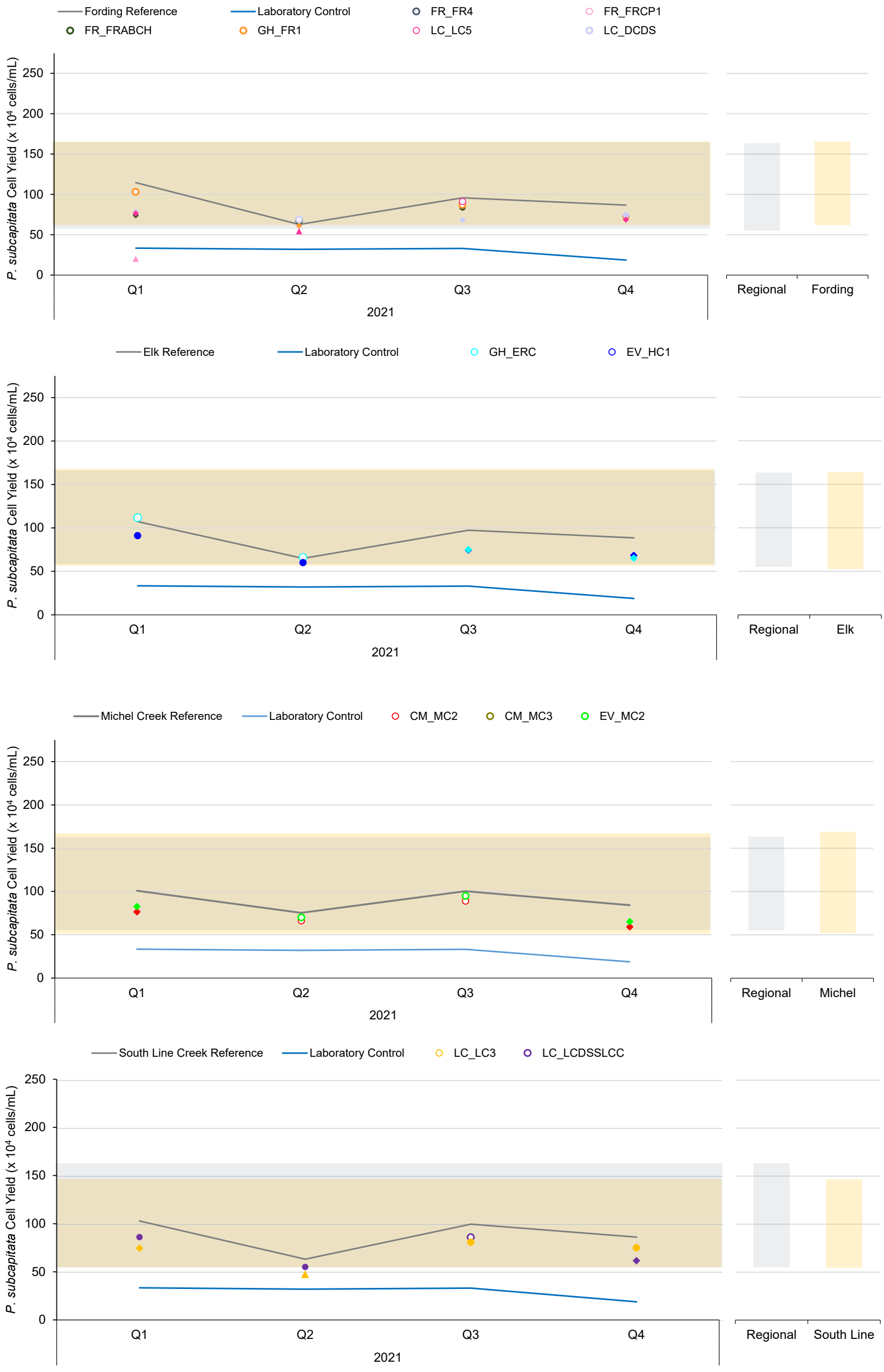
Figure 3.3-6: Individual replicate and mean results for *P. subcapitata* cell yield in reference (Ref) and test site waters.



Note: See Figure 2.3-2 for description of lines and symbols.

[22] Site water chemistry may affect the bioavailability and/or solubility of nutrients, which could reduce cell yield.

Figure 3.3-7: Mean results for *P. subcapitata* cell yield in the Fording River reference and its paired test site waters (top left panel), the Elk River reference and its paired test site waters (second left panel), and the Michel Creek reference and its paired test site waters (third left panel), and the South Line Creek and its paired test waters (bottom left panel). Regional and local normal ranges (2.5th and 97.5th percentile) are shown as bars (right panels).



Note: See Figure 2.3-3 for description of lines and symbols. Test sites were compared to their paired local NR (Section 2.3.3)

3.3.1.3 *Hyalella azteca*

Survival was significantly reduced in 3 of 36 tests (CM_MC2 Q2 and Q3 and LC_DCDS Q4) (Figure 3.3-8; Figure 3.3-10; Table 3.3-1; Table 3.3-2). In one of three tests with significantly reduced survival (LC_DCDS Q4), mean survival indicated no adverse response; compared to the mean response in batch-specific references, the effect size was 19.9%. In two of three tests with significantly reduced survival, mean survival indicated a likely adverse response to the test water; compared to the mean response in batch-specific references, the effect sizes were 28% (CM_MC2 Q2) and 60% (CM_MC2 Q3).

Dry weight was significantly reduced in 11 of 24 tests[23] (Figure 3.3-9; Figure 3.3-11; Table 3.3-1; Table 3.3-2), including most tests in Q3 (all except RG_MIDAG, EV_MC2 and EV_HC1) and two tests in Q4 (LC_DCDS and GH_ERC). In 4 of 11 tests with significantly reduced dry weight relative to one or more references (Q3 LC_DCDS, GH_ERC, LC_LC3 and LC_LCDSSLCC), mean dry weight was categorized as no adverse response; compared to the mean response in batch-specific references, the effect size ranged from 5.7% (LC_DCDS [Q3]) to 19% (GH_ERC [Q3]). In 6 of 11 tests with significantly reduced dry weight relative to one or more references, mean dry weight was categorized as possible adverse response (Q3 tests with FR_FRCP1, FR_FRABCH, GH_FR1, and LC_LC5 and Q4 tests with LC_DCDS and GH_ERC); effect sizes for tests categorized as possible adverse response ranged from 20% (Q3 GH_FR1) to 27% (Q3 FR_FRCP1). In the remaining test with significantly reduced dry weight relative to one or more references (Q3 CM_MC2), mean dry weight was categorized as likely adverse response; compared to the mean response in batch-specific references, the effect size for this test was 48%.

The highest frequency of significant dry weight responses was observed in Q3. As discussed in Section 3.2.3.3 and at the February 2022 EMC meeting, mean control normalized dry weight in the Q3 Michel Creek reference (90%) was higher than the other three references (which ranged from 62% to 71%). This resulted in all test sites having significantly lower responses relative to the Michel reference only. Except for CM_MC2, Q3 test site responses were statistically similar to all other batch-specific references. Therefore, it is unlikely that the Q3 dry weight results represent an adverse response to toxicants in the test water, but rather reflect natural variance in test organism performance unrelated to water quality.

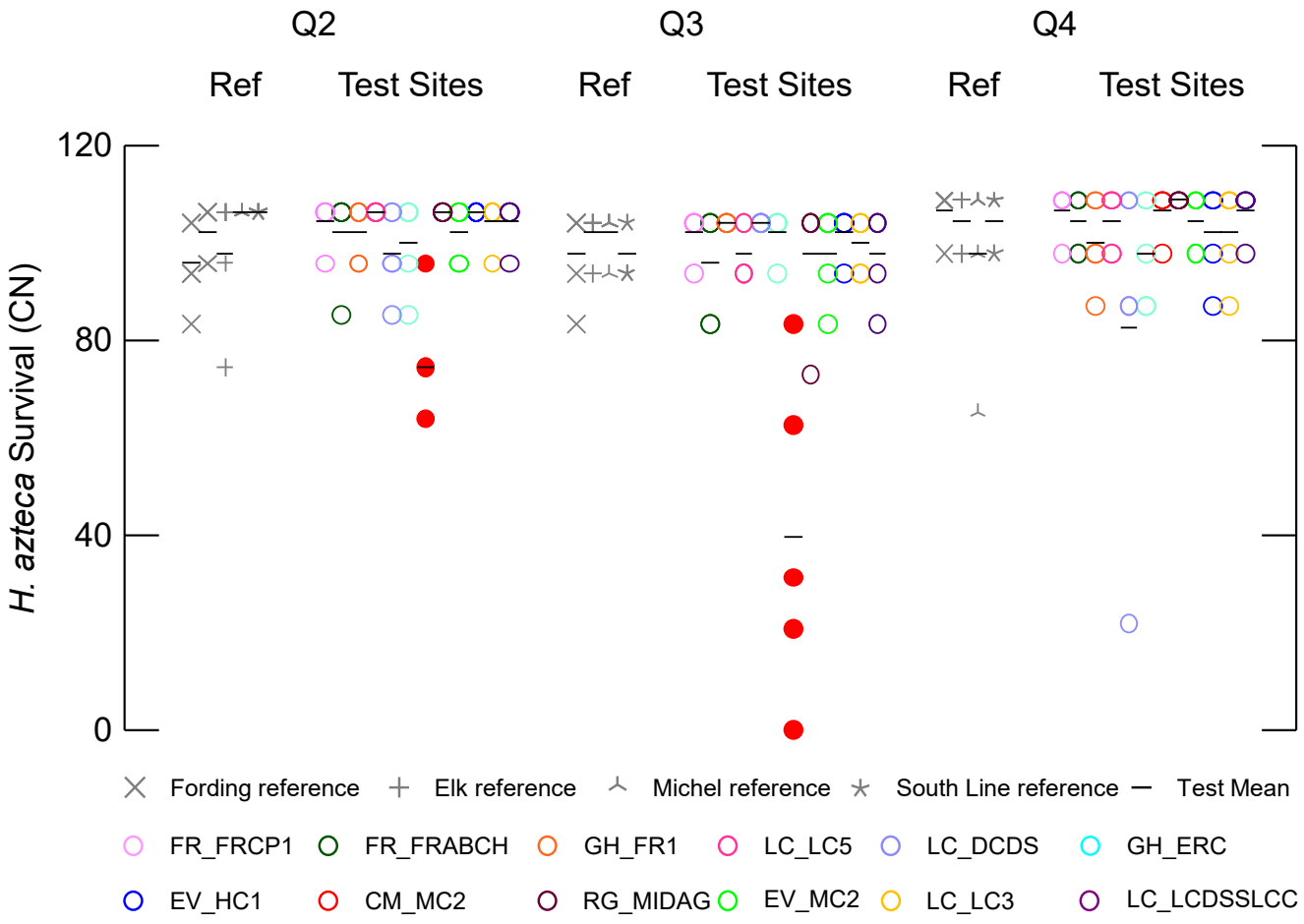
Based on the decision framework in Figure 2.3-1, *H. azteca* tests were categorized as follows:

- **No adverse response (28 of 36 tests)**: All Q2 tests except CM_MC2; Q3 tests with LC_DCDS, GH_ERC, RG_MIDAG, EV_MC2, EV_HC1, LC_LC3 and LC_LCDSSLCC; all Q4 tests except LC_DCDS and GH_ERC.
- **Possible adverse response (6 of 36 tests)**: Q3 tests with FR_FRCP1, FR_FRABCH, GH_FR1, and LC_LC5; and Q4 tests with LC_DCDS and GH_ERC.
- **Likely adverse response (2 of 36 tests)**: Q2 and Q3 tests with CM_MC2.

The causation assessment for *H. azteca* survival and dry weight is presented in Section 3.4.3.

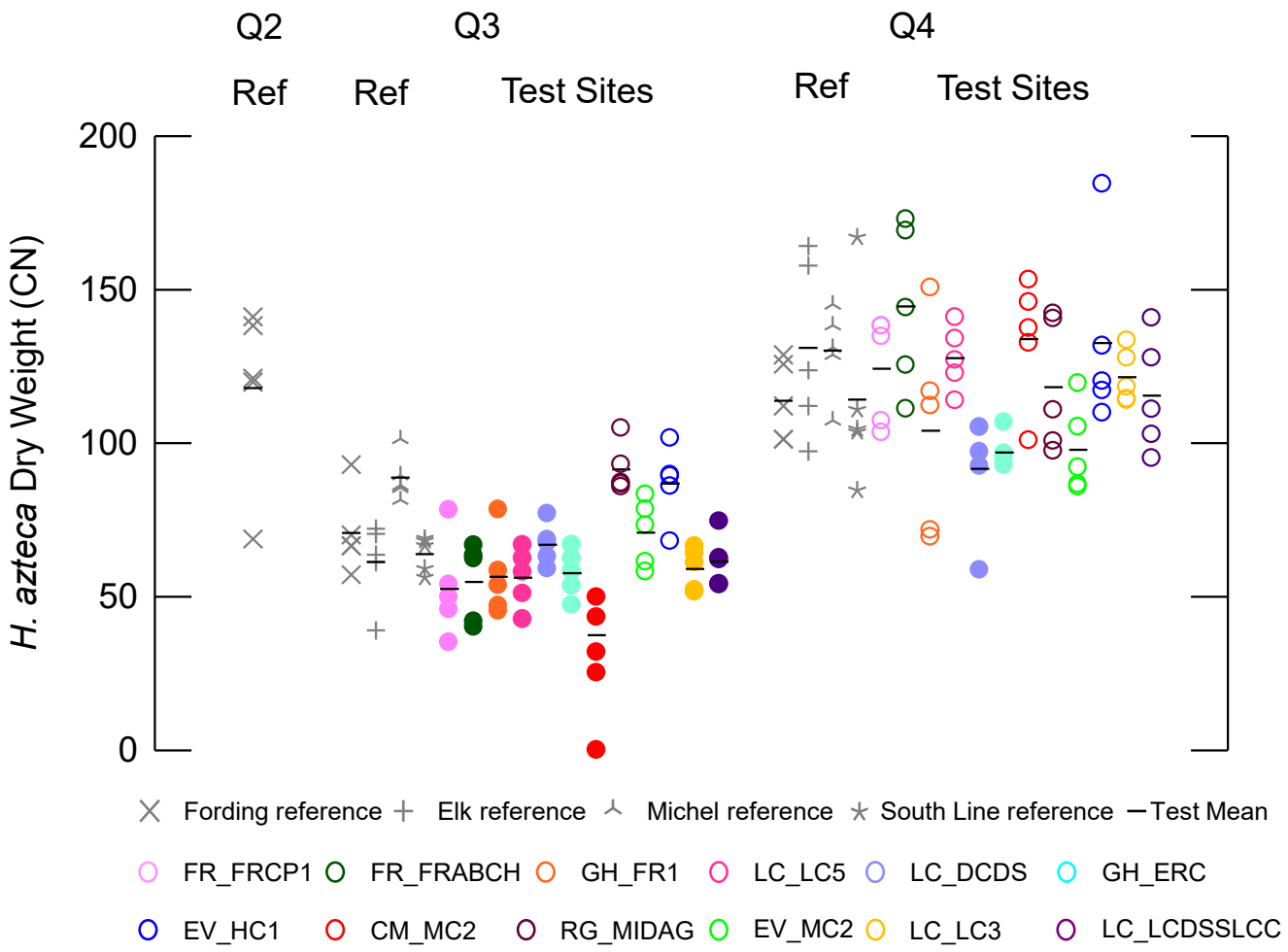
[23] *H. azteca* tests in Q2 were successfully conducted and survival was measured; however, test organisms were disposed prior to measuring dry weight due to a lab technician error. Tests were repeated for all stations in Q3, resulting in 24 of the 36 tests conducted having dry weight results only.

Figure 3.3-8: Individual replicate and mean results for *H. azteca* survival in reference (Ref) and test site waters.



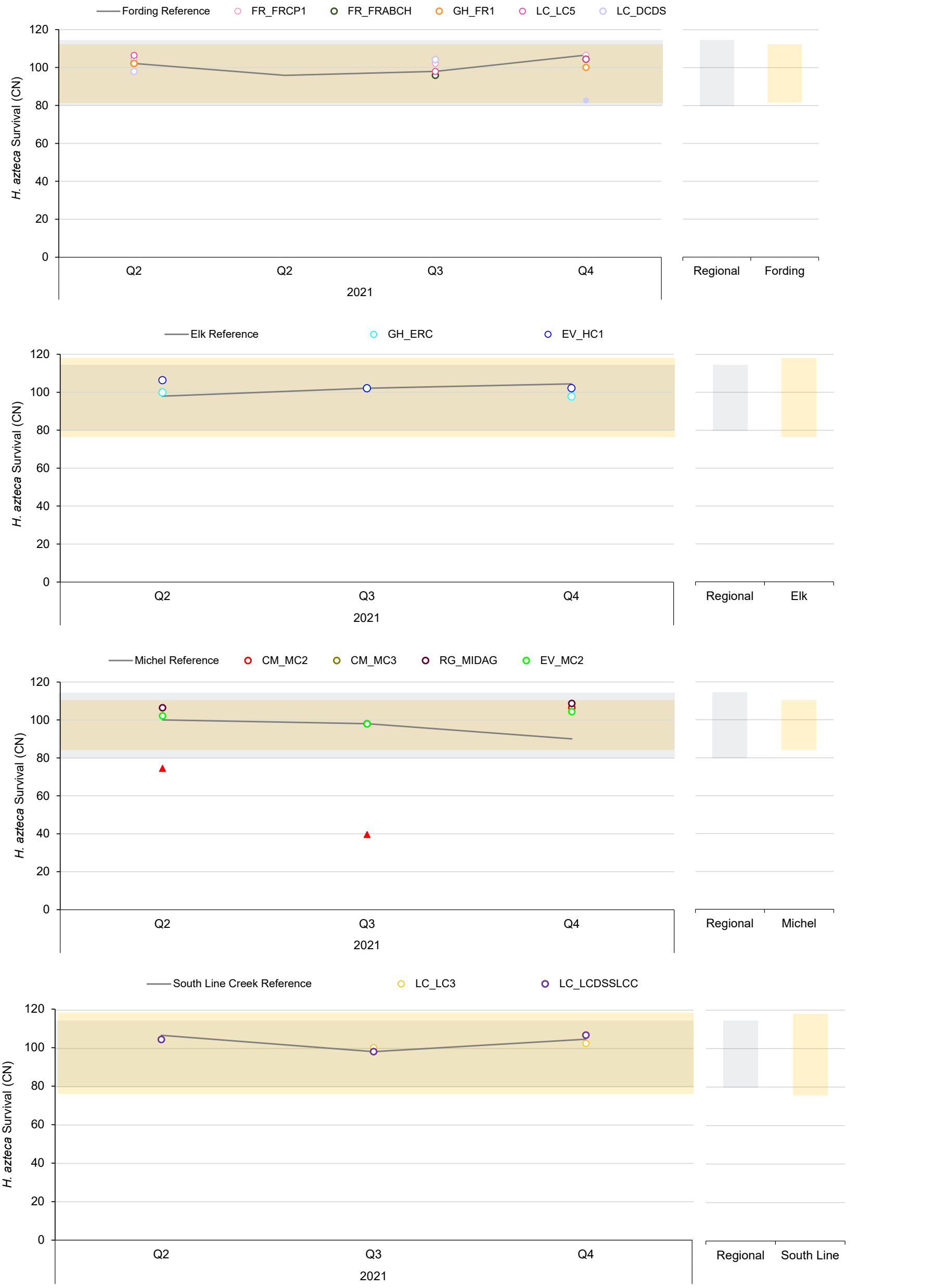
Note: See Figure 2.3-2 for description of lines and symbols. Due to a lab technician error, Q2 *H. azteca* tests were disposed prior to the measurement of dry weight (see Section 3.1). Tests were repeated in Q2 for the Fording River reference and then repeated for all stations in Q3 resulting in the Fording River reference being re-tested in both Q2 and Q3. CN = control normalized.

Figure 3.3-9: Individual replicate and mean results for *H. azteca* dry weight in reference (Ref) and test site waters.



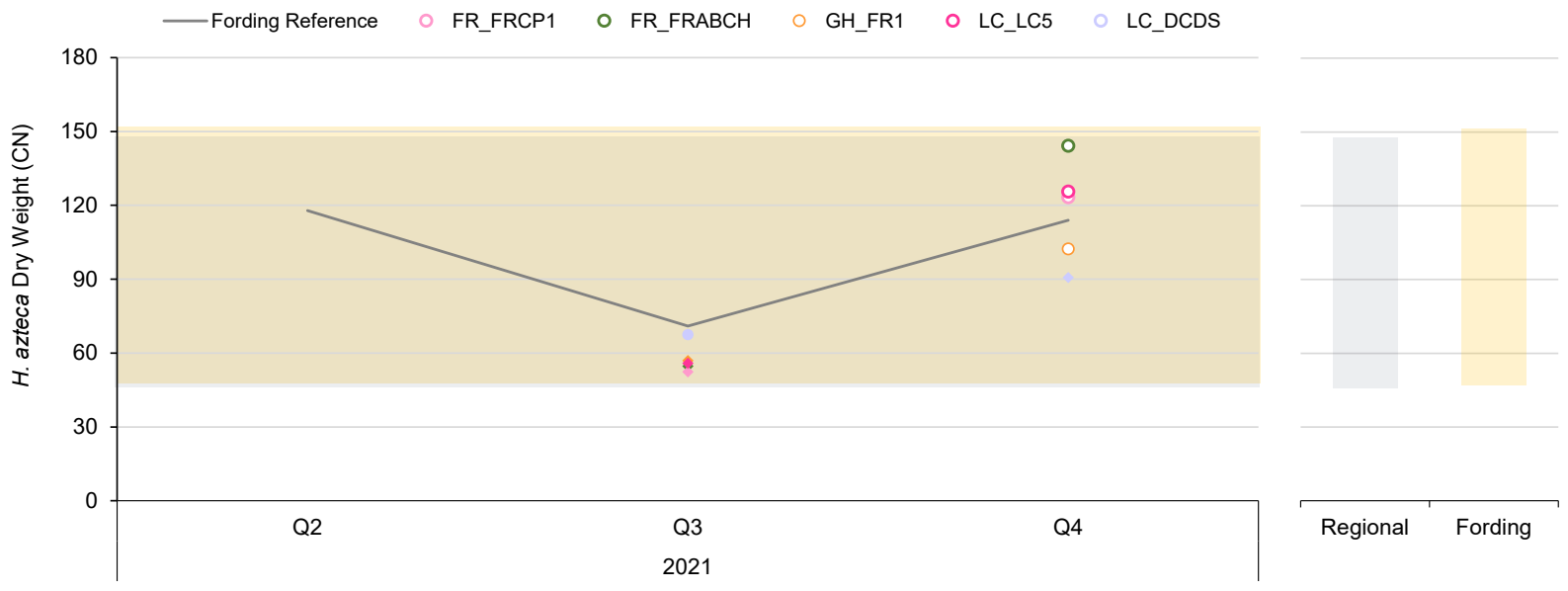
Note: See Figure 2.3-2 for description of lines and symbols. Due to a lab technician error, Q2 *H. azteca* tests were disposed prior to the measurement of dry weight (see Section 3.1). Dry weight results for the Fording River reference in this figure are from the Q2 re-test. CN = control normalized.

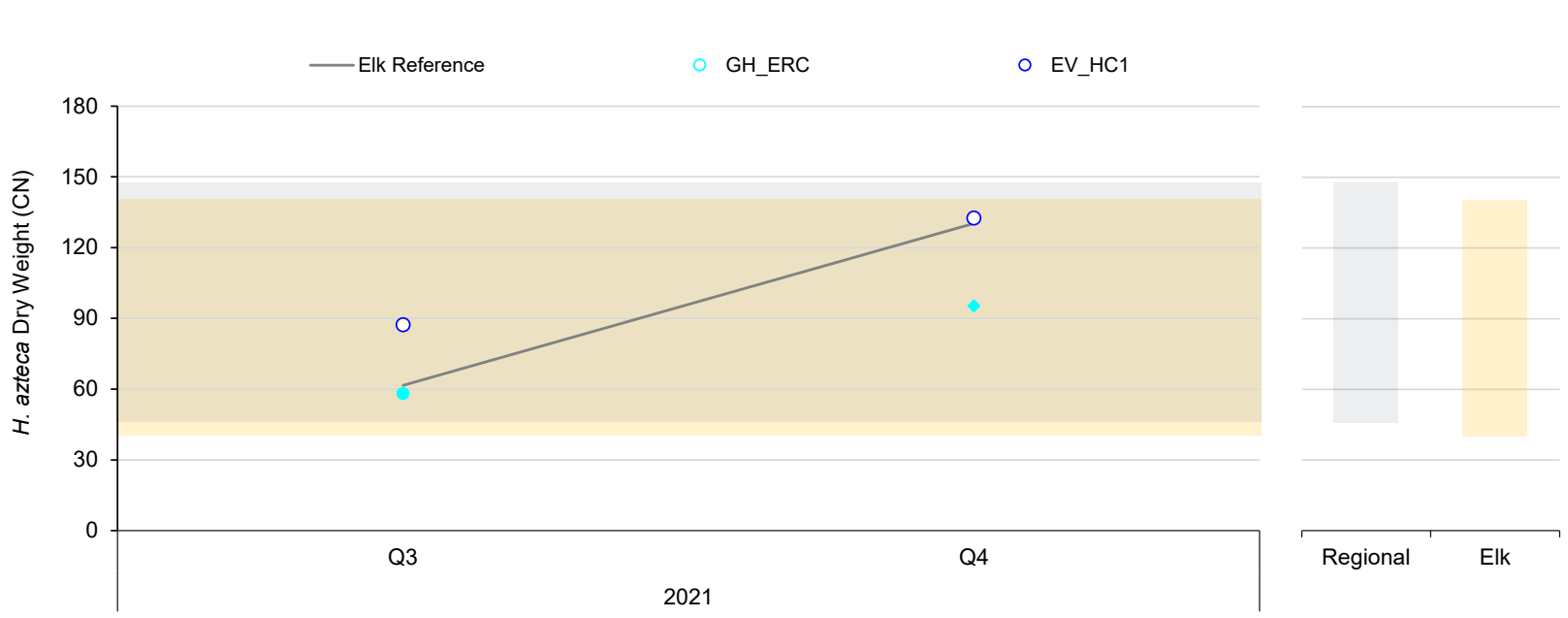
Figure 3.3-10: Mean results for *H. azteca* survival in the Fording River reference and its test site waters (top left panel), the Elk River reference and its paired test site waters (second left panel), the Michel Creek reference and its paired test site waters (third left panel), and the South Line Creek reference and its paired test site waters (bottom left panel). Regional and local normal ranges (2.5th to 97.5th percentile) are shown as bars (right panels).

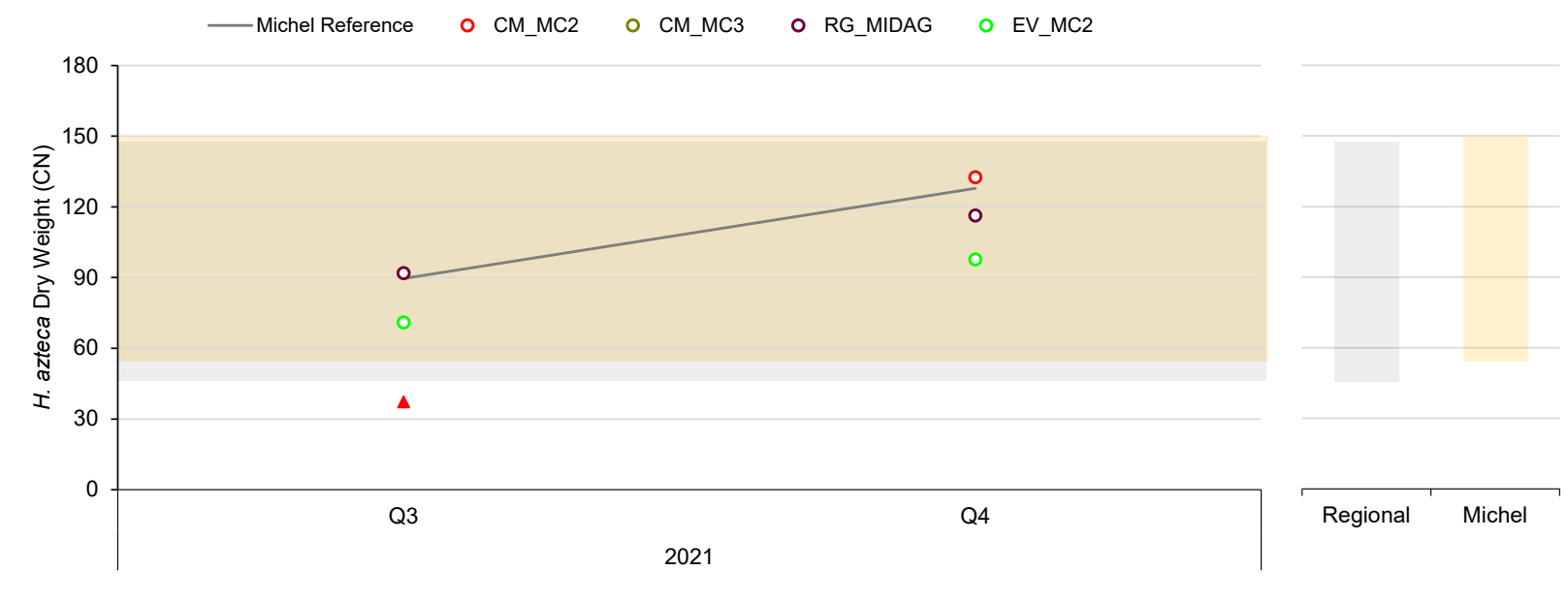


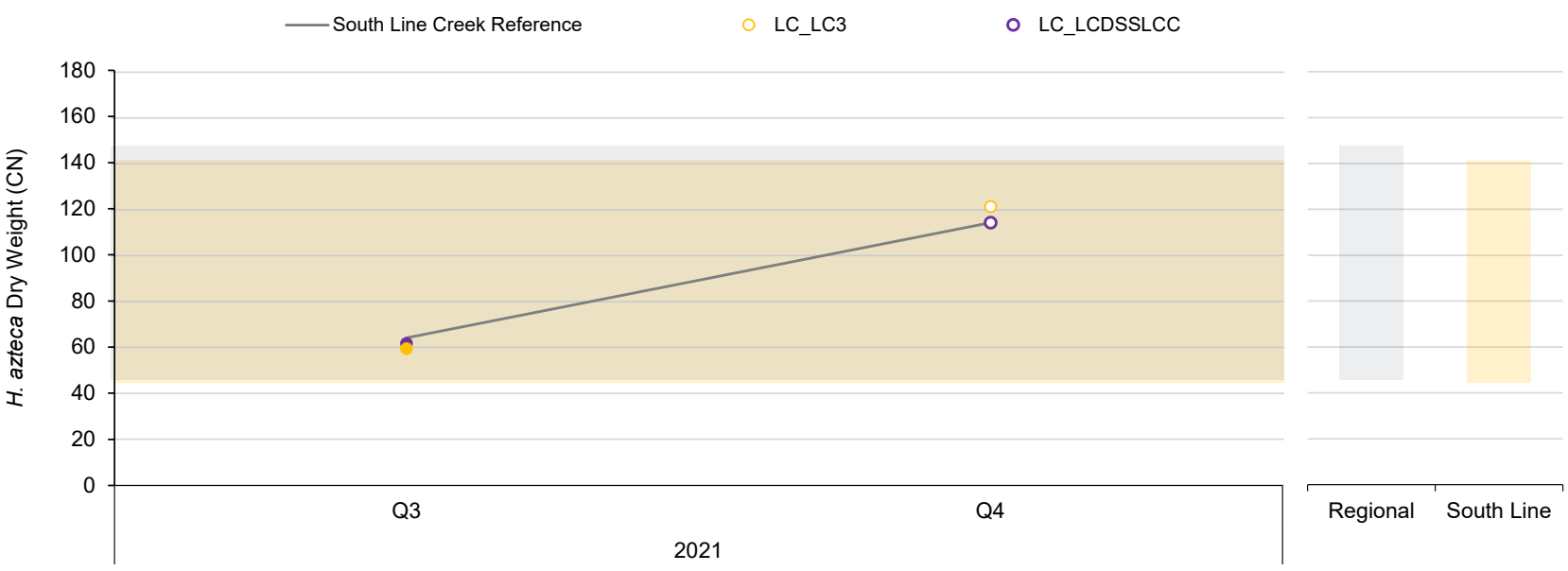
Note: See Figure 2.3-3 for description of lines and symbols. Test sites were compared to their paired local NR (Section 2.3.3). *H. azteca* tests in Q2 were successfully conducted and survival was measured; however, test organisms were disposed prior to measuring dry weight due to a lab technician error. Tests were repeated for the Fording River reference in Q2 and for all stations in Q3, resulting in two Q2 survival results for the Fording reference. CN = control normalized.

Figure 3.3-11: Mean results for *H. azteca* dry weight in the Fording River reference and its test site waters (top left panel), the Elk River reference and its paired test site waters (second left panel), the Michel Creek reference and its paired test site waters (third left panel), and the South Line Creek reference and its paired test site waters (bottom left panel). Regional and local normal ranges (2.5th to 97.5th percentile) are shown as bars (right panels).









Note: See Figure 2.3-3 for description of lines and symbols. Test sites were compared to their paired local NR (Section 2.3.3). As discussed in Sections 3.1 and 3.2.3.3, Q4 2020 results were not included in updated NR calculations. Test sites were compared to their paired local NR (Section 2.3.3). *H. azteca* tests in Q2 were successfully conducted and survival was measured; however, test organisms were disposed prior to measuring dry weight due to a lab technician error. Tests were repeated for the Fording River reference in Q2 and for all stations in Q3, resulting in two Q2 survival results for the Fording reference. Q2 results presented are from the Q2 re-test. CN= control normalized.

3.3.1.4 *Oncorhynchus mykiss*

There were no adverse behavioural responses of *O. mykiss* in 2021 tests. The survival and viability endpoint responses were numerically similar, indicating a low rate of deformities in all samples (Appendix B). These results are expected given that rainbow trout alevins are not sufficiently developed to exhibit indications of deformations or behaviour that are more commonly assessed at the fry stage.

Survival was significantly reduced relative to one or more references in 4 of 22 tests (Figure 3.3-12; Figure 3.3-16; Table 3.3-1; Table 3.3-2), including two Q2 tests (GH_FR1 and LC_LC5) and two Q4 tests (FR_FRCP1 and GH_FR1). In three of four tests with significantly reduced survival relative to one or more references, mean survival was categorized as no adverse response; compared to the mean response in batch-specific references, the effect sizes in these three tests ranged from 11% (GH_FR1 Q2) to 16% (LC_LC5 Q2). In the Q4 FR_FRCP1 test, mean survival indicated a possible adverse response; compared to the mean response in batch-specific references, the effect size was 21%.

Viability outcomes were similar to those for survival. Viability was significantly reduced relative to one or more references in 4 of 22 tests (Figure 3.3-13; Figure 3.3-17; Table 3.3-1; Table 3.3-2), including two Q2 tests (GH_FR1 and LC_LC5) and two Q4 tests (FR_FRCP1 and GH_FR1). In all tests with significantly reduced viability relative to one or more references, mean viability was categorized as no adverse response; compared to the mean response in batch-specific references, the effect sizes in significant tests categorized as no adverse response ranged from 9.5% (GH_FR1 Q2) to 19% (FR_FRCP1 Q4).

There were no tests where length or weight were significantly reduced relative to one or more references. Lack of growth responses (length or weight) is consistent with historical testing of this species, which indicate survival and viability are the most sensitive endpoints.

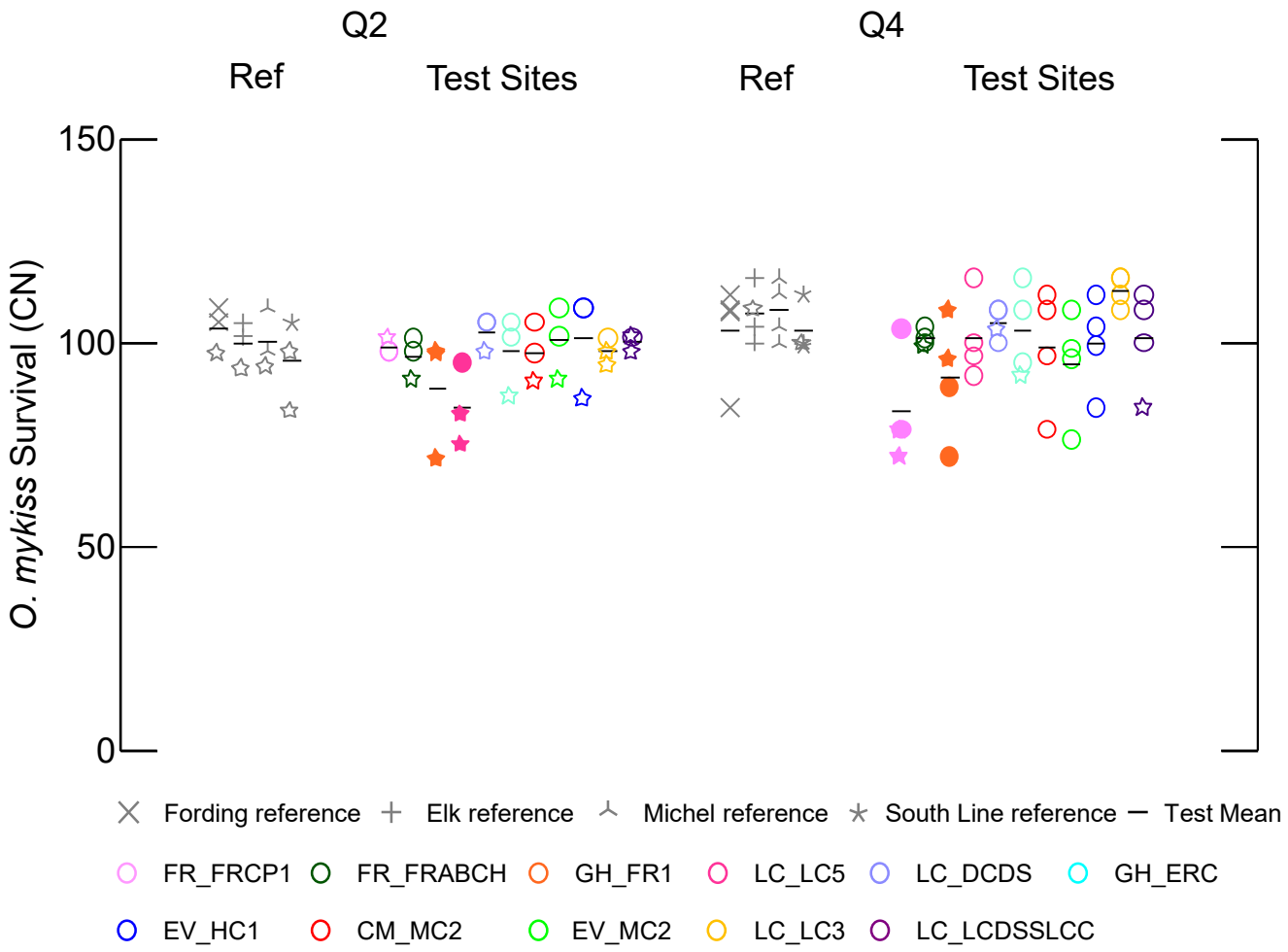
As discussed in the Q2 and Q4 laboratory reports (Appendices B-2 and B-4), microbial growth was observed in one or more replicates of all Q2 tests and Q4 tests with FR_FRCP1, FR_FRABCH, GH_FR1, LC_DCDS, GH_ERC, and LC_LCDSSLCC.[24] All reference and test site waters were amended with 20 µg/L copper. Based on these results, it appears that 20 µg/L copper was insufficient to completely curtail microbial growth, although it may have reduced the magnitude of microbe growth and consequences for organism performance. Microbial growth was observed in all tests with a mean test result that was statistically lower than one or more batch-specific reference responses. Although microbes were ubiquitous, infestations that substantially affected the toxicity tests were rare. In tests with significant responses, results were sometimes lower than the test mean in replicates with microbes observed (e.g., Q2 LC_LC5, Q4 FR_FRCP1) but this was not always the case (e.g., Q2 and Q4 GH_FR1).

Using the decision framework presented in Figure 2.3-1, 21 of 22 tests were categorized as no adverse response and one test (Q4 FR_FRCP1) was categorized as having a possible adverse response.

The causation assessment for *O. mykiss* survival is presented in Section 3.4.4.

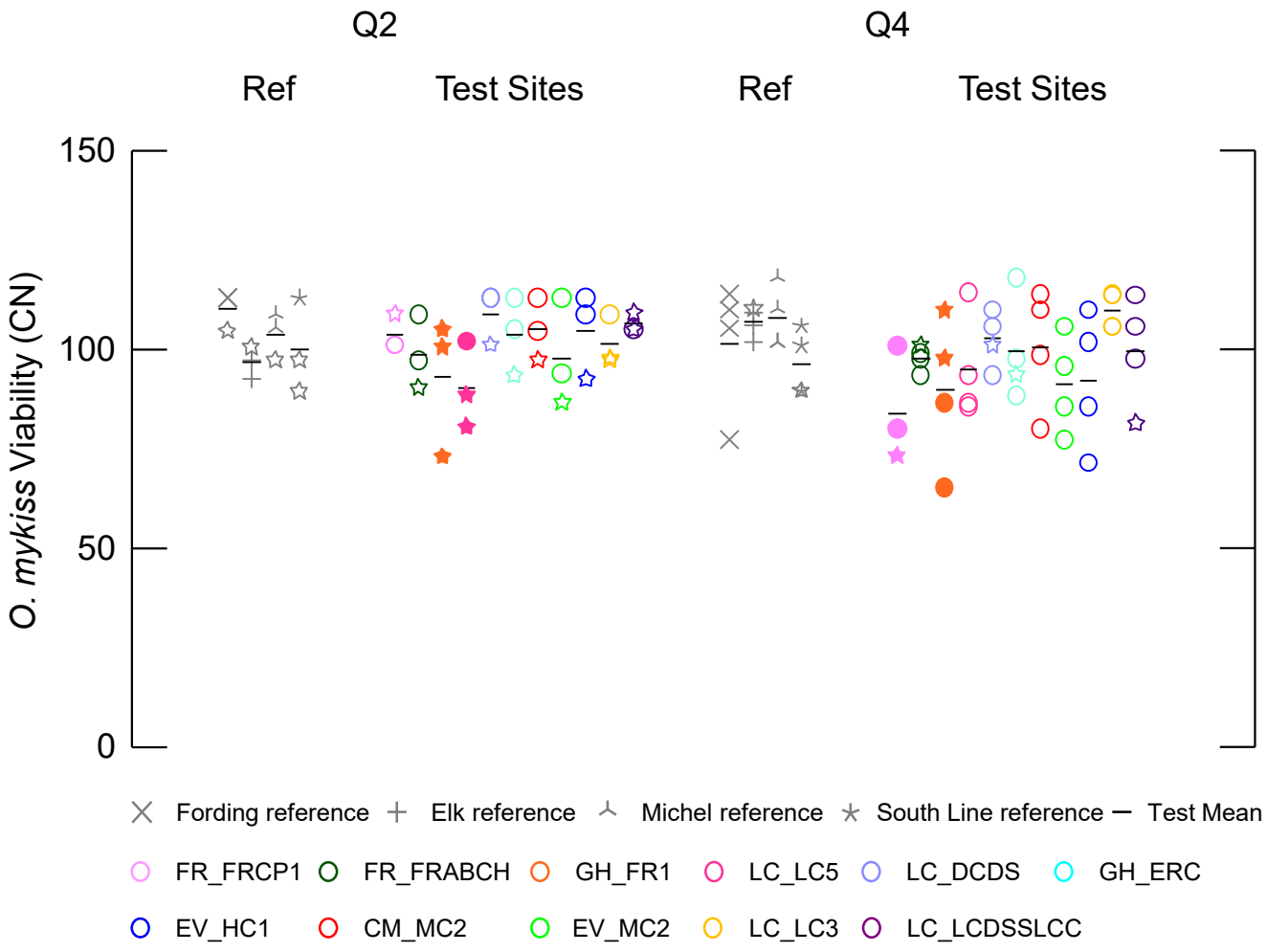
[24] Per discussions at the March 2021 EMC meeting, although several *O. mykiss* tests had microbes identified, these tests were included in statistical analyses conducted herein (e.g., PCA, Spearman Rank correlations).

Figure 3.3-12: Individual replicate and mean results for *O. mykiss* survival in reference (Ref) and test site waters.



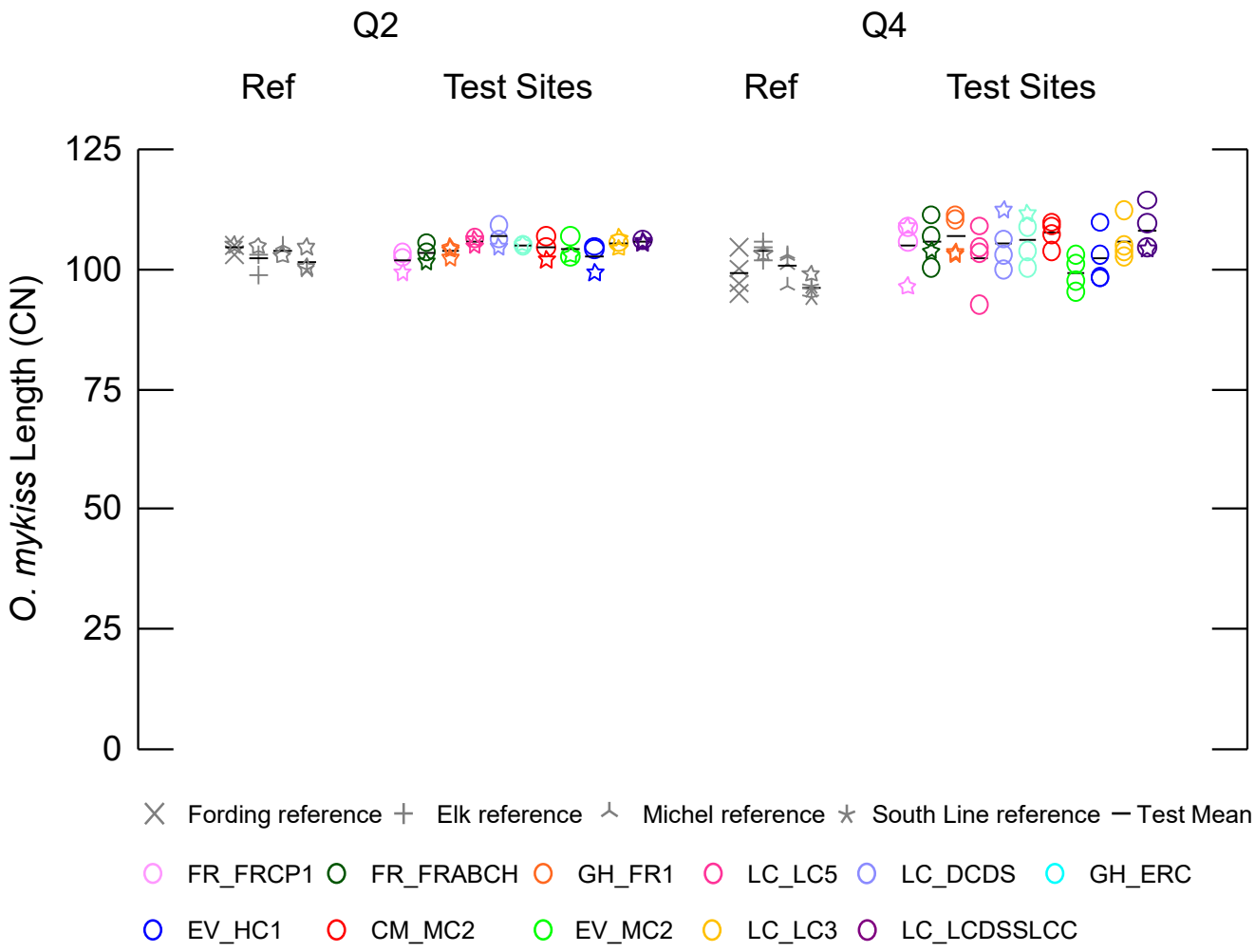
Note: Star symbols indicate a test replicate documented to exhibit presence of microbes; see Figure 2.3-2 for description of other lines and symbols. CN = control normalized.

Figure 3.3-13: Individual replicate and mean results for *O. mykiss* viability in reference (Ref) and test site waters.



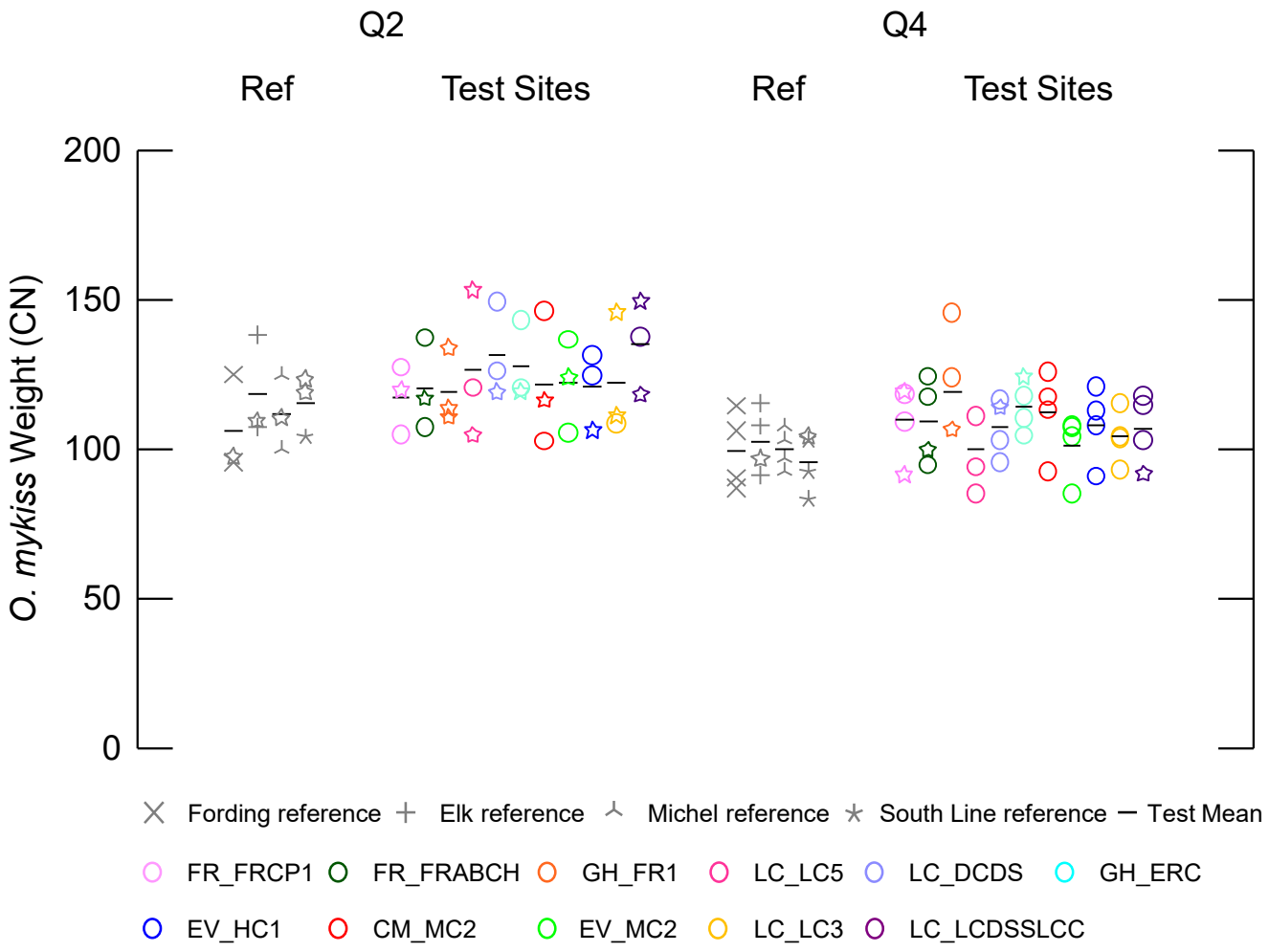
Note: Star symbols indicate a test replicate documented to exhibit presence of microbes; see Figure 2.3-2 for description of other lines and symbols. CN = control normalize.

Figure 3.3-14: Individual replicate and mean results for O. mykiss length in reference (Ref) and test site waters.



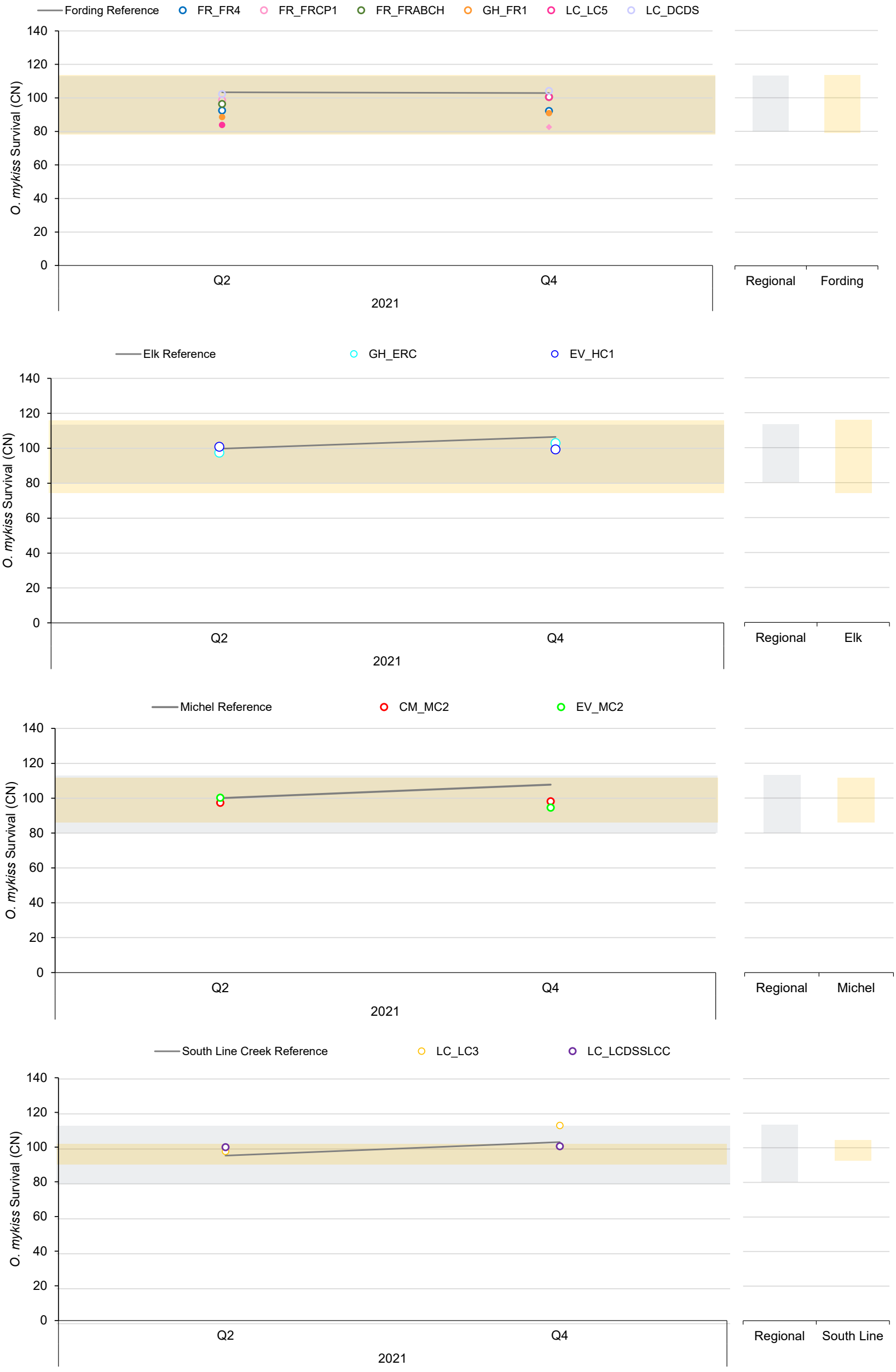
Note: Star symbols indicate a test replicate documented to exhibit presence of microbes; see Figure 2.3-2 for description of other lines and symbols. CN = control normalized.

Figure 3.3-15: Individual replicate and mean results for *O. mykiss* weight in reference (Ref) and test site waters.



Note: Star symbols indicate a test replicate documented to exhibit presence of microbes; see Figure 2.3-2 for description of other lines and symbols. CN = control normalized.

Figure 3.3-16: Mean results for *O. mykiss* survival in the Fording River reference and its test site waters (top left panel) and the Elk River reference and its paired test site waters (second left panel), Michel Creek reference and its test site waters (third left panel), and the South Line Creek reference and its test site waters (bottom left panel). Regional and local normal ranges (2.5th to 97.5th percentile) are shown as bars (right panels).

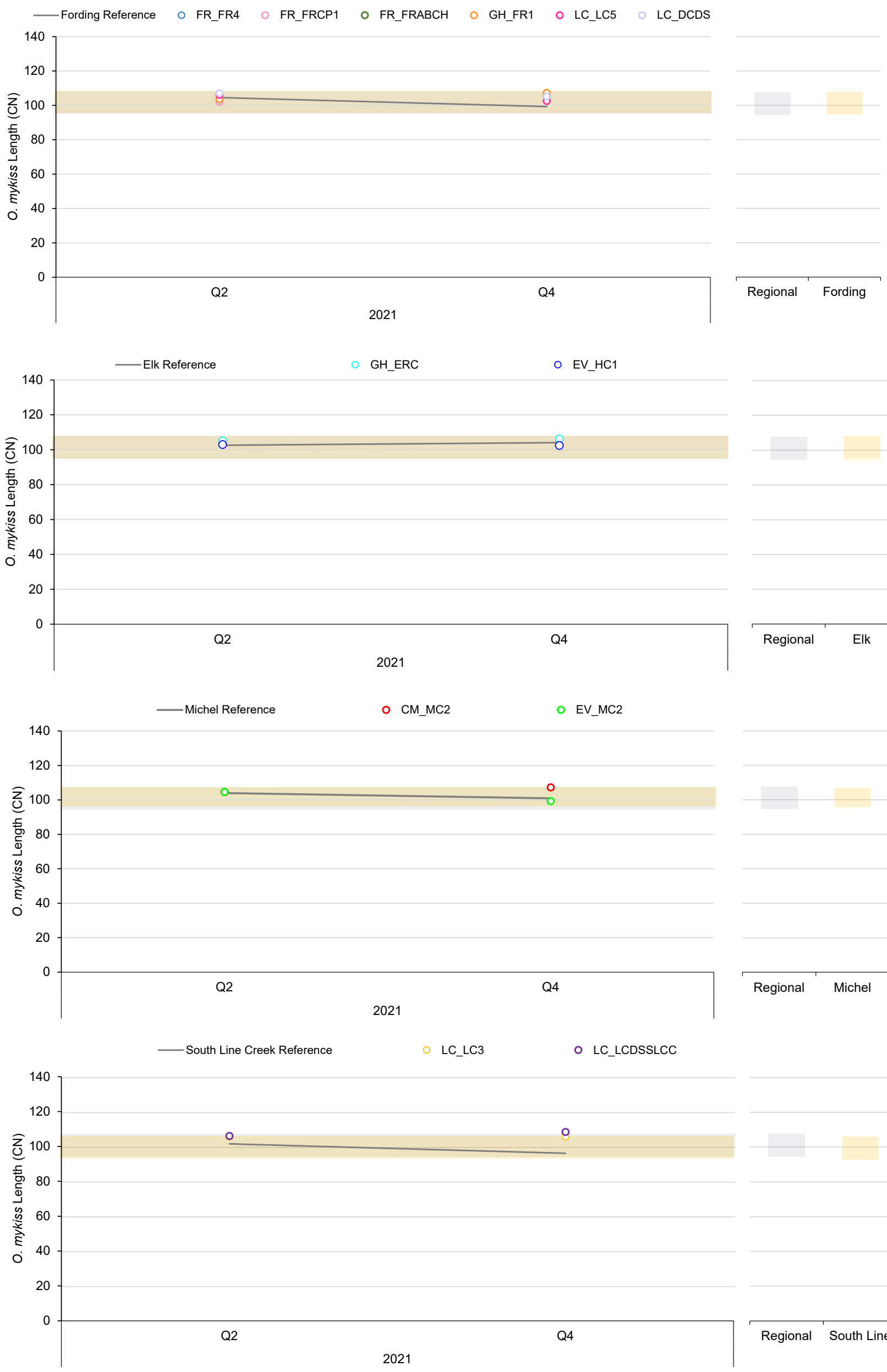


Note: See Figure 2.3-3 for description of lines and symbols. Test sites were compared to their paired local NR (Section 2.3.3). Evidence of microbes were observed in all Q2 tests and Q4 GH_ER2, LC_SLC, FR_FRABCH, FR_FRCP1, GH_FR1, GH_ERC, LC_DCDS, and LC_LCDSSLCC *O. mykiss* tests (Section 3.1).

Figure 3.3-17: Mean results for *O. mykiss* viability in the Fording River reference and its test site waters (top left panel) and the Elk River reference and its paired test site waters (second left panel), Michel Creek reference and its test site waters (third left panel), and the South Line Creek reference and its test site waters (bottom left panel). Regional and local normal ranges (2.5th to 97.5th percentile) are shown as bars (right panels).

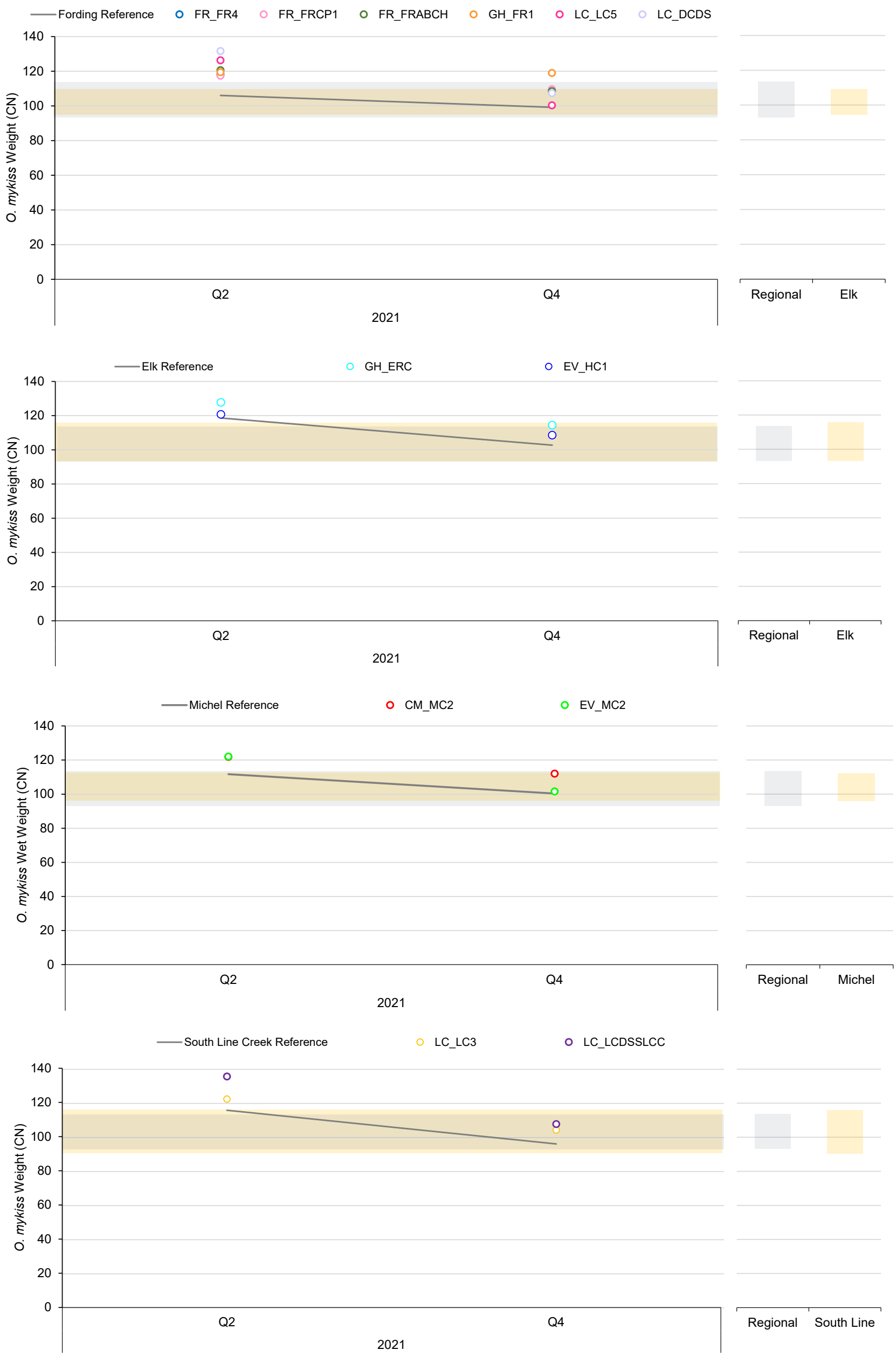
Note: See Figure 2.3-3 for description of lines and symbols. Test sites were compared to their paired local NR (Section 2.3.3). Evidence of microbes were observed in all Q2 tests and Q4 GH_ER2, LC_SLC, FR_FRABCH, FR_FRCP1, GH_FR1, GH_ERC, LC_DCDS, and LC_LCDSSLCC *O. mykiss* tests (Section 3.1).

Figure 3.3-18: Mean results for *O. mykiss* length in the Fording River reference and its test site waters (top left panel) and the Elk River reference and its paired test site waters (second left panel), Michel Creek reference and its test site waters (third left panel), and the South Line Creek reference and its test site waters (bottom left panel). Regional and local normal ranges (2.5th to 97.5th percentile) are shown as bars (right panels).



Note: See Figure 2.3-3 for description of lines and symbols. Test sites were compared to their paired local NR (Section 2.3.3). Evidence of microbes were observed in all Q2 tests and Q4 GH_ER2, LC_SLC, FR_FRABCH, FR_FRCP1, GH_FR1, GH_ERC, LC_DCDS, and LC_LCDSSLCC *O. mykiss* tests (Section 3.1).

Figure 3.3-19: Mean results for *O. mykiss* weight in the Fording River reference and its test site waters (top left panel) and the Elk River reference and its paired test site waters (second left panel), Michel Creek reference and its test site waters (third left panel), and the South Line Creek reference and its test site waters (bottom left panel). Regional and local normal ranges (2.5th to 97.5th percentile) are shown as bars (right panels).



Note: See Figure 2.3-3 for description of lines and symbols. Test sites were compared to their paired local NR (Section 2.3.3). Evidence of microbes were observed in all Q2 tests and Q4 GH_ER2, LC_SLC, FR_FRABCH, FR_FRCP1, GH_FR1, GH_ERC, LC_DCDS, and LC_LCDSSLCC *O. mykiss* tests (Section 3.1

3.3.1.5 *Pimephales promelas*

There was no evidence of adverse effects on hatch rate (Figure 3.3-20; Figure 3.3-25), biomass (Figure 3.3-22; Figure 3.3-27), length (Figure 3.3-23; Figure 3.3-28), or normal development (Figure 3.3-24; Figure 3.3-29) in any of the 2021 tests.

Survival was significantly reduced relative to one or more references in 3 of 24 tests (Figure 3.3-21; Figure 3.3-26), including the Q1 test with FR_FRCP1 and Q3 tests with EV_HC1 and LC_LCDSSLCC. In two of three tests with significantly reduced survival relative to one or more references, mean survival was categorized as no adverse response (Q3 EV_HC1 and LC_LCDSSLCC); compared to the mean response in batch-specific references, the effect size in both tests was 19%. In the Q1 FR_FRCP1 test, mean survival was categorized as a likely adverse response; compared to the mean response in two of the four batch-specific references, the effect size was 41% (FR_FRCP1 Q1). However, there is uncertainty associated with the categorization of likely adverse response because of the variability observed in Q1 reference waters, and associated filtering of reference data to exclude underperforming reference stations. Specifically, as discussed in Section 3.2.3.5 and at the February 2022 EMC meeting, the Q1 reference results were unusual in that two of the four references had control normalized survival that was comparable to the negative laboratory control (Fording reference = 103% and South Line reference = 94%) and the remaining two references had survival that was much lower (Elk reference = 34% and Michel reference = 56%). As discussed in Section 3.1, the reason for the reduced survival is unknown. The Q1 Elk River and Michel Creek references were excluded from normal range and effect size calculations, thereby increasing the likelihood of categorizing site water results as likely adverse responses even where responses were similar to half of the reference data. Survival in the FR_FRCP1 test was higher than both the Elk River and Michel Creek reference tests. Therefore, it is uncertain whether the FR_FRCP1 results represent an adverse response to toxicants in the test water or alternatively may reflect natural variance in test organism performance unrelated to water quality. Furthermore, there was an inconsistency in response among replicates exposed to the same site water in this test, where survival in replicates ranged from 42% to 87% for FR_FRCP1 in Q1.

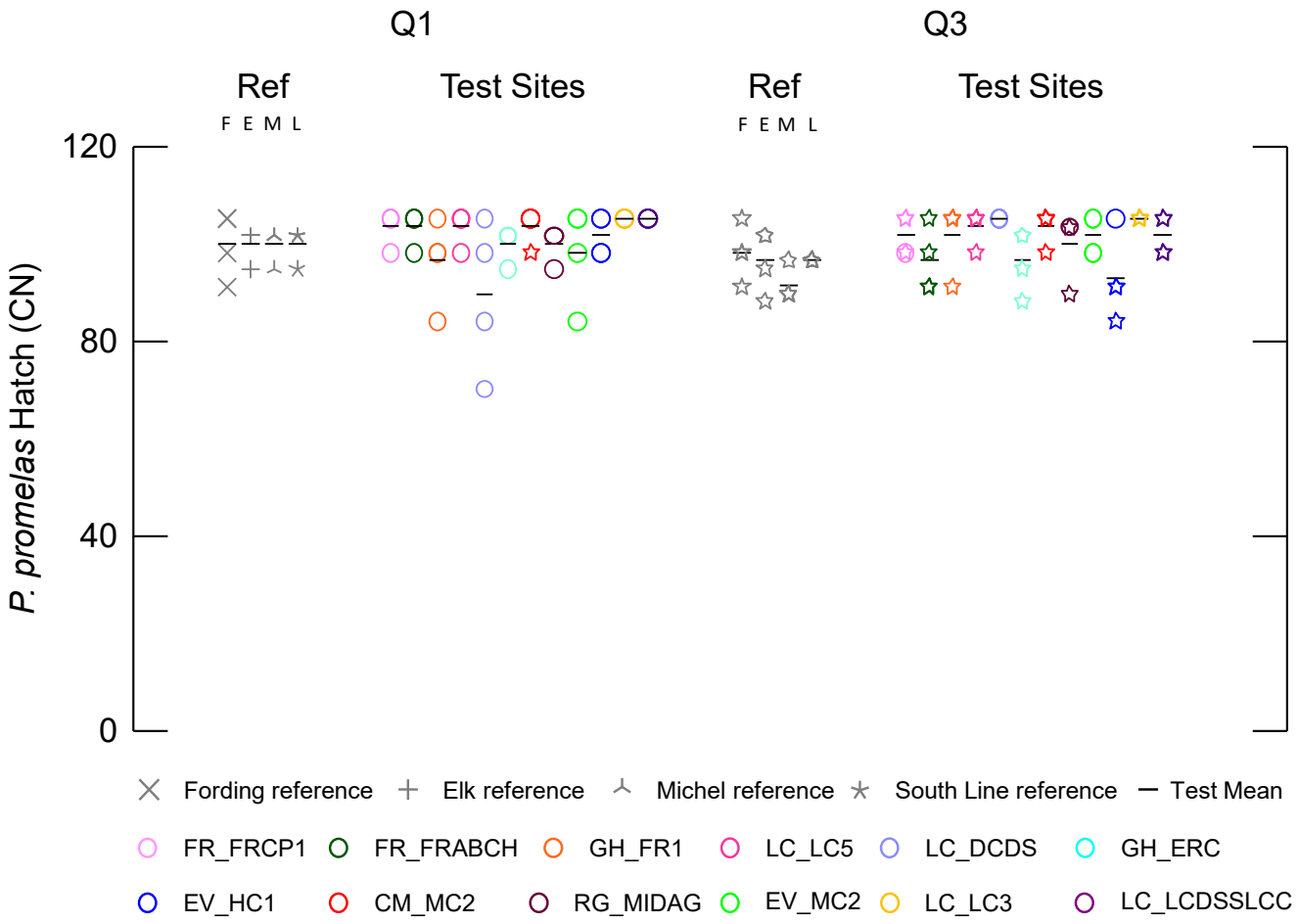
As discussed in the Q1 and Q3 laboratory reports (Appendices B-1 and B-3), microbial growth was observed in the Q1 test with CM_MC2 and in all Q3 tests except LC_DCDS and EV_MC2. For tests with microbes, microbial growth was observed in all replicates except for the Q1 test with CM_MC2 and Q3 tests with FR_FRCP1, RG_MIDAG, and EV_HC1. Both reference and test site exposures were amended with 10 to 20 µg/L copper. Based on these results, it appears that 10 to 20 µg/L copper was insufficient to completely curtail microbial growth most samples.

As with previous test events in which microbial growth was observed, the mortalities occurred predominantly between days 6 and 12 of exposure, which is consistent with the conclusion that the adverse responses were associated with microbial growth (i.e., concentrated mortality approximately one week into the test). These infrequent mortalities were insufficient to result in large changes to the mean survival endpoint in any treatment.

Using the decision framework presented in Figure 2.3-1, all tests except for Q1 FR_FRCP1 were categorized as no adverse response. The remaining test, Q1 FR_FRCP1, was categorized as having a likely adverse response.

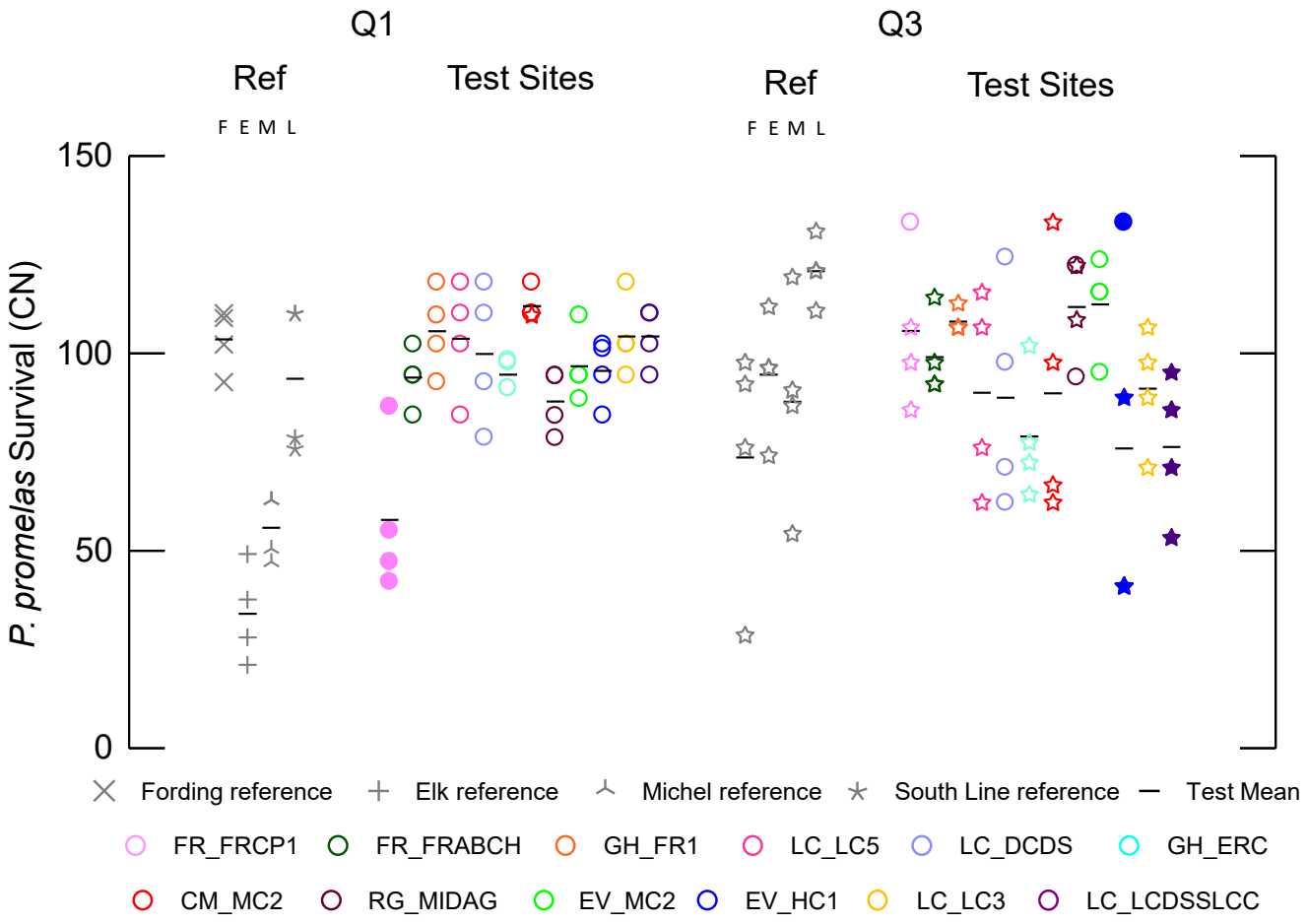
The causation assessment for *P. promelas* survival is presented in Section 3.4.5.

Figure 3.3-20: Individual replicate and mean results for *P. promelas* hatch in reference (Ref) and test site waters.



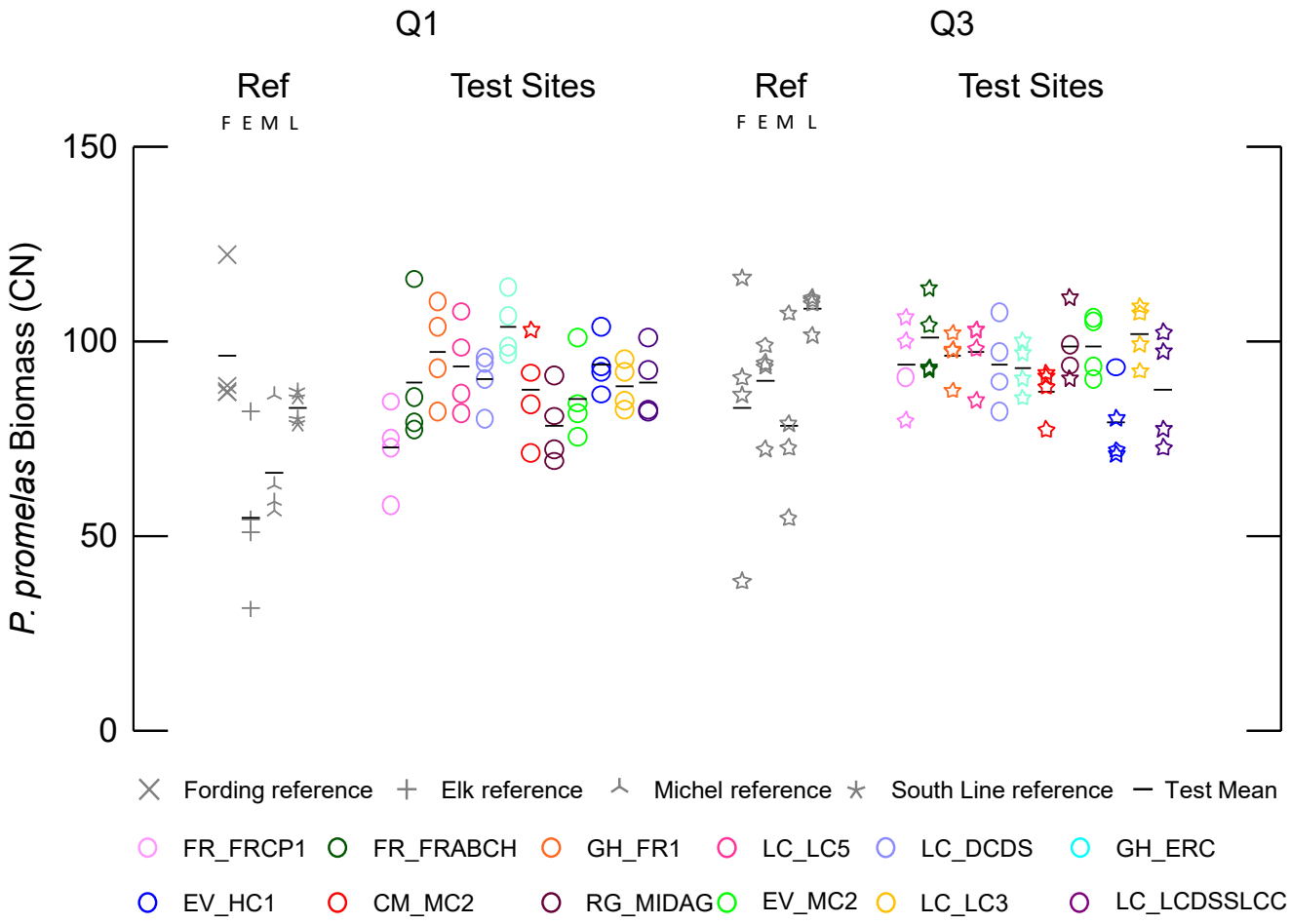
Note: Star symbols indicate a test replicate documented to exhibit presence of microbes; see Figure 2.3-2 for description of other lines and symbols. Results from the Q1 Elk and Michel references are shown here for informational purposes but were excluded from statistical calculations; see Section 3.2.3.5. CN = control normalized

Figure 3.3-21: Individual replicate and mean results for *P. promelas* survival in reference (Ref) and test site waters.



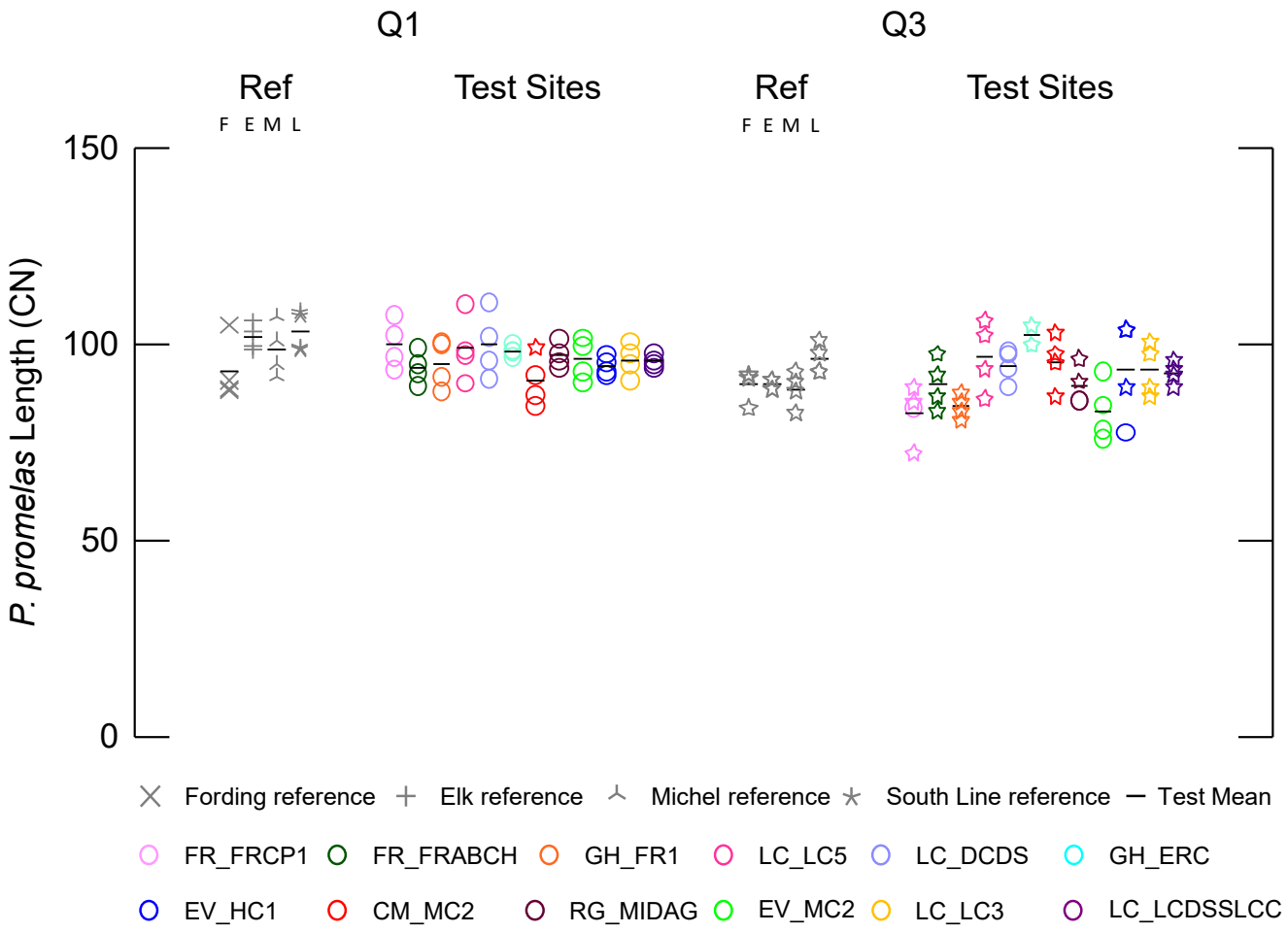
Note: Star symbols indicate a test replicate documented to exhibit presence of microbes; see Figure 2.3-2 for description of other lines and symbols. Results from the Q1 Elk and Michel references are shown here for informational purposes but were excluded from statistical calculations; see Section 3.2.3.5. CN = control normalized.

Figure 3.3-22: Individual replicate and mean results for *P. promelas* biomass in reference (Ref) and test site waters.



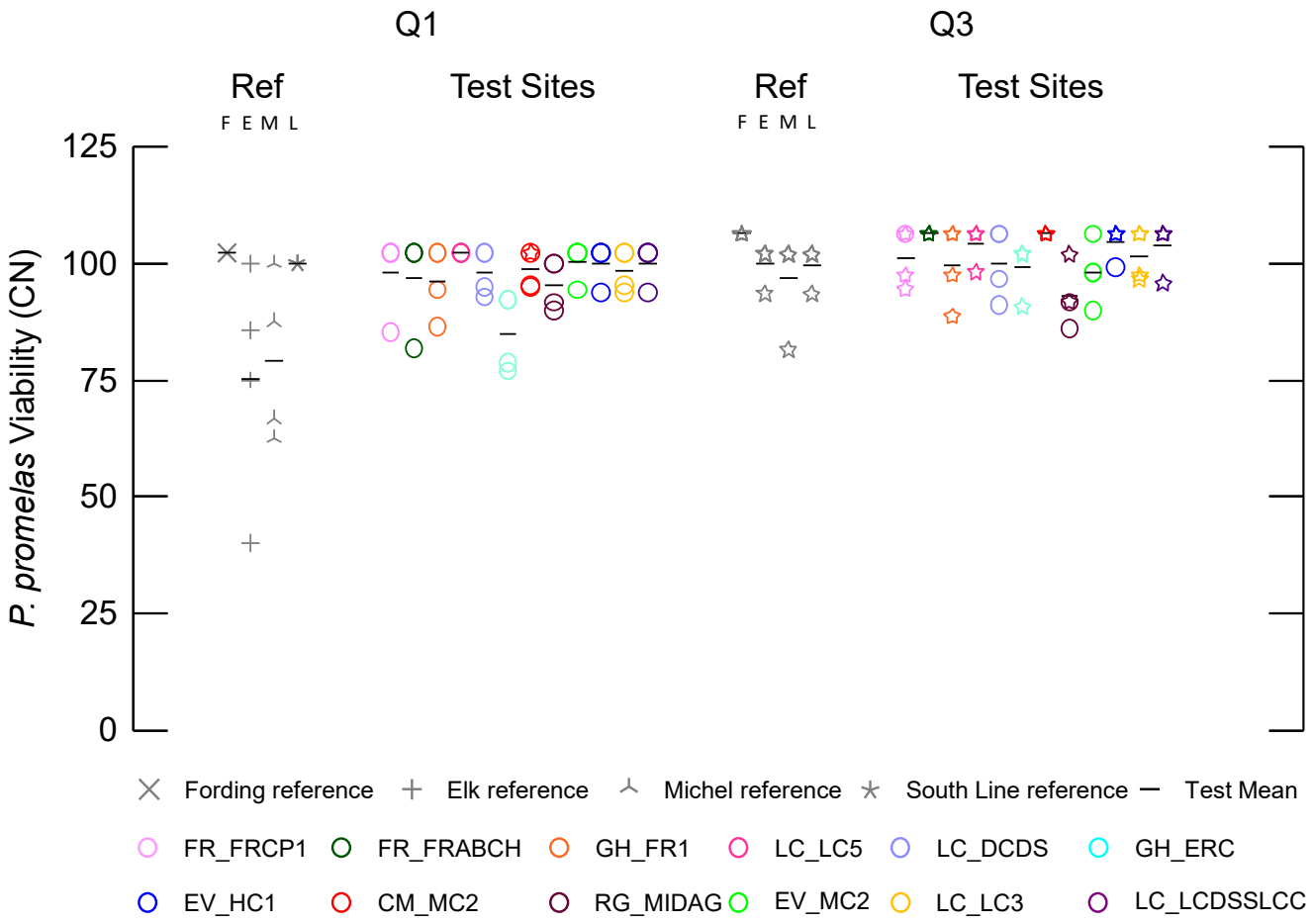
Note: Star symbols indicate a test replicate documented to exhibit presence of microbes; see Figure 2.3-2 for description of other lines and symbols. Results from the Q1 Elk and Michel references are shown here for informational purposes but were excluded from statistical calculations; see Section 3.2.3.5. CN = control normalized

Figure 3.3-23: Individual replicate and mean results for *P. promelas* length in reference (Ref) and test site waters.



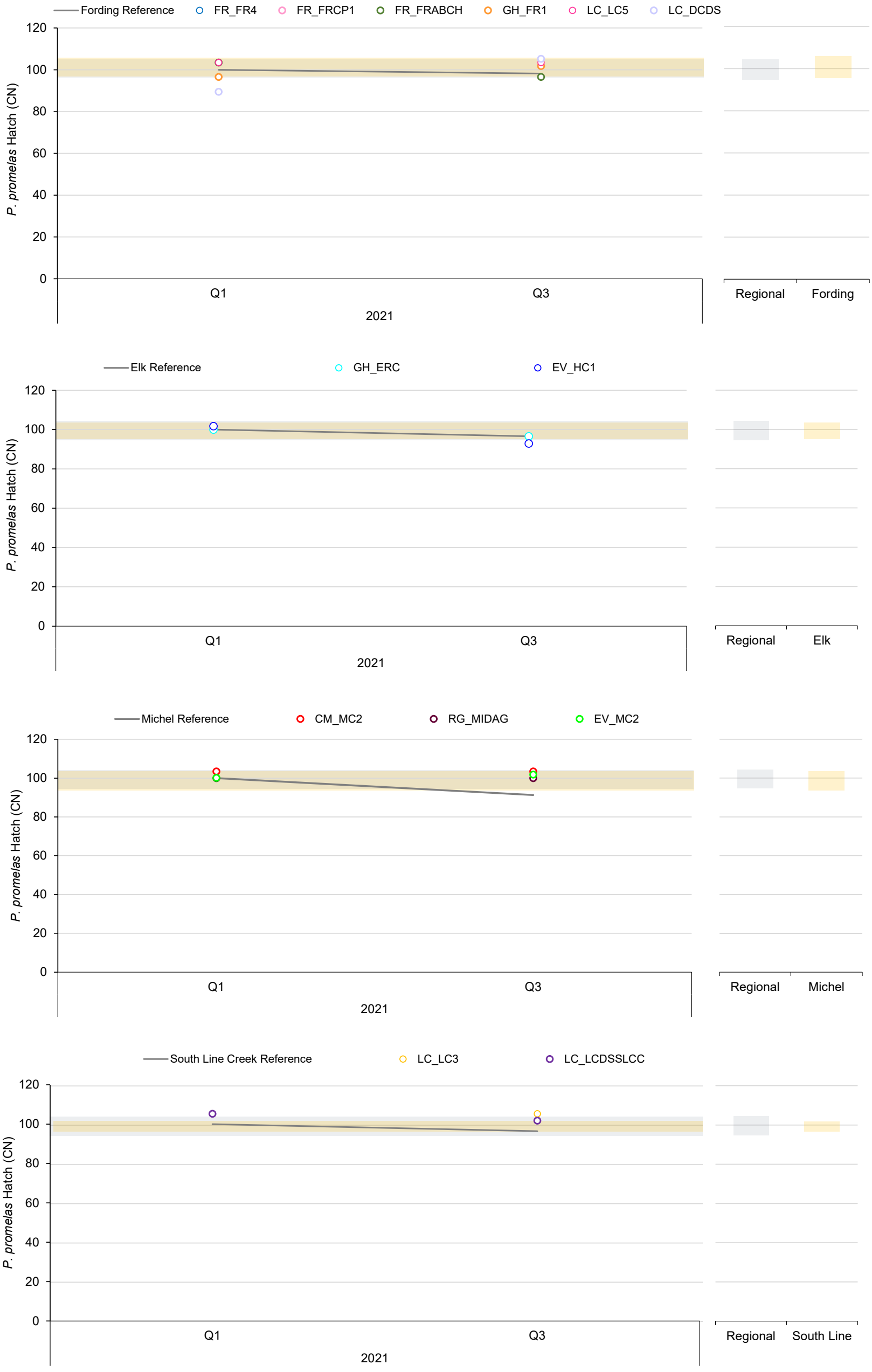
Note: Star symbols indicate a test replicate documented to exhibit presence of microbes; see Figure 2.3-2 for description of other lines and symbols. Results from the Q1 Elk and Michel references are shown here for informational purposes but were excluded from statistical calculations; see Section 3.2.3.5. CN = control normalized.

Figure 3.3-24: Individual replicate and mean results for *P. promelas* normal development in reference (Ref) and test site waters.



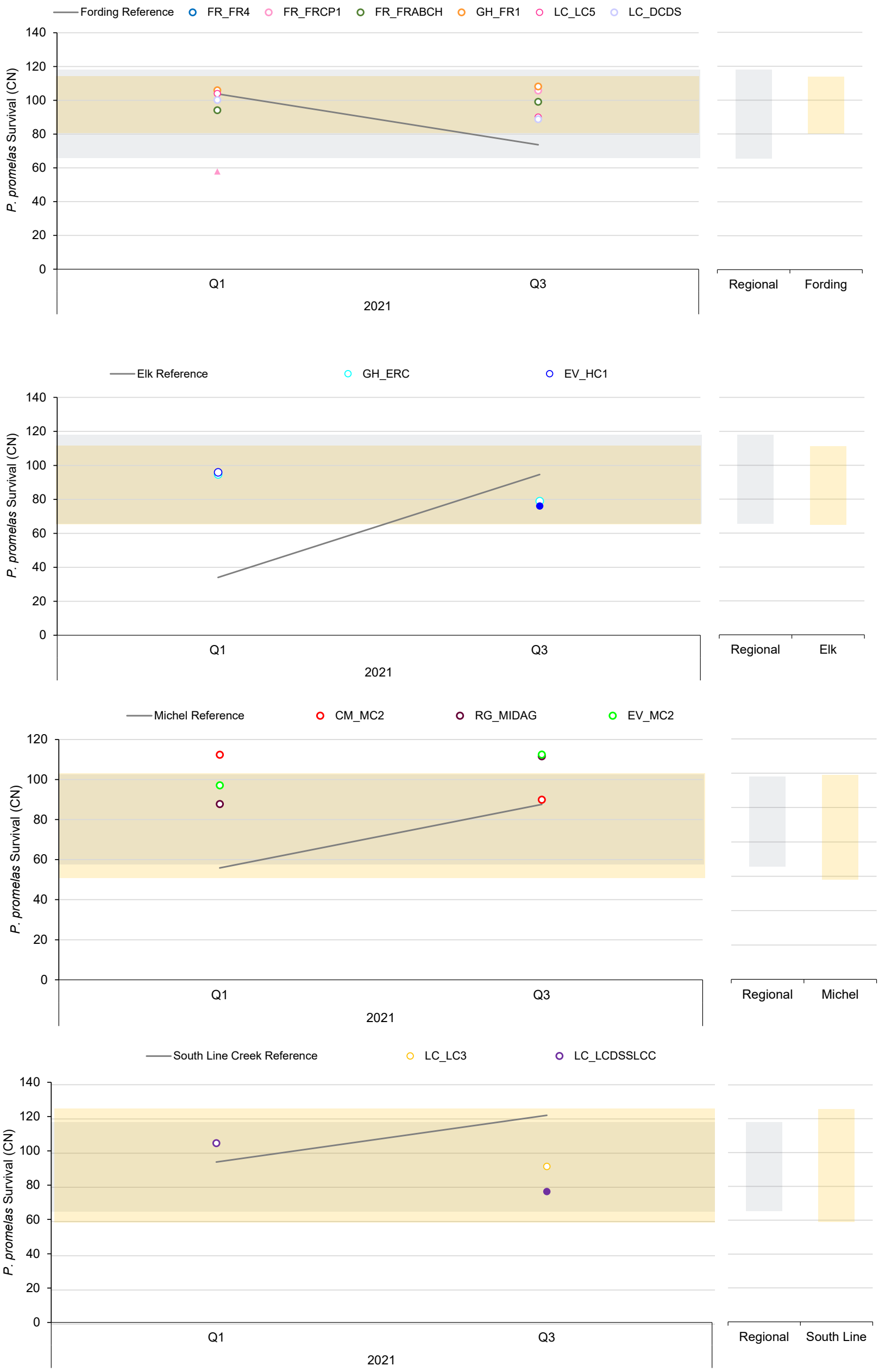
Note: Star symbols indicate a test replicate documented to exhibit presence of microbes; see Figure 2.3-2 for description of other lines and symbols. Results from the Q1 Elk and Michel references are shown here for informational purposes but were excluded from statistical calculations; see Section 3.2.3.5. CN = control normalized.

Figure 3.3-25: Mean results for *P. promelas* hatch in the Fording River reference and its test site waters (top left panel), the Elk River reference and its test site waters (middle left panel), and the Michel Creek reference and its paired test site waters (bottom left panel). Regional and local normal ranges (2.5th to 97.5th percentile) are shown as bars (right panels).



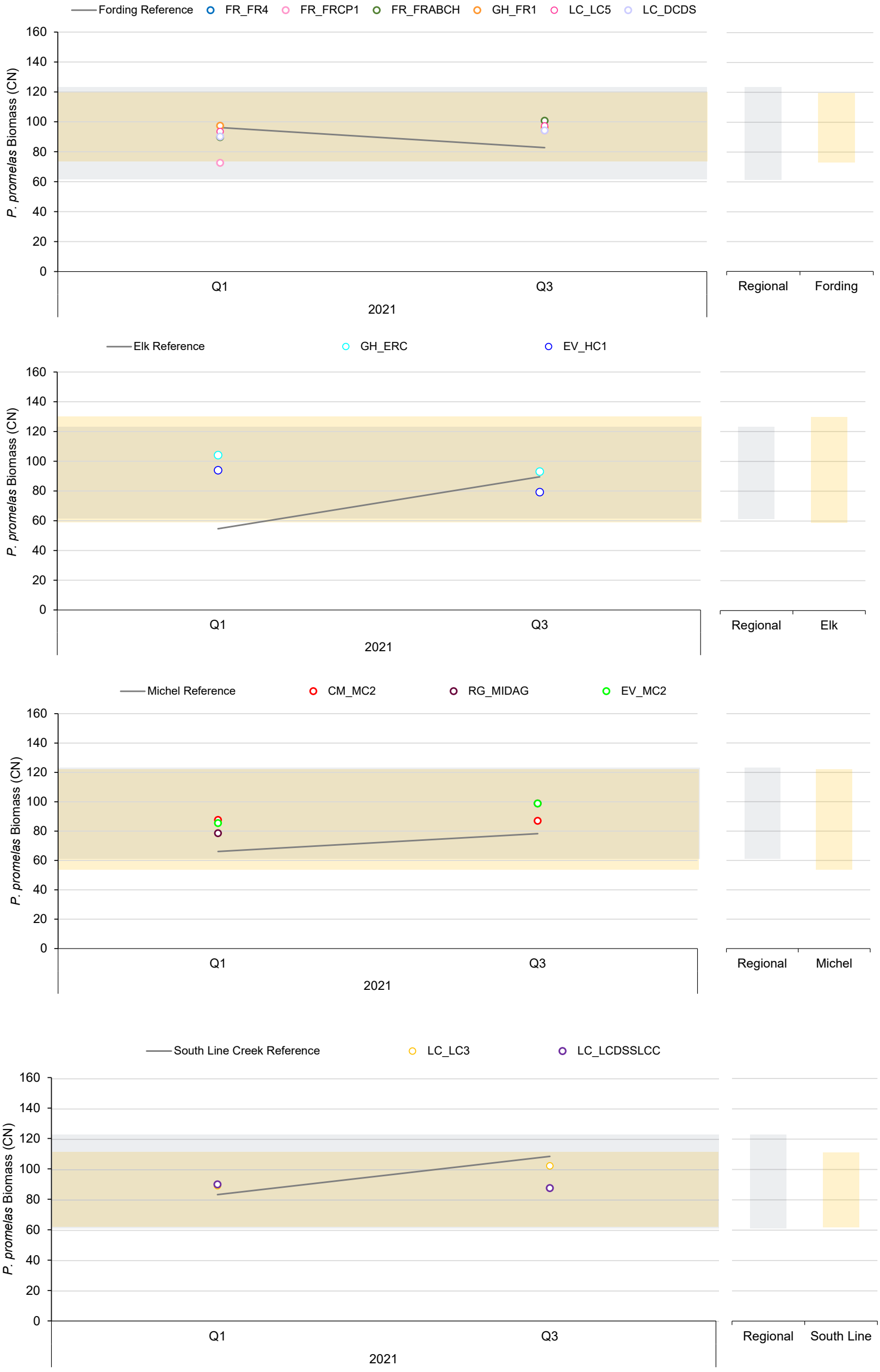
Note: See Figure 2.3-3 for description of lines and symbols. Test sites were compared to their paired local NR (Section 2.3.3). Evidence of microbes were observed in Q1 CM_MC2 and all Q3 tests except EV_MC2 and LC_DCDS (Section 3.1). Results from the Q1 Elk and Michel references are shown here for informational purposes but were excluded from statistical calculations; see Section 3.2.3.5. CN= control normalized.

Figure 3.3-26: Mean results for *P. promelas* survival in the Fording River reference and its test site waters (top left panel), the Elk River reference and its test site waters (middle left panel), and the Michel Creek reference and its paired test site waters (bottom left panel). Regional and local normal ranges (2.5th to 97.5th percentile) are shown as bars (right panels).



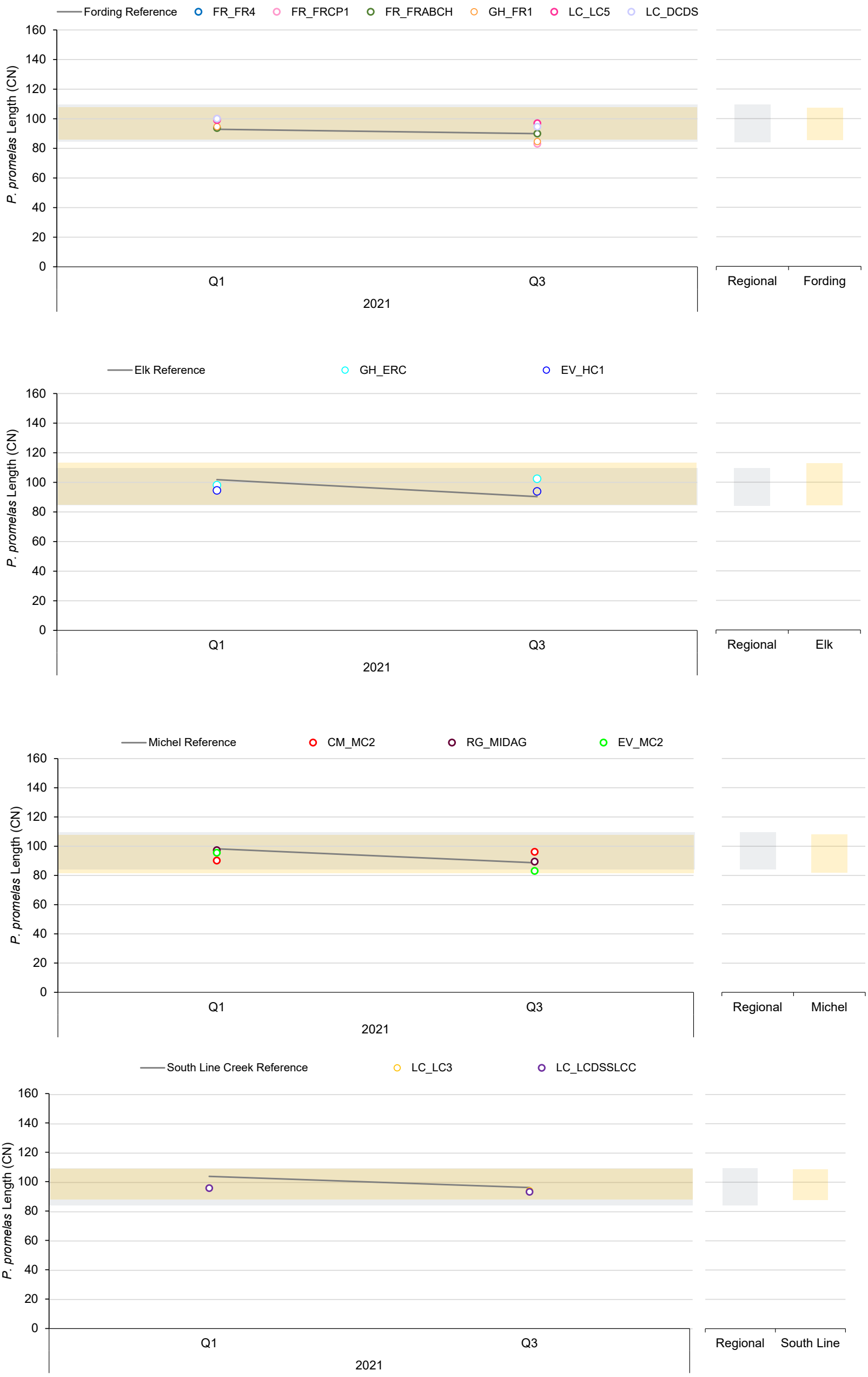
Note: See Figure 2.3-3 for description of lines and symbols. Test sites were compared to their paired local NR (Section 2.3.3). Evidence of microbes were observed in Q1 CM_MC2 and all Q3 tests except EV_MC2 and LC_DCDS (Section 3.1). Results from the Q1 Elk and Michel references are shown here for informational purposes but were excluded from statistical calculations; see Section 3.2.3.5. CN= control normalized.

Figure 3.3-27: Mean results for *P. promelas* biomass in the Fording River reference and its test site waters (top left panel), the Elk River reference and its test site waters (middle left panel), and the Michel Creek reference and its paired test site waters (bottom left panel). Regional and local normal ranges (2.5th to 97.5th percentile) are shown as bars (right panels).



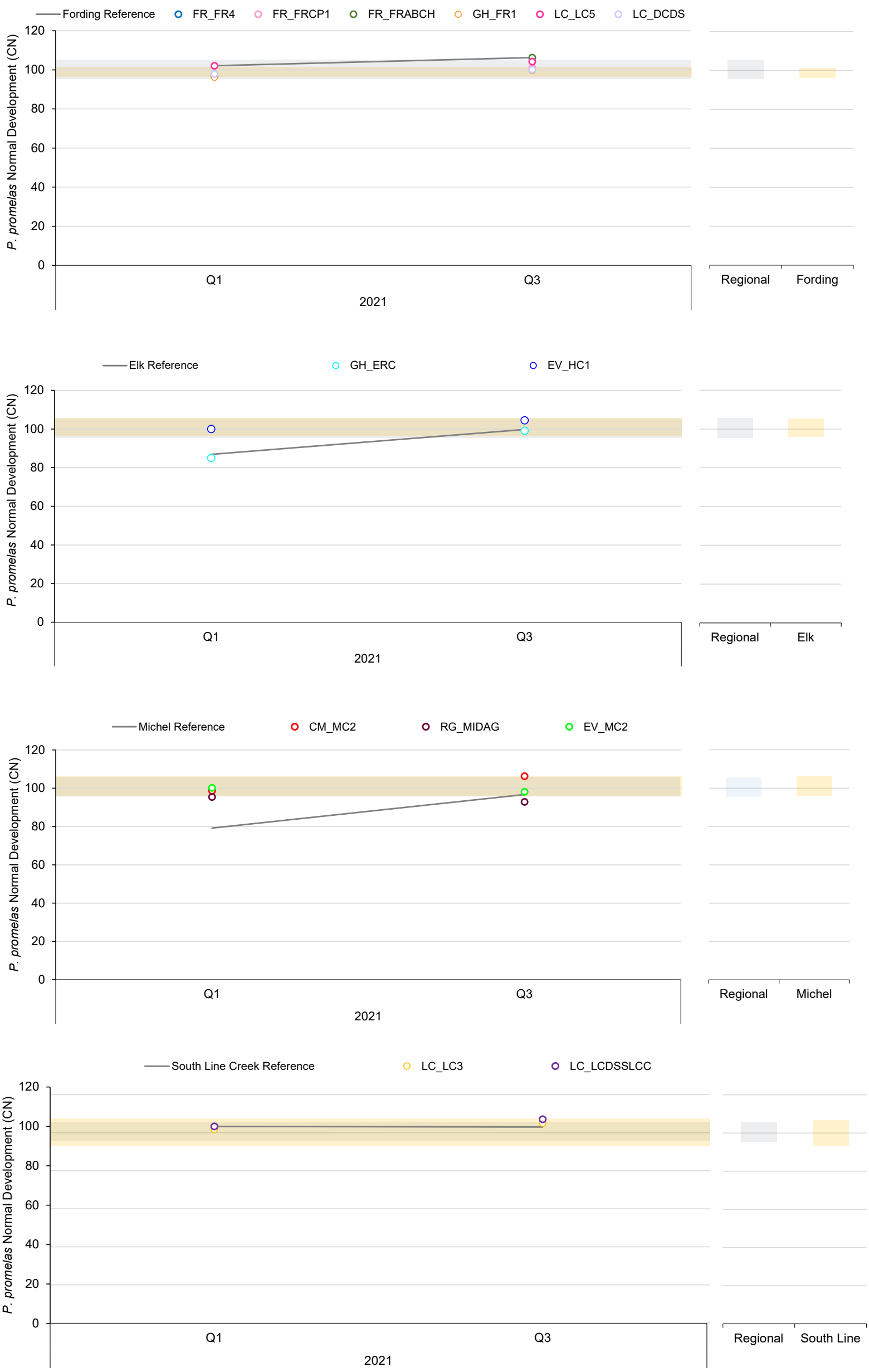
Note: See Figure 2.3-3 for description of lines and symbols. Test sites were compared to their paired local NR (Section 2.3.3). Evidence of microbes were observed in Q1 CM_MC2 and all Q3 tests except EV_MC2 and LC_DCDS (Section 3.1). Results from the Q1 Elk and Michel references are shown here for informational purposes but were excluded from statistical calculations; see Section 3.2.3.5. CN= control normalized.

Figure 3.3-28: Mean results for *P. promelas* length in the Fording River reference and its test site waters (top left panel), the Elk River reference and its test site waters (middle left panel), and the Michel Creek reference and its paired test site waters (bottom left panel). Regional and local normal ranges (2.5th to 97.5th percentile) are shown as bars (right panels).



Note: See Figure 2.3-3 for description of lines and symbols. Test sites were compared to their paired local NR (Section 2.3.3). Evidence of microbes were observed in Q1 CM_MC2 and all Q3 tests except EV_MC2 and LC_DCDS (Section 3.1). Results from the Q1 Elk and Michel references are shown here for informational purposes but were excluded from statistical calculations; see Section 3.2.3.5. CN= control normalized.

Figure 3.3-29: Mean results for *P. promelas* normal development in the Fording River reference and its test site waters (top left panel), the Elk River reference and its test site waters (middle left panel), and the Michel Creek reference and its paired test site waters (bottom left panel). Regional and local normal ranges (2.5th to 97.5th percentile) are shown as bars (right panels).



Note: See Figure 2.3-3 for description of lines and symbols. Test sites were compared to their paired local NR (Section 2.3.3). Evidence of microbes were observed in Q1 CM_MC2 and all Q3 tests except EV_MC2 and LC_DCDS (Section 3.1). Results from the Q1 Elk and Michel references are shown here for informational purposes but were excluded from statistical calculations; see Section 3.2.3.5. CN= control normalized.

3.3.2 Results by Test Site

Presentation of the combined results of chronic toxicity tests at each test site provides a means of assessing the strength of evidence for toxicity, including consistency of responses across multiple tests and multiple sampling stations and quarters. Results are summarized in Figure 3.3-30.

- **FR_FRCP1**—No adverse responses were observed in any quarter for 9 of 14 endpoints: *C. dubia* survival, *H. azteca* survival, *O. mykiss* viability, length, and weight, and *P. promelas* hatch, biomass, length, and development. Possible adverse responses were observed in 2 of 14 endpoints: *H. azteca* dry weight (Q3) and *O. mykiss* survival (Q4). Likely adverse responses were observed in 3 of 14 endpoints: *C. dubia* reproduction (Q1, Q3, and Q4), *P. subcapitata* cell yield (Q1) and *P. promelas* survival (Q1).
- **FR_FRABCH**—No adverse responses were observed in any quarter for 12 of 14 endpoints: all *C. dubia* endpoints, *H. azteca* survival, *O. mykiss* survival, viability, length, and weight, and all *P. promelas* endpoints. Possible adverse responses were observed for 2 of 14 endpoints: *P. subcapitata* cell yield (Q1) and *H. azteca* dry weight (Q3).
- **GH_FR1**—No adverse responses were observed in any quarter for 12 of 14 endpoints: *H. azteca* survival, and all *C. dubia, O. mykiss,* and *P. promelas* endpoints. Possible adverse responses were observed for 2 of 14 endpoints: *P. subcapitata* cell yield (Q2) and *H. azteca* dry weight (Q3).
- **LC_LC5**—No adverse responses were observed in any quarter for 12 of 14 endpoints: *H. azteca* survival, and all *C. dubia, O. mykiss* and *P. promelas* endpoints. Possible adverse responses were observed for 2 of 14 endpoints: *P. subcapitata* cell yield (Q1 and Q4) and *H. azteca* dry weight (Q3). A likely adverse response was observed for *P. subcapitata* cell yield in Q2.
- **LC_DCDS**—No adverse responses were observed in any quarter for 11 of 14 endpoints: *C. dubia* survival, *H. azteca* survival and all *O. mykiss* and *P. promelas* endpoints. Possible adverse responses were observed for 2 of 14 endpoints: *P. subcapitata* cell yield (Q1 and Q3) and *H. azteca* dry weight (Q4). A likely adverse response was observed for *C. dubia* reproduction (Q3 and Q4).
- **GH_ERC**—No adverse responses were observed in any quarter for 12 of 14 endpoints: all *C. dubia* endpoints, *H. azteca* survival and all *O. mykiss* and *P. promelas* endpoints. Possible adverse responses were observed for 2 of 14 endpoints: *P. subcapitata* cell yield (Q3 and Q4) and *H. azteca* dry weight (Q4).
- **CM_MC2**—No adverse responses were observed in any quarter for 10 of 14 endpoints: *C. dubia* survival and all *O. mykiss* and *P. promelas* endpoints. Possible adverse responses were observed for *P. subcapitata* cell yield in Q1 and Q4. Likely adverse responses were observed for 3 of 14 endpoints: *C. dubia* reproduction (Q1 and Q4) and *H. azteca* survival (Q2 and Q3) and dry weight (Q3).
- **RG_MIDAG**—No adverse responses were observed in any quarter for any endpoint.
- **EV_MC2**—No adverse responses were observed in any quarter for 13 of 14 test endpoints. Possible adverse responses were observed for *P. subcapitata* cell yield in Q1 and Q4.
- **EV_HC1**—No adverse responses were observed in any quarter for 13 of 14 test endpoints. Possible adverse responses were observed for *P. subcapitata* cell yield in Q3 and Q4.

- **LC_LC3**—No adverse responses were observed in any quarter for 12 of 14 endpoints: *C. dubia* survival and all *H. azteca*, *O. mykiss,* and *P. promelas* endpoints. Possible adverse responses were observed for 2 of 14 endpoints: *C. dubia* reproduction (Q4) and *P. subcapitata* cell yield (Q1). A likely adverse response was observed for *P. subcapitata* cell yield in Q2.
- **LC_LCDSSLCC**—No adverse responses were observed in any quarter for 13 of 14 test endpoints. A possible adverse response was observed for *P. subcapitata* cell yield in Q4.

The greatest number of adverse responses were observed at stations CM_MC2 (seven adverse responses summed across quarters) and FR_FRCP1 (seven adverse responses summed across quarters). These broad findings are similar to recent years in which CM_MC2 and FR_FRCP1 have been among the sites with greatest number of adverse responses.

Figure 3.3-30: Summary of test results by category for 2021 chronic toxicity stations.

Note: Test results are categorized in Section 3.3.1. Evidence of microbes were observed in *P. promelas* tests and *O. mykiss* tests for at least one replicate in all quarters (Section 3.1, 3.3.1.4 and 3.3.1.5).

3.4 Causation Assessment

Causation assessments were conducted for test endpoints for which possible or likely toxicity responses were observed for one or more test site waters in 2021. These endpoints included *C. dubia* reproduction, *H. azteca* growth and survival, *P. subcapitata* cell yield, *O. mykiss* survival, and *P. promelas* survival. The following appendices have supporting information for the causation assessment:

- Appendix B provides laboratory documentation of TIEs used to identify substances that explain patterns of toxicity.
- Appendix C provides water chemistry data screened against WQGs for all 2021 tests conducted with reference and test site waters. Sum of toxic units (∑TUs) and coefficients of variation (CVs) for multi-week tests are also provided in this appendix.
- Appendix D provides response data paired with water chemistry data and other explanatory variables (i.e., PCs and ∑TUs).
- Appendix E provides PCA component loadings and percent of variance explained by each component.
- Appendix F provides Spearman rank order correlations between constituent and explanatory variables.

Results of the causation assessment are provided in the following sections, organized by species and endpoint.

3.4.1 *Ceriodaphnia dubia* Reproduction

Eight tests conducted in 2021 were carried forward to the causation assessment, consisting of one test categorized as possible adverse response (Q4 LC_LC3) and seven tests categorized as likely adverse response (Q1 tests with FR_FRCP1 and CM_MC2; Q3 tests with FR_FRCP1 and LC_DCDS; and Q4 tests with FR_FRCP1, CM_MC2, LC_LCDS, and LC_LC3). Results are provided below for the *C. dubia* causation assessment.

Toxicity Identification Evaluation (C. dubia)

The following bullets summarize TIE results for quarterly tests categorized as a possible or likely adverse response:

- **FR_FRCP1** (Appendix B-6)—Reproduction was categorized as a likely adverse response in Q1, Q3, and Q4 (Section 3.3.1.1). In the Q1 and Q3 TIE tests, reproduction was improved in the EDTA-treated test compared to the untreated test, although not enough to return reproduction to reference levels. Effects on reproduction decreased from 41% in the untreated sample to 20% in the EDTA-treated test for Q1 and from 43% in the untreated sample to 16% in the EDTA-treated test for Q3. In the Q4 test, adverse effects on reproduction increased in the EDTA treatment (47%) compared to the untreated tests (30%). For Q1 and Q3, results indicate that divalent metals (likely nickel, see screening results below) may have contributed to adverse effects. As discussed in Appendix B-6, the EDTA controls in Q1, Q3, and Q4 had reduced reproduction relative to the negative laboratory controls; these results indicate that the EDTA treatment itself may have contributed to adverse effects, as was observed with the Q4 FR_FRCP1 test with EDTA.
- **CM_MC2** (Appendix B-7)—Reproduction was categorized as a likely adverse response in Q1 and Q4 (Section 3.3.1.1). In the Q1 and Q4 tests, reproduction was improved in the EDTA-treated test compared to the untreated test, although not enough to return reproduction to reference levels in Q4. Effects on reproduction decreased from 33% in the untreated sample to -1% in the EDTA-treated test for Q1 and from 36% in the untreated sample to 24% in the EDTA-treated test for Q4. These results indicate that divalent metals (likely nickel, see screening results below) may have contributed to adverse effects.

Water Quality Screening (C. dubia)

In the eight tests categorized as possible or likely adverse effects, concentrations of one or more constituents exceeded WQGs or lowest level 1 EVWQP benchmarks:

- **FR_FRCP1 (Q1)** — Concentrations of nitrate and selenium exceeded the lowest level 1 EVWQP benchmarks, the concentration of nickel exceeded the level 1 interim screening value, and the concentration of nitrite exceeded the chronic WQG.
- **FR_FRCP1 (Q3 and Q4)** — Concentrations of nitrate and selenium exceeded the lowest level 1 EVWQP benchmarks, the concentration of nickel exceeded the level 1 interim screening value, and the concentration of fluoride exceeded the chronic WQG.
- **LC_DCDS (Q3 and Q4)**— Concentrations of nitrate and selenium exceeded the lowest level 1 EVWQP benchmarks, and the concentration of nickel exceeded the level 1 interim screening value.
- **CM_MC2 (Q1 and Q4)**— The concentration of nickel exceeded the level 1 interim screening value.
- **LC_LC3 (Q4)**— The concentration of selenium exceeded the lowest level 1 EVWQP benchmark, the concentration of nickel exceeded the level 1 interim screening value, and the concentration of fluoride exceeded the chronic WQG.

The concentration of field measured dissolved oxygen was below the chronic WQGs for LC_DCDS (Q3); however, dissolved oxygen concentrations were maintained within protocol limits during the *C. dubia* tests (Appendix B) and therefore would not be expected to contribute to the observed responses in these tests.

Spearman Rank Correlation (C. dubia)

Constituents and explanatory variables with statistically significant Spearman rank correlations for *C. dubia* reproduction for the combined and 2021 datasets are summarized in Table 3.4-1. No strong negative correlations ($r_s \leq -0.6$) were identified in the combined dataset (Table F-1). For the 2021 dataset, strong negative correlations ($r_s \leq -0.6$) were identified for TDS, components of TDS (e.g., calcium, sulphate), lithium, uranium, and PC1 for the 2021 dataset.

The PC scores that had statistically significant Spearman rank correlations for reproduction are described below:

- PC1 (combined dataset): This component accounted for 27.4% of the variance (Table E-1). PC1 had strong positive loadings for TDS, components of TDS (e.g., calcium, magnesium), Order constituents (nitrate, selenium, sulphate), and several metals (lithium, nickel, uranium).
- PC2 (combined dataset): This component accounted for 14.7% of the variance (Table E-1). PC2 had strong positive loadings for arsenic, lead, and vanadium.
- PC1 (2021 dataset): This component accounted for 37.3% of the variance (Table E-1). As with the combined dataset, PC1 had strong positive loadings for TDS, components of TDS (e.g., calcium, magnesium), Order constituents (selenium, sulphate), and metals (lithium, uranium).

The component loadings for PC1, which appeared to be a strong signal of mine influence (i.e., strong loadings for TDS and Order constituents), exhibited similar patterns between the combined dataset and the 2021 dataset, with strong loadings for the same constituents (Table E-1). PC2 had strong loadings for various metals in both datasets; however, PC2 demonstrated different patterns between the combined and 2021 dataset.

Table 3.4-1: Constituents and Explanatory Variable with Significant Spearman Rank Correlations for *Ceriodaphnia dubia* Reproduction.

Constituent[a]	R_s Combined Dataset	R_s 2021 Dataset	Comparison to WQGs/EVWQP Benchmarks	Retained for Graphical Analysis?
Bicarbonate Alkalinity	-0.26	-0.50	No WQG	No - assessed as TDS/MIT
Carbonate Alkalinity	ns	-0.40	No WQG	No - assessed as TDS/MIT
Total Alkalinity	-0.31	-0.51	No WQG	No - assessed as TDS/MIT
Total Antimony	-0.36	-0.50	No	No
Total Barium	ns	-0.40	No	No
Total Boron	-0.26	-0.46	No	No
Dissolved Bromide	-0.20	-0.48	No WQG	No - low detection frequency[b]
Dissolved Cadmium	-0.27	-0.46	No	No
Total Calcium	-0.37	-0.64	No WQG	No - assessed as TDS/MIT
Dissolved Chloride	-0.23	-0.42	No	No
Total Cobalt	-0.34	ns	No	No
Lab Conductivity	-0.39	-0.62	No WQG	No - assessed as TDS/MIT
Total Hardness	-0.37	-0.63	No WQG	No - assessed as TDS/MIT
Dissolved Iron	-0.15	ns	No	No
Total Lithium	-0.38	-0.61	No	No
Total Magnesium	-0.37	-0.62	No WQG	No - assessed as TDS/MIT
Major Anion Sum	-0.35	-0.62	No WQG	No - assessed as TDS/MIT
Major Cation Sum	-0.34	-0.63	No WQG	No - assessed as TDS/MIT
Total Manganese	-0.25	ns	No	No
Total Molybdenum	-0.30	-0.45	No	No
Total Nickel	-0.42	-0.44	Yes	Yes
Nitrate	-0.35	-0.53	Yes	Yes
Nitrite	-0.36	-0.51	Yes	Yes
Total Potassium	-0.40	-0.64	No WQG	No - assessed as TDS/MIT
Total Selenium	-0.31	-0.51	Yes	Yes
Total Sodium	-0.28	-0.39	No WQG	No - assessed as TDS/MIT
Dissolved Strontium	-0.25	-0.36	No	No
Sulphate	-0.39	-0.61	No	No
Total Thallium	-0.32	ns	No	No
Total Dissolved Solids	-0.39	-0.63	No WQG	Yes
Total Kjeldahl Nitrogen	-0.15	ns	No WQG	Yes
Total Uranium	-0.38	-0.64	No	No
Total Zinc	-0.21	ns	No	No
∑TUs−WQGs	-0.41	-0.58	No WQG	Yes
∑TU−WQGs/Benchmarks	-0.41	-0.47	No WQG	Yes
PC1 Combined	-0.42	ns	No WQG	Yes
PC2 Combined	-0.15	ns	No WQG	Yes
PC1 2021	ns	-0.65	No WQG	Yes

Notes: Values shown here were statistically significant at $\alpha < 0.005$, $r_s = -0.131$ for the combined dataset and $\alpha < 0.005$, $r_s = -0.286$ for the 2021 dataset. WQGs = water quality guidelines; EVWQP = Elk Valley Water Quality Program; MIT = multi-ion toxicity; ns = not significant; ∑TU = sum of toxicity units; TDS = total dissolved solids. Shaded values indicate a strong Spearman rank correlation at $r_s \leq -0.6$.

(a) Total concentrations are shown for metals that have a WQG for the total fraction or that lack a chronic WQG. Dissolved concentrations were used for metals with a WQG for the dissolved fraction.

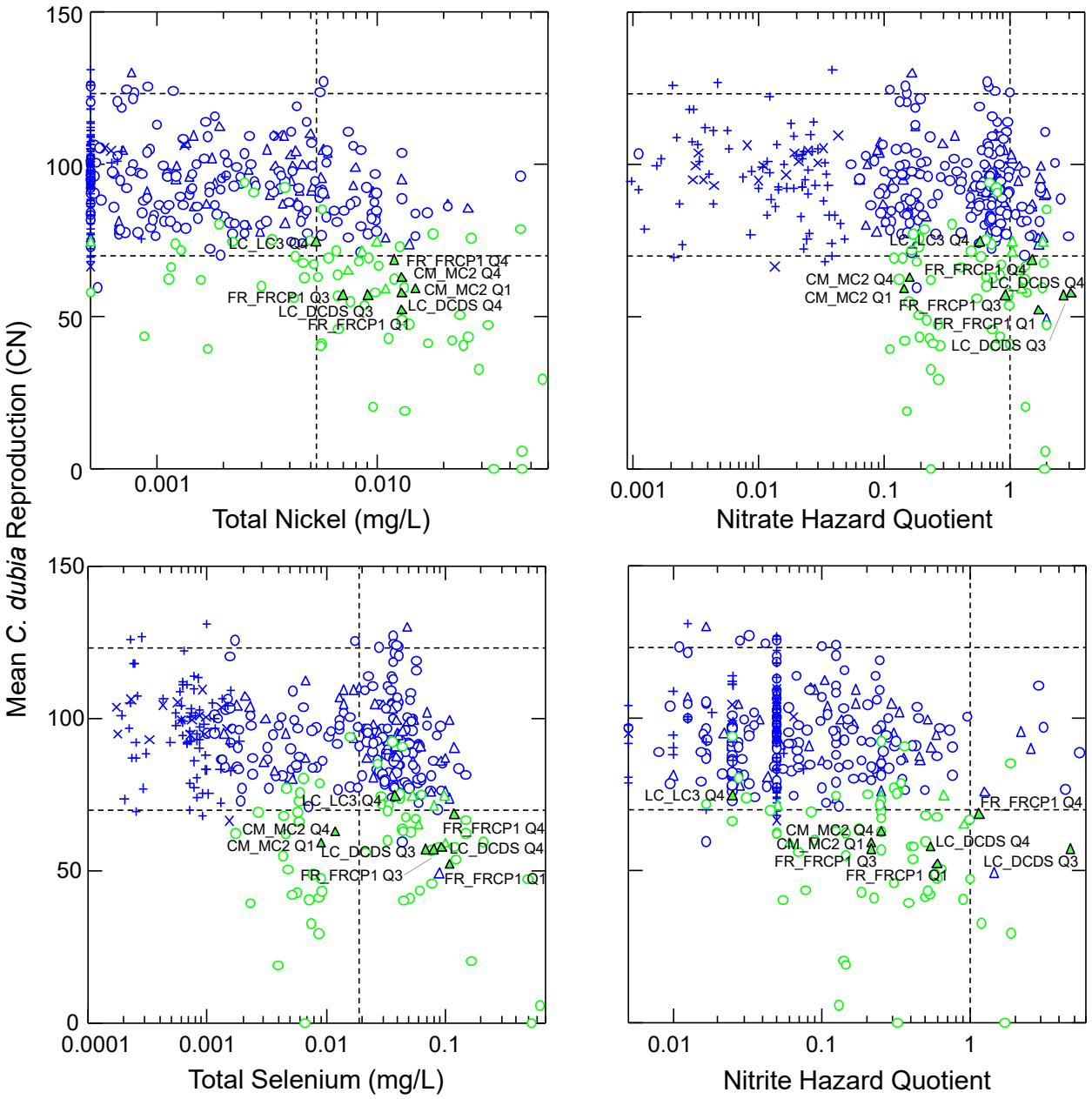
(b) Out of 80 *C. dubia* tests in 2021, bromide was only detected in five tests and was not detected in any test with possible or likely adverse effects.

Graphical Analysis (C. dubia)

Constituents and explanatory variables with significant Spearman rank correlations, and that were either above WQGs or did not have WQGs, were carried through to graphical analysis (Figures 3.4-1 to 3.4-4). Graphical analysis was conducted for two Order constituents (selenium, nitrate), total nickel, nitrite, TDS, MIT, total Kjeldahl nitrogen, ∑TU (calculated with WQGs only, and with WQGs and EVWQP benchmarks), PC1 (combined and 2021 datasets), and PC2 (combined dataset).

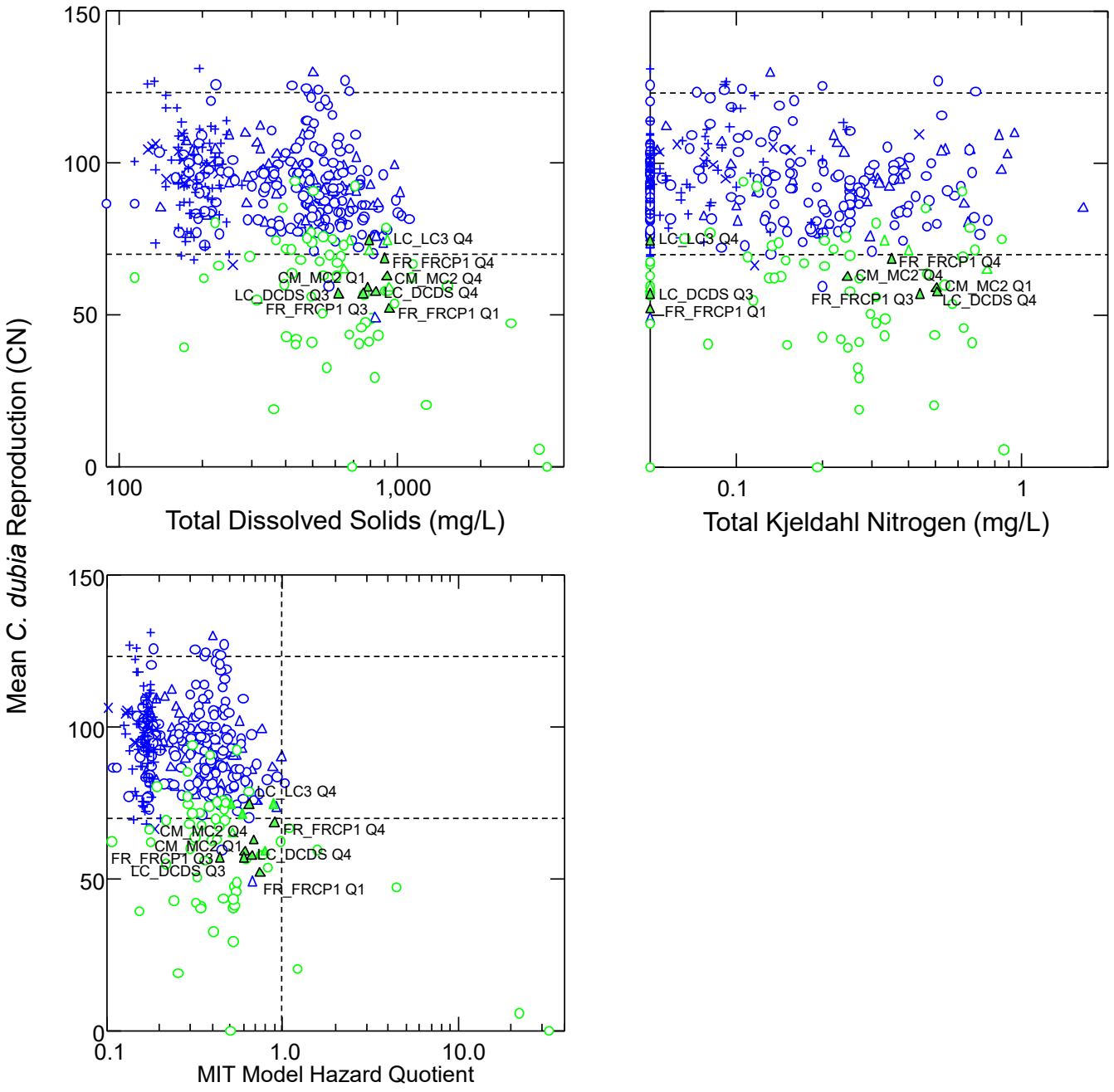
Most of the constituents and explanatory variables did not exhibit a consistent exposure-response relationship across all tests. For the PCs that were carried forward to graphical analysis, no consistent patterns were apparent between the PC scores and test responses. However, nickel exhibited a general relationship between concentrations and magnitude of adverse response. The potential for nickel to explain observed effects is discussed in the next section.

Figure 3.4-1: Mean *C. dubia* reproduction versus total nickel (top left), nitrate (top right), total selenium (bottom left), and nitrite (bottom right).



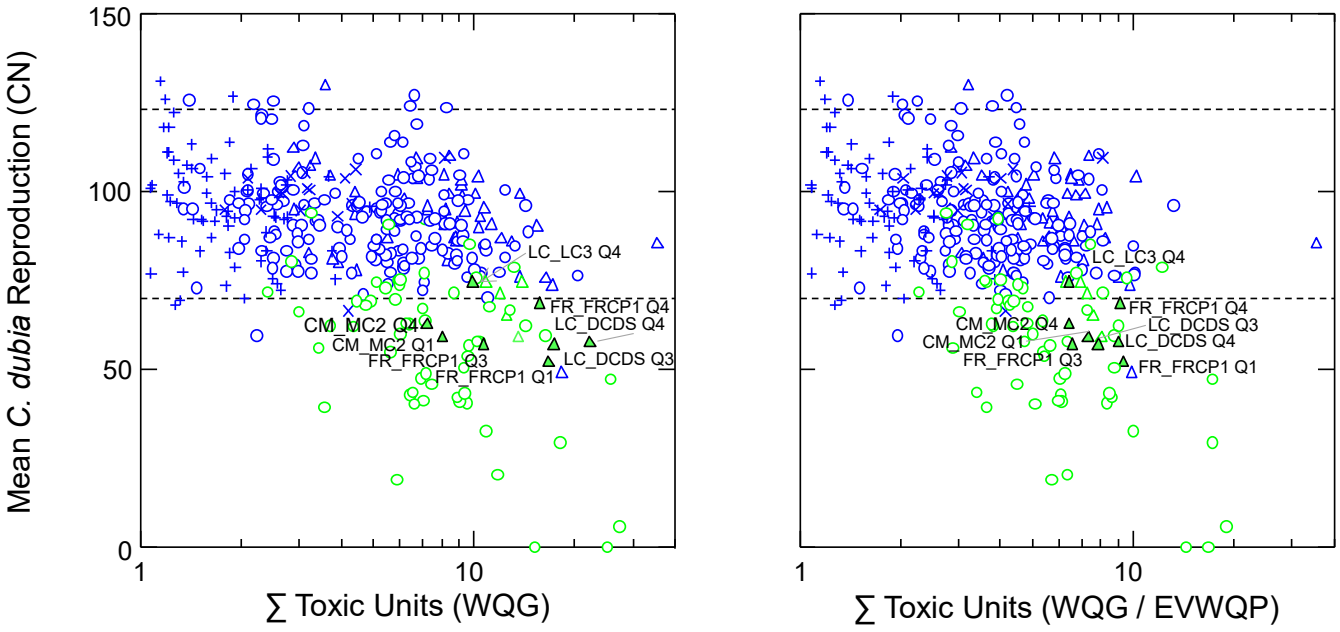
Notes: Symbols indicate reference waters (× = 2015 to 2020; + = 2021), test site waters with mean results categorized as no adverse response (○ = 2015 to 2020; Δ = 2021), and test site waters with mean results categorized as possible or likely adverse response (○ = 2015 to 2020; ▲ = 2021 stations; Δ = UFR stations). Regional chronic toxicity test site waters categorized as possible or likely in 2021 (▲) are labelled with the test site and quarter. Nitrate hazard quotients are the ratio of nitrate concentrations to the lowest level 1 EVWQP benchmark for invertebrates. Nitrite hazard quotients are the ratio of nitrite concentrations to the chronic BC WQG. Vertical lines are screening values: for the nitrate and nitrite hazard quotients, the screening value is 1; for nickel the screening value is the level 1 interim screening value (5.3 µg/L), for selenium, the screening value is the level 1 EVWQP benchmark for invertebrates (104 µg/L). Horizontal lines are the regional normal range (see Figure 2.3-3 for description). CN = control normalized; EVWQP = Elk Valley Water Quality Plan; UFR= Upper Fording River; mg/L = milligrams per litre; WQG= water quality guideline.

Figure 3.4-2: Mean *C. dubia* reproduction versus total dissolved solids (top left), total Kjeldahl nitrogen (top right), and MIT model hazard quotient (bottom left).



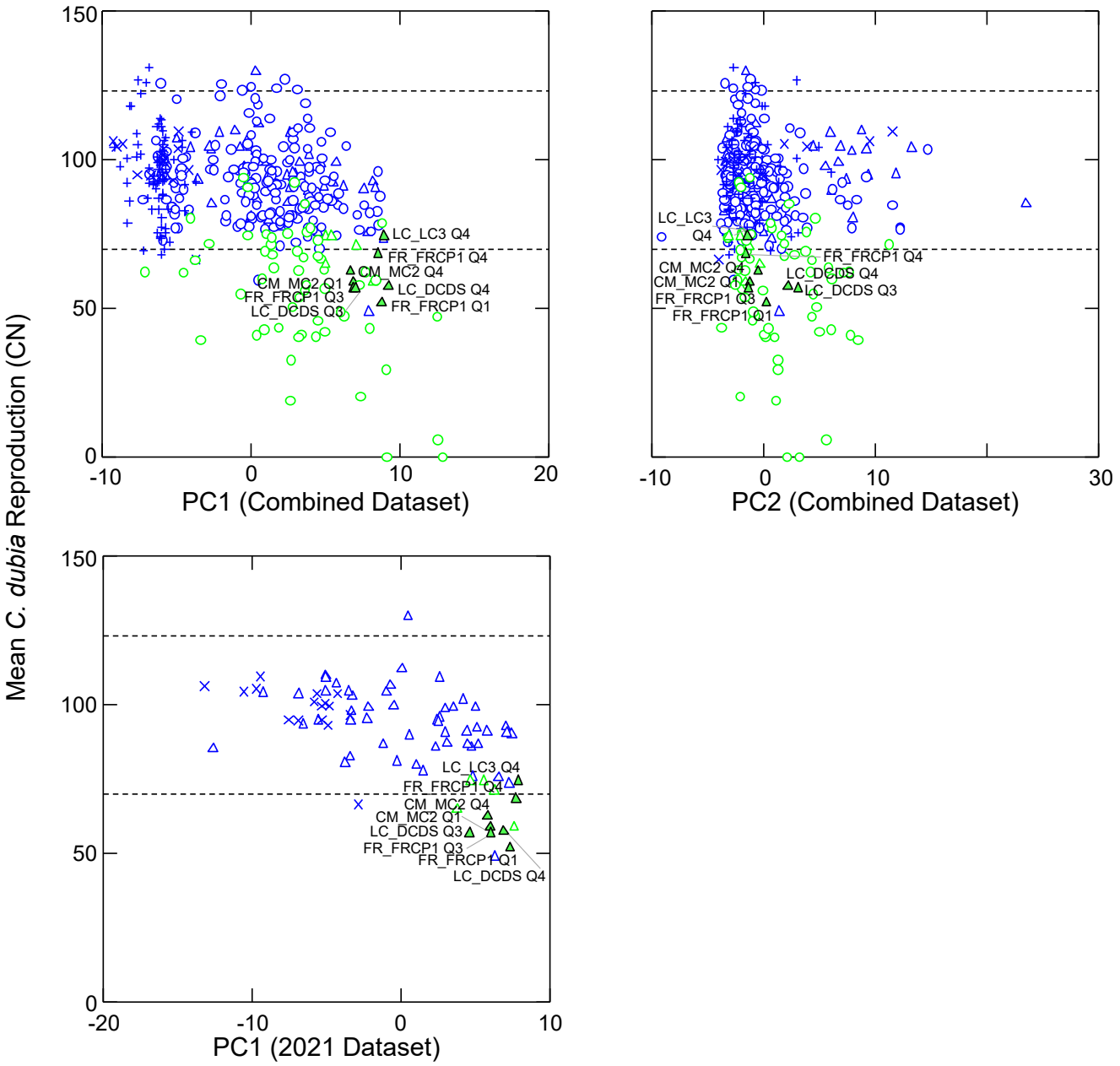
Notes: Symbols indicate reference waters (× = 2015 to 2020; + = 2021), test site waters with mean results categorized as no adverse response (○ = 2015 to 2020; Δ = 2021), and test site waters with mean results categorized as possible or likely adverse response (○ = 2015 to 2020; ▲ = 2021 stations; Δ = UFR stations). Test site waters categorized as possible or likely in 2021 (▲) are labelled with the test site and quarter. MIT hazard quotients are the ratio of MIT to the Mount et al. (2019) EC_{20}, i.e., a hazard quotient (HQ) of 1 indicates the tests had MIT equal to the EC_{20} (Mount et al. 2019). The vertical line for the MIT hazard quotient at 1 is the screening value. Horizontal lines are the regional normal range (see Figure 2.3-3 for description). CN = control normalized; HQ = hazard quotient; mg/L = milligrams per litre; MIT = Multi-Ion Toxicity; UFR = Upper Fording River.

Figure 3.4-3: Mean *C. dubia* reproduction versus sum of toxic units calculated using WQGs only (left) and WQGs and EVWQP benchmarks (right).



Notes: Symbols indicate reference waters (× = 2015 to 2020; + = 2021), test site waters with mean results categorized as no adverse response (○ = 2015 to 2020; Δ = 2021), and test site waters with mean results categorized as possible or likely adverse response (○ = 2015 to 2020; ▲ = 2021 stations; Δ = UFR stations). Test waters categorized as possible or likely in 2021 (▲) are labelled with the test site and quarter. Horizontal lines are the regional normal range (see Figure 2.3-3 for description). CN = control normalized; EVWQP = Elk Valley Water Quality Plan; UFR = Upper Fording River; WQG = water quality guideline; Σ = sum.

Figure 3.4-4: Mean *C. dubia* reproduction versus PC1 for the combined dataset (top left), PC2 for the combined dataset (top right), and PC1 for the 2021 dataset (bottom left).



Notes: Symbols indicate reference waters (× = 2015 to 2020; + = 2021), test site waters with mean results categorized as no adverse response (○ = 2015 to 2020; Δ = 2021), and test site waters with mean results categorized as possible or likely adverse response (○ = 2015 to 2020; ▲ = 2021 stations; Δ = 2021 UFR stations). Test site waters categorized as possible or likely in 2021 (▲) are labelled with the test site and quarter. Horizontal lines are regional normal range (see Figure 2.3-3 for description). CN = control normalized; PC = principal component; UFR = Upper Fording River

Identification of Potential Contributors to Toxicity (C. dubia)

In tests categorized as having a possible or likely adverse response, concentrations of most constituents were equal to or lower than concentrations in test site waters categorized as no adverse response (Table D-1), and/or were lower than chronic WQG or lowest level 1 EVWQP benchmark (Appendix C). Such constituents are not expected to contribute to toxicity in these tests. For the remaining constituents, published toxicity data were reviewed to evaluative their potential to contribute to observed effects. These constituents are discussed below.

- **FR_FRCP1 (Q1)**—Nickel showed the greatest evidence of causing the observed response in this test. The total nickel concentration in this test (13 µg/L) was higher than the reproduction EC_{25} for nickel in Michel Creek water (10.8 µg/L; Nautilus 2018), indicating that nickel may have contributed to toxicity in this test. This interpretation aligns with the 2021 *C. dubia* TIE testing conducted with Q1 FR_FRCP1 water, which showed decreased effects on reproduction upon addition of EDTA, and the graphical analysis of nickel, which demonstrated a concentration-response relationship for *C. dubia* reproduction (Figure 3.4-1). Other constituents exhibited weak to no evidence of potential for toxicity at this station in Q1 2021. The concentration of nitrate in this test (26 mg/L as N) was above the level 1 EVWQP benchmark but approximately two times lower than the updated, site-specific reproduction EC_{10} derived for the MQ2 project (Golder 2021b) using site water testing (57 mg/L as N, at the maximum hardness that the equation applies [709 mg/L]); these results indicate that nitrate did not contribute to the observed response. The concentration of nitrite in this test (0.024 mg/L as N) was above the chronic WQG but more than an order of magnitude below the reproduction EC_{10} (1.4 mg/L as N; US EPA 2010), indicating that nitrite did not contribute to the observed response.[25] The concentration of potassium in this test was higher than in tests categorized as no adverse response. There is no WQG or screening value for potassium, so potassium was assessed via TDS and MIT for which potassium is a component. The hazard quotient for the *C. dubia* EC_{20} MIT model was 0.75 (i.e., below the EC_{20}), and the concentration of TDS in this test (940 mg/L) was lower than the reproduction EC_{20} value for TDS in Fording River water (1,012 mg/L at hardness >500 mg/L as $CaCO_3$; Golder 2013); these results indicate that MIT did not contribute to the observed response.
- **FR_FRCP1 (Q3)** — Nickel showed the greatest evidence of causing the observed response in this test. The total nickel concentration in this test (7.0 µg/L) was higher than the reproduction EC_{10} for nickel in Michel Creek water (5.1 µg/L; Nautilus 2018), indicating that nickel may have contributed to toxicity in this test. This interpretation aligns with the 2021 *C. dubia* TIE testing conducted with Q3 FR_FRCP1 water, which showed decreased effects on reproduction upon addition of EDTA, and the graphical analysis of nickel, which demonstrated a concentration-response relationship for *C. dubia* reproduction (Figure 3.4-1). Other constituents exhibited weak to no evidence of potential for toxicity at this station in Q3 2021. The concentration of nitrate in this test (14 mg/L as N) was above the level 1 EVWQP benchmark but approximately three times lower than the updated, site-specific reproduction EC_{10} derived for the MQ2 project (Golder 2021b) using site water testing (46 mg/L as N at hardness 596 mg/L as $CaCO_3$), indicating that nitrate did not contribute to the observed response.

[25] There is some uncertainty in this comparison because the chloride concentration in the Q1 FR_FRCP1 test (1.6 mg/L) was lower than that used in the US EPA (2013) toxicity test (2 mg/L). This uncertainty is offset by the nitrite concentration in the FR_FRCP1 test being more than an order of magnitude below the nitrite EC_{10}.

- **FR_FRCP1 (Q4)** — Nickel showed the greatest evidence of causing the observed response in this test. The total nickel concentration in this test (12 µg/L) was higher than the reproduction EC_{25} for nickel in Michel Creek water (10.8 µg/L; Nautilus 2018), indicating that nickel may have contributed to observed effects. Although the TIE results demonstrated comparable effects to reproduction between the EDTA treated sample and to the untreated sample, this appears to be related to EDTA-specific effects, which were also observed in the negative laboratory control. The nickel screening results align with the graphical analysis of nickel, which demonstrated a concentration-response relationship for *C. dubia* reproduction (Figure 3.4-1). Other constituents exhibited weak to no evidence of potential for toxicity at this station in Q4 2021. The concentration of nitrate in this test (23 mg/L as N) was above the level 1 EVWQP benchmark but approximately three times lower than the updated, site-specific reproduction EC_{10} derived for the MQ2 project (Golder 2021b) using site water testing (57 mg/L as N at hardness 701 mg/L as $CaCO_3$), indicating that nitrate did not contribute to the observed response.
- **LC_DCDS (Q3 and Q4)** — Nickel and nitrate showed the greatest evidence of causing the observed response in these tests. The total nickel concentration in the Q3 test (9.1 µg/L) was higher than the reproduction EC_{20} for nickel in Michel Creek water (8.6 µg/L) and the total nickel concentration in the Q4 test (13 µg/L) was higher than the reproduction EC_{25} for nickel in Michel Creek water (10.8 µg/L; Nautilus 2018). These results indicate that nickel may have contributed to the observed effects in both tests. The nickel screening results also align with the graphical analysis of nickel, which demonstrated a concentration-response relationship for *C. dubia* reproduction (Figure 3.4-1). Other constituents exhibited weak to no evidence of potential for toxicity at this station in Q3 or Q4 2021. Concentrations of potassium in these tests were higher than tests categorized as no adverse response. There is no WQG or screening value for potassium, so potassium was assessed via TDS and MIT for which potassium is a component. The hazard quotients for the *C. dubia* reproduction EC_{20} MIT model were 0.44 (Q3) and 0.68 (Q4; i.e., below the EC_{20}), and the concentrations of TDS in these tests (618 mg/L [Q3] and 838 mg/L [Q4]) were lower than the reproduction EC_{20} value for TDS in Fording River water (1,012 mg/L at hardness >500 mg/L as $CaCO_3$; Golder 2013). These results indicate that MIT did not contribute to the observed response. The concentration of nitrate in the Q4 test was higher than tests categorized as no adverse response and the concentrations of nitrate in both tests (36 mg/L as N [Q3] and 47 mg/L as N [Q4]) were above the level 1 EVWQP benchmark as well as than the updated, site-specific reproduction EC_{10} values derived for the MQ2 project (Golder 2021b) using site water testing (31 mg/L as N at hardness 438 mg/L as $CaCO_3$ [Q3] and 45 mg/L as N at hardness 590 mg/L as $CaCO_3$ [Q4]), indicating that nitrate may have contributed to observed effects.
- **CM_MC2 (Q1)** — Nickel showed the greatest evidence of causing the observed response in this test. The total nickel concentration in this test (15 µg/L) was higher than the reproduction EC_{25} for nickel in Michel Creek water (10.8 µg/L; Nautilus 2018), indicating that nickel may have contributed to toxicity in this test. This interpretation aligns with the 2021 *C. dubia* TIE testing conducted with Q1 CM_MC2 water, which showed decreased effects on reproduction upon addition of EDTA, and the graphical analysis of nickel, which demonstrated a concentration-response relationship for *C. dubia* reproduction (Figure 3.4-1). Other constituents exhibited weak to no evidence of potential for toxicity at this station in Q1 2021. The concentration of sodium in this test was higher than tests categorized as no adverse response. There is no WQG or screening value for sodium, so sodium was assessed via TDS and MIT for which sodium is a component. The hazard quotient for the *C. dubia* EC_{20} MIT model was 0.61 (i.e., below the EC_{20}), and the concentration of TDS in this test (785 mg/L) was lower than the reproduction EC_{20} value for TDS in Fording River water (1,012 mg/L at hardness >500 mg/L as $CaCO_3$; Golder 2013); these results indicate that MIT did not contribute to the observed response.

- **CM_MC2 (Q4)** — Nickel showed the greatest evidence of causing the observed response in this test. The total nickel concentration in this test (13 µg/L) was higher than the reproduction EC_{25} for nickel in Michel Creek water (10.8 µg/L; Nautilus 2018), indicating that nickel may have contributed to toxicity in this test. This interpretation aligns with the 2021 *C. dubia* TIE testing conducted with Q4 CM_MC2 water, which showed decreased effects on reproduction upon addition of EDTA, and the graphical analysis of nickel, which demonstrated a concentration-response relationship for *C. dubia* reproduction (Figure 3.4-1).
- **LC_LC3 (Q4)** — Nickel showed the greatest evidence of causing the observed response in this test. The total nickel concentration in this test (10 µg/L) was higher than the reproduction EC_{20} for nickel in Michel Creek water (8.6 µg/L; Nautilus 2018), indicating that nickel may have contributed to observed effects.

3.4.2 *Pseudokirchneriella subcapitata* Cell Yield

Nineteen tests conducted in 2021 were carried forward to the causation assessment, consisting of 16 tests categorized as possible adverse response (Q1 tests with FR_FRABCH, LC_LC5, LC_DCDS, CM_MC2, EV_MC2, and LC_LC3; Q2 test with GH_FR1; Q3 tests with LC_DCDS, GH_ERC, and EV_HC1; and Q4 tests with LC_LC5, LC_LCDSSLCC, GH_ERC, CM_MC2, EV_MC2, and EV_HC1) and 3 tests categorized as likely adverse response (Q1 test with FR_FRCP1 and Q2 tests with LC_LC5 and LC_LC3). Results are provided below for the *P. subcapitata* causation assessment.

Water Quality Screening (P. subcapitata)

In two of nineteen tests categorized as possible or likely (EV_MC2 [Q1 and Q3]), concentrations were below chronic WQGs or lowest level 1 EVWQP benchmarks. In the seventeen remaining tests categorized as possible or likely adverse effects, concentrations of one or more constituents exceeded chronic WQGs[26] or lowest level 1 EVWQP benchmarks for at least one constituent:

- **FR_FRCP1 (Q1)**—Concentrations of sulphate, nitrate and selenium exceeded the lowest level 1 EVWQP benchmarks, the concentration of nickel exceeded the level 1 interim screening value, and concentrations of fluoride and uranium exceeded chronic WQGs.
- **FR_FRABCH (Q1)**—Concentrations of nitrate and selenium exceeded the lowest level 1 EVWQP benchmarks.
- **LC_LC5 (Q2)**—The concentration of selenium exceeded the lowest level 1 EVWQP benchmark, and the concentration of fluoride and chromium exceeded the chronic WQGs.
- **LC_DCDS (Q1 and Q3)**—Concentrations of nitrate and selenium exceeded the lowest level 1 EVWQP benchmarks, the concentration of nickel exceeded the level 1 interim screening value.
- **GH_ERC (Q3 and Q4)**—The concentration of fluoride exceeded the chronic WQG.
- **CM_MC2 (Q1 and Q4)**—The concentration of nickel exceeded the level 1 interim screening value.
- **LC_LC3 (Q1)**—Concentrations of sulphate, and selenium exceeded the lowest level 1 EVWQP benchmarks, and the concentration of nickel exceeded the level 1 interim screening value.

[26] Per Section 2.3.4, nickel was compared to the interim level 1 screening value (5.3 µg/L), which is based on potential effects to invertebrates.

- **LC_LC3 (Q2)**—The concentration of selenium exceeded the lowest level 1 EVWQP benchmarks, the concentration of nickel exceeded the level 1 interim screening value, and the concentration of fluoride exceeded the chronic WQG.
- **LC_LC5 (Q1 and Q4), GH_FR1 (Q2), EV_HC1 (Q3 and Q4), LC_LCDSSLCC (Q4)**—The concentration of selenium exceeded the lowest level 1 EVWQP benchmark, and the concentration of fluoride exceeded the chronic WQG.

Concentrations of field measured dissolved oxygen were below the minimum chronic WQGs in several tests[27] and below the minimum acute WQG for GH_ERC (Q3). However, dissolved oxygen concentrations were maintained within protocol limits during the test duration (Appendix B) and therefore are not considered to be a causal factor in the observed response.

Spearman Rank Correlation (P. subcapitata)

Constituents and explanatory variables with a statistically significant Spearman rank correlation for *P. subcapitata* cell yield for the combined and 2021 datasets are summarized in Table 3.4-2. Strong negative statistical correlations (i.e., $r_s \leq -0.4$) were observed in the combined dataset for total acidity, and in the 2021 dataset for TOC, TSS, turbidity, several metals (e.g., cobalt, mercury, zinc), and PC2 (Table F-1).

The PC score that had a statistically significant Spearman rank correlation is described below:

- **PC2 (2021 dataset)**—This component accounted for 23.3% of the variance (Table E-2). PC2 had strong positive loadings for TSS and turbidity, one Order constituent (cadmium), and several metals (e.g., cobalt, mercury, zinc).

The component loadings for PC2 exhibited similar patterns between the combined dataset and the 2021 dataset. PC2 in both datasets had strong positive loadings for TSS and turbidity and several metals; however, loadings tended to be stronger in the 2021 dataset compared to the combined dataset.

[27] FR_FRABCH (Q1), GH_FR1 (Q1), LC_LC5 (Q2), LC_DCDS (Q3), GH_ERC (Q4), EV_MC2 (Q4), EV_HC1 (Q3), LC_LC3 (Q2), and LC_LCDSSLCC (Q4)

Table 3.4-2: Constituents and Explanatory Variables with Significant Spearman Rank Correlations for *Pseudokirchneriella subcapitata* Cell Yield.

Constituent[(a)]	R_s Combined Dataset	R_s 2021 Dataset	Comparison to WQGs/ EVWQP Benchmarks	Retained for Graphical Analysis?
Total Acidity	-0.45	ns	No WQG	Yes
Bicarbonate Alkalinity	-0.36	ns	No WQG	No - assessed as TDS
Total Alkalinity	-0.16	ns	No	No
Total Antimony	ns	-0.34	No	No
Total Arsenic	ns	-0.33	No	No
Total Boron	-0.16	ns	No	No
Dissolved Cadmium	ns	-0.33	No	No
Total Calcium	-0.18	ns	No WQG	No - assessed as TDS
Dissolved Organic Carbon	ns	-0.38	No WQG	Yes
Total Cobalt	-0.14	-0.43	No	No
Conductivity	-0.16	ns	No WQG	No - assessed as TDS
Dissolved Copper	ns	-0.33	No	No
Hardness	-0.15	ns	No WQG	No - assessed as TDS
Total Iron	ns	-0.59	No	No
Total Lead	ns	-0.43	No	No
Total Lithium	-0.19	ns	No	No
Total Magnesium	-0.17	ns	No WQG	No - assessed as TDS
Total Manganese	ns	-0.57	No	No
Total Mercury	ns	-0.53	No	No
Total Nickel	-0.15	-0.47	Yes	Yes
Nitrate	-0.15	ns	Yes	Yes
Total Ammonia	-0.15	ns	No	No
Oxidation-Reduction Potential	-0.40	ns	No WQG	No – not a direct toxicant[28]
Total Potassium	-0.17	ns	No WQG	No - assessed as TDS
Total Selenium	-0.15	ns	Yes	Yes
Total Silicon	-0.32	ns	No WQG	Yes
Total Thallium	ns	-0.40	No	No
Total Dissolved Solids	-0.16	ns	No WQG	Yes
Total Organic Carbon	ns	-0.44	No WQG	Yes
Total Suspended Solids	ns	-0.51	No WQG	Yes
Turbidity	ns	-0.52	No WQG	Yes
Total Uranium	-0.19	ns	Yes	Yes
Total Vanadium	ns	-0.41	No	No
Zinc−Total	-0.20	-0.51	No	No
∑TUs−WQGs	-0.30	ns	No WQG	Yes
∑TU−WQGs/Benchmarks	-0.25	-0.36	No WQG	Yes
PC1 Combined	-0.22	ns	No WQG	Yes
PC2 2021	ns	-0.56	No WQG	Yes

Notes: Values shown here were statistically significant at $\alpha < 0.005$, $r_s = -0.137$ for the combined dataset and $\alpha < 0.005$, $r_s = -0.33$ for the 2021 dataset. WQGs = British Columbia water quality guidelines; EVWQP = Elk Valley Water Quality Program; ns = not significant; ∑TU = sum of toxicity units; TDS = total dissolved solids. Shaded values indicate a strong Spearman rank correlation at $r_s \leq -0.4$.

(a) Total concentrations are shown for metals that have a WQG for the total fraction or that lack a chronic WQG. Dissolved concentrations were used for metals with a WQG for the dissolved fraction.

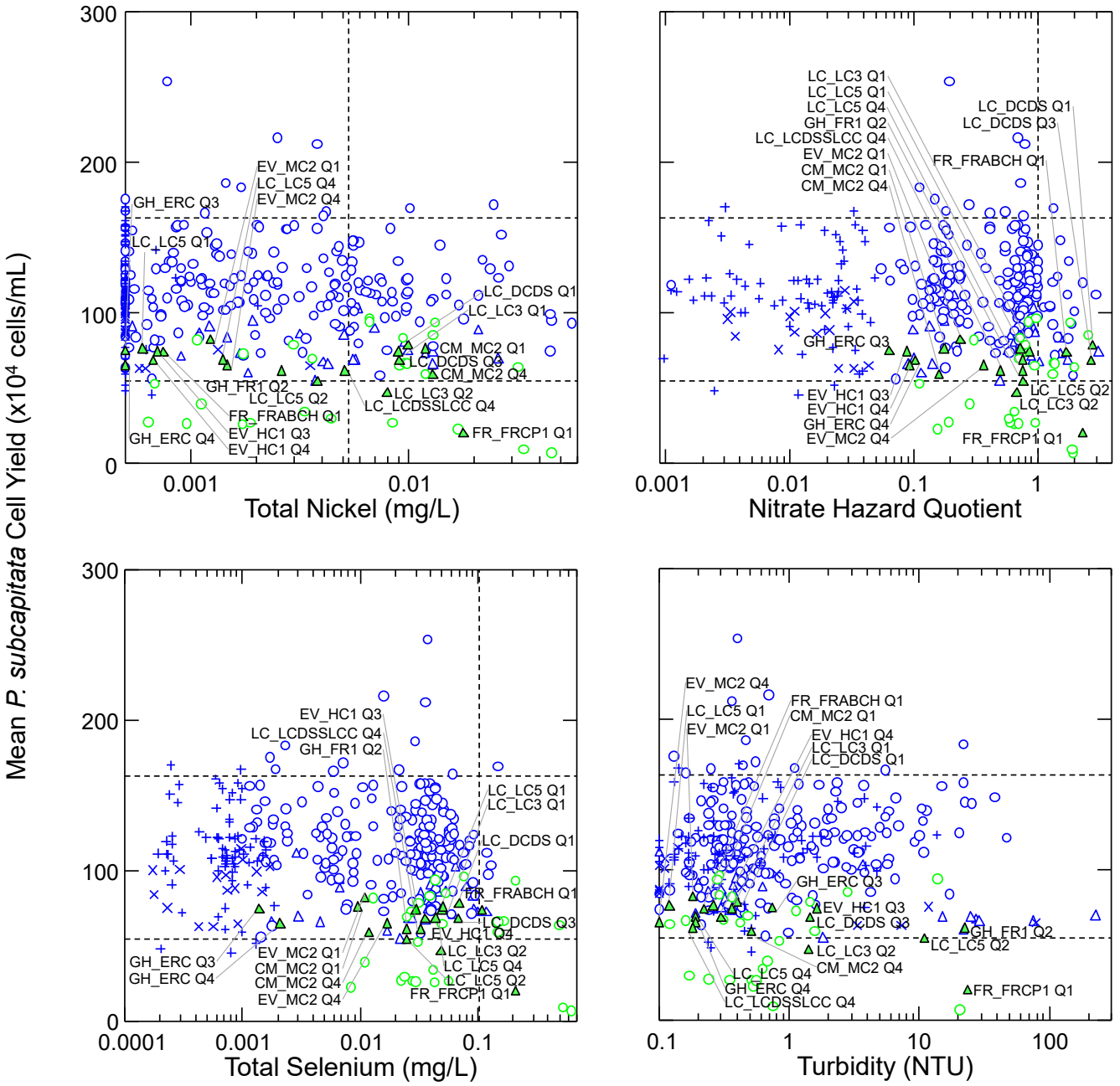
[28] Oxidation-reduction potential is not a direct toxicant to aquatic life but refers to the tendency of a water body to undergo oxidizing or reducing process upon introduction of a new substance (US EPA 2017b), and therefore was not expected to explain observed toxicity.

Graphical Analysis (P. subcapitata)

Constituents and explanatory variables with significant Spearman rank correlations, and that were either above WQGs or did not have WQGs, were carried through to graphical analysis (Figures 3.4-5 to 3.4-8). Graphical analysis was conducted for two Order constituents (total selenium, nitrate), total nickel, turbidity, TDS, TSS, total organic carbon, DOC, uranium, silicon, total acidity, ∑TU (calculated with WQGs only and WQGs and EVWQP benchmarks), PC1 (combined), and PC2 (2021 dataset).

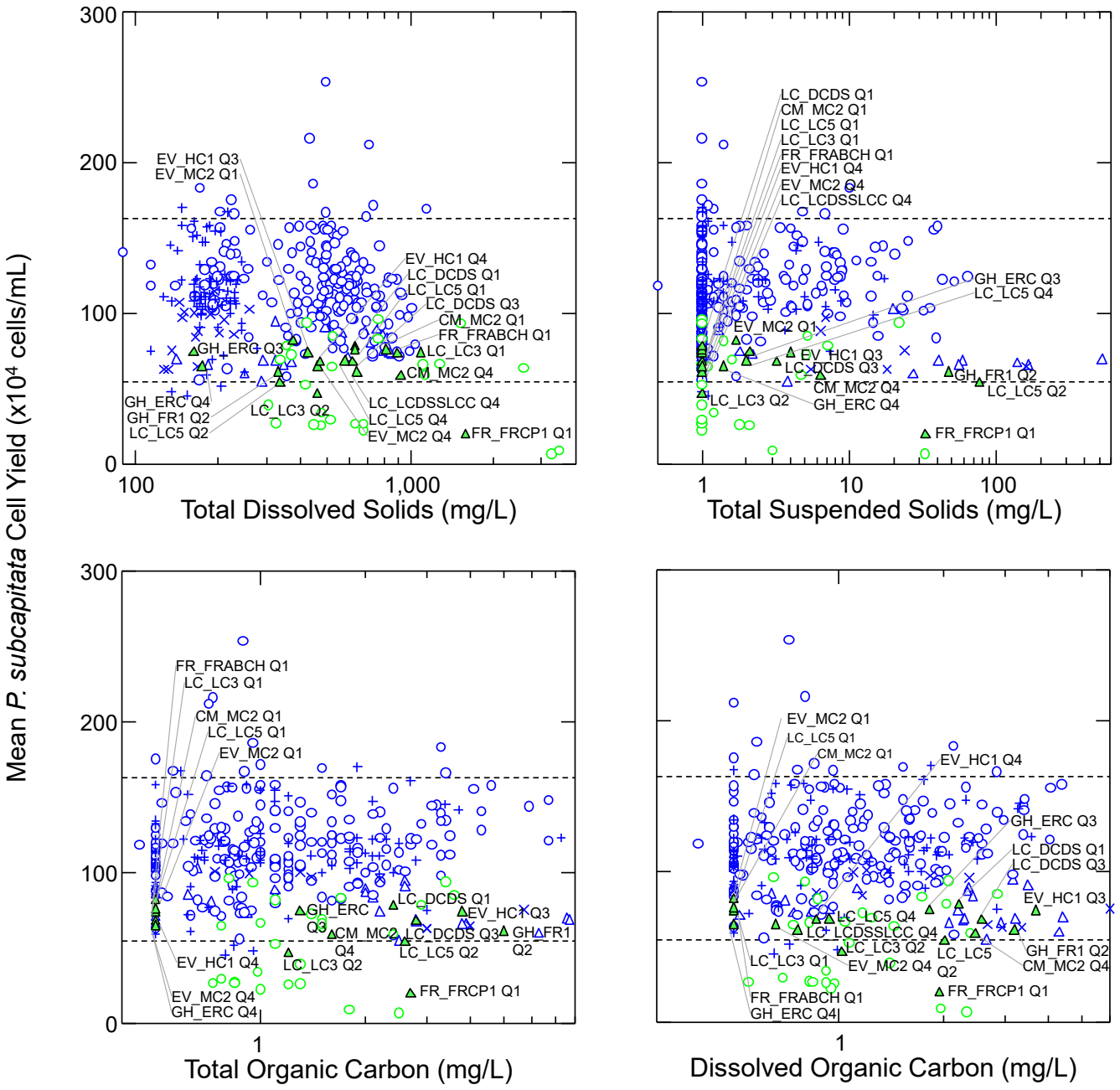
None of the evaluated explanatory variables exhibited a consistent exposure-response relationship across *P. subcapitata* tests. The lack of relationship was not surprising, given that many of the 2021 tests categorized as possible or likely had similar magnitude responses, despite the sites having different chemistry profiles (Section 3.3.1.2). Because no strong or consistent relationships were observed for concentrations versus responses, the water quality screening (next subsection) was relied upon for identification of potential causes of observed effects.

Figure 3.4-5: Mean *P. subcapitata* cell yield versus total nickel (top left), nitrate (top right), total selenium (bottom left), and turbidity (bottom right).



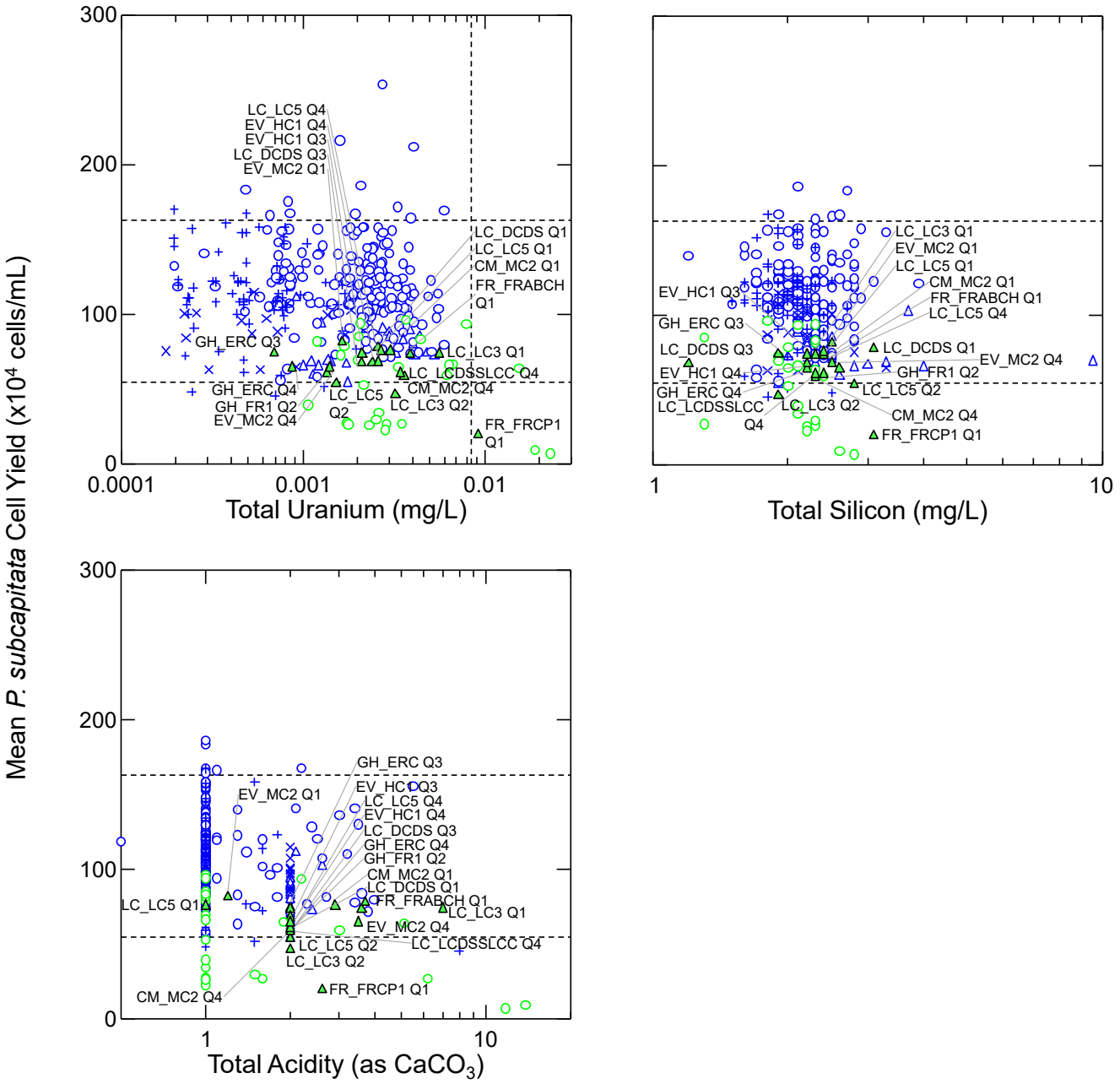
Notes: Symbols indicate reference waters (× = 2015 to 2020; + = 2021), test site waters with mean results categorized as no adverse response (○ = 2015 to 2020; Δ = 2021), and test site waters with mean results categorized as possible or likely adverse response (○ = 2015 to 2020; ▲ = 2021 stations). Regional chronic toxicity test site waters categorized as possible or likely in 2021 (▲) are labelled with the test site and quarter. Nitrate hazard quotients are the ratio of nitrate concentrations to the lowest level 1 EVWQP benchmark for invertebrates. Nitrite hazard quotients are the ratio of nitrite concentrations to the chronic BC WQG. Vertical lines are screening values: for the nitrate hazard quotients, the screening value is 1; for nickel the screening value is the level 1 interim screening value (5.3 µg/L), for selenium, the screening value is the level 1 EVWQP benchmark for invertebrates (104 µg/L). Horizontal lines are the regional normal range (see Figure 2.3-3 for description). Cells/mL = cells per milliliter; EVWQP = Elk Valley Water Quality Plan; HQ = hazard quotient; mg/L = milligrams per litre; NTU = nephelometric turbidity units; WQG= water quality guideline.

Figure 3.4-6: Mean *P. subcapitata* cell yield versus total dissolved solids (top left), total suspended solids (top right), total organic carbon (bottom left), and dissolved organic carbon (bottom right).



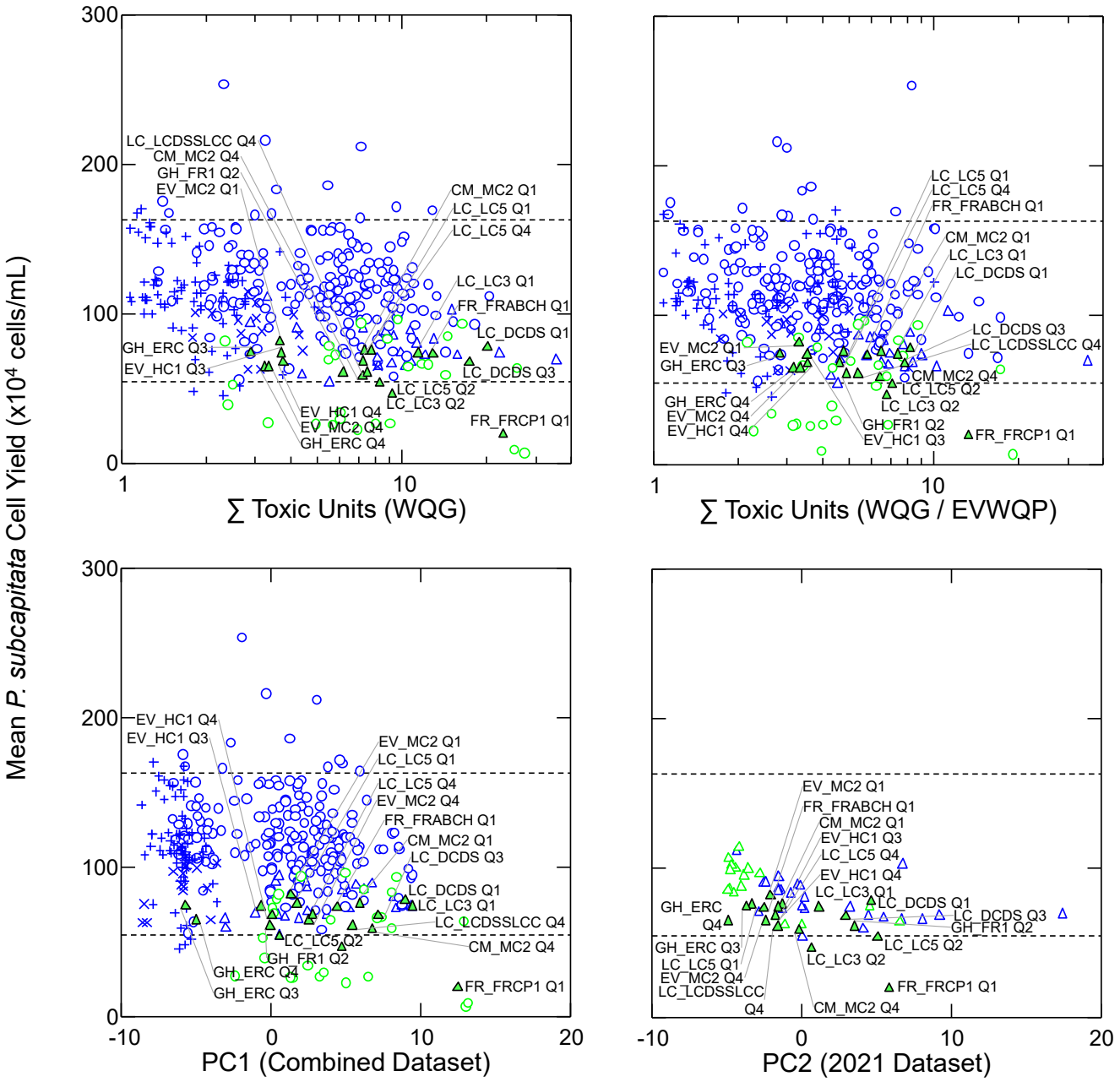
Notes: Symbols indicate reference waters (× = 2015 to 2020; + = 2021), test site waters with mean results categorized as no adverse response (○ = 2015 to 2020; Δ = 2021), and test site waters with mean results categorized as possible or likely adverse response (○ = 2015 to 2020; ▲ = 2021 stations). Test site waters categorized as possible or likely in 2021 (▲) are labelled with the test site and quarter. Horizontal lines are the regional normal range (see Figure 2.3-3 for description). Cells/mL = cells per milliliter; mg/L = milligrams per litre.

Figure 3.4-7: Mean *P. subcapitata* cell yield versus total uranium (top left), total silicon (top right), and total acidity (bottom left).



Notes: Symbols indicate reference waters (× = 2015 to 2020; + = 2021), test site waters with mean results categorized as no adverse response (○ = 2015 to 2020; Δ = 2021), and test site waters with mean results categorized as possible or likely adverse response (○ = 2015 to 2020; ▲ = 2021 stations). Test site waters categorized as possible or likely in 2021 (▲) are labelled with the test site and quarter. Horizontal lines are the regional normal range (see Figure 2.3-3 for description). $CaCO_3$ = calcium carbonate; cells/mL = cells per milliliter; mg/L = milligrams per litre.

Figure 3.4-8: Mean *P. subcapitata* cell yield versus sum of toxic units calculated using WQGs only (top left), sum of toxic units calculated using WQGs and EVWQP benchmarks (top right), PC1 for the combined dataset (bottom left), and PC2 for the 2021 dataset (bottom right).



Notes: Symbols indicate reference waters (× = 2015 to 2020; + = 2021), test site waters with mean results categorized as no adverse response (○ = 2015 to 2020; Δ = 2021), and test site waters with mean results categorized as possible or likely adverse response (○ = 2015 to 2020; ▲ = 2021 stations). Test waters categorized as possible or likely in 2021 (▲) are labelled with the test site and quarter. Horizontal lines are the regional normal range (see Figure 2.3-3 for description). Cells/mL = cells per milliliter; EVWQP = Elk Valley Water Quality Plan; PC = principal component; WQG = water quality guideline; Σ = sum.

Identification of Potential Contributors to Toxicity (P. subcapitata)

In tests categorized as having a possible or likely adverse response to *P. subcapitata*, concentrations of most constituents were equal to or lower than concentrations in reference waters and/or test site waters categorized as no adverse response (Table D-2), and/or were lower than the chronic WQG (Appendix C). Such constituents are not expected to contribute to toxicity in these tests. For the remaining constituents, published toxicity data were reviewed to evaluate their potential to contribute to observed effects. These constituents are discussed below.

- **FR_FRCP1 (Q1)**—No water quality constituent was identified as the potential cause of the observed response in this test. Several constituents were above WQGs and/or concentrations measured in tests categorized as no adverse response; however, as described in the following bullets, these constituents were identified to be unlikely to have contributed to the response.
  - The ∑TUs (calculated with WQGs) for this test was higher than test sites categorized as no adverse response. The ∑TUs for this test was largely driven by nitrate, which accounted for 51% of the ∑TUs, and nickel, which accounted for 15% of the ∑TUs. As discussed below, neither of these constituents are expected to have contributed to the observed response in this test.
  - Concentrations of nitrate (35 mg/L as N at hardness 1,300 mg/L as $CaCO_3$) and sulphate (811 mg/L) in this test were above the level 1 EVWQP benchmarks but below the highest concentrations tested in the Golder (2013) mixture toxicity test that resulted in no significant adverse effects to *P. subcapitata* cell yield (nitrate = 50 mg/L as N at hardness 702 mg/L as $CaCO_3$; sulphate = 931 mg/L). These results indicate that nitrate and sulphate did not contribute to the observed response.
  - The concentration of nickel in this test (18 µg/L) was above the level 1 interim screening value for invertebrates[29] but below the lowest effect concentration estimated by European Union (EU 2008) of 61 µg/L for pH of 8.1, DOC of 1 mg/L, and hardness of 6 mg/L (i.e., conditions that would result in similar toxicity [pH and DOC] or much higher toxicity [hardness] relative to test conditions), indicating that nickel did not contribute to the observed response.[30]
  - The concentration of dissolved silicon in this test (3.0 mg/L) was higher than tests categorized as no adverse response but was below the EC_{10} of 3.4 mg/L for *P. subcapitata* growth (3.4 mg/L; Van Hoecke et al. 2008), indicating that silicon did not contribute to the observed response.
  - The concentration of total uranium in this test (9.2 µg/L) was above the chronic WQG and higher than tests categorized as no adverse response but was below the EC_{10} of 40 µg/L for *P. subcapitata* growth (CCME 2011), indicating that uranium did not contribute to the observed response.

[29] Per Section 2.3.4, nickel was compared to the interim level 1 screening value for (5.3 µg/L), which is based on potential effects to invertebrates.

[30] EU 2008 generated EC10 estimates for various combinations of pH (7, 7.5, 8.1), hardness (6 to 320 mg/L), and DOC (1 to 25 mg/L). Nickel EC10 estimates for *P. subcapitata* ranged from 61 to 297 µg/L. The lowest value (61 µg/L) was used for screening.

  - Concentrations of TDS and components of TDS (e.g., calcium) in this test were higher than tests categorized as no adverse response. In absence of WQGs or screening values, these constituents were assessed collectively via TDS. The concentration of TDS in this test (1,590 mg/L) was greater than the highest concentration in the Golder (2013) mixture toxicity test that resulted in no significant adverse effects to *P. subcapitata* cell yield (1,498 mg/L), so it cannot be ruled out that TDS may have contributed to the observed response in this test based on toxicity testing data alone. However, Figure 3.4-6 indicates a lack of concentration-response relationship between the observed effects on cell yield and TDS, where cell yield was 20×10^4 cells/mL in the Q1 FR_FRCP1 test with 1,590 mg/L TDS, and 64×10^4 cells/mL in the Q1 2015 FR_FRCP1 test at a greater TDS concentration (2,580 mg/L). The marginal (6%) difference in TDS between toxicity tests and the lack of relationship between TDS and response in cell yield indicates that TDS was unlikely to have contributed to the observed response.
  - The concentration of selenium in this test (210 µg/L) was greater than the lowest level 1 EVWQP invertebrate benchmark and concentrations observed in tests categorized as no adverse response but was two orders of magnitude below the 72-h EC_{50} of 99,000 µg/L for *P. subcapitata* growth (Ibrahim and Spacie 1990), indicating that selenium did not contribute to the observed response.

- **FR_FRABCH (Q1)**—No water quality constituent was identified as the potential cause of the observed response in this test. The concentration of dissolved calcium in this test was higher than tests categorized as no adverse response. In absence of a WQG or screening value, calcium was assessed via TDS of which calcium is a component. The concentration of TDS in this test (898 mg/L) was lower than the highest concentration tested in the Golder (2013) mixture toxicity test that resulted in no significant adverse effects to *P. subcapitata* cell yield (1,498 mg/L), indicating that TDS did not contribute to the observed response. The concentration of nitrate in this test (26 mg/L as N at hardness 756 mg/L as $CaCO_3$) was above the level 1 EVWQP benchmark but was below the highest concentration tested in the Golder (2013) mixture toxicity test that resulted in no significant adverse effects to *P. subcapitata* cell yield (50 mg/L as N at hardness 702 mg/L as $CaCO_3$), indicating that nitrate did not contribute to the observed response. As discussed in Section 3.3.1.2 and illustrated on Figures 3.5-4 to 3.5-8, adverse effects were observed across most tests in Q1 and Q4, despite dissimilar water chemistries.
- **LC_DCDS (Q1)**—No water quality constituent was identified as the potential cause of the observed response in this test. Several constituents were above WQGs and/or concentrations measured in tests categorized as no adverse response; however, as described in the following bullets, these constituents were identified to be unlikely to have contributed to the response.
  - The concentration of potassium in this test was higher than tests categorized as no adverse response. In absence of a WQG or screening value, potassium was assessed via TDS of which potassium is a component. The concentration of TDS in this test (627 mg/L) was lower than the highest concentration tested in the Golder (2013) mixture toxicity test that resulted in no significant adverse effects to *P. subcapitata* cell yield (1,498 mg/L), indicating that TDS did not contribute to the observed response.
  - The concentration of nitrate in this test (42 mg/L as N at hardness 530 mg/L as $CaCO_3$) was above the level 1 EVWQP benchmark but was below the highest concentration tested in the Golder (2013) mixture toxicity test that resulted in no significant adverse effects to *P. subcapitata* cell yield (nitrate = 50 mg/L as N at hardness 702 mg/L as $CaCO_3$), indicating that nitrate did not contribute to the observed response.

- The concentration of nickel in this test (10 µg/L) was above the level 1 interim screening value but below the lowest effect concentration estimated by European Union (EU 2008) of 61 µg/L for pH of 8.1, DOC of 1 mg/L, and hardness of 6 mg/L (i.e., conditions that would result in similar toxicity [pH and DOC] or much higher toxicity [hardness] relative to test conditions), indicating that nickel did not contribute to the observed response.[30]
- The concentration of dissolved silicon in this test (2.9 mg/L) was higher than tests categorized as no adverse response but was below the EC_{10} of 3.4 mg/L for *P. subcapitata* growth (Van Hoecke et al. 2008), indicating that silicon did not contribute to the observed response.

As discussed in Section 3.3.1.2 and illustrated on Figures 3.5-4 to 3.5-8, adverse effects were observed across most tests in Q1 and Q4, despite dissimilar water chemistries.

- **LC_DCDS (Q3)**—No water quality constituent was identified as the potential cause of the observed response in this test. The concentration of nitrate in this test (36 mg/L as N at hardness 438 mg/L as $CaCO_3$) was above the level 1 EVWQP benchmark but was below the highest concentration tested in the Golder (2013) mixture toxicity test that resulted in no significant adverse effects to *P. subcapitata* cell yield (50 mg/L as N at hardness 702 mg/L as $CaCO_3$), indicating that nitrate did not contribute to the observed response. The concentration of nickel in this test (9.1 µg/L) was above the level 1 interim screening value but below the lowest effect concentration estimated by European Union (EU 2008) of 61 µg/L for pH of 8.1, DOC of 1 mg/L, and hardness of 6 mg/L (i.e., conditions that would result in similar toxicity [pH and DOC] or much higher toxicity [hardness] relative to test conditions), indicating that nickel did not contribute to the observed response.[30]
- **LC_LC3 (Q1)**—No water quality constituent was identified as the potential cause of the observed response in this test. Concentrations of components of TDS (e.g., calcium) in this test were higher than categorized as no adverse response. In absence of WQGs or screening values, these constituents were assessed via TDS. The concentration of TDS in this test (1,090 mg/L) was lower than the highest concentration tested in the Golder (2013) mixture toxicity test that resulted in no significant adverse effects to *P. subcapitata* cell yield (1,498 mg/L) indicating that TDS did not contribute to the observed response. The concentration of sulphate in this test (483 mg/L) was above the level 1 EVWQP benchmark but was below the highest concentration tested in the Golder (2013) mixture toxicity test that resulted in no significant adverse effects to *P. subcapitata* cell yield (931 mg/L) indicating that sulphate did not contribute to the observed response. The concentration of nickel in this test (9.0 µg/L) was above the level 1 interim screening value but was below the lowest effect concentration estimated by European Union (EU 2008) of 61 µg/L for pH of 8.1, DOC of 1 mg/L, and hardness of 6 mg/L (i.e., conditions that would result in similar toxicity [pH and DOC] or much higher toxicity [hardness] relative to test conditions), indicating that nickel did not contribute to the observed response.[30] As discussed in Section 3.3.1.2 and illustrated on Figures 3.5-4 to 3.5-8, adverse effects were observed across most tests in Q1 and Q4, despite dissimilar water chemistries.
- **CM_MC2 (Q1 and Q4), and LC_LC3 (Q2)**—No water quality constituent was identified as the potential cause of the observed response in this test. The concentrations of nickel in these tests (12 µg/L [CM_MC2 Q1], 13 µg/L [CM_MC2 Q4], and 8.0 µg/L [LC_LC3 Q2]) were above the level 1 interim screening value but were below the lowest effect concentration estimated by European Union (EU 2008) of 61 µg/L for pH of 8.1, DOC of 1 mg/L, and hardness of 6 mg/L (i.e., conditions that would result in similar toxicity [pH and DOC] or much higher toxicity [hardness] relative to test conditions), indicating that nickel did not contribute to the observed response.[30] As discussed in Section 3.3.1.2 and illustrated on Figures 3.5-4 to 3.5-8, adverse effects were observed across most tests in Q1 and Q4, despite dissimilar water chemistries.

- **LC_LC5 (Q1, Q2 and Q4), GH_FR1 (Q2), GH_ERC (Q3 and Q4), EV_MC2 (Q1 and Q4, EV_HC1 (Q3 and Q4), and LC_LCDSSLCC (Q4)**—No water quality constituent was identified as the potential cause of the observed response in this test. Concentrations of constituents were equal to or lower than concentrations in other test waters categorized as no adverse response (Table D-2), and/or were lower than the chronic WQG and lowest level 1 EVWQP benchmarks (Appendix C). As discussed in Section 3.3.1.2 and illustrated on Figures 3.5-4 to 3.5-8, adverse effects were observed across most tests in Q1 and Q4, despite dissimilar water chemistries.

3.4.3 *Hyalella azteca* Survival and Growth

Eight tests conducted in 2021 were carried forward to the causation assessment, consisting of six tests categorized as possible adverse response (Q3 tests with FR_FRCP1, FR_FRABCH, GH_FR1, and LC_LC5; Q4 tests with LC_DCDS and GH_ERC) and two tests categorized as likely adverse response (Q2 and Q3 tests with CM_MC2). As discussed in Section 3.3.1.3, there is elevated uncertainty in the Q3 categories, due to high inter- reference variability.

Toxicity Identification Evaluation (H. azteca)

The following bullets summarize TIE results for quarterly tests categorized as a possible or likely adverse response.

- **FR_FRCP1**—Dry weight was categorized as a possible adverse response in Q3 (Section 3.3.1.3). In the Q3 test, effects to dry weight worsened in the EDTA treatment (43%) compared to untreated tests (27%). As discussed in Appendix B-6, the EDTA controls in Q3 had reduced dry weight relative to the negative laboratory controls indicating that the EDTA treatment itself may have contributed to adverse effects, as was observed with the Q3 FR_FRCP1 test with EDTA.

- **CM_MC2**—Survival (Q2 and Q3) and dry weight (Q3) were categorized as likely adverse responses. In both quarters, survival was improved in the EDTA-treated test compared to the untreated test. Effects on survival decreased from 28% in the untreated sample to 1% in the EDTA-treated test for Q2, and from 60% in the untreated samples to 8% in the EDTA-treated sample for Q3. These results indicate that divalent metals (likely nickel, see screening results below) may have contributed to the adverse effects. In Q3, effects on dry weight worsened in the EDTA treatment (61%) compared to the untreated test (48%). As discussed in Appendix B-7, the EDTA control in Q3 had reduced growth relative to the negative laboratory control, indicating that the EDTA treatment itself may have contributed to adverse effects, as was observed with the Q3 CM_MC2 test with EDTA.

Water Quality Screening (H. azteca)

In the eight tests categorized as possible or likely adverse effects for the *H. azteca* survival and/or dry weight endpoints, concentrations exceeded chronic WQGs or lowest level 1 EVWQP benchmarks for one or more constituent:

- **FR_FRCP1 (Q3)**—The average concentration of selenium exceeded the lowest level 1 EVWQP benchmark, the average concentration of nickel exceeded the level 1 interim screening value, and the average concentration of fluoride exceeded the chronic WQG.

- **FR_FRABCH (Q3)**—The average concentrations of selenium and nitrate exceeded lowest level 1 EVWQP benchmarks, and the average concentration of fluoride exceeded the chronic WQG.

- **GH_FR1 (Q3) and LC_LC5 (Q3)**—The average concentration of selenium exceeded the lowest level 1 EVWQP benchmark, and average concentration of fluoride exceeded the chronic WQG.
- **LC_DCDS (Q4)**—The average concentrations of selenium and nitrate exceeded lowest level 1 EVWQP benchmarks, and the average concentration of nickel exceeded the level 1 interim screening value.
- **GH_ERC (Q4)**—The average concentration of fluoride exceeded the chronic WQG.
- **CM_MC2 (Q2)**—The average concentration of nickel exceeded the level 1 interim screening value, and the average concentration of chromium exceeded the chronic WQG.
- **CM_MC2 (Q3)**—The average concentration of nickel exceeded the level 1 interim screening value, and the average concentration of fluoride exceeded the chronic WQG.

The concentration of field measured dissolved oxygen was below the chronic WQG for GH_ERC (Q4); however, dissolved oxygen concentrations were maintained within protocol limits during the test duration (Appendix B) and therefore are not considered to be a causal factor in the observed response.

Spearman Rank Correlation (H. azteca)

Constituents and explanatory variables with a statistically significant Spearman rank correlation for *H. azteca* survival and dry weight for the combined and 2021 datasets are summarized in Table 3.4-3.

Survival—No strong negative correlations ($r_s \leq -0.4$) were identified in the combined or 2021 datasets for survival (Table F-2).

Dry Weight—No strong negative correlations ($r_s \leq -0.4$) were observed in the combined dataset (Table F-3). For the 2021 dataset, strong correlations were identified for several metals (mercury, lead, silver, vanadium), DOC, TOC, TSS, turbidity, and PC2 for the 2021 dataset.

PC scores were generated separately for the survival and dry weight endpoints because a subset of tests in Q2 2021 had only survival data and no dry weight data; therefore, the analysis differed between the two endpoints. The PC scores that had statistically significant Spearman rank correlations for survival and dry weight are described below:

- Survival
  - PC3 (combined dataset)—This component accounted for 10.3% of the variance (Table E-3). PC3 had strong negative loadings for iron, lead, and TSS.
- Dry weight
  - PC1 (combined dataset)—This component accounted for 25.4% of the variance (Table E-3). PC1 had strong positive loadings for TDS, components of TDS (e.g., calcium, magnesium), three Order constituents (nitrate, selenium, sulphate), and metals (lithium, uranium).
  - PC2 (combined dataset)—This component accounted for 22.8% of the variance (Table E-3). PC2 had strong positive loadings for several metals (beryllium, bismuth, lead, mercury, silver, tin, vanadium).
  - PC4 (combined dataset)—This component accounted for 6.9% of the variance (Table E-3). PC4 had strong negative loadings for bicarbonate alkalinity, oxidation-reduction potential, and silicon.

- PC2 (2021 dataset)—This component accounted for 13.2% of the variance (Table E-3). PC2 had strong positive loadings for turbidity and several metals (aluminium, lead, titanium).

The factor loading scores from the combined datasets and the respective 2021 datasets showed similar patterns for PC1 and dissimilar patterns for PC2 and PC3. The component loadings for PC1 for dry weight, which appeared to be a strong signal of mine influence (i.e., strong loadings for TDS and Order constituents), exhibited similar patterns between the combined dataset and the 2021 dataset. PC1 in both datasets had strong loadings for the same constituents (Table E-3). PC2 for dry weight and PC3 for survival showed no clear consistency in loadings between the two datasets.

Table 3.4-3: Constituents and Explanatory Variables with Significant Spearman Rank Correlations for *Hyalella azteca* Survival and Dry Weight.

Constituent[(a)]	Survival		Dry Weight		Comparison to WQGs/EVWQP Benchmarks		Retained for Further Analysis?	
	R_s Combined Dataset	R_s 2021 Dataset	R_s Combined Dataset	R_s 2021 Dataset	Survival	Dry Weight	Survival	Dry Weight
Total Alkalinity	ns	ns	-0.20	ns	-	No WQG	No - assessed as TDS	
Total Antimony	ns	ns	-0.22	ns	-	No	No	
Total Boron	ns	ns	-0.23	ns	-	No	No	
Total Calcium	-0.20	ns	-0.27	ns	No WQG	No WQG	No - assessed as TDS	
DOC	ns	ns	ns	-0.55	-	No WQG	No	Yes
Chloride	-0.19	ns	-0.30	ns	No	No	No	
Total Cobalt	ns	ns	-0.24	ns	-	No	No	
Conductivity	-0.19	ns	-0.26	ns	No WQG	No WQG	No - assessed as TDS	
Dissolved Copper	-0.18	ns	ns	ns	No	-	No	
Hardness	-0.19	ns	-0.25	ns	No WQG	No WQG	No - assessed as TDS	
Total Lead	ns	ns	ns	-0.49	-	No	No	
Total Magnesium	ns	ns	-0.24	ns	-	No WQG	No - assessed as TDS	
Total Mercury	ns	ns	ns	-0.61	-	No	No	
Total Molybdenum	-0.18	ns	-0.27	ns	No	No	No	
Total Nickel	ns	ns	-0.24	ns	-	Yes	No	Yes
Nitrate	ns	ns	-0.19	ns	-	Yes	No	Yes
Nitrite	ns	ns	-0.28	ns	-	Yes	No	Yes
Total Ammonia	ns	ns	-0.24	ns	-	No	No	
Total Potassium	ns	ns	-0.22	ns	-	No WQG	No - assessed as TDS	
Total Silver	ns	ns	ns	-0.46	-	No	No	
Total Sodium	-0.21	ns	-0.25	ns	No WQG	No WQG	No - assessed as TDS	
Dissolved Strontium	-0.28	ns	-0.33	ns	No	No	No	
Sulphate	-0.20	ns	-0.27	ns	No	No	No	
Total Titanium	-0.30	ns	ns	-0.39	No	No	No	
Total Dissolved Solids	-0.19	ns	-0.26	ns	No WQG	No WQG	Yes	
Total Organic Carbon	ns	ns	ns	-0.58	-	No WQG	No	Yes
Total Suspended Solids	ns	ns	ns	-0.46	-	No WQG	No	Yes
Turbidity	ns	ns	ns	-0.64	-	No WQG	No	Yes
Total Uranium	ns	ns	-0.24	ns	-	No	No	
Total Vanadium	ns	ns	ns	-0.46	-	No	No	
∑TU−WQG	ns	ns	-0.24	ns	-	No WQG	No	Yes
∑TU−WQG/Benchmark	ns	ns	-0.26	ns	-	No WQG	No	Yes
PC1 Combined	ns	ns	-0.23	ns	-	No WQG	No	Yes
PC2 Combined	ns	ns	-0.20	ns	-	No WQG	No	Yes
PC3 Combined	-0.23	ns	ns	ns	No WQG	-	Yes	No
PC4 Combined	ns	ns	-0.22	ns	-	No WQG	No	Yes
PC2 2021	ns	ns	ns	-0.50	-	No WQG	No	Yes

Notes: Values shown here were statistically significant for survival at $\alpha < 0.005$, $r_s = -0.177$ for the combined dataset and $\alpha < 0.005$, $r_s = -0.317$ for the 2021 dataset; and, for dry weight at $\alpha < 0.005$, $r_s = -0.185$ for the combined dataset and $\alpha < 0.005$, $r_s = -0.338$ for the 2021 dataset.
DOC = dissolved organic carbon; EVWQP = Elk Valley Water Quality Program; ns = not significant; WQGs = water quality guidelines; ∑TU = sum of toxicity units; TDS = total dissolved solids. Shaded values indicate a strong Spearman rank correlation at $r_s \leq -0.6$.

(a) Total concentrations are shown for metals that have a WQG for the total fraction or that lack a chronic WQG. Dissolved concentrations were used for metals with a WQG for the dissolved fraction.

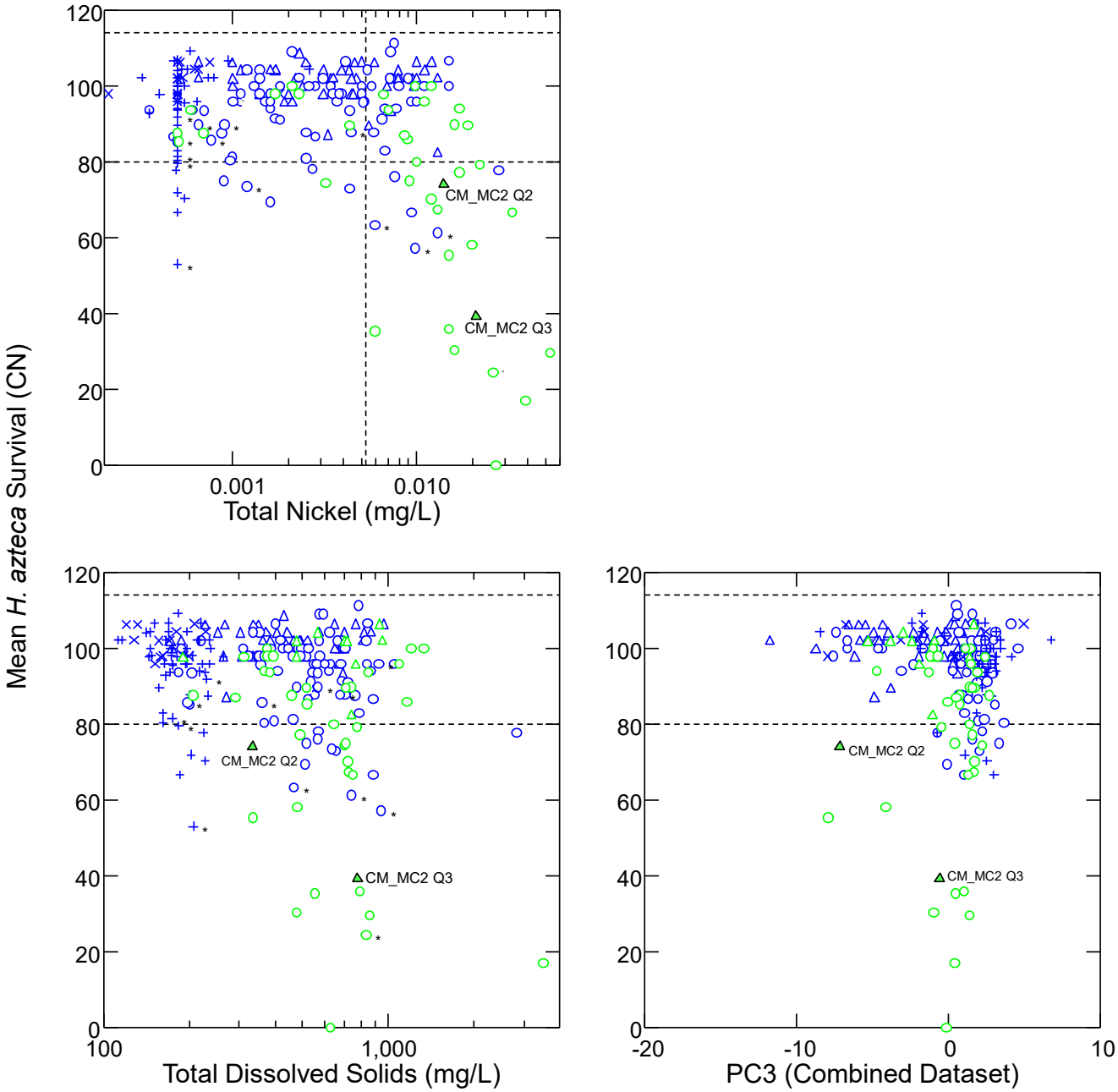
Graphical Analysis (H. azteca)

Constituents and explanatory variables with significant Spearman rank correlations, and that were either above WQGs or did not have WQGs, were carried through to graphical analysis (Figures 3.4-9 to 3.4-13). Graphical analysis for survival was conducted for nickel[31], total dissolved solids, and PC3 (combined dataset). Graphical analysis for dry weight was conducted for one Order constituent (nitrate), total nickel, nitrite, turbidity, dissolved and total organic carbon, dissolved and total suspended solids, ∑TU (calculated with WQGs only, and with WQGs and EVWQP benchmarks), PC1 (combined dataset), PC2 (combined and 2021 datasets), and PC4 (combined dataset).

Most of the constituents and explanatory variables did not exhibit a consistent exposure-response relationship across all tests for survival and dry weight. For the PCs that were carried forward to graphical analysis, no consistent patterns were apparent between the PC scores and test responses. However, nickel exhibited a general relationship between concentrations and magnitude of adverse response for both survival and dry weight. The potential for nickel to explain observed effects on dry weight is discussed in the next section.

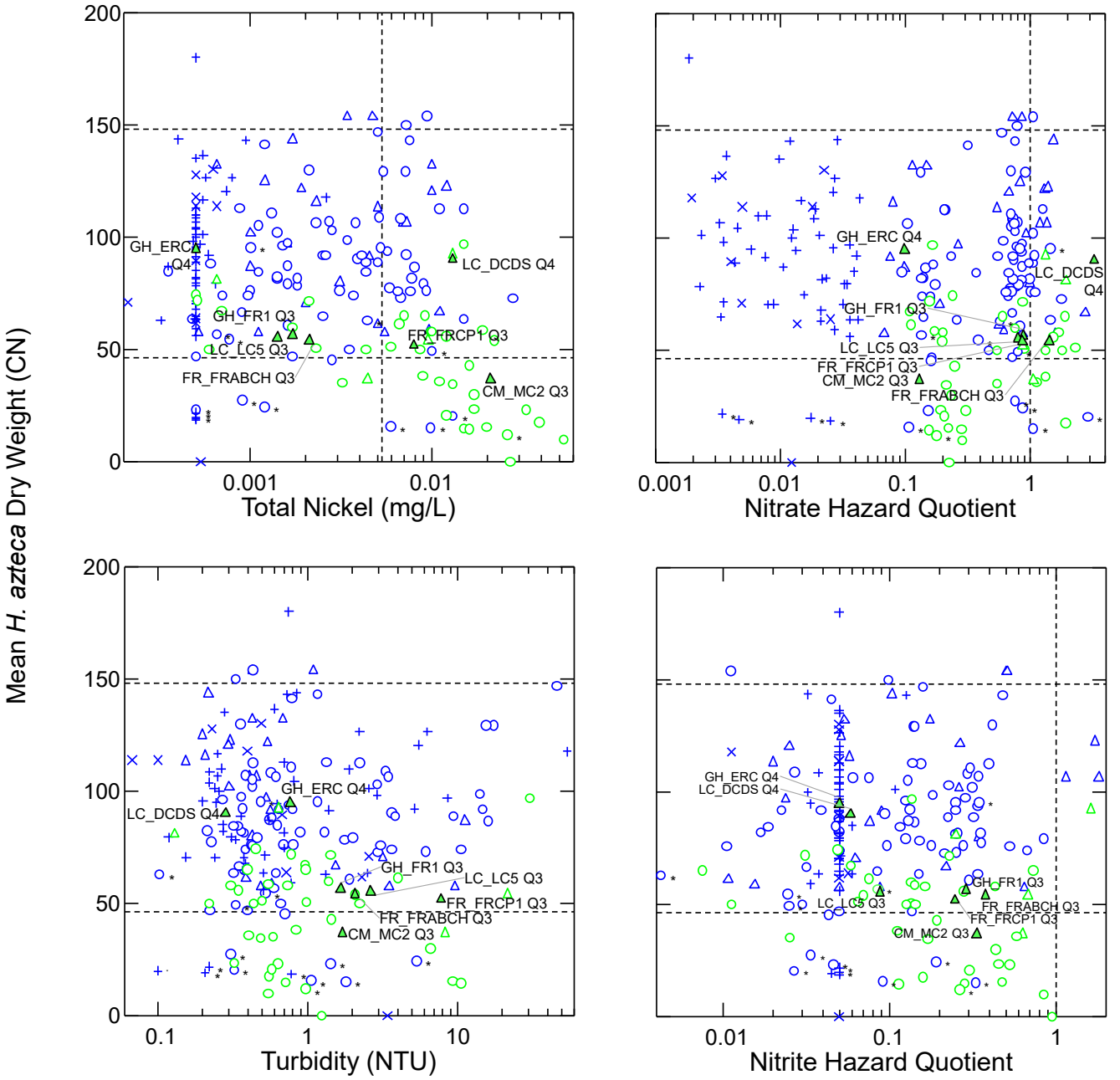
[31] Although survival was not significantly correlated with nickel, nickel was retained because it has been commonly identified as a possible or likely cause of observed responses in CM_MC2 tests.

Figure 3.4-9: Mean *H. azteca* survival versus total nickel (top left), total dissolved solids (bottom left), and PC3 for the combined dataset (bottom right).



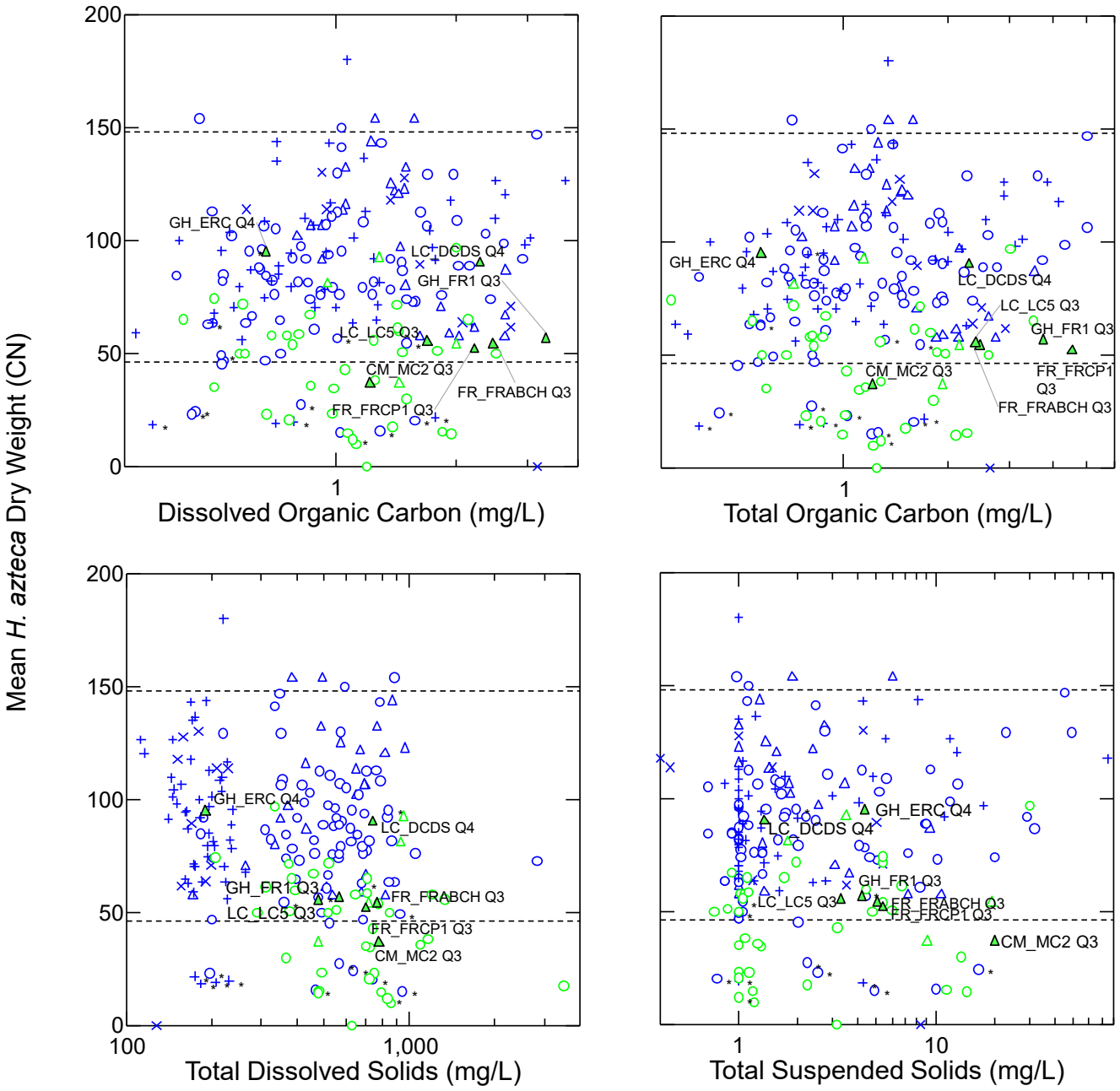
Notes: Symbols indicate reference waters (× = 2015 to 2020; + = 2021), test site waters with mean results categorized as no adverse response (○ = 2015 to 2020; Δ = 2021), and test site waters with mean results categorized as possible or likely adverse response (○ = 2015 to 2020; ▲ = 2021 UFR stations; △ = 2021 non-UFR stations). UFR test site waters categorized as possible or likely in 2021 (▲) are labelled with the test site and quarter. The vertical line is the level 1 interim screening value for nickel (5.3 µg/L). Horizontal lines are regional normal range (see Figure 2.3-3 for description). Asterisks indicate tests that were excluded from statistical analysis (i.e., Q4 2020). CN = control normalized; mg/L = milligrams per litre; PC = principal component; UFR = Upper Fording River.

Figure 3.4-10: Mean *H. azteca* dry weight versus total nickel (top left), nitrate (top right), turbidity (bottom left), and nitrite (bottom left).



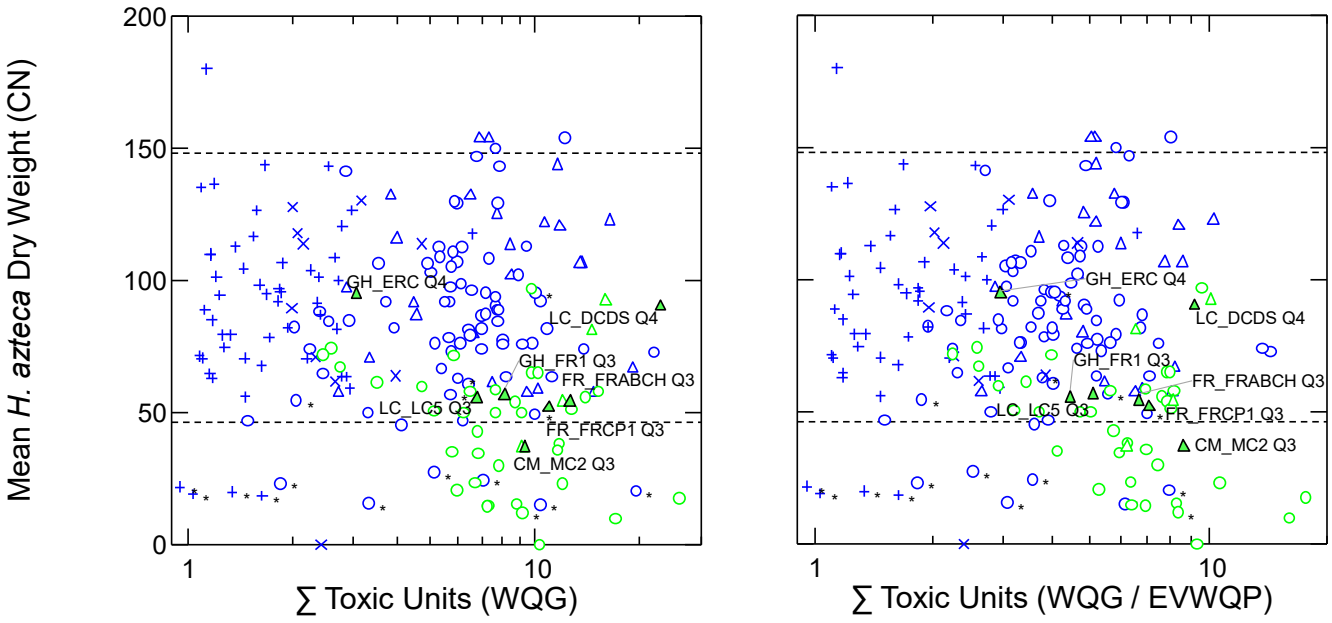
Notes: Symbols indicate reference waters (× = 2015 to 2020; + = 2021), test site waters with mean results categorized as no adverse response (○ = 2015 to 2020; Δ = 2021), and test site waters with mean results categorized as possible or likely adverse response (○ = 2015 to 2020; ▲ = 2021 stations; Δ = UFR stations). Regional chronic toxicity test site waters categorized as possible or likely in 2021 (▲) are labelled with the test site and quarter. Nitrate hazard quotients are the ratio of nitrate concentrations to the lowest level 1 EVWQP benchmark for invertebrates. Nitrite hazard quotients are the ratio of nitrite concentrations to the chronic BC WQG. Vertical lines are screening values: for the nitrate and nitrite hazard quotients, the screening value is 1; and, for nickel the screening value is the level 1 interim screening value (5.3 µg/L). Horizontal lines are the regional normal range (see Figure 2.3-3 for description). Asterisks indicate tests that were excluded from statistical analysis (i.e., Q4 2020). CN = control normalized; EVWQP = Elk Valley Water Quality Plan; mg/L = milligrams per litre; UFR= Upper Fording River; WQG= water quality guideline.

Figure 3.4-11: Mean *H. azteca* dry weight versus dissolved organic carbon (top left), total organic carbon (top right), total dissolved solids (bottom left), and total suspended solids (bottom right).



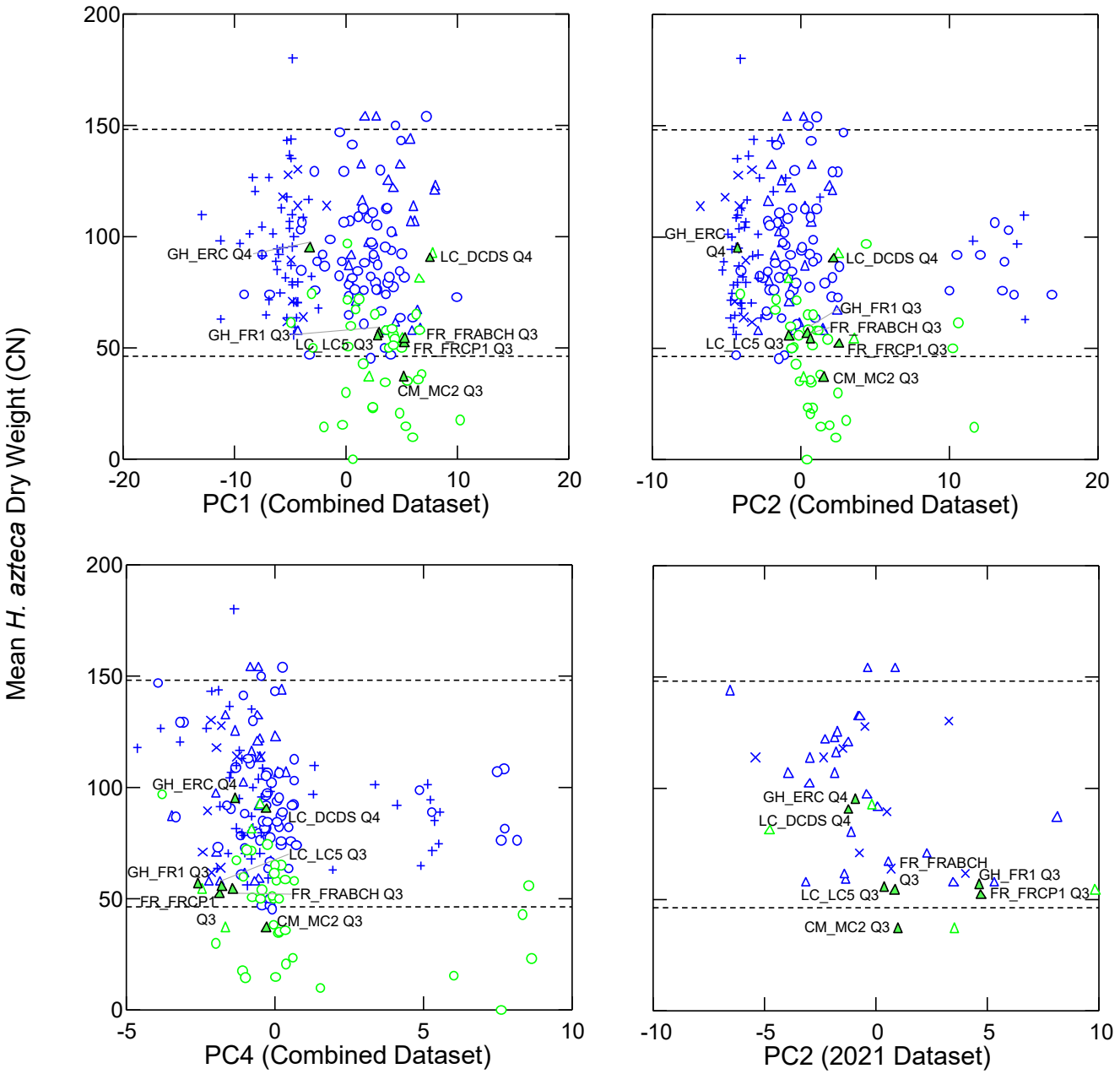
Notes: Symbols indicate reference waters (× = 2015 to 2020; + = 2021), test site waters with mean results categorized as no adverse response (○ = 2015 to 2020; Δ = 2021), and test site waters with mean results categorized as possible or likely adverse response (○ = 2015 to 2020; ▲ = 2021 stations; Δ = UFR stations). Test site waters categorized as possible or likely in 2021 (▲) are labelled with the test site and quarter. Asterisks indicate tests that were excluded from statistical analysis (i.e., Q4 2020). Horizontal lines are the regional normal range (see Figure 2.3-3 for description). CN = control normalized; mg/L = milligrams per litre; = Upper Fording River.

Figure 3.4-12: Mean *H. azteca* dry weight versus sum of toxic units calculated using WQGs only (left) and WQGs and EVWQP benchmarks (right).



Notes: Symbols indicate reference waters (× = 2015 to 2020; + = 2021), test site waters with mean results categorized as no adverse response (○ = 2015 to 2020; Δ = 2021), and test site waters with mean results categorized as possible or likely adverse response (○ = 2015 to 2020; ▲ = 2021 stations; Δ = UFR stations). Test waters categorized as possible or likely in 2021 (▲) are labelled with the test site and quarter. Horizontal lines are the regional normal range (see Figure 2.3-3 for description). Asterisks indicate tests that were excluded from statistical analysis (i.e., Q4 2020). CN = control normalized; EVWQP = Elk Valley Water Quality Plan; UFR = Upper Fording River; WQG = water quality guideline; Σ = sum.

Figure 3.4-13: Mean *H. azteca* dry weight versus PC1 (top left), PC2 (top right), and PC4 (bottom left) for the combined dataset and PC2 for the 2021 dataset (bottom right).



Notes: Symbols indicate reference waters (× = 2015 to 2020; + = 2021), test site waters with mean results categorized as no adverse response (○ = 2015 to 2020; Δ = 2021), and test site waters with mean results categorized as possible or likely adverse response (○ = 2015 to 2020; ▲ = 2021 stations; Δ = 2021 UFR stations). Test site waters categorized as possible or likely in 2021 (▲) are labelled with the test site and quarter. Horizontal lines are regional normal range (see Figure 2.3-3 for description). CN = control normalized; PC = principal component; UFR = Upper Fording River.

Identification of Potential Contributors to Toxicity (H. azteca)

In tests categorized as having a possible or likely adverse response, concentrations of most constituents were equal to or lower than concentrations in reference waters and/or test site waters categorized as no adverse response (Table D-3), and/or were lower than the chronic WQG (Appendix C). Such constituents are not expected to contribute to toxicity in these tests. For the remaining constituents, published toxicity data were reviewed to evaluate the potential for these constituents to contribute to observed effects. These constituents are discussed below.

- **FR_FRCP1 (Q3)**—Nickel showed the strongest evidence of causing the observed effect on dry weight in this test. The nickel concentration in this test (7.9 µg/L) exceeded the dry weight EC_{10} in Michel Creek water (6.8 µg/L; Nautilus 2020c). Although the TIE results demonstrated worsened effects to production in the EDTA treated sample compared to the untreated sample, this appears to be related to EDTA-specific effects, which were also observed in the negative laboratory control. The nickel screening results align with the graphical analysis of nickel, which demonstrated a concentration-response relationship for *H. azteca* dry weight (Figure 3.4-10).

- **FR_FRABCH (Q3)**—No water quality constituent was identified as the potential cause of the observed response in this test. On one occasion, the concentration of fluoride in a weekly refresh sample (0.42 mg/L) exceeded the concentration observed in tests previously categorized as no adverse response; however, this concentration was approximately four times below the chronic effects benchmark for the protection of aquatic life (1.94 mg/L; MacPherson et al 2014), indicating that fluoride did not contribute to the observed response. The average nitrate concentration in this test (22 mg/L as N at hardness 582 mg/L as $CaCO_3$) was above the lowest level 1 EVWQP benchmark but was below the 14-day EC_{10} of 36 mg/L as N for *H. azteca* dry weight in Elk Valley water (Teck 2014; hardness 500 mg/L as $CaCO_3$)[32], indicating that nitrate did not contribute to the observed response[33]. As discussed in Section 3.3.1.2, the narrative category for this test (possible adverse response) has elevated uncertainty due to high inter-reference variability in Q3. This interpretation is supported by the observation that: (1) dry weight in this test was statistically similar to three of four references tested in Q3, including the local reference for FR_FRABCH (Fording River); and (2) no water quality constituent was identified as a potential cause of the observed response.

- **LC_DCDS (Q4)**—Nitrate and nickel showed the strongest evidence of causing the observed effect on dry weight in this test. The nitrate concentration in this test (49 mg/L as N at hardness 582 mg/L as $CaCO_3$) was above the 14-day EC_{10} of 36 mg/L as N for *H. azteca* dry weight in Elk Valley water (Teck 2014; hardness 500 mg/L as $CaCO_3$)[32], indicating that nitrate may have contributed to the observed response. The nickel concentration in this test (13 µg/L) was above the dry weight EC_{20} in Michel Creek water (9.4 µg/L; Nautilus 2020c), indicating that nickel may have contributed to the observed response. The nickel screening results align with the graphical analysis of nickel, which demonstrated a concentration-response relationship for *H. azteca* dry weight (Figure 3.4-10). The ∑TUs (calculated with WQGs) for this test was higher than test sites categorized as no adverse response. The ∑TUs for this test was largely driven by nitrate, which accounted for 71% of the ∑TU, and nickel, which accounted for 10% of the ∑TUs, both of which were identified as potential contributors to the observed response through the water quality screening.

[32] EC_{10} is the geometric mean of two Elk River tests and two Fording River tests normalized to test hardness or the highest hardness that the equation applies (500 mg/L as $CaCO_3$).

[33] There is some uncertainty in this comparison because the EC_{10} is based on a 14-day test, whereas tests conducted for this study consisted of 28 days. The uncertainty is offset by the magnitude of the difference between the test concentration and the EC_{10}, i.e., the EC_{10} is almost two times greater than the FR_FRABCH Q3 test concentration.

- **CM_MC2 (Q2)** — Nickel may have contributed to the observed effect on survival in this test. The nickel concentration in this test (14 µg/L) was above the level 1 interim screening value. Although the concentration in this test was below the LC_{10} in Michel Creek water (17.5 µg/L; Nautilus 2020c), the results of the graphical analysis which demonstrated a concentration-response relationship for *H. azteca* survival (Figure 3.4-9) and the TIE results showed decreased effects to survival upon addition of EDTA, supporting nickel as a potential causal factor in this test.
- **CM_MC2 (Q3)** — Nickel showed the strongest evidence of causing the observed effects on dry weight and survival in this test. The nickel concentration in this test (22 µg/L) was above the dry weight EC_{50} (15.1 µg/L) and comparable to the LC_{20} (21 µg/L) in Michel Creek water; Nautilus 2020c), indicating that nickel may have contributed to the observed response. This interpretation aligns with the 2021 *H. azteca* TIE testing conducted with Q3 CM_MC2 water, which showed decreased effects on survival upon addition of EDTA. Although the TIE results in Q3 demonstrated worsened effects to dry weight upon addition of EDTA, this may be related to an EDTA-specific effect on growth, which was also observed in the laboratory control. This uncertainty is offset by the results of the graphical analysis which demonstrated a concentration-response relationship for both *H. azteca* dry weight and survival (Figure 3.4-10). Other constituents exhibited weak to no evidence of potential for toxicity at this station in Q3 2021. The concentration of sodium in this test was higher than tests categorized as no adverse response. In absence of a WQG or screening value, sodium was assessed via TDS. The concentration of TDS in this test (779 mg/L) was below the highest concentrations tested in two Elk River tests (1,431 mg/L and 1,455 mg/L) and two Fording River tests (1,788 mg/L and 1,829 mg/L) that resulted in no significant adverse effects on *H. azteca* dry weight or survival (Teck 2014)[34]. This result indicates that TDS did not contribute to the observed response.
- **GH_FR1 (Q3) and LC_LC5 (Q3) —** No water quality constituent was identified as the potential cause of the observed response in this test. Concentrations of all constituents in this test were lower than concentrations in reference waters and/or test site waters categorized as no adverse response and/or were lower than the chronic WQG. As discussed in Section 3.3.1.2, the narrative categories for these tests have elevated uncertainty due to high inter-reference variability in Q3. This interpretation is supported by the observation that: (1) dry weight in this test was statistically similar to three of four references tested in Q3; and (2) no water quality constituent was identified as a potential cause of the observed response.
- **GH_ERC (Q4) —** No water quality constituent was identified as the potential cause of the observed response in this test. Concentrations of all constituents in this test were lower than concentrations in reference waters and/or test site waters categorized as no adverse response and/or were lower than the chronic WQG.

[34] There is some uncertainty in this comparison because the Teck (2014) toxicity tests were conducted over 14 days, whereas tests conducted for this study were conducted over 28 days. The uncertainty is offset by the magnitude of difference between the test concentration and the Teck (2014) test concentrations: the highest tested concentrations across the two Elk River and two Fording River tests were 1.8 to 2.3 times greater than the CM_MC2 Q3 test concentration.

3.4.4 *Oncorhynchus mykiss* Survival

As discussed in Section 3.3.1.4, survival in the Q4 FR_FRCP1 test was the only test categorized as a possible adverse response. However, survival in this test (83%) was within the local NR for the Fording River reference (79%–114%) and the regional NR (80%–113%). This test was carried forward to the causation assessment and results are provided below.

Water Quality Screening (O. mykiss)

In the Q4 FR_FRCP1 test, concentrations of nitrate and selenium exceeded the lowest level 1 EVWQP benchmarks, the concentration of nickel exceeded the level 1 interim screening value[35], and the concentration of fluoride exceeded the chronic WQG. Concentrations of nitrite exceeded the chronic WQG for two test collection dates; however, the average concentration was below the guideline. Concentrations of field measured dissolved oxygen were below the chronic WQGs during one sample collection. However, dissolved oxygen concentrations were maintained within protocol limits during the test duration (Appendix B) and therefore are not considered to be a causal factor in the observed response.

Spearman Rank Correlation (O. mykiss)

Constituents and explanatory variables with statistically significant Spearman rank correlations for *O. mykiss* survival for the combined and 2021 datasets are summarized in Table 3.4-4. Strong negative statistical correlations ($r_s \leq -0.4$) were identified for calcium and conductivity in the combined dataset, and for total ammonia and total Kjeldahl nitrogen in the 2021 dataset. Total ammonia and total Kjeldahl nitrogen were also the only constituents with statistically significant Spearman rank correlations for survival in the 2021 dataset.

The PC score that had a statistically significant Spearman rank correlation for survival is described below:

- PC1 (combined dataset): This component accounted for 30.3% of the variance (Table E-3). PC1 had strong positive loadings for TDS, components of TDS (e.g., calcium, magnesium), three Order constituents (nitrate, selenium, sulphate), and metals (lithium, uranium).

When compared, the factor loading scores from the combined dataset and the 2021 dataset showed the similar patterns. The component loadings for PC1, which appeared to be a strong signal of mine influence (i.e., strong loadings for TDS and Order constituents; Table E-3).

[35] Per Section 2.3.4, nickel was compared to the interim level 1 screening value (5.3 µg/L) , which is based on potential effects to invertebrates.

Table 3.4-4: Constituents and Explanatory Variables with Significant Spearman Rank Correlations for *Oncorhynchus mykiss* Survival.

Constituent[(a)]	R_s Combined Dataset	R_s 2021 Dataset	Comparison to WQGs/EVWQP Benchmarks	Retained for Graphical Analysis?
Bicarbonate Alkalinity	-0.328	ns	No WQG	No - assessed as TDS
Hydroxide Alkalinity	-0.334	ns	No WQG	No - assessed as TDS
Total Barium	-0.276	ns	No	No
Dissolved Bromide	-0.299	ns	No WQG	Low detection frequency[(b)]
Total Calcium	-0.403	ns	No WQG	No - assessed as TDS
Dissolved Chloride	-0.271	ns	No	No
Conductivity	-0.403	ns	No WQG	No - assessed as TDS
Hardness	-0.397	ns	No WQG	No - assessed as TDS
Total Lithium	-0.261	ns	No	No
Total Magnesium	-0.385	ns	No WQG	No - assessed as TDS
Major Anion Sun	-0.363	ns	No WQG	No - assessed as TDS
Major Cation Sum	-0.371	ns	No WQG	No - assessed as TDS
Nitrate	-0.345	ns	Yes	Yes
Nitrite	-0.382	ns	No	No
Total Ammonia	ns	-0.515	No	No
Total Potassium	-0.294	ns	No WQG	No - assessed as TDS
Total Selenium	-0.358	ns	Yes	Yes
Sulphate	-0.385	ns	No	No
Total Titanium	-0.324	ns	No	No
Total Dissolved Solids	-0.391	ns	No WQG	Yes
Total Kjeldahl Nitrogen	ns	-0.540	No WQG	Yes
Total Uranium	-0.331	ns	No	No
PC1 Combined	-0.324	ns	No WQG	Yes

Notes: Values shown here were statistically significant at $\alpha < 0.005$ where $r_s = -0.202$ for the combined dataset; $r = -0.272$ and $r_s = -0.413$ for the 2021 dataset. WQGs = British Columbia water quality guidelines; EVWQP = Elk Valley Water Quality Plan; MIT: ns = not significant; ∑TU = sum of toxicity units; TDS = total dissolved solids. Shaded values indicate a strong Spearman rank correlation at $r_s \leq -0.4$.

(a) Total concentrations are shown for metals that have a WQG for the total fraction or that lack a chronic WQG. Dissolved concentrations were used for metals with a WQG for the dissolved fraction.

(b) Out of 38 *O. mykiss* tests in 2021, bromide was only detected once and was not detected in any test with possible or likely adverse effects.

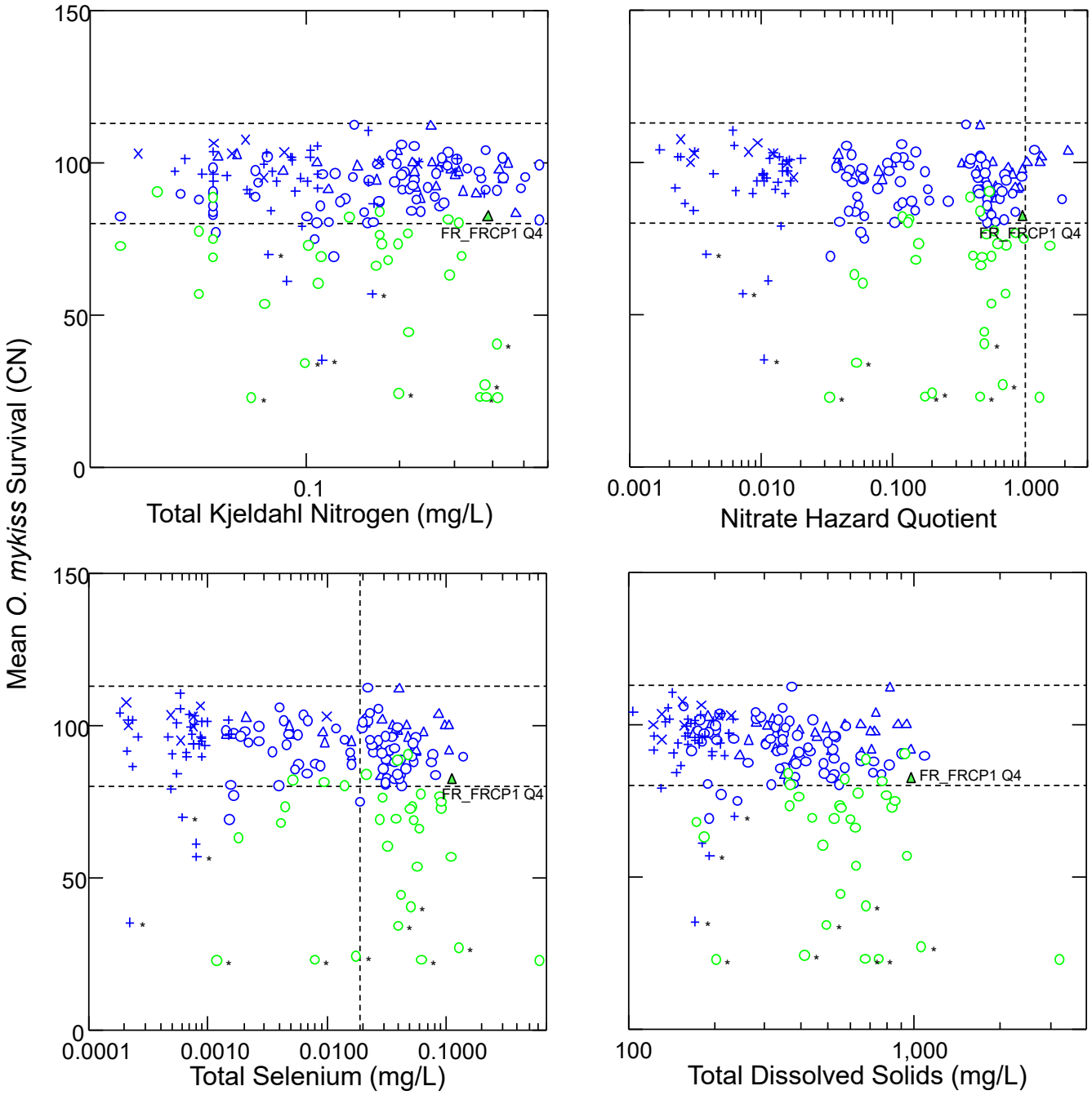
Graphical Analysis (O. mykiss)

Constituents and explanatory variables with significant Spearman rank correlations, and that were either above WQGs or did not have WQGs, were carried through to graphical analysis (Figures 3.4-14; Figure 3.4-15). Graphical analysis was conducted for two Order constituents (nitrate, selenium), TDS, total Kjeldahl nitrogen, and PC1 (combined dataset). Although bromide exhibited significant negative correlations, it was not included in graphical analysis because of low detection frequency[36].

None of the evaluated explanatory variables exhibited a consistent exposure-response relationship across *O. mykiss* tests. Because no strong or consistent relationships were observed for concentrations versus responses, the water quality screening (next subsection) was relied upon for identification of potential causes of observed effects.

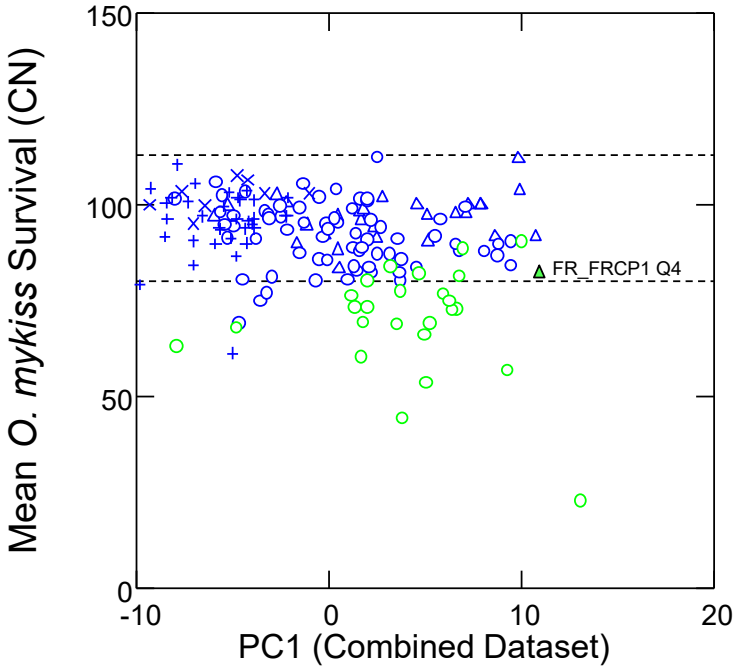
[36] Out of 38 *O. mykiss* tests in 2021, bromide was only detected once and was not detected in any test with possible or likely adverse effects.

Figure 3.4-14: Mean *O. mykiss* survival versus total Kjeldahl nitrogen (top left), nitrate hazard quotient (top right), total selenium (bottom left), and total dissolved solids (bottom right).



Notes: Symbols indicate reference waters (× = 2015 to 2020; + = 2021), test site waters with mean results categorized as no adverse response (○ = 2015 to 2020; Δ = 2021), and test site waters with mean results categorized as possible or likely adverse response (○ = 2015 to 2020; ▲ = 2021 UFR stations; Δ = 2021 non-UFR stations). UFR test site waters categorized as possible or likely in 2021 (▲) are labelled with the test site and quarter. Nitrate hazard quotients are the ratio of nitrate concentrations to the lowest level 1 benchmark for fish. Vertical lines are screening values: for the nitrate hazard quotient, the screening value is 1; and, for selenium, the screening value is the level 1 benchmark for fish (19 µg/L). Horizontal lines are regional normal range (see Figure 2.3-3 for description). Asterisks indicate tests that were excluded from statistical analysis (i.e., Q4 2017 tests that had no copper amendments and evidence of microbes). CN = control normalized; EVWQP = Elk Valley Water Quality Plan; mg/L = milligrams per litre; UFR = Upper Fording River, WQG = water quality guideline.

Figure 3.4-15: Mean *O. mykiss* survival versus PC1 for the combined dataset.



Notes: Symbols indicate reference waters (× = 2015 to 2020; + = 2021), test site waters with mean results categorized as no adverse response (○ = 2015 to 2020; Δ = 2021), and test site waters with mean results categorized as possible or likely adverse response (○ = 2015 to 2020; ▲ = 2021 UFR stations; Δ = 2021 non-UFR stations). UFR test site waters categorized as possible or likely in 2021 (▲) are labelled with the test site and quarter. Horizontal lines are regional normal range (see Figure 2.3-3 for description). CN = control normalized; PC = principal component; UFR = Upper Fording River.

Identification of Potential Contributors to Toxicity (O. mykiss)

In the Q4 FR_FRCP1 test, of the chemical and biological stressors evaluated, the strongest evidence for causation was identified for nitrate and microbes. The average nitrate concentration in this test (22 mg/L as N) was approximately equal to the 30-d survival/viability EC_{10} of 20 mg/L as N, at hardness >448 mg/L as $CaCO_3$ (Golder 2021b), indicating that nitrate may have contributed to the observed response in this test. Early life stages of fish are much more sensitive to nitrate compared to other life stages (CCME 2012), so the identification of nitrate in this Q4 test would not be expected to be translate to older life stages of WCT that are present under winter low-flow conditions. As discussed in Section 3.3.1.3, microbes were observed in two of four test replicates. One of the two replicates with microbes had the lowest survival, whereas the response in the other replicate with was equal to the minimum response in replicates with no observed microbes. This suggests that, at a minimum, the replicates with observed microbes may have depressed the average response in this test.

Other constituents exhibited weak to no evidence of potential for toxicity to *O. mykiss* in 2021. Concentrations of most constituents were equal to or lower than concentrations in reference waters and/or test site waters categorized as no adverse response (Table D-5), and/or were lower than chronic WQGs (Appendix C). Such constituents are not expected to contribute to toxicity in these tests. The average nickel concentration in this test (12 µg/L) was above the level 1 interim screening value for invertebrates[37] but was an order of magnitude lower than the lowest effect concentration for *O. mykiss* estimated by European Union (EU 2008) of 105 µg/L for

[37] Per Section 2.3.4, nickel was compared to the interim level 1 screening value (5.3 µg/L), which is based on potential effects to invertebrates.

pH of 8.1, DOC of 1 mg/L, and hardness of 6 mg/L (i.e., conditions that would result in similar toxicity [pH and DOC] or much higher toxicity [hardness] relative to FR_FRCP1 conditions), indicating that nickel did not contribute to the observed response. The concentration of nitrite in this test was above the chronic WQG for two test collection dates; however, the average nitrite concentration in this test (0.035 mg/L as N; test chloride of 2.1 mg/L) was below the chronic WQG and was approximately seven times lower than the 30-d *O. mykiss* survival NOEC of 0.27 mg/L (Kroupová et al. 2006; Golder 2020a[38]), indicating that nitrite did not contribute to the observed response.

3.4.5 *Pimephales promelas* Survival

One test conducted in 2021 (Q1 FR_FRCP1) was carried forward to the causation assessment, for which results are provided below. As discussed in Section 3.3.1.3, the Q1 Elk and Michel references were excluded from normal range and effect size calculations, thereby increasing the likelihood of categorizing this test as a likely adverse response. Survival in this test was higher than both the excluded references. Results are provided below for the *P. promelas* causation assessment.

Water Quality Screening (P. promelas)

In the Q1 FR_FRCP1 test, concentrations of nitrate and selenium exceeded the lowest level 1 EVWQP benchmarks, the concentration of nickel exceeded the level 1 interim screening value[39], and the concentration of fluoride exceeded the chronic WQG.

Spearman Rank Correlation (P. promelas)

Constituents and explanatory variables with a statistically significant Spearman rank correlation for *P. promelas* survival were reviewed for the combined and 2021 datasets.

No strong correlations (i.e., r_s >-0.4) or significant Spearman rank correlations with survival were observed for any constituents in the combined or 2021 datasets (Table F-4).

No significant correlations were observed for the PCs. When compared, PC1 in the combined dataset showed strong positive loadings for several metals (e.g., beryllium, bismuth, silver) whereas PC1 in the 2021 dataset showed strong positive loadings for TDS, components of TDS (e.g., calcium), Order constituents (nitrate, selenium, sulphate), and a different suite of metals (e.g., cadmium, lithium, nickel) (Table E-4).

Graphical Analysis (P. promelas)

No constituents and explanatory variables had significant Spearman rank correlations and therefore no constituents were carried through to graphical analysis.

Identification of Potential Contributors to Toxicity (P. promelas)

In the Q1 FR_FRCP1 test, no water quality constituent was identified as a potential cause of the observed response in this test. As discussed in Section 3.3.1.4, the narrative category for this test has elevated uncertainty due to high inter-reference variability in Q1. This interpretation is supported by the observation that: (1) responses in two reference waters were depressed to a similar magnitude as observed in this test; and (2) no water quality constituent was identified as a potential cause of the observed response (as follows). The concentration of potassium in this test was higher than reference waters and tests categorized as no adverse response. In the absence of a WQG or screening value, potassium was assessed via TDS of which potassium is a component.

[38] Normalized for chloride using the slope derived by Golder (2020)

[39] Per Section 2.3.4, nickel was compared to the interim level 1 screening value (5.3 µg/L), which is based on potential effects to invertebrates.

The concentration of TDS in this test (1,008 mg/L) was lower than the survival NOEC value for TDS in Fording River water (2,000 mg/L; Golder 2013), indicating that TDS did not contribute to the observed response. The average nitrate concentration in this test (25 mg/L as N; hardness 783 mg/L as $CaCO_3$) was above the lowest level 1 EVWQP benchmark but approximately two times lower than the 30-d *P. promelas* survival NOEC of 58 mg/L (Adelman et al. 2009; hardness of ~220 mg/L), indicating that nitrate did not contribute to the observe response. The average nickel concentration in this test (13 µg/L) was above the level 1 interim screening value but was less than the 32-day *P. promelas* survival EC_{10} of 151 µg/L (normalized to test conditions[31]; Birge et al. 1984), indicating that nickel did not contribute to the observe response. Therefore, there is negligible evidence that the response observed at FR_FRCP1 in Q1 was a result of mine-influenced water quality. Given the elevated uncertainty due to the anomalous responses observed in reference waters, leading to inter-reference variations, factors unrelated to water quality are likely responsible for the observed responses. Therefore, responses in these tests are not expected to be indicative of adverse effects to other life stages of WCT that are present in the UFR in Q1.

3.5 Comparison of 2021 Results to Previous Years

Mean results for 2015 through 2021 were plotted by species and are in Appendix G. Effect categories for 2015 through 2021 were plotted by station and are presented in Sections 3.5.1 to 3.5.12. Plots were visually examined to identify potential seasonal or inter-annual changes in responses and the following sections discuss 2021 test results compared to previous years (i.e., 2015 to 2020) for each test site.

3.5.1 FR_FRCP1

Results for FR_FRCP1 (Fording River downstream of Cataract Creek) in 2015–2021 are summarized in Figure 3.5-1. An overview of the results is provided below:

- ***C. dubia***—All tests except one (Q1 2019) were categorized as no adverse response for survival (Figure G-1). Mean reproduction has consistently been the most sensitive endpoint for this test. FR_FRCP1 has exhibited the greatest frequency of adverse responses to reproduction of any test site, with mean reproduction below the local and regional NRs over much of the period of monitoring (Figure G-2). In 2021, reproduction was generally below the local and regional NRs, although the magnitude of response was not as large as in 2017 to 2019. Constituents that have been identified as potentially contributing to observed responses over time are nickel (10 tests, including Q1, Q3, and Q4 2021), nitrate (eight tests), and sulphate/TDS (seven tests).
- ***P. subcapitata***— FR_FRCP1 has exhibited the greatest frequency of adverse responses to cell yield of any test site. The responses to green algae cell yield have been variable over the period of record, with large differences observed among consecutive quarters and among years. Although approximately 40% of tests were categorized as possible or likely adverse response, mean cell yield was within the local and regional NRs in most quarterly tests (Figure G-3). Cell yield fell outside the local and regional NRs in Q4 2018, Q1 and Q3 in 2019, Q1 2020 and Q1 2021. In Q3 2019, most tests including reference tests exhibited adverse responses on cell yield and results for that batch of tests were considered anomalous (Golder 2020b). For all tests with depressed cell yield relative to reference except Q4 2018, the cause of adverse responses is unknown. In the Q4 2018 tests, sulphate and TDS were identified as potentially contributing to the observed response.
- ***H. azteca***—All but two tests (Q4 in 2018 and 2020) were categorized as no adverse response to survival (Figure G-4). As expected, the sublethal endpoint (growth in dry weight) was the most sensitive endpoint for this species. Adverse responses to dry weight were observed in approximately a third of all tests. Historically,

FR_FRCP1 has exhibited the greatest frequency of adverse responses to amphipod growth of any test site and the largest magnitude responses across the period of record. Mean dry weight was generally within the local and regional NRs, but the wide range of the NRs reflects the high variability in results across batches (Figure G-5). In 2021, responses were within the local and regional NRs. Constituents that have been identified as potentially contributing to observed responses over time are primarily nickel (two tests, including Q3 2021) and nitrate (four tests), although uranium and sulphate/TDS were also identified for Q4 2018.

- ***O. mykiss***—All Q2 tests were categorized as no adverse response. This finding has high ecological relevance to field conditions because the timing of early life stages of WCT in the UFR best aligns with the Q2 testing; therefore, the Q2 results are considered the most relevant for evaluating potential effects on early life stages of the congenic WCT (Section 1.2.3). In Q4 tests, mean length and weight were usually within the local and regional NRs (Figure G-8; Figure G-9). Most responses for these endpoints were categorized as no adverse response, except for Q4 2018 which was categorized as a likely adverse response. The trout growth endpoints have not typically been a sensitive indicator of responses for this species. Instead, mean survival and viability have historically been the most sensitive endpoints, typically resulting in similar temporal response trends (Figure G-6; Figure G-7). Within Q4 tests, there was a pattern towards more frequent and larger responses through 2018, but responses improved starting in 2019. This pattern continued in 2021, where all tests were within the local and regional NRs for both endpoints. The Q4 temporal trend analysis for survival and viability is complicated by the presence of microbes in all Q4 tests categorized as possible or likely. Nitrate and/or sulphate/TDS were identified as potentially contributing factors in four of the six Q4 tests with adverse responses.
- ***P. promelas***—There were no adverse responses on hatch or development in *P. promelas* tests (Figures G-10 and G-14) *P. promelas* endpoints were usually within local and regional NRs, but with exceptions occurring for one or more endpoints between Q3 2018 and Q1 2019 and for survival in Q1 2021 (Figures G-10 to G-14). As discussed in Section 3.4.4, the narrative category for the Q1 2021 test has elevated uncertainty due to high inter-reference variability in Q1. This interpretation is supported by the observations that: (1) responses in two reference waters were depressed to a similar magnitude as observed in this test; and (2) no water quality constituent was identified as a potential cause of the observed response. Sulphate/TDS were identified as potentially contributing to observed adverse responses in Q4 2018 and Q1 2019, and microbes were identified in Q3 2018 and 2019.

Overall, FR_FRCP1 has shown relatively consistent patterns of response over time, with toxicity indicated in several test endpoints, particularly under base flow conditions. The response to several endpoints were greatest in Q4 2018, associated with elevated concentrations of several mine-related constituents including sulphate, TDS, nitrate, and nickel. A broad trend towards more frequent and larger responses for *C. dubia* was observed until Q2 of 2019. However, that trend did not continue into or beyond 2020; magnitudes of response in *C. dubia* in 2020 and 2021 tests were similar to those observed at the beginning of the monitoring program (2015 and 2016), indicating environmental improvement in recent years. Several constituents have been identified as potential causes of toxicity in previous testing, including nitrate, TDS and/or sulphate, and nickel. Concentrations of TDS appear to have peaked in Q4 2018 and Q1 2019, when concentrations were ~3,300 mg/L, but have decreased in 2020 and continued to show reduced concentrations in 2021 (~320 to ~1,000 mg/L). The peak in TDS concentrations corresponded with higher frequencies of responses and higher magnitudes of response in several test species.

As discussed in Section 2.2.2.1, water quality under winter low flow conditions at FR_FRCP1 may not be representative of conditions in the Fording River, such that this station does provide a reliable indicator of broader aquatic health responses to evaluate cumulative discharges from Fording River Operations in the receiving environment (Teck 2019). During low flow conditions, water quality at FR_FRCP1 historically has been predominantly discharge from upstream mine-impacted Cataract Creek. Commissioning of the Cataract Creek diversion in August 2019 improved water quality and associated test responses in subsequent quarters.

Figure 3.5-1: Summary of test results by category at FR_FRCP1.

Note: Results were categorized using local and regional normal ranges calculated in this report, see Section 3.2.3. Possible and likely symbols are annotated with constituent(s) identified as potentially contributing to observed response. Ref Var = high inter-reference variability; HI-RV = high inter-replicate variability; Ni = nickel; NO_3 = nitrate; SO4 = sulphate; TDS = total dissolved solids; U = uranium; UN = unknown: no water quality constituent was identified. Toxicity Identification Evaluations were conducted to support the causation assessment for *C. dubia* tests in 2018 (Q4), 2019 (Q1 to Q4), 2020 (Q1 to Q4) and 2021 (Q1 to Q4), *H. azteca* tests in 2019 (Q1, Q3, and Q4), 2020 (Q1 to Q4) and 2021 (Q1 to Q4).

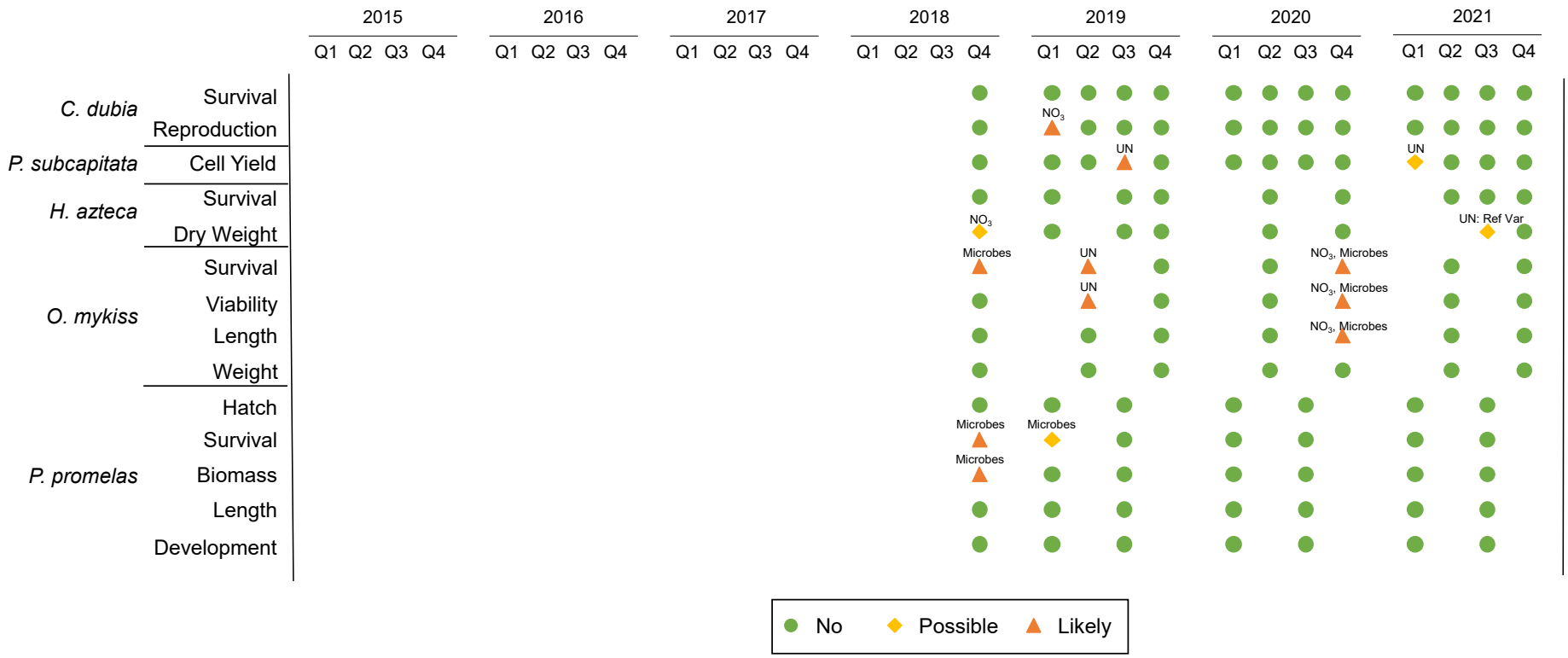
3.5.2 FR_FRABCH

FR_FRABCH is approximately 5 km downstream of FR_FRCP1 and is intended to represent mixed Fording River water quality, capture more completely constituent loadings from upstream mining, and reduce the confounding influence of mid-winter Cataract Creek flows at FR_FRCP1 (see Section 2.2.2). In 2021, the Fording River Operations compliance location was moved from FR_FRCP1 to FR_FRABCH. Results are summarized in Figure 3.5-2. An overview of the results is provided below:

- ***C. dubia***—No effects were observed on survival in any test (Figure G-1). All but one test (Q1 2019) was categorized as no adverse response for reproduction (Figure G-2). A potential contributor to the observed response in this test was nitrate.
- ***P. subcapitata***—All but two tests (Q3 2019, Q1 2021) were categorized as no adverse response. In Q3 2019, most tests, including reference tests, exhibited adverse responses on cell yield and results for that batch of tests were considered anomalous (Golder 2020b). In Q1 2021, many test sites had mean cell yield that was systematically depressed across test sites despite variability in water chemistries; this resulted in poor correspondence between water chemistry and responses (Section 3.4.2). No water quality constituent was identified as potentially contributing to observed responses in either test.
- ***H. azteca***— No effects were observed on survival in any test (Figure G-3). All but two tests (Q4 2018 and Q3 2021) were categorized as no adverse response for dry weight (Figure G-4). A potential contributor to the observed response in Q4 2018 was nitrate. No water quality constituent was identified as potentially contributing to the observed response in Q3 2021; however, as discussed in Section 3.4.2, high inter-reference variability increased the uncertainty associated with the assigned narrative category (possible adverse response) for the Q3 2021 test.
- ***O. mykiss***—All but three tests (Q4 2018, Q2 2019 and Q4 2020) were categorized as no adverse response (Figure G-6 to Figure G-9). Nitrate was identified as a possible contributor in Q4 2018, and microbes were identified as a possible contributor in Q4 2018 and 2020. As discussed in the Section 1.2.3, spring (Q2) results are considered the most relevant for evaluating potential effects on early life stages of the congenic WCT. All but one Q2 test (Q2 2019) were categorized as no adverse response. In Q2 2019, responses appeared factors unrelated to water quality because concentrations of all constituents were below chronic WQGs and EVWQP benchmarks and were below concentrations measured in tests categorized as no adverse response. Results that show poor correspondence with water quality (as in Q2 2019) are best distinguished from true toxicity responses through validation and trend assessment over time. In the case of Q2 FR_FRABCH tests, no adverse responses have been observed in subsequent tests, indicating no trend over time.
- ***P. promelas***—All but two tests (Q4 2018 and Q1 2019) were categorized as no adverse response (Figures G-10 to G-14). Responses observed in both tests were consistent with responses associated with microbial growth.

Overall, FR_FRABCH showed fewer and lower magnitude responses relative to FR_FRCP1. This downstream improvement in water quality was apparent in 2021, where only two endpoints were categorized as a possible adverse response compared to seven adverse responses identified at FR_FRCP1 across quarters.

Figure 3.5-2: Summary of test results by category at FR_FRABCH.



Notes: Results were categorized using local and regional normal ranges calculated in this report, see Section 3.2.3. Possible and likely symbols are annotated with constituent(s) identified as potentially contributing to observed response. Ref Var = high inter-reference variability; NO_3 = nitrate; UN = unknown: no water quality constituent was identified.

3.5.3 GH_FR1

Results for GH_FR1 (Fording River downstream of Greenhills Creek) in 2015–2021 are summarized in Figure 3.5-3. An overview of the results is provided below:

- ***C. dubia***—No effects were observed on survival in any test (Figure G-1). All but four tests (Q2 2016 and 2018, Q3 2017, Q1 2020) were categorized as no adverse response for reproduction (Figure G-2). Nitrite was identified as a potential contributor in the Q2 2016 test. In other tests with adverse responses, responses appeared unrelated to water quality because concentrations of all constituents were below chronic WQGs and EVWQP benchmarks, and/or were below concentrations measured in tests categorized as no adverse response.
- ***P. subcapitata***—All but two tests (Q3 2019 and Q2 2021) were categorized as no adverse response. In Q3 2019, most tests including reference tests exhibited adverse responses on cell yield and results for that batch of tests were considered anomalous (Golder 2020b). No water quality constituent was identified as potentially contributing to observed responses in either test.
- ***H. azteca***——No effects were observed on survival in any test (Figure G-4). All but two tests (Q2 2016, Q3 2021) were categorized as no adverse response for dry weight (Figure G-4; Figure G-5). As discussed in Section 3.4.2, high inter-reference variability increased the uncertainty associated with the assigned narrative category (possible adverse response) for the Q3 2021 test. No water quality constituent was identified as potentially contributing to observed responses.
- ***O. mykiss***—All 2021 tests were categorized as no adverse response, representing an improvement compared with previous years in which 67% of tests were categorized as adverse response for at least one endpoint (Figures G-6 to G-9) Microbes were identified as a potential contributor in approximately half of the tests with adverse responses. As discussed in the Section 1.2.3, Q2 results are considered the most relevant for evaluating potential effects on early life stages of the congenic WCT. In all but two Q2 tests (Q2 2016 and 2019), tests were categorized as no adverse response. In both tests, responses appeared unrelated to water quality because concentrations of all constituents were below chronic WQGs and EVWQP benchmarks, and/or were below concentrations measured in tests categorized as no adverse response. Results that show poor correspondence with water quality (as in Q2 2016 and 2019) are best distinguished from true toxicity responses through validation and trend assessment over time. In the case of Q2 GH_FR1 tests, no adverse responses have been observed in adjacent years tests or since 2019, indicating a lack of Q2 trend over time.
- ***P. promelas***—All tests except one (Q2 2017) were categorized as no adverse response, and responses for all endpoints have generally been within local and regional NRs (Figure G-10 to Figure G-14). Responses observed in Q2 2017 were consistent with responses associated with microbial growth.

Overall, GH_FR1 has shown a lack of responses for all test species except *O. mykiss*, with no apparent consistent pattern of responses over time and no clear evidence of causal factors. For *O. mykiss*, approximately half of adverse responses were consistent with responses associated with microbes. In the other half of tests with adverse responses, no water quality constituent has been identified because concentrations of all constituents were below chronic WQGs and EVWQP benchmarks, and/or were below concentrations measured in tests categorized as no adverse response. In aggregate, there is a lack of correspondence between *O. mykiss* responses and water quality variables. Furthermore, the *O. mykiss* results do not align with GH_FR1 results for other test species, which have shown a lack of adverse responses over time.

Figure 3.5-3: Summary of test results by category at GH_FR1.

Notes: Results were categorized using local and regional normal ranges calculated in this report, see Section 3.2.3. Possible and likely symbols are annotated with constituent(s) identified as potentially contributing to observed response. NO_3 = nitrate; Ref Var = high inter-reference variability; UN = unknown: no water quality constituent was identified.

3.5.4 LC_LC5

Results for LC_LC5 (Fording River downstream of Line Creek) in 2015–2021 are summarized in Figure 3.5-4. An overview of the results is provided below:

- ***C. dubia***—No effects were observed on survival in any test (Figure G-1). All but two tests (Q2 2018 and Q4 2018) were categorized as no adverse response for reproduction, and mean responses were generally within the local and regional NRs (Figure G-2). No water quality constituent was identified as potentially contributing to observed responses.
- ***P. subcapitata***—Mean cell yield was generally within the local and regional NRs except for Q3 2019 and Q2 2021 (Figure G-3). Prior to 2021, all but two tests (Q3 2019 and Q2 2015) were categorized as no adverse response. In 2021, three tests (Q1, Q2, and Q4) exhibited adverse responses. In Q3 2019, most tests including reference tests exhibited adverse responses on cell yield and results for that batch of tests were considered anomalous (Golder 2020b). In Q1 and Q4 2021, many test sites had mean cell yield that was systematically depressed across test sites despite variability in water chemistries; this resulted in poor correspondence between water chemistry and responses (Section 3.4.2). No water quality constituent was identified as potentially contributing to observed responses in these tests.
- ***H. azteca***—All but three tests (Q3 and Q4 2019 and Q3 2021) were categorized as no adverse response. (Figure G-4; Figure G-5). In tests with adverse responses, there was elevated uncertainty associated with the test result due to high inter-replicate variability (Q3 and Q4 2019) or high inter-reference variability (Q3 2021). No water quality constituent was identified as potentially contributing to observed responses.
- ***O. mykiss***—All tests except one (Q4 2019) were categorized as no adverse response (Figures G-6 to Figure G-9). No water quality constituent was identified as potentially contributing to the observed response.
- ***P. promelas***—There were no adverse responses observed for any endpoint, and mean responses were generally within the local and regional NRs (Figure G-9 to Figure G-13).

Overall, LC_LC5 has shown few adverse responses over time, with no apparent consistent pattern of responses and no clear evidence of causal factors. Over the period of record, no responses have been identified that can be plausibly linked to mine-influenced chemical parameters.

Figure 3.5-4: Summary of test results by category at LC_LC5.

Notes: Results were categorized using local and regional normal ranges calculated in this report, see Section 3.2.3. Possible and likely symbols are annotated with constituent(s) identified as potentially contributing to observed response. RV = high inter-replicate variability; Ref Var = high inter-reference variability; UN = unknown: no water quality constituent was identified.

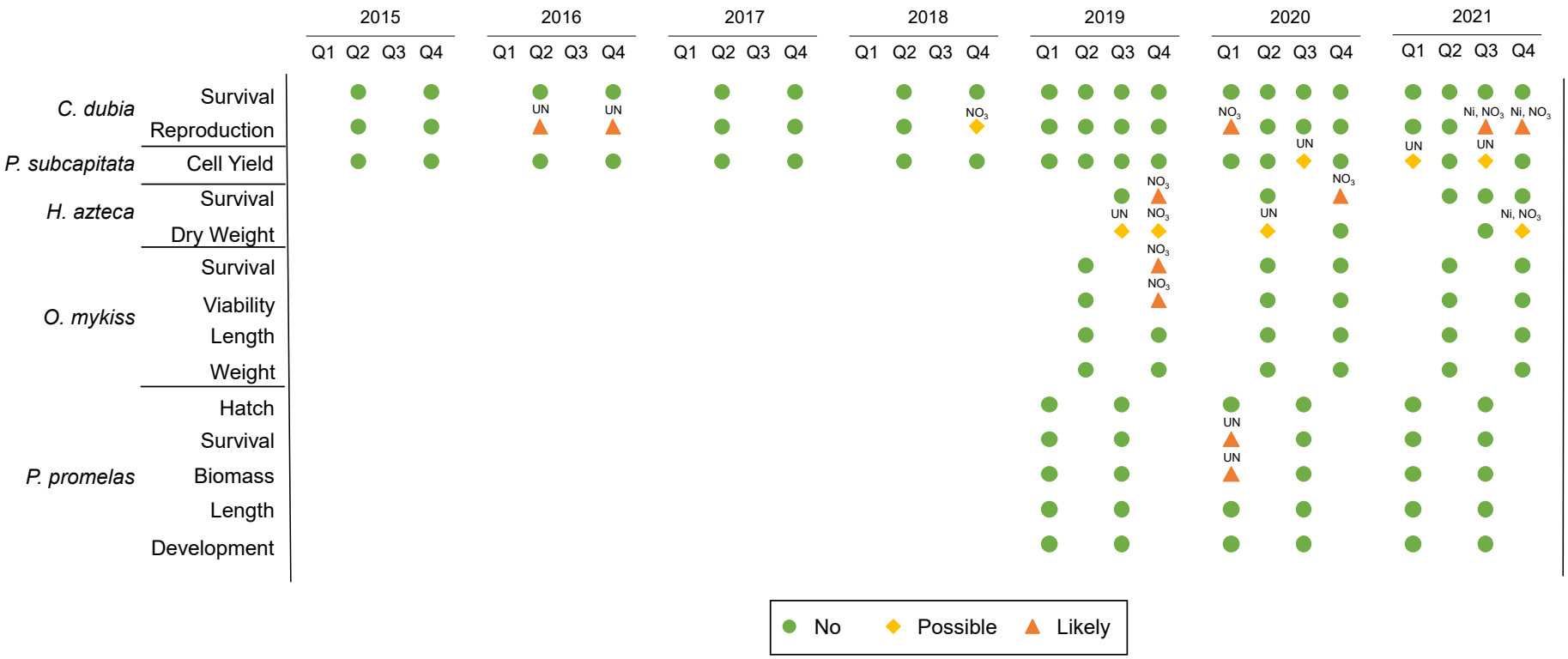
3.5.5 LC_DCDS

Station LC_DCDS (Dry Creek downstream of sedimentation ponds) was added to the regional chronic toxicity testing program after the 2019 integration of the Line Creek toxicity testing and regional toxicity testing permits. Results are summarized in Figure 3.5-5. An overview of the results is provided below:

- ***C. dubia***—No effects were observed on survival in any test (Figure G-1). Approximately 30% of tests were categorized as an adverse response for reproduction (Figure G-2). Nitrate was identified as potentially contributing to observed responses in the Q1 2018, Q1 2020, and Q3 and Q4 tests in 2021. Nickel was identified as a potential contributor to responses in Q3 and Q4 2021 tests. No water quality constituent was identified as potentially contributing to observed responses in the 2016 tests.
- ***P. subcapitata***—All but three tests (Q3 2020, and Q1 and Q3 2021) were categorized as no adverse response. In Q1 2021, many test sites had mean cell yield that was systematically depressed across test sites despite variability in water chemistries; this resulted in poor correspondence between water chemistry and responses (Section 3.4.2). No water quality constituent was identified as potentially contributing to observed responses in these tests.
- ***H. azteca***—Five tests (2019 tests, 2020 tests and Q4 2021) were categorized as a possible or likely adverse response, although most tests fell within the local and regional NRs (Figure G-5; Figure G-6). Nitrate was identified as potentially contributing to observed responses in Q4 2019, Q4 2020, and Q4 2021. Nickel was also identified as a potential contributor to responses observed in Q4 2021. No water quality constituent was identified as potentially contributing to observed responses in other tests.
- ***O. mykiss***—All tests except Q4 2019 were categorized as no adverse response (Figure G-6 to Figure G-9). Nitrate was identified as potentially contributing to the observed response in this test. As discussed in the Section 1.2.3, spring (Q2) results are considered the most relevant for evaluating potential effects on early life stages of the congenic WCT, and all Q2 tests were categorized as no adverse response.
- ***P. promelas***—All tests except Q1 2020 were categorized as no adverse response. No water quality constituent was identified as potentially contributing to the observed response; however, this test had high inter-replicate variability (Golder 2021a).

Overall, LC_DCDS has exhibited a low proportion of adverse responses with no apparent consistent pattern of responses over time. Nitrate was identified as a potential cause of observed responses in 8 of 16 tests with possible or likely adverse responses, half of which were *C. dubia* tests between Q4 2018 and 2021. This is likely due to the observed increase in nitrate in these years (12 to 47 mg/L as N for *C. dubia* tests) compared to concentrations in previous quarters and years (<9.0 mg/L as N for *C. dubia* tests). Nickel was also identified as a plausible cause of observed responses in Q3 and Q4 2021 tests; nickel concentrations in 2021 (0.003 to 0.015 mg/L for *C. dubia* tests) were increased compared to previous years (0.001 to 0.007 mg/L for *C. dubia* tests). The slightly increased frequency of adverse responses in LC_DCDS relative to several stations on the mainstem upper Fording River (FR_FRABCH, GH_FR1, and LC_LC5) may be attributable to differences in nitrate and nickel concentrations.

Figure 3.5-5: Summary of test results by category at LC_DCDS.



Notes: Results were categorized using local and regional normal ranges calculated in this report, see Section 3.2.3. Possible and likely symbols are annotated with constituent(s) identified as potentially contributing to observed response. NO_3 = nitrate; Ni = nickel; UN = unknown: no water quality constituent was identified.

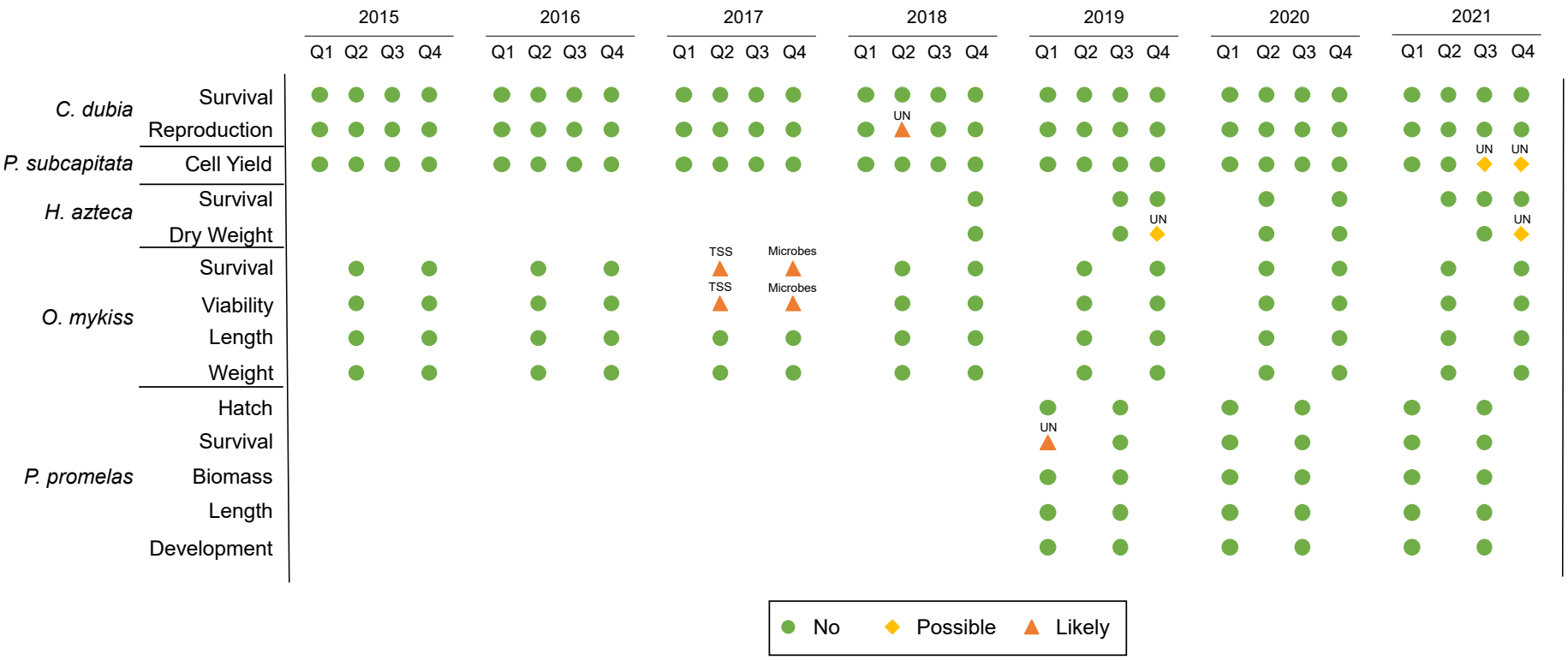
3.5.6 GH_ERC

Results for GH_ERC (Elk River upstream of Fording River confluence) in 2015–2021 are summarized in Figure 3.5-6. An overview of the results is provided below:

- ***C. dubia***— No effects were observed on survival in any test (Figure G-1). All tests except Q2 2018 were categorized as no adverse response on reproduction (Figures G-2). No water quality constituent was identified as potentially contributing to the observed response.
- ***P. subcapitata***—All but two tests (Q3 and Q4 2021) were categorized as no adverse response (Figure G-3). In Q4 2021, many test sites had mean cell yield that was systematically depressed across test sites despite variability in water chemistries; this resulted in poor correspondence between water chemistry and responses (Section 3.4.2). The observed responses in both quarters appeared unrelated to water quality because concentrations of all constituents were below chronic WQGs and EVWQP benchmarks, and/or were below concentrations measured in tests categorized as no adverse response.
- ***H.* azteca**— No effects were observed on survival in any test (Figure G-4). All but two tests (Q4 2019 and 2021) were categorized as no adverse response for dry weight (Figure G-5). Both tests with adverse responses were within the local and regional normal ranges. No water quality constituent was identified as potentially contributing to the observed responses.
- ***O. mykiss***—All but two tests (Q2 and Q4 2017) were categorized as no adverse response (Figure G-6 to G-9). TSS was identified as potentially contributing to observed responses in Q2 2017 and responses in Q4 2017 were consistent with responses associated with microbial growth (Golder 2018).
- ***P. promelas***—All tests except Q1 2019 were categorized as no adverse response (Figures G-10 to G-14). No water quality constituent was identified as potentially contributing to the observed response.

Overall, GH_ERC has shown few adverse responses, with no apparent consistent pattern of responses over time and no clear evidence of causal factors. The results for GH_ERC in recent years of monitoring are also consistent with findings from the closest upstream station on the mainstem Fording River (LC_LC5), with both stations exhibiting no adverse responses for all endpoints in 2020, and a few (three to four) adverse responses in 2021.

Figure 3.5-6: Summary of test results by category at GH_ERC.



Notes: Results were categorized using local and regional normal ranges calculated in this report, see Section 3.2.3. Possible and likely symbols are annotated with constituent(s) identified as potentially contributing to observed response. TSS = total suspended solids; UN = unknown: no water quality constituent was identified.

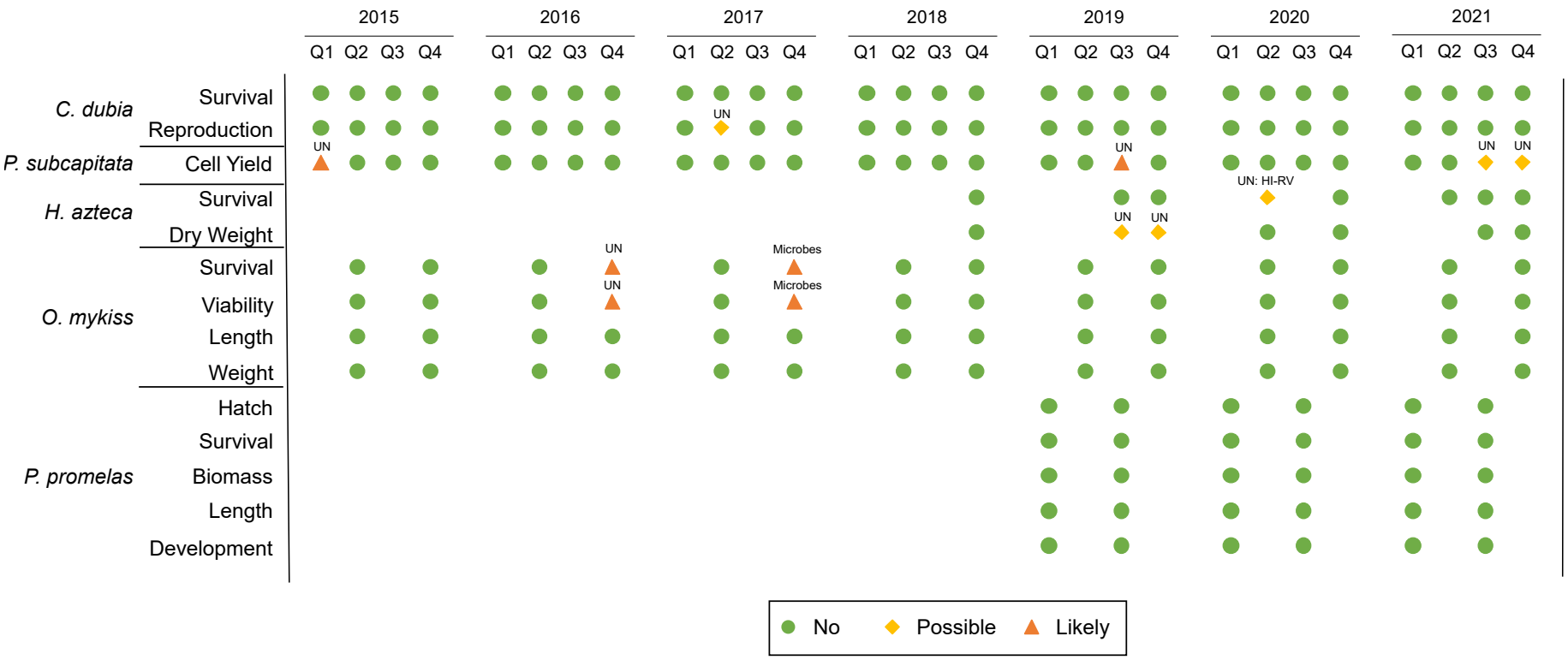
3.5.7 EV_HC1

Results for EV_HC1 (Harmer Creek) in 2015–2021 are summarized in Figure 3.5-7. An overview of the results is provided below:

- ***C. dubia***— No effects were observed on survival in any test (Figure G-1). All tests except Q2 2017 were categorized as no adverse response on reproduction (Figure G-1). Mean reproduction was within local and regional NRs except Q1 2018. No water quality constituent was identified as potentially contributing to observed response.
- ***P. subcapitata***—All but four tests (Q1 2015, Q3 2019 and Q3 and Q4 2021) were categorized as no adverse response (Figure G-3). In Q3 2019, most tests including reference tests exhibited adverse responses on cell yield and results for that batch of tests were considered anomalous (Golder 2020b). In Q4 2021, many test sites had mean cell yield that was systematically depressed across test sites despite variability in water chemistries; this resulted in poor correspondence between water chemistry and responses (Section 3.4.2). No water quality constituent was identified as potentially contributing to observed responses.
- ***H.* azteca**—All but three tests (Q3 2019, Q4 2019, and Q2 2020) were categorized as no adverse response (Figure G-3; Figure G-4). No water quality constituent was identified as potentially contributing to the observed response; however, high inter-replicate variability was observed in Q2 2020 and may have contributed to observed effects.
- ***O. mykiss***—All tests but two tests (Q4 2016 and 2017) were categorized as no adverse response (Figure G-6 to Figure G-9). As discussed in the Section 1.2.3, spring (Q2) results are considered the most relevant for evaluating potential effects on early life stages of the congenic WCT, and all Q2 tests were categorized as no adverse response. Responses observed in Q4 2017 were consistent with responses associated with microbial growth (Golder 2018). No water quality constituent was identified as potentially contributing to observed responses in the Q4 2016 test.
- ***P. promelas***—All tests were categorized as no adverse response and response were generally within the local and regional NRs (Figures G-10 to G-14).

Overall, EV_HC1 has shown few adverse responses over time, with no apparent consistent pattern of responses and no clear evidence of causal factors. Adverse responses on *O. mykiss* survival and viability have not been observed since Q4 2017. In 2021, all but two test results were categorized as no adverse response, with one adverse response (Q4) having high uncertainty. Over the period of record, no responses have been identified that can be plausibly linked to mine-influenced chemical parameters.

Figure 3.5-7: Summary of test results by category at EV_HC1.



Notes: Results were categorized using local and regional normal ranges calculated in this report, see Section 3.2.3. Possible and likely symbols are annotated with constituent(s) identified as potentially contributing to observed response. RV = high inter-replicate variability; UN = unknown: no water quality constituent was identified.

3.5.8 CM_MC2

Results for CM_MC2 (Michel Creek downstream of Corbin Creek) in 2015–2021 are summarized in Figure 3.5-8. An overview of the results is provided below:

- ***C. dubia***— No effects were observed on survival in any test (Figure G-1). Mean reproduction was generally below the local and regional NRs and 66% of tests were categorized as a possible or likely response (Figure G-2). A lower frequency and magnitude of adverse responses was observed between 2019 and 2021 compared to 2017 and 2018, in which all quarters were categorized as likely adverse responses. Nickel was identified as potentially contributing to observed responses in tests conducted between 2017 and 2021. No water quality constituent was identified as potentially contributing to observed responses in 2015 and 2016 tests.
- ***P. subcapitata***—All but three tests (Q3 2019 and Q1 and Q4 2021) were categorized as no adverse response (Figure G-3). In Q3 2019, most tests including reference tests exhibited adverse responses on cell yield and results for that batch of tests were considered anomalous (Golder 2020b). In Q1 and Q4 2021, many test sites had mean cell yield that was systematically depressed across test sites despite variability in water chemistries; this resulted in poor correspondence between water chemistry and responses (Section 3.4.2). No water quality constituent was identified as potentially contributing to observed responses.
- ***H.* azteca**—Seventeen tests (approximately 70% of all tests) were categorized as a possible or likely adverse response (Figure G-4; Figure G-5). Responses were trending towards an increase in frequency and magnitude in responses over time until Q4 2018. Nickel has been identified as potentially contributing to observed responses in most tests. There was increased uncertainty for the Q4 2020 dry weight results (where responses were unusually low across most tests, including reference) and the Q2 and Q4 2020 survival results (which demonstrated high levels of inter-replicate variability).
- ***O. mykiss***—All but five tests (Q2 test in 2016 and Q4 tests in 2015, 2016, 2017 and 2019) were categorized as no adverse response (Figures G-6 to Figure G-9). Responses observed in Q4 2017 were consistent with responses associated with microbial growth (Golder 2018). No water quality constituent was identified as potentially contributing to observed responses in the remainder of tests.
- ***P. promelas***—All but four tests (Q3 2016, 2018, 2019, and 2020) were categorized as no adverse response (G 3.5-10 to G-14). No water quality constituent was identified as potentially contributing to observed responses, but responses observed in Q3 2018, 2019, and 2020 were consistent with responses associated with microbial growth.

Overall, CM_MC2 has shown similar patterns of response over time for *C. dubia* reproduction and *H. azteca* survival and dry weight. These two crustacean species are known to be sensitive to dissolved nickel exposure, and multiple lines of evidence have implicated nickel as driving adverse responses at this sampling location. A trend towards more frequent and larger responses for *C. dubia* and *H. azteca* was observed until Q4 2018. For *C. dubia,* mean responses from 2019 to 2021 have generally been within local and regional NRs, indicating that response sizes have decreased since 2018.

The pattern in responses for both species between 2015 and 2018 corresponds with an increase in aqueous nickel concentrations from 2015 (generally ranged from 5 to 15 µg/L) to 2018 (generally ranged from 10 to 60 µg/L). Compared to the 2018 peak, nickel concentrations decreased through 2021, ranging from 8 to 25 µg/L except for two samples at 45 µg/L in Q1 and Q3 2020. The pattern in nickel concentrations may help explain the fewer and lower-magnitude responses observed between 2019 and 2021 relative to 2018, particularly for crustaceans.

Aside from the responses to nickel-sensitive crustaceans discussed above, adverse effects to other species (trout, minnows, and algae) in recent years of testing have been rare at CM_MC2, and where observed, appear linked to confounding factors (microbes or atypical batch-wide test results). This finding is also consistent with the water quality composition of Michel Creek test waters because the concentrations of major ions (sulphate, nitrate, and total dissolved solids) are lower in Michel Creek relative to portions of the upper Fording River. As such, nickel has been the only constituent identified in Michel Creek that would introduce incremental potential for toxicity relative to other stations in the regional program. The concentrations of nickel observed in Michel Creek are not predicted to cause effects to fish or algae, and the chronic tests in this program confirm this expectation.

Figure 3.5-8: Summary of test results by category at CM_MC2.

Note: Results were categorized using local and regional normal ranges calculated in this report, see Section 3.2.3. Possible and likely symbols are annotated with constituent(s) identified as potentially contributing to observed response. HI-RV = high inter-replicate variability; Ni = nickel; UN = unknown: no water quality constituent was identified; Recat = category was previously assigned as "no adverse response." Toxicity Identification Evaluations were conducted to support the causation assessment for *C. dubia* tests in 2017 (Q3 and Q4), 2018 (Q1 to Q4), 2019 (Q1 to Q4), 2020 (Q1 to Q4), and 2021 (Q1 to Q4); and. *H. azteca* tests in 2018 (Q1 to Q4), 2019 (Q1, Q3, and Q4), 2020 (Q2 and Q4), and 2021 (Q2 and Q4).

3.5.9 RG_MIDAG

In 2018, non-permit station CM_MC3 was added to the program in 2018 as part of the AMP response framework to characterize the spatial extent of effects observed in previous CM_MC2 testing. Station CM_MC3 was replaced with station RG_MIDAG in 2019, which is approximately 2 km downstream of CM_MC2. As discussed at the June 2019 EMC meeting, the replacement occurred because there was uncertainty in the amount of flow along Michel Creek at CM_MC3 due to an ice dam in winter conditions. Michel Creek flows were consolidated in one channel throughout the year at RG_MIDAG, making this station a better candidate to evaluate the spatial extent of observed effects.

Results are summarized in Figure 3.5-9. An overview of the RG_MIDAG results is provided below:

- ***C. dubia***— No effects were observed on survival or reproduction in any test (Figure G-1; Figure G-2). All responses were within local and regional NRs.
- ***H.* azteca**—All but two tests (Q2 and Q4 2020) were categorized as no adverse response (Figure G-4 and G- 5). Nickel was identified as potentially contributing to observed responses in Q2 2020, and high variability across replicates was observed in the Q4 2020 test (Golder 2021a).
- ***P. promelas***— All test were categorized as no adverse response on survival and reproduction and responses were within local and regional NRs (Figure G-10 to G-14).

Overall, RG_MIDAG showed fewer and lower magnitude responses relative to CM_MC2. Between 2019 and 2021, the only results categorized as adverse response were *H. azteca* results with high uncertainty. Furthermore, the temporal improvement in crustacean responses observed at CM_MC2 since 2018 were also observed at RG_MIDAG.

Figure 3.5-9: Summary of test results by category at RG_MIDAG.

Note: 2018 test results are for CM_MC3. In 2019, CM_MC3 was replaced by RG_MIDAG, the station located 2 km downstream of CM_MC3. Results were categorized using local and regional normal ranges calculated in this report, see Section 3.2.3. High inter-reference variability was observed for Q3 *H. azteca* and Q1 *P. promelas*, see Section 3.3.1. Possible and likely symbols are annotated with constituent(s) identified as potentially contributing to observed response. HI-RV = high inter-replicate variability; Ni = nickel; UN = unknown: no water quality constituent was identified.

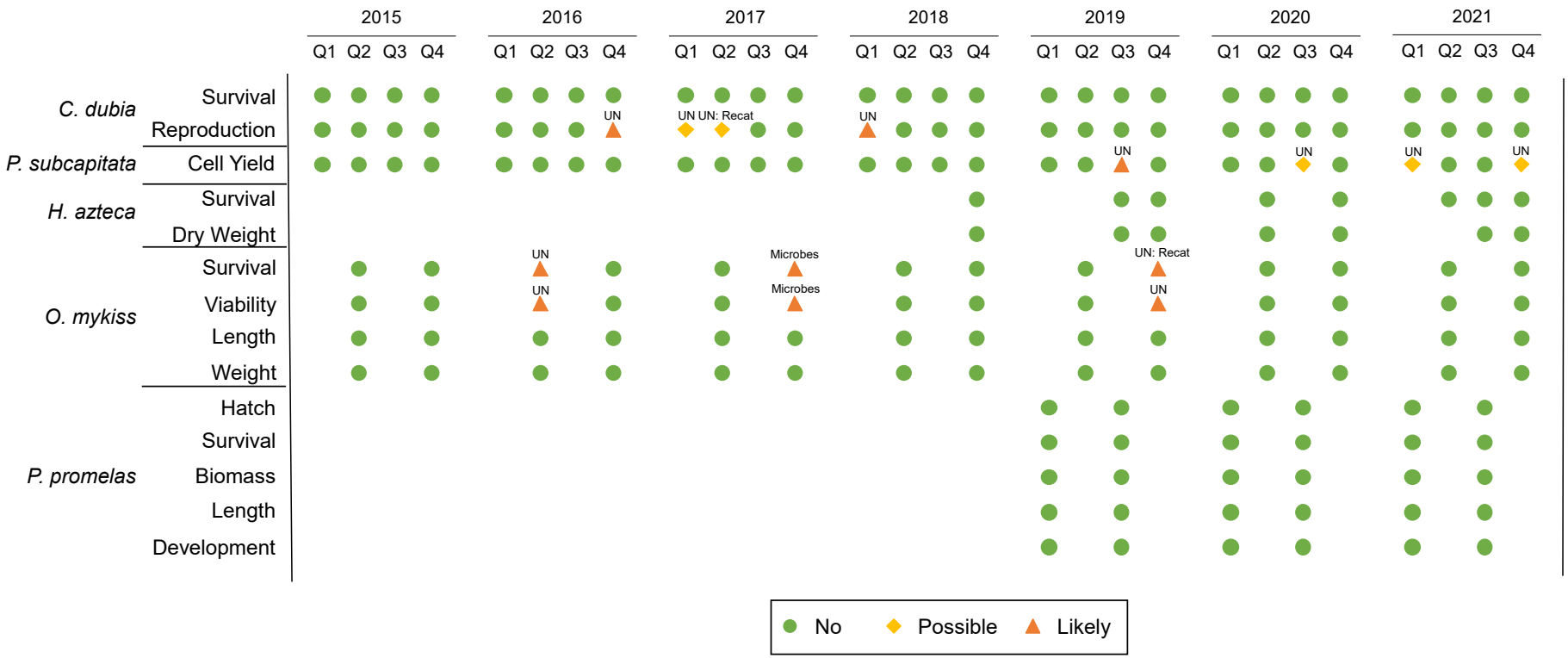
3.5.10 EV_MC2

Results for EV_MC2 (Michel Creek downstream of Bodie Creek) in 2015–2021 are summarized in Figure 3.5-10. An overview of the results is provided below:

- ***C. dubia***— No effects were observed on survival in any test (Figure G-1). All but three tests (Q4 2016, Q1 and Q2 2017 and Q1 2018) were categorized as no adverse response for reproduction (Figure G-2). No water quality constituent was identified as potentially contributing to observed responses.
- ***P. subcapitata***—All but four tests (Q3 2019, Q3 2020 and Q1 and Q4 2021) were categorized as no adverse response (Figure G-3). In Q3 2019, most tests including reference tests exhibited adverse responses on cell yield and results for that batch of tests were considered anomalous (Golder 2020b). In Q1 and Q4 2021, many test sites had mean cell yield that was systematically depressed across test sites despite variability in water chemistries; this resulted in poor correspondence between water chemistry and responses (Section 3.4.2). No water quality constituent was identified as potentially contributing to observed responses.
- ***H.* azteca**— All tests were categorized as no adverse response, and responses were within local and/or regional NRs (Figure G-4 and G-6).
- ***O. mykiss***—All but three tests (Q2 2016 and Q4 2017 and 2019) were categorized as no adverse response (Figures G-6 to G9). No water quality constituent was identified as potentially contributing to observed responses, although responses observed in 2017 were consistent with responses associated with microbial growth (Golder 2018).
- ***P. promelas***— All tests were categorized as no adverse response and mean results were generally within local and/or regional NRs (Figure G-10 to G-14).

Overall, EV_MC2 has shown few adverse responses over time, with no apparent consistent pattern of responses and no clear evidence of causal factors. Over the period of record, no responses have been identified that can be plausibly linked to mine-influenced chemical parameters.

Figure 3.5-10: Summary of test results by category at EV_MC2.



Note: Results were categorized using local and regional normal ranges calculated in this report, see Section 3.2.3. Possible and likely symbols are annotated with constituent(s) identified as potentially contributing to observed response. UN = unknown: no water quality constituent was identified; Recat = category was previously assigned as “no adverse response.

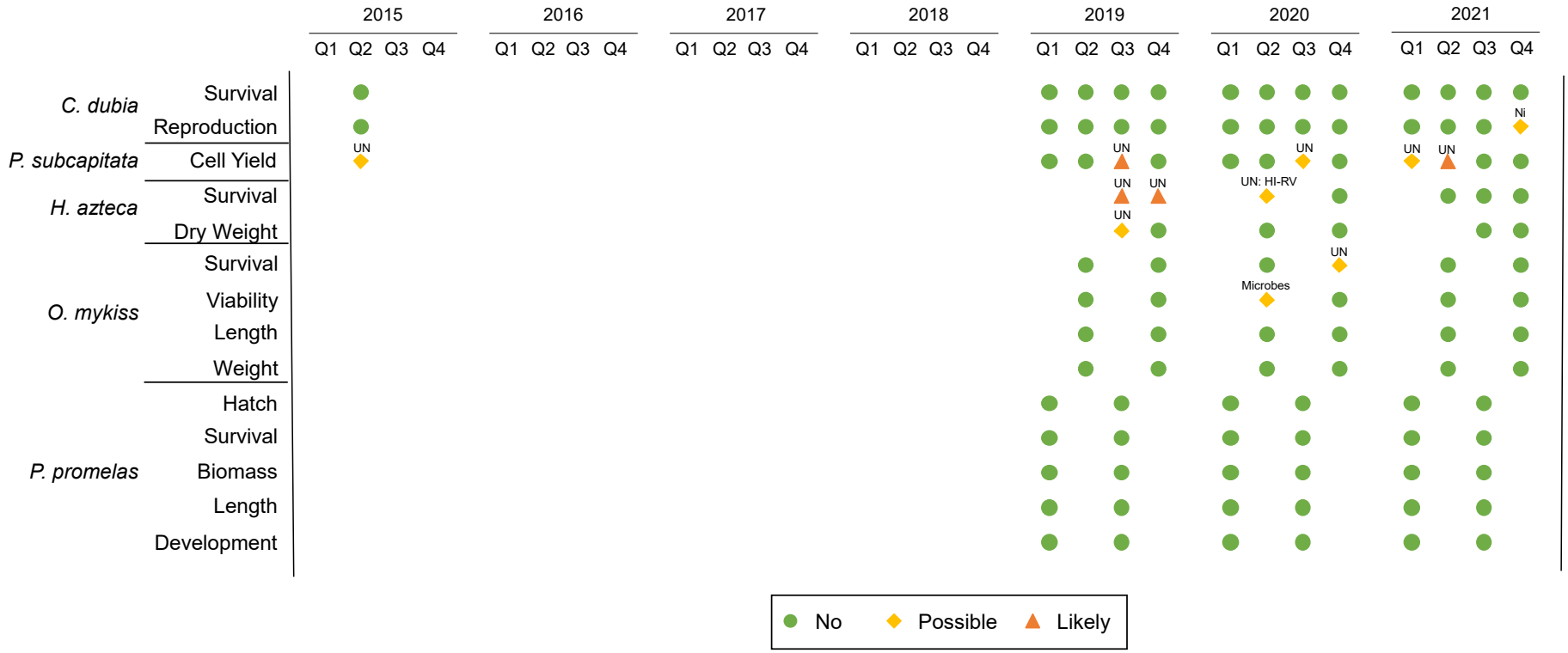
3.5.11 LC_LC3

Station LC_LC3 (Line Creek downstream of West Line Creek) was added to the regional chronic toxicity testing program after 2019 integration of the Line Creek toxicity testing and regional toxicity testing permits. Results are summarized in Figure 3.5-11. An overview of the results is provided below:

- ***C. dubia***—No effects were observed on survival in any test (Figure G-1). All test except one (Q4 2021) were categorized as no adverse response for reproduction (Figures G-1 and G-2). Nickel was identified as potentially contributing to the observed effect in Q4 2021.
- ***P. subcapitata***—Mean cell yield was within the local and regional NRs (Figure G-3) except for Q3 2019 and Q2 2021. Approximately 40% of tests were categorized as possible or likely adverse response, including Q3 2019 for which the batch test results were considered anomalous (Golder 2020b), and Q1 2021, which was associated with elevated uncertainty due to the systematic depression of cell yield despite variability across water chemistries (Section 3.4.2). No water quality constituent was identified as potentially contributing to observed responses.
- ***H.* azteca**—All but three tests (Q3 and Q4 2019 and Q1 2020) were categorized as no adverse response (Figure G-4 and G-5). No water quality constituent was identified as potentially contributing to the observed responses, although high replicate variability was observed for survival in Q2 2020 (Golder 2021a).
- ***O. mykiss***—All but two tests (Q2 2020 and Q4 2020) were categorized as no adverse response (Figures G-6 to Figure G-9). No water quality constituent was identified as potentially contributing to the observed response, although responses in the Q2 2020 test were consistent with microbial influence (Golder 2021a).
- ***P. promelas***—All tests were categorized as no adverse response across all endpoints, and response were generally within local and normal NRs (Figures G-10 to G-14).

Overall, LC_LC3 has shown few adverse responses over time, with no apparent consistent pattern of responses and no clear evidence of causal factors.

Figure 3.5-11: Summary of test results by category at LC_LC3.



Note: Results were categorized using local and regional normal ranges calculated in this report, see Section 3.2.3. Possible and likely symbols are annotated with constituent(s) identified as potentially contributing to observed response. HI-RV = high inter-replicate variability; Ni = nickel; UN = unknown: no water quality constituent was identified.

3.5.12 LC_LCDSSLCC

Results for LC_LCDSSLCC (Line Creek downstream of South Line Creek) in 2015 to 2021 are summarized in Figure 3.5-12. An overview of the results is provided below:

- ***C. dubia***—No effects were observed on survival in any test (Figure G-1). All but four tests (Q1 2017, Q2 and Q4 2018, and Q3 2020) were categorized as no adverse response for reproduction (Figure G-2). No water quality constituent was identified as potentially contributing to observed responses in these tests.
- ***P. subcapitata***—All but three tests (Q2 2015, Q3 2019, and Q4 2021) were categorized as no adverse response (Figure G-3). In Q3 2019, most tests including reference tests exhibited adverse responses on cell yield and results for that batch of tests were considered anomalous (Golder 2020b). In Q4 2021, many test sites had mean cell yield that was systematically depressed across test sites despite variability in water chemistries; this resulted in poor correspondence between water chemistry and responses (Section 3.4.2). No water quality constituent was identified as potentially contributing to observed responses.
- ***H.* azteca**—All but three tests (Q4 2018, Q3 2019, and Q4 2019) were categorized as no adverse response (Figures G-4 and G-5). No water quality constituent was identified as potentially contributing to the observed responses.
- ***O. mykiss***—All but four tests (Q2 and Q4 2016, Q4 2017, and Q4 2020) were categorized as no adverse response (Figures G-8 and G-9). No water quality constituent was identified as potentially contributing to observed responses, although responses observed in 2017 were consistent with responses associated with microbial growth (Golder 2018).
- ***P. promelas***—All tests except one (Q1 2020) were categorized as no adverse response (Figures G-10 to G-14). These responses were consistent with responses associated with microbial growth and no water quality constituent was identified as potentially contributing to observed responses.

Overall, LC_LCDSSLCC has shown few adverse responses over time, with no apparent consistent pattern of responses and no clear evidence of causal factors. Over the period of record, no responses have been identified that can be plausibly linked to mine-influenced chemical parameters.

Figure 3.5-12: Summary of test results by category at LC_LCDSSLCC.

Note: Results were categorized using local and regional normal ranges calculated in this report, see Section 3.2.3. Possible and likely symbols are annotated with constituent(s) identified as potentially contributing to observed response. UN = unknown: no water quality constituent was identified.

4.0 SUMMARY

The following bullets summarize results from the 2021 interpretive report.

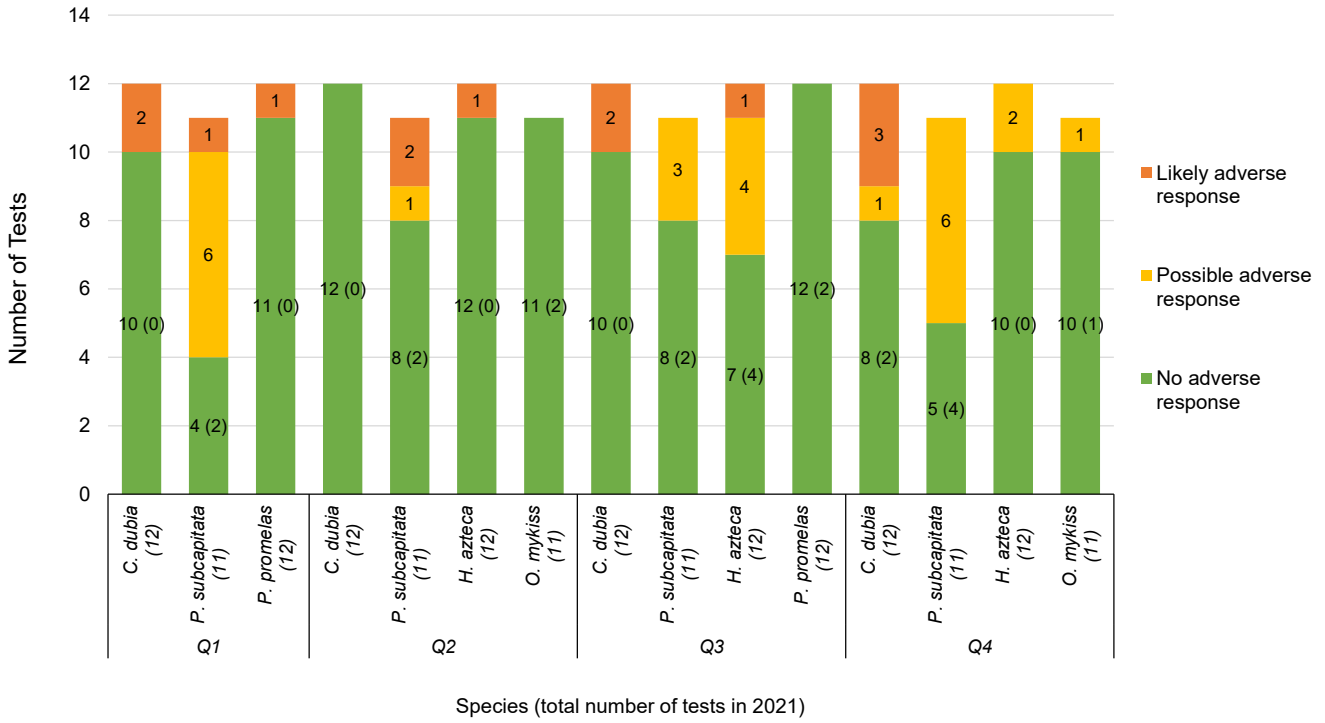
- **Quality Assurance/Quality Control**—QA/QC results indicated that organism performance in the laboratory control water generally met acceptability criteria for health histories and sensitivity of the organisms (Section 3.1). Where deviations occurred that could influence the reliability of the data, actions for data processing were taken to address this influence:
  - *P. subcapitata* in Q1 and Q4—many of the test sites had mean cell yield that was affected systematically (reduced growth) across the batch, despite the tested sites having different water quality profiles; this resulted in poor correspondence between water chemistry and responses (Section 3.4.2). This finding did not warrant outright rejection as invalid test outcomes, but instead indicated higher uncertainty for this endpoint relative to previous years.
  - *H. azteca* dry weight in Q3—the high inter-reference variability resulted in the identification of possible adverse responses for several test sites. For many of the possible responses for this endpoint, the responses did not match previous tests nor did any findings associate strongly with water quality. These unusual findings did not warrant outright rejection as invalid test outcomes, but instead indicated higher uncertainty for this endpoint relative to previous years.
  - Q1 *P. promelas* tests with Elk River and Michel Creek reference waters—results from these waters were excluded from statistical analyses, and the results from the remaining two references were used to categorize site water responses. As described for Q3 *H. azteca* results in the preceding bullet, adverse responses in Q1 tests did not match previous tests or water quality; these unusual findings did not warrant outright rejection as invalid test site outcomes, but instead indicate higher uncertainty than in previous years for these endpoints. Exclusion of these references made the identification of adverse responses more likely in test site waters, but was adopted as a conservative screening approach.
  - Microbes were observed in a subset of test treatments for both fish species. The potential for confounding of test endpoints was partially controlled through administration of copper, which prevented large disruptions to the test endpoint performance, but did not eliminate the presence of microbes entirely. Comparisons of results for replicates with and without evidence of microbe presence indicated potential for a small downward bias in survival and viability of tested fish.
- **Sources of Variance**—Key sources of variance that could affect responses observed in test waters were addressed herein, including variation in test organism performance (addressed by control normalization), variation in test organism sensitivity to toxicants (addressed by reviewing reference toxicant results), variation in background water quality characteristics (addressed by developing regional and local NRs), and variation in concentrations of toxicants in test waters (addressed by reviewing CVs; Section 3.2). Addressing these sources of variance is expected to improve the ability to identify a true toxicological response.
- **Evaluation of 2021 Test Results**—The 2021 test results categorized as “no adverse response”, “possible adverse response”, or “likely adverse response” are illustrated on Figure 4-1 and Figure 4-2. Historical (i.e., 2015 to 2020) test results were re-categorized using normal ranges developed in this year’s report. Key findings were:

- For all species, most tests were categorized as exhibiting no adverse response. Likely adverse responses were most common for *C. dubia* reproduction and least common for *O. mykiss* and *P. promelas*; the latter two species had only one adverse response each for survival.
- The frequency of likely adverse responses was similar across quarters, with three likely adverse responses in Q2 and Q4 and four in Q1 and Q3. A high frequency of possible adverse effects was observed in Q1, Q3, and Q4, although most of these tests were linked to atypical results for *P. subcapitata* (Q1 and Q4) and *H. azteca* (Q3), as mentioned above.
- The frequency of adverse effects was highest at FR_FRCP1 (seven tests), LC_DCDS (five tests), and CM_MC2 (six tests), a finding consistent with spatial patterns from previous years of monitoring. Other stations have fewer adverse responses, ranging from no adverse responses observed at RG_MIDAG to four adverse responses observed at LC_LC5.
- The proportion of samples exhibiting adverse effects to fish endpoints was low for fathead minnow (1 of 32 tests) and rainbow trout (1 of 30 tests)—the introduction of low copper concentrations to control the prevalence and confounding effects of microbes has greatly improved the reliability of that test endpoint relative to early rounds of testing. As discussed in Section 1.2.3, chronic toxicity results for early life stages of fish can be conservatively relied upon to infer potential effects to other fish life stages; if no adverse response is observed in early life stage tests, then no adverse response would be expected for older life stages.
- The addition of FR_FRABCH and integration of the Line Creek and regional monitoring programs has improved the spatial characterization of sampling in the mainstem Fording and Elk rivers. The results from 2021 provide evidence that several stations of the mainstem Fording River downstream of FR_FRCP1 (i.e., FR_FRABCH, GH_FR1, and LC_LC5) have lower frequency and magnitude of chronic toxicity.

- **Causation Assessment**—Constituents identified as potential causes of toxicity in 2021 tests categorized as possible or likely (Section 3.4) are summarized in Figure 4-3. Key findings were:
  - In the Fording River (FR_FRCP1) and its tributary Dry Creek (LC_DCDS), nickel and/or nitrate showed the greatest evidence of causing the observed effects to *C. dubia* and *H. azteca* in one or more tests:
    - Nickel was identified in the largest number of tests at FR_FRCP1 and LC_DCDS as a potential causal factor for the observed effects to crustaceans (i.e., *C. dubia* reproduction and *H. azteca* dry weight). The interpretation of nickel as potentially contributing to effects at FR_FRCP1 aligned with TIE findings and graphical analysis. The magnitude of toxicity observed at FR_FRCP1 in 2021 was lower than in other recent years, possibly reflecting the lower concentrations of major ions (i.e., TDS components) measured in site water.
    - Nitrate was identified as potentially contributing to effects on *O. mykiss* survival at FR_FRCP1, although the influence of microbes cannot be discounted in this test. Adverse responses in this test would not be expected to translate to other life stages of WCT, given that responses were attributed to a testing artifact (microbes) and to a stressor (nitrate) for which older life stages of fish are less sensitive (CCME 2012). Nitrate was also identified as potentially contributing to observed effects on *C. dubia* reproduction and *H. azteca* dry weight at LC_DCDS.

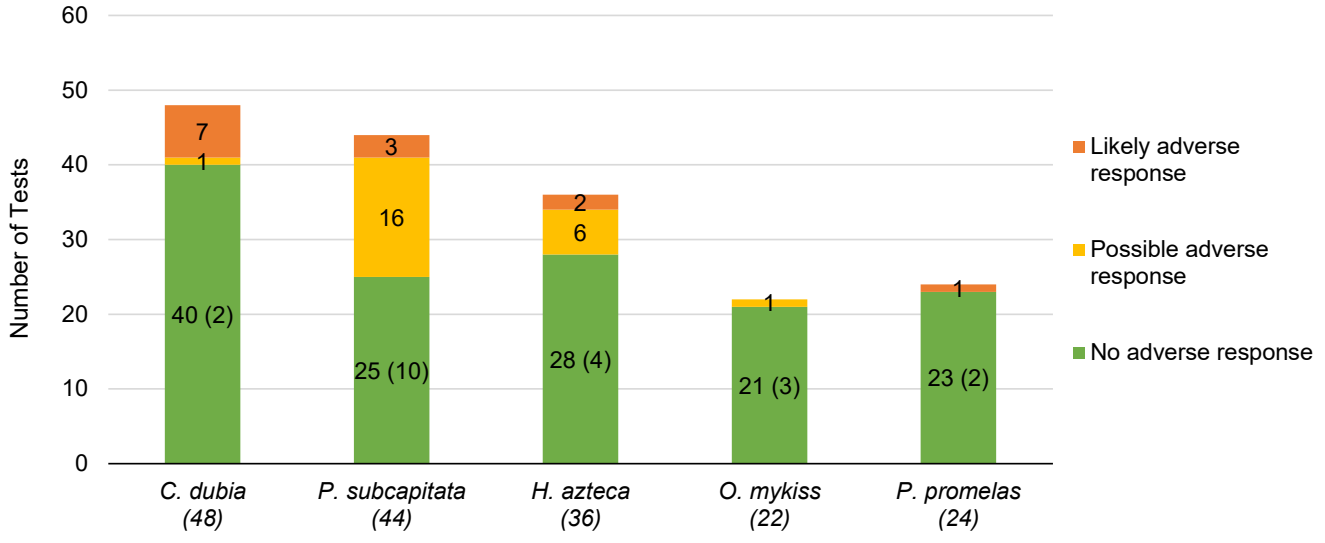
- Nickel was the only constituent identified as a causal factor for adverse responses observed in Michel Creek station CM_MC2, potentially contributing to observed effects on *C. dubia* reproduction and *H. azteca* survival and dry weight. This finding aligned with TIE results for these species and is consistent with previous years of water quality and toxicity monitoring. The influence of nickel in Michel Creek is limited spatially, as the tests of sensitive crustaceans at RG_MIDAG showed improvement relative to CM_MC2.
- Nickel was identified as a potential causal factor in for the possible adverse response to *C. dubia* reproduction observed for Line Creek station LC_LC3 in Q4. In previous years, no water quality constituent had been identified at this station.
- Potential explanatory factors other than water quality were identified in some tests, including microbial interference (Q4 *O. mykiss*; discussed above), high inter-reference variability (discussed below), and unusually similar magnitude of responses across varying water chemistries (discussed below).
  - High inter-reference variability was identified in Q3 for *H. azteca* and Q1 for *P. promelas*. The variability observed in references for both species (see Section 3.3.1) created elevated uncertainty to whether tests categorized as possible or likely represented an adverse response to toxicants in the test water. These results indicate the presence of variance in test organism performance due to factors other than water quality. This is further supported by the observation that all Q3 *H. azteca* tests (with the exception of CM_MC2) were statistically similar to three of the four references tested concurrently. In the case of Q1 *P. promelas*, survival in this test (with a conservatively-assigned category of likely adverse response) was higher than Elk and Michel references. The removal of the anomalous references introduces potential for a false positive designation; site waters with similar results to these Elk and Michel references were retained for statistical analysis.
  - For Q1 and Q4 *P. subcapitata* tests, many test sites had mean cell yields that were systematically depressed across test sites despite variability across water chemistries, resulting in poor correspondence between water chemistry and responses (Section 3.4.2).
- For other tests categorized as possible or likely adverse response, no explanatory factor was identified as causing the observed response.

Figure 4-1: Summary of 2021 Test Results by Species and Quarter.



Note: Values in parentheses are the number of tests with endpoint(s) significantly lower than one or more reference but categorized as no adverse response according to the decision framework in Figure 2.3-1.

Figure 4-2: Summary of 2021 Test Results by Species.



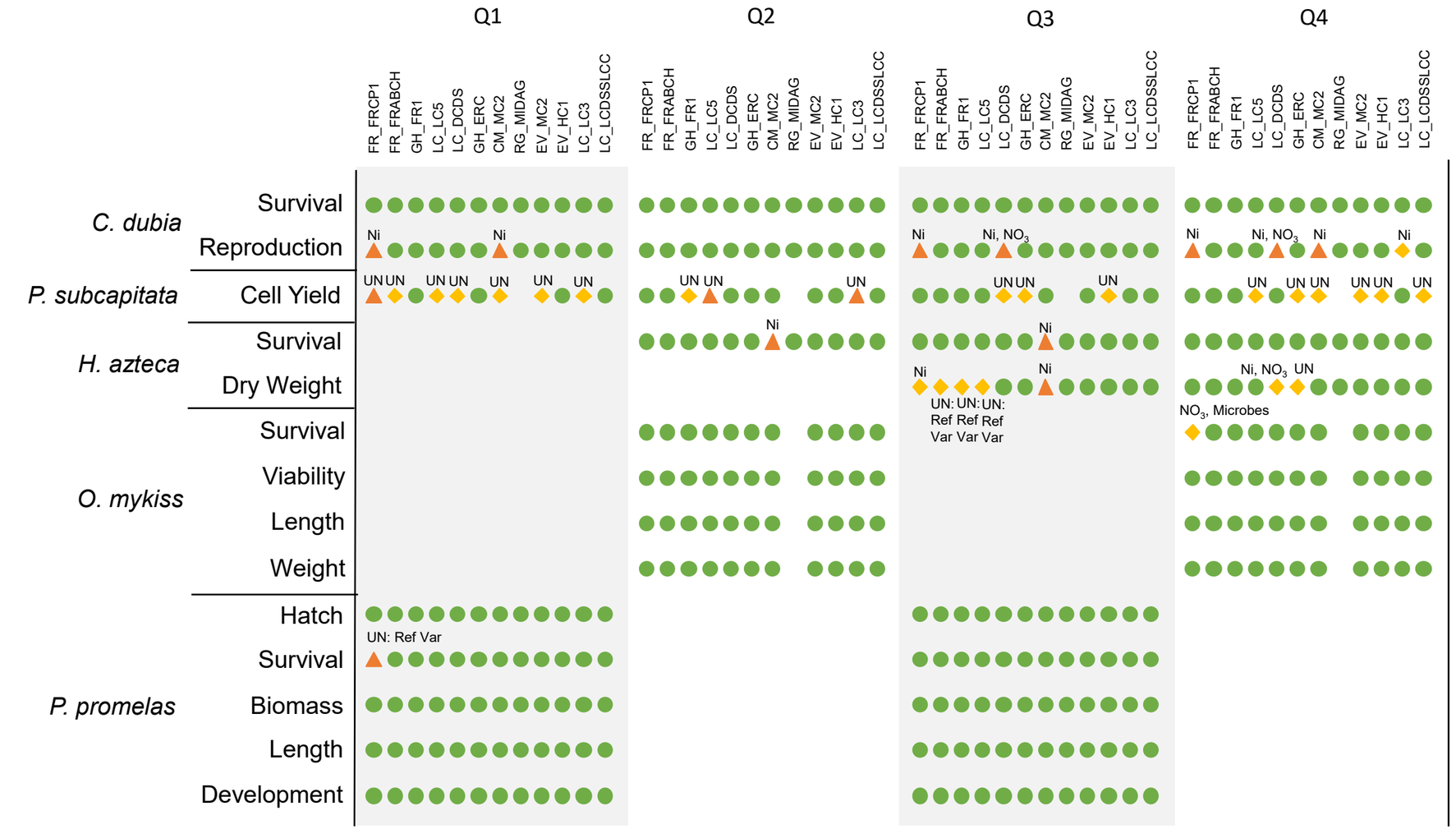
Note: Values in parentheses are the number of tests with endpoint(s) significantly lower than one or more reference but categorized as no adverse response according to the decision framework in Figure 2.3-1.

- **Comparison of 2021 Results to Previous Years**—Similarities and differences were summarized between test results in the 2021 program and previous programs (2015 to 2020), focusing on the incidence of adverse responses by season and station (Section 3.5). The broad findings of the program were similar to 2020, with most stations exhibiting a low proportion of significant toxicity outcomes, *C. dubia* remaining a sensitive indicator for influence of mine-related constituents, and the greatest frequency of mine-related responses observed for FR_FRCP1 in the upper Fording River, LC_DCDS in Dry Creek, and CM_MC2 in Michel Creek. The remaining stations have exhibited possible or likely adverse effects in a minority of sampling events, but these cases were typically associated with elevated uncertainty in the toxicity tests (i.e., anomalous responses in site and reference waters, or high inter-reference variations) and/or had weak to negligible evidence for influence of mine-influenced water quality. Other key findings were:
  - The strength of toxicity at FR_FRCP1 has decreased in recent years. At FR_FRCP1, there was a pattern of more frequent and larger responses for *C. dubia* until Q2 of 2019, when mean reproduction recovered to lie within local and regional NRs. Although 2021 results indicate adverse responses are still occurring, the magnitude of response was lower than in 2017 and 2018 and was similar to results observed in 2015 and 2016. In 2021, the adverse responses observed for *C. dubia* (Q1, Q3, and Q4), *H. azteca* (Q3), and *O. mykiss* (Q4) were attributed to nickel and nitrate. Teck has initiated several actions in response to these results (see Section 2.2.2), including diverting Cataract Creek through Swift Creek Ponds for eventual treatment at the FRO South AWTF, which avoids discharging into the seasonally dry reach of the Fording River; the water quality measured at FR_FRCP1 under base flow conditions suggests at least partial improvement in water quality and toxicity. Teck also applied to relocate the Fording River Operations compliance location from FR_FRCP1 to FR_FRABCH to better capture all upstream mine influence, and early indications from FR_FRABCH are that chronic toxicity is reduced relative to FR_FRCP1. Approval to move the compliance location was received in March 2021. Commissioning of the FRO South AWTF is expected to further improve water quality at FR_FRCP1, FR_FRABCH, and all downstream reaches.
  - At LC_DCDS, the overall frequency and magnitude of responses has remained stable (and mostly limited to invertebrate endpoints), but recently there has been improved understanding of causation. Nitrate was identified as potentially causing observed effects in some tests with *C. dubia* (Q4 2018, Q1 2020, and Q3 and Q4 2021), *H. azteca* (Q4 2019 and Q4 2021), and *O. mykiss* (Q4 2019), which corresponded with an observed increase in nitrate in these quarters (~20 to ~47 mg/L as N) compared to concentrations in previous quarters and years (5 to 10 mg/L as N). In addition to nitrate, nickel was identified as potentially causing observed effects in some tests with *C. dubia* (Q3 and Q4) and *H. azteca* (Q4) in 2021 but had not been identified as such in previous years. Teck has initiated several actions under the AMP Response framework and submitted the Nitrogen Source Control Plan Annual Report which encompasses water management and blasting practices at LCO related to nitrogen management. In addition, Teck also has initiated the conveyance and supplementation project in LCO Dry Creek, which is intended to improve water quality in Dry Creek in the earliest timeframe possible (pending approval, scheduled to be operational in Q1 2023). Longer-term mitigation to manage water quality in Dry Creek, incorporating water treatment, is being developed by Teck for operation in 2026.

- At CM_MC2, responses to nickel-sensitive crustaceans have been observed in historical testing, and this continued in 2021. However, the frequency and magnitude of toxicity has reduced in recent years (2019 to 2021) relative to 2017 and 2018. There has been a consistent pattern of nickel being identified as a potential or likely cause of observed effects in most of these tests. Spatially, nickel concentrations decrease from upstream to downstream on Michel Creek. At the station further downstream on Michel Creek (RG_MIDAG), nickel concentrations were lower relative to CM_MC2 (e.g., average nickel concentration of 5 µg/L at RG_MIDAG compared to 17 µg/L at CM_MC2, for *H. azteca* tests in 2021) and adverse test responses to crustaceans were reduced. As discussed in Section 2.2.2.2, Teck has initiated several actions under the AMP response framework to address water quality in Michel Creek. These actions include:
  - Expanding monitoring at CMm (including the addition of CM_MC3 [2018 only] and RG_MIDAG to characterize spatial extent of effects at CM_MC2)
  - Initiating laboratory and desktop studies to support the development of site-specific effects benchmarks for nickel in the Elk Valley. This work includes an ongoing series of laboratory-based toxicity studies and desktop data analyses to better understand the toxicity of nickel in Elk Valley waters, the influence of water chemistry factors on toxicity, and to what extent nickel may be contributing to observed effects in the chronic toxicity and biological monitoring programs. The outcome of this work is expected to be a set of site-specific benchmarks that will support evaluation and management of nickel at CMm and throughout the Elk Valley,
  - Modifying pit dewatering activities at CMm to minimize the effect of 34 pit pumping on downstream concentrations of nickel and other mine-influenced constituents. The changes in pit dewatering have reduced peak concentrations of nickel since 2019. This has been associated with a reduction in the frequency and magnitude of chronic toxicity test results in 2019, 2020 and 2021 as compared to 2017 and 2018.
  - Developing nickel tank and non-tank-based removal technology.
  - Evaluating mitigation options for nickel at CMm.

At other stations, there was no apparent consistent pattern of responses and no clear evidence of causal factors. The elevated incidence of adverse effects to *H. azteca* in Q3 and *P. subcapitata* in Q1 and Q4 did not occur in a concentration-dependent manner, are inconsistent with previous patterns, and appear to be related to high inter- reference variability (*H. azteca)* or the systematic depression responses across varying water chemistries (*P. subcapitata*).

Figure 4-3: Summary of Constituents Identified as Potentially Contributing to Observed Responses in 2021.



Note: Results were categorized using local and regional normal ranges calculated in this report, see Section 3.2.3. Due to a lab technician error in the Q2 amphipod test, the Fording River reference was re-tested in Q2 resulting in two sets of survival results for this station (see Section 3.3.1.2). Both results for the Fording River reference in Q2 were categorized as no adverse response and have been combined in this figure. All stations were re-tested in Q3. Possible and likely symbols are annotated with constituent(s) identified as potentially contributing to observed response. Ref Var = high inter-reference variability; Ni = nickel; NO3 = nitrate; UN = unknown: no water quality constituent was identified. Toxicity Identification Evaluations were conducted to support the causation assessment for *C. dubia* and *H. azteca* tests.

5.0 UNCERTAINTY

Sources of uncertainty associated with the interpretation of the quarterly and semi-annual toxicity testing program were:

- **Pairing of water quality and response data**—For the *H. azteca*, *P. promelas*, and *O. mykiss* tests, where test durations extended over multiple weeks, refresh water samples were collected on a weekly basis for the duration of the test. Refresh water samples, as well as the mean concentration over the test, were compared to chronic WQGs. In the causation assessment, effects data for these tests were paired with the mean concentration of the weekly samples to conduct correlations. If concentrations of water quality constituents were higher (or lower) in one of the weekly samples, then examination of weekly samples may have resulted in different conclusions regarding constituents retained for graphical analysis. This uncertainty is not expected to affect the overall interpretation of the quarterly and semi-annual toxicity testing program because weekly refresh samples were screened against chronic WQGs and EVWQP benchmarks, so constituents potentially contributing to observed effects were captured in the overall causation assessment. In addition, results of other testing of Elk Valley waters confirmed that variations over the span of a few weeks tend to be low (Golder 2018).
- **Mixture effects**—The causation assessment presented in Section 3.4 evaluated individual water quality constituents potentially contributing to observed test responses. Although ∑TUs were used in the causation assessment as an exposure metric for mixtures, it cannot be ruled out that some constituents may act in combination in such a way that is not captured by the ∑TU calculations. A qualitative multiple-stressor analysis was conducted in Chapter 8 of the EVWQP to assess potential interactions among the four EVWQP constituents. Although mechanisms of action have not been definitively determined, the available information indicates that these constituents likely have different mechanisms of action:
  - Selenium produces adverse effects following dietary accumulation of seleno-amino acids into protein-rich tissues.
  - Although the specific mechanism of action is uncertain, nitrate may exhibit toxicity following uptake and conversion to nitrite, which can then impair oxygen transport. In the Elk Valley, nitrate is not likely to contribute meaningfully to the osmotic pressure that may be important for sulphate toxicity, because it is present at low concentrations relative to the total ionic content of mine-influenced water.
  - Sulphate appears to act primarily on the iono-regulatory organs of freshwater organisms and may exert stress because of general osmoregulatory pressure or disruption of cellular membrane function in conjunction with other components of TDS.

  In addition to those constituents discussed in the EVWQP, nickel was also identified herein as a likely cause of toxicity in some tests. Potential mechanisms for nickel toxicity on aquatic organisms include disruption of trace element and ion homeostasis (e.g., calcium, magnesium, and iron), allergic reactions at respiratory epithelia, disruption of energy metabolism, and oxidative stress (Brix et al. 2017).

  Notwithstanding the different mechanisms of action, conceptually it is possible that effects from multiple constituents could operate in an additive manner where they ultimately affect the same toxicological endpoint (e.g., nitrate and TDS could separately influence *O. mykiss* survival via different toxicological pathways).

Most water quality constituents evaluated in the causation assessment had concentrations below water quality guidelines or orders of magnitude below effect concentrations. Based on the information above (i.e., different mechanisms of action and most concentrations below water quality guidelines or toxicological benchmarks), there is a low potential for additive effects of multiple constituents. It is unlikely that combined effects among the constituents would occur, and the approach taken in the assessment of evaluating each substance independently is expected to provide a reliable assessment of the overall potential for adverse effects from water quality.

- **Microbial Influence (Fathead Minnows)**—The uncertainty related to microbial activity (i.e., sporadic mortality phenomenon) has been substantially reduced through use of up to 20 µg/L copper amendment (Appendix B). In 2021, no tests with microbial presence had adverse effects on any endpoint.
  The implementation of copper amendment has greatly reduced this source of variance (that is unrelated to mining activity) and thereby reduced the incidence of false positive toxicity findings. As a result, the incidence of toxicity to fathead minnows decreased substantially from 2015 to 2021, to the extent that fathead minnows currently yield one of the lowest rates of significant results among the five species tested in quarterly or semi-annual chronic testing.

- **Microbial Influence (Rainbow Trout)**—The frequency of microbial observations was high, particularly in Q2; however, survival was affected in only one of seventeen tests with evidence of microbe presence. Similar to fathead minnows, the timing of mortalities in the affected test indicated that microbial interference can influence the survival endpoint but, as demonstrated in these results, the use of copper amendment was effective in preventing large magnitude effects to survival. Although many of the rainbow trout tests (80%) had some evidence of microbes in one or more replicates, adverse effects were not observed in most tests, suggesting that rainbow trout are often tolerant of at least some level of microbe presence. Where microbes were observed, the survival endpoint in that replicate was often, but not always, reduced relative to replicates without documentation of microbes.

- **High Inter-Reference Variability**—There were atypical findings observed for *H. azteca* dry weight (Q3) and *P. promelas* survival (Q1), where high variability was observed among references tested in the same quarter. This variability introduces elevated uncertainty associated with the assigned narrative category. For many of the adverse responses associated with these references, the responses did not match previous tests or water quality. These tests did not warrant outright rejection as invalid test outcomes, but instead indicate higher uncertainty than in previous testing for these endpoints.

- **Atypical Endpoint Results**—There were atypical findings for *P. subcapitata* (Q1 and Q4) where many test sites had mean cell yield that was systematically depressed, despite the variability in water quality profiles. This resulted in poor correspondence between water chemistry and responses. The causation analysis was also unable to identify an explanation for these test results based on water quality composition. These unusual findings did not warrant outright rejection as invalid test outcomes, but instead indicate higher uncertainty than in previous years for this endpoint. These results were retained in the toxicity summaries for each location; testing in 2022 will help to confirm whether the findings are anomalous (i.e., not repeated through testing under similar exposure conditions).

6.0 RECOMMENDATIONS

Recommendations for future quarterly and semi-annual toxicity testing programs are:

- **Revisit the potential contribution of nickel in historical test results for invertebrates**—For the 2022 reporting, we recommend that the potential contribution of nickel in historical invertebrate results be re- evaluated using the final nickel benchmark, which is expected in 2022. This will improve interpretation of historical comparisons and potentially amend adverse responses that currently have "no constituent identified".
- **Return to standard *C. dubia* Environment Canada protocol tests**—In 2021, the test durations for *C. dubia* were run according to protocol methods (i.e., 7 ± 1 day), with the test being terminated on the day that at least 60% of control organisms have produced three broods. A parallel set of results was obtained by extending the test to 8 days, regardless of when the control organisms produced a third brood, and the output was counted from the first three broods only. As discussed in Section 3.3.1.1, the 2021 tests did not identify a meaningful difference between procedures (i.e., influence test significance decisions). Therefore, as recommended in the 2020 Chronic Toxicity Report (Golder 2021a), testing may return to the Environment Canada protocol in subsequent years, beginning in 2022.
- **Revise *H. azteca* refresh rate from twice-daily to once-daily**—Historical testing has used twice-daily water refreshes to be consistent with sediment test methods. Nautilus has successfully implemented *H. azteca* tests with thrice-weekly water refreshes, as is recommended in the Environment Canada method for the water-only 14-d exposure for other testing programs. Per the February 2022 EMC meeting, we propose to use once-daily water refreshes which will reduce organism handling and may help to address high inter-replicate variability observed in recent rounds of testing.
- **Conduct *P. promelas* tests using US EPA 2016 method starting in Q1 2023**—Historical testing for *P. promelas* used US EPA 1996 and ASTM 2013 test methods, as specified in Permit 107517. As discussed at the February 2022 EMC meeting, we propose to use the updated test method, US EPA 2016, starting in Q1 2023. Key differences between the methods include 20 fish per replicate as opposed to 15, increased volume per exposure vessel, and thrice-daily feeding as opposed to twice-daily. There is a potential for raw growth metrics to be affected (i.e., absolute dry weight in individual measurements); however, this is not expected to affect control-normalized metrics or comparisons to reference. This will be supported by paired control tests conducted by Nautilus in 2022, to compare control performance using the two methods.
- **Maintain modified *P. promelas* test procedures**—Nautilus conducted *P. promelas* quarterly tests with reference and test site water treated with 10 µg/L to 30 µg/L of copper amendment (Appendix B). Due to the efficacy and minimal impact on control performance, copper treatment is recommended as a method to effectively mitigate toxicity due to microbial/fungal interference, while still allowing a relevant measure of the presence of other toxicants in the samples. In most testing conducted to date, a copper amendment of 15 to 30 µg/L has effectively mitigated toxicity due to microbial effects. Copper additions up to 20 µg/L are approved for standard quarterly testing with fathead minnow; testing with higher copper doses (e.g., 40 µg/L) remains an option for Teck to consider as part of test refinement but would require ENV approval for formal amendment of the study design. Given the cost and complexity of additional studies conducted over multiple copper concentrations, we recommend keeping the 10–20 µg/L amendment range specified in the January 2018 amendment to Permit 107517 and continuing to evaluate frequency and intensity of microbial interference. Ameliorating factors that influence copper toxicity (e.g., hardness, DOC) will be considered when determining the base copper amendment within the range of 10 µg/L to 20 µg/L. We also recommend that, where the optimal copper concentration is unclear, a concentration toward the upper end of this range be applied.

- **Maintain *O. mykiss* test procedures**—Nautilus conducted *O. mykiss* semi-annual tests with reference and test site water treated with 20 µg/L of copper amendment (Appendix B). Due to the efficacy and minimal impact on control performance, copper treatment is recommended as a method to effectively mitigate toxicity due to microbial/fungal interference, while still allowing a relevant measure of the presence of other toxicants in the samples. Results of the 2021 testing indicated that amendments of 20 µg/L copper were not always effective. Copper additions up to 20 µg/L copper are approved by ENV for testing with rainbow trout; therefore, it is recommended to continue testing with this dose and to continue monitoring the frequency of microbial observations. Similar to fathead minnow testing, we recommend that, where the optimal copper concentration is unclear, a concentration toward the upper end the range of 10 µg/L to 20 µg/L be applied, particularly as rainbow trout are predicted to be less sensitive to copper relative to fathead minnows[40]. If the frequency of microbes increases in 2022, or the evidence for interference by microbes increases, we will recommend that the concentrations of copper be increased to a maximum of 40 µg/L.
- **Continue toxicity testing with Elk River, Fording River, Michel Creek, and South Line Creek reference waters**—Test organism responses references were usually comparable within a given season. However, in some quarterly tests, responses were significantly different in reference waters. Inclusion of all four references provided useful information about the natural variability in reference responses and important context for the interpretation of test site results. The 2021 data confirmed findings from previous years that, although individual references can vary within a single batch of testing, the long-term performance of reference waters is generally equivalent across all four reference sites. The strength of including multiple reference stations appears to come from increased sample size used to develop reliable reference normal ranges, rather than a need to characterize references in specific watersheds within the Elk Valley. The additional references provide a contingency for an anomalous response in one reference water (as occurred in 2021 for the *P. promelas* tests with Elk River and Michel Creek references). Furthermore, the increase in sample sizes for recently-added reference stations (Michel Creek and South Line Creek) has improved the confidence in the local NRs calculated for these waters.
- **Continue RG_MIDAG testing with invertebrates in 2022**—Testing at RG_MIDAG has been primarily conducted with *C. dubia* and *H. azteca* to characterize the spatial extent of potential nickel effects to invertebrates. Testing conducted to date indicates a lack of adverse responses at RG_MIDAG. Moving forward, it is recommended that if 2022 testing also shows a lack of adverse responses, RG_MIDAG testing with *C. dubia* and *H. azteca* can be discontinued and aqueous nickel concentrations can be used to evaluate the spatial extent of potential effects. Nickel concentrations in Michel Creek are well below effect concentrations for *O. mykiss*, *P. promelas*, and *P. subcapitata*, as demonstrated by the lack of adverse responses for these test species at both CM_MC2 and RG_MIDAG and screening against reported effect concentrations; therefore, testing at RG_MIDAG for these species is not recommended.

[40] This prediction is based on the output of the model developed by Kevin Brix that calculates the estimated low-effect benchmark for chronic toxicity to fish based on concentrations of toxicity modifying factors.

7.0 CLOSURE

We trust the above meets your present requirements. If you have questions or require additional details, please contact the undersigned.

Yours very truly,

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https://golderassociates.sharepoint.com/sites/155049/project files/6 deliverables/3.0 issued/004-r-rev1-regional chronic tox report/21500229-004-r-rev1-1000_chronictox_report 01sept_22.docx

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APPENDIX A

Legal Requirements

Permit #107517 issued under the Environmental Management Act (Elk Valley EMA Permit) – Section 8.9

8.9 CHRONIC TOXICITY TESTING PROGRAM

The permittee must develop and implement a toxicity testing program for receiving environments affected by coal mining operations. The purpose of the program is to evaluate chronic toxicity at the compliance points and other locations throughout the Elk Valley.

The program shall be planned and implemented by qualified professionals using methods that have documented test procedures, reliability, and quality assurance.

The toxicity testing program must include, at a minimum, the following elements:

i. Once every three years beginning in 2015, bioassays must be conducted to evaluate the survival and development (incidence of deformities) of targeted aquatic species using gametes obtained from species using habitats in the Elk River, the Fording River, their tributaries, and associated lentic habitats, and the Koocanusa Reservoir. The concentrations of selenium in the eggs of each female spawned must be measured.

ii. For the purposes of the following requirements the listed mine-influenced stations must include:

- FR_FRCP1 (EMS E300071),
- FR_FRABCH (EMS 223753),
- GH_FR1 (EMS 0200378),
- LC_LC5 (EMS E200028),
- GH_ERC (E300090),
- CM_MC2 (EMS E258937),
- EV_MC2 (EMS E300091),
- EV_HC1 (EMSE102682),
- LC_LCDSSLCC (EMS E297110),
- LC_LC3 (EMS 200337), and

- LC_DCDS (EMS E295210).

Appropriate reference stations must be determined in consultation with the Environmental Monitoring Committee.

The following toxicity test must be conducted during each semi-annual (spring and fall) sampling event at all listed mine-influenced stations plus multiple reference stations:

- 30-day early life-stage test with the rainbow trout (*Oncorhynchus mykiss*; EPS1/RM/28) using <24-hour post-fertilization eggs; endpoints: survival, viability, length, wet weight (plus documentation of observed deformities or behavioral changes); and
- 28-day water-only test with amphipod, *Hyalella azteca* (adapted from USEPA 2000, with appropriate supplementation of halides); endpoints: survival, growth.

The following toxicity tests must be conducted during each semi-annual (summer and winter) sampling event at all listed mine-influenced stations plus multiple reference stations:

- 30-day early life-stage test with the fathead minnow, *Pimephales promelas* (USEPA 1996) using <24-hour post-fertilization eggs; endpoints: survival, normal development, length, biomass (plus documentation of observed deformities or behavioral changes).

The following toxicity tests must be conducted during each quarterly sampling event at all listed mine-influenced stations plus multiple reference stations:

- 7-day water-only test with the cladoceran, *Ceriodaphnia dubia* (EPS1/RM/21); endpoints: survival, reproduction; and
- 72-hour test with the alga, *Pseudokirchneriella subcapitata* (EPS1/RM/25); endpoints: growth inhibition.

iii. Toxicity testing methods must be consistent with Environment Canada's, U.S. Environmental Protection Agency's, or ASTM's approved biological test methods. Waters used for fathead minnow (Pimephales promelas) and rainbow trout (Oncorhynchus mykiss) 30-day early life-stage tests may be augmented with up to, and not exceeding, 20 ug/L copper to control for fungi and microbial pathogens. Ameliorating factors that influence copper toxicity (e.g., water hardness, dissolved organic carbon, and major ions) must be considered when determining the lowest and most effective dose below this limit.

iv. A Quality Assurance/Quality Control component.

v. A proposed schedule of dates that coincide with water quality sampling and that target predicted worst-case times such as low flow, during flocculant use, or when discharge quality is expected to be reduced.

The suite of toxicity tests will be reviewed on an annual basis by the EMC and recommendations provided to the director for consideration.

8.9.1 SULPHATE TOXICITY AT HIGH HARDNESS CONCENTRATIONS

The permittee must develop with input from the EMC and implement a toxicity testing program specifically to assess sulphate toxicity at high hardness concentrations. Results will be used to support finalization of long-term sulphate site performance objectives.

The following toxicity test shall be conducted as a component of the Sulphate toxicity testing program.

- 30-day early life-stage test with the fathead minnow, *Pimephales promelas* (USEPA 1996) using <24-hour post-fertilization eggs; endpoints: survival, hatching, growth, deformity.
- Other sensitive species (amphibian, trout, water flea, etc.) shall be included.

Monitoring results and interpretation must be compiled into a written report and submitted to the satisfaction of the director by December 31, 2017.

8.9.2 SUBLETHAL TOXICITY STUDY

The permittee must develop with input from the EMC and implement a sublethal toxicity study to confirm that surface waters meeting the Site Performance Objectives for the order stations are not toxic to sensitive aquatic receptors. The permittee must submit the study design to the director by April 30, 2015.

APPENDIX B

Quarterly and Semi-Annual Laboratory Reports

Toxicity testing on Elk Valley Samples with *Ceriodaphnia dubia*, *Pseudokirchneriella subcapitata* and *Pimephales promelas*

First Quarter 2021

Final Report

July 29, 2021

Submitted to: **Teck Coal Ltd.**
Sparwood, BC

#4, 6125 12 St SE, Calgary, Alberta T2H 2K1

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SIGNATURE PAGE

Report By:
Karen Lee, RPBio
Project Biologist

Reviewed By:
Melanie Gallant, PhD
Environmental Toxicologist

This report has been prepared by Nautilus Environmental Company Inc. based on data and/or samples provided by our client and the results of this study are for their sole benefit. Any reliance on the data by a third party is at the sole and exclusive risk of that party. The results presented here relate only to the samples tested.

1.0 INTRODUCTION

Nautilus Environmental (Nautilus) conducted toxicity tests for Teck Coal Ltd. (Teck) on samples collected from various locations in the Elk Valley as part of a quarterly toxicity testing program required under the BC Ministry of Environment and Climate Change Strategy permit number 107517.

Stations sampled in the first quarter of 2021 are shown in Figure 1 and align with the integrated chronic toxicity testing program, which was designed to eliminate redundancy between Permit 107517 Section 9.8 (ii) and Permit 106970 toxicity testing programs. The integrated program was approved by BC Ministry of Environment and Climate Change Strategy on March 4, 2019 (BC ENV 2019). Four new sites from the Upper Fording River location were added to the testing program for *Ceriodaphnia dubia* testing. Test species required to be tested quarterly include a cladoceran (*Ceriodaphnia dubia*) and a unicellular green alga (*Pseudokirchneriella subcapitata*). Tests are also required on a semi-annual basis using rainbow trout (*Oncorhynchus mykiss*; Q2 and Q4), an amphipod (*Hyalella azteca*; Q2 and Q4), and fathead minnows (*Pimephales promelas*; Q1 and Q3).

Water samples used for testing were transported in 20-L plastic containers in coolers containing ice packs. Samples were received at temperatures ranging from -0.7 to 8.4°C and were stored in the dark at 4 ± 2°C prior to testing. Table 1 summarizes the toxicity tests that were conducted on each sample as well as sample collection dates. Samples were collected weekly on the dates shown in Table 1 for the duration of the *P. promelas* test. The *C. dubia* and *P. promelas* test was conducted at the Nautilus Environmental laboratory in Calgary, AB; the *P. subcapitata* test was conducted at the Burnaby, BC location.

This report presents the results of the toxicity tests. Copies of laboratory data sheets and printouts of statistical analyses are provided in Appendices A through C. The chain-of-custody forms are provided in Appendix D. Results of analytical chemistry that was performed on the samples tested in this program are uploaded by Teck to the Environmental Management System database. Analytical chemistry samples were collected by Teck personnel at the same time the samples were collected for toxicity testing.

Figure 1. Chronic toxicity monitoring locations.

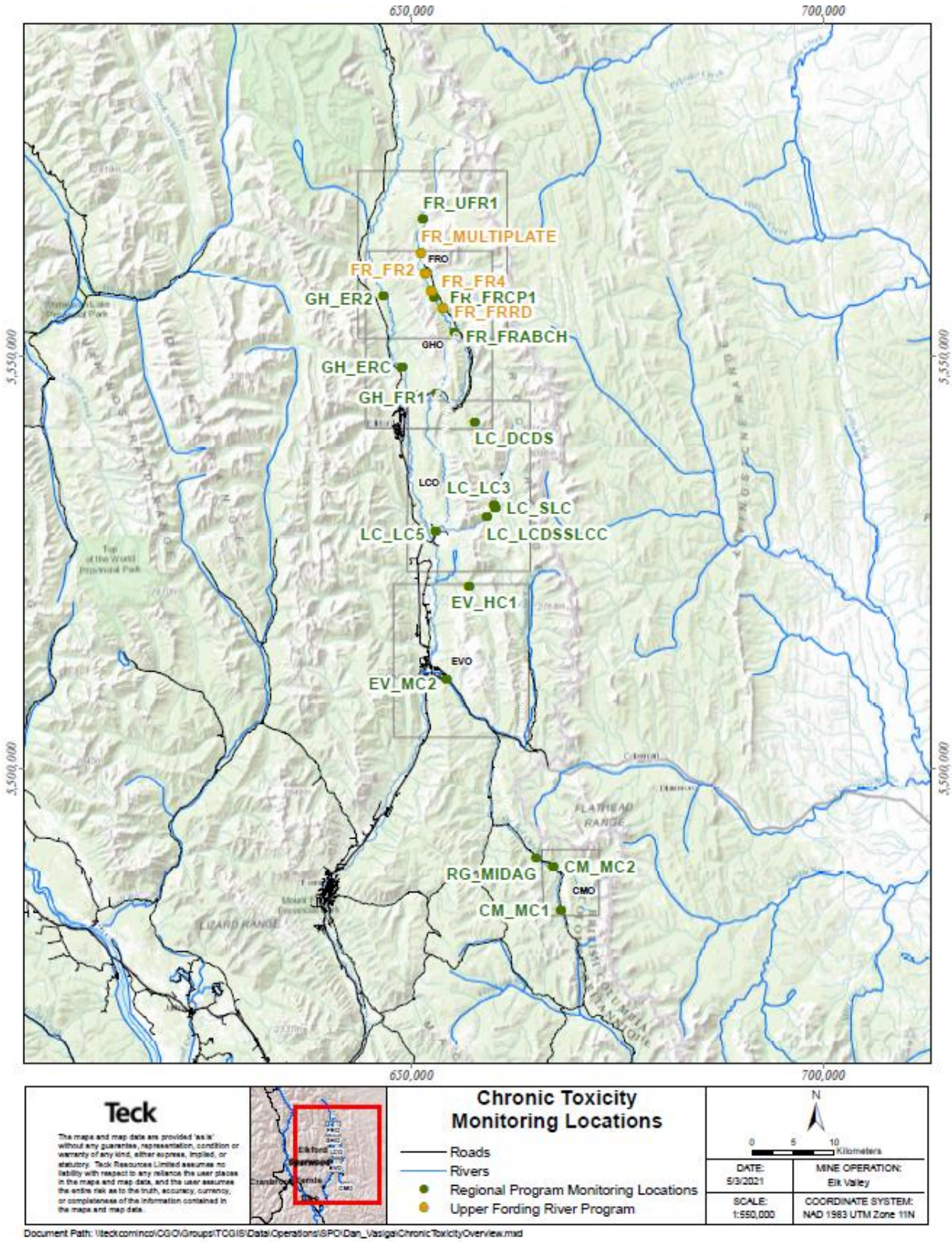

Table 1. Summary of toxicity testing program.

Sample ID	EMS Location ID	Species Tested	Sample Collection Dates
FR_UFR1 *	E300071	*C. dubia*, *P. subcapitata*, and *P. promelas*	February 23, March 2, 9,16, 23, 30, and April 13, 2021
GH_ER2 *	E300090	*C. dubia*, *P. subcapitata*, and *P. promelas*	February 23, March 2, 9,16, 23, 30, and April 13, 2021
CM_MC1 *	E258937	*C. dubia*, *P. subcapitata*, and *P. promelas*	February 23, March 2, 9,16, 23, 30, and April 13, 2021
LC_SLC *	E282149	*C. dubia*, *P. subcapitata*, and *P. promelas*	February 23, March 2, 9,16, 23, 30, and April 13, 2021
FR_FRABCH	E223753	*C. dubia*, *P. subcapitata*, and *P. promelas*	February 23, March 2, 9,16, 23, 30, and April 13, 2021
FR_FRCP1	E299272	*C. dubia*, *P. subcapitata*, and *P. promelas*	February 23, March 2, 9,16, 23, 30, and April 13, 2021
GH_FR1	E200028	*C. dubia*, *P. subcapitata*, and *P. promelas*	February 23, March 2, 9,16, 23, 30, and April 13, 2021
GH_ERC	E258175	*C. dubia*, *P. subcapitata*, and *P. promelas*	February 23, March 2, 9,16, 23, 30, and April 13, 2021
CM_MC2	E300091	*C. dubia*, *P. subcapitata*, and *P. promelas*	February 23, March 2, 9,16, 23, 30, and April 13, 2021
RG_MIDAG	-	*C. dubia*, and *P. promelas*	February 23, March 2, 9,16, 23, 30, and April 13, 2021
EV_MC2	E102682	*C. dubia*, *P. subcapitata*, and *P. promelas*	February 23, March 2, 9,16, 23, 30, and April 13, 2021
EV_HC1	E299270	*C. dubia*, *P. subcapitata*, and *P. promelas*	February 23, March 2, 9,16, 23, 30, and April 13, 2021
LC_DCDS	E291569	*C. dubia*, *P. subcapitata*, and *P. promelas*	February 23, March 2, 9,16, 23, 30, and April 13, 2021
LC_LC3	E297110	*C. dubia*, *P. subcapitata*, and *P. promelas*	February 23, March 2, 9,16, 23, 30, and April 13, 2021
LC_LC5	0200389	*C. dubia*, *P. subcapitata*, and *P. promelas*	February 23, March 2, 9,16, 23, 30, and April 13, 2021
LC_LCDSSLCC	E282149	*C. dubia*, *P. subcapitata*, and *P. promelas*	February 23, March 2, 9,16, 23, 30, and April 13, 2021
FR_FR4	0200311	*C. dubia*, *P. subcapitata*, and *P. promelas*	February 23, March 2, 9,16, 23, 30, and April 13, 2021
FR_FRRD	E300097	*C. dubia*, *P. subcapitata*, and *P. promelas*	February 23, March 2, 9,16, 23, 30, and April 13, 2021
FR_FR2	200201	*C. dubia*, *P. subcapitata*, and *P. promelas*	February 23, March 2, 9,16, 23, 30, and April 13, 2021
FR_MULTIPLATE	--	*C. dubia*, *P. subcapitata*, and *P. promelas*	February 23, March 2, 9,16, 23, 30, and April 13, 2021

* Site water controls

2.0 METHODS

Methods for the toxicity tests using *C. dubia* (test initiated on April 15th, 2021), *P. subcapitata* (test initiated on February 25th, 2021), and *P. promelas subcapitata* (test initiated on March 6th, 2021) are summarized in Tables 2 through 4. Laboratory control water was 20% Perrier water prepared with deionized water for *C. dubia*; deionized water with supplemented nutrients for *P. subcapitata*; and dechlorinated City of Calgary municipal tap water with the addition of 4 mg/L potassium chloride (KCl) for *P. promelas*.

For *C. dubia*, the test protocol specifies that test duration must be 7 ± 1 day, with the test being terminated on the day that at least 60% of control organisms have produced three broods. To provide additional information on reproduction patterns in the samples, and as requested by Teck, the tests were extended to 8 days, regardless of when 60% of controls had produced three broods. However, the results reported below were calculated based on the specifications of the test method, which in this case was based on the reproduction that had been observed up to Day 7 of exposure. The additional information on reproduction up to Day 8 of exposure is available in Appendix A.

As requested by Teck, site water used in the tests with *P. promelas* were amended with either 10, 15, or 20 µg/L of copper, depending on the hardness of each sample, to reduce the potential for confounding effects from microbial growth. Fathead minnows are known to be susceptible to adverse effects caused by fungi and microbes (Grothe and Johnson, 1996; Kszos et al., 1997; Downey et al., 2000). Results of toxicity tests and Toxicity Identification Evaluation efforts conducted in 2015 indicated that artefactual toxicity (*i.e.*, adverse effects that were not associated with toxicants in the sample) had occurred in fathead minnow tests using ambient water samples from the Elk Valley and amendment of the samples with a low dose of copper appeared to counteract the adverse effect. Consequently, samples were amended with copper for the *P. promelas* tests in order to reduce the potential adverse effects caused by fungi and microbes.

The fathead minnows were evaluated for potential microbial growth during daily replenishments and test termination (Nautilus, 2020). Microbial growth is noted on the bench sheets at every instance of visual confirmation of a superficial fungus-like growth around the gill region and/or surrounding the surfaces of the test organisms, and high mortality that is not consistent across replicates, as described in Downey et al. (2000).

Statistical analyses were performed using CETIS (Tidepool Scientific Software, 2013), and involved comparison of results to both the laboratory and site water controls.

Table 2. Test conditions: *Ceriodaphnia dubia* survival and reproduction test.

Test species	*Ceriodaphnia dubia*
Organism source	In-house culture
Organism age	<24 hour old neonates, produced within a 12 hour window
Test type	Static-renewal
Test duration	8 days*
Test vessel	20-mL glass test tube
Test volume	15 mL
Test solution depth	10 cm
Test concentrations	100% (undiluted) sample, plus laboratory control
Test replicates	10 per treatment
Number of organisms	1 per replicate
Control water	20% Perrier water and 80% deionized water + 5 µg/L Se and 2 µg/L vitamin B12
Test solution renewal	Daily (100% renewal)
Test temperature	25 ± 1°C
Feeding	Daily with *Pseudokirchneriella subcapitata* and TCC[1] (3:1 ratio)
Light intensity	100 to 600 lux at water surface
Photoperiod	16 hours light / 8 hours dark
Aeration	None
Test measurements	Temperature, dissolved oxygen, pH and conductivity measured daily; hardness and alkalinity of undiluted sample measured at test initiation; survival and reproduction checked daily
Test protocol	Environment Canada (2007a), EPS 1/RM/21
Statistical software	CETIS Version 1.9.4
Test endpoints	Survival and reproduction
Test acceptability criteria for controls	≥80% survival; ≥15 young per surviving control producing three broods; ≥60% of controls producing three or more broods; no ephippia present
Reference toxicant	Sodium chloride (NaCl)

* Test duration was extended to 8 days to provide additional information on patterns of reproduction. Summarized data and calculated endpoints are based on results from Day 6, according to the standard test procedure; however, all of the data through 8 days are provided in Appendix A.

[1] TCC = Trout Chow + cerophyl

Table 3. Test conditions: *Pseudokirchneriella subcapitata* growth inhibition test.

Test species	*Pseudokirchneriella subcapitata*, strain CPCC# 37
Organism source	In-house axenic culture, obtained from Canadian Phycological Culture Center, and originally isolated from Nivelta River, Norway.
Organism age	3-to 7-day old culture in logarithmic growth phase
Test type	Static
Test duration	72 hours
Test vessel	Microplate
Test volume	220 µL
Test concentrations	Full strength sample diluted to 95.2% (v/v) by addition of nutrients, plus laboratory control
Test replicates	4 per treatment; 8 for laboratory control and site controls
Number of organisms	10,000 cells/mL
Control water	Deionized water supplemented with nutrients
Test solution renewal	None
Test temperature	24 ± 2°C
Feeding	None
Light intensity	3600 to 4400 lux
Photoperiod	24 hours light
Aeration	None
Test measurements	Test area temperature measured daily; temperature and pH measured at test initiation; pH of two control wells measured at test termination
Test protocol	Environment Canada (2007b), EPS 1/RM/25
Statistical software	CETIS Version 1.9.4
Test endpoints	Algal cell growth inhibition
Test acceptability criteria for controls	>16-fold increase in number of algal cells; CV ≤ 20%; no trend when analyzed using Mann-Kendall test
Reference toxicant	Zinc (added as $ZnSO_4$)

Table 4. Test conditions: 32-day fathead minnow *(Pimephales promelas)* survival and growth test.

Test species	*Pimephales promelas*
Organism source	Aquatic Biosystems, CO
Organism age	<24 hours
Test type	Static-renewal
Test duration	From egg stage until 28 days post hatch
Test vessel	1-L glass jar
Test volume	1 L
Test concentrations	100% (undiluted) sample amended with 10, 15, or 20 µg/L Cu, plus laboratory control and control amended with 10, 15, or 20 µg/L Cu
Test replicates	4 per treatment
Number of organisms	10 per replicate
Control water	Dechlorinated City of Calgary municipal tapwater amended with 4 mg/L KCl.
Test solution renewal	Daily (80% renewal)
Test temperature	25 ± 1°C
Feeding	Twice a day, after hatch, with newly hatched brine shrimp (*Artemia* nauplii)
Light intensity	100 to 500 lux
Photoperiod	16 hours light / 8 hours dark
Aeration	None unless dissolved oxygen fell to less than 60% saturation
Test measurements	Temperature, dissolved oxygen, pH and conductivity measured daily; hardness and alkalinity measured upon arrival; survival and any incidence of fungal growth on the test organisms recorded daily
Test protocol	US EPA (1996) and ASTM (2013)
Statistical software	CETIS Version 1.9.4
Test endpoints	Hatch, survival, length, biomass, normal development (which assesses incidence of deformities)
Test acceptability criteria for controls	>66% hatch, ≥70% post-hatch survival
Reference toxicant	Sodium chloride (NaCl)

3.0 RESULTS

3.1 *Ceriodaphnia dubia*

Results of the toxicity tests using *C. dubia* are provided in Table 5. The site water control samples from FR_UFR1, GH_ER2, CM_MC1 and LC_SLC performed similarly to the laboratory control, indicating that there were no adverse effects associated with the upstream stations.

There were no adverse effects on survival in any of the samples tested; survival ranged between 80 and 100%. Significantly lower reproduction relative to the laboratory control or one or more of the site controls was observed in FR_FRCP1, CM_MC2 and FR_FR4.

3.2 *Pseudokirchneriella subcapitata*

Results of the toxicity tests using *P. subcapitata* are provided in Table 6. The site water controls FR_UFR1, GH_ER2, CM_MC1 and LC_SLC produced 3.0- to 3.4-fold greater growth than the laboratory control. This finding is not unusual, since the higher ionic strength associated with the site water controls would be expected to stimulate cell growth of this species relative to the very low ionic strength associated with the laboratory control water.

There were no adverse effects on cell yield in any of the samples tested relative to the laboratory control except in sample FR_FRCP1. Stimulation of growth was observed in all samples tested compared to the laboratory control with the exception of FR_FRCP1; percent stimulation ranged between 121.7 and 243.4%. With the exception of GH_FR1 and GH_ERC, all samples had reduced cell yield to one or more site controls.

3.3 *Pimephales promelas*

Results of the toxicity tests using *P. promelas* are provided in Table 7. Relative to the laboratory control, there were no adverse effects observed in the copper-amended controls for hatch rate, survival, biomass, or length or normal development. Adverse effects were observed in site controls GH_ER2 and CM_MC1 relative to the respective copper controls in three endpoints.

There were no adverse effects observed in hatch rate for any samples with the exception of LC_DCDS, which was significantly lower compared to the laboratory control. Adverse effects on survival in downstream stations relative to one or more controls were observed in samples FR_FRCP1, RG_MIDAG, FR_FR2 and FR_FR4. Decreased biomass relative to one or more controls

was observed in FR_FRCP1 and FR_FR2. No adverse effects on length or normal development were observed in downstream samples.

Microbial growth was observed on test organisms in one or more replicates of samples CM_MC2 (replicate d), FR_FR4 (replicate d), FR_FR2 (all replicates), and F4_FRRD (replicate c), suggesting that the copper dose employed in these samples was not sufficient to curtail microbial effects. In the case of FR_FR2, observations of microbial growth were noted every day in at least one replicate in between day 9 and 15 of the test. Observed patterns are consistent with previous observations regarding mortalities caused by microbial growth.

Table 5. Results: *Ceriodaphnia dubia* survival and reproduction test.

Sample ID	Survival (%)	Reproduction (Mean ± SD)
Laboratory Control	100	19.9 ± 7.8
FR_UFR1 (Site Control)	100	18.9 ± 2.2
GH_ER2 (Site Control)	90	20.0 ± 9.4
CM_MC1 (Site Control)	90	18.5 ± 7.6
LC_SLC (Site Control)	80	13.2 ± 6.9
FR_FRABCH	100	19.8 ± 4.8
FR_FRCP1	90	10.4 ± 5.5 * # ‡
GH_FR1	100	20.3 ± 3.4
GH_ERC	100	16.5 ± 4.1
CM_MC2	100	11.8 ± 5.7 * #
RG_MIDAG	100	15.5 ± 5.0
EV_MC2	100	21.3 ± 1.6
EV_HC1	100	25.9 ± 2.2
LC_DCDS	90	17.9 ± 7.2
LC_LC3	90	18.5 ± 7.9
LC_LC5	100	19.8 ± 6.5
LC_LCDSSLCC	100	18.2 ± 5.5
FR_FR4	100	14.7 ± 4.6 *
FR_FR2	100	15.1 ± 5.3
FR_MULTIPLATE	100	9.8 ± 8.3
FR_FRRD	100	18.0 ± 7.7

SD = Standard Deviation
* Result was significantly lower than the laboratory control
# Result was significantly lower than the FR_UFR1 site control
† Result was significantly lower than the GH_ER2 site control
‡ Result was significantly lower than the CM_MC1 site control
§ Result was significantly lower than the LC_SLC site control

Table 6. Results: *Pseudokirchneriella subcapitata* growth inhibition test.

Sample ID	Cell Yield (x 10^4 cells/mL) (Mean ± SD)	Stimulation relative to laboratory control (%)
Laboratory Control	33.4 ± 1.4	--
FR_UFR1 (Site Control)	114.6 ± 7.3	243.4
GH_ER2 (Site Control)	107.2 ± 6.8	221.4
CM_MC1 (Site Control)	100.9 ± 13.0 #	202.2
LC_SLC (Site Control)	102.8 ± 7.8 #	207.9
FR_FRABCH	74.0 ± 2.2 #, †, ‡, §	121.7
FR_FRCP1	20.2 ± 2.1 *, #, †, ‡, §	--
GH_FR1	103.2 ± 14.4	209.4
GH_ERC	111.8 ± 16.7	234.8
CM_MC2	76.5 ± 5.0 #, †, ‡, §	129.2
EV_MC2	82.5 ± 6.8 #, †, ‡, §	147.2
EV_HC1	91.2 ± 7.1 #, †	173.4
LC_DCDS	78.5 ± 5.0 #, †, ‡, §	135.2
LC_LC3	74.5 ± 9.0 #, †, ‡, §	123.2
LC_LC5	76.5 ± 3.9 #, †, ‡, §	129.2
LC_LCDSSLCC	86.0 ± 3.4 #, †, ‡, §	157.7

SD = Standard Deviation
* Result was significantly lower than the laboratory control
# Result was significantly lower than the FR_UFR1 site control
† Result was significantly lower than the GH_ER2 site control
‡ Result was significantly lower than the CM_MC1 site control
§ Result was significantly lower than the LC_SLC site control

Table 7. Results: *Pimephales promelas* survival and growth test.

Sample ID	(Mean ± SD)				
	Hatch (%)	Survival (%)	Biomass (mg)	Length (mm)	Normal development (%)
Laboratory Control	100.0 ± 0.0	90.0 ± 8.6	2.28 ± 0.29	10.9 ± 0.4	100.0 ± 0.0
Laboratory Control [+10 µg/L Cu]	98.3 ± 3.3	95.0 ± 6.4	2.16 ± 0.19	10.7 ± 0.2	100.0 ± 0.0
Laboratory Control [+15 µg/L Cu]	98.3 ± 3.3	84.9 ± 17.5	2.42 ± 0.38	11.1 ± 0.7	100.0 ± 0.0
Laboratory Control [+20 µg/L Cu]	95.0 ± 6.4	84.5 ± 17.5	2.34 ± 0.25	11.2 ± 0.6	97.9 ± 4.2
FR_UFR1 (Site Control) [+20 µg/L Cu]	95.0 ± 6.5	87.7 ± 6.8	2.25 ± 0.41	10.4 ± 0.9	100.0 ± 0.0
GH_ER2 (Site Control) [+10 µg/L Cu]	98.3 ± 3.3	32.3 ± 11.6 [a, b, 1, 4]	1.18 ± 0.45 [a]	10.9 ± 0.4	86.9 ± 12.5 [a, b, 1, 4]
CM_MC1 (Site Control) [+15 µg/L Cu]	98.3 ± 3.3	47.4 ± 7.0 [a, c, 1, 4]	1.60 ± 0.33 [c,]	10.9 ± 0.8	79.2 ± 17.7 [a, c, 1, 4]
LC_SLC (Site Control) [+15 µg/L Cu]	98.3 ± 3.3	79.4 ± 16.1	2.01 ± 0.10	11.5 ± 0.6	100.0 ± 0.0
FR_FRABCH [+20 µg/L Cu]	98.3 ± 3.3	79.5 ± 6.3	2.10 ± 0.42	10.5 ± 0.5	95.0 ± 10.0
FR_FRCP1 [+20 µg/L Cu]	98.3 ± 3.3	48.9 ± 16.9 [a, d, 1, 4]	1.70 ± 0.26 [d]	11.2 ± 0.7	95.8 ± 8.3
GH_FR1 [+20 µg/L Cu]	91.7 ± 8.4	89.5 ± 9.1	2.28 ± 0.29	10.6 ± 0.7	94.2 ± 7.4
GH_ERC [+10 µg/L Cu]	98.3 ± 3.3	89.9 ± 3.7	2.25 ± 0.17	10.5 ± 0.2	85.0 ± 8.4
CM_MC2 [+20 µg/L Cu][M]	98.3 ± 3.3	94.9 ± 3.4	2.05 ± 0.31	10.1 ± 0.7	96.6 ± 4.0
RG_MIDAG [+15 µg/L Cu]	98.3 ± 3.3	74.5 ± 6.6 [b]	1.90 ± 0.24	10.8 ± 0.4	95.4 ± 5.3
EV_MC2 [+20 µg/L Cu]	95.1 ± 11.6	82.0 ± 7.6	2.00 ± 0.26	10.7 ± 0.6	98.1 ± 3.9
EV_HC1 [+20 µg/L Cu]	96.7 ± 3.9	81.0 ± 7.0	2.20 ± 0.17	10.6 ± 0.3	97.9 ± 4.2

SD = Standard Deviation; M = microbial growth
[a] Result was significantly lower than the laboratory control
[b] Result was significantly lower than the 10 µg/L copper-treated laboratory control for fathead minnow
[c] Result was significantly lower than the 15 µg/L copper-treated laboratory control for fathead minnow
[d] Result was significantly lower than the 20 µg/L copper-treated laboratory control for fathead minnow
[1] Result was significantly lower than the FR_UFR1 site control
[2] Result was significantly lower than the GH_ER2 site control
[3] Result was significantly lower than the CM_MC1 site control
[4] Result was significantly lower than the LC_SLC site control

Table 7. Results: 32-day *Pimephales promelas* survival and growth test (continued).

Sample ID	(Mean ± SD)				
	Hatch (%)	Survival (%)	Biomass (mg)	Length (mm)	Normal development (%)
LC_DCDS [+20 µg/L Cu]	85.0 ± 14.8 [a]	84.6 ±15.0	2.11 ± 0.17	11.2 ± 0.9	95.9 ± 4.8
LC_LC3 [+20 µg/L Cu]	100.0 ± 0.0	88.3 ± 8.4	2.08 ± 0.14	10.7 ± 0.5	96.3 ± 4.4
LC_LC5 [+20 µg/L Cu]	98.3 ± 3.3	87.9 ± 12.2	2.19 ± 0.28	11.1 ± 0.9	100.0 ± 0.0
LC_LCDSSLCC [+20 µg/L Cu]	100.0 ± 0.0	88.3 ± 6.4	2.10 ± 0.21	10.7 ± 0.2	97.9 ± 4.2
FR_FR4 [+20 µg/L Cu] [M]	98.3 ± 3.3	64.5 ± 9.5 [a,]	2.01 ± 0.39	11.1 ± 0.6	100.0 ± 0.0
FR_FR2 [+20 µg/L Cu] [M]	98.3 ± 3.3	46.1 ± 15.4 [a, d, 1, 4]	1.24 ± 0.37 [a, d,]	10.5 ± 1.6	92.9 ± 8.3
FR_MULTIPLATE [+20 µg/L Cu]	98.3 ± 3.3	77.9 ± 6.9	2.35 ± 0.38	10.9 ± 0.6	100.0 ± 0.0
FR_FRRD [+20 µg/L Cu] [M]	93.3 ± 5.4	75.2 ± 12.8	2.34 ± 0.31	10.8 ± 1.0	95.8 ± 4.8

SD = Standard Deviation; M = microbial growth
[a] Result was significantly lower than the laboratory control
[b] Result was significantly lower than the 10 µg/L copper-treated laboratory control for fathead minnow
[c] Result was significantly lower than the 15 µg/L copper-treated laboratory control for fathead minnow
[d] Result was significantly lower than the 20 µg/L copper-treated laboratory control for fathead minnow
[1] Result was significantly lower than the FR_UFR1 site control
[2] Result was significantly lower than the GH_ER2 site control
[3] Result was significantly lower than the CM_MC1 site control
[4] Result was significantly lower than the LC_SLC site control

4.0 QA/QC

The health histories of the test organisms used in the exposures were acceptable and met the requirements of the test protocols. Tests met all control acceptability criteria and water quality parameters remained within ranges specified in the protocol throughout the tests. There were no other deviations from the test methodologies, other than the planned addition of copper in the *P. promelas* tests, as described in Section 2.0. Uncertainty associated with the test is best described by the standard deviation around the mean.

Results of the reference toxicant tests conducted during the testing program are summarized in Table 8. Results fell within the acceptable range for organism performance of two standard deviations around the mean, based on historical results obtained by the laboratory with these tests. Thus, the sensitivity of the organisms used in these tests was appropriate.

Table 8. Reference toxicant test results.

Test species	Endpoint	Historical mean (2 SD Range)	CV (%)	Test date
C. dubia	Survival (LC50): 1.7 g/L NaCl	1.8 (1.6 – 2.1)	4	April 5, 2021
	Reproduction (IC50): 1.6 g/L NaCl	1.5 (1.2 – 1.8)	6	
P. subcapitata	Growth (IC50): 27.6 µg/L Zn	31.5 (25.7 – 38.6)	10	February 12, 2021
P. promelas	Survival (LC50): 5.3 g/L NaCl	7.2 (4.8 – 10.8)	13	March 11, 2021
	Biomass (IC25): 3.2 g/L NaCl	3.9 (2.1 – 7.4)	21	

SD = Standard Deviation, CV = Coefficient of Variation, LC = Lethal Concentration, IC = Inhibition Concentration

5.0 REFERENCES

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APPENDIX A – *Ceriodaphnia dubia* Toxicity Test Data

Ceriodaphnia dubia Summary Sheet

Client: Teck Coal
Start Date/Time: 2021/04/15 1400h
Work Order No.: 2021-0970, 2021-0971, 2021-0972, 2021-0973, 2021-0974, 2021-0975, 2021-0976, 2021-0977, 2021-0978, 2021-0979, 2021-0980, 2021-0981, 2021-0982, 2021-0983, 2021-0984, 2021-0985, 2021-0986, 2021-0987, 2021-0988, 2021-0989
Set up by: SC

Sample Information:

Sample ID: Various - See Below
Sample Date: 2021/02/23
Date Received: 2021/02/24
Sample Volume: Various

Test Validity Criteria:

1) Mean survival of first generation controls is ≥80 %
2) At least 60% of controls have produced three broods within 8 days
3) An average of ≥15 live young produced per surviving female in the control solutions during the first three broods.
4) Invalid if ephippia observed in any control solution at any time.

WQ Ranges:

T (°C) = 25 ± 1; DO (mg/L) = 3.3 to 8.4 ; pH = 6.0 to 8.5

Test Organism Information:

Broodstock No.: Tuesday B2; Thursday A1
Age of young (Day 0): <24-h (within 12-h)
Avg No. young in first 3 broods of previous 7 d: 27
Mortality (%) in previous 7 d: 1
Individual female # used ≥8 young on test day: A1, A2, A3, A4, B1, B2, B3, B4, B5, D1, D2, D3, D4, C1, C2, C4, C5, E3, E5; A4, B2, B5, C1, D1, C3, C4, C5, D2

NaCl Reference Toxicant Results:

Reference Toxicant ID: QA 90
Stock Solution ID: NA
Date Initiated: 2021/04/05

7-d LC50 (95% CL): 1.7 (1.6-1.7) g/L NaCL
7-d IC50 (95% CL): 1.6 (1.5-1.6) g/L NaCL

7-d LC50 Reference Toxicant Mean and Historical Range: 1.8 (1.6-2.1) g/L NaCL CV (%): 4.5
7-d IC50 Reference Toxicant Mean and Historical Range: 1.5 (1.2-1.8) g/L NaCL CV (%): 12.4

Test Results:

	Survival (%)	Reproduction (Mean ± SD)
Negative Control	100	19.9 ± 7.8
FR-UFR1	100	18.9 ± 2.2
GM-ER2	90	20.0 ± 9.4
CM-MC1	90	18.5 ± 7.6
LC-SLC	80	13.2 ± 6.9
FR-FRABCH	100	19.8 ± 4.8
FR-FRCP1	90	10.4 ± 5.5 a,b,a
GM-FR1	100	20.3 ± 3.4
GM-ERC	100	16.5 ± 4.1

Results that are significantly lower than=
a= negative control
b=FR-UFR1
c=GM-ER2
d=CM-MC1
e=LC-SLC

Reviewed by: MG
Date reviewed: 2021/05/20

Ceriodaphnia dubia Summary Sheet

Client: Teck Coal

Start Date/Time: 2021/04/15 1400h

Work Order No.: 2021-0970, 2021-0971, 2021-0972, 2021-0973, 2021-0974, 2021-0975, 2021-0976, 2021-0977, 2021-0978, 2021-0979, 2021-0980, 2021-0981, 2021-0982, 2021-0983, 2021-0984, 2021-0985, 2021-0986, 2021-0987, 2021-0988, 2021-0989

Set up by: SC

Sample Information:

Sample ID: Various- See below

Sample Date: 2021/02/23

Date Received: 2021/02/24

Sample Volume: Various

Test Validity Criteria:

1) Mean survival of first generation controls is ≥80 %

2) At least 60% of controls have produced three broods within 8 days

3) An average of ≥15 live young produced per surviving female in the control solutions during the first three broods.

4) Invalid if ephippia observed in any control solution at any time.

WQ Ranges:

T (°C) = 25 ± 1; DO (mg/L) = 3.3 to 8.4 ; pH = 6.0 to 8.5

Test Organism Information:

Broodstock No.: Tuesday B2; Thursday A1

Age of young (Day 0): <24-h (within 12-h)

Avg No. young in first 3 broods of previous 7 d: 27

Mortality (%) in previous 7 d: 1

Individual female # used ≥8 young on test day: A1, A2, A3, A4, B1, B2, B3, B4, B5, D1, D2, D3, D4, C1, C2, C4, C5, E3, E5; A4, B2, B5, C1, D1, C3, C4, C5, D2

NaCl Reference Toxicant Results:

Reference Toxicant ID: QA 90

Stock Solution ID: NA

Date Initiated: 2021/04/05

7-d LC50 (95% CL): 1.7 (1.6-1.7) g/L NaCL

7-d IC50 (95% CL): 1.6 (1.5-1.6) g/L NaCL

7-d LC50 Reference Toxicant Mean and Historical Range: 1.8 (1.6-2.1) g/L NaCL CV (%): 4.5

7-d IC50 Reference Toxicant Mean and Historical Range: 1.5 (1.2-1.8) g/L NaCL CV (%): 6.4

Test Results:

Results that are significantly lower than =

a = negative control
b = FR-UFR1
c = BH-ER2
d = CM-MC1
e = LC-SLC

	Survival (%)	Reproduction (Mean ± SD)
Negative Control	100	19.9 ± 7.8
CM-MC2	100	11.8 ± 5.7 b,a
RG-MIDA6	100	15.5 ± 5.0
EV-MC2	100	21.3 ± 1.6
EV-MC1	100	25.9 ± 2.2
LC-DCD5	90	17.9 ± 7.2
LC-LC3	90	18.5 ± 7.9
LC-LC5	100	19.8 ± 6.5
LC-LCD5LCC	100	18.2 ± 5.5

Reviewed by: MG

Date reviewed: 2021/05/20

Ceriodaphnia dubia Summary Sheet

Client: Teck Coal

Start Date/Time: 2021 10 4 15 1400h

Work Order No.: 2021-0970, 2021-0971, 2021-0972, 2021-0973, 2021-0974, 2021-0975, 2021-0976, 2021-0977, 2021-0978, 2021-0979, 2021-0980, 2021-0981, 2021-0982, 2021-0983, 2021-0984, 2021-0985, 2021-0986, 2021-0987, 2021-0988, 2021-0989

Set up by: SC.

Sample Information:

Sample ID: Various - See Below

Sample Date: 2021/02/23

Date Received: 2021/02/24

Sample Volume: various

Test Validity Criteria:

1) Mean survival of first generation controls is ≥80 %

2) At least 60% of controls have produced three broods within 8 days

3) An average of ≥15 live young produced per surviving female in the control solutions during the first three broods.

4) Invalid if ephippia observed in any control solution at any time.

WQ Ranges:

T (°C) = 25 ± 1; DO (mg/L) = 3.3 to 8.4 ; pH = 6.0 to 8.5

Test Organism Information:

Broodstock No.: Tuesday B2; Thursday A1

Age of young (Day 0): <24-h (within 12-h)

Avg No. young in first 3 broods of previous 7 d: 27

Mortality (%) in previous 7 d: 1

Individual female # used ≥8 young on test day: ~~A1, A2, A3, A4, A5~~[3] B1, B2, B3, B4, B5, D1, D2, D3, D4, C1, C2, C4, C5, E3, E5; A4, B2, B5, C1, D1, C3, C4, C5, D2

NaCl Reference Toxicant Results:

Reference Toxicant ID: QA 90

Stock Solution ID: NA

Date Initiated: 2021/04/05

7-d LC50 (95% CL): 1.7 (1.6-1.7) g/L NaCl

7-d IC50 (95% CL): 1.6 (1.5-1.6) g/L NaCl

7-d LC50 Reference Toxicant Mean and Historical Range: 1.8 (1.6-2.1) g/L NaCl CV (%): 4.5

7-d IC50 Reference Toxicant Mean and Historical Range: 1.5 (1.2-1.8) g/L NaCl CV (%): 10.4

Test Results:

Results that are significantly lower than =

a = negative control
b = FR-UFR1
c = GH-ER2
d = CM-MC1
e = LC-SLC

	Survival (%)	Reproduction (Mean ± SD)
Negative Control	100	19.9 ± 7.8
FR-FR4	100	14.7 ± 4.6[a]
FR-FR2	100	15.1 ± 5.3
FR-MULTIPLATE	100	9.8 ± 8.3
FR-FRD	100	18.0 ± 7.7
		±
		±
		±
		±

Reviewed by: MG

Date reviewed: 2021/05/13

NAUTILUS ENVIRONMENTAL

Ceriodaphnia Bench Sheet

Method OOS-mod Client TEC164 Reference LAB CTL + 0970 - 0979

Test Log

Date	Day	Time	Technician	Chem. Cart Used	Subsample Fed (✓)	Daily Data Review	Subsample Used	
2021/04/15	0	1400	SC	2	✓	MW	Day 0	✓
2021/04/16	1	1400/1000	SC	2	✓	AW	Day 1	✓
2021/04/17	2	0900	SC	2	✓	MF	Day 2	✓
2021/04/18	3	0800	KK	2	✓	AW	Day 3	✓
2021/04/19	4	1400	KK	2	✓	AW	Day 4	✓
2021/04/20	5	1030	KK	2	✓	DW	Day 5	✓
2021/04/21	6	0800	SC	2	✓	MF	Day 6	✓
2021/04/22	7	0800	SC	2	✓	DW	Day 7	✓
2021/04/23	8	1400	SC	2	—	—	-	—

Sample Information

Initial pH:
Initial EC (µS/cm):
Initial DO (mg/L):
Initial Temp (°C):
Filtered with 60 µm nitex screen
Yes/No
Sample pre-aerated/hardness/pH adjust:
Yes/No
*if yes, describe procedure, rate and duration

Test Specifics

Food expiration: 05/02, 05/16

Dilution water vessel and preparation date: 3: 04/12, 5: 04/~~17~~ 14/12, 1 04/15
2: 04/15

Cup	Control Validity SC Day ~~6~~ 7 Number of Young	Number of Broods
1	18	3
2	22	3
3	0	0
4	27	3
5	20	
6	27	
7	24	
8	24	
9	19	
10	18	

Average # of Young: 20

% with ≥ 3 Broods: 90

Control Mortality: 0
(must be ≤20%)

Reproduction Validity Criteria: the average number of young produced in first three broods is ≥ 15, when 60% of control organsims had 3 or more broods: Yes / No

Reviewed By: MG Date Reviewed: 2021/04/26

NAUTILUS ENVIRONMENTAL

Ceriodaphnia Bench Sheet

Method CD.S-mod Client TEC164 Reference LAB CTL + 2021-0970 - 2021-0979

Chemistry

Conc. (%) / Day	New Solutions								Old Solutions							
	LAB CTL	0970	0971	0972	0973	0974	0975	0976	LAB CTL	0970	0971	0972	0973	0974	0975	0976

pH (units) (range: **6.5-8.5**)

0	7.8	8.2	8.2	8.1	8.3	8.1	8.2	8.2	0								
1	8.1	8.3	8.3	8.1	8.3	8.2	8.2	8.2	1	8.2	8.3	8.3	8.2	8.3	8.3	8.3	8.2
2	7.9	8.2	8.3	8.1	8.2	8.1	8.2	8.1	2	8.1	8.3	8.2	8.1	8.2	8.1	8.2	8.1
3	8.1	8.1	8.3	8.1	8.2	8.1	8.2	8.1	3	8.0	8.1	8.2	8.0	8.1	8.1	8.2	8.1
4	8.1	8.1	8.3	8.2	8.2	8.1	8.2	8.0	4	7.9	8.1	8.2	8.0	8.1	8.1	8.2	8.0
5	8.1	8.1	8.1	8.0	8.1	8.1	8.1	8.0	5	8.0	8.1	8.2	8.0	8.1	8.1	8.1	8.0
6	8.1	8.1	8.2	8.0	8.2	8.1	8.1	8.1	6	8.0	8.2	8.2	8.1	8.2	8.1	8.2	8.1
7	8.2	8.2	8.2	8.0	8.2	8.1	8.1	8.1	7	7.9	8.0	8.2	8.1	8.2	8.1	8.2	8.1
8									8	7.9	8.2	8.2	8.1	8.3	8.2	8.2	8.2

Conductance (µS/cm)

0	199	1157	328	1176	1248	1124	1130	1360	0								
1	206	1234	354	1204	1301	1173	1173	1379	1	257	1226	394	1182	1255	1140	1151	1348
2	195	1228	453	1207	1312	1178	1182	1370	2	221	1225	397	1191	1273	1137	1157	1314
3	194	1231	613	1220	1327	1174	1187	1382	3	220	1235	404	1197	1286	1152	1167	1330
4	200	1203	380	1251	1344	1205	1209	1397	4	213	1231	370	1200	1310	1165	1175	1348
5	232	1252	374	1191	1316	1180	1181	1372	5	230	1201	389	1204	1308	1172	1185	1347
6	217	1252	400	1214	1314	1177	1191	1371	6	225	1224	379	1177	1311	1172	1170	1379
7	210	1207	402	1220	1286	1183	1191	1380	7	220	1229	393	1235	1316	1203	1202	1366
8									8	238	1188	382	1224	1313	1200	1215	1361

0976 Day 1: 1379

Dissolved Oxygen (mg/L) (**40-100% saturation**)

0	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	0	7.0							
1	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	1	7.3	7.0	6.9	6.9	6.9	6.9	6.9	6.8
2	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	2	6.9	6.9	6.9	6.9	7.0	7.1	7.0	6.9
3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	3	6.6	6.6	6.5	6.5	6.5	6.5	6.5	6.5
4	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	4	6.8	6.8	6.7	6.7	6.7	6.7	6.7	6.8
5	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	5	6.6	6.6	6.6	6.6	6.6	6.6	6.6	6.6
6	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	6	6.6	6.5	6.5	6.4	6.5	6.4	6.4	6.5
7	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7	6.5	6.5	6.4	6.3	6.4	6.4	6.4	6.2
8									8	6.3	6.5	6.7	6.9	6.8	6.6	6.6	6.5

Temperature **24 - 26** (°C)

0	24	24	24	24	24	24	24	24	0								
1	24	24	24	24	24	24	24	24	1	24	24	24	24	24	24	24	24
2	24	24	24	24	24	24	24	24	2	24	24	24	24	24	24	24	24
3	24	24	24	24	24	24	24	24	3	24	24	24	24	24	24	24	24
4	24	24	24	24	24	24	24	24	4	24	24	24	24	24	24	24	24
5	24	24	24	24	24	24	24	24	5	24	24	24	24	24	24	24	24
6	24	24	24	24	24	24	24	24	6	24	24	24	24	24	24	24	24
7	24	24	24	24	24	24	24	24	7	24	24	24	24	24	24	24	24
8									8	24	24	24	24	24	24	24	24

DO Levels (40-100% saturation)* -
2.9 to 7.3 mg/L at 24°C
2.9 to 7.2 mg/L at 25°C
2.8 to 7.1 mg/L at 26°C

*corrected for altitude

Reviewed By: MG Date Reviewed: 2021/04/26

NAUTILUS ENVIRONMENTAL

Ceriodaphnia Bench Sheet

Method EMS-mod Client TEC164 Reference LMB CR + 0970 - 0979

Chemistry

Conc. (%) / Day	New Solutions								Old Solutions							
	0977	0978	0979						0977	0978	0979					
pH (units) (range: 6.5-8.5)																
0	8.2	8.2	8.2													
1	8.2	8.3	8.2						8.2	8.4	8.4					
2	8.1	8.1	8.2						8.1	8.3	8.3					
3	8.1	8.2	8.3						8.1	8.2	8.3					
4	8.1	8.2	8.2						8.1	8.2	8.2					
5	8.0	8.2	8.2						8.1	8.2	8.2					
6	8.1	8.1	8.2						8.1	8.2	8.2					
7	8.1	8.2	8.2						8.2	8.2	8.2					
8									8.2	8.2	8.2					
Conductance (µS/cm)																
0	198	478	358													
1	1043	520	366						1040	452	369					
2	1042	461	375						1028	473	369					
3	1070	465	370						1059	469	380					
4	1060	462	379						1048	474	380					
5	1054	466	371						1034	479	382					
6	1044	455	375						1041	480	374					
7	1052	461	373						1041	502	385					
8									1041	474	381					
Dissolved Oxygen (mg/L) (40-100% saturation)																
0	7.3	7.3	7.3													
1	7.3	7.3	7.3						6.9	6.8	6.9					
2	7.1	7.3	7.3						7.0	7.0	7.1					
3	7.3	7.3	7.3						6.7	6.6	6.6					
4	7.3	7.3	7.3						6.8	6.7	6.7					
5	7.3	7.3	7.3						6.6	6.6	6.6					
6	7.3	7.3	7.3						6.5	6.4	6.4					
7	7.3	7.3	7.3						6.2	6.3	6.3					
8									6.5	6.5	6.5					
Temperature 24 - 26 (°C)																
0	24	24	24													
1	24	24	24						24	24	24					
2	24	24	24						24	24	24					
3	24	24	24						24	24	24					
4	24	24	24						24	24	24					
5	24	24	24						24	24	24					
6	24	24	24						24	24	24					
7	24	24	24						24	24	24					
8									24	24	24					

DO Levels (40-100% saturation)* -
2.9 to 7.3 mg/L at 24°C
2.9 to 7.2 mg/L at 25°C
2.8 to 7.1 mg/L at 26°C

*corrected for altitude

Reviewed By: MH Date Reviewed: 2021/04/24

NAUTILUS ENVIRONMENTAL

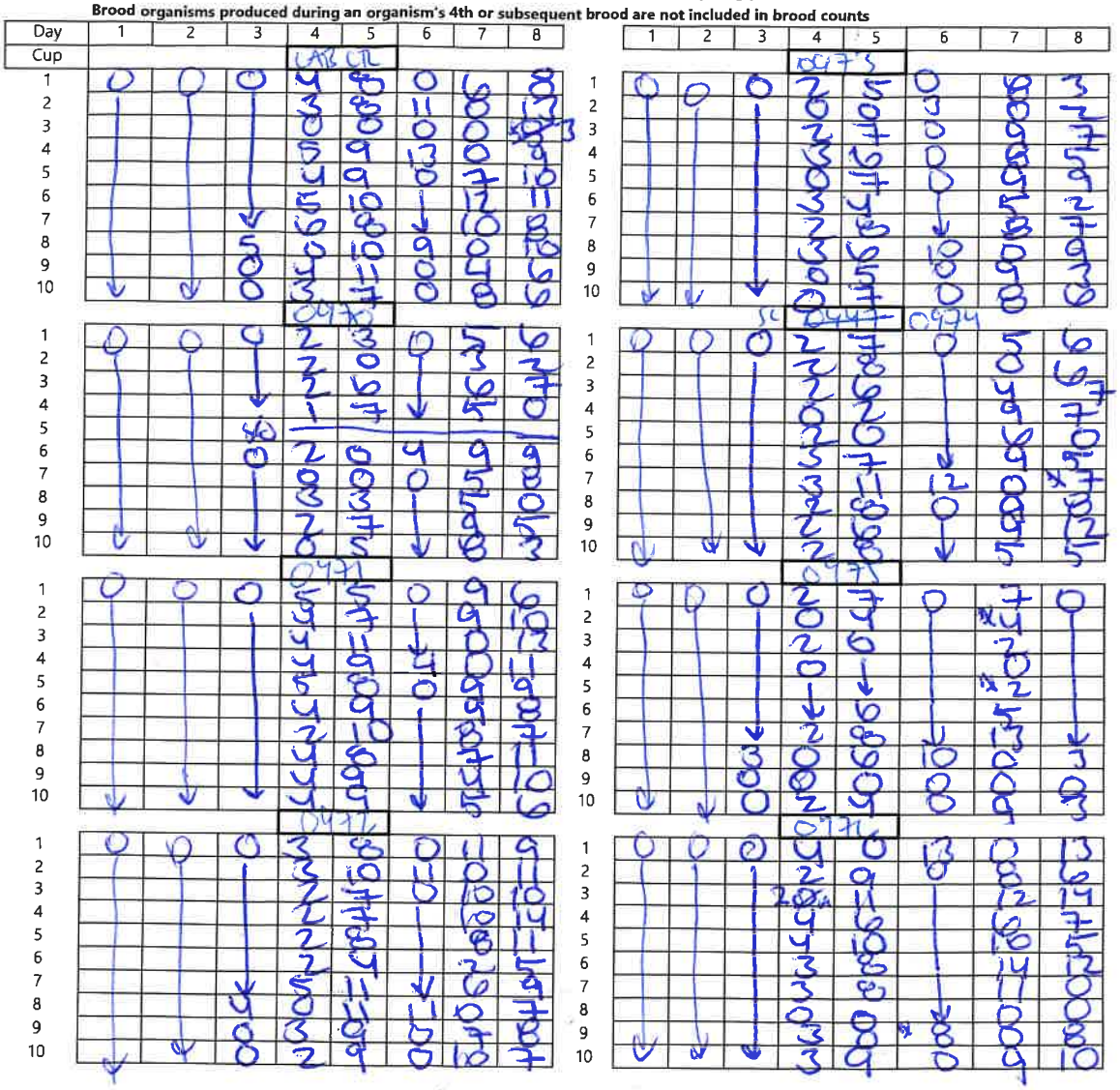
Ceriodaphnia Bench Sheet

Method ODS mod Client TEC164 Reference LAB CTL 0970 - 0979

Biology

(#, young produced; 0, no young; X, dead; X#, young produced-dead; —,young produced after 3rd brood)

Brood organisms produced during an organism's 4th or subsequent brood are not included in brood counts



Day	1	2	3	4	5	6	7	8
Cup				LAB CTL				
1	0	0	0	4	8	0	6	8
2				3	8	11	8	13
3				0	0	0	0	3
4				5	9	13	0	9
5				4	9	0	7	10
6				5	10		12	11
7				6	8		10	8
8			5	0	10	9	0	10
9			0	4	11	0	4	6
10			0	3	7	0	8	6
				0970				
1	0	0	0	2	3	0	5	6
2				2	0		3	2
3				2	6		6	7
4				1	7		5	0
5			0					
6			0	2	0	4	9	9
7				0	0	0	5	8
8				3	3		5	0
9				2	7		9	5
10				0	5		8	3
				0971				
1	0	0	0	5	5	0	9	6
2				4	7		9	10
3				4	11		0	13
4				4	9	4	0	11
5				5	8	0	9	9
6				4	9		9	8
7				2	10		8	7
8				4	8		7	11
9				4	9		4	10
10				4	9		5	6
				0972				
1	0	0	0	3	8	0	11	9
2				3	10	11	0	11
3				2	7	0	10	10
4				2	7		10	14
5				2	8		8	11
6				2	4		2	5
7				5	11		6	9
8			4	0	11	11	0	7
9			0	3	9	0	7	8
10			0	2	9	0	10	7

Day	1	2	3	4	5	6	7	8
Cup				0973				
1	0	0	0	2	5	0	8	3
2				0	0	3	0	2
3				2	7	0	9	7
4				3	6	0	8	5
5				0	7	0	9	9
6				3	4		5	2
7				2	8		8	7
8				3	6	10	0	9
9				0	5	0	9	3
10				0	7	0	8	6
			SC	0974		0974		
1	0	0	0	2	7	0	5	6
2				2	8		0	6
3				2	6		4	7
4				0	2		9	7
5				2	0		6	0
6				3	7		9	5
7				3	11	12	0	7
8				2	8	0	0	8
9				2	6		9	12
10				2	8		5	5
				0975				
1	0	0	0	2	7	0	7	0
2				0	4		4	
3				2	0		2	
4				0			0	
5							2	
6					6		5	
7				2	8		13	
8			3	0	6	10	0	3
9			0	0	0	0	0	0
10			0	2	4	0	9	3
				0976				
1	0	0	0	4	0	13	0	13
2				2	9	0	8	6
3				2	11		12	14
4				4	6		6	7
5				4	10		10	5
6				3	8		14	12
7				3	8		11	0
8				0	0		0	0
9				3	0	8	0	8
10				3	9	0	9	10

Reviewed By: MG Date Reviewed: 2021/04/26

NAUTILUS ENVIRONMENTAL

Ceriodaphnia Bench Sheet

Method CDS-mod Client TEC164 Reference LAB CTL + 2021-0970 - 2021-0979

Biology

(#, young produced; 0, no young; X, dead; X#, young produced-dead; —,young produced after 3rd brood)

Brood organisms produced during an organism's 4th or subsequent brood are not included in brood counts

Day	1	2	3	4	5	6	7	8
Cup				0977				
1	0	0	0	4	8	0	8	3
2			0	4	9	7	8	12
3			4	0	8	11	0	9
4			0	3	10	0	4	12
5				4	11	0	10	10
6				4	10		7	10
7				4	10		7	7
8				4	12		8	10
9				5	9		7	12
10				3	7		6	8
				0978				
1	0	0	0	3	0	0	3	6
2				4	8	7	5	14
3				4	9	0	5	5
4				4	8		5	6
5				4	9		5	7
6				3	9		8	13
7				4	6		8	9
8				3	8	5	6	11
9				3	11	0	4	11
10				4	8		4	9
				0979				
1	0	0	0	3	9	0	6	6
2			4	0	15	4	3	10
3			0	4	11	0	5	9
4				4	10	0	9	12
5				5	15	10	7	14
6				3	9	X0	8	9
7			X0					
8			0	5	12	0	11	14
9				5	9	0	6	13
10				2	0	8	6	10

Reviewed By: MG Date Reviewed: 2021/04/26

NAUTILUS ENVIRONMENTAL

Ceriodaphnia Bench Sheet

Test Organism Information

Client: TECHeq

Culture history for adults used in the test for sample reference: LAB CTL + 2021-0970 – 2021-0979

Day Used: 2021/04/15

Test organisms appeared healthy before use: (Yes) No

Number of young produced per brood adult within first three broods:

Brood	row/replicate	A1	A2	A3	A4	B1	B2	B3	B4	SL B5	D1	D2
	number of young	3	3	3	2	3	5	5	5	3	5	3
	number of young	8	12	12	9	9	10	10	12	11	11	7
	number of young	10	9	10	7	8	7	7	6	2	12	13
	number of young	9	9	12	9	9	9	9	8	11	10	8

Culture(s) Used for Testing: TUES B2

Number of Adults Alive in Culture	7 days prior: 50	day used: 47

Notes: all cups have 1 adult

Average No. of young in first 3 broods: 23
(must be ≥15)

Culture % mortality (7-days prior to testing): 6%
(must be ≤20%)

Number of young produced by each brood organism in last complete brood is ≥8: Y
Yes (Y) or No (N)

Reviewed By: MG Date Reviewed: 2021/04/26

NAUTILUS ENVIRONMENTAL

Ceriodaphnia Bench Sheet

Method OOS-mod Client TEC164 Reference LAB CTL + 0970 - 0979

Test Log

Date	Day	Time	Technician	Chem. Cart Used	Subsample Fed (✓)	Daily Data Review	Subsample Used	
2021/04/15	0	1400	SC	2	✓	MW	Day 0	✓
2021/04/16	1	1400/1000	SC	2	✓	AW	Day 1	✓
2021/04/17	2	0900	SC	2	✓	MF	Day 2	✓
2021/04/18	3	0800	KK	2	✓	AW	Day 3	✓
2021/04/19	4	1400	KK	2	✓	AW	Day 4	✓
2021/04/20	5	1030	KK	2	✓	DW	Day 5	✓
2021/04/21	6	0800	SC	2	✓	MF	Day 6	✓
2021/04/22	7	0800	SC	2	✓	DW	Day 7	✓
2021/04/23	8	1400	SC	2	—	—	-	—

Sample Information

Initial pH:
Initial EC (µS/cm):
Initial DO (mg/L):
Initial Temp (°C):
Filtered with 60 µm nitex screen
Yes/No
Sample pre-aerated/hardness/pH adjust:
Yes/No
*if yes, describe procedure, rate and duration

Test Specifics

Food expiration: 05/02, 05/16

Dilution water vessel and preparation date: 3: 04/12, 5: 04/~~17~~ 14/12, 1 04/15
2: 04/15

Cup	Control Validity SC Day ~~6~~ 7 Number of Young	Number of Broods
1	18	3
2	22	3
3	0	0
4	27	3
5	20	
6	27	
7	24	
8	24	
9	19	
10	18	

Average # of Young: 20

% with ≥ 3 Broods: 90

Control Mortality: 0
(must be ≤20%)

Reproduction Validity Criteria: the average number of young produced in first three broods is ≥ 15, when 60% of control organsims had 3 or more broods: Yes / No

Reviewed By: MG Date Reviewed: 2021/04/26

NAUTILUS ENVIRONMENTAL

Ceriodaphnia Bench Sheet

Method CD.S-mod Client TEC164 Reference LAB CTL + 2021-0970 - 2021-0979

Chemistry

Conc. (%) / Day	New Solutions								Old Solutions							
	LAB CTL	0970	0971	0972	0973	0974	0975	0976	LAB CTL	0970	0971	0972	0973	0974	0975	0976

pH (units) (range: **6.5-8.5**)

0	7.8	8.2	8.2	8.1	8.3	8.1	8.2	8.2	0								
1	8.1	8.3	8.3	8.1	8.3	8.2	8.2	8.2	1	8.2	8.3	8.3	8.2	8.3	8.3	8.3	8.2
2	7.9	8.2	8.3	8.1	8.2	8.1	8.2	8.1	2	8.1	8.3	8.2	8.1	8.2	8.1	8.2	8.1
3	8.1	8.1	8.3	8.1	8.2	8.1	8.2	8.1	3	8.0	8.1	8.2	8.0	8.1	8.1	8.2	8.1
4	8.1	8.1	8.3	8.2	8.2	8.1	8.2	8.0	4	7.9	8.1	8.2	8.0	8.1	8.1	8.2	8.0
5	8.1	8.1	8.1	8.0	8.1	8.1	8.1	8.0	5	8.0	8.1	8.2	8.0	8.1	8.1	8.1	8.0
6	8.1	8.1	8.2	8.0	8.2	8.1	8.1	8.1	6	8.0	8.2	8.2	8.1	8.2	8.1	8.2	8.1
7	8.2	8.2	8.2	8.0	8.2	8.1	8.1	8.1	7	7.9	8.0	8.2	8.1	8.2	8.1	8.2	8.1
8									8	7.9	8.2	8.2	8.1	8.3	8.2	8.2	8.2

Conductance (µS/cm)

0	199	1157	328	1176	1248	1124	1130	1360	0								
1	206	1234	354	1204	1301	1173	1173	1379	1	257	1226	394	1182	1255	1140	1151	1348
2	195	1228	453	1207	1312	1178	1182	1370	2	221	1225	397	1191	1273	1137	1157	1314
3	194	1231	613	1220	1327	1174	1187	1382	3	220	1235	404	1197	1286	1152	1167	1330
4	200	1203	380	1251	1344	1205	1209	1397	4	213	1231	370	1200	1310	1165	1175	1348
5	232	1252	374	1191	1316	1180	1181	1372	5	230	1201	389	1204	1308	1172	1185	1347
6	217	1252	400	1214	1314	1177	1191	1371	6	225	1224	379	1177	1311	1172	1170	1379
7	210	1207	402	1220	1286	1183	1191	1380	7	220	1229	393	1235	1316	1203	1202	1366
8									8	238	1188	382	1224	1313	1200	1215	1361

0976 Day 1: 1379

Dissolved Oxygen (mg/L) (**40-100% saturation**)

0	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	0	7.0							
1	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	1	7.3	7.0	6.9	6.9	6.9	6.9	6.9	6.8
2	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	2	6.9	6.9	6.9	6.9	7.0	7.1	7.0	6.9
3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	3	6.6	6.6	6.5	6.5	6.5	6.5	6.5	6.5
4	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	4	6.8	6.8	6.7	6.7	6.7	6.7	6.7	6.8
5	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	5	6.6	6.6	6.6	6.6	6.6	6.6	6.6	6.6
6	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	6	6.6	6.5	6.5	6.4	6.5	6.4	6.4	6.5
7	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7	6.5	6.5	6.4	6.3	6.4	6.4	6.4	6.2
8									8	6.3	6.5	6.7	6.9	6.8	6.6	6.6	6.5

Temperature **24 - 26** (°C)

0	24	24	24	24	24	24	24	24	0								
1	24	24	24	24	24	24	24	24	1	24	24	24	24	24	24	24	24
2	24	24	24	24	24	24	24	24	2	24	24	24	24	24	24	24	24
3	24	24	24	24	24	24	24	24	3	24	24	24	24	24	24	24	24
4	24	24	24	24	24	24	24	24	4	24	24	24	24	24	24	24	24
5	24	24	24	24	24	24	24	24	5	24	24	24	24	24	24	24	24
6	24	24	24	24	24	24	24	24	6	24	24	24	24	24	24	24	24
7	24	24	24	24	24	24	24	24	7	24	24	24	24	24	24	24	24
8									8	24	24	24	24	24	24	24	24

DO Levels (40-100% saturation)* -
2.9 to 7.3 mg/L at 24°C
2.9 to 7.2 mg/L at 25°C
2.8 to 7.1 mg/L at 26°C

*corrected for altitude

Reviewed By: MG Date Reviewed: 2021/04/26

NAUTILUS ENVIRONMENTAL

Ceriodaphnia Bench Sheet

Method EMS-mod Client TEC164 Reference LMB CR + 0970 - 0979

Chemistry

Conc. (%) / Day	New Solutions								Old Solutions							
	0977	0978	0979						0977	0978	0979					
pH (units) (range: 6.5-8.5)																
0	8.2	8.2	8.2													
1	8.2	8.3	8.2						8.2	8.4	8.4					
2	8.1	8.1	8.2						8.1	8.3	8.3					
3	8.1	8.2	8.3						8.1	8.2	8.3					
4	8.1	8.2	8.2						8.1	8.2	8.2					
5	8.0	8.2	8.2						8.1	8.2	8.2					
6	8.1	8.1	8.2						8.1	8.2	8.2					
7	8.1	8.2	8.2						8.2	8.2	8.2					
8									8.2	8.2	8.2					
Conductance (µS/cm)																
0	198	478	358													
1	1043	520	366						1040	452	369					
2	1042	461	375						1028	473	369					
3	1070	465	370						1059	469	380					
4	1060	462	379						1048	474	380					
5	1054	466	371						1034	479	382					
6	1044	455	375						1041	480	374					
7	1052	461	373						1041	502	385					
8									1041	474	381					
Dissolved Oxygen (mg/L) (40-100% saturation)																
0	7.3	7.3	7.3													
1	7.3	7.3	7.3						6.9	6.8	6.9					
2	7.1	7.3	7.3						7.0	7.0	7.1					
3	7.3	7.3	7.3						6.7	6.6	6.6					
4	7.3	7.3	7.3						6.8	6.7	6.7					
5	7.3	7.3	7.3						6.6	6.6	6.6					
6	7.3	7.3	7.3						6.5	6.4	6.4					
7	7.3	7.3	7.3						6.2	6.3	6.3					
8									6.5	6.5	6.5					
Temperature 24 - 26 (°C)																
0	24	24	24													
1	24	24	24						24	24	24					
2	24	24	24						24	24	24					
3	24	24	24						24	24	24					
4	24	24	24						24	24	24					
5	24	24	24						24	24	24					
6	24	24	24						24	24	24					
7	24	24	24						24	24	24					
8									24	24	24					

DO Levels (40-100% saturation)* -
2.9 to 7.3 mg/L at 24°C
2.9 to 7.2 mg/L at 25°C
2.8 to 7.1 mg/L at 26°C

*corrected for altitude

Reviewed By: MH Date Reviewed: 2021/04/24

NAUTILUS ENVIRONMENTAL

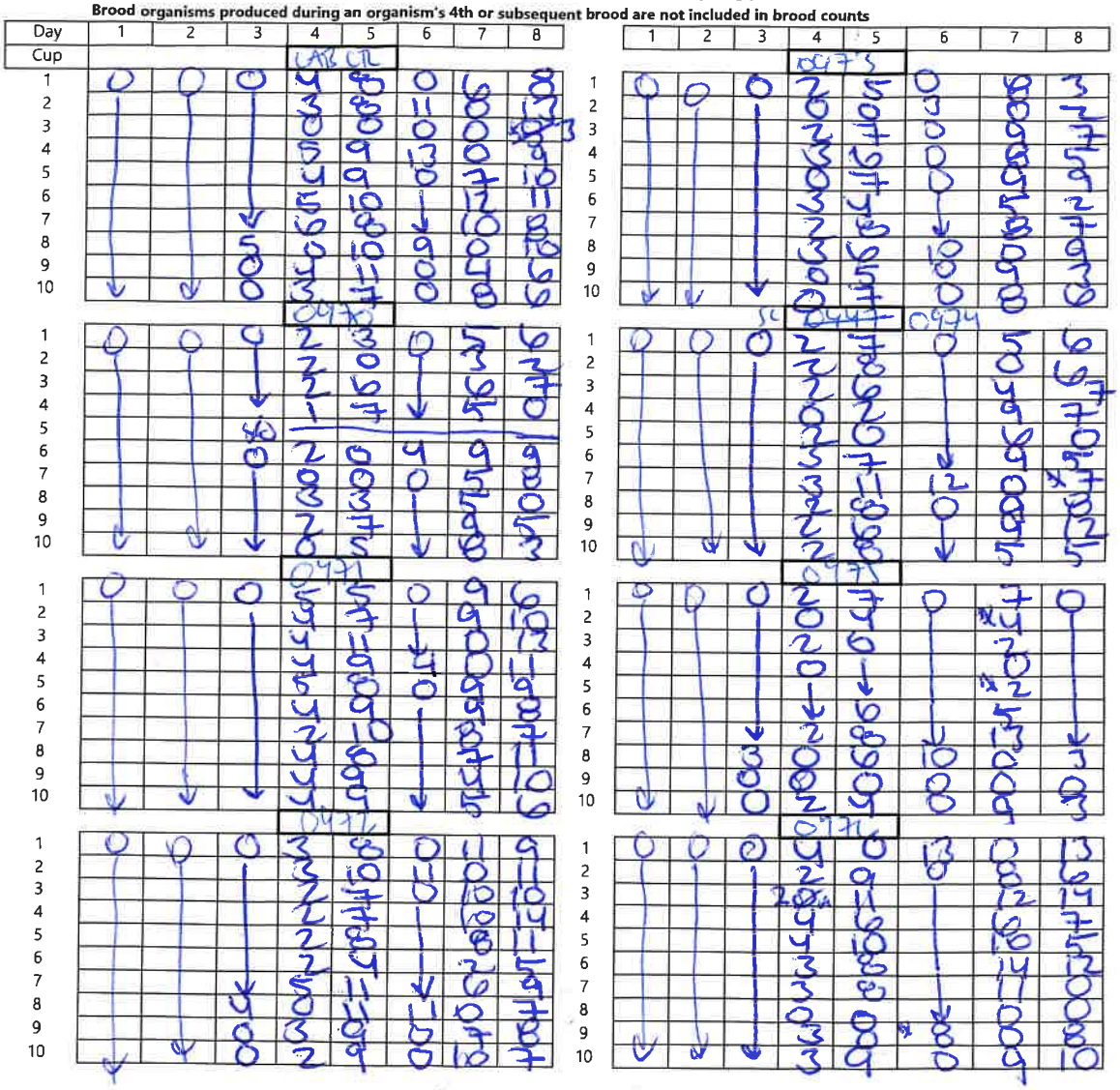
Ceriodaphnia Bench Sheet

Method ODS mod Client TEC164 Reference LAB CTL 0970 - 0979

Biology

(#, young produced; 0, no young; X, dead; X#, young produced-dead; —,young produced after 3rd brood)

Brood organisms produced during an organism's 4th or subsequent brood are not included in brood counts



Day	1	2	3	4	5	6	7	8
Cup				LAB CTL				
1	0	0	0	4	8	0	6	8
2				3	8	11	8	13
3				0	0	0	0	3
4				5	9	13	0	9
5				4	9	0	7	10
6				5	10		12	11
7				6	8		10	8
8			5	0	10	9	0	10
9			0	4	11	0	4	6
10			0	3	7	0	8	6
				0970				
1	0	0	0	2	3	0	5	6
2				2	0		3	2
3				2	6		6	7
4				1	7		5	0
5			0					
6			0	2	0	4	9	9
7				0	0	0	5	8
8				3	3		5	0
9				2	7		9	5
10				0	5		8	3
				0971				
1	0	0	0	5	5	0	9	6
2				4	7		9	10
3				4	11		0	13
4				4	9	4	0	11
5				5	8	0	9	9
6				4	9		9	8
7				2	10		8	7
8				4	8		7	11
9				4	9		4	10
10				4	9		5	6
				0972				
1	0	0	0	3	8	0	11	9
2				3	10	11	0	11
3				2	7	0	10	10
4				2	7		10	14
5				2	8		8	11
6				2	4		2	5
7				5	11		6	9
8			4	0	11	11	0	7
9			0	3	9	0	7	8
10			0	2	9	0	10	7

Day	1	2	3	4	5	6	7	8
Cup				0973				
1	0	0	0	2	5	0	8	3
2				0	0	3	0	2
3				2	7	0	9	7
4				3	6	0	8	5
5				0	7	0	9	9
6				3	4		5	2
7				2	8		8	7
8				3	6	10	0	9
9				0	5	0	9	3
10				0	7	0	8	6
			SC	0974		0974		
1	0	0	0	2	7	0	5	6
2				2	8		0	6
3				2	6		4	7
4				0	2		9	7
5				2	0		6	0
6				3	7		9	5
7				3	11	12	0	7
8				2	8	0	0	8
9				2	6		9	12
10				2	8		5	5
				0975				
1	0	0	0	2	7	0	7	0
2				0	4		4	
3				2	0		2	
4				0			0	
5							2	
6					6		5	
7				2	8		13	
8			3	0	6	10	0	3
9			0	0	0	0	0	0
10			0	2	4	0	9	3
				0976				
1	0	0	0	4	0	13	0	13
2				2	9	0	8	6
3				2	11		12	14
4				4	6		6	7
5				4	10		10	5
6				3	8		14	12
7				3	8		11	0
8				0	0		0	0
9				3	0	8	0	8
10				3	9	0	9	10

Reviewed By: MG Date Reviewed: 2021/04/26

NAUTILUS ENVIRONMENTAL

Ceriodaphnia Bench Sheet

Method CDS-mod Client TEC164 Reference LAB CTL + 2021-0970 - 2021-0979

Biology

(#, young produced; 0, no young; X, dead; X#, young produced-dead; —,young produced after 3rd brood)

Brood organisms produced during an organism's 4th or subsequent brood are not included in brood counts

Day	1	2	3	4	5	6	7	8
Cup				0977				
1	0	0	0	4	8	0	8	3
2			0	4	9	7	8	12
3			4	0	8	11	0	9
4			0	3	10	0	4	12
5				4	11	0	10	10
6				4	10		7	10
7				4	10		7	7
8				4	12		8	10
9				5	9		7	12
10				3	7		6	8
				0978				
1	0	0	0	3	0	0	3	6
2				4	8	7	5	14
3				4	9	0	5	5
4				4	8		5	6
5				4	9		5	7
6				3	9		8	13
7				4	6		8	9
8				3	8	5	6	11
9				3	11	0	4	11
10				4	8		4	9
				0979				
1	0	0	0	3	9	0	6	6
2			4	0	15	4	3	10
3			0	4	11	0	5	9
4				4	10	0	9	12
5				5	15	10	7	14
6				3	9	X0	8	9
7			X0					
8			0	5	12	0	11	14
9				5	9	0	6	13
10				2	0	8	6	10

Reviewed By: MG Date Reviewed: 2021/04/26

NAUTILUS ENVIRONMENTAL

Ceriodaphnia Bench Sheet

Test Organism Information

Client: TECHeq

Culture history for adults used in the test for sample reference: LAB CTL + 2021-0970 – 2021-0979

Day Used: 2021/04/15

Test organisms appeared healthy before use: (Yes) No

Number of young produced per brood adult within first three broods:

Brood	row/replicate	A1	A2	A3	A4	B1	B2	B3	B4	SL B5	D1	D2
	number of young	3	3	3	2	3	5	5	5	3	5	3
	number of young	8	12	12	9	9	10	10	12	11	11	7
	number of young	10	9	10	7	8	7	7	6	2	12	13
	number of young	9	9	12	9	9	9	9	8	11	10	8

Culture(s) Used for Testing: TUES B2

Number of Adults Alive in Culture	7 days prior: 50	day used: 47

Notes: all cups have 1 adult

Average No. of young in first 3 broods: 23
(must be ≥15)

Culture % mortality (7-days prior to testing): 6%
(must be ≤20%)

Number of young produced by each brood organism in last complete brood is ≥8: Y
Yes (Y) or No (N)

Reviewed By: MG Date Reviewed: 2021/04/26

NAUTILUS ENVIRONMENTAL

Ceriodaphnia Bench Sheet

Method COS-mod Client TEC164 Reference 2021-0980 - 2021-0989

Test Log

Date	Day	Time	Technician	Chem. Cart Used	Subsample Fed (✓)	Daily Data Review	Subsample Used
2021/04/15	0	1415	JC	2	✓	MW	Day 0 ✓
2021/04/16	1	0936	SC	2	✓	AW	Day 1 ✓
2021/04/17	2	0900	SC	2	✓	MF	Day 2 ✓
2021/04/18	3	0850	KM	2	✓	AW	Day 3 ✓
2021/04/19	4	1430	KM	2	✓	AW	Day 4 ✓
2021/04/20	5	1115	KM	2	✓	DW	Day 5 ✓
2021/04/21	6	0830	JC	2	✓	MF	Day 6 ✓
2021/04/22	7	0850	SC	2	✓	DW	Day 7 ✓
2021/04/23	8	1410	SC	2	—	—	—

Sample Information

Initial pH: ____
Initial EC (µS/cm): ____
Initial DO (mg/L): ____
Initial Temp (°C): ____

Filtered with 60 µm nitex screen Yes/No

Sample pre-aerated/hardness/pH adjust: Yes/No

*if yes, describe procedure, rate and duration

Test Specifics

Food expiration: 05102, 05116

Dilution water vessel and preparation date: —

Cup	Control Validity Day ___ Number of Young	Number of Broods
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		

See data on bench sheet for Lab CTL # 0970 - 0979

Average # of Young: ____

% with ≥ 3 Broods: ____

Control Mortality: ____
(must be ≤20%)

Reproduction Validity Criteria: the average number of young produced in first three broods is ≥ 15, when 60% of control organsims had 3 or more broods: **Yes / No**

Reviewed By: MW Date Reviewed: 2021/04/26

NAUTILUS ENVIRONMENTAL

Ceriodaphnia Bench Sheet

Method CDS-mod Client TEC164 Reference 2021-0980 - 2021-0989

Chemistry

Conc. (%)	New Solutions								Old Solutions							
Day	0988	0989							0988	0989						

pH (units) (range: 6.5-8.5)

Day	New Solutions								Old Solutions							
0	8.2	8.2														
1	8.2	8.2							8.3	8.2						
2	8.2	8.2							8.3	8.1						
3	8.2	8.1							8.1	8.0						
4	8.2	8.0							8.1	8.1						
5	8.1	8.0							8.1	8.1						
6	8.1	8.0							8.1	8.1						
7	8.2	8.1							8.1	8.0						
8									8.1	8.2						

Conductance (µS/cm)

Day	New Solutions								Old Solutions							
0	628	907														
1	648	930							650	903						
2	664	929							661	923						
3	679	939							675	940						
4	667	950							680	93[illegible]						
5	681	937							689	939						
6	662	903							665	910						
7	664	916							680	947						
8									674	961						

Dissolved Oxygen (mg/L) (40-100% saturation)

Day	New Solutions								Old Solutions							
0	7.3	7.3														
1	7.3	7.3							6.9	6.8						
2	7.3	7.3							6.9	6.9						
3	7.3	7.3							6.5	6.5						
4	7.2	7.3							6.5	6.5						
5	7.3	7.3							6.6	6.6						
6	7.3	7.3							6.5	6.5						
7	7.3	7.3							6.2	6.2						
8									6.4	6.4						

Temperature 24 - 26 (°C)

Day	New Solutions								Old Solutions							
0	24	24														
1	24	24							24	24						
2	24	24							24	24						
3	24	24							24	24						
4	24	24							24	24						
5	24	24							24	24						
6	24	24							24	24						
7	24	24							24	24						
8									24	24						

DO Levels (40-100% saturation)* -
2.9 to 7.3 mg/L at 24°C
2.9 to 7.2 mg/L at 25°C
2.8 to 7.1 mg/L at 26°C

*corrected for altitude

Reviewed By: MB Date Reviewed: 2021/04/26

NAUTILUS ENVIRONMENTAL

Ceriodaphnia Bench Sheet

Method CDS-mod Client TEC164 Reference 2021-0980 - 2021-0989

Biology

(#, young produced; 0, no young; X, dead; X#, young produced-dead; —,young produced after 3rd brood)

Brood organisms produced during an organism's 4th or subsequent brood are not included in brood counts

Day	1	2	3	4	5	6	7	8
Cup				0980				
1	0	0	0	5	0	8	4	0
2				3	11	0	5	14
3				3	9		6	8
4				2	8		5	10
5			↓	3	11	↓	11	8
6			X0					
7			0	3	9	0	10	11
8				2	8	↓	9	6
9				2	7	↓	10	5
10	↓	↓	↓	4	9	13	0	12
				0989				
1	0	0	0	3	9	0	4	10
2				3	9	↓	10	14
3				3	7		8	7
4				4	11		5	7
5				3	9		5	8
6				4	11		8	8
7				5	10		11	12
8				2	7		5	11
9				4	9		9	11
10	↓	↓	↓	3	8	13	0	X12

Reviewed By: ML Date Reviewed: 2021/04/26

CETIS Analytical Report

Ceriodaphnia 7-d Survival and Reproduction Test — **Nautilus Environmental Calgary**

Analysis ID:	16-4426-3125	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.9.4
Analyzed:	11 May-21 14:57	**Analysis:**	Nonparametric-Control vs Treatments	**Status Level:**	1
Batch ID:	00-6487-4444	**Test Type:**	Reproduction-Survival (7d)	**Analyst:**	Kayla Knol
Start Date:	15 Apr-21	**Protocol:**	EC/EPS 1/RM/21	**Diluent:**	Site Water
Ending Date:	23 Apr-21	**Species:**	Ceriodaphnia dubia	**Brine:**	
Test Length:	8d 0h	**Taxon:**	Branchiopoda	**Source:**	In House

Age:

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
Control	03-0483-0188	15 Apr-21	15 Apr-21	n/a	Teck Coal Ltd	
FR_UFR1	16-8343-8286	13 Apr-21	14 Apr-21	48h (3.6 °C)		
GH_ER2	08-7643-8625	13 Apr-21	14 Apr-21	48h (4.9 °C)		
CM_MC1	10-8021-6522	13 Apr-21	14 Apr-21	48h (6.9 °C)		
LC_SLC	11-7695-7825	13 Apr-21	14 Apr-21	48h (6.4 °C)		
FR_FRABCH	13-2920-6522	13 Apr-21	14 Apr-21	48h (6.6 °C)		
FR_FRCP1	09-5241-6620	13 Apr-21	14 Apr-21	48h (4.2 °C)		
GH_FR1	17-2466-1900	13 Apr-21	14 Apr-21	48h (4.6 °C)		
GH_ERC	01-8068-9122	13 Apr-21	15 Apr-21	48h (5.9 °C)		
CM_MC2	01-5234-6297	13 Apr-21	14 Apr-21	48h (5.9 °C)		
RG_MIDAG	13-4002-6845	13 Apr-21	14 Apr-21	48h (7.1 °C)		
EV_MC2	09-1256-0143	14 Apr-21	14 Apr-21	24h (2.6 °C)		
EV_HC1	16-7262-0562	14 Apr-21	14 Apr-21	24h (3.6 °C)		
LC_DCDS	04-7285-8751	13 Apr-21	14 Apr-21	48h (3.6 °C)		
LC_LC3	14-0701-1007	13 Apr-21	14 Apr-21	48h (4.2 °C)		
LC_LC5	02-9493-3505	13 Apr-21	14 Apr-21	48h (3.2 °C)		
LC_LCDSSLCC	01-8317-5860	13 Apr-21	14 Apr-21	48h (4.2 °C)		
FR_FR4	18-5240-1271	13 Apr-21	14 Apr-21	48h (4.3 °C)		
FR_FR2	13-9611-3182	13 Apr-21	14 Apr-21	48h (6.4 °C)		
FR_MULTIPLATE	00-1904-7274	13 Apr-21	14 Apr-21	48h (6.3 °C)		
FR_FRRD	02-2561-5672	13 Apr-21	14 Apr-21	48h (4.4 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
Control	Ambient Sample	Teck Coal Ltd	Control	
FR_UFR1	Ambient Sample	Teck Coal Ltd	FR_UFR1_WEK_2021-04-1	
GH_ER2	Ambient Sample	Teck Coal Ltd	GH_ER2_WS_2021-04-12_	
CM_MC1	Ambient Sample	Teck Coal Ltd	CM_MC1_WS_2021-04-13	
LC_SLC	Ambient Sample	Teck Coal Ltd	LC_SLC_WS_2021-04-13_	
FR_FRABCH	Ambient Sample	Teck Coal Ltd	FR_FRABCH_WEK_2021-	
FR_FRCP1	Ambient Sample	Teck Coal Ltd	FR_FRCP1_WEK_2021-04	
GH_FR1	Ambient Sample	Teck Coal Ltd	GH_FR1_WS_2021-04-12_	
GH_ERC	Ambient Sample	Teck Coal Ltd	GH_ERC_WS_2021-04-12	
CM_MC2	Ambient Sample	Teck Coal Ltd	CM_MC2_WS_2021-04-13	
RG_MIDAG	Ambient Sample	Teck Coal Ltd	RG_MIDAG_WS_2021-04-	
EV_MC2	Ambient Sample	Teck Coal Ltd	EV_MC2_WS_2021-04-14_	
EV_HC1	Ambient Sample	Teck Coal Ltd	EV_HC1_WS_2021-04-14_	
LC_DCDS	Ambient Sample	Teck Coal Ltd	LC_DCDS_WS_2021-04-13	
LC_LC3	Ambient Sample	Teck Coal Ltd	LC_LC3_WS_2021-04-13_	
LC_LC5	Ambient Sample	Teck Coal Ltd	LC_LC5_WS_2021-04-13_	
LC_LCDSSLCC	Ambient Sample	Teck Coal Ltd	LC_LCDSSLCC_WS_2021-	
FR_FR4	Ambient Sample	Teck Coal Ltd	FR_FR4_WS_2021-04-13_	
FR_FR2	Ambient Sample	Teck Coal Ltd	FR_FR2_WS_2021-04-13_	
FR_MULTIPLATE	Ambient Sample	Teck Coal Ltd	FR_MULTIPLATE_WS_202	
FR_FRRD	Ambient Sample	Teck Coal Ltd	FR_FRRD_WS_2021-04-13	

Analyst: KK QA: 2021/05/20 MH

Ceriodaphnia 7-d Survival and Reproduction Test — **Nautilus Environmental Calgary**

Analysis ID: 16-4426-3125 **Endpoint:** Reproduction **CETIS Version:** CETISv1.9.4
Analyzed: 11 May-21 14:57 **Analysis:** Nonparametric-Control vs Treatments **Status Level:** 1

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	FR_UFR1 passed reproduction	36.30%
		GH_ER2 passed reproduction	36.30%
		CM_MC1 passed reproduction	36.30%
		LC_SLC passed reproduction	36.30%
		FR_FRABCH passed reproduction	36.30%
		FR_FRCP1 failed reproduction	36.30%
		GH_FR1 passed reproduction	36.30%
		GH_ERC passed reproduction	36.30%
		CM_MC2 failed reproduction	36.30%
		RG_MIDAG passed reproduction	36.30%
		EV_MC2 passed reproduction	36.30%
		EV_HC1 passed reproduction	36.30%
		LC_DCDS passed reproduction	36.30%
		LC_LC3 passed reproduction	36.30%
		LC_LC5 passed reproduction	36.30%
		LC_LCDSSLCC passed reproduction	36.30%
		FR_FR4 failed reproduction	36.30%
		FR_FR2 passed reproduction	36.30%
		FR_MULTIPLATE passed reproduction	36.30%
		FR_FRRD passed reproduction	36.30%

Steel Many-One Rank Sum Test

Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)
Negative Control		FR_UFR1	87	70	4	18	CDF	0.4766	Non-Significant Effect
		GH_ER2	108	70	3	18	CDF	0.9750	Non-Significant Effect
		CM_MC1	95.5	70	4	18	CDF	0.7740	Non-Significant Effect
		LC_SLC	75.5	70	3	18	CDF	0.1276	Non-Significant Effect
		FR_FRABCH	99.5	70	4	18	CDF	0.8722	Non-Significant Effect
		FR_FRCP1*	65.5	70	2	18	CDF	0.0199	Significant Effect
		GH_FR1	98.5	70	2	18	CDF	0.8509	Non-Significant Effect
		GH_ERC	76.5	70	3	18	CDF	0.1480	Non-Significant Effect
		CM_MC2*	67	70	1	18	CDF	0.0274	Significant Effect
		RG_MIDAG	77	70	3	18	CDF	0.1590	Non-Significant Effect
		EV_MC2	106	70	4	18	CDF	0.9612	Non-Significant Effect
		EV_HC1	137.5	70	3	18	CDF	1.0000	Non-Significant Effect
		LC_DCDS	90	70	4	18	CDF	0.5896	Non-Significant Effect
		LC_LC3	92.5	70	4	18	CDF	0.6790	Non-Significant Effect
		LC_LC5	98	70	1	18	CDF	0.8395	Non-Significant Effect
		LC_LCDSSLCC	88.5	70	3	18	CDF	0.5334	Non-Significant Effect
		FR_FR4*	69.5	70	2	18	CDF	0.0454	Significant Effect
		FR_FR2	77	70	1	18	CDF	0.1590	Non-Significant Effect
		FR_MULTIPLATE	71.5	70	2	18	CDF	0.0658	Non-Significant Effect
		FR_FRRD	95.5	70	4	18	CDF	0.7740	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	3.473	3.62	0.0905	No Outliers Detected
Treatment Effect	Kruskal-Wallis Omnibus Test	77.91	31.41	<1.0E-37	Significant Overall Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	2989.87	149.493	20	4.075	1.3E-07	Significant Effect
Error	6932.8	36.6815	189			
Total	9922.67		209			

Ceriodaphnia 7-d Survival and Reproduction Test — **Nautilus Environmental Calgary**

Analysis ID: 16-4426-3125 **Endpoint:** Reproduction **CETIS Version:** CETISv1.9.4
Analyzed: 11 May-21 14:57 **Analysis:** Nonparametric-Control vs Treatments **Status Level:** 1

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Variances	Bartlett Equality of Variance Test	57.5	31.41	1.7E-05	Unequal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9315	0.9869	2.4E-08	Non-Normal Distribution

Reproduction Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
Control	N	10	19.9	14.34	25.46	21	0	27	2.456	39.03%	0.00%
FR_UFR1		10	18.9	17.3	20.5	19	15	22	0.7063	11.82%	5.03%
GH_ER2		10	20	13.26	26.74	20	0	31	2.978	47.08%	-0.50%
CM_MC1		10	18.5	13.08	23.92	19	0	29	2.396	40.95%	7.04%
LC_SLC		10	13.2	8.235	18.17	13.5	0	22	2.195	52.58%	33.67%
FR_FRABCH		10	19.8	16.33	23.27	20	8	26	1.533	24.49%	0.50%
FR_FRCP1		10	10.4	6.464	14.34	12	0	18	1.74	52.90%	47.74%
GH_FR1		10	20.3	17.89	22.71	21	15	25	1.065	16.59%	-2.01%
GH_ERC		10	16.5	13.59	19.41	17.5	6	20	1.285	24.62%	17.09%
CM_MC2		10	11.8	7.728	15.87	13	2	18	1.8	48.24%	40.70%
RG_MIDAG		10	15.5	11.96	19.04	16	7	23	1.565	31.93%	22.11%
EV_MC2		10	21.3	20.18	22.42	22	19	24	0.4955	7.36%	-7.04%
EV_HC1		10	25.9	24.34	27.46	26.5	22	29	0.6904	8.43%	-30.15%
LC_DCDS		10	17.9	12.76	23.04	18.5	0	26	2.273	40.15%	10.05%
LC_LC3		10	18.5	12.81	24.19	18.5	0	30	2.513	42.96%	7.04%
LC_LC5		10	19.8	15.14	24.46	18.5	10	30	2.059	32.89%	0.50%
LC_LCDSSLCC		10	18.2	14.3	22.1	18.5	6	28	1.724	29.96%	8.54%
FR_FR4		10	14.7	11.4	18	15.5	3	19	1.461	31.43%	26.13%
FR_FR2		10	15.1	11.28	18.92	14.5	8	26	1.69	35.38%	24.12%
FR_MULTIPLATE		10	9.8	3.884	15.72	9.5	0	23	2.615	84.39%	50.75%
FR_FRRD		10	18	12.47	23.53	20	0	25	2.445	42.95%	9.55%

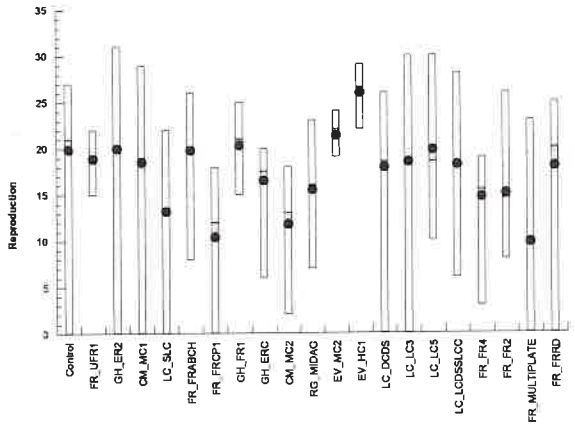
Reproduction Detail

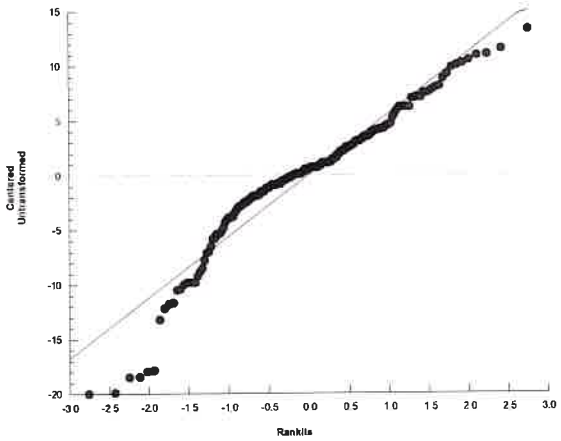
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
Control	N	18	22	0	27	20	27	24	24	19	18
FR_UFR1		19	20	15	17	22	22	20	19	17	18
GH_ER2		18	31	20	23	30	20	0	28	20	10
CM_MC1		19	22	19	29	0	19	17	21	15	24
LC_SLC		13	4	13	21	19	12	14	22	14	0
FR_FRABCH		22	24	19	19	18	8	22	26	19	21
FR_FRCP1		10	5	14	13	0	15	5	11	18	13
GH_FR1		20	15	23	17	25	21	21	24	21	16
GH_ERC		6	19	17	16	18	20	15	18	20	16
CM_MC2		3	11	18	12	15	16	18	14	2	9
RG_MIDAG		14	9	13	18	7	20	19	17	23	15
EV_MC2		21	20	19	19	22	22	22	22	24	22
EV_HC1		28	22	29	27	27	26	25	25	23	27
LC_DCDS		17	18	18	15	25	0	22	19	19	26
LC_LC3		26	20	16	17	16	30	19	23	18	0
LC_LC5		16	21	10	30	16	26	26	14	15	24
LC_LCDSSLCC		16	20	18	17	28	21	17	20	19	6
FR_FR4		15	3	18	17	16	12	18	19	14	15
FR_FR2		14	10	12	11	8	19	26	19	17	15
FR_MULTIPLATE		16	8	4	0	2	11	23	19	0	15
FR_FRRD		17	19	25	16	24	25	22	0	11	21

Ceriodaphnia 7-d Survival and Reproduction Test — **Nautilus Environmental Calgary**

Analysis ID:	16-4426-3125	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.9.4
Analyzed:	11 May-21 14:57	**Analysis:**	Nonparametric-Control vs Treatments	**Status Level:**	1

Graphics





Analyst: _____ QA: 2021/05/20 MG

CETIS Analytical Report

Ceriodaphnia 7-d Survival and Reproduction Test — **Nautilus Environmental Calgary**

Analysis ID:	02-0002-3190	**Endpoint:**	7d Survival Rate	**CETIS Version:**	CETISv1.9.4
Analyzed:	11 May-21 14:38	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1
Batch ID:	00-6487-4444	**Test Type:**	Reproduction-Survival (7d)	**Analyst:**	Kayla Knol
Start Date:	15 Apr-21	**Protocol:**	EC/EPS 1/RM/21	**Diluent:**	Site Water
Ending Date:	23 Apr-21	**Species:**	Ceriodaphnia dubia	**Brine:**	
Test Length:	8d 0h	**Taxon:**	Branchiopoda	**Source:**	In House

Age:

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
Control	03-0483-0188	15 Apr-21	15 Apr-21	n/a	Teck Coal Ltd	
FR_UFR1	16-8343-8286	13 Apr-21	14 Apr-21	48h (3.6 °C)		
GH_ER2	08-7643-8625	13 Apr-21	14 Apr-21	48h (4.9 °C)		
CM_MC1	10-8021-6522	13 Apr-21	14 Apr-21	48h (6.9 °C)		
LC_SLC	11-7695-7825	13 Apr-21	14 Apr-21	48h (6.4 °C)		
FR_FRABCH	13-2920-6522	13 Apr-21	14 Apr-21	48h (6.6 °C)		
FR_FRCP1	09-5241-6620	13 Apr-21	14 Apr-21	48h (4.2 °C)		
GH_FR1	17-2466-1900	13 Apr-21	14 Apr-21	48h (4.6 °C)		
GH_ERC	01-8068-9122	13 Apr-21	15 Apr-21	48h (5.9 °C)		
CM_MC2	01-5234-6297	13 Apr-21	14 Apr-21	48h (5.9 °C)		
RG_MIDAG	13-4002-6845	13 Apr-21	14 Apr-21	48h (7.1 °C)		
EV_MC2	09-1256-0143	14 Apr-21	14 Apr-21	24h (2.6 °C)		
EV_HC1	16-7262-0562	14 Apr-21	14 Apr-21	24h (3.6 °C)		
LC_DCDS	04-7285-8751	13 Apr-21	14 Apr-21	48h (3.6 °C)		
LC_LC3	14-0701-1007	13 Apr-21	14 Apr-21	48h (4.2 °C)		
LC_LC5	02-9493-3505	13 Apr-21	14 Apr-21	48h (3.2 °C)		
LC_LCDSSLCC	01-8317-5860	13 Apr-21	14 Apr-21	48h (4.2 °C)		
FR_FR4	18-5240-1271	13 Apr-21	14 Apr-21	48h (4.3 °C)		
FR_FR2	13-9611-3182	13 Apr-21	14 Apr-21	48h (6.4 °C)		
FR_MULTIPLATE	00-1904-7274	13 Apr-21	14 Apr-21	48h (6.3 °C)		
FR_FRRD	02-2561-5672	13 Apr-21	14 Apr-21	48h (4.4 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
Control	Ambient Sample	Teck Coal Ltd	Control	
FR_UFR1	Ambient Sample	Teck Coal Ltd	FR_UFR1_WEK_2021-04-1	
GH_ER2	Ambient Sample	Teck Coal Ltd	GH_ER2_WS_2021-04-12_	
CM_MC1	Ambient Sample	Teck Coal Ltd	CM_MC1_WS_2021-04-13	
LC_SLC	Ambient Sample	Teck Coal Ltd	LC_SLC_WS_2021-04-13_	
FR_FRABCH	Ambient Sample	Teck Coal Ltd	FR_FRABCH_WEK_2021-	
FR_FRCP1	Ambient Sample	Teck Coal Ltd	FR_FRCP1_WEK_2021-04	
GH_FR1	Ambient Sample	Teck Coal Ltd	GH_FR1_WS_2021-04-12_	
GH_ERC	Ambient Sample	Teck Coal Ltd	GH_ERC_WS_2021-04-12	
CM_MC2	Ambient Sample	Teck Coal Ltd	CM_MC2_WS_2021-04-13	
RG_MIDAG	Ambient Sample	Teck Coal Ltd	RG_MIDAG_WS_2021-04-	
EV_MC2	Ambient Sample	Teck Coal Ltd	EV_MC2_WS_2021-04-14_	
EV_HC1	Ambient Sample	Teck Coal Ltd	EV_HC1_WS_2021-04-14_	
LC_DCDS	Ambient Sample	Teck Coal Ltd	LC_DCDS_WS_2021-04-13	
LC_LC3	Ambient Sample	Teck Coal Ltd	LC_LC3_WS_2021-04-13_	
LC_LC5	Ambient Sample	Teck Coal Ltd	LC_LC5_WS_2021-04-13_	
LC_LCDSSLCC	Ambient Sample	Teck Coal Ltd	LC_LCDSSLCC_WS_2021-	
FR_FR4	Ambient Sample	Teck Coal Ltd	FR_FR4_WS_2021-04-13_	
FR_FR2	Ambient Sample	Teck Coal Ltd	FR_FR2_WS_2021-04-13_	
FR_MULTIPLATE	Ambient Sample	Teck Coal Ltd	FR_MULTIPLATE_WS_202	
FR_FRRD	Ambient Sample	Teck Coal Ltd	FR_FRRD_WS_2021-04-13	

Fisher Exact/Bonferroni Adj Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
Negative Control		FR_UFR1	1.0000	Exact	1.0000	Non-Significant Effect
		GH_ER2	0.5000	Exact	1.0000	Non-Significant Effect

Analyst: KJL QA: MG 2021/05/20

Ceriodaphnia 7-d Survival and Reproduction Test — **Nautilus Environmental Calgary**

Analysis ID: 02-0002-3190 **Endpoint:** 7d Survival Rate **CETIS Version:** CETISv1.9.4
Analyzed: 11 May-21 14:38 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Fisher Exact/Bonferroni Adj Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
		CM_MC1	0.5000	Exact	1.0000	Non-Significant Effect
		LC_SLC	0.2368	Exact	1.0000	Non-Significant Effect
		FR_FRABCH	1.0000	Exact	1.0000	Non-Significant Effect
		FR_FRCP1	0.5000	Exact	1.0000	Non-Significant Effect
		GH_FR1	1.0000	Exact	1.0000	Non-Significant Effect
		GH_ERC	1.0000	Exact	1.0000	Non-Significant Effect
		CM_MC2	1.0000	Exact	1.0000	Non-Significant Effect
		RG_MIDAG	1.0000	Exact	1.0000	Non-Significant Effect
		EV_MC2	1.0000	Exact	1.0000	Non-Significant Effect
		EV_HC1	1.0000	Exact	1.0000	Non-Significant Effect
		LC_DCDS	0.5000	Exact	1.0000	Non-Significant Effect
		LC_LC3	0.5000	Exact	1.0000	Non-Significant Effect
		LC_LC5	1.0000	Exact	1.0000	Non-Significant Effect
		LC_LCDSSLCC	1.0000	Exact	1.0000	Non-Significant Effect
		FR_FR4	1.0000	Exact	1.0000	Non-Significant Effect
		FR_FR2	1.0000	Exact	1.0000	Non-Significant Effect
		FR_MULTIPLATE	1.0000	Exact	1.0000	Non-Significant Effect
		FR_FRRD	1.0000	Exact	1.0000	Non-Significant Effect

Data Summary

Sample	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
Control	N	10	0	10	1	0	0.0%
FR_UFR1		10	0	10	1	0	0.0%
GH_ER2		9	1	10	0.9	0.1	10.0%
CM_MC1		9	1	10	0.9	0.1	10.0%
LC_SLC		8	2	10	0.8	0.2	20.0%
FR_FRABCH		10	0	10	1	0	0.0%
FR_FRCP1		9	1	10	0.9	0.1	10.0%
GH_FR1		10	0	10	1	0	0.0%
GH_ERC		10	0	10	1	0	0.0%
CM_MC2		10	0	10	1	0	0.0%
RG_MIDAG		10	0	10	1	0	0.0%
EV_MC2		10	0	10	1	0	0.0%
EV_HC1		10	0	10	1	0	0.0%
LC_DCDS		9	1	10	0.9	0.1	10.0%
LC_LC3		9	1	10	0.9	0.1	10.0%
LC_LC5		10	0	10	1	0	0.0%
LC_LCDSSLCC		10	0	10	1	0	0.0%
FR_FR4		10	0	10	1	0	0.0%
FR_FR2		10	0	10	1	0	0.0%
FR_MULTIPLATE		10	0	10	1	0	0.0%
FR_FRRD		10	0	10	1	0	0.0%

Ceriodaphnia 7-d Survival and Reproduction Test — **Nautilus Environmental Calgary**

Analysis ID: 02-0002-3190 **Endpoint:** 7d Survival Rate **CETIS Version:** CETISv1.9.4
Analyzed: 11 May-21 14:38 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

7d Survival Rate Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
Control	N	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
FR_UFR1		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
GH_ER2		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	1.0000	1.0000	1.0000
CM_MC1		1.0000	1.0000	1.0000	1.0000	0.0000	1.0000	1.0000	1.0000	1.0000	1.0000
LC_SLC		1.0000	0.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000
FR_FRABCH		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
FR_FRCP1		1.0000	1.0000	1.0000	1.0000	0.0000	1.0000	1.0000	1.0000	1.0000	1.0000
GH_FR1		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
GH_ERC		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
CM_MC2		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
RG_MIDAG		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
EV_MC2		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
EV_HC1		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
LC_DCDS		1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	1.0000	1.0000	1.0000	1.0000
LC_LC3		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000
LC_LC5		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
LC_LCDSSLCC		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
FR_FR4		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
FR_FR2		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
FR_MULTIPLATE		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
FR_FRRD		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

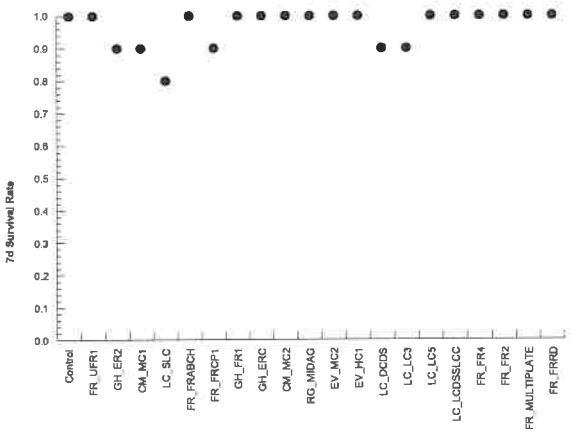
7d Survival Rate Binomials

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
Control	N	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
FR_UFR1		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
GH_ER2		1/1	1/1	1/1	1/1	1/1	1/1	0/1	1/1	1/1	1/1
CM_MC1		1/1	1/1	1/1	1/1	0/1	1/1	1/1	1/1	1/1	1/1
LC_SLC		1/1	0/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	0/1
FR_FRABCH		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
FR_FRCP1		1/1	1/1	1/1	1/1	0/1	1/1	1/1	1/1	1/1	1/1
GH_FR1		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
GH_ERC		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
CM_MC2		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
RG_MIDAG		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
EV_MC2		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
EV_HC1		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
LC_DCDS		1/1	1/1	1/1	1/1	1/1	0/1	1/1	1/1	1/1	1/1
LC_LC3		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	0/1
LC_LC5		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
LC_LCDSSLCC		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
FR_FR4		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
FR_FR2		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
FR_MULTIPLATE		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
FR_FRRD		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1

Ceriodaphnia 7-d Survival and Reproduction Test — **Nautilus Environmental Calgary**

Analysis ID:	02-0002-3190	**Endpoint:**	7d Survival Rate	**CETIS Version:**	CETISv1.9.4
Analyzed:	11 May-21 14:38	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1

Graphics



CETIS Analytical Report

Ceriodaphnia 7-d Survival and Reproduction Test — **Nautilus Environmental Calgary**

Analysis ID:	18-5495-3294	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.9.4
Analyzed:	14 May-21 11:04	**Analysis:**	Nonparametric-Control vs Treatments	**Status Level:**	1
Batch ID:	00-6487-4444	**Test Type:**	Reproduction-Survival (7d)	**Analyst:**	Kayla Knol
Start Date:	15 Apr-21	**Protocol:**	EC/EPS 1/RM/21	**Diluent:**	Site Water
Ending Date:	23 Apr-21	**Species:**	Ceriodaphnia dubia	**Brine:**	
Test Length:	8d 0h	**Taxon:**	Branchiopoda	**Source:**	In House **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
FR_UFR1	16-8343-8286	13 Apr-21	14 Apr-21	48h (3.6 °C)	Teck Coal Ltd	
GH_ER2	08-7643-8625	13 Apr-21	14 Apr-21	48h (4.9 °C)		
CM_MC1	10-8021-6522	13 Apr-21	14 Apr-21	48h (6.9 °C)		
LC_SLC	11-7695-7825	13 Apr-21	14 Apr-21	48h (6.4 °C)		
FR_FRABCH	13-2920-6522	13 Apr-21	14 Apr-21	48h (6.6 °C)		
FR_FRCP1	09-5241-6620	13 Apr-21	14 Apr-21	48h (4.2 °C)		
GH_FR1	17-2466-1900	13 Apr-21	14 Apr-21	48h (4.6 °C)		
GH_ERC	01-8068-9122	13 Apr-21	15 Apr-21	48h (5.9 °C)		
CM_MC2	01-5234-6297	13 Apr-21	14 Apr-21	48h (5.9 °C)		
RG_MIDAG	13-4002-6845	13 Apr-21	14 Apr-21	48h (7.1 °C)		
EV_MC2	09-1256-0143	14 Apr-21	14 Apr-21	24h (2.6 °C)		
EV_HC1	16-7262-0562	14 Apr-21	14 Apr-21	24h (3.6 °C)		
LC_DCDS	04-7285-8751	13 Apr-21	14 Apr-21	48h (3.6 °C)		
LC_LC3	14-0701-1007	13 Apr-21	14 Apr-21	48h (4.2 °C)		
LC_LC5	02-9493-3505	13 Apr-21	14 Apr-21	48h (3.2 °C)		
LC_LCDSSLCC	01-8317-5860	13 Apr-21	14 Apr-21	48h (4.2 °C)		
FR_FR4	18-5240-1271	13 Apr-21	14 Apr-21	48h (4.3 °C)		
FR_FR2	13-9611-3182	13 Apr-21	14 Apr-21	48h (6.4 °C)		
FR_MULTIPLATE	00-1904-7274	13 Apr-21	14 Apr-21	48h (6.3 °C)		
FR_FRRD	02-2561-5672	13 Apr-21	14 Apr-21	48h (4.4 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_UFR1	Ambient Sample	Teck Coal Ltd	FR_UFR1_WEK_2021-04-1	
GH_ER2	Ambient Sample	Teck Coal Ltd	GH_ER2_WS_2021-04-12_	
CM_MC1	Ambient Sample	Teck Coal Ltd	CM_MC1_WS_2021-04-13	
LC_SLC	Ambient Sample	Teck Coal Ltd	LC_SLC_WS_2021-04-13_	
FR_FRABCH	Ambient Sample	Teck Coal Ltd	FR_FRABCH_WEK_2021-	
FR_FRCP1	Ambient Sample	Teck Coal Ltd	FR_FRCP1_WEK_2021-04	
GH_FR1	Ambient Sample	Teck Coal Ltd	GH_FR1_WS_2021-04-12_	
GH_ERC	Ambient Sample	Teck Coal Ltd	GH_ERC_WS_2021-04-12	
CM_MC2	Ambient Sample	Teck Coal Ltd	CM_MC2_WS_2021-04-13	
RG_MIDAG	Ambient Sample	Teck Coal Ltd	RG_MIDAG_WS_2021-04-	
EV_MC2	Ambient Sample	Teck Coal Ltd	EV_MC2_WS_2021-04-14_	
EV_HC1	Ambient Sample	Teck Coal Ltd	EV_HC1_WS_2021-04-14_	
LC_DCDS	Ambient Sample	Teck Coal Ltd	LC_DCDS_WS_2021-04-1	
LC_LC3	Ambient Sample	Teck Coal Ltd	LC_LC3_WS_2021-04-13_	
LC_LC5	Ambient Sample	Teck Coal Ltd	LC_LC5_WS_2021-04-13_	
LC_LCDSSLCC	Ambient Sample	Teck Coal Ltd	LC_LCDSSLCC_WS_2021-	
FR_FR4	Ambient Sample	Teck Coal Ltd	FR_FR4_WS_2021-04-13_	
FR_FR2	Ambient Sample	Teck Coal Ltd	FR_FR2_WS_2021-04-13_	
FR_MULTIPLATE	Ambient Sample	Teck Coal Ltd	FR_MULTIPLATE_WS_202	
FR_FRRD	Ambient Sample	Teck Coal Ltd	FR_FRRD_WS_2021-04-1	

Ceriodaphnia 7-d Survival and Reproduction Test — **Nautilus Environmental Calgary**

Analysis ID: 18-5495-3294 **Endpoint:** Reproduction **CETIS Version:** CETISv1.9.4
Analyzed: 14 May-21 11:04 **Analysis:** Nonparametric-Control vs Treatments **Status Level:** 1

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	FR_UFR1 passed reproduction	38.23%
		GH_ER2 passed reproduction	38.23%
		LC_SLC passed reproduction	38.23%
		FR_FRABCH passed reproduction	38.23%
		FR_FRCP1 failed reproduction	38.23%
		GH_FR1 passed reproduction	38.23%
		GH_ERC passed reproduction	38.23%
		CM_MC2 passed reproduction	38.23%
		RG_MIDAG passed reproduction	38.23%
		EV_MC2 passed reproduction	38.23%
		EV_HC1 passed reproduction	38.23%
		LC_DCDS passed reproduction	38.23%
		LC_LC3 passed reproduction	38.23%
		LC_LC5 passed reproduction	38.23%
		LC_LCDSSLCC passed reproduction	38.23%
		FR_FR4 passed reproduction	38.23%
		FR_FR2 passed reproduction	38.23%
		FR_MULTIPLATE passed reproduction	38.23%
		FR_FRRD passed reproduction	38.23%

Steel Many-One Rank Sum Test

Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)
Site Control		FR_UFR1	100.5	70	4	18	CDF	0.8869	Non-Significant Effect
		GH_ER2	114.5	70	1	18	CDF	0.9949	Non-Significant Effect
		LC_SLC	80	70	4	18	CDF	0.2305	Non-Significant Effect
		FR_FRABCH	111.5	70	4	18	CDF	0.9886	Non-Significant Effect
		FR_FRCP1*	67	70	2	18	CDF	0.0264	Significant Effect
		GH_FR1	112	70	4	18	CDF	0.9900	Non-Significant Effect
		GH_ERC	86.5	70	3	18	CDF	0.4498	Non-Significant Effect
		CM_MC2	70.5	70	1	18	CDF	0.0529	Non-Significant Effect
		RG_MIDAG	84.5	70	3	18	CDF	0.3764	Non-Significant Effect
		EV_MC2	122.5	70	4	18	CDF	0.9996	Non-Significant Effect
		EV_HC1	143	70	2	18	CDF	1.0000	Non-Significant Effect
		LC_DCDS	100	70	5	18	CDF	0.8774	Non-Significant Effect
		LC_LC3	102.5	70	3	18	CDF	0.9197	Non-Significant Effect
		LC_LC5	105.5	70	3	18	CDF	0.9548	Non-Significant Effect
		LC_LCDSSLCC	98	70	3	18	CDF	0.8340	Non-Significant Effect
		FR_FR4	76	70	3	18	CDF	0.1336	Non-Significant Effect
		FR_FR2	82	70	3	18	CDF	0.2912	Non-Significant Effect
		FR_MULTIPLATE	76	70	3	18	CDF	0.1336	Non-Significant Effect
		FR_FRRD	106	70	6	18	CDF	0.9592	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	3.529	3.606	0.0681	No Outliers Detected
Treatment Effect	Kruskal-Wallis Omnibus Test	75.47	30.14	<1.0E-37	Significant Overall Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	2920.7	153.721	19	4.33	<1.0E-37	Significant Effect
Error	6389.9	35.4994	180			
Total	9310.59		199			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)

Ceriodaphnia 7-d Survival and Reproduction Test — **Nautilus Environmental Calgary**

Analysis ID: 18-5495-3294 **Endpoint:** Reproduction **CETIS Version:** CETISv1.9.4
Analyzed: 14 May-21 11:04 **Analysis:** Nonparametric-Control vs Treatments **Status Level:** 1

Variances	Bartlett Equality of Variance Test	56.13	36.19	1.6E-05	Unequal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9398	0.9816	2.2E-07	Non-Normal Distribution

Reproduction Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
FR_UFR1		10	18.9	17.3	20.5	19	15	22	0.7063	11.82%	0.00%
GH_ER2		10	20	13.26	26.74	20	0	31	2.978	47.08%	-5.82%
CM_MC1	XC	10	18.5	13.08	23.92	19	0	29	2.396	40.95%	2.12%
LC_SLC		10	13.2	8.235	18.17	13.5	0	22	2.195	52.58%	30.16%
FR_FRABCH		10	19.8	16.33	23.27	20	8	26	1.533	24.49%	-4.76%
FR_FRCP1		10	10.4	6.464	14.34	12	0	18	1.74	52.90%	44.97%
GH_FR1		10	20.3	17.89	22.71	21	15	25	1.065	16.59%	-7.41%
GH_ERC		10	16.5	13.59	19.41	17.5	6	20	1.285	24.62%	12.70%
CM_MC2		10	11.8	7.728	15.87	13	2	18	1.8	48.24%	37.57%
RG_MIDAG		10	15.5	11.96	19.04	16	7	23	1.565	31.93%	17.99%
EV_MC2		10	21.3	20.18	22.42	22	19	24	0.4955	7.36%	-12.70%
EV_HC1		10	25.9	24.34	27.46	26.5	22	29	0.6904	8.43%	-37.04%
LC_DCDS		10	17.9	12.76	23.04	18.5	0	26	2.273	40.15%	5.29%
LC_LC3		10	18.5	12.81	24.19	18.5	0	30	2.513	42.96%	2.12%
LC_LC5		10	19.8	15.14	24.46	18.5	10	30	2.059	32.89%	-4.76%
LC_LCDSSLCC		10	18.2	14.3	22.1	18.5	6	28	1.724	29.96%	3.70%
FR_FR4		10	14.7	11.4	18	15.5	3	19	1.461	31.43%	22.22%
FR_FR2		10	15.1	11.28	18.92	14.5	8	26	1.69	35.38%	20.11%
FR_MULTIPLATE		10	9.8	3.884	15.72	9.5	0	23	2.615	84.39%	48.15%
FR_FRRD		10	18	12.47	23.53	20	0	25	2.445	42.95%	4.76%

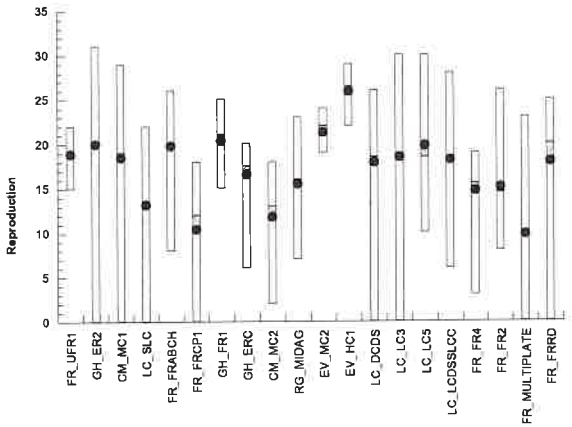
Reproduction Detail

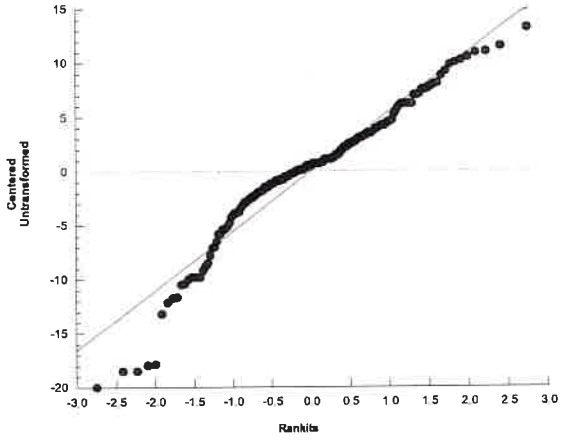
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
FR_UFR1		19	20	15	17	22	22	20	19	17	18
GH_ER2		18	31	20	23	30	20	0	28	20	10
CM_MC1	XC	19	22	19	29	0	19	17	21	15	24
LC_SLC		13	4	13	21	19	12	14	22	14	0
FR_FRABCH		22	24	19	19	18	8	22	26	19	21
FR_FRCP1		10	5	14	13	0	15	5	11	18	13
GH_FR1		20	15	23	17	25	21	21	24	21	16
GH_ERC		6	19	17	16	18	20	15	18	20	16
CM_MC2		3	11	18	12	15	16	18	14	2	9
RG_MIDAG		14	9	13	18	7	20	19	17	23	15
EV_MC2		21	20	19	19	22	22	22	22	24	22
EV_HC1		28	22	29	27	27	26	25	25	23	27
LC_DCDS		17	18	18	15	25	0	22	19	19	26
LC_LC3		26	20	16	17	16	30	19	23	18	0
LC_LC5		16	21	10	30	16	26	26	14	15	24
LC_LCDSSLCC		16	20	18	17	28	21	17	20	19	6
FR_FR4		15	3	18	17	16	12	18	19	14	15
FR_FR2		14	10	12	11	8	19	26	19	17	15
FR_MULTIPLATE		16	8	4	0	2	11	23	19	0	15
FR_FRRD		17	19	25	16	24	25	22	0	11	21

Ceriodaphnia 7-d Survival and Reproduction Test — **Nautilus Environmental Calgary**

Analysis ID:	18-5495-3294	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.9.4
Analyzed:	14 May-21 11:04	**Analysis:**	Nonparametric-Control vs Treatments	**Status Level:**	1

Graphics





CETIS Analytical Report

Ceriodaphnia 7-d Survival and Reproduction Test — **Nautilus Environmental Calgary**

Analysis ID:	10-5494-7542	**Endpoint:**	7d Survival Rate	**CETIS Version:**	CETISv1.9.4
Analyzed:	14 May-21 11:18	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1
Batch ID:	00-6487-4444	**Test Type:**	Reproduction-Survival (7d)	**Analyst:**	Kayla Knol
Start Date:	15 Apr-21	**Protocol:**	EC/EPS 1/RM/21	**Diluent:**	Site Water
Ending Date:	23 Apr-21	**Species:**	Ceriodaphnia dubia	**Brine:**	
Test Length:	8d 0h	**Taxon:**	Branchiopoda	**Source:**	In House **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
FR_UFR1	16-8343-8286	13 Apr-21	14 Apr-21	48h (3.6 °C)	Teck Coal Ltd	
GH_ER2	08-7643-8625	13 Apr-21	14 Apr-21	48h (4.9 °C)		
CM_MC1	10-8021-6522	13 Apr-21	14 Apr-21	48h (6.9 °C)		
LC_SLC	11-7695-7825	13 Apr-21	14 Apr-21	48h (6.4 °C)		
FR_FRABCH	13-2920-6522	13 Apr-21	14 Apr-21	48h (6.6 °C)		
FR_FRCP1	09-5241-6620	13 Apr-21	14 Apr-21	48h (4.2 °C)		
GH_FR1	17-2466-1900	13 Apr-21	14 Apr-21	48h (4.6 °C)		
GH_ERC	01-8068-9122	13 Apr-21	15 Apr-21	48h (5.9 °C)		
CM_MC2	01-5234-6297	13 Apr-21	14 Apr-21	48h (5.9 °C)		
RG_MIDAG	13-4002-6845	13 Apr-21	14 Apr-21	48h (7.1 °C)		
EV_MC2	09-1256-0143	14 Apr-21	14 Apr-21	24h (2.6 °C)		
EV_HC1	16-7262-0562	14 Apr-21	14 Apr-21	24h (3.6 °C)		
LC_DCDS	04-7285-8751	13 Apr-21	14 Apr-21	48h (3.6 °C)		
LC_LC3	14-0701-1007	13 Apr-21	14 Apr-21	48h (4.2 °C)		
LC_LC5	02-9493-3505	13 Apr-21	14 Apr-21	48h (3.2 °C)		
LC_LCDSSLCC	01-8317-5860	13 Apr-21	14 Apr-21	48h (4.2 °C)		
FR_FR4	18-5240-1271	13 Apr-21	14 Apr-21	48h (4.3 °C)		
FR_FR2	13-9611-3182	13 Apr-21	14 Apr-21	48h (6.4 °C)		
FR_MULTIPLATE	00-1904-7274	13 Apr-21	14 Apr-21	48h (6.3 °C)		
FR_FRRD	02-2561-5672	13 Apr-21	14 Apr-21	48h (4.4 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_UFR1	Ambient Sample	Teck Coal Ltd	FR_UFR1_WEK_2021-04-1	
GH_ER2	Ambient Sample	Teck Coal Ltd	GH_ER2_WS_2021-04-12_	
CM_MC1	Ambient Sample	Teck Coal Ltd	CM_MC1_WS_2021-04-13	
LC_SLC	Ambient Sample	Teck Coal Ltd	LC_SLC_WS_2021-04-13_	
FR_FRABCH	Ambient Sample	Teck Coal Ltd	FR_FRABCH_WEK_2021-	
FR_FRCP1	Ambient Sample	Teck Coal Ltd	FR_FRCP1_WEK_2021-04	
GH_FR1	Ambient Sample	Teck Coal Ltd	GH_FR1_WS_2021-04-12_	
GH_ERC	Ambient Sample	Teck Coal Ltd	GH_ERC_WS_2021-04-12	
CM_MC2	Ambient Sample	Teck Coal Ltd	CM_MC2_WS_2021-04-13	
RG_MIDAG	Ambient Sample	Teck Coal Ltd	RG_MIDAG_WS_2021-04-	
EV_MC2	Ambient Sample	Teck Coal Ltd	EV_MC2_WS_2021-04-14_	
EV_HC1	Ambient Sample	Teck Coal Ltd	EV_HC1_WS_2021-04-14_	
LC_DCDS	Ambient Sample	Teck Coal Ltd	LC_DCDS_WS_2021-04-1	
LC_LC3	Ambient Sample	Teck Coal Ltd	LC_LC3_WS_2021-04-13_	
LC_LC5	Ambient Sample	Teck Coal Ltd	LC_LC5_WS_2021-04-13_	
LC_LCDSSLCC	Ambient Sample	Teck Coal Ltd	LC_LCDSSLCC_WS_2021-	
FR_FR4	Ambient Sample	Teck Coal Ltd	FR_FR4_WS_2021-04-13_	
FR_FR2	Ambient Sample	Teck Coal Ltd	FR_FR2_WS_2021-04-13_	
FR_MULTIPLATE	Ambient Sample	Teck Coal Ltd	FR_MULTIPLATE_WS_202	
FR_FRRD	Ambient Sample	Teck Coal Ltd	FR_FRRD_WS_2021-04-1	

Fisher Exact/Bonferroni Adj Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
Site Control		GH_ER2	0.5000	Exact	1.0000	Non-Significant Effect
		CM_MC1	0.5000	Exact	1.0000	Non-Significant Effect
		LC_SLC	0.2368	Exact	1.0000	Non-Significant Effect
		FR_FRABCH	1.0000	Exact	1.0000	Non-Significant Effect

Ceriodaphnia 7-d Survival and Reproduction Test — **Nautilus Environmental Calgary**

Analysis ID: 10-5494-7542 **Endpoint:** 7d Survival Rate **CETIS Version:** CETISv1.9.4
Analyzed: 14 May-21 11:18 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Fisher Exact/Bonferroni Adj Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
		FR_FRCP1	0.5000	Exact	1.0000	Non-Significant Effect
		GH_FR1	1.0000	Exact	1.0000	Non-Significant Effect
		GH_ERC	1.0000	Exact	1.0000	Non-Significant Effect
		CM_MC2	1.0000	Exact	1.0000	Non-Significant Effect
		RG_MIDAG	1.0000	Exact	1.0000	Non-Significant Effect
		EV_MC2	1.0000	Exact	1.0000	Non-Significant Effect
		EV_HC1	1.0000	Exact	1.0000	Non-Significant Effect
		LC_DCDS	0.5000	Exact	1.0000	Non-Significant Effect
		LC_LC3	0.5000	Exact	1.0000	Non-Significant Effect
		LC_LC5	1.0000	Exact	1.0000	Non-Significant Effect
		LC_LCDSSLCC	1.0000	Exact	1.0000	Non-Significant Effect
		FR_FR4	1.0000	Exact	1.0000	Non-Significant Effect
		FR_FR2	1.0000	Exact	1.0000	Non-Significant Effect
		FR_MULTIPLATE	1.0000	Exact	1.0000	Non-Significant Effect
		FR_FRRD	1.0000	Exact	1.0000	Non-Significant Effect

Data Summary

Sample	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
FR_UFR1	XC	10	0	10	1	0	0.0%
GH_ER2		9	1	10	0.9	0.1	10.0%
CM_MC1		9	1	10	0.9	0.1	10.0%
LC_SLC		8	2	10	0.8	0.2	20.0%
FR_FRABCH		10	0	10	1	0	0.0%
FR_FRCP1		9	1	10	0.9	0.1	10.0%
GH_FR1		10	0	10	1	0	0.0%
GH_ERC		10	0	10	1	0	0.0%
CM_MC2		10	0	10	1	0	0.0%
RG_MIDAG		10	0	10	1	0	0.0%
EV_MC2		10	0	10	1	0	0.0%
EV_HC1		10	0	10	1	0	0.0%
LC_DCDS		9	1	10	0.9	0.1	10.0%
LC_LC3		9	1	10	0.9	0.1	10.0%
LC_LC5		10	0	10	1	0	0.0%
LC_LCDSSLCC		10	0	10	1	0	0.0%
FR_FR4		10	0	10	1	0	0.0%
FR_FR2		10	0	10	1	0	0.0%
FR_MULTIPLATE		10	0	10	1	0	0.0%
FR_FRRD		10	0	10	1	0	0.0%

Ceriodaphnia 7-d Survival and Reproduction Test — **Nautilus Environmental Calgary**

Analysis ID: 10-5494-7542 **Endpoint:** 7d Survival Rate **CETIS Version:** CETISv1.9.4
Analyzed: 14 May-21 11:18 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

7d Survival Rate Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
FR_UFR1	XC	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
GH_ER2		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	1.0000	1.0000	1.0000
CM_MC1		1.0000	1.0000	1.0000	1.0000	0.0000	1.0000	1.0000	1.0000	1.0000	1.0000
LC_SLC		1.0000	0.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000
FR_FRABCH		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
FR_FRCP1		1.0000	1.0000	1.0000	1.0000	0.0000	1.0000	1.0000	1.0000	1.0000	1.0000
GH_FR1		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
GH_ERC		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
CM_MC2		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
RG_MIDAG		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
EV_MC2		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
EV_HC1		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
LC_DCDS		1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	1.0000	1.0000	1.0000	1.0000
LC_LC3		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000
LC_LC5		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
LC_LCDSSLCC		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
FR_FR4		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
FR_FR2		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
FR_MULTIPLATE		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
FR_FRRD		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

7d Survival Rate Binomials

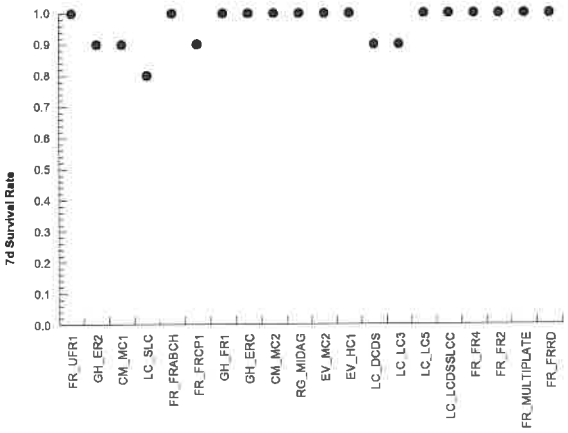
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
FR_UFR1	XC	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
GH_ER2		1/1	1/1	1/1	1/1	1/1	1/1	0/1	1/1	1/1	1/1
CM_MC1		1/1	1/1	1/1	1/1	0/1	1/1	1/1	1/1	1/1	1/1
LC_SLC		1/1	0/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	0/1
FR_FRABCH		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
FR_FRCP1		1/1	1/1	1/1	1/1	0/1	1/1	1/1	1/1	1/1	1/1
GH_FR1		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
GH_ERC		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
CM_MC2		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
RG_MIDAG		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
EV_MC2		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
EV_HC1		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
LC_DCDS		1/1	1/1	1/1	1/1	1/1	0/1	1/1	1/1	1/1	1/1
LC_LC3		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	0/1
LC_LC5		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
LC_LCDSSLCC		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
FR_FR4		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
FR_FR2		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
FR_MULTIPLATE		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
FR_FRRD		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1

Analyst: KSC QA: MB 2021/05/20

Ceriodaphnia 7-d Survival and Reproduction Test — **Nautilus Environmental Calgary**

Analysis ID:	10-5494-7542	**Endpoint:**	7d Survival Rate	**CETIS Version:**	CETISv1.9.4
Analyzed:	14 May-21 11:18	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1

Graphics



Analyst: KL QA: MG 2021/05/20

CETIS Analytical Report

Ceriodaphnia 7-d Survival and Reproduction Test — **Nautilus Environmental Calgary**

Analysis ID:	17-2747-1797	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.9.4
Analyzed:	14 May-21 11:07	**Analysis:**	Nonparametric-Control vs Treatments	**Status Level:**	1
Batch ID:	00-6487-4444	**Test Type:**	Reproduction-Survival (7d)	**Analyst:**	Kayla Knol
Start Date:	15 Apr-21	**Protocol:**	EC/EPS 1/RM/21	**Diluent:**	Site Water
Ending Date:	23 Apr-21	**Species:**	Ceriodaphnia dubia	**Brine:**	
Test Length:	8d 0h	**Taxon:**	Branchiopoda	**Source:**	In House **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
FR_UFR1	16-8343-8286	13 Apr-21	14 Apr-21	48h (3.6 °C)	Teck Coal Ltd	
GH_ER2	08-7643-8625	13 Apr-21	14 Apr-21	48h (4.9 °C)		
CM_MC1	10-8021-6522	13 Apr-21	14 Apr-21	48h (6.9 °C)		
LC_SLC	11-7695-7825	13 Apr-21	14 Apr-21	48h (6.4 °C)		
FR_FRABCH	13-2920-6522	13 Apr-21	14 Apr-21	48h (6.6 °C)		
FR_FRCP1	09-5241-6620	13 Apr-21	14 Apr-21	48h (4.2 °C)		
GH_FR1	17-2466-1900	13 Apr-21	14 Apr-21	48h (4.6 °C)		
GH_ERC	01-8068-9122	13 Apr-21	15 Apr-21	48h (5.9 °C)		
CM_MC2	01-5234-6297	13 Apr-21	14 Apr-21	48h (5.9 °C)		
RG_MIDAG	13-4002-6845	13 Apr-21	14 Apr-21	48h (7.1 °C)		
EV_MC2	09-1256-0143	14 Apr-21	14 Apr-21	24h (2.6 °C)		
EV_HC1	16-7262-0562	14 Apr-21	14 Apr-21	24h (3.6 °C)		
LC_DCDS	04-7285-8751	13 Apr-21	14 Apr-21	48h (3.6 °C)		
LC_LC3	14-0701-1007	13 Apr-21	14 Apr-21	48h (4.2 °C)		
LC_LC5	02-9493-3505	13 Apr-21	14 Apr-21	48h (3.2 °C)		
LC_LCDSSLCC	01-8317-5860	13 Apr-21	14 Apr-21	48h (4.2 °C)		
FR_FR4	18-5240-1271	13 Apr-21	14 Apr-21	48h (4.3 °C)		
FR_FR2	13-9611-3182	13 Apr-21	14 Apr-21	48h (6.4 °C)		
FR_MULTIPLATE	00-1904-7274	13 Apr-21	14 Apr-21	48h (6.3 °C)		
FR_FRRD	02-2561-5672	13 Apr-21	14 Apr-21	48h (4.4 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_UFR1	Ambient Sample	Teck Coal Ltd	FR_UFR1_WEK_2021-04-1	
GH_ER2	Ambient Sample	Teck Coal Ltd	GH_ER2_WS_2021-04-12_	
CM_MC1	Ambient Sample	Teck Coal Ltd	CM_MC1_WS_2021-04-13	
LC_SLC	Ambient Sample	Teck Coal Ltd	LC_SLC_WS_2021-04-13_	
FR_FRABCH	Ambient Sample	Teck Coal Ltd	FR_FRABCH_WEK_2021-	
FR_FRCP1	Ambient Sample	Teck Coal Ltd	FR_FRCP1_WEK_2021-04	
GH_FR1	Ambient Sample	Teck Coal Ltd	GH_FR1_WS_2021-04-12_	
GH_ERC	Ambient Sample	Teck Coal Ltd	GH_ERC_WS_2021-04-12	
CM_MC2	Ambient Sample	Teck Coal Ltd	CM_MC2_WS_2021-04-13	
RG_MIDAG	Ambient Sample	Teck Coal Ltd	RG_MIDAG_WS_2021-04-	
EV_MC2	Ambient Sample	Teck Coal Ltd	EV_MC2_WS_2021-04-14_	
EV_HC1	Ambient Sample	Teck Coal Ltd	EV_HC1_WS_2021-04-14_	
LC_DCDS	Ambient Sample	Teck Coal Ltd	LC_DCDS_WS_2021-04-1	
LC_LC3	Ambient Sample	Teck Coal Ltd	LC_LC3_WS_2021-04-13_	
LC_LC5	Ambient Sample	Teck Coal Ltd	LC_LC5_WS_2021-04-13_	
LC_LCDSSLCC	Ambient Sample	Teck Coal Ltd	LC_LCDSSLCC_WS_2021-	
FR_FR4	Ambient Sample	Teck Coal Ltd	FR_FR4_WS_2021-04-13_	
FR_FR2	Ambient Sample	Teck Coal Ltd	FR_FR2_WS_2021-04-13_	
FR_MULTIPLATE	Ambient Sample	Teck Coal Ltd	FR_MULTIPLATE_WS_202	
FR_FRRD	Ambient Sample	Teck Coal Ltd	FR_FRRD_WS_2021-04-1	

Ceriodaphnia 7-d Survival and Reproduction Test — **Nautilus Environmental Calgary**

Analysis ID: 17-2747-1797 **Endpoint:** Reproduction **CETIS Version:** CETISv1.9.4
Analyzed: 14 May-21 11:07 **Analysis:** Nonparametric-Control vs Treatments **Status Level:** 1

Data Transform	Alt Hyp
Untransformed	C > T

Comparison Result	PMSD
FR_UFR1 passed reproduction	35.36%
CM_MC1 passed reproduction	35.36%
LC_SLC passed reproduction	35.36%
FR_FRABCH passed reproduction	35.36%
FR_FRCP1 passed reproduction	35.36%
GH_FR1 passed reproduction	35.36%
GH_ERC passed reproduction	35.36%
CM_MC2 passed reproduction	35.36%
RG_MIDAG passed reproduction	35.36%
EV_MC2 passed reproduction	35.36%
EV_HC1 passed reproduction	35.36%
LC_DCDS passed reproduction	35.36%
LC_LC3 passed reproduction	35.36%
LC_LC5 passed reproduction	35.36%
LC_LCDSSLCC passed reproduction	35.36%
FR_FR4 passed reproduction	35.36%
FR_FR2 passed reproduction	35.36%
FR_MULTIPLATE passed reproduction	35.36%
FR_FRRD passed reproduction	35.36%

Steel Many-One Rank Sum Test

Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)
Site Control		FR_UFR1	90.5	70	2	18	CDF	0.5999	Non-Significant Effect
		CM_MC1	95.5	70	1	18	CDF	0.7674	Non-Significant Effect
		LC_SLC	81.5	70	1	18	CDF	0.2753	Non-Significant Effect
		FR_FRABCH	99.5	70	1	18	CDF	0.8674	Non-Significant Effect
		FR_FRCP1	71.5	70	3	18	CDF	0.0636	Non-Significant Effect
		GH_FR1	104	70	2	18	CDF	0.9392	Non-Significant Effect
		GH_ERC	81	70	2	18	CDF	0.2599	Non-Significant Effect
		CM_MC2	73	70	1	18	CDF	0.0827	Non-Significant Effect
		RG_MIDAG	81.5	70	3	18	CDF	0.2753	Non-Significant Effect
		EV_MC2	108.5	70	1	18	CDF	0.9764	Non-Significant Effect
		EV_HC1	125	70	2	18	CDF	0.9998	Non-Significant Effect
		LC_DCDS	90.5	70	2	18	CDF	0.5999	Non-Significant Effect
		LC_LC3	93.5	70	5	18	CDF	0.7050	Non-Significant Effect
		LC_LC5	100	70	2	18	CDF	0.8774	Non-Significant Effect
		LC_LCDSSLCC	90	70	3	18	CDF	0.5814	Non-Significant Effect
		FR_FR4	76	70	1	18	CDF	0.1336	Non-Significant Effect
		FR_FR2	80.5	70	1	18	CDF	0.2449	Non-Significant Effect
		FR_MULTIPLATE	74.5	70	2	18	CDF	0.1059	Non-Significant Effect
		FR_FRRD	97.5	70	1	18	CDF	0.8217	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	3.529	3.606	0.0681	No Outliers Detected
Treatment Effect	Kruskal-Wallis Omnibus Test	75.47	30.14	<1.0E-37	Significant Overall Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	2920.7	153.721	19	4.33	<1.0E-37	Significant Effect
Error	6389.9	35.4994	180			
Total	9310.59		199			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)

Ceriodaphnia 7-d Survival and Reproduction Test **Nautilus Environmental Calgary**

Analysis ID: 17-2747-1797 **Endpoint:** Reproduction **CETIS Version:** CETISv1.9.4
Analyzed: 14 May-21 11:07 **Analysis:** Nonparametric-Control vs Treatments **Status Level:** 1

Variances	Bartlett Equality of Variance Test	56.13	36.19	1.6E-05	Unequal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9398	0.9816	2.2E-07	Non-Normal Distribution

Reproduction Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
FR_UFR1		10	18.9	17.3	20.5	19	15	22	0.7063	11.82%	0.00%
GH_ER2	XC	10	20	13.26	26.74	20	0	31	2.978	47.08%	-5.82%
CM_MC1		10	18.5	13.08	23.92	19	0	29	2.396	40.95%	2.12%
LC_SLC		10	13.2	8.235	18.17	13.5	0	22	2.195	52.58%	30.16%
FR_FRABCH		10	19.8	16.33	23.27	20	8	26	1.533	24.49%	-4.76%
FR_FRCP1		10	10.4	6.464	14.34	12	0	18	1.74	52.90%	44.97%
GH_FR1		10	20.3	17.89	22.71	21	15	25	1.065	16.59%	-7.41%
GH_ERC		10	16.5	13.59	19.41	17.5	6	20	1.285	24.62%	12.70%
CM_MC2		10	11.8	7.728	15.87	13	2	18	1.8	48.24%	37.57%
RG_MIDAG		10	15.5	11.96	19.04	16	7	23	1.565	31.93%	17.99%
EV_MC2		10	21.3	20.18	22.42	22	19	24	0.4955	7.36%	-12.70%
EV_HC1		10	25.9	24.34	27.46	26.5	22	29	0.6904	8.43%	-37.04%
LC_DCDS		10	17.9	12.76	23.04	18.5	0	26	2.273	40.15%	5.29%
LC_LC3		10	18.5	12.81	24.19	18.5	0	30	2.513	42.96%	2.12%
LC_LC5		10	19.8	15.14	24.46	18.5	10	30	2.059	32.89%	-4.76%
LC_LCDSSLCC		10	18.2	14.3	22.1	18.5	6	28	1.724	29.96%	3.70%
FR_FR4		10	14.7	11.4	18	15.5	3	19	1.461	31.43%	22.22%
FR_FR2		10	15.1	11.28	18.92	14.5	8	26	1.69	35.38%	20.11%
FR_MULTIPLATE		10	9.8	3.884	15.72	9.5	0	23	2.615	84.39%	48.15%
FR_FRRD		10	18	12.47	23.53	20	0	25	2.445	42.95%	4.76%

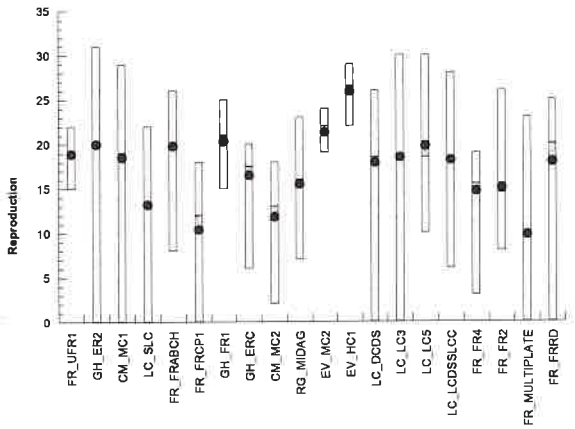
Reproduction Detail

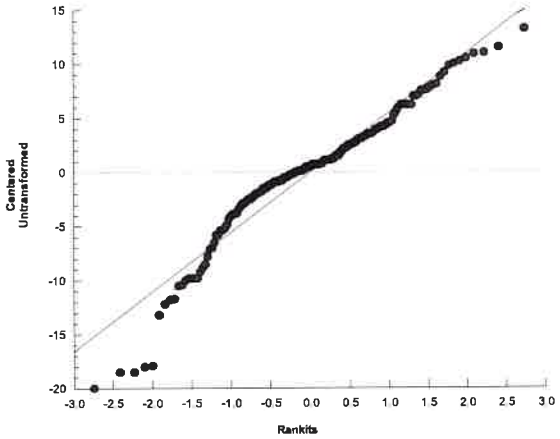
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
FR_UFR1		19	20	15	17	22	22	20	19	17	18
GH_ER2	XC	18	31	20	23	30	20	0	28	20	10
CM_MC1		19	22	19	29	0	19	17	21	15	24
LC_SLC		13	4	13	21	19	12	14	22	14	0
FR_FRABCH		22	24	19	19	18	8	22	26	19	21
FR_FRCP1		10	5	14	13	0	15	5	11	18	13
GH_FR1		20	15	23	17	25	21	21	24	21	16
GH_ERC		6	19	17	16	18	20	15	18	20	16
CM_MC2		3	11	18	12	15	16	18	14	2	9
RG_MIDAG		14	9	13	18	7	20	19	17	23	15
EV_MC2		21	20	19	19	22	22	22	22	24	22
EV_HC1		28	22	29	27	27	26	25	25	23	27
LC_DCDS		17	18	18	15	25	0	22	19	19	26
LC_LC3		26	20	16	17	16	30	19	23	18	0
LC_LC5		16	21	10	30	16	26	26	14	15	24
LC_LCDSSLCC		16	20	18	17	28	21	17	20	19	6
FR_FR4		15	3	18	17	16	12	18	19	14	15
FR_FR2		14	10	12	11	8	19	26	19	17	15
FR_MULTIPLATE		16	8	4	0	2	11	23	19	0	15
FR_FRRD		17	19	25	16	24	25	22	0	11	21

Ceriodaphnia 7-d Survival and Reproduction Test — **Nautilus Environmental Calgary**

Analysis ID:	17-2747-1797	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.9.4
Analyzed:	14 May-21 11:07	**Analysis:**	Nonparametric-Control vs Treatments	**Status Level:**	1

Graphics





Analyst: RAL QA: MG 2021/05/20

CETIS Analytical Report

Ceriodaphnia 7-d Survival and Reproduction Test — **Nautilus Environmental Calgary**

Analysis ID:	04-3470-1905	**Endpoint:**	7d Survival Rate	**CETIS Version:**	CETISv1.9.4
Analyzed:	14 May-21 11:06	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1
Batch ID:	00-6487-4444	**Test Type:**	Reproduction-Survival (7d)	**Analyst:**	Kayla Knol
Start Date:	15 Apr-21	**Protocol:**	EC/EPS 1/RM/21	**Diluent:**	Site Water
Ending Date:	23 Apr-21	**Species:**	Ceriodaphnia dubia	**Brine:**	
Test Length:	8d 0h	**Taxon:**	Branchiopoda	**Source:**	In House **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
FR_UFR1	16-8343-8286	13 Apr-21	14 Apr-21	48h (3.6 °C)	Teck Coal Ltd	
GH_ER2	08-7643-8625	13 Apr-21	14 Apr-21	48h (4.9 °C)		
CM_MC1	10-8021-6522	13 Apr-21	14 Apr-21	48h (6.9 °C)		
LC_SLC	11-7695-7825	13 Apr-21	14 Apr-21	48h (6.4 °C)		
FR_FRABCH	13-2920-6522	13 Apr-21	14 Apr-21	48h (6.6 °C)		
FR_FRCP1	09-5241-6620	13 Apr-21	14 Apr-21	48h (4.2 °C)		
GH_FR1	17-2466-1900	13 Apr-21	14 Apr-21	48h (4.6 °C)		
GH_ERC	01-8068-9122	13 Apr-21	15 Apr-21	48h (5.9 °C)		
CM_MC2	01-5234-6297	13 Apr-21	14 Apr-21	48h (5.9 °C)		
RG_MIDAG	13-4002-6845	13 Apr-21	14 Apr-21	48h (7.1 °C)		
EV_MC2	09-1256-0143	14 Apr-21	14 Apr-21	24h (2.6 °C)		
EV_HC1	16-7262-0562	14 Apr-21	14 Apr-21	24h (3.6 °C)		
LC_DCDS	04-7285-8751	13 Apr-21	14 Apr-21	48h (3.6 °C)		
LC_LC3	14-0701-1007	13 Apr-21	14 Apr-21	48h (4.2 °C)		
LC_LC5	02-9493-3505	13 Apr-21	14 Apr-21	48h (3.2 °C)		
LC_LCDSSLCC	01-8317-5860	13 Apr-21	14 Apr-21	48h (4.2 °C)		
FR_FR4	18-5240-1271	13 Apr-21	14 Apr-21	48h (4.3 °C)		
FR_FR2	13-9611-3182	13 Apr-21	14 Apr-21	48h (6.4 °C)		
FR_MULTIPLATE	00-1904-7274	13 Apr-21	14 Apr-21	48h (6.3 °C)		
FR_FRRD	02-2561-5672	13 Apr-21	14 Apr-21	48h (4.4 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_UFR1	Ambient Sample	Teck Coal Ltd	FR_UFR1_WEK_2021-04-1	
GH_ER2	Ambient Sample	Teck Coal Ltd	GH_ER2_WS_2021-04-12_	
CM_MC1	Ambient Sample	Teck Coal Ltd	CM_MC1_WS_2021-04-13	
LC_SLC	Ambient Sample	Teck Coal Ltd	LC_SLC_WS_2021-04-13_	
FR_FRABCH	Ambient Sample	Teck Coal Ltd	FR_FRABCH_WEK_2021-	
FR_FRCP1	Ambient Sample	Teck Coal Ltd	FR_FRCP1_WEK_2021-04	
GH_FR1	Ambient Sample	Teck Coal Ltd	GH_FR1_WS_2021-04-12_	
GH_ERC	Ambient Sample	Teck Coal Ltd	GH_ERC_WS_2021-04-12	
CM_MC2	Ambient Sample	Teck Coal Ltd	CM_MC2_WS_2021-04-13	
RG_MIDAG	Ambient Sample	Teck Coal Ltd	RG_MIDAG_WS_2021-04-	
EV_MC2	Ambient Sample	Teck Coal Ltd	EV_MC2_WS_2021-04-14_	
EV_HC1	Ambient Sample	Teck Coal Ltd	EV_HC1_WS_2021-04-14_	
LC_DCDS	Ambient Sample	Teck Coal Ltd	LC_DCDS_WS_2021-04-1	
LC_LC3	Ambient Sample	Teck Coal Ltd	LC_LC3_WS_2021-04-13_	
LC_LC5	Ambient Sample	Teck Coal Ltd	LC_LC5_WS_2021-04-13_	
LC_LCDSSLCC	Ambient Sample	Teck Coal Ltd	LC_LCDSSLCC_WS_2021-	
FR_FR4	Ambient Sample	Teck Coal Ltd	FR_FR4_WS_2021-04-13_	
FR_FR2	Ambient Sample	Teck Coal Ltd	FR_FR2_WS_2021-04-13_	
FR_MULTIPLATE	Ambient Sample	Teck Coal Ltd	FR_MULTIPLATE_WS_202	
FR_FRRD	Ambient Sample	Teck Coal Ltd	FR_FRRD_WS_2021-04-1	

Fisher Exact/Bonferroni Adj Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
Site Control		FR_UFR1	1.0000	Exact	1.0000	Non-Significant Effect
		CM_MC1	0.7632	Exact	1.0000	Non-Significant Effect
		LC_SLC	0.5000	Exact	1.0000	Non-Significant Effect
		FR_FRABCH	1.0000	Exact	1.0000	Non-Significant Effect

Ceriodaphnia 7-d Survival and Reproduction Test — **Nautilus Environmental Calgary**

Analysis ID: 04-3470-1905 **Endpoint:** 7d Survival Rate **CETIS Version:** CETISv1.9.4
Analyzed: 14 May-21 11:06 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Fisher Exact/Bonferroni Adj Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
		FR_FRCP1	0.7632	Exact	1.0000	Non-Significant Effect
		GH_FR1	1.0000	Exact	1.0000	Non-Significant Effect
		GH_ERC	1.0000	Exact	1.0000	Non-Significant Effect
		CM_MC2	1.0000	Exact	1.0000	Non-Significant Effect
		RG_MIDAG	1.0000	Exact	1.0000	Non-Significant Effect
		EV_MC2	1.0000	Exact	1.0000	Non-Significant Effect
		EV_HC1	1.0000	Exact	1.0000	Non-Significant Effect
		LC_DCDS	0.7632	Exact	1.0000	Non-Significant Effect
		LC_LC3	0.7632	Exact	1.0000	Non-Significant Effect
		LC_LC5	1.0000	Exact	1.0000	Non-Significant Effect
		LC_LCDSSLCC	1.0000	Exact	1.0000	Non-Significant Effect
		FR_FR4	1.0000	Exact	1.0000	Non-Significant Effect
		FR_FR2	1.0000	Exact	1.0000	Non-Significant Effect
		FR_MULTIPLATE	1.0000	Exact	1.0000	Non-Significant Effect
		FR_FRRD	1.0000	Exact	1.0000	Non-Significant Effect

Data Summary

Sample	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
FR_UFR1		10	0	10	1	0	-11.11%
GH_ER2	XC	9	1	10	0.9	0.1	0.0%
CM_MC1		9	1	10	0.9	0.1	0.0%
LC_SLC		8	2	10	0.8	0.2	11.11%
FR_FRABCH		10	0	10	1	0	-11.11%
FR_FRCP1		9	1	10	0.9	0.1	0.0%
GH_FR1		10	0	10	1	0	-11.11%
GH_ERC		10	0	10	1	0	-11.11%
CM_MC2		10	0	10	1	0	-11.11%
RG_MIDAG		10	0	10	1	0	-11.11%
EV_MC2		10	0	10	1	0	-11.11%
EV_HC1		10	0	10	1	0	-11.11%
LC_DCDS		9	1	10	0.9	0.1	0.0%
LC_LC3		9	1	10	0.9	0.1	0.0%
LC_LC5		10	0	10	1	0	-11.11%
LC_LCDSSLCC		10	0	10	1	0	-11.11%
FR_FR4		10	0	10	1	0	-11.11%
FR_FR2		10	0	10	1	0	-11.11%
FR_MULTIPLATE		10	0	10	1	0	-11.11%
FR_FRRD		10	0	10	1	0	-11.11%

Ceriodaphnia 7-d Survival and Reproduction Test — **Nautilus Environmental Calgary**

Analysis ID: 04-3470-1905 **Endpoint:** 7d Survival Rate **CETIS Version:** CETISv1.9.4
Analyzed: 14 May-21 11:06 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

7d Survival Rate Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
FR_UFR1		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
GH_ER2	XC	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	1.0000	1.0000	1.0000
CM_MC1		1.0000	1.0000	1.0000	1.0000	0.0000	1.0000	1.0000	1.0000	1.0000	1.0000
LC_SLC		1.0000	0.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000
FR_FRABCH		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
FR_FRCP1		1.0000	1.0000	1.0000	1.0000	0.0000	1.0000	1.0000	1.0000	1.0000	1.0000
GH_FR1		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
GH_ERC		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
CM_MC2		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
RG_MIDAG		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
EV_MC2		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
EV_HC1		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
LC_DCDS		1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	1.0000	1.0000	1.0000	1.0000
LC_LC3		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000
LC_LC5		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
LC_LCDSSLCC		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
FR_FR4		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
FR_FR2		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
FR_MULTIPLATE		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
FR_FRRD		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

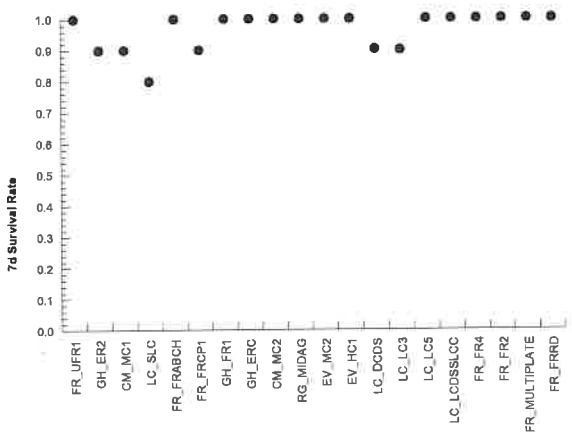
7d Survival Rate Binomials

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
FR_UFR1		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
GH_ER2	XC	1/1	1/1	1/1	1/1	1/1	1/1	0/1	1/1	1/1	1/1
CM_MC1		1/1	1/1	1/1	1/1	0/1	1/1	1/1	1/1	1/1	1/1
LC_SLC		1/1	0/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	0/1
FR_FRABCH		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
FR_FRCP1		1/1	1/1	1/1	1/1	0/1	1/1	1/1	1/1	1/1	1/1
GH_FR1		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
GH_ERC		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
CM_MC2		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
RG_MIDAG		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
EV_MC2		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
EV_HC1		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
LC_DCDS		1/1	1/1	1/1	1/1	1/1	0/1	1/1	1/1	1/1	1/1
LC_LC3		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	0/1
LC_LC5		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
LC_LCDSSLCC		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
FR_FR4		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
FR_FR2		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
FR_MULTIPLATE		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
FR_FRRD		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1

Ceriodaphnia 7-d Survival and Reproduction Test — **Nautilus Environmental Calgary**

Analysis ID:	04-3470-1905	**Endpoint:**	7d Survival Rate	**CETIS Version:**	CETISv1.9.4
Analyzed:	14 May-21 11:06	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1

Graphics



Analyst: _____ QA: MB 2021/05/20

CETIS Analytical Report

Ceriodaphnia 7-d Survival and Reproduction Test

Nautilus Environmental Calgary

Analysis ID:	14-6264-3845	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.9.4
Analyzed:	14 May-21 10:57	**Analysis:**	Nonparametric-Control vs Treatments	**Status Level:**	1
Batch ID:	00-6487-4444	**Test Type:**	Reproduction-Survival (7d)	**Analyst:**	Kayla Knol
Start Date:	15 Apr-21	**Protocol:**	EC/EPS 1/RM/21	**Diluent:**	Site Water
Ending Date:	23 Apr-21	**Species:**	Ceriodaphnia dubia	**Brine:**	
Test Length:	8d 0h	**Taxon:**	Branchiopoda	**Source:**	In House **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
FR_UFR1	16-8343-8286	13 Apr-21	14 Apr-21	48h (3.6 °C)	Teck Coal Ltd	
GH_ER2	08-7643-8625	13 Apr-21	14 Apr-21	48h (4.9 °C)		
CM_MC1	10-8021-6522	13 Apr-21	14 Apr-21	48h (6.9 °C)		
LC_SLC	11-7695-7825	13 Apr-21	14 Apr-21	48h (6.4 °C)		
FR_FRABCH	13-2920-6522	13 Apr-21	14 Apr-21	48h (6.6 °C)		
FR_FRCP1	09-5241-6620	13 Apr-21	14 Apr-21	48h (4.2 °C)		
GH_FR1	17-2466-1900	13 Apr-21	14 Apr-21	48h (4.6 °C)		
GH_ERC	01-8068-9122	13 Apr-21	15 Apr-21	48h (5.9 °C)		
CM_MC2	01-5234-6297	13 Apr-21	14 Apr-21	48h (5.9 °C)		
RG_MIDAG	13-4002-6845	13 Apr-21	14 Apr-21	48h (7.1 °C)		
EV_MC2	09-1256-0143	14 Apr-21	14 Apr-21	24h (2.6 °C)		
EV_HC1	16-7262-0562	14 Apr-21	14 Apr-21	24h (3.6 °C)		
LC_DCDS	04-7285-8751	13 Apr-21	14 Apr-21	48h (3.6 °C)		
LC_LC3	14-0701-1007	13 Apr-21	14 Apr-21	48h (4.2 °C)		
LC_LC5	02-9493-3505	13 Apr-21	14 Apr-21	48h (3.2 °C)		
LC_LCDSSLCC	01-8317-5860	13 Apr-21	14 Apr-21	48h (4.2 °C)		
FR_FR4	18-5240-1271	13 Apr-21	14 Apr-21	48h (4.3 °C)		
FR_FR2	13-9611-3182	13 Apr-21	14 Apr-21	48h (6.4 °C)		
FR_MULTIPLATE	00-1904-7274	13 Apr-21	14 Apr-21	48h (6.3 °C)		
FR_FRRD	02-2561-5672	13 Apr-21	14 Apr-21	48h (4.4 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_UFR1	Ambient Sample	Teck Coal Ltd	FR_UFR1_WEK_2021-04-1	
GH_ER2	Ambient Sample	Teck Coal Ltd	GH_ER2_WS_2021-04-12_	
CM_MC1	Ambient Sample	Teck Coal Ltd	CM_MC1_WS_2021-04-13	
LC_SLC	Ambient Sample	Teck Coal Ltd	LC_SLC_WS_2021-04-13_	
FR_FRABCH	Ambient Sample	Teck Coal Ltd	FR_FRABCH_WEK_2021-	
FR_FRCP1	Ambient Sample	Teck Coal Ltd	FR_FRCP1_WEK_2021-04	
GH_FR1	Ambient Sample	Teck Coal Ltd	GH_FR1_WS_2021-04-12_	
GH_ERC	Ambient Sample	Teck Coal Ltd	GH_ERC_WS_2021-04-12	
CM_MC2	Ambient Sample	Teck Coal Ltd	CM_MC2_WS_2021-04-13	
RG_MIDAG	Ambient Sample	Teck Coal Ltd	RG_MIDAG_WS_2021-04-	
EV_MC2	Ambient Sample	Teck Coal Ltd	EV_MC2_WS_2021-04-14_	
EV_HC1	Ambient Sample	Teck Coal Ltd	EV_HC1_WS_2021-04-14_	
LC_DCDS	Ambient Sample	Teck Coal Ltd	LC_DCDS_WS_2021-04-1	
LC_LC3	Ambient Sample	Teck Coal Ltd	LC_LC3_WS_2021-04-13_	
LC_LC5	Ambient Sample	Teck Coal Ltd	LC_LC5_WS_2021-04-13_	
LC_LCDSSLCC	Ambient Sample	Teck Coal Ltd	LC_LCDSSLCC_WS_2021-	
FR_FR4	Ambient Sample	Teck Coal Ltd	FR_FR4_WS_2021-04-13_	
FR_FR2	Ambient Sample	Teck Coal Ltd	FR_FR2_WS_2021-04-13_	
FR_MULTIPLATE	Ambient Sample	Teck Coal Ltd	FR_MULTIPLATE_WS_202	
FR_FRRD	Ambient Sample	Teck Coal Ltd	FR_FRRD_WS_2021-04-1	

Ceriodaphnia 7-d Survival and Reproduction Test — **Nautilus Environmental Calgary**

Analysis ID: 14-6264-3845 **Endpoint:** Reproduction **CETIS Version:** CETISv1.9.4
Analyzed: 14 May-21 10:57 **Analysis:** Nonparametric-Control vs Treatments **Status Level:** 1

Data Transform	Alt Hyp
Untransformed	C > T

Comparison Result	PMSD
FR_UFR1 passed reproduction	53.58%
GH_ER2 passed reproduction	53.58%
CM_MC1 passed reproduction	53.58%
FR_FRABCH passed reproduction	53.58%
FR_FRCP1 passed reproduction	53.58%
GH_FR1 passed reproduction	53.58%
GH_ERC passed reproduction	53.58%
CM_MC2 passed reproduction	53.58%
RG_MIDAG passed reproduction	53.58%
EV_MC2 passed reproduction	53.58%
EV_HC1 passed reproduction	53.58%
LC_DCDS passed reproduction	53.58%
LC_LC3 passed reproduction	53.58%
LC_LC5 passed reproduction	53.58%
LC_LCDSSLCC passed reproduction	53.58%
FR_FR4 passed reproduction	53.58%
FR_FR2 passed reproduction	53.58%
FR_MULTIPLATE passed reproduction	53.58%
FR_FRRD passed reproduction	53.58%

Steel Many-One Rank Sum Test

Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)
Site Control		FR_UFR1	133	70	2	18	CDF	1.0000	Non-Significant Effect
		GH_ER2	128.5	70	1	18	CDF	1.0000	Non-Significant Effect
		CM_MC1	130	70	4	18	CDF	1.0000	Non-Significant Effect
		FR_FRABCH	134	70	3	18	CDF	1.0000	Non-Significant Effect
		FR_FRCP1	91.5	70	3	18	CDF	0.6362	Non-Significant Effect
		GH_FR1	139.5	70	1	18	CDF	1.0000	Non-Significant Effect
		GH_ERC	122.5	70	1	18	CDF	0.9996	Non-Significant Effect
		CM_MC2	97.5	70	2	18	CDF	0.8217	Non-Significant Effect
		RG_MIDAG	115.5	70	3	18	CDF	0.9962	Non-Significant Effect
		EV_MC2	144	70	3	18	CDF	1.0000	Non-Significant Effect
		EV_HC1	154.5	70	1	18	CDF	1.0000	Non-Significant Effect
		LC_DCDS	128	70	3	18	CDF	0.9999	Non-Significant Effect
		LC_LC3	129	70	2	18	CDF	1.0000	Non-Significant Effect
		LC_LC5	132.5	70	2	18	CDF	1.0000	Non-Significant Effect
		LC_LCDSSLCC	127	70	2	18	CDF	0.9999	Non-Significant Effect
		FR_FR4	114	70	3	18	CDF	0.9941	Non-Significant Effect
		FR_FR2	108.5	70	3	18	CDF	0.9764	Non-Significant Effect
		FR_MULTIPLATE	94	70	3	18	CDF	0.7213	Non-Significant Effect
		FR_FRRD	127	70	4	18	CDF	0.9999	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	3.529	3.606	0.0681	No Outliers Detected
Treatment Effect	Kruskal-Wallis Omnibus Test	75.47	30.14	<1.0E-37	Significant Overall Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	2920.7	153.721	19	4.33	<1.0E-37	Significant Effect
Error	6389.9	35.4994	180			
Total	9310.59		199			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)

Ceriodaphnia 7-d Survival and Reproduction Test — **Nautilus Environmental Calgary**

Analysis ID: 14-6264-3845 **Endpoint:** Reproduction **CETIS Version:** CETISv1.9.4
Analyzed: 14 May-21 10:57 **Analysis:** Nonparametric-Control vs Treatments **Status Level:** 1

Variances	Bartlett Equality of Variance Test	56.13	36.19	1.6E-05	Unequal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9398	0.9816	2.2E-07	Non-Normal Distribution

Reproduction Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
FR_UFR1		10	18.9	17.3	20.5	19	15	22	0.7063	11.82%	0.00%
GH_ER2		10	20	13.26	26.74	20	0	31	2.978	47.08%	-5.82%
CM_MC1		10	18.5	13.08	23.92	19	0	29	2.396	40.95%	2.12%
LC_SLC	XC	10	13.2	8.235	18.17	13.5	0	22	2.195	52.58%	30.16%
FR_FRABCH		10	19.8	16.33	23.27	20	8	26	1.533	24.49%	-4.76%
FR_FRCP1		10	10.4	6.464	14.34	12	0	18	1.74	52.90%	44.97%
GH_FR1		10	20.3	17.89	22.71	21	15	25	1.065	16.59%	-7.41%
GH_ERC		10	16.5	13.59	19.41	17.5	6	20	1.285	24.62%	12.70%
CM_MC2		10	11.8	7.728	15.87	13	2	18	1.8	48.24%	37.57%
RG_MIDAG		10	15.5	11.96	19.04	16	7	23	1.565	31.93%	17.99%
EV_MC2		10	21.3	20.18	22.42	22	19	24	0.4955	7.36%	-12.70%
EV_HC1		10	25.9	24.34	27.46	26.5	22	29	0.6904	8.43%	-37.04%
LC_DCDS		10	17.9	12.76	23.04	18.5	0	26	2.273	40.15%	5.29%
LC_LC3		10	18.5	12.81	24.19	18.5	0	30	2.513	42.96%	2.12%
LC_LC5		10	19.8	15.14	24.46	18.5	10	30	2.059	32.89%	-4.76%
LC_LCDSSLCC		10	18.2	14.3	22.1	18.5	6	28	1.724	29.96%	3.70%
FR_FR4		10	14.7	11.4	18	15.5	3	19	1.461	31.43%	22.22%
FR_FR2		10	15.1	11.28	18.92	14.5	8	26	1.69	35.38%	20.11%
FR_MULTIPLATE		10	9.8	3.884	15.72	9.5	0	23	2.615	84.39%	48.15%
FR_FRRD		10	18	12.47	23.53	20	0	25	2.445	42.95%	4.76%

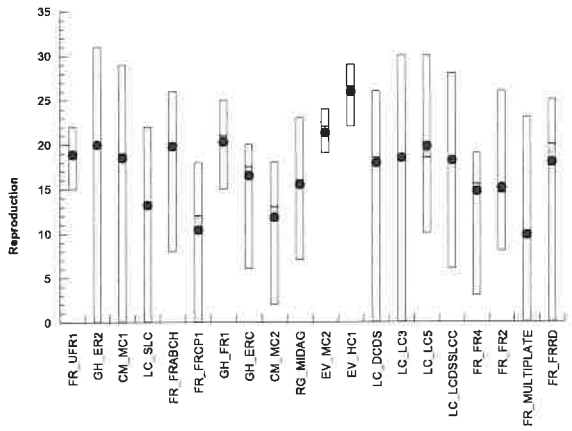
Reproduction Detail

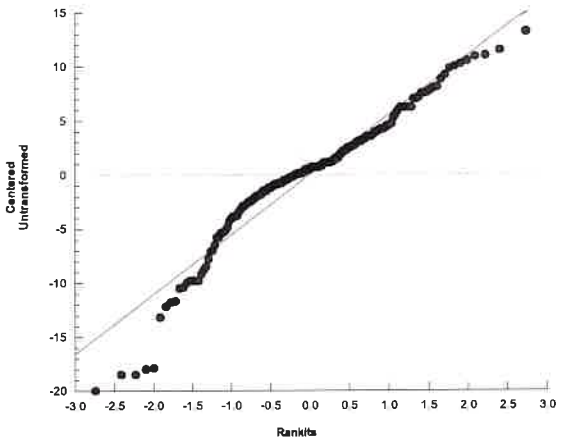
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
FR_UFR1		19	20	15	17	22	22	20	19	17	18
GH_ER2		18	31	20	23	30	20	0	28	20	10
CM_MC1		19	22	19	29	0	19	17	21	15	24
LC_SLC	XC	13	4	13	21	19	12	14	22	14	0
FR_FRABCH		22	24	19	19	18	8	22	26	19	21
FR_FRCP1		10	5	14	13	0	15	5	11	18	13
GH_FR1		20	15	23	17	25	21	21	24	21	16
GH_ERC		6	19	17	16	18	20	15	18	20	16
CM_MC2		3	11	18	12	15	16	18	14	2	9
RG_MIDAG		14	9	13	18	7	20	19	17	23	15
EV_MC2		21	20	19	19	22	22	22	22	24	22
EV_HC1		28	22	29	27	27	26	25	25	23	27
LC_DCDS		17	18	18	15	25	0	22	19	19	26
LC_LC3		26	20	16	17	16	30	19	23	18	0
LC_LC5		16	21	10	30	16	26	26	14	15	24
LC_LCDSSLCC		16	20	18	17	28	21	17	20	19	6
FR_FR4		15	3	18	17	16	12	18	19	14	15
FR_FR2		14	10	12	11	8	19	26	19	17	15
FR_MULTIPLATE		16	8	4	0	2	11	23	19	0	15
FR_FRRD		17	19	25	16	24	25	22	0	11	21

Ceriodaphnia 7-d Survival and Reproduction Test — **Nautilus Environmental Calgary**

Analysis ID:	14-6264-3845	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.9.4
Analyzed:	14 May-21 10:57	**Analysis:**	Nonparametric-Control vs Treatments	**Status Level:**	1

Graphics





CETIS Analytical Report

Ceriodaphnia 7-d Survival and Reproduction Test — **Nautilus Environmental Calgary**

Analysis ID:	00-8033-9705	**Endpoint:**	7d Survival Rate	**CETIS Version:**	CETISv1.9.4
Analyzed:	14 May-21 9:32	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1
Batch ID:	00-6487-4444	**Test Type:**	Reproduction-Survival (7d)	**Analyst:**	Kayla Knol
Start Date:	15 Apr-21	**Protocol:**	EC/EPS 1/RM/21	**Diluent:**	Site Water
Ending Date:	23 Apr-21	**Species:**	Ceriodaphnia dubia	**Brine:**	
Test Length:	8d 0h	**Taxon:**	Branchiopoda	**Source:**	In House **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
FR_UFR1	16-8343-8286	13 Apr-21	14 Apr-21	48h (3.6 °C)	Teck Coal Ltd	
GH_ER2	08-7643-8625	13 Apr-21	14 Apr-21	48h (4.9 °C)		
CM_MC1	10-8021-6522	13 Apr-21	14 Apr-21	48h (6.9 °C)		
LC_SLC	11-7695-7825	13 Apr-21	14 Apr-21	48h (6.4 °C)		
FR_FRABCH	13-2920-6522	13 Apr-21	14 Apr-21	48h (6.6 °C)		
FR_FRCP1	09-5241-6620	13 Apr-21	14 Apr-21	48h (4.2 °C)		
GH_FR1	17-2466-1900	13 Apr-21	14 Apr-21	48h (4.6 °C)		
GH_ERC	01-8068-9122	13 Apr-21	15 Apr-21	48h (5.9 °C)		
CM_MC2	01-5234-6297	13 Apr-21	14 Apr-21	48h (5.9 °C)		
RG_MIDAG	13-4002-6845	13 Apr-21	14 Apr-21	48h (7.1 °C)		
EV_MC2	09-1256-0143	14 Apr-21	14 Apr-21	24h (2.6 °C)		
EV_HC1	16-7262-0562	14 Apr-21	14 Apr-21	24h (3.6 °C)		
LC_DCDS	04-7285-8751	13 Apr-21	14 Apr-21	48h (3.6 °C)		
LC_LC3	14-0701-1007	13 Apr-21	14 Apr-21	48h (4.2 °C)		
LC_LC5	02-9493-3505	13 Apr-21	14 Apr-21	48h (3.2 °C)		
LC_LCDSSLCC	01-8317-5860	13 Apr-21	14 Apr-21	48h (4.2 °C)		
FR_FR4	18-5240-1271	13 Apr-21	14 Apr-21	48h (4.3 °C)		
FR_FR2	13-9611-3182	13 Apr-21	14 Apr-21	48h (6.4 °C)		
FR_MULTIPLATE	00-1904-7274	13 Apr-21	14 Apr-21	48h (6.3 °C)		
FR_FRRD	02-2561-5672	13 Apr-21	14 Apr-21	48h (4.4 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_UFR1	Ambient Sample	Teck Coal Ltd	FR_UFR1_WEK_2021-04-1	
GH_ER2	Ambient Sample	Teck Coal Ltd	GH_ER2_WS_2021-04-12_	
CM_MC1	Ambient Sample	Teck Coal Ltd	CM_MC1_WS_2021-04-13	
LC_SLC	Ambient Sample	Teck Coal Ltd	LC_SLC_WS_2021-04-13_	
FR_FRABCH	Ambient Sample	Teck Coal Ltd	FR_FRABCH_WEK_2021-	
FR_FRCP1	Ambient Sample	Teck Coal Ltd	FR_FRCP1_WEK_2021-04	
GH_FR1	Ambient Sample	Teck Coal Ltd	GH_FR1_WS_2021-04-12_	
GH_ERC	Ambient Sample	Teck Coal Ltd	GH_ERC_WS_2021-04-12	
CM_MC2	Ambient Sample	Teck Coal Ltd	CM_MC2_WS_2021-04-13	
RG_MIDAG	Ambient Sample	Teck Coal Ltd	RG_MIDAG_WS_2021-04-	
EV_MC2	Ambient Sample	Teck Coal Ltd	EV_MC2_WS_2021-04-14_	
EV_HC1	Ambient Sample	Teck Coal Ltd	EV_HC1_WS_2021-04-14_	
LC_DCDS	Ambient Sample	Teck Coal Ltd	LC_DCDS_WS_2021-04-1	
LC_LC3	Ambient Sample	Teck Coal Ltd	LC_LC3_WS_2021-04-13_	
LC_LC5	Ambient Sample	Teck Coal Ltd	LC_LC5_WS_2021-04-13_	
LC_LCDSSLCC	Ambient Sample	Teck Coal Ltd	LC_LCDSSLCC_WS_2021-	
FR_FR4	Ambient Sample	Teck Coal Ltd	FR_FR4_WS_2021-04-13_	
FR_FR2	Ambient Sample	Teck Coal Ltd	FR_FR2_WS_2021-04-13_	
FR_MULTIPLATE	Ambient Sample	Teck Coal Ltd	FR_MULTIPLATE_WS_202	
FR_FRRD	Ambient Sample	Teck Coal Ltd	FR_FRRD_WS_2021-04-1	

Fisher Exact/Bonferroni Adj Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
Site Control		FR_UFR1	1.0000	Exact	1.0000	Non-Significant Effect
		GH_ER2	0.8947	Exact	1.0000	Non-Significant Effect
		CM_MC1	0.8947	Exact	1.0000	Non-Significant Effect
		FR_FRABCH	1.0000	Exact	1.0000	Non-Significant Effect

 Analyst: KK QA: mb 2021/05/20

Ceriodaphnia 7-d Survival and Reproduction Test — **Nautilus Environmental Calgary**

Analysis ID: 00-8033-9705 **Endpoint:** 7d Survival Rate **CETIS Version:** CETISv1.9.4
Analyzed: 14 May-21 9:32 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Fisher Exact/Bonferroni Adj Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
		FR_FRCP1	0.8947	Exact	1.0000	Non-Significant Effect
		GH_FR1	1.0000	Exact	1.0000	Non-Significant Effect
		GH_ERC	1.0000	Exact	1.0000	Non-Significant Effect
		CM_MC2	1.0000	Exact	1.0000	Non-Significant Effect
		RG_MIDAG	1.0000	Exact	1.0000	Non-Significant Effect
		EV_MC2	1.0000	Exact	1.0000	Non-Significant Effect
		EV_HC1	1.0000	Exact	1.0000	Non-Significant Effect
		LC_DCDS	0.8947	Exact	1.0000	Non-Significant Effect
		LC_LC3	0.8947	Exact	1.0000	Non-Significant Effect
		LC_LC5	1.0000	Exact	1.0000	Non-Significant Effect
		LC_LCDSSLCC	1.0000	Exact	1.0000	Non-Significant Effect
		FR_FR4	1.0000	Exact	1.0000	Non-Significant Effect
		FR_FR2	1.0000	Exact	1.0000	Non-Significant Effect
		FR_MULTIPLATE	1.0000	Exact	1.0000	Non-Significant Effect
		FR_FRRD	1.0000	Exact	1.0000	Non-Significant Effect

Data Summary

Sample	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
FR_UFR1		10	0	10	1	0	-25.0%
GH_ER2		9	1	10	0.9	0.1	-12.5%
CM_MC1		9	1	10	0.9	0.1	-12.5%
LC_SLC	XC	8	2	10	0.8	0.2	0.0%
FR_FRABCH		10	0	10	1	0	-25.0%
FR_FRCP1		9	1	10	0.9	0.1	-12.5%
GH_FR1		10	0	10	1	0	-25.0%
GH_ERC		10	0	10	1	0	-25.0%
CM_MC2		10	0	10	1	0	-25.0%
RG_MIDAG		10	0	10	1	0	-25.0%
EV_MC2		10	0	10	1	0	-25.0%
EV_HC1		10	0	10	1	0	-25.0%
LC_DCDS		9	1	10	0.9	0.1	-12.5%
LC_LC3		9	1	10	0.9	0.1	-12.5%
LC_LC5		10	0	10	1	0	-25.0%
LC_LCDSSLCC		10	0	10	1	0	-25.0%
FR_FR4		10	0	10	1	0	-25.0%
FR_FR2		10	0	10	1	0	-25.0%
FR_MULTIPLATE		10	0	10	1	0	-25.0%
FR_FRRD		10	0	10	1	0	-25.0%

Analyst: VDL QA: MB 2021/05/20

Ceriodaphnia 7-d Survival and Reproduction Test — **Nautilus Environmental Calgary**

Analysis ID: 00-8033-9705 **Endpoint:** 7d Survival Rate **CETIS Version:** CETISv1.9.4
Analyzed: 14 May-21 9:32 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

7d Survival Rate Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
FR_UFR1		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
GH_ER2		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	1.0000	1.0000	1.0000
CM_MC1		1.0000	1.0000	1.0000	1.0000	0.0000	1.0000	1.0000	1.0000	1.0000	1.0000
LC_SLC	XC	1.0000	0.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000
FR_FRABCH		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
FR_FRCP1		1.0000	1.0000	1.0000	1.0000	0.0000	1.0000	1.0000	1.0000	1.0000	1.0000
GH_FR1		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
GH_ERC		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
CM_MC2		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
RG_MIDAG		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
EV_MC2		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
EV_HC1		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
LC_DCDS		1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	1.0000	1.0000	1.0000	1.0000
LC_LC3		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000
LC_LC5		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
LC_LCDSSLCC		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
FR_FR4		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
FR_FR2		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
FR_MULTIPLATE		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
FR_FRRD		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

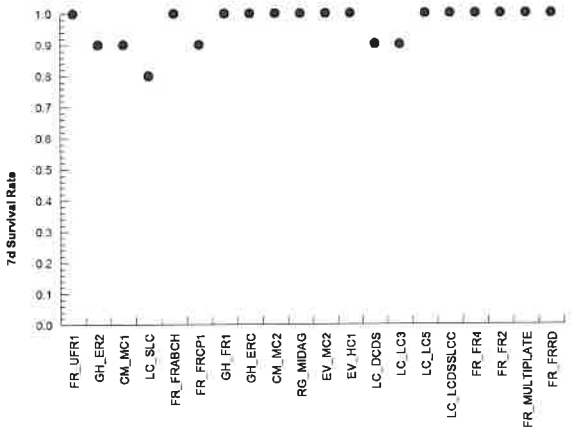
7d Survival Rate Binomials

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
FR_UFR1		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
GH_ER2		1/1	1/1	1/1	1/1	1/1	1/1	0/1	1/1	1/1	1/1
CM_MC1		1/1	1/1	1/1	1/1	0/1	1/1	1/1	1/1	1/1	1/1
LC_SLC	XC	1/1	0/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	0/1
FR_FRABCH		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
FR_FRCP1		1/1	1/1	1/1	1/1	0/1	1/1	1/1	1/1	1/1	1/1
GH_FR1		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
GH_ERC		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
CM_MC2		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
RG_MIDAG		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
EV_MC2		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
EV_HC1		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
LC_DCDS		1/1	1/1	1/1	1/1	1/1	0/1	1/1	1/1	1/1	1/1
LC_LC3		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	0/1
LC_LC5		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
LC_LCDSSLCC		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
FR_FR4		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
FR_FR2		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
FR_MULTIPLATE		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
FR_FRRD		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1

Ceriodaphnia 7-d Survival and Reproduction Test — **Nautilus Environmental Calgary**

Analysis ID:	00-8033-9705	**Endpoint:**	7d Survival Rate	**CETIS Version:**	CETISv1.9.4
Analyzed:	14 May-21 9:32	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1

Graphics



Analyst: KL QA: mb 2021/05/20

APPENDIX B – *Pseudokirchneriella subcapitata* Toxicity Test Data

Pseudokirchneriella subcapitata Summary Sheet

Client: TECK
Work Order No.: 210288

Start Date: Feb. 25/21 @1530h
Set up by: SAK

Sample Information:

Sample ID: Various - see below
Sample Date: Feb. 23/21
Date Received: Feb. 24/21
Sample Volume: 1 × 20L

Test Organism Information:

Culture Date: Feb. 19/21
Age of culture (Day 0): 6d

Zinc Reference Toxicant Results:

Reference Toxicant ID: SC211
Stock Solution ID: 21ZN01
Date Initiated: Feb. 12/21

72-h IC50 (95% CL): 27.6 (24.1 - 31.3)

72-h IC50 Reference Toxicant Mean and Range: 31.5 (25.7 - 38.6) CV (%): 10

Test Results:

	Cell Yield (Mean± SD)
Negative Control	33.4 ± 1.4
FR_UFRI	114.6 ± 7.3 a,d,e
GH_ER2	107.2 ± 6.8 a,d,e
CM_MCI	100.9 ± 13.0 a,g
LC_SLC	102.8 ± 7.8 a,g
FR_FRABCH	74 ± 2.2 a,g,h,i,j
FR_FRCPI	20.2 ± 2.1 f,g,h,i,j
GH_FRI	103.2 ± 14.4 a
GH_ERC	111.8 ± 16.7 a

Results that are significantly greater than:
a = Lab Control
~~b = FR_UFRI~~ SAK
c = GH_ER2
d = CM_MCI
e = LC_SLC

Results that are significantly lower than:
f = Lab Control
g = FR_UFRI
h = GH_ER2
i = CM_MCI
j = LC_SLC

Reviewed by: JGM

Date reviewed: Apr. 16/21

72-h Algal Growth Inhibition Toxicity Test
Water Quality Measurements

Client: TELK | Setup by: SAH

Sample ID: Various | Test Date/Time: Feb. 25/21 @ 1530h

Work Order No.: 210288 | CER #: 4

Test Species: *Pseudokirchneriella subcapitata*

Culture Date: 021921C | Age of Culture: 6d | Culture Health: Good

Culture Count: 1 255 2 240 | Average: 247.5 | Culture Cell Density (c1): 247.5×10^4 cells/mL

v1 = 220,000 cells/ml x 70 ml / (c1) 247.5×10^4 cells/ml = 6.2 mL

Time Zero Counts: 1 20 2 21 | Average: 20.5×10^4 cells/mL

No. of Cells/mL: 20.5×10^4 cells/mL | Initial Density: # cells/mL + 220 µL x 10 µL = 9318 cells/mL

Concentration %(v/v)	Water Quality		Incubator Temperature (°C)				Microplates rotated 2X per day?			
	pH	Temp (°C)								
	0 h	0 h	0 h	24 h	48 h	72 h	0 h	24 h	48 h	72 h
Control	6.8	23.0	24.0	25.0	24.0	24.0	SAH ✓	✓	✓	RZ ✓
(site) FR-UFR1	8.1	↓	↓	↓	↓	↓	↓	↓	↓	↓
(site) GH-ER2	8.0									
(site) CM-MC1	8.0									
(site) LC-SLC	8.1									
FR-FRABCH	8.2									
FR-FRCP1	8.2									
GH-FR1	8.2									
GH-ERC	8.0									
CM-MC2	8.2	↓	↓	↓	↓	↓	↓	↓	↓	↓
Initials	SAH	SAH	SAH	SAH	JZL	RZJ	SAH	SAH	JZL	RZJ

Initial control pH: Well 1: 6.9 | Well 2: 6.9

Final control pH: Well 1: 6.9 | Well 2: 7.0

Light intensity (lux): ~~3460~~ SAH 3640 | Date measured: Feb. 25/21

Thermometer: 1 | Light meter: C | pH meter/probe: 1 / 1

Sample Description: refer to COC

Comments:

Reviewed: JGa | Date reviewed: Mar. 22/21

72-h Algal Growth Inhibition Toxicity Test
Water Quality Measurements

Client: TECK | Setup by: SAK

Sample ID: Various | Test Date/Time: Feb. 25/21 @ 1530h

Work Order No.: 210288 | CER #: 4

Test Species: *Pseudokirchneriella subcapitata*

Culture Date: 021921C | Age of Culture: 6d | Culture Health: Good

Culture Count: 1 255 2 240 | Average: 247.5 | Culture Cell Density (c1): 247.5×10^4 cells/mL

$$v1 = \frac{220{,}000 \text{ cells/ml} \times 70 \text{ ml}}{(c1)\ 247.5 \times 10^4 \text{ cells/ml}} = 6.2 \text{ mL}$$

Time Zero Counts: 1 20 2 21 | Average: 20.5×10^4 cells/mL

No. of Cells/mL: 20.5×10^4 cells/mL | Initial Density: # cells/mL ÷ 220 µL x 10 µL = 9318 cells/mL

Concentration %(v/v)	Water Quality		Incubator Temperature (°C)				Microplates rotated 2X per day?			
	pH	Temp (°C)								
	0 h	0 h	0 h	24 h	48 h	72 h	0 h	24 h	48 h	72 h
Control	6.8	23.0	24.0	25.0	24.0	24.0	✓	✓	✓	~~24.0~~
EV_MC2	8.2	↓	↓	↓	↓	↓	↓	↓	↓	↓
EV_HCl	8.0									
LC_DCDS	8.1									
LC_LC3	8.1									
LC_LC5	8.2									
LC_LCDSSUL	8.2	✓	✓	✓	✓	✓	✓	✓	✓	✓
Initials	SAK	SAK	SAK	SAK	JGL	RZ	SAK	SAK	JGL	RZ

Initial control pH: Well 1: 6.9 | Well 2: 6.9

Final control pH: Well 1: 6.9 | Well 2: 7.0

Light intensity (lux): ~~3460~~ 3640 | Date measured: Feb. 25/21

Thermometer: 1 | Light meter: 1 | pH meter/probe: 1 / 1

Sample Description: refer to COC

Comments:

Reviewed: JGL | Date reviewed: Mar. 22/21

Pseudokirchneriella subcapitata Toxicity Test Data Sheet
72-h Algal Cell Counts

Client: TECK
Work Order #: 210288
Sample ID: various
%(v/v)

Start Date/Time: Feb. 25/21 @1530h
Termination Date: Feb. 28/21 @1530h
Test set up by: SAM

Concentration	Rep	Count 1	Count 2	Count 3	Count 4	Comments	Initials
Control	A	36					SAM
	B	33					
	C	32					
	D	36					
	E	34					
	F	35					
	G	35					
	H	34					
FR_UFR1 (site)	A	110					
	B	112					
	C	118					
	D	129					
	E A SAM	120					
	F B	111					
	G C	106					
	H D	119					
GH_ER2 (site)	A	108					
	B	102					
	C	111					
	D	118					
	E A SAM	98					
	F B	111					
	G C	115					
	H D	103					
CM_MC1 (site)	A	88					
	B	90					
	C	91					
	D	117					
	E A SAM	91					
	F B	109					
	G C	117					
	H D	112					
LC_SLC (site)	A	99					
	B	104					
	C	97					
	D	113					

Comments:

Reviewed by: JCM Date Reviewed: Mar. 22/21

Pseudokirchneriella subcapitata Toxicity Test Data Sheet
72-h Algal Cell Counts

Client: TECK
Start Date/Time: Feb. 25/21 @ 1530h
Work Order #: 210288
Termination Date: Feb. 28/21 @ 1530h
Sample ID: various
Test set up by: SAH
%(v/v)

Concentration	Rep	Count 1	Count 2	Count 3	Count 4	Comments	Initials
~~Control~~ SAH LC-SLC (SHE)	E A SAH	111					SAH
	F B	100					
	G C	93					
	H D	113					
FR_FRABCH	SAH E A	77					
	SAH F B	76					
	SAH G C	75					
	SAH H D	72					
FR_FRLP1	A	23					
	B	23					
	C	20					
	D	19					
GH_FR1	A	95					
	B	91					
	C	123					
	D	108					
GH_ERC	A	107					
	B	129					
	C	123					
	D	92					
CM_MC2	A	~~85~~ SAH 76					
	B	~~SAH 88~~ 72					
	C	~~SAH 86~~ 84					
	D	78					
EV_MC2	A	82					
	B	93					
	C	82					
	D	77					
EV_HC1	A	93					
	B	82					
	C	98					
	D	96					
LC_DC05	A	79					
	B	73					
	C	85					
	D	81					

Comments:

Reviewed by: JCL
Date Reviewed: Mar. 22/21

Pseudokirchneriella subcapitata Toxicity Test Data Sheet
72-h Algal Cell Counts

Client: TECH
Start Date/Time: Feb. 25/21 @1530h
Work Order #: 210288
Termination Date: Feb. 28/21 @1530h
Sample ID: various
Test set up by: SAH
%(v/v)

Concentration	Rep	Count 1	Count 2	Count 3	Count 4	Comments	Initials
Control	A						
	B						
	C						
	D						
	E						
	F						
	G						
	H						
LC-LC3	A	72					SAH
	B	67					
	C	75					
	D	88					
LC-LC5	A	79					
	B	72					
	C	78					
	D	81					
LC-LCDSSLCC	A	83					
	B	88					
	C	86					
	D	91					
	A						
	B						
	C						
	D						
	A						
	B						
	C						
	D						
	A						
	B						
	C						
	D						
	A						
	B						
	C						
	D						

Comments:

Reviewed by: JCH
Date Reviewed: Mar. 22/21

Pseudokirchneriella subcapitata Algal Counts

Client: TECK
WO#: 210288
Sample ID: Various

Start Date/Time: Feb.25/21@1530h
Termination Date/Time: Feb.28/21@1530h

Initial Cell Density: 9318 cell/mL

									205000
									0.22
95.2 % (v/v)									0.01
Concentration	Rep	Count 1 ($\times 10^4$)	Count 2 ($\times 10^4$)	Count 3 ($\times 10^4$)	Count 4 ($\times 10^4$)	Mean ($\times 10^4$)	Cell Yield ($\times 10^4$) cell/mL		9318.182
Control	A	36				36	35.1	mean	33.4
	B	33				33	32.1	SD	1.407886
	C	32				32	31.1	CV	4.209785
	D	36				36	35.1		
	E	34				34	33.1		
	F	35				35	34.1		
	G	35				35	34.1		
	H	34				34	33.1		
Control	A	110				110	109.1		
Site Water	B	112				112	111.1		
(FR_UFR1)	C	118				118	117.1		
	D	129				129	128.1		
	E	120				120	119.1		
	F	111				111	110.1		
	G	106				106	105.1		
	H	119				119	118.1		
Control	A	108				108	107.1		
Site Water	B	102				102	101.1		
(GH_ER2)	C	111				111	110.1		
	D	118				118	117.1		
	E	98				98	97.1		
	F	111				111	110.1		
	G	115				115	114.1		
	H	103				103	102.1		
Control	A	88				88	87.1		
Site Water	B	90				90	89.1		
(CM_MC1)	C	91				91	90.1		
	D	117				117	116.1		
	E	91				91	90.1		
	F	109				109	108.1		
	G	117				117	116.1		
	H	112				112	111.1		
						#DIV/0!	#DIV/0!		
						#DIV/0!	#DIV/0!		
						#DIV/0!	#DIV/0!		
						#DIV/0!	#DIV/0!		

Reviewed by: JCH

Date reviewed: Mar. 22/21

Pseudokirchneriella subcapitata Algal Counts

Client: TECK
WO#: 210288
Sample ID: Various

Start Date/Time: Feb.25/21@1530h
Termination Date/Time: Feb.28/21@1530h

Initial Cell Density: 9318 cell/mL

									205000
									0.22
95.2 % (v/v)									0.01
Concentration	Rep	Count 1 ($\times 10^4$)	Count 2 ($\times 10^4$)	Count 3 ($\times 10^4$)	Count 4 ($\times 10^4$)	Mean ($\times 10^4$)	Cell Yield ($\times 10^4$) cell/mL		9318.182
Control	A	36				36	35.1	mean	33.4
	B	33				33	32.1	SD	1.407886
	C	32				32	31.1	CV	4.209785
	D	36				36	35.1		
	E	34				34	33.1		
	F	35				35	34.1		
	G	35				35	34.1		
	H	34				34	33.1		
Control	A	99				99	98.1		
Site Water	B	104				104	103.1		
(LC_SLC)	C	97				97	96.1		
	D	113				113	112.1		
	E	111				111	110.1		
	F	100				100	99.1		
	G	93				93	92.1		
	H	113				113	112.1		
FR_FRABCH	A	77				77	76.1		
	B	76				76	75.1		
	C	75				75	74.1		
	D	72				72	71.1		
FR_FRCP1	A	23				23	22.1		
	B	23				23	22.1		
	C	20				20	19.1		
	D	19				19	18.1		
GH_FR1	A	95				95	94.1		
	B	91				91	90.1		
	C	123				123	122.1		
	D	108				108	107.1		
GH_ERC	A	107				107	106.1		
	B	129				129	128.1		
	C	123				123	122.1		
	D	92				92	91.1		
CM_MC2	A	76				76	75.1		
	B	72				72	71.1		
	C	84				84	83.1		
	D	78				78	77.1		

Reviewed by: _____ Date reviewed: Mar. 22/21

Pseudokirchneriella subcapitata Algal Counts

Client: TECK
WO#: 210288
Sample ID: Various

Start Date/Time: Feb.25/21@1530h
Termination Date/Time: Feb.28/21@1530h

Initial Cell Density: 9318 cell/mL

									205000
									0.22
95.2 % (v/v)									0.01
Concentration	Rep	Count 1 (x 10^4)	Count 2 (x 10^4)	Count 3 (x 10^4)	Count 4 (x 10^4)	Mean (x 10^4)	Cell Yield (x 10^4) cell/mL		9318.182
Control	A	36				36	35.1	mean	33.4
	B	33				33	32.1	SD	1.407886
	C	32				32	31.1	CV	4.209785
	D	36				36	35.1		
	E	34				34	33.1		
	F	35				35	34.1		
	G	35				35	34.1		
	H	34				34	33.1		
EV_MC2	A	82				82	81.1		
	B	93				93	92.1		
	C	82				82	81.1		
	D	77				77	76.1		
EV_HC1	A	93				93	92.1		
	B	82				82	81.1		
	C	98				98	97.1		
	D	96				96	95.1		
LC_DCDS	A	79				79	78.1		
	B	73				73	72.1		
	C	85				85	84.1		
	D	81				81	80.1		
LC_LC3	A	72				72	71.1		
	B	67				67	66.1		
	C	75				75	74.1		
	D	88				88	87.1		
LC_LC5	A	79				79	78.1		
	B	72				72	71.1		
	C	78				78	77.1		
	D	81				81	80.1		
LC_LCDSSLC	A	83				83	82.1		
	B	88				88	87.1		
	C	86				86	85.1		
	D	91				91	90.1		
	A					#DIV/0!	#DIV/0!		
	B					#DIV/0!	#DIV/0!		
	C					#DIV/0!	#DIV/0!		
	D					#DIV/0!	#DIV/0!		

Reviewed by: JCL

Date reviewed: Mar. 22/21

EC Alga Growth Inhibition Test

Nautilus Environmental

Batch ID:	06-1249-4935	**Test Type:**	Cell Growth	**Analyst:**	Sierra Klueppel
Start Date:	25 Feb-21 15:30	**Protocol:**	EC/EPS 1/RM/25	**Diluent:**	Deionized Water + nutrients
Ending Date:	28 Feb-21 15:30	**Species:**	Pseudokirchneriella subcapitata	**Brine:**	
Test Length:	72h	**Taxon:**	Chlorophyta	**Source:**	In-House Culture **Age:** 6d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
Lab Control	15-2426-6587	25 Feb-21	25 Feb-21 04:00	16h	Teck Coal	
FR_UFR1	14-8234-3686	23 Feb-21 09:40	24 Feb-21 11:44	54h (4.4 °C)		
GH_ER2	20-0147-7232	23 Feb-21 14:00	24 Feb-21 11:44	50h (7.8 °C)		
CM_MC1	07-2038-4904	23 Feb-21 11:25	24 Feb-21 11:44	52h (-0.3 °C)		
LC_SLC	11-8707-6195	23 Feb-21 11:45	24 Feb-21 11:44	52h (0.9 °C)		
FR_FRBACH	02-7366-1775	23 Feb-21	24 Feb-21 11:44	64h (5.7 °C)		
FR_FRCP1	14-4134-6165	23 Feb-21	24 Feb-21 11:44	64h (5.8 °C)		
GH_FR1	07-4036-9929	23 Feb-21 10:20	24 Feb-21 11:44	53h (-0.7 °C)		
GH_ERC	20-9193-0706	23 Feb-21 15:35	24 Feb-21 11:44	48h (8.4 °C)		
CM_MC2	13-6384-2177	23 Feb-21 10:25	24 Feb-21 11:44	53h (-0.3 °C)		
EV_MC2	18-6797-1941	23 Feb-21 12:40	24 Feb-21 11:44	51h (0 °C)		
EV_HC1	13-6939-5644	23 Feb-21 11:10	24 Feb-21 11:44	52h (0 °C)		
LC_DCDS	02-0790-9169	23 Feb-21 11:15	24 Feb-21 11:44	52h (8.1 °C)		
LC_LC3	20-2187-6678	23 Feb-21 11:00	24 Feb-21 11:44	52h (2.9 °C)		
LC_LC5	19-0487-3769	23 Feb-21 13:45	24 Feb-21 11:44	50h (1.8 °C)		
LC_LCDSSLCC	18-4784-1853	23 Feb-21 13:00	24 Feb-21 11:44	51h (0.9 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
Lab Control	Water Sample	Teck Coal	Lab Control	
FR_UFR1	Water Sample	Teck Coal	FR_UFR1_MON_2021-02-0	
GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-02-23_	
CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-02-23	
LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021_02-22_	
FR_FRBACH	Water Sample	Teck Coal	FR_FRABCH_MON_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_MON_2021-02	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-02-23_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-02-23	
CM_MC2	Water Sample	Teck Coal	CM_MC2_AHC_2021-02-23	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2020_Q1_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2020_Q1_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-02-23	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-02-22_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-02-22_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	LC_LC3 passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	FR_UFR1 passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	GH_ER2 passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	GH_ERC passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	LC_LC5 passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	LC_SLC passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	LC_DCDS passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	EV_HC1 passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	CM_MC1 passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	EV_MC2 passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	CM_MC2 passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	LC_LCDSSLCC passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	GH_FR1 passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	Lab Control passed cell yield	1

EC Alga Growth Inhibition Test **Nautilus Environmental**

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	FR_FRBACH passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	FR_FRCP1 passed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0012	GH_FR1 failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0012	LC_DCDS failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0012	EV_HC1 failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0012	EV_MC2 failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0012	CM_MC2 failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0012	LC_LCDSSLCC failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0012	Lab Control failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0012	FR_FRBACH failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0012	LC_SLC failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0012	CM_MC1 failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0012	GH_ERC failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0012	LC_LC3 failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0012	FR_UFR1 failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0012	GH_ER2 failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0012	FR_FRCP1 failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0012	LC_LC5 failed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	LC_LC3 passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	FR_UFR1 passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	GH_ER2 passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	FR_FRCP1 passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	LC_LC5 passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	LC_DCDS passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	EV_HC1 passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	CM_MC1 passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	EV_MC2 passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	CM_MC2 passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	Lab Control passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	LC_LCDSSLCC passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	LC_SLC passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	FR_FRBACH passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	GH_FR1 passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	GH_ERC passed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0012	GH_ERC failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0012	FR_UFR1 failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0012	GH_ER2 failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0012	CM_MC1 failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0012	LC_SLC failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0012	FR_FRCP1 failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0012	Lab Control failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0012	EV_HC1 failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0012	GH_FR1 failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0012	LC_LCDSSLCC failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0012	CM_MC2 failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0012	FR_FRBACH failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0012	LC_LC5 failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0012	LC_LC3 failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0012	LC_DCDS failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0012	EV_MC2 failed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	FR_FRBACH passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	CM_MC2 passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	CM_MC1 passed cell yield	1

EC Alga Growth Inhibition Test **Nautilus Environmental**

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	FR_UFR1 passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	GH_FR1 passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	EV_MC2 passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	Lab Control passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	FR_FRCP1 passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	LC_DCDS passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	LC_LCDSSLCC passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	GH_ERC passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	LC_LC5 passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	GH_ER2 passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	LC_SLC passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	LC_LC3 passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	EV_HC1 passed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0012	FR_FRBACH failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0012	LC_LC3 failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0012	LC_LC5 failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0012	GH_FR1 failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0012	CM_MC1 failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0012	LC_DCDS failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0012	GH_ER2 failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0012	FR_UFR1 failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0012	LC_SLC failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0012	EV_MC2 failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0012	FR_FRCP1 failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0012	GH_ERC failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0012	EV_HC1 failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0012	LC_LCDSSLCC failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0012	Lab Control failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0012	CM_MC2 failed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	LC_DCDS passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	EV_HC1 passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	LC_LC3 passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	FR_FRCP1 passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	CM_MC1 passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	LC_LC5 passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	GH_ER2 passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	GH_ERC passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	GH_FR1 passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	LC_SLC passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	EV_MC2 passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	CM_MC2 passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	FR_FRBACH passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	LC_LCDSSLCC passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	Lab Control passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	FR_UFR1 passed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0012	FR_FRBACH failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0012	GH_ERC failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0012	GH_FR1 failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0012	FR_UFR1 failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0012	LC_SLC failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0012	CM_MC1 failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0012	GH_ER2 failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0012	EV_HC1 failed cell yield	1

EC Alga Growth Inhibition Test **Nautilus Environmental**

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0012	CM_MC2 failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0012	LC_LCDSSLCC failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0012	EV_MC2 failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0012	Lab Control failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0012	FR_FRCP1 failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0012	LC_LC5 failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0012	LC_LC3 failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0012	LC_DCDS failed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	LC_SLC passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	FR_FRBACH passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	Lab Control passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	GH_FR1 passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	LC_LCDSSLCC passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	CM_MC1 passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	EV_MC2 passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	GH_ER2 passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	EV_HC1 passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	LC_DCDS passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	LC_LC3 passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	GH_ERC passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	LC_LC5 passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	FR_FRCP1 passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	CM_MC2 passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	FR_UFR1 passed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	LC_DCDS failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	GH_ERC failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	FR_FRBACH failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	FR_UFR1 failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	FR_FRCP1 failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	LC_LC3 failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	LC_SLC failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	LC_LCDSSLCC failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	EV_HC1 failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	EV_MC2 failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	GH_ER2 failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	LC_LC5 failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	GH_FR1 failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	CM_MC2 failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	Lab Control failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	CM_MC1 failed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	LC_LC5 failed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	FR_FRBACH failed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	Lab Control failed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	CM_MC2 failed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	FR_UFR1 failed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	LC_DCDS failed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	EV_MC2 failed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	CM_MC1 failed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	EV_HC1 failed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	GH_ERC failed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	GH_FR1 failed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	LC_LCDSSLCC failed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	GH_ER2 failed cell yield	1

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Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	FR_FRCP1 failed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	LC_SLC failed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	LC_LC3 failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	LC_DCDS passed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	FR_UFR1 passed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	GH_ERC passed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	LC_LC3 passed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	GH_FR1 passed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	LC_LC5 passed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	GH_ER2 passed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	EV_HC1 passed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	LC_LCDSSLCC passed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	CM_MC1 passed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	CM_MC2 passed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	FR_FRCP1 passed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	LC_SLC passed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	Lab Control passed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	EV_MC2 passed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	FR_FRBACH passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	EV_HC1 passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	LC_LC5 passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	LC_DCDS passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	LC_LCDSSLCC passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	LC_SLC passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	LC_LC3 passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	Lab Control passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	CM_MC1 passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	GH_FR1 passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	CM_MC2 passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	FR_FRCP1 passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	FR_FRBACH passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	FR_UFR1 passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	GH_ERC passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	EV_MC2 passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	GH_ER2 passed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	LC_LCDSSLCC failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	LC_LC3 failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	CM_MC1 failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	LC_LC5 failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	GH_ERC failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	FR_UFR1 failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	Lab Control failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	LC_SLC failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	GH_ER2 failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	FR_FRBACH failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	LC_DCDS failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	EV_HC1 failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	GH_FR1 failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	CM_MC2 failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	EV_MC2 failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	FR_FRCP1 failed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	CM_MC2 passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	GH_ERC passed cell yield	1

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14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	EV_MC2 passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	GH_ER2 passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	GH_FR1 passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	LC_LC5 passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	LC_DCDS passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	LC_SLC passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	CM_MC1 passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	EV_HC1 passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	LC_LC3 passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	LC_LCDSSLCC passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	FR_FRCP1 passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	FR_UFR1 passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	Lab Control passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	FR_FRBACH passed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	EV_HC1 failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	EV_MC2 failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	GH_FR1 failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	LC_DCDS failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	FR_FRBACH failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	FR_UFR1 failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	GH_ER2 failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	LC_LCDSSLCC failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	LC_LC3 failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	FR_FRCP1 failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	GH_ERC failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	Lab Control failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	LC_SLC failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	LC_LC5 failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	CM_MC1 failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	CM_MC2 failed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	Lab Control passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	EV_HC1 passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	GH_ER2 passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	LC_LCDSSLCC passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	FR_FRCP1 passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	LC_LC3 passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	LC_SLC passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	CM_MC2 passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	LC_LC5 passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	EV_MC2 passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	CM_MC1 passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	GH_FR1 passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	LC_DCDS passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	FR_UFR1 passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	GH_ERC passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	FR_FRBACH passed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	EV_MC2 failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	LC_LC3 failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	CM_MC1 failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	FR_UFR1 failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	GH_FR1 failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	FR_FRCP1 failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	CM_MC2 failed cell yield	1

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Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	GH_ERC failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	Lab Control failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	GH_ER2 failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	FR_FRBACH failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	EV_HC1 failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	LC_LCDSSLCC failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	LC_DCDS failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	LC_SLC failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	LC_LC5 failed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	EV_MC2 passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	FR_FRBACH passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	EV_HC1 passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	LC_LCDSSLCC passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	CM_MC2 passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	GH_ERC passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	LC_SLC passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	FR_UFR1 passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	LC_DCDS passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	FR_FRCP1 passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	GH_ER2 passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	CM_MC1 passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	GH_FR1 passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	Lab Control passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	LC_LC5 passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	LC_LC3 passed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	Lab Control failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	CM_MC2 failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	LC_LC5 failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	FR_FRCP1 failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	EV_HC1 failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	LC_SLC failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	EV_MC2 failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	CM_MC1 failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	GH_ERC failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	GH_FR1 failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	FR_FRBACH failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	FR_UFR1 failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	LC_DCDS failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	LC_LC3 failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	GH_ER2 failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	LC_LCDSSLCC failed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	Lab Control passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	GH_ERC passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	LC_SLC passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	CM_MC1 passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	CM_MC2 passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	FR_FRCP1 passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	FR_UFR1 passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	GH_ER2 passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	GH_FR1 passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	LC_LCDSSLCC passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	EV_HC1 passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	LC_LC5 passed cell yield	1

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14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	FR_FRBACH passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	LC_LC3 passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	LC_DCDS passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	EV_MC2 passed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	LC_LC3 failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	FR_FRCP1 failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	CM_MC2 failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	EV_MC2 failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	LC_DCDS failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	GH_ERC failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	CM_MC1 failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	LC_LC5 failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	LC_LCDSSLCC failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	GH_ER2 failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	LC_SLC failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	FR_UFR1 failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	GH_FR1 failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	EV_HC1 failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	Lab Control failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	FR_FRBACH failed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	FR_FRCP1 passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	LC_DCDS passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	LC_LC5 passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	CM_MC1 passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	LC_LC3 passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	GH_FR1 passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	CM_MC2 passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	FR_FRBACH passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	GH_ERC passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	EV_HC1 passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	EV_MC2 passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	LC_LCDSSLCC passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	Lab Control passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	LC_SLC passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	FR_UFR1 passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	GH_ER2 passed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	LC_LC3 failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	CM_MC1 failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	LC_LC5 failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	GH_ER2 failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	LC_SLC failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	Lab Control failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	LC_LCDSSLCC failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	GH_FR1 failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	FR_FRBACH failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	FR_UFR1 failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	EV_HC1 failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	FR_FRCP1 failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	GH_ERC failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	LC_DCDS failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	EV_MC2 failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	CM_MC2 failed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	LC_LC5 passed cell yield	1

EC Alga Growth Inhibition Test **Nautilus Environmental**

SIngle Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	GH_ER2 passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	LC_SLC passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	EV_HC1 passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	LC_LCDSSLCC passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	Lab Control passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	FR_UFR1 passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	EV_MC2 passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	LC_DCDS passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	GH_FR1 passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	CM_MC1 passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	LC_LC3 passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	GH_ERC passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	FR_FRCP1 passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	CM_MC2 passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	FR_FRBACH passed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	LC_SLC failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	Lab Control failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	LC_DCDS failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	LC_LC3 failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	FR_FRBACH failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	EV_MC2 failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	CM_MC1 failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	CM_MC2 failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	GH_ER2 failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	FR_FRCP1 failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	LC_LC5 failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	FR_UFR1 failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	EV_HC1 failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	GH_ERC failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	GH_FR1 failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	LC_LCDSSLCC failed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	GH_ER2 passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	CM_MC1 passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	FR_UFR1 passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	GH_ERC passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	LC_LCDSSLCC passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	LC_LC3 passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	LC_LC5 passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	EV_MC2 passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	CM_MC2 passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	LC_DCDS passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	FR_FRCP1 passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	EV_HC1 passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	GH_FR1 passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	Lab Control passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	FR_FRBACH passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	LC_SLC passed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	GH_ERC failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	CM_MC1 failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	FR_FRBACH failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	FR_UFR1 failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	Lab Control failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	GH_FR1 failed cell yield	1

EC Alga Growth Inhibition Test **Nautilus Environmental**

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	LC_SLC failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	LC_LCDSSLCC failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	CM_MC2 failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	GH_ER2 failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	EV_MC2 failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	EV_HC1 failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	LC_DCDS failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	LC_LC3 failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	LC_LC5 failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	FR_FRCP1 failed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	FR_FRCP1 passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	GH_ERC passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	GH_ER2 passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	LC_SLC passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	FR_FRBACH passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	Lab Control passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	GH_FR1 passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	LC_LCDSSLCC passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	CM_MC2 passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	EV_MC2 passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	FR_UFR1 passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	EV_HC1 passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	LC_DCDS passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	CM_MC1 passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	LC_LC3 passed cell yield	1
14-9165-3480	Cell Yield	Wilcoxon/Bonferroni Adj Test	1.0000	LC_LC5 passed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	EV_MC2 failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	LC_LC5 failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	GH_ER2 failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	LC_LC3 failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	GH_ERC failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	LC_DCDS failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	CM_MC1 failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	LC_LCDSSLCC failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	FR_FRCP1 failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	Lab Control failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	LC_SLC failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	CM_MC2 failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	FR_UFR1 failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	FR_FRBACH failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	GH_FR1 failed cell yield	1
18-5529-3649	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	EV_HC1 failed cell yield	1

EC Alga Growth Inhibition Test **Nautilus Environmental**

Cell Yield Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
Lab Control	N	8	33.38	32.2	34.55	31	35	0.4978	1.408	4.22%	0.00%
FR_UFR1		8	114.6	108.5	120.7	105	128	2.584	7.308	6.38%	-243.45%
GH_ER2		8	107.2	101.5	113	97	117	2.418	6.84	6.38%	-221.35%
CM_MC1		8	100.9	90.02	111.7	87	116	4.592	12.99	12.88%	-202.25%
LC_SLC		8	102.8	96.26	109.2	92	112	2.743	7.76	7.55%	-207.87%
FR_FRBACH		4	74	70.56	77.44	71	76	1.08	2.16	2.92%	-121.72%
FR_FRCP1		4	20.25	16.97	23.53	18	22	1.031	2.062	10.18%	39.33%
GH_FR1		4	103.2	80.25	126.2	90	122	7.227	14.45	14.00%	-209.36%
GH_ERC		4	111.8	85.24	138.3	91	128	8.33	16.66	14.91%	-234.83%
CM_MC2		4	76.5	68.54	84.46	71	83	2.5	5	6.54%	-129.21%
EV_MC2		4	82.5	71.75	93.25	76	92	3.379	6.758	8.19%	-147.19%
EV_HC1		4	91.25	79.9	102.6	81	97	3.568	7.136	7.82%	-173.41%
LC_DCDS		4	78.5	70.54	86.46	72	84	2.5	5	6.37%	-135.21%
LC_LC3		4	74.5	60.24	88.76	66	87	4.481	8.963	12.03%	-123.22%
LC_LC5		4	76.5	70.34	82.66	71	80	1.936	3.873	5.06%	-129.21%
LC_LCDSSLCC		4	86	80.64	91.36	82	90	1.683	3.367	3.91%	-157.68%

Cell Yield Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
Lab Control	N	35	32	31	35	33	34	34	33
FR_UFR1		109	111	117	128	119	110	105	118
GH_ER2		107	101	110	117	97	110	114	102
CM_MC1		87	89	90	116	90	108	116	111
LC_SLC		98	103	96	112	110	99	92	112
FR_FRBACH		76	75	74	71				
FR_FRCP1		22	22	19	18				
GH_FR1		94	90	122	107				
GH_ERC		106	128	122	91				
CM_MC2		75	71	83	77				
EV_MC2		81	92	81	76				
EV_HC1		92	81	97	95				
LC_DCDS		78	72	84	80				
LC_LC3		71	66	74	87				
LC_LC5		78	71	77	80				
LC_LCDSSLCC		82	87	85	90				

CETIS Analytical Report

EC Alga Growth Inhibition Test — **Nautilus Environmental**

Analysis ID:	14-9165-3480	**Endpoint:**	Cell Yield	**CETIS Version:**	CETISv1.9.4
Analyzed:	12 Apr-21 16:39	**Analysis:**	Nonparametric-Multiple Comparison	**Status Level:**	1
Batch ID:	06-1249-4935	**Test Type:**	Cell Growth	**Analyst:**	Sierra Klueppel
Start Date:	25 Feb-21 15:30 ✓	**Protocol:**	EC/EPS 1/RM/25 ✓	**Diluent:**	Deionized Water + nutrients
Ending Date:	28 Feb-21 15:30 ✓	**Species:**	Pseudokirchneriella subcapitata	**Brine:**	
Test Length:	72h	**Taxon:**	Chlorophyta	**Source:**	In-House Culture **Age:** 6d ✓

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
Lab Control	15-2426-6587	25 Feb-21	25 Feb-21 04:00	16h	Teck Coal	
FR_UFR1	14-8234-3686	23 Feb-21 09:40	24 Feb-21 11:44	54h (4.4 °C)		
GH_ER2	20-0147-7232	23 Feb-21 14:00	24 Feb-21 11:44	50h (7.8 °C)		
CM_MC1	07-2038-4904	23 Feb-21 11:25	24 Feb-21 11:44	52h (-0.3 °C)		
LC_SLC	11-8707-6195	23 Feb-21 11:45	24 Feb-21 11:44	52h (0.9 °C)		
FR_FRBACH	02-7366-1775	23 Feb-21	24 Feb-21 11:44	64h (5.7 °C)		
FR_FRCP1	14-4134-6165	23 Feb-21	24 Feb-21 11:44	64h (5.8 °C)		
GH_FR1	07-4036-9929	23 Feb-21 10:20	24 Feb-21 11:44	53h (-0.7 °C)		
GH_ERC	20-9193-0706	23 Feb-21 15:35	24 Feb-21 11:44	48h (8.4 °C)		
CM_MC2	13-6384-2177	23 Feb-21 10:25	24 Feb-21 11:44	53h (-0.3 °C)		
EV_MC2	18-6797-1941	23 Feb-21 12:40	24 Feb-21 11:44	51h (0 °C)		
EV_HC1	13-6939-5644	23 Feb-21 11:10	24 Feb-21 11:44	52h (0 °C)		
LC_DCDS	02-0790-9169	23 Feb-21 11:15	24 Feb-21 11:44	52h (8.1 °C)		
LC_LC3	20-2187-6678	23 Feb-21 11:00	24 Feb-21 11:44	52h (2.9 °C)		
LC_LC5	19-0487-3769	23 Feb-21 13:45	24 Feb-21 11:44	50h (1.8 °C)		
LC_LCDSSLCC	18-4784-1853	23 Feb-21 13:00	24 Feb-21 11:44	51h (0.9 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
Lab Control	Water Sample	Teck Coal	Lab Control	
FR_UFR1	Water Sample	Teck Coal	FR_UFR1_MON_2021-02-0	
GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-02-23_	
CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-02-23	
LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021_02-22_	
FR_FRBACH	Water Sample	Teck Coal	FR_FRABCH_MON_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_MON_2021-02	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-02-23_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-02-23	
CM_MC2	Water Sample	Teck Coal	CM_MC2_AHC_2021-02-23	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2020_Q1_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2020_Q1_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-02-23	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-02-22_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-02-22_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	

JBu
Apr. 14/21

EC Alga Growth Inhibition Test — **Nautilus Environmental**

Analysis ID: 14-9165-3480 **Endpoint:** Cell Yield **CETIS Version:** CETISv1.9.4
Analyzed: 12 Apr-21 16:39 **Analysis:** Nonparametric-Multiple Comparison **Status Level:** 1

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	FR_UFR1 passed cell yield	42.07%
		GH_ER2 passed cell yield	42.07%
		CM_MC1 passed cell yield	42.07%
		LC_SLC passed cell yield	42.07%
		FR_FRBACH passed cell yield	42.07%
		FR_FRCP1 failed cell yield	42.07%
		GH_FR1 passed cell yield	42.07%
		GH_ERC passed cell yield	42.07%
		CM_MC2 passed cell yield	42.07%
		EV_MC2 passed cell yield	42.07%
		EV_HC1 passed cell yield	42.07%
		LC_DCDS passed cell yield	42.07%
		LC_LC3 passed cell yield	42.07%
		LC_LC5 passed cell yield	42.07%
		LC_LCDSSLCC passed cell yield	42.07%

Wilcoxon/Bonferroni Adj Test

Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)
Negative Control		FR_UFR1	100	n/a	0	14	Exact	1.0000	Non-Significant Effect
		GH_ER2	100	n/a	0	14	Exact	1.0000	Non-Significant Effect
		CM_MC1	100	n/a	0	14	Exact	1.0000	Non-Significant Effect
		LC_SLC	100	n/a	0	14	Exact	1.0000	Non-Significant Effect
		FR_FRBACH	42	n/a	0	10	Exact	1.0000	Non-Significant Effect
		FR_FRCP1*	10	n/a	0	10	Exact	0.0303	Significant Effect
		GH_FR1	42	n/a	0	10	Exact	1.0000	Non-Significant Effect
		GH_ERC	42	n/a	0	10	Exact	1.0000	Non-Significant Effect
		CM_MC2	42	n/a	0	10	Exact	1.0000	Non-Significant Effect
		EV_MC2	42	n/a	0	10	Exact	1.0000	Non-Significant Effect
		EV_HC1	42	n/a	0	10	Exact	1.0000	Non-Significant Effect
		LC_DCDS	42	n/a	0	10	Exact	1.0000	Non-Significant Effect
		LC_LC3	42	n/a	0	10	Exact	1.0000	Non-Significant Effect
		LC_LC5	42	n/a	0	10	Exact	1.0000	Non-Significant Effect
		LC_LCDSSLCC	42	n/a	0	10	Exact	1.0000	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	2.798	3.323	0.3559	No Outliers Detected
Control Trend	Mann-Kendall Trend Test	2.798		0.7305	Non-Significant Trend in Controls

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	59649.9	3976.66	15	59.25	<1.0E-37	Significant Effect
Error	4563.62	67.1121	68			
Total	64213.6		83			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance Test	44.57	30.58	8.9E-05	Unequal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9885	0.9596	0.6683	Normal Distribution

EC Alga Growth Inhibition Test — **Nautilus Environmental**

Analysis ID: 14-9165-3480 **Endpoint:** Cell Yield **CETIS Version:** CETISv1.9.4
Analyzed: 12 Apr-21 16:39 **Analysis:** Nonparametric-Multiple Comparison **Status Level:** 1

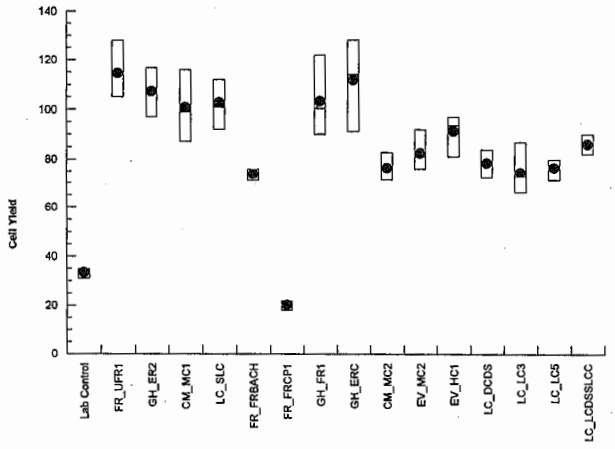
Cell Yield Summary

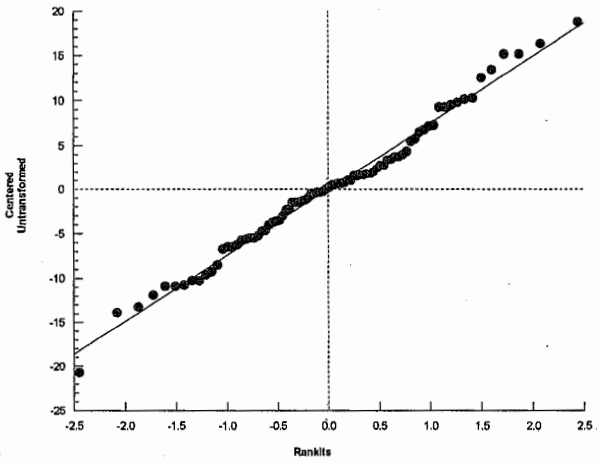
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
Lab Control	N	8	33.38	32.2	34.55	33.5	31	35	0.4978	4.22%	0.00%
FR_UFR1		8	114.6	108.5	120.7	114	105	128	2.584	6.38%	-243.45%
GH_ER2		8	107.2	101.5	113	108.5	97	117	2.418	6.38%	-221.35%
CM_MC1		8	100.9	90.02	111.7	99	87	116	4.592	12.88%	-202.25%
LC_SLC		8	102.8	96.26	109.2	101	92	112	2.743	7.55%	-207.87%
FR_FRBACH		4	74	70.56	77.44	74.5	71	76	1.08	2.92%	-121.72%
FR_FRCP1		4	20.25	16.97	23.53	20.5	18	22	1.031	10.18%	39.33%
GH_FR1		4	103.2	80.25	126.2	100.5	90	122	7.227	14.00%	-209.36%
GH_ERC		4	111.8	85.24	138.3	114	91	128	8.33	14.91%	-234.83%
CM_MC2		4	76.5	68.54	84.46	76	71	83	2.5	6.54%	-129.21%
EV_MC2		4	82.5	71.75	93.25	81	76	92	3.379	8.19%	-147.19%
EV_HC1		4	91.25	79.9	102.6	93.5	81	97	3.568	7.82%	-173.41%
LC_DCDS		4	78.5	70.54	86.46	79	72	84	2.5	6.37%	-135.21%
LC_LC3		4	74.5	60.24	88.76	72.5	66	87	4.481	12.03%	-123.22%
LC_LC5		4	76.5	70.34	82.66	77.5	71	80	1.936	5.06%	-129.21%
LC_LCDSSLCC		4	86	80.64	91.36	86	82	90	1.683	3.91%	-157.68%

Cell Yield Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
Lab Control	N	35	32	31	35	33	34	34	33
FR_UFR1		109	111	117	128	119	110	105	118
GH_ER2		107	101	110	117	97	110	114	102
CM_MC1		87	89	90	116	90	108	116	111
LC_SLC		98	103	96	112	110	99	92	112
FR_FRBACH		76	75	74	71				
FR_FRCP1		22	22	19	18				
GH_FR1		94	90	122	107				
GH_ERC		106	128	122	91				
CM_MC2		75	71	83	77				
EV_MC2		81	92	81	76				
EV_HC1		92	81	97	95				
LC_DCDS		78	72	84	80				
LC_LC3		71	66	74	87				
LC_LC5		78	71	77	80				
LC_LCDSSLCC		82	87	85	90				

Graphics





EC Alga Growth Inhibition Test

Nautilus Environmental

Analysis ID:	18-5529-3649	**Endpoint:**	Cell Yield	**CETIS Version:**	CETISv1.9.4
Analyzed:	12 Apr-21 16:39	**Analysis:**	Nonparametric-Multiple Comparison	**Status Level:**	1
Batch ID:	06-1249-4935	**Test Type:**	Cell Growth	**Analyst:**	Sierra Klueppel
Start Date:	25 Feb-21 15:30	**Protocol:**	EC/EPS 1/RM/25	**Diluent:**	Deionized Water + nutrients
Ending Date:	28 Feb-21 15:30	**Species:**	Pseudokirchneriella subcapitata	**Brine:**	
Test Length:	72h	**Taxon:**	Chlorophyta	**Source:**	In-House Culture **Age:** 6d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
Lab Control	15-2426-6587	25 Feb-21	25 Feb-21 04:00	16h	Teck Coal	
FR_UFR1	14-8234-3686	23 Feb-21 09:40	24 Feb-21 11:44	54h (4.4 °C)		
GH_ER2	20-0147-7232	23 Feb-21 14:00	24 Feb-21 11:44	50h (7.8 °C)		
CM_MC1	07-2038-4904	23 Feb-21 11:25	24 Feb-21 11:44	52h (-0.3 °C)		
LC_SLC	11-8707-6195	23 Feb-21 11:45	24 Feb-21 11:44	52h (0.9 °C)		
FR_FRBACH	02-7366-1775	23 Feb-21	24 Feb-21 11:44	64h (5.7 °C)		
FR_FRCP1	14-4134-6165	23 Feb-21	24 Feb-21 11:44	64h (5.8 °C)		
GH_FR1	07-4036-9929	23 Feb-21 10:20	24 Feb-21 11:44	53h (-0.7 °C)		
GH_ERC	20-9193-0706	23 Feb-21 15:35	24 Feb-21 11:44	48h (8.4 °C)		
CM_MC2	13-6384-2177	23 Feb-21 10:25	24 Feb-21 11:44	53h (-0.3 °C)		
EV_MC2	18-6797-1941	23 Feb-21 12:40	24 Feb-21 11:44	51h (0 °C)		
EV_HC1	13-6939-5644	23 Feb-21 11:10	24 Feb-21 11:44	52h (0 °C)		
LC_DCDS	02-0790-9169	23 Feb-21 11:15	24 Feb-21 11:44	52h (8.1 °C)		
LC_LC3	20-2187-6678	23 Feb-21 11:00	24 Feb-21 11:44	52h (2.9 °C)		
LC_LC5	19-0487-3769	23 Feb-21 13:45	24 Feb-21 11:44	50h (1.8 °C)		
LC_LCDSSLCC	18-4784-1853	23 Feb-21 13:00	24 Feb-21 11:44	51h (0.9 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
Lab Control	Water Sample	Teck Coal	Lab Control	
FR_UFR1	Water Sample	Teck Coal	FR_UFR1_MON_2021-02-0	
GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-02-23_	
CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-02-23	
LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021_02-22_	
FR_FRBACH	Water Sample	Teck Coal	FR_FRABCH_MON_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_MON_2021-02	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-02-23_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-02-23	
CM_MC2	Water Sample	Teck Coal	CM_MC2_AHC_2021-02-23	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2020_Q1_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2020_Q1_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-02-23	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-02-22_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-02-22_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	

EC Alga Growth Inhibition Test — **Nautilus Environmental**

Analysis ID: 18-5529-3649 **Endpoint:** Cell Yield **CETIS Version:** CETISv1.9.4
Analyzed: 12 Apr-21 16:39 **Analysis:** Nonparametric-Multiple Comparison **Status Level:** 1

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C < T	FR_UFR1 failed cell yield	42.07%
		GH_ER2 failed cell yield	42.07%
		CM_MC1 failed cell yield	42.07%
		LC_SLC failed cell yield	42.07%
		FR_FRBACH failed cell yield	42.07%
		FR_FRCP1 passed cell yield	42.07%
		GH_FR1 failed cell yield	42.07%
		GH_ERC failed cell yield	42.07%
		CM_MC2 failed cell yield	42.07%
		EV_MC2 failed cell yield	42.07%
		EV_HC1 failed cell yield	42.07%
		LC_DCDS failed cell yield	42.07%
		LC_LC3 failed cell yield	42.07%
		LC_LC5 failed cell yield	42.07%
		LC_LCDSSLCC failed cell yield	42.07%

Wilcoxon/Bonferroni Adj Test

Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)
Negative Control		FR_UFR1*	36	n/a	0	14	Exact	0.0012	Significant Effect
		GH_ER2*	36	n/a	0	14	Exact	0.0012	Significant Effect
		CM_MC1*	36	n/a	0	14	Exact	0.0012	Significant Effect
		LC_SLC*	36	n/a	0	14	Exact	0.0012	Significant Effect
		FR_FRBACH*	10	n/a	0	10	Exact	0.0303	Significant Effect
		FR_FRCP1	42	n/a	0	10	Exact	1.0000	Non-Significant Effect
		GH_FR1*	10	n/a	0	10	Exact	0.0303	Significant Effect
		GH_ERC*	10	n/a	0	10	Exact	0.0303	Significant Effect
		CM_MC2*	10	n/a	0	10	Exact	0.0303	Significant Effect
		EV_MC2*	10	n/a	0	10	Exact	0.0303	Significant Effect
		EV_HC1*	10	n/a	0	10	Exact	0.0303	Significant Effect
		LC_DCDS*	10	n/a	0	10	Exact	0.0303	Significant Effect
		LC_LC3*	10	n/a	0	10	Exact	0.0303	Significant Effect
		LC_LC5*	10	n/a	0	10	Exact	0.0303	Significant Effect
		LC_LCDSSLCC*	10	n/a	0	10	Exact	0.0303	Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	2.798	3.323	0.3559	No Outliers Detected
Control Trend	Mann-Kendall Trend Test	2.798		0.7305	Non-Significant Trend in Controls

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	59649.9	3976.66	15	59.25	<1.0E-37	Significant Effect
Error	4563.62	67.1121	68			
Total	64213.6		83			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance Test	44.57	30.58	8.9E-05	Unequal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9885	0.9596	0.6683	Normal Distribution

EC Alga Growth Inhibition Test **Nautilus Environmental**

Analysis ID: 18-5529-3649 **Endpoint:** Cell Yield **CETIS Version:** CETISv1.9.4
Analyzed: 12 Apr-21 16:39 **Analysis:** Nonparametric-Multiple Comparison **Status Level:** 1

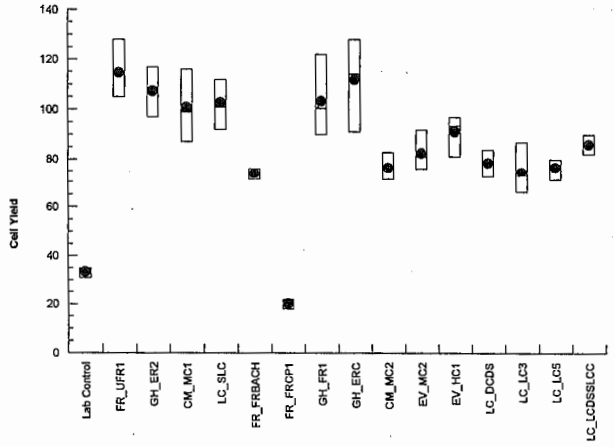
Cell Yield Summary

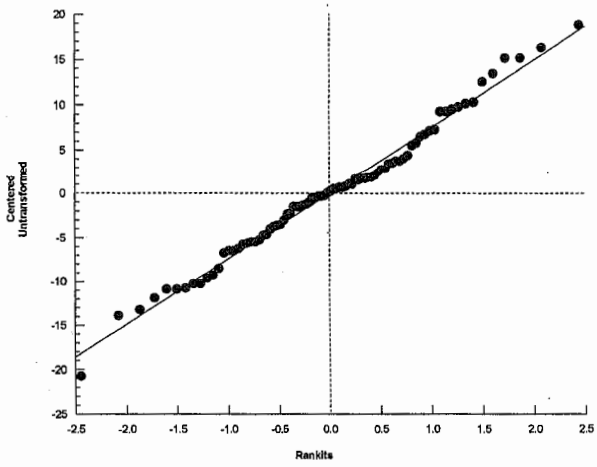
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
Lab Control	N	8	33.38	32.2	34.55	33.5	31	35	0.4978	4.22%	0.00%
FR_UFR1		8	114.6	108.5	120.7	114	105	128	2.584	6.38%	-243.45%
GH_ER2		8	107.2	101.5	113	108.5	97	117	2.418	6.38%	-221.35%
CM_MC1		8	100.9	90.02	111.7	99	87	116	4.592	12.88%	-202.25%
LC_SLC		8	102.8	96.26	109.2	101	92	112	2.743	7.55%	-207.87%
FR_FRBACH		4	74	70.56	77.44	74.5	71	76	1.08	2.92%	-121.72%
FR_FRCP1		4	20.25	16.97	23.53	20.5	18	22	1.031	10.18%	39.33%
GH_FR1		4	103.2	80.25	126.2	100.5	90	122	7.227	14.00%	-209.36%
GH_ERC		4	111.8	85.24	138.3	114	91	128	8.33	14.91%	-234.83%
CM_MC2		4	76.5	68.54	84.46	76	71	83	2.5	6.54%	-129.21%
EV_MC2		4	82.5	71.75	93.25	81	76	92	3.379	8.19%	-147.19%
EV_HC1		4	91.25	79.9	102.6	93.5	81	97	3.568	7.82%	-173.41%
LC_DCDS		4	78.5	70.54	86.46	79	72	84	2.5	6.37%	-135.21%
LC_LC3		4	74.5	60.24	88.76	72.5	66	87	4.481	12.03%	-123.22%
LC_LC5		4	76.5	70.34	82.66	77.5	71	80	1.936	5.06%	-129.21%
LC_LCDSSLCC		4	86	80.64	91.36	86	82	90	1.683	3.91%	-157.68%

Cell Yield Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
Lab Control	N	35	32	31	35	33	34	34	33
FR_UFR1		109	111	117	128	119	110	105	118
GH_ER2		107	101	110	117	97	110	114	102
CM_MC1		87	89	90	116	90	108	116	111
LC_SLC		98	103	96	112	110	99	92	112
FR_FRBACH		76	75	74	71				
FR_FRCP1		22	22	19	18				
GH_FR1		94	90	122	107				
GH_ERC		106	128	122	91				
CM_MC2		75	71	83	77				
EV_MC2		81	92	81	76				
EV_HC1		92	81	97	95				
LC_DCDS		78	72	84	80				
LC_LC3		71	66	74	87				
LC_LC5		78	71	77	80				
LC_LCDSSLCC		82	87	85	90				

Graphics





CETIS Analytical Report

EC Alga Growth Inhibition Test — **Nautilus Environmental**

Analysis ID:	11-7866-5350	**Endpoint:**	Cell Yield	**CETIS Version:**	CETISv1.9.4
Analyzed:	12 Mar-21 16:22	**Analysis:**	Parametric-Control vs Treatments	**Status Level:**	1
Batch ID:	06-1249-4935	**Test Type:**	Cell Growth	**Analyst:**	Sierra Klueppel
Start Date:	25 Feb-21 15:30	**Protocol:**	EC/EPS 1/RM/25	**Diluent:**	Deionized Water + nutrients
Ending Date:	28 Feb-21 15:30	**Species:**	Pseudokirchneriella subcapitata	**Brine:**	
Test Length:	72h	**Taxon:**	Chlorophyta	**Source:**	In-House Culture **Age:** 6d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
FR_UFR1	14-8234-3686	23 Feb-21 09:40	24 Feb-21 11:44	54h (4.4 °C)	Teck Coal	
GH_ER2	20-0147-7232	23 Feb-21 14:00	24 Feb-21 11:44	50h (7.8 °C)		
CM_MC1	07-2038-4904	23 Feb-21 11:25	24 Feb-21 11:44	52h (-0.3 °C)		
LC_SLC	11-8707-6195	23 Feb-21 11:45	24 Feb-21 11:44	52h (0.9 °C)		
FR_FRBACH	02-7366-1775	23 Feb-21	24 Feb-21 11:44	64h (5.7 °C)		
FR_FRCP1	14-4134-6165	23 Feb-21	24 Feb-21 11:44	64h (5.8 °C)		
GH_FR1	07-4036-9929	23 Feb-21 10:20	24 Feb-21 11:44	53h (-0.7 °C)		
GH_ERC	20-9193-0706	23 Feb-21 15:35	24 Feb-21 11:44	48h (8.4 °C)		
CM_MC2	13-6384-2177	23 Feb-21 10:25	24 Feb-21 11:44	53h (-0.3 °C)		
EV_MC2	18-6797-1941	23 Feb-21 12:40	24 Feb-21 11:44	51h (0 °C)		
EV_HC1	13-6939-5644	23 Feb-21 11:10	24 Feb-21 11:44	52h (0 °C)		
LC_DCDS	02-0790-9169	23 Feb-21 11:15	24 Feb-21 11:44	52h (8.1 °C)		
LC_LC3	20-2187-6678	23 Feb-21 11:00	24 Feb-21 11:44	52h (2.9 °C)		
LC_LC5	19-0487-3769	23 Feb-21 13:45	24 Feb-21 11:44	50h (1.8 °C)		
LC_LCDSSLCC	18-4784-1853	23 Feb-21 13:00	24 Feb-21 11:44	51h (0.9 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_UFR1	Water Sample	Teck Coal	FR_UFR1_MON_2021-02-0	
GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-02-23_	
CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-02-23	
LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021_02-22_	
FR_FRBACH	Water Sample	Teck Coal	FR_FRABCH_MON_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_MON_2021-02	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-02-23_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-02-23	
CM_MC2	Water Sample	Teck Coal	CM_MC2_AHC_2021-02-23	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2020_Q1_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2020_Q1_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-02-23	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-02-22_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-02-22_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	

JBL

EC Alga Growth Inhibition Test — **Nautilus Environmental**

Analysis ID: 11-7866-5350 **Endpoint:** Cell Yield **CETIS Version:** CETISv1.9.4
Analyzed: 12 Mar-21 16:22 **Analysis:** Parametric-Control vs Treatments **Status Level:** 1

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	GH_ER2 passed cell yield	12.35%
		CM_MC1 failed cell yield	12.35%
		LC_SLC failed cell yield	12.35%
		FR_FRBACH failed cell yield	12.35%
		FR_FRCP1 failed cell yield	12.35%
		GH_FR1 passed cell yield	12.35%
		GH_ERC passed cell yield	12.35%
		CM_MC2 failed cell yield	12.35%
		EV_MC2 failed cell yield	12.35%
		EV_HC1 failed cell yield	12.35%
		LC_DCDS failed cell yield	12.35%
		LC_LC3 failed cell yield	12.35%
		LC_LC5 failed cell yield	12.35%
		LC_LCDSSLCC failed cell yield	12.35%

Dunnett Multiple Comparison Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Site Control (FR_UFRI)		GH_ER2	1.708	2.677	11.56	14	CDF	0.3215	Non-Significant Effect
		CM_MC1*	3.184	2.677	11.56	14	CDF	0.0135	Significant Effect
		LC_SLC*	2.75	2.677	11.56	14	CDF	0.0420	Significant Effect
		FR_FRBACH*	7.682	2.677	14.16	10	CDF	1.9E-07	Significant Effect
		FR_FRCP1*	17.84	2.677	14.16	10	CDF	1.9E-07	Significant Effect
		GH_FR1	2.151	2.677	14.16	10	CDF	0.1542	Non-Significant Effect
		GH_ERC	0.5436	2.677	14.16	10	CDF	0.8639	Non-Significant Effect
		CM_MC2*	7.209	2.677	14.16	10	CDF	2.0E-07	Significant Effect
		EV_MC2*	6.074	2.677	14.16	10	CDF	7.9E-07	Significant Effect
		EV_HC1*	4.42	2.677	14.16	10	CDF	2.8E-04	Significant Effect
		LC_DCDS*	6.831	2.677	14.16	10	CDF	2.2E-07	Significant Effect
		LC_LC3*	7.587	2.677	14.16	10	CDF	1.9E-07	Significant Effect
		LC_LC5*	7.209	2.677	14.16	10	CDF	2.0E-07	Significant Effect
		LC_LCDSSLCC*	5.413	2.677	14.16	10	CDF	7.8E-06	Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	2.664	3.288	0.4929	No Outliers Detected
Control Trend	Mann-Kendall Trend Test	2.664		0.9049	Non-Significant Trend in Controls

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	35746.4	2553.31	14	34.23	<1.0E-37	Significant Effect
Error	4549.75	74.5861	61			
Total	40296.1		75			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance Test	27.88	29.14	0.0148	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9921	0.9559	0.9225	Normal Distribution

EC Alga Growth Inhibition Test — **Nautilus Environmental**

Analysis ID: 11-7866-5350 **Endpoint:** Cell Yield **CETIS Version:** CETISv1.9.4
Analyzed: 12 Mar-21 16:22 **Analysis:** Parametric-Control vs Treatments **Status Level:** 1

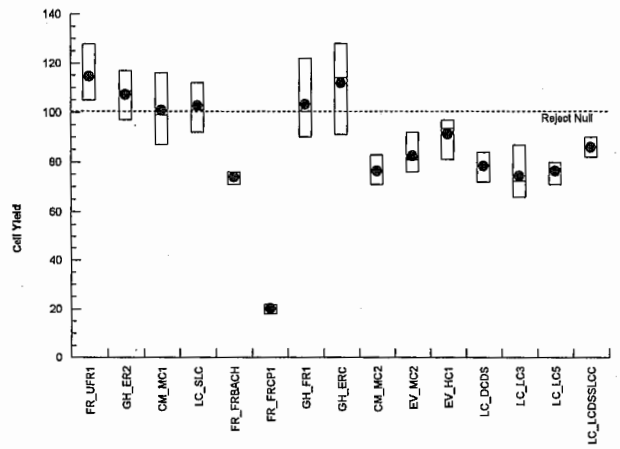
Cell Yield Summary

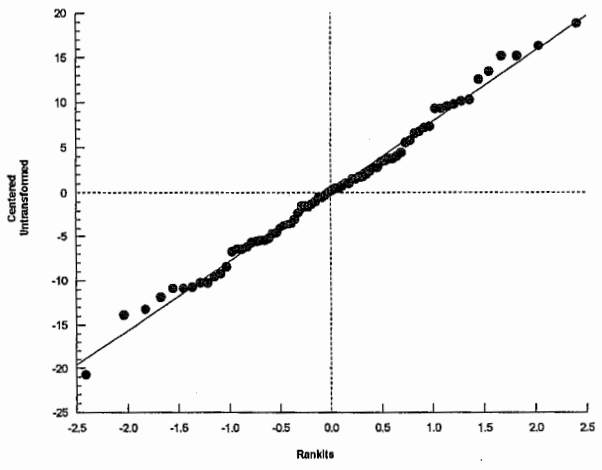
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
FR_UFR1	XC	8	114.6	108.5	120.7	114	105	128	2.584	6.38%	0.00%
GH_ER2		8	107.2	101.5	113	108.5	97	117	2.418	6.38%	6.43%
CM_MC1		8	100.9	90.02	111.7	99	87	116	4.592	12.88%	12.00%
LC_SLC		8	102.8	96.26	109.2	101	92	112	2.743	7.55%	10.36%
FR_FRBACH		4	74	70.56	77.44	74.5	71	76	1.08	2.92%	35.44%
FR_FRCP1		4	20.25	16.97	23.53	20.5	18	22	1.031	10.18%	82.33%
GH_FR1		4	103.2	80.25	126.2	100.5	90	122	7.227	14.00%	9.92%
GH_ERC		4	111.8	85.24	138.3	114	91	128	8.33	14.91%	2.51%
CM_MC2		4	76.5	68.54	84.46	76	71	83	2.5	6.54%	33.26%
EV_MC2		4	82.5	71.75	93.25	81	76	92	3.379	8.19%	28.03%
EV_HC1		4	91.25	79.9	102.6	93.5	81	97	3.568	7.82%	20.39%
LC_DCDS		4	78.5	70.54	86.46	79	72	84	2.5	6.37%	31.52%
LC_LC3		4	74.5	60.24	88.76	72.5	66	87	4.481	12.03%	35.01%
LC_LC5		4	76.5	70.34	82.66	77.5	71	80	1.936	5.06%	33.26%
LC_LCDSSLCC		4	86	80.64	91.36	86	82	90	1.683	3.91%	24.97%

Cell Yield Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
FR_UFR1	XC	109	111	117	128	119	110	105	118
GH_ER2		107	101	110	117	97	110	114	102
CM_MC1		87	89	90	116	90	108	116	111
LC_SLC		98	103	96	112	110	99	92	112
FR_FRBACH		76	75	74	71				
FR_FRCP1		22	22	19	18				
GH_FR1		94	90	122	107				
GH_ERC		106	128	122	91				
CM_MC2		75	71	83	77				
EV_MC2		81	92	81	76				
EV_HC1		92	81	97	95				
LC_DCDS		78	72	84	80				
LC_LC3		71	66	74	87				
LC_LC5		78	71	77	80				
LC_LCDSSLCC		82	87	85	90				

Graphics





EC Alga Growth Inhibition Test

Nautilus Environmental

Analysis ID:	05-9554-5035	**Endpoint:**	Cell Yield	**CETIS Version:**	CETISv1.9.4
Analyzed:	12 Mar-21 16:22	**Analysis:**	Parametric-Control vs Treatments	**Status Level:**	1
Batch ID:	06-1249-4935	**Test Type:**	Cell Growth	**Analyst:**	Sierra Klueppel
Start Date:	25 Feb-21 15:30	**Protocol:**	EC/EPS 1/RM/25	**Diluent:**	Deionized Water + nutrients
Ending Date:	28 Feb-21 15:30	**Species:**	Pseudokirchneriella subcapitata	**Brine:**	
Test Length:	72h	**Taxon:**	Chlorophyta	**Source:**	In-House Culture **Age:** 6d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
FR_UFR1	14-8234-3686	23 Feb-21 09:40	24 Feb-21 11:44	54h (4.4 °C)	Teck Coal	
GH_ER2	20-0147-7232	23 Feb-21 14:00	24 Feb-21 11:44	50h (7.8 °C)		
CM_MC1	07-2038-4904	23 Feb-21 11:25	24 Feb-21 11:44	52h (-0.3 °C)		
LC_SLC	11-8707-6195	23 Feb-21 11:45	24 Feb-21 11:44	52h (0.9 °C)		
FR_FRBACH	02-7366-1775	23 Feb-21	24 Feb-21 11:44	64h (5.7 °C)		
FR_FRCP1	14-4134-6165	23 Feb-21	24 Feb-21 11:44	64h (5.8 °C)		
GH_FR1	07-4036-9929	23 Feb-21 10:20	24 Feb-21 11:44	53h (-0.7 °C)		
GH_ERC	20-9193-0706	23 Feb-21 15:35	24 Feb-21 11:44	48h (8.4 °C)		
CM_MC2	13-6384-2177	23 Feb-21 10:25	24 Feb-21 11:44	53h (-0.3 °C)		
EV_MC2	18-6797-1941	23 Feb-21 12:40	24 Feb-21 11:44	51h (0 °C)		
EV_HC1	13-6939-5644	23 Feb-21 11:10	24 Feb-21 11:44	52h (0 °C)		
LC_DCDS	02-0790-9169	23 Feb-21 11:15	24 Feb-21 11:44	52h (8.1 °C)		
LC_LC3	20-2187-6678	23 Feb-21 11:00	24 Feb-21 11:44	52h (2.9 °C)		
LC_LC5	19-0487-3769	23 Feb-21 13:45	24 Feb-21 11:44	50h (1.8 °C)		
LC_LCDSSLCC	18-4784-1853	23 Feb-21 13:00	24 Feb-21 11:44	51h (0.9 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_UFR1	Water Sample	Teck Coal	FR_UFR1_MON_2021-02-0	
GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-02-23_	
CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-02-23	
LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021_02-22_	
FR_FRBACH	Water Sample	Teck Coal	FR_FRABCH_MON_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_MON_2021-02	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-02-23_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-02-23	
CM_MC2	Water Sample	Teck Coal	CM_MC2_AHC_2021-02-23	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2020_Q1_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2020_Q1_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-02-23	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-02-22_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-02-22_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	

EC Alga Growth Inhibition Test — **Nautilus Environmental**

Analysis ID: 05-9554-5035 **Endpoint:** Cell Yield **CETIS Version:** CETISv1.9.4
Analyzed: 12 Mar-21 16:22 **Analysis:** Parametric-Control vs Treatments **Status Level:** 1

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C < T	GH_ER2 passed cell yield	12.35%
		CM_MC1 passed cell yield	12.35%
		LC_SLC passed cell yield	12.35%
		FR_FRBACH passed cell yield	12.35%
		FR_FRCP1 passed cell yield	12.35%
		GH_FR1 passed cell yield	12.35%
		GH_ERC passed cell yield	12.35%
		CM_MC2 passed cell yield	12.35%
		EV_MC2 passed cell yield	12.35%
		EV_HC1 passed cell yield	12.35%
		LC_DCDS passed cell yield	12.35%
		LC_LC3 passed cell yield	12.35%
		LC_LC5 passed cell yield	12.35%
		LC_LCDSSLCC passed cell yield	12.35%

Dunnett Multiple Comparison Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Site Control		GH_ER2	-1.708	2.677	11.56	14	CDF	1.0000	Non-Significant Effect
(FR-UFRI)		CM_MC1	-3.184	2.677	11.56	14	CDF	1.0000	Non-Significant Effect
		LC_SLC	-2.75	2.677	11.56	14	CDF	1.0000	Non-Significant Effect
		FR_FRBACH	-7.682	2.677	14.16	10	CDF	1.0000	Non-Significant Effect
		FR_FRCP1	-17.84	2.677	14.16	10	CDF	1.0000	Non-Significant Effect
		GH_FR1	-2.151	2.677	14.16	10	CDF	1.0000	Non-Significant Effect
		GH_ERC	-0.5436	2.677	14.16	10	CDF	0.9958	Non-Significant Effect
		CM_MC2	-7.209	2.677	14.16	10	CDF	1.0000	Non-Significant Effect
		EV_MC2	-6.074	2.677	14.16	10	CDF	1.0000	Non-Significant Effect
		EV_HC1	-4.42	2.677	14.16	10	CDF	1.0000	Non-Significant Effect
		LC_DCDS	-6.831	2.677	14.16	10	CDF	1.0000	Non-Significant Effect
		LC_LC3	-7.587	2.677	14.16	10	CDF	1.0000	Non-Significant Effect
		LC_LC5	-7.209	2.677	14.16	10	CDF	1.0000	Non-Significant Effect
		LC_LCDSSLCC	-5.413	2.677	14.16	10	CDF	1.0000	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	2.664	3.288	0.4929	No Outliers Detected
Control Trend	Mann-Kendall Trend Test	2.664		0.9049	Non-Significant Trend in Controls

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	35746.4	2553.31	14	34.23	<1.0E-37	Significant Effect
Error	4549.75	74.5861	61			
Total	40296.1		75			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance Test	27.88	29.14	0.0148	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9921	0.9559	0.9225	Normal Distribution

EC Alga Growth Inhibition Test — **Nautilus Environmental**

Analysis ID: 05-9554-5035 **Endpoint:** Cell Yield **CETIS Version:** CETISv1.9.4
Analyzed: 12 Mar-21 16:22 **Analysis:** Parametric-Control vs Treatments **Status Level:** 1

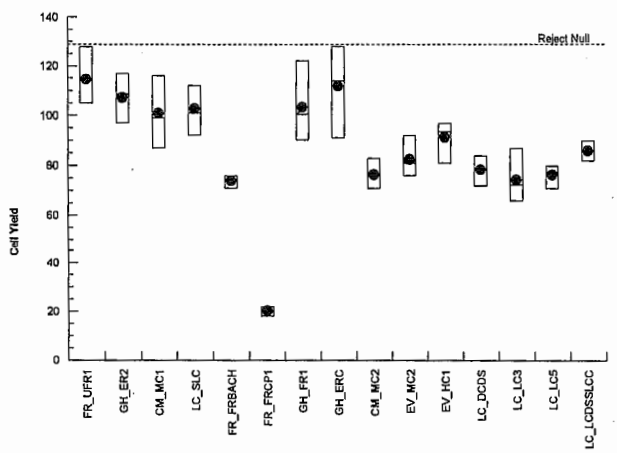
Cell Yield Summary

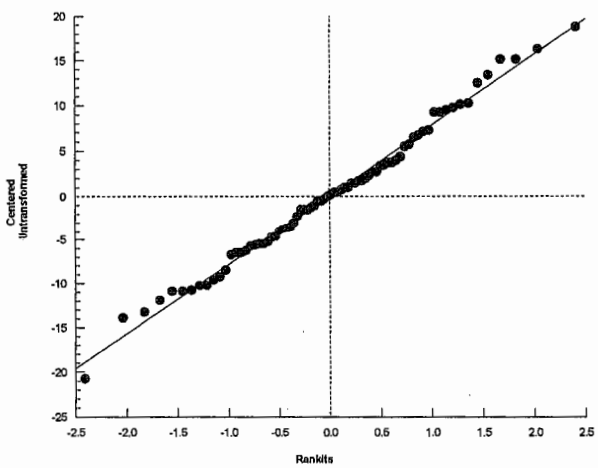
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
FR_UFR1	XC	8	114.6	108.5	120.7	114	105	128	2.584	6.38%	0.00%
GH_ER2		8	107.2	101.5	113	108.5	97	117	2.418	6.38%	6.43%
CM_MC1		8	100.9	90.02	111.7	99	87	116	4.592	12.88%	12.00%
LC_SLC		8	102.8	96.26	109.2	101	92	112	2.743	7.55%	10.36%
FR_FRBACH		4	74	70.56	77.44	74.5	71	76	1.08	2.92%	35.44%
FR_FRCP1		4	20.25	16.97	23.53	20.5	18	22	1.031	10.18%	82.33%
GH_FR1		4	103.2	80.25	126.2	100.5	90	122	7.227	14.00%	9.92%
GH_ERC		4	111.8	85.24	138.3	114	91	128	8.33	14.91%	2.51%
CM_MC2		4	76.5	68.54	84.46	76	71	83	2.5	6.54%	33.26%
EV_MC2		4	82.5	71.75	93.25	81	76	92	3.379	8.19%	28.03%
EV_HC1		4	91.25	79.9	102.6	93.5	81	97	3.568	7.82%	20.39%
LC_DCDS		4	78.5	70.54	86.46	79	72	84	2.5	6.37%	31.52%
LC_LC3		4	74.5	60.24	88.76	72.5	66	87	4.481	12.03%	35.01%
LC_LC5		4	76.5	70.34	82.66	77.5	71	80	1.936	5.06%	33.26%
LC_LCDSSLCC		4	86	80.64	91.36	86	82	90	1.683	3.91%	24.97%

Cell Yield Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
FR_UFR1	XC	109	111	117	128	119	110	105	118
GH_ER2		107	101	110	117	97	110	114	102
CM_MC1		87	89	90	116	90	108	116	111
LC_SLC		98	103	96	112	110	99	92	112
FR_FRBACH		76	75	74	71				
FR_FRCP1		22	22	19	18				
GH_FR1		94	90	122	107				
GH_ERC		106	128	122	91				
CM_MC2		75	71	83	77				
EV_MC2		81	92	81	76				
EV_HC1		92	81	97	95				
LC_DCDS		78	72	84	80				
LC_LC3		71	66	74	87				
LC_LC5		78	71	77	80				
LC_LCDSSLCC		82	87	85	90				

Graphics





EC Alga Growth Inhibition Test — **Nautilus Environmental**

Analysis ID:	08-0379-4023	**Endpoint:**	Cell Yield	**CETIS Version:**	CETISv1.9.4
Analyzed:	12 Mar-21 16:24	**Analysis:**	Parametric-Control vs Treatments	**Status Level:**	1
Batch ID:	06-1249-4935	**Test Type:**	Cell Growth	**Analyst:**	Sierra Klueppel
Start Date:	25 Feb-21 15:30	**Protocol:**	EC/EPS 1/RM/25	**Diluent:**	Deionized Water + nutrients
Ending Date:	28 Feb-21 15:30	**Species:**	Pseudokirchneriella subcapitata	**Brine:**	
Test Length:	72h	**Taxon:**	Chlorophyta	**Source:**	In-House Culture **Age:** 6d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
FR_UFR1	14-8234-3686	23 Feb-21 09:40	24 Feb-21 11:44	54h (4.4 °C)	Teck Coal	
GH_ER2	20-0147-7232	23 Feb-21 14:00	24 Feb-21 11:44	50h (7.8 °C)		
CM_MC1	07-2038-4904	23 Feb-21 11:25	24 Feb-21 11:44	52h (-0.3 °C)		
LC_SLC	11-8707-6195	23 Feb-21 11:45	24 Feb-21 11:44	52h (0.9 °C)		
FR_FRBACH	02-7366-1775	23 Feb-21	24 Feb-21 11:44	64h (5.7 °C)		
FR_FRCP1	14-4134-6165	23 Feb-21	24 Feb-21 11:44	64h (5.8 °C)		
GH_FR1	07-4036-9929	23 Feb-21 10:20	24 Feb-21 11:44	53h (-0.7 °C)		
GH_ERC	20-9193-0706	23 Feb-21 15:35	24 Feb-21 11:44	48h (8.4 °C)		
CM_MC2	13-6384-2177	23 Feb-21 10:25	24 Feb-21 11:44	53h (-0.3 °C)		
EV_MC2	18-6797-1941	23 Feb-21 12:40	24 Feb-21 11:44	51h (0 °C)		
EV_HC1	13-6939-5644	23 Feb-21 11:10	24 Feb-21 11:44	52h (0 °C)		
LC_DCDS	02-0790-9169	23 Feb-21 11:15	24 Feb-21 11:44	52h (8.1 °C)		
LC_LC3	20-2187-6678	23 Feb-21 11:00	24 Feb-21 11:44	52h (2.9 °C)		
LC_LC5	19-0487-3769	23 Feb-21 13:45	24 Feb-21 11:44	50h (1.8 °C)		
LC_LCDSSLCC	18-4784-1853	23 Feb-21 13:00	24 Feb-21 11:44	51h (0.9 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_UFR1	Water Sample	Teck Coal	FR_UFR1_MON_2021-02-0	
GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-02-23_	
CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-02-23	
LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021_02-22_	
FR_FRBACH	Water Sample	Teck Coal	FR_FRABCH_MON_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_MON_2021-02	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-02-23_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-02-23	
CM_MC2	Water Sample	Teck Coal	CM_MC2_AHC_2021-02-23	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2020_Q1_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2020_Q1_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-02-23	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-02-22_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-02-22_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	

EC Alga Growth Inhibition Test — **Nautilus Environmental**

Analysis ID: 08-0379-4023 **Endpoint:** Cell Yield **CETIS Version:** CETISv1.9.4
Analyzed: 12 Mar-21 16:24 **Analysis:** Parametric-Control vs Treatments **Status Level:** 1

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	FR_UFR1 passed cell yield	13.20%
		CM_MC1 passed cell yield	13.20%
		LC_SLC passed cell yield	13.20%
		FR_FRBACH failed cell yield	13.20%
		FR_FRCP1 failed cell yield	13.20%
		GH_FR1 passed cell yield	13.20%
		GH_ERC passed cell yield	13.20%
		CM_MC2 failed cell yield	13.20%
		EV_MC2 failed cell yield	13.20%
		EV_HC1 failed cell yield	13.20%
		LC_DCDS failed cell yield	13.20%
		LC_LC3 failed cell yield	13.20%
		LC_LC5 failed cell yield	13.20%
		LC_LCDSSLCC failed cell yield	13.20%

Dunnett Multiple Comparison Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Site Control (GH-ER2)		FR_UFR1	-1.708	2.677	11.56	14	CDF	1.0000	Non-Significant Effect
		CM_MC1	1.476	2.677	11.56	14	CDF	0.4350	Non-Significant Effect
		LC_SLC	1.042	2.677	11.56	14	CDF	0.6607	Non-Significant Effect
		FR_FRBACH*	6.287	2.677	14.16	10	CDF	4.5E-07	Significant Effect
		FR_FRCP1*	16.45	2.677	14.16	10	CDF	1.9E-07	Significant Effect
		GH_FR1	0.7563	2.677	14.16	10	CDF	0.7894	Non-Significant Effect
		GH_ERC	-0.8509	2.677	14.16	10	CDF	0.9989	Non-Significant Effect
		CM_MC2*	5.814	2.677	14.16	10	CDF	1.8E-06	Significant Effect
		EV_MC2*	4.68	2.677	14.16	10	CDF	1.1E-04	Significant Effect
		EV_HC1*	3.025	2.677	14.16	10	CDF	0.0208	Significant Effect
		LC_DCDS*	5.436	2.677	14.16	10	CDF	7.1E-06	Significant Effect
		LC_LC3*	6.193	2.677	14.16	10	CDF	5.7E-07	Significant Effect
		LC_LC5*	5.814	2.677	14.16	10	CDF	1.8E-06	Significant Effect
		LC_LCDSSLCC*	4.018	2.677	14.16	10	CDF	0.0011	Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	2.664	3.288	0.4929	No Outliers Detected
Control Trend	Mann-Kendall Trend Test	2.664		0.9049	Non-Significant Trend in Controls

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	35746.4	2553.31	14	34.23	<1.0E-37	Significant Effect
Error	4549.75	74.5861	61			
Total	40296.1		75			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance Test	27.88	29.14	0.0148	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9921	0.9559	0.9225	Normal Distribution

EC Alga Growth Inhibition Test — **Nautilus Environmental**

Analysis ID: 08-0379-4023 **Endpoint:** Cell Yield **CETIS Version:** CETISv1.9.4
Analyzed: 12 Mar-21 16:24 **Analysis:** Parametric-Control vs Treatments **Status Level:** 1

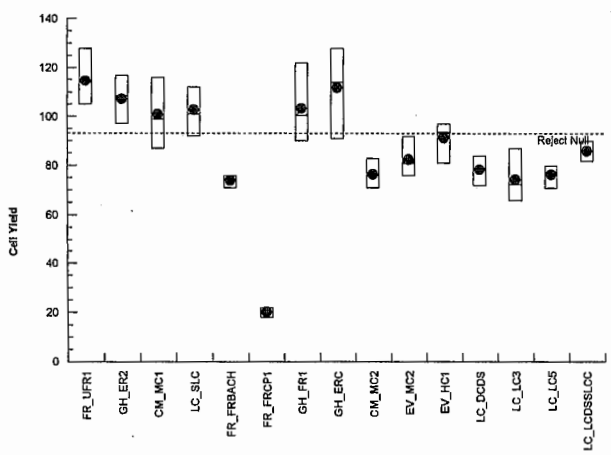
Cell Yield Summary

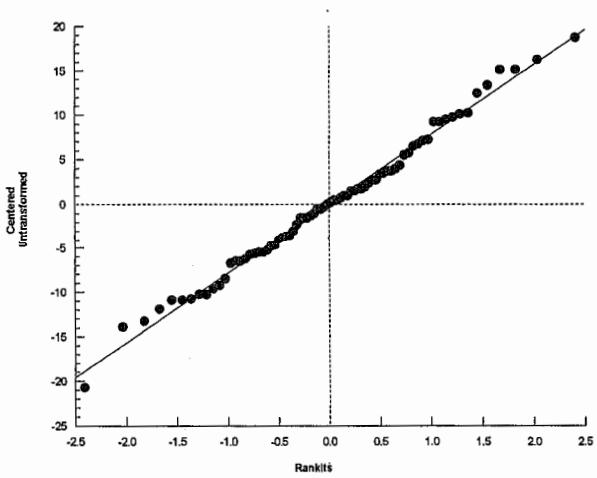
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
FR_UFR1		8	114.6	108.5	120.7	114	105	128	2.584	6.38%	0.00%
GH_ER2	XC	8	107.2	101.5	113	108.5	97	117	2.418	6.38%	6.43%
CM_MC1		8	100.9	90.02	111.7	99	87	116	4.592	12.88%	12.00%
LC_SLC		8	102.8	96.26	109.2	101	92	112	2.743	7.55%	10.36%
FR_FRBACH		4	74	70.56	77.44	74.5	71	76	1.08	2.92%	35.44%
FR_FRCP1		4	20.25	16.97	23.53	20.5	18	22	1.031	10.18%	82.33%
GH_FR1		4	103.2	80.25	126.2	100.5	90	122	7.227	14.00%	9.92%
GH_ERC		4	111.8	85.24	138.3	114	91	128	8.33	14.91%	2.51%
CM_MC2		4	76.5	68.54	84.46	76	71	83	2.5	6.54%	33.26%
EV_MC2		4	82.5	71.75	93.25	81	76	92	3.379	8.19%	28.03%
EV_HC1		4	91.25	79.9	102.6	93.5	81	97	3.568	7.82%	20.39%
LC_DCDS		4	78.5	70.54	86.46	79	72	84	2.5	6.37%	31.52%
LC_LC3		4	74.5	60.24	88.76	72.5	66	87	4.481	12.03%	35.01%
LC_LC5		4	76.5	70.34	82.66	77.5	71	80	1.936	5.06%	33.26%
LC_LCDSSLCC		4	86	80.64	91.36	86	82	90	1.683	3.91%	24.97%

Cell Yield Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
FR_UFR1		109	111	117	128	119	110	105	118
GH_ER2	XC	107	101	110	117	97	110	114	102
CM_MC1		87	89	90	116	90	108	116	111
LC_SLC		98	103	96	112	110	99	92	112
FR_FRBACH		76	75	74	71				
FR_FRCP1		22	22	19	18				
GH_FR1		94	90	122	107				
GH_ERC		106	128	122	91				
CM_MC2		75	71	83	77				
EV_MC2		81	92	81	76				
EV_HC1		92	81	97	95				
LC_DCDS		78	72	84	80				
LC_LC3		71	66	74	87				
LC_LC5		78	71	77	80				
LC_LCDSSLCC		82	87	85	90				

Graphics





EC Alga Growth Inhibition Test — **Nautilus Environmental**

Analysis ID:	06-9233-1505	**Endpoint:**	Cell Yield	**CETIS Version:**	CETISv1.9.4
Analyzed:	12 Mar-21 16:24	**Analysis:**	Parametric-Control vs Treatments	**Status Level:**	1
Batch ID:	06-1249-4935	**Test Type:**	Cell Growth	**Analyst:**	Sierra Klueppel
Start Date:	25 Feb-21 15:30	**Protocol:**	EC/EPS 1/RM/25	**Diluent:**	Deionized Water + nutrients
Ending Date:	28 Feb-21 15:30	**Species:**	Pseudokirchneriella subcapitata	**Brine:**	
Test Length:	72h	**Taxon:**	Chlorophyta	**Source:**	In-House Culture **Age:** 6d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
FR_UFR1	14-8234-3686	23 Feb-21 09:40	24 Feb-21 11:44	54h (4.4 °C)	Teck Coal	
GH_ER2	20-0147-7232	23 Feb-21 14:00	24 Feb-21 11:44	50h (7.8 °C)		
CM_MC1	07-2038-4904	23 Feb-21 11:25	24 Feb-21 11:44	52h (-0.3 °C)		
LC_SLC	11-8707-6195	23 Feb-21 11:45	24 Feb-21 11:44	52h (0.9 °C)		
FR_FRBACH	02-7366-1775	23 Feb-21	24 Feb-21 11:44	64h (5.7 °C)		
FR_FRCP1	14-4134-6165	23 Feb-21	24 Feb-21 11:44	64h (5.8 °C)		
GH_FR1	07-4036-9929	23 Feb-21 10:20	24 Feb-21 11:44	53h (-0.7 °C)		
GH_ERC	20-9193-0706	23 Feb-21 15:35	24 Feb-21 11:44	48h (8.4 °C)		
CM_MC2	13-6384-2177	23 Feb-21 10:25	24 Feb-21 11:44	53h (-0.3 °C)		
EV_MC2	18-6797-1941	23 Feb-21 12:40	24 Feb-21 11:44	51h (0 °C)		
EV_HC1	13-6939-5644	23 Feb-21 11:10	24 Feb-21 11:44	52h (0 °C)		
LC_DCDS	02-0790-9169	23 Feb-21 11:15	24 Feb-21 11:44	52h (8.1 °C)		
LC_LC3	20-2187-6678	23 Feb-21 11:00	24 Feb-21 11:44	52h (2.9 °C)		
LC_LC5	19-0487-3769	23 Feb-21 13:45	24 Feb-21 11:44	50h (1.8 °C)		
LC_LCDSSLCC	18-4784-1853	23 Feb-21 13:00	24 Feb-21 11:44	51h (0.9 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_UFR1	Water Sample	Teck Coal	FR_UFR1_MON_2021-02-0	
GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-02-23_	
CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-02-23	
LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021_02-22_	
FR_FRBACH	Water Sample	Teck Coal	FR_FRABCH_MON_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_MON_2021-02	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-02-23_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-02-23	
CM_MC2	Water Sample	Teck Coal	CM_MC2_AHC_2021-02-23	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2020_Q1_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2020_Q1_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-02-23	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-02-22_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-02-22_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	

EC Alga Growth Inhibition Test — **Nautilus Environmental**

Analysis ID: 06-9233-1505 **Endpoint:** Cell Yield **CETIS Version:** CETISv1.9.4
Analyzed: 12 Mar-21 16:24 **Analysis:** Parametric-Control vs Treatments **Status Level:** 1

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C < T	FR_UFR1 passed cell yield	13.20%
		CM_MC1 passed cell yield	13.20%
		LC_SLC passed cell yield	13.20%
		FR_FRBACH passed cell yield	13.20%
		FR_FRCP1 passed cell yield	13.20%
		GH_FR1 passed cell yield	13.20%
		GH_ERC passed cell yield	13.20%
		CM_MC2 passed cell yield	13.20%
		EV_MC2 passed cell yield	13.20%
		EV_HC1 passed cell yield	13.20%
		LC_DCDS passed cell yield	13.20%
		LC_LC3 passed cell yield	13.20%
		LC_LC5 passed cell yield	13.20%
		LC_LCDSSLCC passed cell yield	13.20%

Dunnett Multiple Comparison Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Site Control (GH-ER2)		FR_UFR1	1.708	2.677	11.56	14	CDF	0.3215	Non-Significant Effect
		CM_MC1	-1.476	2.677	11.56	14	CDF	1.0000	Non-Significant Effect
		LC_SLC	-1.042	2.677	11.56	14	CDF	0.9995	Non-Significant Effect
		FR_FRBACH	-6.287	2.677	14.16	10	CDF	1.0000	Non-Significant Effect
		FR_FRCP1	-16.45	2.677	14.16	10	CDF	1.0000	Non-Significant Effect
		GH_FR1	-0.7563	2.677	14.16	10	CDF	0.9982	Non-Significant Effect
		GH_ERC	0.8509	2.677	14.16	10	CDF	0.7500	Non-Significant Effect
		CM_MC2	-5.814	2.677	14.16	10	CDF	1.0000	Non-Significant Effect
		EV_MC2	-4.68	2.677	14.16	10	CDF	1.0000	Non-Significant Effect
		EV_HC1	-3.025	2.677	14.16	10	CDF	1.0000	Non-Significant Effect
		LC_DCDS	-5.436	2.677	14.16	10	CDF	1.0000	Non-Significant Effect
		LC_LC3	-6.193	2.677	14.16	10	CDF	1.0000	Non-Significant Effect
		LC_LC5	-5.814	2.677	14.16	10	CDF	1.0000	Non-Significant Effect
		LC_LCDSSLCC	-4.018	2.677	14.16	10	CDF	1.0000	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	2.664	3.288	0.4929	No Outliers Detected
Control Trend	Mann-Kendall Trend Test	2.664		0.9049	Non-Significant Trend in Controls

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	35746.4	2553.31	14	34.23	<1.0E-37	Significant Effect
Error	4549.75	74.5861	61			
Total	40296.1		75			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance Test	27.88	29.14	0.0148	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9921	0.9559	0.9225	Normal Distribution

EC Alga Growth Inhibition Test — **Nautilus Environmental**

Analysis ID: 06-9233-1505 **Endpoint:** Cell Yield **CETIS Version:** CETISv1.9.4
Analyzed: 12 Mar-21 16:24 **Analysis:** Parametric-Control vs Treatments **Status Level:** 1

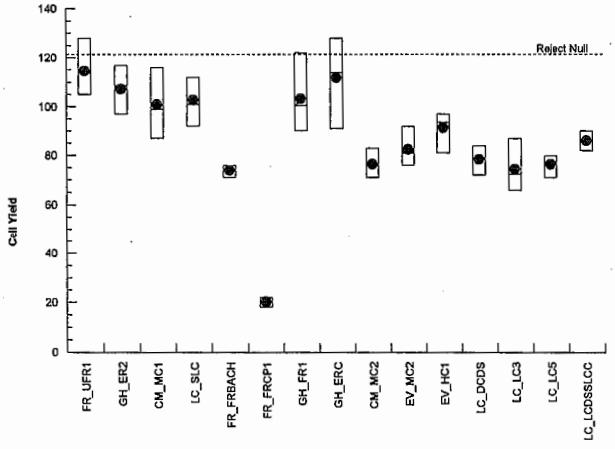
Cell Yield Summary

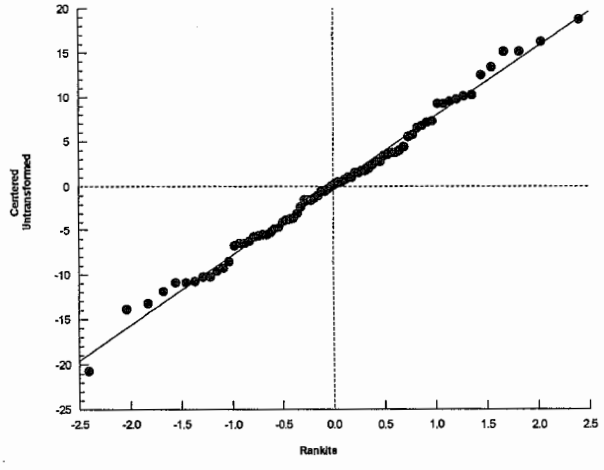
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
FR_UFR1		8	114.6	108.5	120.7	114	105	128	2.584	6.38%	0.00%
GH_ER2	XC	8	107.2	101.5	113	108.5	97	117	2.418	6.38%	6.43%
CM_MC1		8	100.9	90.02	111.7	99	87	116	4.592	12.88%	12.00%
LC_SLC		8	102.8	96.26	109.2	101	92	112	2.743	7.55%	10.36%
FR_FRBACH		4	74	70.56	77.44	74.5	71	76	1.08	2.92%	35.44%
FR_FRCP1		4	20.25	16.97	23.53	20.5	18	22	1.031	10.18%	82.33%
GH_FR1		4	103.2	80.25	126.2	100.5	90	122	7.227	14.00%	9.92%
GH_ERC		4	111.8	85.24	138.3	114	91	128	8.33	14.91%	2.51%
CM_MC2		4	76.5	68.54	84.46	76	71	83	2.5	6.54%	33.26%
EV_MC2		4	82.5	71.75	93.25	81	76	92	3.379	8.19%	28.03%
EV_HC1		4	91.25	79.9	102.6	93.5	81	97	3.568	7.82%	20.39%
LC_DCDS		4	78.5	70.54	86.46	79	72	84	2.5	6.37%	31.52%
LC_LC3		4	74.5	60.24	88.76	72.5	66	87	4.481	12.03%	35.01%
LC_LC5		4	76.5	70.34	82.66	77.5	71	80	1.936	5.06%	33.26%
LC_LCDSSLCC		4	86	80.64	91.36	86	82	90	1.683	3.91%	24.97%

Cell Yield Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
FR_UFR1		109	111	117	128	119	110	105	118
GH_ER2	XC	107	101	110	117	97	110	114	102
CM_MC1		87	89	90	116	90	108	116	111
LC_SLC		98	103	96	112	110	99	92	112
FR_FRBACH		76	75	74	71				
FR_FRCP1		22	22	19	18				
GH_FR1		94	90	122	107				
GH_ERC		106	128	122	91				
CM_MC2		75	71	83	77				
EV_MC2		81	92	81	76				
EV_HC1		92	81	97	95				
LC_DCDS		78	72	84	80				
LC_LC3		71	66	74	87				
LC_LC5		78	71	77	80				
LC_LCDSSLCC		82	87	85	90				

Graphics





EC Alga Growth Inhibition Test — **Nautilus Environmental**

Analysis ID:	00-9936-0297	**Endpoint:**	Cell Yield	**CETIS Version:**	CETISv1.9.4
Analyzed:	12 Mar-21 16:24	**Analysis:**	Parametric-Control vs Treatments	**Status Level:**	1
Batch ID:	06-1249-4935	**Test Type:**	Cell Growth	**Analyst:**	Sierra Klueppel
Start Date:	25 Feb-21 15:30	**Protocol:**	EC/EPS 1/RM/25	**Diluent:**	Deionized Water + nutrients
Ending Date:	28 Feb-21 15:30	**Species:**	Pseudokirchneriella subcapitata	**Brine:**	
Test Length:	72h	**Taxon:**	Chlorophyta	**Source:**	In-House Culture **Age:** 6d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
FR_UFR1	14-8234-3686	23 Feb-21 09:40	24 Feb-21 11:44	54h (4.4 °C)	Teck Coal	
GH_ER2	20-0147-7232	23 Feb-21 14:00	24 Feb-21 11:44	50h (7.8 °C)		
CM_MC1	07-2038-4904	23 Feb-21 11:25	24 Feb-21 11:44	52h (-0.3 °C)		
LC_SLC	11-8707-6195	23 Feb-21 11:45	24 Feb-21 11:44	52h (0.9 °C)		
FR_FRBACH	02-7366-1775	23 Feb-21	24 Feb-21 11:44	64h (5.7 °C)		
FR_FRCP1	14-4134-6165	23 Feb-21	24 Feb-21 11:44	64h (5.8 °C)		
GH_FR1	07-4036-9929	23 Feb-21 10:20	24 Feb-21 11:44	53h (-0.7 °C)		
GH_ERC	20-9193-0706	23 Feb-21 15:35	24 Feb-21 11:44	48h (8.4 °C)		
CM_MC2	13-6384-2177	23 Feb-21 10:25	24 Feb-21 11:44	53h (-0.3 °C)		
EV_MC2	18-6797-1941	23 Feb-21 12:40	24 Feb-21 11:44	51h (0 °C)		
EV_HC1	13-6939-5644	23 Feb-21 11:10	24 Feb-21 11:44	52h (0 °C)		
LC_DCDS	02-0790-9169	23 Feb-21 11:15	24 Feb-21 11:44	52h (8.1 °C)		
LC_LC3	20-2187-6678	23 Feb-21 11:00	24 Feb-21 11:44	52h (2.9 °C)		
LC_LC5	19-0487-3769	23 Feb-21 13:45	24 Feb-21 11:44	50h (1.8 °C)		
LC_LCDSSLCC	18-4784-1853	23 Feb-21 13:00	24 Feb-21 11:44	51h (0.9 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_UFR1	Water Sample	Teck Coal	FR_UFR1_MON_2021-02-0	
GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-02-23_	
CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-02-23	
LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021_02-22_	
FR_FRBACH	Water Sample	Teck Coal	FR_FRABCH_MON_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_MON_2021-02	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-02-23_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-02-23	
CM_MC2	Water Sample	Teck Coal	CM_MC2_AHC_2021-02-23	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2020_Q1_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2020_Q1_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-02-23	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-02-22_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-02-22_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	

EC Alga Growth Inhibition Test — **Nautilus Environmental**

Analysis ID: 00-9936-0297 **Endpoint:** Cell Yield **CETIS Version:** CETISv1.9.4
Analyzed: 12 Mar-21 16:24 **Analysis:** Parametric-Control vs Treatments **Status Level:** 1

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	FR_UFR1 passed cell yield	14.04%
		GH_ER2 passed cell yield	14.04%
		LC_SLC passed cell yield	14.04%
		FR_FRBACH failed cell yield	14.04%
		FR_FRCP1 failed cell yield	14.04%
		GH_FR1 passed cell yield	14.04%
		GH_ERC passed cell yield	14.04%
		CM_MC2 failed cell yield	14.04%
		EV_MC2 failed cell yield	14.04%
		EV_HC1 passed cell yield	14.04%
		LC_DCDS failed cell yield	14.04%
		LC_LC3 failed cell yield	14.04%
		LC_LC5 failed cell yield	14.04%
		LC_LCDSSLCC failed cell yield	14.04%

Dunnett Multiple Comparison Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Site Control (CM-MC1)		FR_UFR1	-3.184	2.677	11.56	14	CDF	1.0000	Non-Significant Effect
		GH_ER2	-1.476	2.677	11.56	14	CDF	1.0000	Non-Significant Effect
		LC_SLC	-0.4342	2.677	11.56	14	CDF	0.9932	Non-Significant Effect
		FR_FRBACH*	5.082	2.677	14.16	10	CDF	2.6E-05	Significant Effect
		FR_FRCP1*	15.24	2.677	14.16	10	CDF	1.9E-07	Significant Effect
		GH_FR1	-0.4491	2.677	14.16	10	CDF	0.9936	Non-Significant Effect
		GH_ERC	-2.056	2.677	14.16	10	CDF	1.0000	Non-Significant Effect
		CM_MC2*	4.609	2.677	14.16	10	CDF	1.4E-04	Significant Effect
		EV_MC2*	3.474	2.677	14.16	10	CDF	0.0059	Significant Effect
		EV_HC1	1.82	2.677	14.16	10	CDF	0.2721	Non-Significant Effect
		LC_DCDS*	4.231	2.677	14.16	10	CDF	5.3E-04	Significant Effect
		LC_LC3*	4.987	2.677	14.16	10	CDF	3.7E-05	Significant Effect
		LC_LC5*	4.609	2.677	14.16	10	CDF	1.4E-04	Significant Effect
		LC_LCDSSLCC*	2.813	2.677	14.16	10	CDF	0.0360	Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	2.664	3.288	0.4929	No Outliers Detected
Control Trend	Mann-Kendall Trend Test	2.664		0.0655	Non-Significant Trend in Controls

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	35746.4	2553.31	14	34.23	<1.0E-37	Significant Effect
Error	4549.75	74.5861	61			
Total	40296.1		75			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance Test	27.88	29.14	0.0148	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9921	0.9559	0.9225	Normal Distribution

EC Alga Growth Inhibition Test — **Nautilus Environmental**

Analysis ID: 00-9936-0297 **Endpoint:** Cell Yield **CETIS Version:** CETISv1.9.4
Analyzed: 12 Mar-21 16:24 **Analysis:** Parametric-Control vs Treatments **Status Level:** 1

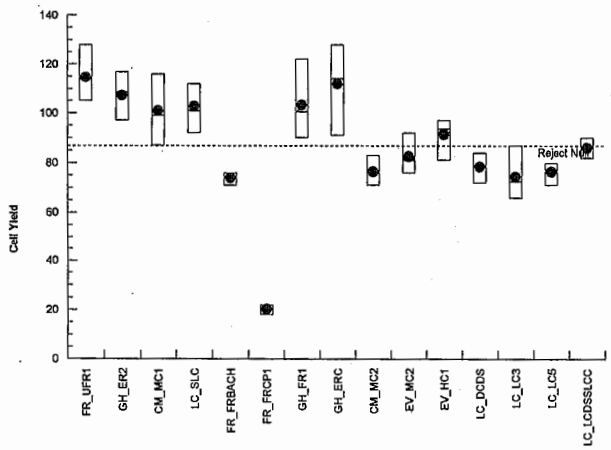
Cell Yield Summary

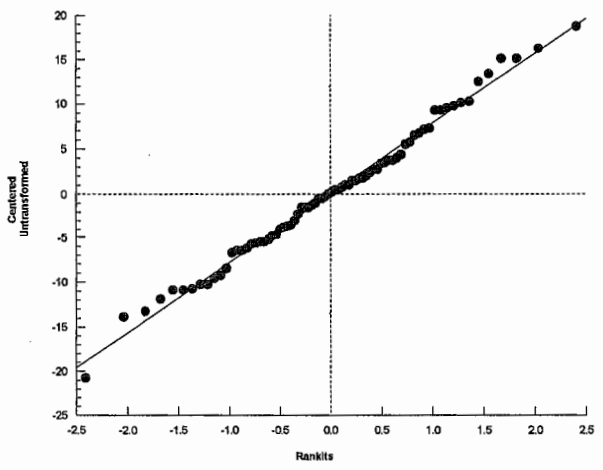
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
FR_UFR1		8	114.6	108.5	120.7	114	105	128	2.584	6.38%	0.00%
GH_ER2		8	107.2	101.5	113	108.5	97	117	2.418	6.38%	6.43%
CM_MC1	XC	8	100.9	90.02	111.7	99	87	116	4.592	12.88%	12.00%
LC_SLC		8	102.8	96.26	109.2	101	92	112	2.743	7.55%	10.36%
FR_FRBACH		4	74	70.56	77.44	74.5	71	76	1.08	2.92%	35.44%
FR_FRCP1		4	20.25	16.97	23.53	20.5	18	22	1.031	10.18%	82.33%
GH_FR1		4	103.2	80.25	126.2	100.5	90	122	7.227	14.00%	9.92%
GH_ERC		4	111.8	85.24	138.3	114	91	128	8.33	14.91%	2.51%
CM_MC2		4	76.5	68.54	84.46	76	71	83	2.5	6.54%	33.26%
EV_MC2		4	82.5	71.75	93.25	81	76	92	3.379	8.19%	28.03%
EV_HC1		4	91.25	79.9	102.6	93.5	81	97	3.568	7.82%	20.39%
LC_DCDS		4	78.5	70.54	86.46	79	72	84	2.5	6.37%	31.52%
LC_LC3		4	74.5	60.24	88.76	72.5	66	87	4.481	12.03%	35.01%
LC_LC5		4	76.5	70.34	82.66	77.5	71	80	1.936	5.06%	33.26%
LC_LCDSSLCC		4	86	80.64	91.36	86	82	90	1.683	3.91%	24.97%

Cell Yield Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
FR_UFR1		109	111	117	128	119	110	105	118
GH_ER2		107	101	110	117	97	110	114	102
CM_MC1	XC	87	89	90	116	90	108	116	111
LC_SLC		98	103	96	112	110	99	92	112
FR_FRBACH		76	75	74	71				
FR_FRCP1		22	22	19	18				
GH_FR1		94	90	122	107				
GH_ERC		106	128	122	91				
CM_MC2		75	71	83	77				
EV_MC2		81	92	81	76				
EV_HC1		92	81	97	95				
LC_DCDS		78	72	84	80				
LC_LC3		71	66	74	87				
LC_LC5		78	71	77	80				
LC_LCDSSLCC		82	87	85	90				

Graphics





EC Alga Growth Inhibition Test — **Nautilus Environmental**

Analysis ID:	02-2284-3026	**Endpoint:**	Cell Yield	**CETIS Version:**	CETISv1.9.4
Analyzed:	12 Mar-21 16:25	**Analysis:**	Parametric-Control vs Treatments	**Status Level:**	1
Batch ID:	06-1249-4935	**Test Type:**	Cell Growth	**Analyst:**	Sierra Klueppel
Start Date:	25 Feb-21 15:30	**Protocol:**	EC/EPS 1/RM/25	**Diluent:**	Deionized Water + nutrients
Ending Date:	28 Feb-21 15:30	**Species:**	Pseudokirchneriella subcapitata	**Brine:**	
Test Length:	72h	**Taxon:**	Chlorophyta	**Source:**	In-House Culture **Age:** 6d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
FR_UFR1	14-8234-3686	23 Feb-21 09:40	24 Feb-21 11:44	54h (4.4 °C)	Teck Coal	
GH_ER2	20-0147-7232	23 Feb-21 14:00	24 Feb-21 11:44	50h (7.8 °C)		
CM_MC1	07-2038-4904	23 Feb-21 11:25	24 Feb-21 11:44	52h (-0.3 °C)		
LC_SLC	11-8707-6195	23 Feb-21 11:45	24 Feb-21 11:44	52h (0.9 °C)		
FR_FRBACH	02-7366-1775	23 Feb-21	24 Feb-21 11:44	64h (5.7 °C)		
FR_FRCP1	14-4134-6165	23 Feb-21	24 Feb-21 11:44	64h (5.8 °C)		
GH_FR1	07-4036-9929	23 Feb-21 10:20	24 Feb-21 11:44	53h (-0.7 °C)		
GH_ERC	20-9193-0706	23 Feb-21 15:35	24 Feb-21 11:44	48h (8.4 °C)		
CM_MC2	13-6384-2177	23 Feb-21 10:25	24 Feb-21 11:44	53h (-0.3 °C)		
EV_MC2	18-6797-1941	23 Feb-21 12:40	24 Feb-21 11:44	51h (0 °C)		
EV_HC1	13-6939-5644	23 Feb-21 11:10	24 Feb-21 11:44	52h (0 °C)		
LC_DCDS	02-0790-9169	23 Feb-21 11:15	24 Feb-21 11:44	52h (8.1 °C)		
LC_LC3	20-2187-6678	23 Feb-21 11:00	24 Feb-21 11:44	52h (2.9 °C)		
LC_LC5	19-0487-3769	23 Feb-21 13:45	24 Feb-21 11:44	50h (1.8 °C)		
LC_LCDSSLCC	18-4784-1853	23 Feb-21 13:00	24 Feb-21 11:44	51h (0.9 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_UFR1	Water Sample	Teck Coal	FR_UFR1_MON_2021-02-0	
GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-02-23_	
CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-02-23	
LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021_02-22_	
FR_FRBACH	Water Sample	Teck Coal	FR_FRABCH_MON_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_MON_2021-02	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-02-23_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-02-23	
CM_MC2	Water Sample	Teck Coal	CM_MC2_AHC_2021-02-23	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2020_Q1_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2020_Q1_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-02-23	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-02-22_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-02-22_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	

EC Alga Growth Inhibition Test — **Nautilus Environmental**

Analysis ID:	02-2284-3026	**Endpoint:**	Cell Yield	**CETIS Version:**	CETISv1.9.4
Analyzed:	12 Mar-21 16:25	**Analysis:**	Parametric-Control vs Treatments	**Status Level:**	1

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C < T	FR_UFR1 failed cell yield	14.04%
		GH_ER2 passed cell yield	14.04%
		LC_SLC passed cell yield	14.04%
		FR_FRBACH passed cell yield	14.04%
		FR_FRCP1 passed cell yield	14.04%
		GH_FR1 passed cell yield	14.04%
		GH_ERC passed cell yield	14.04%
		CM_MC2 passed cell yield	14.04%
		EV_MC2 passed cell yield	14.04%
		EV_HC1 passed cell yield	14.04%
		LC_DCDS passed cell yield	14.04%
		LC_LC3 passed cell yield	14.04%
		LC_LC5 passed cell yield	14.04%
		LC_LCDSSLCC passed cell yield	14.04%

Dunnett Multiple Comparison Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Site Control		FR_UFR1*	3.184	2.677	11.56	14	CDF	0.0135	Significant Effect
(CM-MC1)		GH_ER2	1.476	2.677	11.56	14	CDF	0.4350	Non-Significant Effect
		LC_SLC	0.4342	2.677	11.56	14	CDF	0.8944	Non-Significant Effect
		FR_FRBACH	-5.082	2.677	14.16	10	CDF	1.0000	Non-Significant Effect
		FR_FRCP1	-15.24	2.677	14.16	10	CDF	1.0000	Non-Significant Effect
		GH_FR1	0.4491	2.677	14.16	10	CDF	0.8906	Non-Significant Effect
		GH_ERC	2.056	2.677	14.16	10	CDF	0.1834	Non-Significant Effect
		CM_MC2	-4.609	2.677	14.16	10	CDF	1.0000	Non-Significant Effect
		EV_MC2	-3.474	2.677	14.16	10	CDF	1.0000	Non-Significant Effect
		EV_HC1	-1.82	2.677	14.16	10	CDF	1.0000	Non-Significant Effect
		LC_DCDS	-4.231	2.677	14.16	10	CDF	1.0000	Non-Significant Effect
		LC_LC3	-4.987	2.677	14.16	10	CDF	1.0000	Non-Significant Effect
		LC_LC5	-4.609	2.677	14.16	10	CDF	1.0000	Non-Significant Effect
		LC_LCDSSLCC	-2.813	2.677	14.16	10	CDF	1.0000	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	2.664	3.288	0.4929	No Outliers Detected
Control Trend	Mann-Kendall Trend Test	2.664		0.0655	Non-Significant Trend in Controls

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	35746.4	2553.31	14	34.23	<1.0E-37	Significant Effect
Error	4549.75	74.5861	61			
Total	40296.1		75			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance Test	27.88	29.14	0.0148	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9921	0.9559	0.9225	Normal Distribution

EC Alga Growth Inhibition Test — **Nautilus Environmental**

Analysis ID: 02-2284-3026 **Endpoint:** Cell Yield **CETIS Version:** CETISv1.9.4
Analyzed: 12 Mar-21 16:25 **Analysis:** Parametric-Control vs Treatments **Status Level:** 1

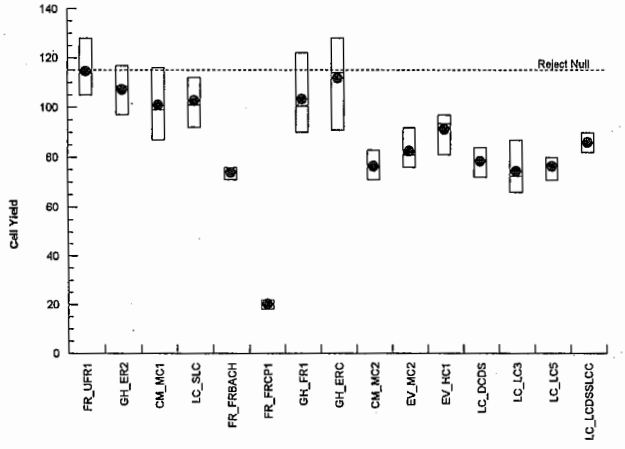
Cell Yield Summary

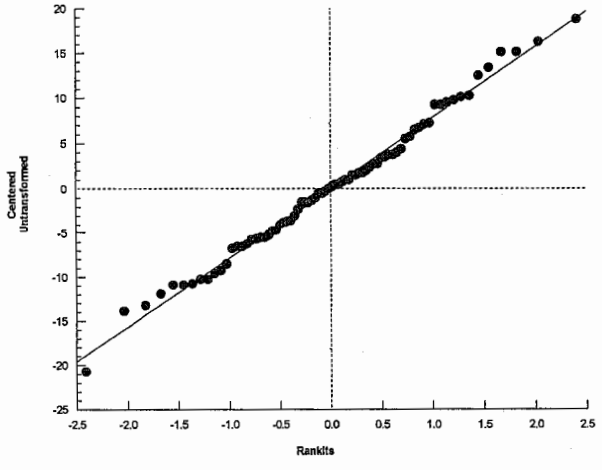
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
FR_UFR1		8	114.6	108.5	120.7	114	105	128	2.584	6.38%	0.00%
GH_ER2		8	107.2	101.5	113	108.5	97	117	2.418	6.38%	6.43%
CM_MC1	XC	8	100.9	90.02	111.7	99	87	116	4.592	12.88%	12.00%
LC_SLC		8	102.8	96.26	109.2	101	92	112	2.743	7.55%	10.36%
FR_FRBACH		4	74	70.56	77.44	74.5	71	76	1.08	2.92%	35.44%
FR_FRCP1		4	20.25	16.97	23.53	20.5	18	22	1.031	10.18%	82.33%
GH_FR1		4	103.2	80.25	126.2	100.5	90	122	7.227	14.00%	9.92%
GH_ERC		4	111.8	85.24	138.3	114	91	128	8.33	14.91%	2.51%
CM_MC2		4	76.5	68.54	84.46	76	71	83	2.5	6.54%	33.26%
EV_MC2		4	82.5	71.75	93.25	81	76	92	3.379	8.19%	28.03%
EV_HC1		4	91.25	79.9	102.6	93.5	81	97	3.568	7.82%	20.39%
LC_DCDS		4	78.5	70.54	86.46	79	72	84	2.5	6.37%	31.52%
LC_LC3		4	74.5	60.24	88.76	72.5	66	87	4.481	12.03%	35.01%
LC_LC5		4	76.5	70.34	82.66	77.5	71	80	1.936	5.06%	33.26%
LC_LCDSSLCC		4	86	80.64	91.36	86	82	90	1.683	3.91%	24.97%

Cell Yield Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
FR_UFR1		109	111	117	128	119	110	105	118
GH_ER2		107	101	110	117	97	110	114	102
CM_MC1	XC	87	89	90	116	90	108	116	111
LC_SLC		98	103	96	112	110	99	92	112
FR_FRBACH		76	75	74	71				
FR_FRCP1		22	22	19	18				
GH_FR1		94	90	122	107				
GH_ERC		106	128	122	91				
CM_MC2		75	71	83	77				
EV_MC2		81	92	81	76				
EV_HC1		92	81	97	95				
LC_DCDS		78	72	84	80				
LC_LC3		71	66	74	87				
LC_LC5		78	71	77	80				
LC_LCDSSLCC		82	87	85	90				

Graphics





CETIS Analytical Report

Report Date: 12 Mar-21 16:35 (p 19 of 30)
Test Code/ID: 210288 / 11-8954-7079

EC Alga Growth Inhibition Test — **Nautilus Environmental**

Analysis ID:	08-9701-7773	**Endpoint:**	Cell Yield	**CETIS Version:**	CETISv1.9.4
Analyzed:	12 Mar-21 16:27	**Analysis:**	Parametric-Control vs Treatments	**Status Level:**	1

Batch ID:	06-1249-4935	**Test Type:**	Cell Growth	**Analyst:**	Sierra Klueppel		
Start Date:	25 Feb-21 15:30	**Protocol:**	EC/EPS 1/RM/25	**Diluent:**	Deionized Water + nutrients		
Ending Date:	28 Feb-21 15:30	**Species:**	Pseudokirchneriella subcapitata	**Brine:**			
Test Length:	72h	**Taxon:**	Chlorophyta	**Source:**	In-House Culture	**Age:**	6d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
FR_UFR1	14-8234-3686	23 Feb-21 09:40	24 Feb-21 11:44	54h (4.4 °C)	Teck Coal	
GH_ER2	20-0147-7232	23 Feb-21 14:00	24 Feb-21 11:44	50h (7.8 °C)		
CM_MC1	07-2038-4904	23 Feb-21 11:25	24 Feb-21 11:44	52h (-0.3 °C)		
LC_SLC	11-8707-6195	23 Feb-21 11:45	24 Feb-21 11:44	52h (0.9 °C)		
FR_FRBACH	02-7366-1775	23 Feb-21	24 Feb-21 11:44	64h (5.7 °C)		
FR_FRCP1	14-4134-6165	23 Feb-21	24 Feb-21 11:44	64h (5.8 °C)		
GH_FR1	07-4036-9929	23 Feb-21 10:20	24 Feb-21 11:44	53h (-0.7 °C)		
GH_ERC	20-9193-0706	23 Feb-21 15:35	24 Feb-21 11:44	48h (8.4 °C)		
CM_MC2	13-6384-2177	23 Feb-21 10:25	24 Feb-21 11:44	53h (-0.3 °C)		
EV_MC2	18-6797-1941	23 Feb-21 12:40	24 Feb-21 11:44	51h (0 °C)		
EV_HC1	13-6939-5644	23 Feb-21 11:10	24 Feb-21 11:44	52h (0 °C)		
LC_DCDS	02-0790-9169	23 Feb-21 11:15	24 Feb-21 11:44	52h (8.1 °C)		
LC_LC3	20-2187-6678	23 Feb-21 11:00	24 Feb-21 11:44	52h (2.9 °C)		
LC_LC5	19-0487-3769	23 Feb-21 13:45	24 Feb-21 11:44	50h (1.8 °C)		
LC_LCDSSLCC	18-4784-1853	23 Feb-21 13:00	24 Feb-21 11:44	51h (0.9 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_UFR1	Water Sample	Teck Coal	FR_UFR1_MON_2021-02-0	
GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-02-23_	
CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-02-23	
LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021_02-22_	
FR_FRBACH	Water Sample	Teck Coal	FR_FRABCH_MON_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_MON_2021-02	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-02-23_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-02-23	
CM_MC2	Water Sample	Teck Coal	CM_MC2_AHC_2021-02-23	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2020_Q1_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2020_Q1_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-02-23	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-02-22_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-02-22_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	

EC Alga Growth Inhibition Test — **Nautilus Environmental**

Analysis ID: 08-9701-7773 **Endpoint:** Cell Yield **CETIS Version:** CETISv1.9.4
Analyzed: 12 Mar-21 16:27 **Analysis:** Parametric-Control vs Treatments **Status Level:** 1

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	FR_UFR1 passed cell yield	13.78%
		GH_ER2 passed cell yield	13.78%
		CM_MC1 passed cell yield	13.78%
		FR_FRBACH failed cell yield	13.78%
		FR_FRCP1 failed cell yield	13.78%
		GH_FR1 passed cell yield	13.78%
		GH_ERC passed cell yield	13.78%
		CM_MC2 failed cell yield	13.78%
		EV_MC2 failed cell yield	13.78%
		EV_HC1 passed cell yield	13.78%
		LC_DCDS failed cell yield	13.78%
		LC_LC3 failed cell yield	13.78%
		LC_LC5 failed cell yield	13.78%
		LC_LCDSSLCC failed cell yield	13.78%

Dunnett Multiple Comparison Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Site Control		FR_UFR1	-2.75	2.677	11.56	14	CDF	1.0000	Non-Significant Effect
(LC-SLC)		GH_ER2	-1.042	2.677	11.56	14	CDF	0.9995	Non-Significant Effect
		CM_MC1	0.4342	2.677	11.56	14	CDF	0.8944	Non-Significant Effect
		FR_FRBACH*	5.436	2.677	14.16	10	CDF	7.1E-06	Significant Effect
		FR_FRCP1*	15.6	2.677	14.16	10	CDF	1.9E-07	Significant Effect
		GH_FR1	-0.09454	2.677	14.16	10	CDF	0.9768	Non-Significant Effect
		GH_ERC	-1.702	2.677	14.16	10	CDF	1.0000	Non-Significant Effect
		CM_MC2*	4.963	2.677	14.16	10	CDF	4.0E-05	Significant Effect
		EV_MC2*	3.829	2.677	14.16	10	CDF	0.0020	Significant Effect
		EV_HC1	2.174	2.677	14.16	10	CDF	0.1474	Non-Significant Effect
		LC_DCDS*	4.585	2.677	14.16	10	CDF	1.6E-04	Significant Effect
		LC_LC3*	5.342	2.677	14.16	10	CDF	1.0E-05	Significant Effect
		LC_LC5*	4.963	2.677	14.16	10	CDF	4.0E-05	Significant Effect
		LC_LCDSSLCC*	3.167	2.677	14.16	10	CDF	0.0141	Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	2.664	3.288	0.4929	No Outliers Detected
Control Trend	Mann-Kendall Trend Test	2.664		0.9049	Non-Significant Trend in Controls

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	35746.4	2553.31	14	34.23	<1.0E-37	Significant Effect
Error	4549.75	74.5861	61			
Total	40296.1		75			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance Test	27.88	29.14	0.0148	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9921	0.9559	0.9225	Normal Distribution

EC Alga Growth Inhibition Test — **Nautilus Environmental**

Analysis ID: 08-9701-7773 **Endpoint:** Cell Yield **CETIS Version:** CETISv1.9.4
Analyzed: 12 Mar-21 16:27 **Analysis:** Parametric-Control vs Treatments **Status Level:** 1

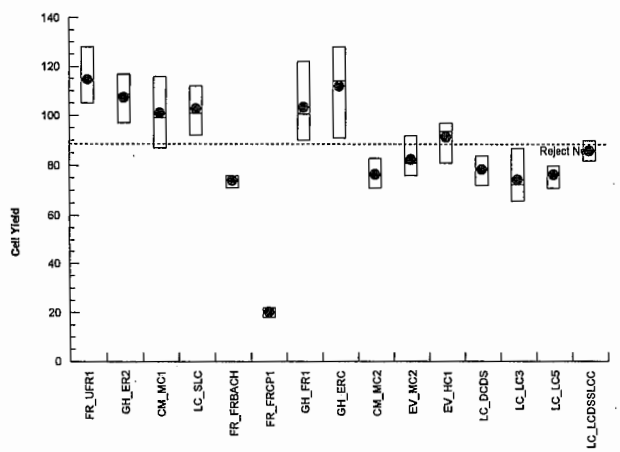
Cell Yield Summary

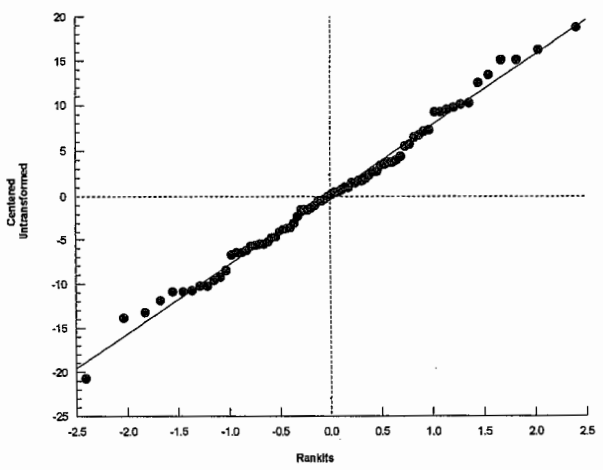
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
FR_UFR1		8	114.6	108.5	120.7	114	105	128	2.584	6.38%	0.00%
GH_ER2		8	107.2	101.5	113	108.5	97	117	2.418	6.38%	6.43%
CM_MC1		8	100.9	90.02	111.7	99	87	116	4.592	12.88%	12.00%
LC_SLC	XC	8	102.8	96.26	109.2	101	92	112	2.743	7.55%	10.36%
FR_FRBACH		4	74	70.56	77.44	74.5	71	76	1.08	2.92%	35.44%
FR_FRCP1		4	20.25	16.97	23.53	20.5	18	22	1.031	10.18%	82.33%
GH_FR1		4	103.2	80.25	126.2	100.5	90	122	7.227	14.00%	9.92%
GH_ERC		4	111.8	85.24	138.3	114	91	128	8.33	14.91%	2.51%
CM_MC2		4	76.5	68.54	84.46	76	71	83	2.5	6.54%	33.26%
EV_MC2		4	82.5	71.75	93.25	81	76	92	3.379	8.19%	28.03%
EV_HC1		4	91.25	79.9	102.6	93.5	81	97	3.568	7.82%	20.39%
LC_DCDS		4	78.5	70.54	86.46	79	72	84	2.5	6.37%	31.52%
LC_LC3		4	74.5	60.24	88.76	72.5	66	87	4.481	12.03%	35.01%
LC_LC5		4	76.5	70.34	82.66	77.5	71	80	1.936	5.06%	33.26%
LC_LCDSSLCC		4	86	80.64	91.36	86	82	90	1.683	3.91%	24.97%

Cell Yield Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
FR_UFR1		109	111	117	128	119	110	105	118
GH_ER2		107	101	110	117	97	110	114	102
CM_MC1		87	89	90	116	90	108	116	111
LC_SLC	XC	98	103	96	112	110	99	92	112
FR_FRBACH		76	75	74	71				
FR_FRCP1		22	22	19	18				
GH_FR1		94	90	122	107				
GH_ERC		106	128	122	91				
CM_MC2		75	71	83	77				
EV_MC2		81	92	81	76				
EV_HC1		92	81	97	95				
LC_DCDS		78	72	84	80				
LC_LC3		71	66	74	87				
LC_LC5		78	71	77	80				
LC_LCDSSLCC		82	87	85	90				

Graphics





EC Alga Growth Inhibition Test — **Nautilus Environmental**

Analysis ID:	19-0063-9404	**Endpoint:**	Cell Yield	**CETIS Version:**	CETISv1.9.4
Analyzed:	12 Mar-21 16:27	**Analysis:**	Parametric-Control vs Treatments	**Status Level:**	1
Batch ID:	06-1249-4935	**Test Type:**	Cell Growth	**Analyst:**	Sierra Klueppel
Start Date:	25 Feb-21 15:30	**Protocol:**	EC/EPS 1/RM/25	**Diluent:**	Deionized Water + nutrients
Ending Date:	28 Feb-21 15:30	**Species:**	Pseudokirchneriella subcapitata	**Brine:**	
Test Length:	72h	**Taxon:**	Chlorophyta	**Source:**	In-House Culture **Age:** 6d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
FR_UFR1	14-8234-3686	23 Feb-21 09:40	24 Feb-21 11:44	54h (4.4 °C)	Teck Coal	
GH_ER2	20-0147-7232	23 Feb-21 14:00	24 Feb-21 11:44	50h (7.8 °C)		
CM_MC1	07-2038-4904	23 Feb-21 11:25	24 Feb-21 11:44	52h (-0.3 °C)		
LC_SLC	11-8707-6195	23 Feb-21 11:45	24 Feb-21 11:44	52h (0.9 °C)		
FR_FRBACH	02-7366-1775	23 Feb-21	24 Feb-21 11:44	64h (5.7 °C)		
FR_FRCP1	14-4134-6165	23 Feb-21	24 Feb-21 11:44	64h (5.8 °C)		
GH_FR1	07-4036-9929	23 Feb-21 10:20	24 Feb-21 11:44	53h (-0.7 °C)		
GH_ERC	20-9193-0706	23 Feb-21 15:35	24 Feb-21 11:44	48h (8.4 °C)		
CM_MC2	13-6384-2177	23 Feb-21 10:25	24 Feb-21 11:44	53h (-0.3 °C)		
EV_MC2	18-6797-1941	23 Feb-21 12:40	24 Feb-21 11:44	51h (0 °C)		
EV_HC1	13-6939-5644	23 Feb-21 11:10	24 Feb-21 11:44	52h (0 °C)		
LC_DCDS	02-0790-9169	23 Feb-21 11:15	24 Feb-21 11:44	52h (8.1 °C)		
LC_LC3	20-2187-6678	23 Feb-21 11:00	24 Feb-21 11:44	52h (2.9 °C)		
LC_LC5	19-0487-3769	23 Feb-21 13:45	24 Feb-21 11:44	50h (1.8 °C)		
LC_LCDSSLCC	18-4784-1853	23 Feb-21 13:00	24 Feb-21 11:44	51h (0.9 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_UFR1	Water Sample	Teck Coal	FR_UFR1_MON_2021-02-0	
GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-02-23_	
CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-02-23	
LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021_02-22_	
FR_FRBACH	Water Sample	Teck Coal	FR_FRABCH_MON_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_MON_2021-02	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-02-23_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-02-23	
CM_MC2	Water Sample	Teck Coal	CM_MC2_AHC_2021-02-23	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2020_Q1_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2020_Q1_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-02-23	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-02-22_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-02-22_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	

EC Alga Growth Inhibition Test — **Nautilus Environmental**

Analysis ID: 19-0063-9404 **Endpoint:** Cell Yield **CETIS Version:** CETISv1.9.4
Analyzed: 12 Mar-21 16:27 **Analysis:** Parametric-Control vs Treatments **Status Level:** 1

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C < T	FR_UFR1 failed cell yield	13.78%
		GH_ER2 passed cell yield	13.78%
		CM_MC1 passed cell yield	13.78%
		FR_FRBACH passed cell yield	13.78%
		FR_FRCP1 passed cell yield	13.78%
		GH_FR1 passed cell yield	13.78%
		GH_ERC passed cell yield	13.78%
		CM_MC2 passed cell yield	13.78%
		EV_MC2 passed cell yield	13.78%
		EV_HC1 passed cell yield	13.78%
		LC_DCDS passed cell yield	13.78%
		LC_LC3 passed cell yield	13.78%
		LC_LC5 passed cell yield	13.78%
		LC_LCDSSLCC passed cell yield	13.78%

Dunnett Multiple Comparison Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Site Control (LC-SLC)		FR_UFR1*	2.75	2.677	11.56	14	CDF	0.0420	Significant Effect
		GH_ER2	1.042	2.677	11.56	14	CDF	0.6607	Non-Significant Effect
		CM_MC1	-0.4342	2.677	11.56	14	CDF	0.9932	Non-Significant Effect
		FR_FRBACH	-5.436	2.677	14.16	10	CDF	1.0000	Non-Significant Effect
		FR_FRCP1	-15.6	2.677	14.16	10	CDF	1.0000	Non-Significant Effect
		GH_FR1	0.09454	2.677	14.16	10	CDF	0.9578	Non-Significant Effect
		GH_ERC	1.702	2.677	14.16	10	CDF	0.3243	Non-Significant Effect
		CM_MC2	-4.963	2.677	14.16	10	CDF	1.0000	Non-Significant Effect
		EV_MC2	-3.829	2.677	14.16	10	CDF	1.0000	Non-Significant Effect
		EV_HC1	-2.174	2.677	14.16	10	CDF	1.0000	Non-Significant Effect
		LC_DCDS	-4.585	2.677	14.16	10	CDF	1.0000	Non-Significant Effect
		LC_LC3	-5.342	2.677	14.16	10	CDF	1.0000	Non-Significant Effect
		LC_LC5	-4.963	2.677	14.16	10	CDF	1.0000	Non-Significant Effect
		LC_LCDSSLCC	-3.167	2.677	14.16	10	CDF	1.0000	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	2.664	3.288	0.4929	No Outliers Detected
Control Trend	Mann-Kendall Trend Test	2.664		0.9049	Non-Significant Trend in Controls

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	35746.4	2553.31	14	34.23	<1.0E-37	Significant Effect
Error	4549.75	74.5861	61			
Total	40296.1		75			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance Test	27.88	29.14	0.0148	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9921	0.9559	0.9225	Normal Distribution

EC Alga Growth Inhibition Test — **Nautilus Environmental**

Analysis ID: 19-0063-9404 **Endpoint:** Cell Yield **CETIS Version:** CETISv1.9.4
Analyzed: 12 Mar-21 16:27 **Analysis:** Parametric-Control vs Treatments **Status Level:** 1

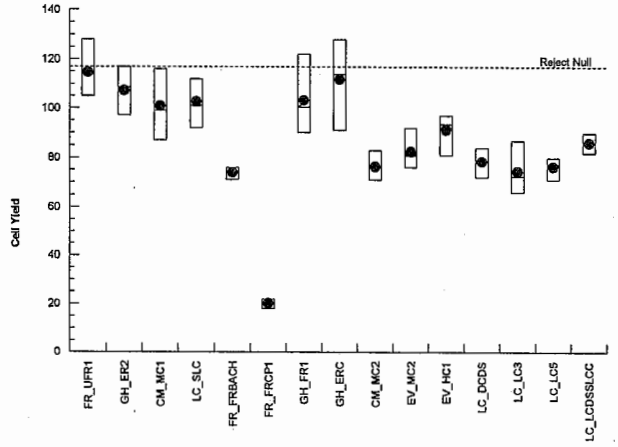
Cell Yield Summary

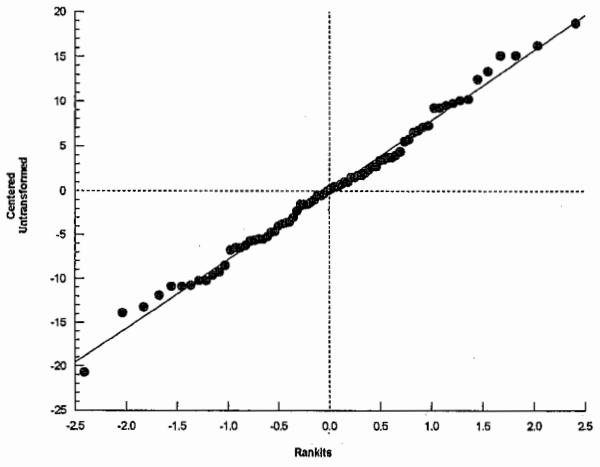
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
FR_UFR1		8	114.6	108.5	120.7	114	105	128	2.584	6.38%	0.00%
GH_ER2		8	107.2	101.5	113	108.5	97	117	2.418	6.38%	6.43%
CM_MC1		8	100.9	90.02	111.7	99	87	116	4.592	12.88%	12.00%
LC_SLC	XC	8	102.8	96.26	109.2	101	92	112	2.743	7.55%	10.36%
FR_FRBACH		4	74	70.56	77.44	74.5	71	76	1.08	2.92%	35.44%
FR_FRCP1		4	20.25	16.97	23.53	20.5	18	22	1.031	10.18%	82.33%
GH_FR1		4	103.2	80.25	126.2	100.5	90	122	7.227	14.00%	9.92%
GH_ERC		4	111.8	85.24	138.3	114	91	128	8.33	14.91%	2.51%
CM_MC2		4	76.5	68.54	84.46	76	71	83	2.5	6.54%	33.26%
EV_MC2		4	82.5	71.75	93.25	81	76	92	3.379	8.19%	28.03%
EV_HC1		4	91.25	79.9	102.6	93.5	81	97	3.568	7.82%	20.39%
LC_DCDS		4	78.5	70.54	86.46	79	72	84	2.5	6.37%	31.52%
LC_LC3		4	74.5	60.24	88.76	72.5	66	87	4.481	12.03%	35.01%
LC_LC5		4	76.5	70.34	82.66	77.5	71	80	1.936	5.06%	33.26%
LC_LCDSSLCC		4	86	80.64	91.36	86	82	90	1.683	3.91%	24.97%

Cell Yield Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
FR_UFR1		109	111	117	128	119	110	105	118
GH_ER2		107	101	110	117	97	110	114	102
CM_MC1		87	89	90	116	90	108	116	111
LC_SLC	XC	98	103	96	112	110	99	92	112
FR_FRBACH		76	75	74	71				
FR_FRCP1		22	22	19	18				
GH_FR1		94	90	122	107				
GH_ERC		106	128	122	91				
CM_MC2		75	71	83	77				
EV_MC2		81	92	81	76				
EV_HC1		92	81	97	95				
LC_DCDS		78	72	84	80				
LC_LC3		71	66	74	87				
LC_LC5		78	71	77	80				
LC_LCDSSLCC		82	87	85	90				

Graphics





APPENDIX C – *Pimephales promelas* Toxicity Test Data

32-d Fathead Minnow Survival and Growth Test

Client: Teck
Work Order No.: NA
Test Date: 06-Mar-21
Test Species: *Pimephales promelas*

Sample Information:

Sample ID: Various - see table below
Sample Date: Tuesday, March 2nd
Date Received: Wednesday, March 3rd

Dilution Water:

Type: Dechlorinated Tap Water (amended with 4 mg/L KCl)
Temperature (°C): 24°C
pH: 8
Conductivity: 524
Dissolved Oxygen (mg/L): 7.3
Hardness (mg/L CaCO3): 237
Alkalinity (mg/L CaCO3): 200

Test Organism Information:

Batch No: 20210306FM-ELS
Source: Aquatox
Age: <24 hours post fertilization
Receipt temperature: 21.1 & 24.1°C
Acclimation Rate: N/A
Swim bladder inflated at test initiation? (Y/N): N/A
Breeding stock mortality during the week prior to test initiation (%): N/A
Breeding stock mortality on weekly basis: N/A
Incidence of disease: No

NaCl Reference Toxicant Results:

Reference Toxicant ID: QA70
Stock Solution ID: NA
Date Initiated: March 11, 2021
7-d LC50 (95% CL): 5.3 (4.6 - 6.1) g/L NaCl
7-d IC25 (95% CL): 3.2 (2.6 - 4.5) g/L NaCl

Survival

Reference Toxicant Mean and Range: 7.2 (4.8 - 10.8) g/L NaCl (13.4 % CV)

Biomass

Reference Toxicant Mean and Range: 3.9 (2.1 - 7.4) g/L NaCl (21.3% CV)

Test Results:

Sample ID	Hatch (%) (Mean ± SD)	Biomass (mg) (Mean ± SD)	Length (mm) (Mean ± SD)	Normality (%) (Mean ± SD)	32 day survival (%) (Mean ± SD)
Lab Control	100.0 ± 0.0	2.28 ± 0.29	10.9 ± 0.4	100.0 ± 0.0	90.0 ± 8.6
10 Cu Control	98.3 ± 3.3	2.16 ± 0.19	10.7 ± 0.2	100.0 ± 0.0	95.0 ± 6.4
15 Cu Control	98.3 ± 3.3	2.42 ± 0.38	11.1 ± 0.7	100.0 ± 0.0	84.9 ± 17.5
20 Cu Control	95.0 ± 6.4	2.34 ± 0.25	11.2 ± 0.6	97.9 ± 4.2	84.5 ± 17.5
FR_UFR1 20 Cu	95.0 ± 6.5	2.25 ± 0.41	10.4 ± 0.9	100.0 ± 0.0	87.7 ± 6.8
GH_ER2 10 Cu	98.3 ± 3.3	1.18 ± 0.45 [a,c,d]	10.9 ± 0.4	86.9 ± 12.5 [a,b,c,1,4]	32.3 ± 11.6 [a,b,c,d,1,4]
CM_MC1 15 Cu	98.3 ± 3.3	1.60 ± 0.33 [c,d]	10.9 ±0.8	79.2 ± 17.7 [a,b,c,1,4]	47.4 ± 7.0 [a,b,c,d,1,4]
LC_SLC 15 Cu	98.3 ± 3.3	2.01 ± 0.10	11.5 ± 0.6	100.0 ± 0.0	79.4 ± 16.1
FR_FRA8CH 20 Cu	98.3 ± 3.3	2.10 ± 0.42	10.5 ± 0.5	95.0 ± 10.0	79.5 ± 6.3
FR_FRCP1 20 Cu	98.3 ± 3.3	1.70 ± 0.26 [c,d]	11.2 ± 0.7	95.8 ± 8.3	48.9 ± 16.9 [a,b,c,d,1,4]

[a] indicates results significantly lower relative to the laboratory control
[b] indicates results significantly lowr relative to the 10 ug/L copper-treated laboratory control
[c] indicates results significantly lower relative to the 15 ug/L copper-treated laboratory control
[d] indicates results significantly lower relative to the 20 ug/L copper-treated laboratory control
[1] indicates results significantly lower relative to the 20 ug/L copper-treated FR_UFR1 site control
[2] indicates results significantly lower relative to the 20 ug/L copper-treated GH_ER2 site control
[3] indicates results significantly lower relative to the 10 ug/L copper-treated CM_MC1 site control
[4] indicates results significanlty lower relative to the 10 ug/L copper-treated LC_SLC site control

Reviewed by: MH
Date reviewed: 2021/06/10

32-d Fathead Minnow Survival and Growth Test

Test Results:

Sample ID	Hatch (%) (Mean ± SD)	Biomass (mg) (Mean ± SD)	Length (mm) (Mean ± SD)	Normality (%) (Mean ± SD)	32 day survival (%) (Mean ± SD)
GH_FR1 20 Cu	91.7 ± 8.4	2.28 ± 0.29	10.6 ± 0.7	94.2 ± 7.4	89.5 ± 9.1
GH_ERC 10 Cu	98.3 ± 3.3	2.25 ± 0.17	10.5 ± 0.2	85.0 ± 8.4	89.9 ± 3.7
CM_MC2 20 Cu	98.3 ± 3.3	2.05 ± 0.31	10.1 ± 0.7	96.6 ± 4.0	94.9 ±3.4
RG_MIDAG 15 Cu	98.3 ± 3.3	1.90 ± 0.24	10.8 ± 0.4	95.4 ± 5.3	74.5 ± 6.6 [b]
EV_MC2 20 Cu	95.1 ± 11.6	2.00 ± 0.26	10.7 ± 0.6	98.1 ± 3.9	82.0 ± 7.6
EV_HC1 20 Cu	96.7 ± 3.9	2.20 ± 0.17	10.6 ± 0.3	97.9 ± 4.2	81.0 ± 7.0
LC_DCDS 20 Cu	85.0 ± 14.8 [a]	2.11 ± 0.17	11.2 ± 0.9	95.9 ± 4.8	84.6 ± 15.0
LC_LC3 20 Cu	100.0 ± 0.0	2.08 ± 0.14	10.7 ± 0.5	96.3 ± 4.4	88.3 ± 8.4
LC_LC5 20 Cu	98.3 ± 3.3	2.19 ± 0.28	11.1 ± 0.9	100.0 ± 0.0	87.9 ± 12.2
LC_LCDSSLCC 20 Cu	100.0 ± 0.0	2.10 ± 0.21	10.7 ± 0.2	97.9 ± 4.2	88.3 ± 6.4
FR_FR4 20 Cu	98.3 ± 3.3	2.01 ± 0.39	11.1 ± 0.6	100.0 ± 0.0	64.5 ± 9.5 [a,b]
FR_FR2 20 Cu	98.3 ± 3.3	1.24 ± 0.37 [a,c,d]	10.5 ± 1.6	92.9 ± 8.3	46.1 ± 15.4 [a,b,c,d,1,4]
FR_MULTIPLATE 20 Cu	98.3 ± 3.3	2.35 ± 0.38	10.9 ± 0.6	100.0 ± 0.0	77.9 ± 6.9
FR_FRRD 20Cu	93.3 ± 5.4	2.34 ± 0.31	10.8 ± 1.0	95.8 ± 4.8	75.2 ± 12.8

[a] indicates results e significantly lower relative to the laboratory control

[b] indicates results significantly lowr relative to the 10 ug/L copper-treated laboratory control

[c] indicates results significantly lower relative to the 15 ug/L copper-treated laboratory control

[d] indicates results significantly lower relative to the 20 ug/L copper-treated laboratory control

[1] indicates results significantly lower relative to the 20 ug/L copper-treated FR_UFR1 site control

[2] indicates results significantly lower relative to the 20 ug/L copper-treated GH_ER2 site control

[3] indicates results significantly lower relative to the 10 ug/L copper-treated CM_MC1 site control

[4] indicates results significanlty lower relative to the 10 ug/L copper-treated LC_SLC site control

Reviewed by: MG Date reviewed: 2021/06/10

NAUTILUS ENVIRONMENTAL

Fathead Minnow Bench Sheet

Method: FMD 32 Day ELS Client: NAU104 Sample: Lab Control, 10 ug/L Cu Control, 15 ug/L Cu Control, 20 ug/L Cu Control

Organism Information

Source: Aquatox Batch: 2021[illegible]FM-ELS Egg Stage: 16 Somites Organisms Received in Good Condition: Yes / No

Test Log

Date	Day	Time	Technicians	Chem Cart Used	Fed AM	Fed PM	Sample Pre-Aeration Time	Bench Sheet Review First
2021/03/06	0	1515	[illegible]	2	–	–	60minutes	AW
2021/03/07	1	0905	CB	2	–	–	60 mins	MF
2021/03/08	2	0925	ST	2	–	–	60 mins	SC
2021/03/09	3	0905	ST	2	–	–	60 mins	AW
2021/03/10	4	0850	KL	2	–	–	60mins	AW
2021/03/11	5	0800	ST	2	–	✓	60 mins	MF
2021/03/12	6	0900	MW	2	✓	✓	60 min	AW
2021/03/13	7	1130	AW	2	✓	✓	60 min	AW
2021/03/14	8	1022	CB	2	✓	✓	60mins	SC
2021/03/15	9	0950	ST	2	✓	✓	60 mins	SC
2021/03/16	10	0945	KL	2	✓	✓	60mins	SC
2021/03/17	11	1100	KL	2	–	–	60mins	ST
2021/03/18	12	1045	ST	2	✓	✓	60 mins	SC
2021/03/19	13	1030	ST	2	✓	–	60 mins	AW
2021/03/20	14	1100	KL	2	✓	✓	60mins	AW
2021/03/21	15	1335	ST/MW	2	✓	✓	60 mins	CB
2021/03/22	16	1125	MW/ST	2	✓	✓	60 mins	AW
2021/03/23	17	1130	MW	2	✓	✓	60 mins	AW
2021/03/24	18	1050	ST	2	✓	–	60 mins	KL
2021/03/25	19	0930	MW	2	✓	✓	60 mins	ST
2021/03/26	20	1130	MF/AW	2	✓	✓	60mins	AW
2021/03/27	21	1130	MF/SC	2	✓	✓	60mins	AW
2021/03/28	22	1130	ST/MW	2	✓	✓	60 mins	CB
2021/03/29	23	1330	AW	2	✓	✓	60 mins	MW
2021/03/30	24	1040	ST/AW	2	✓	✓	60 mins	KL
2021/03/31	25	1010	MF	2	✓	✓	60mins	AW
2021/04/01	26	1130	AW/MF	2	✓	✓	60 mins	AW
2021/04/02	27	1000	MF/SC	2	✓	✓	60mins	AW
2021/04/03	28	1115	MF	2	✓	✓	60mins	AW
2021/04/04	29	1056	MW/[illegible]	2	–	✓	60 mins	MW
2021/04/05	30	1055	AW/ST	2	✓	✓	60 mins	MW
2021/04/06	31	1000	MW/MF	2	✓	✓	60 mins	AW
2021/04/07	32	0940	MW/CB	2	–	–	—	AW

Reviewed By: MG Date Reviewed: 2021/05/04

NAUTILUS

Fathead Minnow Bench Sheet

Method: FMD 32 Day ELS Client: NAU104 Sample: Lab Control, 10 ug/L Cu Control, 15 ug/L Cu Control, 20 ug/L Cu Control

Control hatching success must be >66% (≥10 per replicate). Post hatch survival must be >70%.

Number of Alive Embryos and Hatched Organisms

replicate	CTL Day 1 Alive Embryos	CTL Day 1 Dead Embryos	CTL 10 Day 1 Alive Embryos	CTL 10 Day 1 Dead Embryos	CTL 15 Day 1 Alive Embryos	CTL 15 Day 1 Dead Embryos	CTL 20 Day 1 Alive Embryos	CTL 20 Day 1 Dead Embryos	Day 1 Alive Embryos	Day 1 Dead Embryos	Day 1 Alive Embryos	Day 1 Dead Embryos	Day 1 Alive Embryos	Day 1 Dead Embryos
a	13	2	15	0	12	3	15	0						
b	15	0	14	1	15	0	15	0						
c	15	0	15	0	15	0	15	0						
d	14	1	15	0	15	0	15	0						
e	29	1	29	1	30	0	29	1						
f	26	4	30	0	29	1	29	1						

Comments/Observations:

Number of Alive Embryos and Hatched Organisms

replicate	CTL Day 2 Alive Embryos	CTL Day 2 Dead Embryos	CTL Day 2 Cull to 15	CTL 10 Day 2 Alive Embryos	CTL 10 Day 2 Dead Embryos	CTL 10 Day 2 Cull to 15	CTL 15 Day 2 Alive Embryos	CTL 15 Day 2 Dead Embryos	CTL 15 Day 2 Cull to 15	CTL 20 Day 2 Alive Embryos	CTL 20 Day 2 Dead Embryos	CTL 20 Day 2 Cull to 15
a	13	0	15	14	1	15	12	0	13	15	0	15
b	15	0	15	15	0	15	14	1	15	14	1	15
c	14	1	15	16	0	15	15	0	15	15	0	15
d	14	0	15	15	0	15	15	0	15	16	0	15
e	30	0		27	2		29	1		28	1	
f	26	0		30	0		29	0		27	2	

replicate	Day 2 Alive Embryos	Day 2 Dead Embryos	Day 2 Cull to 15	Day 2 Alive Embryos	Day 2 Dead Embryos	Day 2 Cull to 15	Day 2 Alive Embryos	Day 2 Dead Embryos	Day 2 Cull to 15
a									
b									
c									
d									
e									
f									

Day 2 - Poor looking and dead embryos in replicates a, b, c and d are replaced with healthy embryos from replicates e and f. Replicates e and f are discarded after day 2

Comments/Observations:

Reviewed By: ML Date Reviewed: 2021/05/11

NAUTILUS ENVIRONMENTAL

Fathead Minnow Bench Sheet

Method: FMD 32 Day ELS Client: NAU104 Sample: Lab Control, 10 ug/L Cu Control, 15 ug/L Cu Control, 20 ug/L Cu Control

Control hatching success must be >66% (≥10 per replicate). Post hatch survival must be >70%.

CTL

Day 3

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	15	0	0	0
b	11	0	4	0
c	14	0	1	0
d	13	0	2	0

CTL 10

Day 3

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	15	0	0	0
b	15	0	0	0
c	14	0	1	0
d	15	0	0	0

CTL 15

Day 3

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	14	0	1	0
b	15	0	0	0
c	13	0	1	1
d	14	1	0	0

CTL 20

Day 3

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	12	0	3	0
b	14	1	0	0
c	12	0	3	0
d	15	0	0	0

Day 3

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a				
b				
c				
d				

Day 3

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a				
b				
c				
d				

Day 3

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a				
b				
c				
d				

[redacted]

CTL

Day 4

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	3	0	12(1)	0
b	2	0	13	0
c	2	0	13	0
d	2	0	13	0

CTL 10

Day 4

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	7	0	8	0
b	6	0	9	0
c	6	0	9	0
d	10	0	5	0

CTL 15

Day 4

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	4	0	12(1)	0
b	0	0	15	0
c	0	0	14(1)	0
d	1	0	13	0

CTL 20

Day 4

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	9	0	6(1)	0
b	6	1	7	0
c	9	0	6	0
d	6	0	9	0

Day 4

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a				
b				
c				
d				

Day 4

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a				
b				
c				
d				

Day 4

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a				
b				
c				
d				

Comments/Observations

Reviewed By: MG Date Reviewed: 2021/05/11

NAUTILUS

Fathead Minnow Bench Sheet

Method FMD 32 Day ELS Client NAU104 Sample: Lab Control, 10 ug/L Cu Control, 15 ug/L Cu Control, 20 ug/L Cu Control

Control hatching success must be >66% (≥10 per replicate). Post hatch survival must be >70%.

CTL

Day 5

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	0	0	14(2)	1
b	0	0	15(1)	0
c	0	0	14(1)	01
d	0	0	15	0

CTL 10

Day 5

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	1	0	15(1)	0
b	0	0	15	0
c	0	0	15	0
d	0	0	15	0

CTL 15

Day 5

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	0	0	15	0
b	0	0	15	0
c	0	0	14(1)	0
d	0	0	14	0

CTL 20

Day 5

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	1	1	13(1)	0
b	0	0	13	0
c	0 2M	0	15	0
d	0	0	15(2)	0

Day 5

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a				
b				
c				
d				

Day 5

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a				
b				
c				
d				

[redacted]

CTL

Day 6

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	0	0	13(1)	1
b	0	0	14	1
c	0	0	14(1)	0
d	0	0	15	0

CTL 10

Day 6

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	1	0	14(1)	0
b	0	0	15(1)	0
c	0	0	15	0
d	0	0	15	0

CTL 15

Day 6

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	0	0	15(2)	0
b	0	0	15	0
c	0	0	14(1)	0
d	0	0	14	0

CTL 20

Day 6

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	0	0	13(1)	1
b	0	0	13	0
c	0	0	15(2)	0
d	0	0	15(2)	0

Day 6

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a				
b				
c				
d				

Day 6

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a				
b				
c				
d				

Day 6

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a				
b				
c				
d				

Comments/Observations

Reviewed By: ML Date Reviewed: 2021/05/11

NAUTILUS

Fathead Minnow Bench Sheet

Method: FMD 32 Day ELS Client: NAU104 Sample: Lab Control, 10 ug/L Cu Control, 15 ug/L Cu Control, 20 ug/L Cu Control

Number of Alive Embryos and Hatched Organisms

replicate	CTL Day 7 Alive Hatched	CTL 10 Day 7 Alive Hatched	CTL 15 Day 7 Alive Hatched	CTL 20 Day 7 Alive Hatched	Day 7 Alive Hatched	Day 7 Alive Hatched	Day 7 Alive Hatched
a	14	14	15(1)	13(1)			
b	13	15(1)	15	13			
c	14(1)	15	14	14(1)			
d	15	15	14(1)	14			

Comments/Observations:

replicate	CTL Day 8 Alive Hatched	CTL 10 Day 8 Alive Hatched	CTL 15 Day 8 Alive Hatched	CTL 20 Day 8 Alive Hatched	Day 8 Alive Hatched	Day 8 Alive Hatched	Day 8 Alive Hatched
a	14	14	15	12			
b	13	14	15	13			
c	13	15	13	12			
d	15	15	13	14			

Comments/Observations:

replicate	CTL Day 9 Alive Hatched	CTL 10 Day 9 Alive Hatched	CTL 15 Day 9 Alive Hatched	CTL 20 Day 9 Alive Hatched	Day 9 Alive Hatched	Day 9 Alive Hatched	Day 9 Alive Hatched
a	14	14	15	12			
b	13	14	15	13			
c	13	15	13	12			
d	15	15	13	14			

Comments/Observations:

replicate	CTL Day 10 Alive Hatched	CTL 10 Day 10 Alive Hatched	CTL 15 Day 10 Alive Hatched	CTL 20 Day 10 Alive Hatched	Day 10 Alive Hatched	Day 10 Alive Hatched	Day 10 Alive Hatched
a	14	14	15	12			
b	13	14	15	13			
c	13	15(1)	12	11			
d	15	15	13	14			

Comments/Observations:

Reviewed By: MG Date Reviewed: 2021/05/11

NAUTILUS

Fathead Minnow Bench Sheet

Method FMD 32 Day ELS Client NAU104 Sample: Lab Control, 10 ug/L Cu Control, 15 ug/L Cu Control, 20 ug/L Cu Control

Number of Alive Embryos and Hatched Organisms

replicate	CTL Day 11 Alive Hatched	CTL 10 Day 11 Alive Hatched	CTL 15 Day 11 Alive Hatched	CTL 20 Day 11 Alive Hatched	Day 11 Alive Hatched	Day 11 Alive Hatched	Day 11 Alive Hatched
a	14	14	15	12			
b	13	14(1)	15	13			
c	13	15	12	11			
d	15	15	13	14			

Comments/Observations:

replicate	CTL Day 12 Alive Hatched	CTL 10 Day 12 Alive Hatched	CTL 15 Day 12 Alive Hatched	CTL 20 Day 12 Alive Hatched	Day 12 Alive Hatched	Day 12 Alive Hatched	Day 12 Alive Hatched
a	14	14	15(1)	12			
b	13	14(1)	15	13			
c	13	15	12	10			
d	15	15	13	14			

Comments/Observations:

replicate	CTL Day 13 Alive Hatched	CTL 10 Day 13 Alive Hatched	CTL 15 Day 13 Alive Hatched	CTL 20 Day 13 Alive Hatched	Day 13 Alive Hatched	Day 13 Alive Hatched	Day 13 Alive Hatched
a	14	14	15(1)	12			
b	13	14(1)	15	13			
c	12	15	10	10			
d	15	15	13	14			

Comments/Observations:

replicate	CTL Day 14 Alive Hatched	CTL 10 Day 14 Alive Hatched	CTL 15 Day 14 Alive Hatched	CTL 20 Day 14 Alive Hatched	Day 14 Alive Hatched	Day 14 Alive Hatched	Day 14 Alive Hatched
a	14	14	15(1)	12			
b	13	14(1)	15	13			
c	12	15	10	10(1)			
d	15	15	13	14			

Comments/Observations:

Reviewed By: ML Date Reviewed: 2021/05/11

NAUTILUS

Fathead Minnow Bench Sheet

Method FMD 32 Day ELS Client NAU104 Sample: Lab Control, 10 ug/L Cu Control, 15 ug/L Cu Control, 20 ug/L Cu Control

Number of Alive Embryos and Hatched Organisms

	CTL	CTL 10	CTL 15	CTL 20			
	Day 15	Day 15	Day 15	Day 15	Day 15	Day 15	Day 15
replicate	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched
a	14	14	15(1)	12			
b	13	14(1)	15	13			
c	12	15	10	9			
d	15	15	13	14			

Comments/Observations:

	CTL	CTL 10	CTL 15	CTL 20			
	Day 16	Day 16	Day 16	Day 16	Day 16	Day 16	Day 16
replicate	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched
a	14	14	15(1)	12			
b	13	14(1)	15	13			
c	12	15	10	9			
d	15	15	13	14			

Comments/Observations:

	CTL	CTL 10	CTL 15	CTL 20			
	Day 17	Day 17	Day 17	Day 17	Day 17	Day 17	Day 17
replicate	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched
a	14	14	15(2)	12			
b	13	14(1)	15	13			
c	12	14	9	9			
d	15	15	13	14			

Comments/Observations: A-1A5

	CTL	CTL 10	CTL 15	CTL 20			
	Day 18	Day 18	Day 18	Day 18	Day 18	Day 18	Day 18
replicate	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched
a	14	14	14	12			
b	13	14(1)	15	13			
c	12	14	9	9			
d	15	15	13	14			

Comments/Observations: CTL-2A5

MG 2021/05/11

NAUTILUS

Fathead Minnow Bench Sheet

Method FMD 32 Day ELS Client NAU104 Sample: Lab Control, 10 ug/L Cu Control, 15 ug/L Cu Control, 20 ug/L Cu Control

Number of Alive Embryos and Hatched Organisms

	CTL	CTL 10	CTL 15	CTL 20			
	Day 19	Day 19	Day 19	Day 19	Day 19	Day 19	Day 19
replicate	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched
a	14	14	14	12			
b	13	14(1)	15	13			
c	12	14	9	9			
d	15	15	13	14			

Comments/Observations: CTL 15
A-1 AS

	CTL	CTL 10	CTL 15	CTL 20			
	Day 20	Day 20	Day 20	Day 20	Day 20	Day 20	Day 20
replicate	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched
a	14	14(1)MF	14	12			
b	13	13	15	13			
c	12	14	9	9			
d	15	15	13	14			

Comments/Observations: CTL 15
A: 1 AS

	CTL	CTL 10	CTL 15	CTL 20			
	Day 21	Day 21	Day 21	Day 21	Day 21	Day 21	Day 21
replicate	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched
a	14	14	14	12			
b	13	13	15	13			
c	12	14	9	9			
d	15	15	13	14			

Comments/Observations: CTL 15
A: 1 AS

	CTL	CTL 10	CTL 15	CTL 20			
	Day 22	Day 22	Day 22	Day 22	Day 22	Day 22	Day 22
replicate	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched
a	14	14	14	12			
b	13	13	15	13			
c	12	14	9	9			
d	15	15	13	14			

Comments/Observations: CTL 15
A: 1 AS

MG 2021/05/11

NAUTILUS

Fathead Minnow Bench Sheet

Method FMD 32 Day ELS Client NAU104 Sample: Lab Control, 10 ug/L Cu Control, 15 ug/L Cu Control, 20 ug/L Cu Control

Number of Alive Embryos and Hatched Organisms

replicate	CTL Day 23 Alive Hatched	CTL 10 Day 23 Alive Hatched	CTL 15 Day 23 Alive Hatched	CTL 20 Day 23 Alive Hatched	Day 23 Alive Hatched	Day 23 Alive Hatched	Day 23 Alive Hatched
a	14	14	14(1)	12			
b	13	13	15	13			
c	12	14	9	9			
d	15	15	13	14			

Comments/Observations: CTL 15 A: 1 AS

replicate	CTL Day 24 Alive Hatched	CTL 10 Day 24 Alive Hatched	CTL 15 Day 24 Alive Hatched	CTL 20 Day 24 Alive Hatched	Day 24 Alive Hatched	Day 24 Alive Hatched	Day 24 Alive Hatched
a	14	14	14(1)	12			
b	13	13	15	13			
c	12	14	9	9			
d	15	15	13	14			

Comments/Observations: CTL 15 A-1 AS CTL 20 A: 1 AS

replicate	CTL Day 25 Alive Hatched	CTL 10 Day 25 Alive Hatched	CTL 15 Day 25 Alive Hatched	CTL 20 Day 25 Alive Hatched	Day 25 Alive Hatched	Day 25 Alive Hatched	Day 25 Alive Hatched
a	14	14	14	12			
b	13	13	15	13			
c	12	14	9	9			
d	15	15	13	14			

Comments/Observations: CTL 25 A-1 AS CTL 20 A: 1 AS

replicate	CTL Day 26 Alive Hatched	CTL 10 Day 26 Alive Hatched	CTL 15 Day 26 Alive Hatched	CTL 20 Day 26 Alive Hatched	Day 26 Alive Hatched	Day 26 Alive Hatched	Day 26 Alive Hatched
a	14	14	14(1)	12			
b	13	13	15	13			
c	12	14	9	9			
d	15	15	13	14			

Comments/Observations: CTL 15 A-1 AS CTL 30 A-1 AS

MG 2021/05/11

NAUTILUS

Fathead Minnow Bench Sheet

Method FMD 32 Day ELS Client NAU104 Sample: Lab Control, 10 ug/L Cu Control, 15 ug/L Cu Control, 20 ug/L Cu Control

Number of Alive Embryos and Hatched Organisms

	CTL	CTL 10	CTL 15	CTL 20			
	Day 27	Day 27	Day 27	Day 27	Day 27	Day 27	Day 27
replicate	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched
a	14	14	13	12			
b	13	13	15	13			
c	12	14	9	9			
d	15	15	13	14			

Comments/Observations:

	CTL	CTL 10	CTL 15	CTL 20			
	Day 28	Day 28	Day 28	Day 28	Day 28	Day 28	Day 28
replicate	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched
a	14	14	13	12			
b	13	13	15	13			
c	12	14	9	9			
d	15	15	13	14			

Comments/Observations:

	CTL	CTL 10	CTL 15	CTL 20			
	Day 29	Day 29	Day 29	Day 29	Day 29	Day 29	Day 29
replicate	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched
a	14	14	13	12			
b	13	13	15	13			
c	12	14	9	9			
d	15	15	13	14			

Comments/Observations:

	CTL	CTL 10	CTL 15	CTL 20			
	Day 30	Day 30	Day 30	Day 30	Day 30	Day 30	Day 30
replicate	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched
a	14	14	13	12			
b	13	13	15	13			
c	12	14	9	9			
d	15	15	13	14			

Comments/Observations: CTL 20
A: 1A5

MG 2021/05/11

NAUTILUS

Fathead Minnow Bench Sheet

Method FMD 32 Day ELS Client NAU104 Sample: Lab Control, 10 ug/L Cu Control, 15 ug/L Cu Control, 20 ug/L Cu Control

Number of Alive Embryos and Hatched Organisms

replicate	CTL Day 31 Alive Hatched	CTL 10 Day 31 Alive Hatched	CTL 15 Day 31 Alive Hatched	CTL 20 Day 31 Alive Hatched	Day 31 Alive Hatched	Day 31 Alive Hatched	Day 31 Alive Hatched
a	14	14	13	12			
b	13	13	15	13			
c	12	14	9	9			
d	15	15	13	14			

Comments/Observations: CTL 20 A-1AJ

replicate	CTL Day 32 Alive Hatched	CTL 10 Day 32 Alive Hatched	CTL 15 Day 32 Alive Hatched	CTL 20 Day 32 Alive Hatched	Day 32 Alive Hatched	Day 32 Alive Hatched	Day 32 Alive Hatched
a	14	14	13	12			
b	13	13	15	13			
c	12	14	9	9			
d	15	15	13	14			

Comments/Observations: CTL 20 A-1AJ

Reviewed By: MC Date Reviewed: 2021/05/11

NAUTILUS

Fathead Minnow Bench Sheet

Method: FMD 32 Day ELS Client: NAU104 Sample: Lab Control, 10 ug/L Cu Control, 15 ug/L Cu Control, 20 ug/L Cu Control

New Solutions

Conc (%)	CTL	CTL 10	CTL 15	CTL 20			
Day							
pH (units)							
0	8.2	8.1	8.1	8.1			
1	8.2	8.2	8.1	8.1			
2	8.3	8.2	8.2	8.2			
3	8.2	8.1	8.1	8.1			
4	8.2	8.1	8.1	8.1			
5	8.2	8.2	8.2	8.2			
6	8.2	8.2	8.2	8.2			
7	8.2	8.2	8.1	8.1			
8	8.2	8.2	8.2	8.2			
Conductance (µS/cm)							
0	410	409	402	414			
1	508	418	411	418			
2	417	460	392	407			
3	458	410	398	414			
4	428	416	404	431			
5	417	453	440	434			
6	421	435	425	422			
7	409	419	414	416			
8	409	418	411	407			
Dissolved Oxygen (mg/L) (60-100% saturation)							
0	7.3	7.32	7.2	7.2			
1	7.3	7.3	7.3	7.3			
2	7.3	7.3	7.3	7.3			
3	7.3	7.3	7.03	7.05			
4	7.3	7.3	7.3	7.3			
5	7.3	7.3	7.3	7.3			
6	7.3	7.3	7.3	7.3			
7	7.3	7.3	7.3	7.3			
8	7.3	7.3	7.3	7.3			
Temperature (°C)							
0	24	24	24	24			
1	24	24	24	24			
2	24	24	24	24			
3	24	24	24	24			
4	24	24	24	24			
5	24	24	24	24			
6	24	24	24	24			
7	24	24	24	24			
8	24	24	24	24			

Old Solutions

	CTL	CTL 10	CTL 15	CTL 20			
pH (units)							
0							
1	8.0	7.9	7.9	8.1			
2	8.4	8.2	8.2	8.2			
3	8.3	8.2	8.2	8.2			
4	8.3	8.2	8.2	8.2			
5	8.3	8.2	8.1	8.1			
6	8.1	8.1	8.1	8.1			
7	8.1	8.1	8.1	8.1			
8	8.2	8.1	8.1	8.1			
Conductance (µS/cm)							
0							
1	440	414	420	421			
2	460	410	396	410			
3	450	406	371	416			
4	460	396	414	400			
5	447	408	409	417			
6	413	441	439	437			
7	415	442	434	430			
8	433	435	421	427			
Dissolved Oxygen (mg/L) (60-100% saturation)							
0							
1	7.1	7.0	7.0	6.8			
2	7.2	7.2	6.9	6.9			
3	7.3	7.3	7.0	7.0			
4	7.3	7.3	7.3	7.3			
5	7.1	7.1	7.1	7.3			
6	7.0	7.0	7.0	7.0			
7	7.1	7.0	7.0	7.0			
8	7.2	7.2	7.2	7.2			
Temperature (°C)							
0							
1	24	24	24	24			
2	24	24	24	24			
3	24	24	24	24			
4	24	24	24	24			
5	24	24	24	24			
6	24	24	24	24			
7	24	24	24	24			
8	24	24	24	24			

DO Levels (60-100% saturation)
- 4.4 to 7.3 mg/L at 24°C
- 4.3 to 7.2 mg/L at 25°C
- 4.2 to 7.0 mg/L at 26°C

Comments:

Reviewed By: MG Date Reviewed: 2021/05/06

NAUTILUS

Fathead Minnow Bench Sheet

Method FMD 32 Day ELS Client NAU104 Sample Lab Control, 10 ug/L Cu Control, 15 ug/L Cu Control, 20 ug/L Cu Control

New Solutions

Conc (%) / Day	CTL	CTL 10	CTL 15	CTL 20			
pH (units)							
9	8.2	8.2	8.2	8.2			
10	8.1	8.1	8.1	8.1			
11	8.1	8.1	8.1	8.1			
12	8.0	8.2	8.2	8.2			
13	8.1	8.2	8.2	8.2			
14	8.0	8.0	8.1	8.1			
15	8.2	8.2	8.2	8.2			
16	8.1	8.2	8.2	8.2			
17	8.1	8.2	8.2	8.2			
Conductance (µS/cm)							
9	397	412	400	400			
10	407	417	411	410			
11	427	421	396	419			
12	448	422	407	416			
13	427	431	408	424			
14	387	414	400	422			
15	382	411	367	412			
16	498	448	454	439			
17	504	429	446	444			
Dissolved Oxygen (mg/L) (60-100% saturation)							
9	7.3	7.3	7.3	7.2			
10	7.3	7.3	7.3	7.3			
11	7.3	7.3	7.3	7.3			
12	7.3	7.3	7.3	7.2			
13	7.3	7.3	7.3	7.3			
14	7.3	7.3	7.3	7.3			
15	7.3	7.3	7.3	7.3			
16	7.3	7.3	7.3	7.3			
17	7.1	7.2	7.2	7.3			
Temperature (°C)							
9	24	24	24	24			
10	24	24	24	24			
11	24	24	24	24			
12	24	24	24	24			
13	24	24	24	24			
14	24	24	24	24			
15	24	24	24	24			
16	24	24	24	24			
17	24	24	24	24			

Old Solutions

Conc (%) / Day	CTL	CTL 10	CTL 15	CTL 20			
pH (units)							
9	8.1	8.1	8.1	8.1			
10	8.1	8.1	8.0	8.0			
11	8.0	8.0	8.0	8.0			
12	8.0	8.0	8.0	8.0			
13	8.1	8.1	8.0	8.0			
14	8.0	8.0	7.9	7.9			
15	7.9	7.9	7.8	7.8			
16	7.9	7.8	7.8	7.8			
17	8.1	7.9	7.8	7.8			
Conductance (µS/cm)							
9	420	424	423	422			
10	416	430	416	414			
11	417	420	412	415			
12	423	431	417	431			
13	410	423	412	432			
14	420	422	409	425			
15	415	419	406	423			
16	455	460	443	460			
17	504	465	448	463			
Dissolved Oxygen (mg/L) (60-100% saturation)							
9	7.0	6.9	7.0	7.0			
10	7.3	7.1	7.1	7.2			
11	7.0	7.0	7.0	7.0			
12	6.9	6.9	6.8	6.9			
13	7.0	7.0	7.0	7.1			
14	6.3	6.4	6.4	6.0			
15	6.3	6.3	6.2	6.1			
16	6.4	6.3	6.2	6.0			
17	6.6	6.2	6.0	6.0			
Temperature (°C)							
9	24	24	24	24			
10	24	24	24	24			
11	24	24	24	24			
12	24	24	24	24			
13	24	24	24	24			
14	24	24	24	24			
15	24	24	24	24			
16	24	24	24	24			
17	24	24	24	24			

DO Levels (60-100% saturation) -
4.4 to 7.3 mg/L at 24°C
4.3 to 7.2 mg/L at 25°C
4.2 to 7.0 mg/L at 26°C

Comments:

Reviewed By: MG Date Reviewed: 2021/05/04

NAUTILUS

Fathead Minnow Bench Sheet

Method: FMD 32 Day ELS Client: NAU104 Sample: Lab Control, 10 ug/L Cu Control, 15 ug/L Cu Control, 20 ug/L Cu Control

New Solutions

Conc (%) / Day	CTL	CTL 10	CTL 15	CTL 20			
pH (units)							
18	8.2	8.2	8.1	8.1			
19	8.1	8.1	8.2	8.2			
20	8.2	8.2	8.2	8.2			
21	8.2	8.1	8.2	8.3			
22	8.3	8.2	8.2	8.2			
23	7.9	7.9	8.2	8.2			
24	8.1	8.1	8.1	8.1			
25	8.2	8.2	8.3	8.3			
26	8.0	8.0	8.0	8.0			
Conductance (µS/cm)							
18	477	449	447	431			
19	446	433	446	431			
20	463	453	451	440			
21	448	440	458	458			
22	435	434	434	434			
23	451	436	463	460			
24	442	472	462	462			
25	446	475	463	467			
26	439	470	465	458			
Dissolved Oxygen (mg/L) (60-100% saturation)							
18	7.3	7.3	7.3	7.3			
19	7.3	7.1	7.3	7.3			
20	7.3	7.3	7.3	7.3			
21	7.3	7.3	7.3	7.3			
22	7.3	7.3	7.3	7.3			
23	7.3	7.3	7.3	7.3			
24	7.3	7.3	7.3	7.3			
25	7.3	7.3	7.3	7.3			
26	7.3	7.3	7.3	7.3			
Temperature (°C)							
18	24	24	24	24			
19	24	24	24	24			
20	24	24	24	24			
21	24	24	24	24			
22	24	24	24	24			
23	24	24	24	24			
24	24	24	24	24			
25	24	24	24	24			
26	24	24	24	24			

Old Solutions

Conc (%) / Day	CTL	CTL 10	CTL 15	CTL 20			
pH (units)							
18	7.9	7.8	7.8	7.7			
19	8.0	7.8	7.8	7.8			
20	8.0	7.9	7.9	7.8			
21	8.1	7.9	7.9	7.8			
22	8.0	7.8	7.8	7.7			
23	7.9	7.8	7.9	7.8			
24	7.8	7.9	7.9	7.8			
25	8.0	7.9	7.9	7.9			
26	7.8	7.8	7.7	7.7			
Conductance (µS/cm)							
18	504	466	455	450			
19	527	463	456	441			
20	494	463	460	445			
21	481	458	460	445			
22	462	468	458	447			
23	441	444	465	480			
24	436	442	476	478			
25	454	471	473	473			
26	468	482	472	474			
Dissolved Oxygen (mg/L) (60-100% saturation)							
18	6.1	6.11	6.10	6.10			
19	6.7	6.0	5.7	5.7			
20	6.10	6.5	6.2	6.1			
21	6.9	6.7	6.10	6.4			
22	6.3	6.3	5.6	5.3			
23	6.2	6.2	6.2	6.2			
24	6.6	6.6	6.7	6.6			
25	6.0	6.1	6.1	6.0			
26	6.2	6.3	6.1	6.1			
Temperature (°C)							
18	24	24	24	24			
19	24	24	24	24			
20	24	24	24	24			
21	24	24	24	24			
22	24	24	24	24			
23	24	24	24	24			
24	24	24	24	24			
25	24	24	24	24			
26	24	24	24	24			

DO Levels (60-100% saturation) -
4.4 to 7.3 mg/L at 24°C
4.3 to 7.2 mg/L at 25°C
4.2 to 7.0 mg/L at 26°C

Comments:

Reviewed By: MG Date Reviewed: 2021/05/06

NAUTILUS

Fathead Minnow Bench Sheet

Method FMD 32 Day ELS Client NAU104 Sample Lab Control, 10 ug/L Cu Control, 15 ug/L Cu Control, 20 ug/L Cu Control

New Solutions

Conc. (%) / Day	CTL	CTL 10	CTL 15	CTL 20			
pH (units)							
27	8.1	8.1	8.2	8.2			
28	8.2	8.2	8.2	8.2			
29	8.1	8.2	8.2	8.2			
30	7.9	8.1	8.1	8.1			
31	8.0	8.1	8.1	8.1			
32	8						
Conductance (µS/cm)							
27	443	493	500	469			
28	449	478	494	459			
29	440	466	470	453			
30	427	458	460	452			
31	461	461	462	454			
32							
Dissolved Oxygen (mg/L) (60-100% saturation)							
27	7.3	7.3	7.3	7.3			
28	7.1	7.1	7.1	7.1			
29	7.3	7.3	7.3	7.2			
30	7.3	7.3	7.3	7.3			
31	7.3	7.3	7.3	7.3			
32							
Temperature (°C)							
27	24	24	24	24			
28	24	24	24	24			
29	24	24	24	24			
30	24	24	24	24			
31	24	24	24	24			
32							

Old Solutions

Conc. (%) / Day	CTL	CTL 10	CTL 15	CTL 20			
pH (units)							
27	7.9	7.9	7.8	7.8			
28	8.1	8.0	7.9	7.9			
29	7.9	7.9	7.9	7.8			
30	7.8	7.7	7.7	7.6			
31	7.9	7.8	7.7	7.7			
32	8.0	28	2.8	2.8			
Conductance (µS/cm)							
27	447	476	473	474			
28	456	485	479	476			
29	461	489	486	471			
30	463	474	478	461			
31	454	460	470	468			
32	487	481	482	476			
Dissolved Oxygen (mg/L) (60-100% saturation)							
27	6.9	6.9	6.9	6.8			
28	7.0	7.0	6.9	6.8			
29	6.1	6.1	6.0	6.0			
30	5.3	5.4	5.4	5.2			
31	6.2	6.0	5.9	5.7			
32	6.0	6.0	6.0	6.0			
Temperature (°C)							
27	24	24	24	24			
28	24	24	24	24			
29	24	24	24	24			
30	24	24	24	24			
31	24	24	24	24			
32	24	24	24	24			

DO Levels (60-100% saturation) -
4.4 to 7.3 mg/L at 24°C
4.3 to 7.2 mg/L at 25°C
4.2 to 7.0 mg/L at 26°C

Comments:

Reviewed By: MG Date Reviewed: 2021/05/04

NAUTILUS

Fathead Minnow Bench Sheet

Method FMD 32 Day ELS Client NAU104 Sample: Lab Control, 10 ug/L Cu Control, 15 ug/L Cu Control, 20 ug/L Cu Control

Test Termination

For normal/abnormal column, use the following notation:

N=Normal, A= Abnormal And note location: H=head, O=oral, E=eyes, G=gills, F=fins, S=spine

Conc

CTL

Replicate # A		
Fish	Length (mm)	Normal/ Abnormal
1	12	N
2	10	
3	9	
4	10	
5	10	
6	11	
7	12	
8	11	
9	7	
10	11	
11	13	
12	8	
13	12	
14	11	
15		

Replicate # B		
Fish	Length (mm)	Normal/ Abnormal
1	11	N
2	12	
3	10	
4	13	
5	9	
6	11	
7	9	
8	10	
9	11	
10	11	
11	10	
12	10	
13	11	
14		
15		

Replicate # C		
Fish	Length (mm)	Normal/ Abnormal
1	11	
2	12	
3	10	
4	13	
5	9	
6	11	
7	10	
8	13	
9	11	
10		
11		
12		
13		
14		
15		

Replicate # D		
Fish	Length (mm)	Normal/ Abnormal
1	12	N
2	12	
3	11	
4	10	
5	9	
6	9	
7	9	
8	12	
9	13	
10	10	
11	13	
12	11	
13	12	
14	9	
15	11	

C MW

11 N
9
12
13
13
11
11
13
11
12
12
9

Comments

CTL 10

Replicate # A		
Fish	Length (mm)	Normal/ Abnormal
1	13	N
2	11	
3	11	
4	10	
5	10	
6	13	
7	10	
8	12	
9	13	
10	8	
11	10	
12	9	
13	11	
14	10	
15		

Replicate # B		
Fish	Length (mm)	Normal/ Abnormal
1	13	N
2	11	
3	11	
4	10	
5	10	
6	10	
7	11	
8	10	
9	11	
10	13	
11	11	
12	12	
13	10	
14		
15		

Replicate # C		
Fish	Length (mm)	Normal/ Abnormal
1	9	N
2	10	
3	9	
4	10	
5	11	
6	11	
7	11	
8	9	
9	10	
10	10	
11	10	
12	11	
13	12	
14	11	
15		

Replicate # D		
Fish	Length (mm)	Normal/ Abnormal
1	9	N
2	11	
3	11	
4	10	
5	9	
6	11	
7	8	
8	10	
9	11	
10	12	
11	13	
12	11	
13	13	
14	11	
15	9	

Comments

Reviewed By: MG Date Reviewed: 20211105/04

NAUTILUS

Fathead Minnow Bench Sheet

Method FMD 32 Day ELS Client NAU104 Sample: Lab Control, 10 ug/L Cu Control, 15 ug/L Cu Control, 20 ug/L Cu Control

Test Termination

For normal/abnormal column, use the following notation:

N=Normal, A= Abnormal And note location: H=head, O=oral, E=eyes, G=gills, F=fins, S=spine

Conc

CTL 15

Replicate # A		
Fish	Length (mm)	Normal/ Abnormal
1	9	N
2	10	
3	10	
4	12	
5	13	
6	12	
7	11	
8	10	
9	9	
10	11	
11	10	
12	11	
13	11	
14		
15		

Replicate # B		
Fish	Length (mm)	Normal/ Abnormal
1	10	N
2	10	
3	9	
4	12	
5	11	
6	10	
7	12	
8	11	
9	11	
10	10	
11	10	
12	8	
13	11	
14	10	
15	10	

Replicate # C		
Fish	Length (mm)	Normal/ Abnormal
1	13	N
2	8	
3	11	
4	14	
5	11	
6	12	
7	14	
8	12	
9	13	
10		
11		
12		
13		
14		
15		

Replicate # D		
Fish	Length (mm)	Normal/ Abnormal
1	13	N
2	11	
3	11	
4	13	
5	11	
6	13	
7	10	
8	10	
9	11	
10	12	
11	10	
12	11	
13	11	
14		
15		

Comments

CTL 20

Replicate # A		
Fish	Length (mm)	Normal/ Abnormal
1	9	AS
2	11	N
3	9	
4	10	
5	13	
6	11	
7	10	
8	8	
9	11	
10	14	
11	14	
12	11	
13		
14		
15		

Replicate # B		
Fish	Length (mm)	Normal/ Abnormal
1	12	N
2	10	
3	9	
4	12	
5	10	
6	10	
7	10	
8	11	
9	11	
10	10	
11	11	
12	10	
13	13	
14		
15		

Replicate # C		
Fish	Length (mm)	Normal/ Abnormal
1	12	N
2	13	
3	13	
4	14	
5	13	
6	9	
7	11	
8	11	
9	13	
10		
11		
12		
13		
14		
15		

Replicate # D		
Fish	Length (mm)	Normal/ Abnormal
1	9	N
2	11	
3	11	
4	10	
5	11	
6	12	
7	14	
8	10	
9	13	
10	12	
11	10	
12	11	
13	11	
14	9	
15		

Comments

Reviewed By: MG Date Reviewed: 2021/05/04

NAUTILUS

Fathead Minnow Bench Sheet

Method FMD 32 Day ELS Client NAU104 Sample Lab Control, 10 ug/L Cu Control, 15 ug/L Cu Control, 20 ug/L Cu Control

Date of change 2021103111(PM) **Day of change** 5

Volume (mL) of *Artemia* Fed to Each Test Replicate of Each Sample / Concentration							
Replicate	CTL	CTL 10	CTL 15	CTL 20			
A	0.5	0.5	0.5	0.5			
B	↓	↓	↓	↓			
C	↓	↓	↓	↓			
D	↓	↓	↓	↓			

Date of change 2021103151PM **Day of change** 9

Volume (mL) of *Artemia* Fed to Each Test Replicate of Each Sample / Concentration							
Replicate	CTL	CTL 10	CTL 15	CTL 20			
A	1.5	1.5	1.5	1.5			
B	↓	↓	↓				
C	↓	↓	↓	↓			
D	↓	↓	↓	↓			

Date of change 2021103117(am) **Day of change** 11

Volume (mL) of *Artemia* Fed to Each Test Replicate of Each Sample / Concentration							
Replicate	CTL	CTL 10	CTL 15	CTL 20			
A	2	2	2	2			
B	↓	↓	↓	↓			
C	↓	↓	↓	↓			
D	↓	↓	↓	↓			

Date of change 2021103120(am) **Day of change** 14

Volume (mL) of *Artemia* Fed to Each Test Replicate of Each Sample / Concentration							
Replicate	CTL	CTL 10	CTL 15	CTL 20			
A	2.5	2.5	2.5	2.5			
B	↓	↓	↓	↓			
C	↓	↓	↓	↓			
D	↓	↓	↓	↓			

***Feeding volume is maintained following a feeding change until a new feeding regime is recorded**

NAUTILUS ENVIRONMENTAL

Fathead Minnow Bench Sheet

Method FMD 32 Day ELS Client NAU104 Sample Lab Control, 10 ug/L Cu Control, 15 ug/L Cu Control, 20 ug/L Cu Control

Date of change 20211031 30 **Day of change** 24

Volume (mL) of *Artemia* Fed to Each Test Replicate of Each Sample / Concentration							
Replicate	CTL	CTL 10	CTL 15	CTL 20			
A	3.0	3.0	3.0	3.0			
B	↓	↓	↓	↓			
C	↓	↓	↓	↓			
D	↓	↓	↓	↓			

Date of change _____ **Day of change** _____

Volume (mL) of *Artemia* Fed to Each Test Replicate of Each Sample / Concentration							
Replicate	CTL	CTL 10	CTL 15	CTL 20			
A							
B							
C							
D							

Date of change _____ **Day of change** _____

Volume (mL) of *Artemia* Fed to Each Test Replicate of Each Sample / Concentration							
Replicate	CTL	CTL 10	CTL 15	CTL 20			
A							
B							
C							
D							

Date of change _____ **Day of change** _____

Volume (mL) of *Artemia* Fed to Each Test Replicate of Each Sample / Concentration							
Replicate	CTL	CTL 10	CTL 15	CTL 20			
A							
B							
C							
D							

***Feeding volume is maintained following a feeding change until a new feeding regime is recorded**

NAUTILUS

Fathead Minnow Bench Sheet

Method FMD 32 Day ELS Client NAU104 Sample 2021-0970, 2021-0971, 2021-0972, 2021-0973, 2021-0974, 2021-0975, 2021-0976 (20 ug/L Cu)

Organism Information

Source Aquatox Batch 202105CuFM-ELS Egg Stage 16 somites Organisms Received in Good Condition: Yes or No

Test Log

Date	Day	Time	Technicians	Chem Cart Used	Fed AM	Fed PM	Sample Pre-Aeration Time	Bench Sheet Review First
2021/03/06	0	1515	SH/AW/KH	2	—	—	60mins	AW
2021/03/07	1	0935	CB	2	—	—	60mins	MF
2021/03/08	2	0935	ST	2	—	—	60 mins	SC
2021/03/09	3	0920	ST	2	—	—	60 mins	AW
2021/03/10	4	0850	KH	2	—	—	60mins	AW
2021/03/11	5	0835	ST	2	—	✓	60 mins	MF
2021/03/12	6	1125	MW	2	✓	✓	60 mins	AW
2021/03/13	7	1200	AW	2	✓	✓	60 min	KH
2021/03/14	8	1040	CB	2	✓	✓	60mins	SC
2021/03/15	9	1000	ST	2	✓	✓	60 mins	SC
2021/03/16	10	1000	KH	2	✓	✓	60mins	SC
2021/03/17	11	1100	KH	2	✓	✓	60mins	ST
2021/03/18	12	1105	ST	2	✓	✓	60 mins	SC
2021/03/19	13	0850	ST	2	✓	✓	60 mins	AW
2021/03/20	14	1150	KH	2	✓	✓	60 mins	AW
2021/03/21	15	1355	ST	2	✓	✓	60 mins	CB
2021/03/22	16	1150	MW/ST	2	✓	✓	60 mins	AW
2021/03/23	17	1130	MW/ST	2	✓	✓	60 mins	AW
2021/03/24	18	1050	ST	2	✓	✓	60 mins	KH
2021/03/25	19	0930	MW	2	✓	✓	60mins	ST
2021/03/26	20	1145	AW/MF	2	✓	✓	60 mins	AW
2021/03/27	21	1150	MF/SC	2	✓	✓	60mins	AW
2021/03/28	22	1150	ST/MW	2	✓	✓	60 mins	CB
2021/03/29	23	1350	AW	2	✓	✓	60 mins	MW
2021/03/30	24	1100	ST/AW	2	✓	✓	60 mins	KH
2021/03/31	25	1000	MF	2	✓	✓	60mins	AW
2021/04/01	26	1145	AW/MF	2	✓	✓	60 mins	AW
2021/04/02	27	1050	MF/SC	2	✓	✓	60 mins	AW
2021/04/03	28	1200	SC/MF	2	✓	✓	60 mins	AW
2021/04/04	29	1055	ST/MW	2	✓	✓	60 mins	MW
2021/04/05	30	1125	AW/ST	2	✓	✓	60mins	MW
2021/04/06	31	1030	MW	2	✓	✓	60 mins	AW
2021/04/07	32	1100	MW/CB	2	—	—	—	AW

Reviewed By: MG Date Reviewed: 2021/05/11

NAUTILUS

Fathead Minnow Bench Sheet

Method FMD 32 Day ELS Client NAUTI(4 Sample: 2021-0970, 2021-0971, 2021-0972, 2021-0973, 2021-0974, 2021-0975, 2021-0976 (20 ug/L Cu)

Control hatching success must be >66% (≥10 per replicate). Post hatch survival must be >70%.

Number of Alive Embryos and Hatched Organisms

	2021-0970 Day 1		2021-0971 Day 1		2021-0972 Day 1		2021-0973 Day 1		2021-0974 Day 1		2021-0975 Day 1		2021-0976 Day 1	
replicate	Alive Embryos	Dead Embryos	Alive Embryos	Dead Embryos	Alive Embryos	Dead Embryos	Alive Embryos	Dead Embryos	Alive Embryos	Dead Embryos	Alive Embryos	Dead Embryos	Alive Embryos	Dead Embryos
a	14	1	15	0	15	0	15	0	15	0	15	0	15	0
b	15	0	14	1	15	0	15	0	15	0	15	0	15	0
c	15	0	15	0	14	1	14	1	15	0	15	0	15	0
d	15	0	15	0	14	1	15	0	15	0	15	0	15	0
e	29	1	29	1	30	0	28	2	30	0	29	1	30	0
f	30	0	29	1	25	5	30	0	30	0	30	0	30	0

Comments/Observations:

Number of Alive Embryos and Hatched Organisms

	2021-0970 Day 2			2021-0971 Day 2			2021-0972 Day 2			2021-0973 Day 2		
replicate	Alive Embryos	Dead Embryos	Cull to 15	Alive Embryos	Dead Embryos	Cull to 15	Alive Embryos	Dead Embryos	Cull to 15	Alive Embryos	Dead Embryos	Cull to 15
a	14	0	15	15	0	15	15	0	Ø15 ST	15	0	15
b	15	0	15	14	0	15	15	0	15	15	0	16
c	15	0	15	15	0	15	14	0	15	13	1	15
d	15	0	15	15	0	15	14	0	15	15	0	15
e	29	0		29	0		30	0		28	0	
f	30	0		29	0		25	0		29	1	

	2021-0974 Day 2			2021-0975 Day 2			2021-0976 Day 2		
replicate	Alive Embryos	Dead Embryos	Cull to 15	Alive Embryos	Dead Embryos	Cull to 15	Alive Embryos	Dead Embryos	Cull to 15
a	15	0	15	15	0	15	15	0	15
b	15	0	15	15	0	15	15	0	15
c	14	1	15	15	0	15	15	0	15
d	13	2	15	15	0	15	15	0	15
e	30	0		28	1		27	3	
f	26	4		29	1		30	0	

Day 2 - Poor looking and dead embryos in replicates a, b, c and d are replaced with healthy embryos from replicates e and f. Replicates e and f are discarded after day 2

Comments/Observations:

Reviewed By: MG Date Reviewed: 2021/05/11

NAUTILUS ENVIRONMENTAL

Fathead Minnow Bench Sheet

Method FMD 32 Day ELS Client NAU104 Sample: 2021-0970, 2021-0971, 2021-0972, 2021-0973, 2021-0974, 2021-0975, 2021-0976 (20 ug/L Cu)

Control hatching success must be >66% (≥10 per replicate). Post hatch survival must be >70%.

2021-0970

Day 3

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	6	1	9	0
b	12	0	3	0
c	12	0	3	0
d	5	0	9	1

2021-0971

Day 3

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	13	1	2	0
b	13	0	2	0
c	13	0	2	0
d	13	0	2	0

2021-0972

Day 3

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	10	0	5	0
b	14	0	14	1
c	14	0	1	0
d	14	0	0	1

2021-0973

Day 3

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	12	0	12	1
b	15	0	0	0
c	11	0	4	0
d	7	0	6	2

2021-0974

Day 3

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	6	0	9	0
b	12	0	3	0
c	13	0	2	0
d	11	0	4	0

2021-0975

Day 3

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	10	0	5	0
b	12	0	3	0
c	13	0	2	0
d	12	0	3	0

2021-0976

Day 3

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	14	0	1	0
b	14	0	1	0
c	11	0	3	1
d	12	1	2	0

[redacted]

2021-0970

Day 4

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	1	0	12	1
b	3	0	11	1
c	1	0	14	0
d	0	0	10	4

2021-0971

Day 4

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	0	1	13	0
b	2	0	13	0
c	1	0	14	0
d	2	0	13	0

2021-0972

Day 4

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	0	0	15	0
b	3	0	11	0
c	4	1	9	1
d	1	0	12(5)	1

2021-0973

Day 4

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	1	0	12	1
b	7	0	7	1
c	3	0	12	0
d	1	0	11	1

2021-0974

Day 4

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	2	0	12	1
b	6	0	9	0
c	4	0	11	0
d	2	0	12	1

2021-0975

Day 4

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	12	0	12	0
b	10	0	5	0
c	3	0	12	0
d	1	0	11	1

4 0 (10) 1

2021-0976

Day 4

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	5	0	10	0
b	9	0	6	0
c	6	0	8	1
d	5	0	9	0

Comments/Observations

Reviewed By: ML Date Reviewed: 2021/05/11

NAUTILUS

Fathead Minnow Bench Sheet

Method FMD 32 Day ELS Client NAU104 Sample: 2021-0970, 2021-0971, 2021-0972, 2021-0973, 2021-0974, 2021-0975, 2021-0976 (20 ug/L Cu)

Control hatching success must be >66% (≥10 per replicate). Post hatch survival must be >70%.

2021-0970

Day 5

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	0	0	10	3
b	0	0	12	2
c	0	0	14(1)	1
d	0	0	10	0

2021-0971

Day 5

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	0	0	13(2)	0
b	0	0	15	0
c	0	0	15(2)	0
d	1	0	14	0

2021-0972

Day 5

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	0	0	15	0
b	0	0	14	0
c	0	0	12	1
d	0	0	13	0

2021-0973

Day 5

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	0	0	12	1
b	0	0	14	0
c	0	0	15	0
d	0	1	11(1)	0

2021-0974

Day 5

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	0	0	14	0
b	1	0	14	0
c	0	1	13(1)	1
d	0	0	14	0

2021-0975

Day 5

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	1	0	14	0
b	0	0	15	0
c	2	0	13	0
d	1	0	13	0

2021-0976

Day 5

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	3	0	12	0
b	0	1	14	0
c	1	0	13	0
d	1	0	13	0

[redacted]

2021-0970

Day 6

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	0	0	10(3)	0
b	0	0	12(3)	0
c	0	0	14(1)	0
d	0	0	10(1)	0

2021-0971

Day 6

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	0	0	13(3)	0
b	0	0	14	1
c	0	0	15(2)	0
d	0	1	14(2)	0

2021-0972

Day 6

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	0	0	15	8
b	0	0	14	0
c	0	0	12	0
d	0	0	13	0

2021-0973

Day 6

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	0	0	11(2)	1
b	0	0	14(2)	0
c	0	0	15(2)	0
d	0	0	11(1)	0

2021-0974

Day 6

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	0	0	14(1)	0
b	0	0	15	0
c	0	0	12	1
d	0	0	14	0

2021-0975

Day 6

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	1	0	14	0
b	0	0	15(1)	0
c	0	0	15	0
d	0	0	14	0

2021-0976

Day 6

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	1	0	14	0
b	0	0	14	0
c	0	0	13	1
d	1	0	12	1

Comments/Observations

Reviewed By: MG Date Reviewed: 2021/05/11

NAUTILUS

Fathead Minnow Bench Sheet

Method FMD 32 Day ELS Client NAU104 Sample: 2021-0970, 2021-0971, 2021-0972, 2021-0973, 2021-0974, 2021-0975, 2021-0976 (20 ug/L Cu)

Number of Alive Embryos and Hatched Organisms

replicate	2021-0970 Day 7 Alive Hatched	2021-0971 Day 7 Alive Hatched	2021-0972 Day 7 Alive Hatched	2021-0973 Day 7 Alive Hatched	2021-0974 Day 7 Alive Hatched	2021-0975 Day 7 Alive Hatched	2021-0976 Day 7 Alive Hatched
a	7(2)	13(2)	14	10(1)	*11(1)	14	12 - 1**
b	#10(4)	14	~~13~~ 14*	12(3)	*13(3)	15(3)	14(2)
c	~~13~~(3)	14(2)	12(1)	14(5)	12	14(2)	13(2)
d	9(1)	13(2)	13	11	13*	14(1)	12 - 1**

Comments/Observations: * microbial growth ** unhatched embryo

replicate	2021-0970 Day 8 Alive Hatched	2021-0971 Day 8 Alive Hatched	2021-0972 Day 8 Alive Hatched	2021-0973 Day 8 Alive Hatched	2021-0974 Day 8 Alive Hatched	2021-0975 Day 8 Alive Hatched	2021-0976 Day 8 Alive Hatched
a	6	13	13	10	9	14	12
b	7(1)	14	14	11	10	15	13/14
c	13	14	11	13	11	13	12
d	8(1)	12	13	10	9	12	11

Comments/Observations:

replicate	2021-0970 Day 9 Alive Hatched	2021-0971 Day 9 Alive Hatched	2021-0972 Day 9 Alive Hatched	2021-0973 Day 9 Alive Hatched	2021-0974 Day 9 Alive Hatched	2021-0975 Day 9 Alive Hatched	2021-0976 Day 9 Alive Hatched
a	5(1)	13	13(2)	9(1)	8 * **	14	12
b	7(1)	14	14	11	9 *	15	14
c	13	14(1)	11	13	11	13	12
d	8	12	13(1)	10 *	7 **	12	11

Comments/Observations: * Microbial growth observed in jar 0973D, 0974 B
** Microbial growth in jar + on dead fish

replicate	2021-0970 Day 10 Alive Hatched	2021-0971 Day 10 Alive Hatched	2021-0972 Day 10 Alive Hatched	2021-0973 Day 10 Alive Hatched	2021-0974 Day 10 Alive Hatched	2021-0975 Day 10 Alive Hatched	2021-0976 Day 10 Alive Hatched
a	5(1)	13(1)	~~12~~ 13	9	8*	14(2)	12
b	7(1)	14	14(1)	11	9(1)*	15	14(3)
c	13	14	11	11	11*	13	12
d	8(1)	12	13	10*	4 * **	12	11(2)

Comments/Observations: 0972D - HAS * Microbial growth observed in jar
** 0974D Microbial growth in jar + dead FM

Reviewed By: MG Date Reviewed: 2021/05/11

NAUTILUS

Fathead Minnow Bench Sheet

Method FMD 32 Day ELS Client NAU104 Sample: 2021-0970, 2021-0971, 2021-0972, 2021-0973, 2021-0974, 2021-0975, 2021-0976 (20 ug/L Cu)

Number of Alive Embryos and Hatched Organisms

replicate	2021-0970 Day 11 Alive Hatched	2021-0971 Day 11 Alive Hatched	2021-0972 Day 11 Alive Hatched	2021-0973 Day 11 Alive Hatched	2021-0974 Day 11 Alive Hatched	2021-0975 Day 11 Alive Hatched	2021-0976 Day 11 Alive Hatched
a	5	13(1)	13	9	8*	13(1)	12
b	7(1)	14	14(1)	11	9(1)*	15(2)	14(2)
c	12	14	10	10(1)	10*	13	11(2)
d	8	12	12	10	4*	12	11(1)

Comments/Observations: 0972D: 1AS * Microbial growth in jar

replicate	2021-0970 Day 12 Alive Hatched	2021-0971 Day 12 Alive Hatched	2021-0972 Day 12 Alive Hatched	2021-0973 Day 12 Alive Hatched	2021-0974 Day 12 Alive Hatched	2021-0975 Day 12 Alive Hatched	2021-0976 Day 12 Alive Hatched
a	5	13(2)	13	9	8*	12(1)	(2(1)
b	7(2)	14	14(1)	11	7(2)*	15(3)	14(2)
c	12	14	10	10	10*	13	11(2)
d	8	12	12(1)	10	4*	12(1)	11(1)

Comments/Observations: * Microbial in jar ** Microbial in jar + on dead fish

replicate	2021-0970 Day 13 Alive Hatched	2021-0971 Day 13 Alive Hatched	2021-0972 Day 13 Alive Hatched	2021-0973 Day 13 Alive Hatched	2021-0974 Day 13 Alive Hatched	2021-0975 Day 13 Alive Hatched	2021-0976 Day 13 Alive Hatched
a	5	13(2)	12	9	8(1) *	11(1)	12(2)
b	6(2)	14	14(1)	11	7(2)*	15(3)	14(3)
c	12	14	10	10	10 *	13	11(2)
d	8	12	12(1)	10	4 *	11	11(2)

Comments/Observations: * Microbial in jar (0974 A-D)

replicate	2021-0970 Day 14 Alive Hatched	2021-0971 Day 14 Alive Hatched	2021-0972 Day 14 Alive Hatched	2021-0973 Day 14 Alive Hatched	2021-0974 Day 14 Alive Hatched	2021-0975 Day 14 Alive Hatched	2021-0976 Day 14 Alive Hatched
a	5	12(1)	12(1)	9	7*	11(1)	12(2)
b	6(1)	14	14(1)	11	7(1)*	14(2)	13(1)
c	12	14	10	10	10	13	9*
d	7	12	12	10	4*	11	10(2)

Comments/Observations: 0972D: 1AS 0974B: 1AS * Microbial growth in jar 0976A: 1AS 0976B: 1AS

Reviewed By: MG Date Reviewed: 2021/05/11

NAUTILUS ENVIRONMENTAL

Fathead Minnow Bench Sheet

Method FMD 32 Day ELS Client NAU104 Sample: 2021-0970, 2021-0971, 2021-0972, 2021-0973, 2021-0974, 2021-0975, 2021-0976 (20 ug/L Cu)

Number of Alive Embryos and Hatched Organisms

	2021-0970	2021-0971	2021-0972	2021-0973	2021-0974	2021-0975	2021-0976
	Day 15	Day 15	Day 15	Day 15	Day 15	Day 15	Day 15
replicate	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched
a	5	12	12(1)	9	7(3)*	11(1)	12(2)
b	6(2)	14	14(1)	11	7(1)*	14(2)	13(1)
c	12	14	10	10(1)	9	13	9*
d	7	12	12	10	4(1)	11	9(1)

Comments/Observations: 0972B-1AS 0970B-1AS * Microbial growth in jar 0974A-2AS 0974B-1AS 0974D-1AS 0975B-1AS 0976A-1AS 0976B-1AS 0976C-1AS

	2021-0970	2021-0971	2021-0972	2021-0973	2021-0974	2021-0975	2021-0976
	Day 16	Day 16	Day 16	Day 16	Day 16	Day 16	Day 16
replicate	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched
a	5	12	12(1)	9	7(1)	11	12
b	6(2)	14	14(1)	11	7	14(2)	13(2)
c	11	14	10	10	9	13	9
d	7	12	12	10	4	11	9

Comments/Observations: 0970 B-1AS 0972 B-1AS 0973 C-1AS 0974 A-2AS B-1AS 0975 A-1AS B-1AS 0976 A-2AS B-1AS D-1AS

	2021-0970	2021-0971	2021-0972	2021-0973	2021-0974	2021-0975	2021-0976
	Day 17	Day 17	Day 17	Day 17	Day 17	Day 17	Day 17
replicate	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched
a	5	12	12(1)	9	7(2)	11	12(1)
b	6(2)	14	13(1)	11	7(1)	14(2)	13(2)
c	11	14	10	10	9	13	9
d	7	12	12	10*	4	11	9(1)

Comments/Observations: B-2AS 09- * Microbial in jar 0974A-2AS 0974B-1AS 0975A-1AS 0975B-2AS 0976A-1AS 0976B-2AS 0976D-1AS

	2021-0970	2021-0971	2021-0972	2021-0973	2021-0974	2021-0975	2021-0976
	Day 18	Day 18	Day 18	Day 18	Day 18	Day 18	Day 18
replicate	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched
a	5	12	12(1)	9	7	11	12
b	6	14	13(1)	11	7	14	13
c	11	14	10	10	9	13	9
d	7	12	12	10*	4	11	9

Comments/Observations: 0970B-2AS * Microbial in jar 0974A-2AS 0974B-1AS 0975A-1AS 0975B-1AS A-1AS B-2AS D-1AS

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NAUTILUS

Fathead Minnow Bench Sheet

Method FMD 32 Day ELS Client NAU104 Sample: 2021-0970, 2021-0971, 2021-0972, 2021-0973, 2021-0974, 2021-0975, 2021-0976 (20 ug/L Cu)

Number of Alive Embryos and Hatched Organisms

replicate	2021-0970 Day 19 Alive Hatched	2021-0971 Day 19 Alive Hatched	2021-0972 Day 19 Alive Hatched	2021-0973 Day 19 Alive Hatched	2021-0974 Day 19 Alive Hatched	2021-0975 Day 19 Alive Hatched	2021-0976 Day 19 Alive Hatched
a	5	12	12(1)	9	7	11	12
b	6	14	13(1)	11	7	14(1)	13
c	11	14	10	10	9	13	9
d	7	12(1)	12	10	4	11	9

Comments/Observations:
0970 B-2AS
74 A-2AS B-1AS
75 A-1AS B-1AS
76 A-1AS B-2AS B-1AS

replicate	2021-0970 Day 20 Alive Hatched	2021-0971 Day 20 Alive Hatched	2021-0972 Day 20 Alive Hatched	2021-0973 Day 20 Alive Hatched	2021-0974 Day 20 Alive Hatched	2021-0975 Day 20 Alive Hatched	2021-0976 Day 20 Alive Hatched
a	5	12	12(1)	9	7	11	12(1)
b	6(1)	14	13(1)	11 MF	7	13(1)	13(2)
c	11	14	10	8 9(1)	9	13	9
d	~~11~~ 7	12(1)	12	10	4	11	9

Comments/Observations:
0974 A: 2AS B: 1AS
0975 A: 1AS B: 1AS
0976 A: 1AS B: 2AS

replicate	2021-0970 Day 21 Alive Hatched	2021-0971 Day 21 Alive Hatched	2021-0972 Day 21 Alive Hatched	2021-0973 Day 21 Alive Hatched	2021-0974 Day 21 Alive Hatched	2021-0975 Day 21 Alive Hatched	2021-0976 Day 21 Alive Hatched
a	5	12	12(1)	9	7(1)	11	12(1)
b	6(1)	14	13(1)	11	7	13(1)	13(2)
c	11	14	10	9(1)	9	13	9
d	7	12(1)	12	10	4	11	9

Comments/Observations:
0974 B: 1AS
0975 A: 1AS B: 1AS
0976 A: 1AS B: 2AS

replicate	2021-0970 Day 22 Alive Hatched	2021-0971 Day 22 Alive Hatched	2021-0972 Day 22 Alive Hatched	2021-0973 Day 22 Alive Hatched	2021-0974 Day 22 Alive Hatched	2021-0975 Day 22 Alive Hatched	2021-0976 Day 22 Alive Hatched
a	5	12	12(1)	9	7(1)	11	12(1)
b	6(1)	14	13	11	7	13(1)	13(2)
c	11	14	10	8	9	~~12~~ 13	9
d	7	17(1)	12	10	4	11	9

Comments/Observations:
0974 B 1AS
0975 A 1AS
0976 A: 1AS B: 2AS

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NAUTILUS ENVIRONMENTAL

Fathead Minnow Bench Sheet

Method FMD 32 Day ELS Client NAU104 Sample: 2021-0970, 2021-0971, 2021-0972, 2021-0973, 2021-0974, 2021-0975, 2021-0976 (20 ug/L Cu)

Number of Alive Embryos and Hatched Organisms

	2021-0970	2021-0971	2021-0972	2021-0973	2021-0974	2021-0975	2021-0976
	Day 23	Day 23	Day 23	Day 23	Day 23	Day 23	Day 23
replicate	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched
a	5	12(1)	12(1)	9	7(1)	11(1)	12(1)
b	6(1)	14	13(1)	11	7(1)	12(1)	13(2)
c	11	14	10	8	9	13	9
d	7	12(1)	12	10	4	11	9

Comments/Observations: 0970 B: 1AS; 0971 B: 1AS; 0975 A: 1AS; 0976 A: 1AS B: 2AS

	2021-0970	2021-0971	2021-0972	2021-0973	2021-0974	2021-0975	2021-0976
	Day 24	Day 24	Day 24	Day 24	Day 24	Day 24	Day 24
replicate	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched
a	5	12	12(1)	9	7(1)	11(1)	12(1)
b	6	14	13	11	7B(1)	13(2)	13(2)
c	11	14	10	8	9	13	9
d	7	12(1)	12	10	4	11	9

Comments/Observations: 0970 B: 1AS; 0972 C: 1AS; 0974 A: 1AS B: 1AS; 0975 A: 1AS; 0976 A: 1AS B: 2AS

	2021-0970	2021-0971	2021-0972	2021-0973	2021-0974	2021-0975	2021-0976
	Day 25	Day 25	Day 25	Day 25	Day 25	Day 25	Day 25
replicate	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched
a	5	12	12(1)	9	7(1)	11(1)	12(1)
b	6	14	13	11	7(1)	13(2)	13(2)
c	11	14	10	8	9	13	9
d	7	12(1)	12	10	4	11	9

Comments/Observations: 0970 B: 1AS; 0972 C: 1AS; 0974 A: 1AS B: 1AS; 0975 A: 1AS; 0976 A: 1AS B: 2AS

	2021-0970	2021-0971	2021-0972	2021-0973	2021-0974	2021-0975	2021-0976
	Day 26	Day 26	Day 26	Day 26	Day 26	Day 26	Day 26
replicate	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched
a	5	12	12(1)	9	7(1)	10	12(1)
b	6	14	13	11	7(1)	13(2)	13(2)
c	11	14	10	8	9	13	9
d	7	12(1)	12	10	4	11	9

Comments/Observations: 0970 B: 1AS; 0972 C: 1AS; 0974 A: 1AS B: 1AS; 0976 A: 1AS B: 2AS

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NAUTILUS ENVIRONMENTAL

Fathead Minnow Bench Sheet

Method FMD 32 Day ELS Client NAU104 Sample: 2021-0970, 2021-0971, 2021-0972, 2021-0973, 2021-0974, 2021-0975, 2021-0976 (20 ug/L Cu)

Number of Alive Embryos and Hatched Organisms

replicate	2021-0970 Day 27 Alive Hatched	2021-0971 Day 27 Alive Hatched	2021-0972 Day 27 Alive Hatched	2021-0973 Day 27 Alive Hatched	2021-0974 Day 27 Alive Hatched	2021-0975 Day 27 Alive Hatched	2021-0976 Day 27 Alive Hatched
a	5	12	12(1)	9	7(1)	10	12(1)
b	6	14	13	11	7(1)	13(2)	13(2)
c	11	14	10	8	9	13	9
d	7	12	12	10	4	11	9

Comments/Observations:
0970 B: 1AS
0972 C: 1AS
0974 A: 1AS B: 1AS
0976 A: 1AS B: 2AS

replicate	2021-0970 Day 28 Alive Hatched	2021-0971 Day 28 Alive Hatched	2021-0972 Day 28 Alive Hatched	2021-0973 Day 28 Alive Hatched	2021-0974 Day 28 Alive Hatched	2021-0975 Day 28 Alive Hatched	2021-0976 Day 28 Alive Hatched
a	5	12	12(1)	9	7(1)	10	12(1)
b	6	14	13	11	7(1)	13(2)	13(2)
c	11	13	10	8	9	13	9
d	7	12	12	10	4	11	9

Comments/Observations:
0970 B: 1AS
0972 C: 1AS
0974 A: 1AS B: 1AS
0976 A: 1AS B: 2AS

replicate	2021-0970 Day 29 Alive Hatched	2021-0971 Day 29 Alive Hatched	2021-0972 Day 29 Alive Hatched	2021-0973 Day 29 Alive Hatched	2021-0974 Day 29 Alive Hatched	2021-0975 Day 29 Alive Hatched	2021-0976 Day 29 Alive Hatched
a	5	12	12(1)	9	7(1)	10	12(1)
b	6	14	13	11	7(1)	13(1)	12(1)
c	11	13	10	8	9	13	9
d	7	12	12	10	4	11	9

Comments/Observations:
0970 B: 1AS
0972 C: 1AS
0974 A: 1AS B: 1AS
0976 A: 1AS B: 1AS

replicate	2021-0970 Day 30 Alive Hatched	2021-0971 Day 30 Alive Hatched	2021-0972 Day 30 Alive Hatched	2021-0973 Day 30 Alive Hatched	2021-0974 Day 30 Alive Hatched	2021-0975 Day 30 Alive Hatched	2021-0976 Day 30 Alive Hatched
a	5	12	12(1)	9	7(1)	10	12(1)
b	6	14	13	11	7(1)	12	(2(1)
c	11	13	10	8	9	13	9
d	7	11	12	10	4	11	9

Comments/Observations:
0970 B: 1AS
0972 C: 1AS
0974 A: 1AS B: 1AS
0976 A: 1AS B: 1AS

MG 2021/05/11

NAUTILUS ENVIRONMENTAL

Fathead Minnow Bench Sheet

Method FMD 32 Day ELS Client NAU104 Sample: 2021-0970, 2021-0971, 2021-0972, 2021-0973, 2021-0974, 2021-0975, 2021-0976 (20 ug/L Cu)

Number of Alive Embryos and Hatched Organisms

replicate	2021-0970 Day 31 Alive Hatched	2021-0971 Day 31 Alive Hatched	2021-0972 Day 31 Alive Hatched	2021-0973 Day 31 Alive Hatched	2021-0974 Day 31 Alive Hatched	2021-0975 Day 31 Alive Hatched	2021-0976 Day 31 Alive Hatched
a	5	12	12(1)	9	7	10	12
b	6	14	13	11	7	12	12
c	11	13	10	8	9	13	9
d	7	11	12	10	4	11	9

Comments/Observations:
0970 B-1 NS
72 C-1 NS
0974 A-1 NS B-1 NS
0976 A-1 NS B-1 NS

replicate	2021-0970 Day 32 Alive Hatched	2021-0971 Day 32 Alive Hatched	2021-0972 Day 32 Alive Hatched	2021-0973 Day 32 Alive Hatched	2021-0974 Day 32 Alive Hatched	2021-0975 Day 32 Alive Hatched	2021-0976 Day 32 Alive Hatched
a	5	12	12(1)	9	7	16	12
b	6	14	13	11	7	12	12
c	11	13	16	8	9	13	9
d	7	11	12	16	4 MD	11	9

Comments/Observations:
0970 B-1 NS
72 C-1 NS
0974 A-1 NS B-1 NS
0976 A-1 NS B-1 NS

Reviewed By: MG Date Reviewed: 2021/05/11

NAUTILUS

Fathead Minnow Bench Sheet

Method: FMD 32 Day ELS Client: NAU104 Sample: 2021-0970, 2021-0971, 2021-0972, 2021-0973, 2021-0974, 2021-0975, 2021-0976 (20 ug/L Cu)

New Solutions

Conc (%)	2021-0970	2021-0971	2021-0972	2021-0973	2021-0974	2021-0975	2021-0976
Day							
pH (units)							
0	8.3	8.3	8.2	8.4	8.3	8.3	8.2
1	8.3	8.4	8.2	8.3	8.3	8.3	8.2
2	8.2	8.2	8.0	8.2	8.0	8.0	7.9
3	8.2	8.2	7.9	8.2	8.2	8.0	8.0
4	8.2	8.3	8.2	8.2	8.1	8.0	8.2
5	8.3	8.2	8.2	8.4	8.2	8.2	8.2
6	8.2	8.2	7.9	8.2	8.2	8.2	8.1
7	8.3	8.3	7.8	8.2	8.1	8.2	8.2
8	8.2	8.3	8.0	8.1	8.1	8.1	8.0
Conductance (µS/cm)							
0	1442	473	1164	1462	1128	1121	1513
1	1460	430	1159	1461	1200	1108	1504
2	1343	354	1153	1405	1145	1130	1464
3	1362	348	1130	1437	1118	1121	1456
4	1380	429	1130	1307	1131	1091	1401
5	1329	303	1163	1235	1085	1080	1432
6	1402	293	1162	1288	1051	1090	1407
7	1422	281	1203	1282	1075	1092	1448
8	1432	299	1183	1295	1177	1125	1461
Dissolved Oxygen (mg/L) (60-100% saturation)							
0	7.3	7.3	7.3	7.3	7.3	7.3	7.3
1	7.3	7.3	7.3	7.3	7.3	7.3	7.3
2	7.3	7.3	7.3	7.3	7.3	7.3	7.3
3	7.2	7.2	7.3	7.2	7.3	7.3	7.3
4	7.3	7.3	7.3	7.3	7.3	7.3	7.3
5	7.3	7.3	7.3	7.3	7.3	7.3	7.3
6	7.3	7.3	7.3	7.3	7.3	7.3	7.3
7	7.3	7.3	7.3	7.3	7.3	7.3	7.3
8	7.3	7.3	7.3	7.3	7.3	7.3	7.3
Temperature (°C)							
0	24	24	24	24	24	24	24
1	24	24	24	24	24	24	24
2	24	24	24	24	24	24	24
3	25	25	24	24	24	24	24
4	24	24	24	24	24	24	24
5	24	24	24	24	24	24	24
6	24	24	24	24	24	24	24
7	24	24	24	24	24	24	24
8	24	24	24	24	24	24	24

Old Solutions

Conc (%)	2021-0970	2021-0971	2021-0972	2021-0973	2021-0974	2021-0975	2021-0976
Day							
pH (units)							
0							
1	8.3	8.3	8.1	8.3	8.1	8.2	8.1
2	8.3	8.4	8.1	8.3	8.1	8.1	8.0
3	8.2	8.3	8.0	8.2	8.0	8.0	7.8
4	8.2	8.3	8.0	8.2	8.1	8.1	7.9
5	8.1	8.3	8.0	8.2	8.1	8.1	8.0
6	8.1	8.2	7.9	8.1	7.9	7.9	7.7
7	8.1	8.2	7.8	8.1	7.9	7.9	7.7
8	8.1	8.3	7.9	8.1	8.0	8.0	7.8
Conductance (µS/cm)							
0							
1	1438	446	1171	1452	1189	1170	1471
2	1389	487	1119	1409	1132	1138	1427
3	1400	474	1112	1411	1134	1139	1414
4	1395	426	1122	1424	1148	1151	1425
5	1353	457	1104	1431	1149	1150	1399
6	1386	440	1156	1315	1113	1126	1406
7	1419	246	1170	1296	1049	1058	1371
8	1410	389	1167	1394	1103	1119	1402
Dissolved Oxygen (mg/L) (60-100% saturation)							
0							
1	7.2	7.2	7.2	7.2	7.1	7.2	7.2
2	7.1	7.1	7.1	7.1	7.1	7.1	7.2
3	7.2	7.3	7.2	7.2	7.2	7.2	7.3
4	7.2	7.3	7.3	7.3	7.3	7.3	7.3
5	7.2	7.2	7.2	7.2	7.2	7.2	7.2
6	7.1	7.2	7.2	7.1	7.0	7.0	7.0
7	7.2	7.2	7.1	7.1	7.1	7.1	7.1
8	7.3	7.2	7.2	7.2	7.3	7.2	7.2
Temperature (°C)							
0							
1	24	24	24	24	24	24	24
2	24	24	24	24	24	24	24
3	24	24	24	24	24	24	24
4	24	24	24	24	24	24	24
5	24	24	24	24	24	24	24
6	24	24	24	24	24	24	24
7	24	24	24	24	24	24	24
8	24	24	24	24	24	24	24

DO Levels (60-100% saturation) -
4.4 to 7.3 mg/L at 24°C
4.3 to 7.2 mg/L at 25°C
4.2 to 7.0 mg/L at 26°C

Comments:

Reviewed By: ML Date Reviewed: 2021/05/06

NAUTILUS

Fathead Minnow Bench Sheet

Method FMD 32 Day ELS Client NAU104 Sample 2021-0970, 2021-0971, 2021-0972, 2021-0973, 2021-0974, 2021-0975, 2021-0976 (20 ug/L Cu)

New Solutions

Conc. (%)	2021-0970	2021-0971	2021-0972	2021-0973	2021-0974	2021-0975	2021-0976
Day							
pH (units)							
9	8.2	8.1	8.0	8.2	8.1	8.0	8.0
10	8.1	8.2	8.1	8.2	8.1	8.1	8.1
11	8.3	8.3	8.3	8.2	8.1	8.2	8.0
12	8.2	8.2	7.8	8.2	8.1	8.2	8.1
13	8.3	8.2	7.9	8.3	8.3	8.3	8.0
14	8.2	8.4	8.0	8.3	8.3	8.3	8.0
15	8.3	8.2	8.1	8.3	8.3	8.3	8.1
16	8.2	8.1	8.1	8.3	8.3	8.3	8.1
17	8.3	8.3	8.1	8.3	8.3	8.1	8.0
Conductance (µS/cm)							
9	1389	306	1184	1312	1102	1123	1443
10	1353	298	1160	1283	1080	1116	1406
11	1408	290	1165	1266	1110	1106	1431
12	1136	247	1203	1107	982	952	1377
13	1097	281	1192	1071	974	952	1349
14	1016	240	1188	1080	930	901	1313
15	1114	767	1194	1108	973	937	1349
16	1154	260	1209	1149	999	969	1408
17	1190	262	1246	1173	1033	1023	1439
Dissolved Oxygen (mg/L) (60-100% saturation)							
9	7.3	7.3	7.3	7.2	7.3	7.3	7.3
10	7.3	7.3	7.3	7.3	7.3	7.3	7.3
11	7.3	7.3	7.3	7.3	7.3	7.3	7.3
12	7.3	7.3	7.3	7.3	7.3	7.3	7.3
13	7.3	7.1	7.1	7.1	7.1	7.3	7.3
14	7.3	7.3	7.3	7.3	7.3	7.3	7.3
15	7.3	7.3	7.3	7.3	7.3	7.3	7.3
16	7.3	7.3	7.3	7.3	7.3	7.3	7.3
17	7.2	7.3	7.1	7.1	7.1	7.2	7.2
Temperature (°C)							
9	24	24	24	24	24	24	24
10	24	24	24	24	24	24	24
11	24	24	24	24	24	24	24
12	24	24	24	24	24	24	24
13	24	26	26	26	25	24	24
14	24	24	24	24	24	24	24
15	24	24	24	24	24	24	24
16	24	24	24	24	24	24	24
17	25	24	26	26	26	25	25

Old Solutions

Conc. (%)	2021-0970	2021-0971	2021-0972	2021-0973	2021-0974	2021-0975	2021-0976
Day							
pH (units)							
9	8.1	8.3	7.9	8.0	8.0	8.0	7.8
10	8.1	8.1	7.8	8.0	7.9	7.9	7.8
11	8.0	8.1	7.8	8.0	7.9	7.9	7.7
12	8.1	8.2	8.0	8.1	8.1	8.0	7.8
13	8.2	8.0	7.9	8.1	8.1	8.1	7.9
14	8.1	8.0	7.8	8.1	8.0	8.1	7.8
15	8.1	8.1	7.8	8.1	8.0	8.1	7.7
16	8.1	8.1	7.8	8.0	8.0	8.1	7.8
17	8.2	8.2	7.9	8.0	8.1	8.1	7.9
Conductance (µS/cm)							
9	1315	295	1162	1296	1112	1127	1447
10	1309	303	1178	1316	1125	1137	1437
11	1420	310	1158	1294	1104	1119	NO1
12	1336	295	1179	1318	1109	1116	1427
13	1122	326	1211	1177	1033	1011	1342
14	1115	300	1137	1109	1001	977	1315
15	1103	322	1146	1129	1001	974	1324
16	1201	352	1260	1230	1087	1054	1430
17	1177	335	1224	1227	1088	1061	1420
Dissolved Oxygen (mg/L) (60-100% saturation)							
9	7.1	7.1	7.1	7.1	7.0	7.0	7.0
10	7.0	7.2	7.2	7.3	7.2	7.3	7.3
11	7.0	6.9	6.8	6.8	6.7	6.8	6.9
12	7.2	7.2	7.2	7.2	7.1	7.1	7.0
13	7.0	6.9	6.9	6.9	6.9	6.9	6.8
14	6.9	6.9	6.8	6.8	6.7	6.8	6.8
15	7.0	6.9	6.7	6.5	6.5	6.7	6.9
16	7.0	6.9	6.7	6.5	6.3	6.2	6.1
17	6.7	6.6	6.5	6.5	6.5	6.5	6.3
Temperature (°C)							
9	24	24	24	24	24	24	24
10	24	24	24	24	24	24	24
11	24	24	24	24	24	24	24
12	24	24	24	24	24	24	24
13	24	24	24	24	24	24	24
14	24	24	24	24	24	24	24
15	24	24	24	24	24	24	24
16	24	24	24	24	24	24	24
17	24	24	24	24	24	24	24

DO Levels (60-100% saturation) -
4.4 to 7.3 mg/L at 24°C
4.3 to 7.2 mg/L at 25°C
4.2 to 7.0 mg/L at 26°C

Comments:

Reviewed By _____ Date Reviewed 2021/05/06

NAUTILUS ENVIRONMENTAL

Fathead Minnow Bench Sheet

Method FMD 32 Day ELS Client NAU104 Sample 2021-0970, 2021-0971, 2021-0972, 2021-0973, 2021-0974, 2021-0975, 2021-0976 (20 ug/L Cu)

New Solutions

Conc (%)	2021-0970	2021-0971	2021-0972	2021-0973	2021-0974	2021-0975	2021-0976
Day							

Old Solutions

2021-0970	2021-0971	2021-0972	2021-0973	2021-0974	2021-0975	2021-0976

pH (units)

Day							
18	8.2	8.1	8.1	8.3	8.2	8.1	8.0
19	8.2	8.2	8.1	8.4	8.3	8.3	8.3
20	8.3	8.2	8.2	8.3	8.2	8.3	8.3
21	8.2	8.1	8.1	8.3	8.3	8.2	8.3
22	8.3	8.3	8.2	8.4	8.3	8.4	8.2
23	8.3	8.3	8.1	8.3	8.4	8.3	8.3
24	8.3	8.1	8.1	8.3	8.3	8.3	8.2
25	8.4	8.3	8.2	8.5	8.4	8.4	8.4
26	8.2	8.1	8.1	8.2	8.2	8.2	8.1

pH (units)

Day							
18	8.1	8.0	7.8	8.1	8.0	8.0	7.9
19	8.1	8.0	7.8	8.1	8.0	8.0	7.8
20	8.2	8.0	7.8	8.2	8.1	8.1	7.9
21	8.2	8.2	8.0	8.2	8.2	8.2	8.0
22	8.2	8.0	7.9	8.2	8.2	8.1	7.9
23	8.2	8.0	7.8	8.1	8.1	8.2	7.9
24	8.1	8.2	7.9	8.1	8.1	8.1	7.9
25	8.3	8.2	8.0	8.2	8.2	8.2	8.0
26	8.0	8.0	7.8	8.0	8.1	8.0	7.8

Conductance (µS/cm)

Day							
18	1162	1167	1273	1161	1011	1027	1152
19	1182	1240	1279	1150	1034	1032	1351
20	1196	1243	1255	1182	1012	1032	1335
21	1178	1265	1247	1160	1000	1001	1330
22	1144	1214	1216	1158	1058	1024	1295
23	1167	1245	1216	1173	1053	1023	1319
24	1205	1237	1251	1180	1071	1083	1321
25	1218	1258	1249	1172	1082	1084	1325
26	1187	1235	1242	1206	1146	1153	1324

Conductance (µS/cm)

Day							
18	1212	1272	1277	1232	1087	1067	1413
19	1240	1342	1305	1233	1086	1088	1412
20	1213	1315	1238	1211	1088	1065	1340
21	1206	1324	1210	1190	1087	1067	1331
22	1172	1331	1185	1193	1089	1064	1312
23	1172	1340	1162	1183	1080	1059	1301
24	1174	1368	1173	1192	1085	1083	1305
25	1157	1300	1190	1194	1080	1090	1317
26	1204	1315	1205	1197	1084	1082	1323

Dissolved Oxygen (mg/L) (60-100% saturation)

Day							
18	7.3	7.3	7.3	7.3	7.3	7.3	7.3
19	7.3	7.3	7.3	7.3	7.3	7.3	7.3
20	7.3	7.3	7.3	7.3	7.3	7.3	7.3
21	7.3	7.3	7.3	7.3	7.3	7.3	7.3
22	7.1	7.0	6.9	7.0	7.1	7.1	6.9
23	7.3	7.3	7.3	7.3	7.3	7.3	7.3
24	7.3	7.3	7.3	7.3	7.3	7.3	7.3
25	7.3	7.3	7.3	7.3	7.3	7.3	7.3
26	7.3	7.3	7.3	7.3	7.3	7.3	7.3

Dissolved Oxygen (mg/L) (60-100% saturation)

Day							
18	6.2	6.1	6.1	6.0	6.2	6.2	5.8
19	5.8	5.8	5.8	5.7	5.8	5.9	5.6
20	6.1	6.0	5.9	5.8	5.9	5.9	5.7
21	6.5	6.5	6.7	6.7	6.6	6.7	6.8
22	6.7	6.6	6.2	6.2	6.3	6.4	6.0
23	6.7	6.1	6.2	6.0	6.2	6.1	5.7
24	6.6	6.6	6.6	6.4	6.5	6.0	5.8
25	6.7	6.6	6.6	6.4	6.5	6.6	6.5
26	6.5	6.5	6.6	6.0	6.1	6.0	5.8

Temperature (°C)

Day							
18	24	24	24	24	24	24	24
19	24	24	24	24	24	24	24
20	24	24	24	24	24	24	24
21	24	24	24	24	24	24	24
22	25	26	26	26	25	24	26
23	24	24	24	24	24	24	24
24	24	24	24	24	24	24	24
25	24	24	24	24	24	24	24
26	24	24	24	24	24	24	24

Temperature (°C)

Day							
18	24	24	24	24	24	24	24
19	24	24	24	24	24	24	24
20	24	24	24	24	24	24	24
21	24	24	24	24	24	24	24
22	24	24	24	24	24	24	24
23	24	24	24	24	24	24	24
24	24	24	24	24	24	24	24
25	24	24	24	24	24	24	24
26	24	24	24	24	24	24	24

DO Levels (60-100% saturation) -
4.4 to 7.3 mg/L at 24°C
4.3 to 7.2 mg/L at 25°C
4.2 to 7.0 mg/L at 26°C

Comments:

Reviewed By: MG Date Reviewed: 2021/05/06

NAUTILUS

Fathead Minnow Bench Sheet

Method: FMD 32 Day ELS | Client: NAU104 | Sample: 2021-0970, 2021-0971, 2021-0972, 2021-0973, 2021-0974, 2021-0975, 2021-0976 (20 ug/L Cu)

New Solutions

Conc. (%) / Day	2021-0970	2021-0971	2021-0972	2021-0973	2021-0974	2021-0975	2021-0976
pH (units)							
27	8.2	8.1	8.1	8.3	8.2	8.2	8.1
28	8.1	8.2	8.2	8.1	8.2	8.1	8.1
29	8.3	8.3	8.2	8.4	8.2	8.3	8.2
30	8.2	8.1	8.0	8.1	8.1	8.2	8.1
31	8.1	8.1	8.1	8.3	8.1	8.1	8.2
32							
Conductance (µS/cm)							
27	1359	1291	1247	1188	1140	1161	1302
28	1301	1210	1201	1230	1155	1181	1195
29	1208	1272	1233	1275	1150	1163	1365
30	1367	1201	1266	1266	1111	1153	1343
31	1287	1209	1251	1265	1140	1148	1302
32							
Dissolved Oxygen (mg/L) (60-100% saturation)							
27	7.3	7.3	7.3	7.3	7.3	7.3	7.3
28	7.3	7.3	7.3	7.3	7.3	7.3	7.3
29	7.3	7.3	7.3	7.2	7.3	7.3	7.3
30	7.3	7.3	7.3	7.3	7.3	7.3	7.3
31	7.3	7.3	7.3	7.3	7.3	7.3	7.3
32							
Temperature (°C)							
27	24	24	24	24	24	24	24
28	24	24	24	24	24	24	24
29	24	24	24	24	24	24	24
30	24	24	24	24	24	24	24
31	24	24	24	24	24	24	24
32							

Old Solutions

Conc. (%) / Day	2021-0970	2021-0971	2021-0972	2021-0973	2021-0974	2021-0975	2021-0976
pH (units)							
27	8.1	8.1	7.9	8.1	8.1	8.1	8.0
28	8.0	7.9	7.8	8.0	8.0	8.0	7.8
29	8.1	8.1	7.9	8.1	8.0	M	7.9
30	8.1	8.1	7.8	8.1	8.0	8.0	8.7
31	8.0	8.0	7.8	8.0	8.0	8.0	7.9
32	8.1	8.1	7.8	7.9	8.1	8.0	7.9
Conductance (µS/cm)							
27	1341	1353	1252	1303	1162	1163	1301
28	1349	1283	1248	1315	1173	1149	1190
29	1322	1282	1236	1311	1173	1195	1315
30	1306	1278	1190	1194	1165	1164	1314
31	1335	1308	1245	1214	1170	1163	1302
32	1271	1350	1182	1165	1154	1172	1330
Dissolved Oxygen (mg/L) (60-100% saturation)							
27	6.8	6.7	6.7	6.6	6.5	6.6	6.5
28	6.9	6.6	6.5	6.7	6.3	6.3	6.0
29	6.8	6.3	6.2	6.2	6.2	6.3	6.3
30	6.1	6.1	5.9	6.8	5.8	6.1	5.8
31	6.6	6.5	6.2	6.0	6.2	6.1	5.9
32	6.5	6.5	6.4	6.3	6.2	6.2	6.2
Temperature (°C)							
27	24	24	24	24	24	24	24
28	24	24	24	24	24	24	24
29	24	24	24	24	24	24	24
30	24	24	24	24	24	24	24
31	24	24	24	24	24	24	24
32	24	24	24	24	24	24	24

DO Levels (60-100% saturation) -
4.4 to 7.3 mg/L at 24°C
4.3 to 7.2 mg/L at 25°C
4.2 to 7.0 mg/L at 26°C

Comments:

Reviewed By: MG | Date Reviewed: 2021/05/06

NAUTILUS ENVIRONMENTAL

Fathead Minnow Bench Sheet

Method FMD 32 Day ELS Client NAU104 Sample: 2021-0970, 2021-0971, 2021-0972, 2021-0973, 2021-0974, 2021-0975, 2021-0976 (20 ug/L Cu)

Test Termination

For normal/abnormal column, use the following notation:

N=Normal, A= Abnormal And note location: H=head, O=oral, E=eyes, G=gills, F=fins, S=spine

Conc

2021-0970

Fish	Replicate # A Length (mm)	Normal/ Abnormal	Replicate # B Length (mm)	Normal/ Abnormal	Replicate # C Length (mm)	Normal/ Abnormal	Replicate # D Length (mm)	Normal/ Abnormal
1	8	N	7	N	10	N	15	N
2	11		13		11		11	
3	13		10		9		13	
4	14		13		8		11	
5	14		9		10		11	
6			13	NS	9		10	
7					12		9	
8					11			
9					10			
10					13			
11					12			
12								
13								
14								
15								

Comments

2021-0971

Fish	Replicate # A Length (mm)	Normal/ Abnormal	Replicate # B Length (mm)	Normal/ Abnormal	Replicate # C Length (mm)	Normal/ Abnormal	Replicate # D Length (mm)	Normal/ Abnormal
1	6	N	11	N	12	N	10	N
2	8		8		12		9	
3	8		8		11		13	
4	11		14		7		13	
5	14		8		7		14	
6	10		9		8		11	
7	9		10		10		13	
8	11		8		11		11	
9	6		8		13		11	
10	10		12		12		12	
11	13		9		11		12	
12	13		10		10			
13			9		8			
14			12					
15								

Comments

Reviewed By: ML Date Reviewed: 2021/05/04

Method FMD 32 Day ELS Client NAU104 Sample: 2021-0970, 2021-0971, 2021-0972, 2021-0973, 2021-0974, 2021-0975, 2021-0976 (20 ug/L Cu)

Test Termination

For normal/abnormal column, use the following notation:

N=Normal, A= Abnormal And note location: H=head, O=oral, E=eyes, G=gills, F=fins, S=spine

Conc 2021-0972

Fish	A Length (mm)	A Normal/ Abnormal	B Length (mm)	B Normal/ Abnormal	C Length (mm)	C Normal/ Abnormal	D Length (mm)	D Normal/ Abnormal
1	10	N	9	N	10	AS	11	N
2	7		10		11	AS	12	
3	10		9		10	N	10	
4	13		12		11		11	
5	10		9		11		9	
6	12		11		10		10	
7	11		11		12		13	
8	9		5		12		11	
9	11		11		8		12	
10	8		9		11		11	
11	12		11				12	
12	11		13				11	
13			10					
14								
15								

Comments

2021-0973

Fish	A Length (mm)	A Normal/ Abnormal	B Length (mm)	B Normal/ Abnormal	C Length (mm)	C Normal/ Abnormal	D Length (mm)	D Normal/ Abnormal
1	9	N	13	N	10	N	12	N
2	11		11		11		10	
3	9		8		15		10	
4	8		10		10		11	
5	13		9		10		12	
6	12		11		11		12	
7	12		9		11		12	
8	11		12		11		12	
9	13		9				14	
10			12				14	
11			11					
12								
13								
14								
15								

Comments

Reviewed By: MG Date Reviewed: 2021/05/04

NAUTILUS

Fathead Minnow Bench Sheet

Method FMD 32 Day ELS Client NAU104 Sample: 2021-0970, 2021-0971, 2021-0972, 2021-0973, 2021-0974, 2021-0975, 2021-0976 (20 ug/L Cu)

Test Termination

For normal/abnormal column, use the following notation:

N=Normal, A= Abnormal And note location: H=head, O=oral, E=eyes, G=gills, F=fins, S=spine

Conc **2021-0974**

Replicate # A			Replicate # B			Replicate # C			Replicate # D		
Fish	Length (mm)	Normal/ Abnormal	Fish	Length (mm)	Normal/ Abnormal	Fish	Length (mm)	Normal/ Abnormal	Fish	Length (mm)	Normal/ Abnormal
1	9	N	1	9	N	1	12	N	1	13	N
2	4	A	2	9		2	11		2	14	
3	9	N	3	9		3	10		3	11	
4	9		4	14		4	11		4	12	
5	14		5	12		5	11		5		
6	10		6	5	A	6	11		6		
7	10		7	5	N	7	10		7		
8			8			8	13		8		
9			9			9	10		9		
10			10			10			10		
11			11			11			11		
12			12			12			12		
13			13			13			13		
14			14			14			14		
15			15			15			15		

Comments

2021-0975

Replicate # A			Replicate # B			Replicate # C			Replicate # D		
Fish	Length (mm)	Normal/ Abnormal	Fish	Length (mm)	Normal/ Abnormal	Fish	Length (mm)	Normal/ Abnormal	Fish	Length (mm)	Normal/ Abnormal
1	11	N	1	8	N	1	11	N	1	12	N
2	9		2	10		2	8		2	11	
3	11		3	11		3	10		3	10	
4	10		4	12		4	11		4	7	
5	11		5	9		5	14		5	14	
6	12		6	12		6	10		6	12	
7	13		7	11		7	9		7	11	
8	10		8	9		8	13		8	13	
9	13		9	13		9	11		9	14	
10	12		10	12		10	8		10	10	
11			11	12		11	9		11	13	
12			12	10		12	8		12		
13			13			13	11		13		
14			14			14			14		
15			15			15			15		

Comments

Reviewed By: MG Date Reviewed: 2021/05/04

Method FMD 32 Day ELS Client NAU104 Sample: 2021-0970, 2021-0971, 2021-0972, 2021-0973, 2021-0974, 2021-0975, 2021-0976 (20 ug/L Cu)

Test Termination

For normal/abnormal column, use the following notation:

N=Normal, A= Abnormal And note location: H=head, O=oral, E=eyes, G=gills, F=fins, S=spine

Conc

2021-0976

Replicate # A		
Fish	Length (mm)	Normal/ Abnormal
1	12	N
2	7	A/
3	12	N
4	12	
5	12	
6	10	
7	12	
8	10	
9	10	
10	9	
11	8	
12	5	
13		
14		
15		

Replicate # B		
Fish	Length (mm)	Normal/ Abnormal
1	8	N
2	14	
3	10	
4	11	
5	11	
6	7	N
7	12	N
8	11	
9	7	
10	12	
11	10	
12	7	
13		
14		
15		

Replicate # C		
Fish	Length (mm)	Normal/ Abnormal
1	9	N
2	13	
3	10	
4	14	
5	10	
6	11	
7	13	
8	14	
9	12	
10		
11		
12		
13		
14		
15		

Replicate # D		
Fish	Length (mm)	Normal/ Abnormal
1	12	N
2	13	
3	10	
4	15	
5	12	
6	11	
7	13	
8	11	
9	8	
10		
11		
12		
13		
14		
15		

Comments

Reviewed By: ML Date Reviewed: 2021/05/04

NAUTILUS

Fathead Minnow Bench Sheet

Method FMD 32 Day ELS Client NAU104 Sample 2021-0970, 2021-0971, 2021-0972, 2021-0973, 2021-0974, 2021-0975, 2021-0976 (20 ug/L Cu)

Date of change 20211031111(PM) **Day of change** 5

Volume (mL) of *Artemia* Fed to Each Test Replicate of Each Sample / Concentration							
Replicate	2021-0970	2021-0971	2021-0972	2021-0973	2021-0974	2021-0975	2021-0976
A	0.5ml	0.5ml	0.5	0.5	0.5	0.5	0.5
B	↓	↓	↓	↓	↓	↓	↓
C	↓	↓	↓	↓	↓	↓	↓
D	↓	↓	↓	↓	↓	↓	↓

Date of change 20211103115(PM **Day of change** 9

Volume (mL) of *Artemia* Fed to Each Test Replicate of Each Sample / Concentration							
Replicate	2021-0970	2021-0971	2021-0972	2021-0973	2021-0974	2021-0975	2021-0976
A	~~1.5~~	1.5	1.5	1.0	1.0	1.5	1.5
B	↓	↓	↓	1.5	1.0	↓	↓
C	↓	↓	↓	1.5	1.5	↓	↓
D	↓	↓	↓	1.0	1.0	↓	↓

Date of change 20211103117 **Day of change** 11

Volume (mL) of *Artemia* Fed to Each Test Replicate of Each Sample / Concentration							
Replicate	2021-0970	2021-0971	2021-0972	2021-0973	2021-0974	2021-0975	2021-0976
A	1.5	2	2	1.5	1.0	2	2
B	↓	↓	↓	2	1.0	↓	↓
C	↓	↓	↓	2	1.5	↓	↓
D	↓	↓	↓	1.5	1.0	↓	↓

Date of change 20211103120(PM) **Day of change** 14

Volume (mL) of *Artemia* Fed to Each Test Replicate of Each Sample / Concentration							
Replicate	2021-0970	2021-0971	2021-0972	2021-0973	2021-0974	2021-0975	2021-0976
A	1.5	2.5	2.5	2	1	2.5	2.5
B	1.5	↓	↓	2.5	1	↓	↓
C	2.5	↓	↓	2.5	2	↓	↓
D	1.5	↓	↓	2.5	1	↓	↓

***Feeding volume is maintained following a feeding change until a new feeding regime is recorded**

NAUTILUS ENVIRONMENTAL

Fathead Minnow Bench Sheet

Method FMD 32 Day ELS Client NAU104 Sample 2021-0970, 2021-0971, 2021-0972, 2021-0973, 2021-0974, 2021-0975, 2021-0976 (20 ug/L Cu)

Date of change 20211031 30 (PM) **Day of change** 24

Volume (mL) of *Artemia* Fed to Each Test Replicate of Each Sample / Concentration							
Replicate	2021-0970	2021-0971	2021-0972	2021-0973	2021-0974	2021-0975	2021-0976
A	2.0	3.0	3.0	2.5	1.5	3.0	3.0
B	2.0	↓	↓	3.0	1.5	↓	↓
C	3.0	↓	↓	3.0	2.5	↓	↓
D	2.0	↓	↓	3.0	1.5	↓	↓

Date of change _____ **Day of change** _____

Volume (mL) of *Artemia* Fed to Each Test Replicate of Each Sample / Concentration							
Replicate	2021-0970	2021-0971	2021-0972	2021-0973	2021-0974	2021-0975	2021-0976
A							
B							
C							
D							

Date of change _____ **Day of change** _____

Volume (mL) of *Artemia* Fed to Each Test Replicate of Each Sample / Concentration							
Replicate	2021-0970	2021-0971	2021-0972	2021-0973	2021-0974	2021-0975	2021-0976
A							
B							
C							
D							

Date of change _____ **Day of change** _____

Volume (mL) of *Artemia* Fed to Each Test Replicate of Each Sample / Concentration							
Replicate	2021-0970	2021-0971	2021-0972	2021-0973	2021-0974	2021-0975	2021-0976
A							
B							
C							
D							

***Feeding volume is maintained following a feeding change until a new feeding regime is recorded**

NAUTILUS ENVIRONMENTAL

Fathead Minnow Bench Sheet

Method: FMD 32 Day ELS | Client: NAU104 | Sample: 2021-0977, 2021-0980, 2021-0981, 2021-0982, 2021-0985, 2021-0986, 2021-0988 (20 ug/L Cu)

Organism Information

Source: Aquatoy | Batch: 20210306FM-ELS | Egg Stage: 16 somites | Organisms Received in Good Condition: (Yes) / No

Test Log

Date	Day	Time	Technicians	Chem Cart Used	Fed AM	Fed PM	Sample Pre-Aeration Time	Bench Sheet Review First
2021/03/06	0	1515	SS/DM/KK	2	—	—	60 mins	
2021/03/07	1	0951	CB	2	—	—	60 mins	
2021/03/08	2	1020	ST	2	—	—	60 min	SC
2021/03/09	3	0940	ST	2	—	—	60 min	AW
2021/03/10	4	1030	KK	2	—	—	60mins	AW
2021/03/11	5	0945	ST	2	—	✓	60 mins	MF
2021/03/12	6	0935	ST/MW	2	✓	✓	60 mins	AW
2021/03/13	7	1150	KK	2	✓	✓	60mins	AW
2021/03/14	8	1113	CB	2	✓	✓	60mins	MF
2021/03/15	9	1030	ST	2	✓	✓	60 mins	SC
2021/03/16	10	0945	KK	2	✓	✓	60mins	SC
2021/03/17	11	1100	ST/SC	2	✓	✓	60 mins	SC
2021/03/18	12	1125	ST	2	✓	✓	60 mins	SC
2021/03/19	13	1110	ST	2	✓	✓	60 mins	KK
2021/03/20	14	1110	AW	2	✓	✓	60 mins	KK
2021/03/21	15	1330	MW	2	✓	✓	60 min	ST
2021/03/22	16	1130	ST	2	✓	✓	60mins	MW
2021/03/23	17	1130	MW	2	✓	✓	60 mins	AW
2021/03/24	18	1100	SC	2	✓	✓	60 mins	KK
2021/03/25	19	1050	SC	2	✓	✓	60 mins	ST
2021/03/26	20	1150	AW/MF	2	✓	✓	60 mins	AW
2021/03/27	21	1150	SC/MF	2	✓	✓	60 mins	AW
2021/03/28	22	1115	MW	2	✓	✓	60 mins	—
2021/03/29	23	1330	KK	2	✓	✓	60mins	AW
2021/03/30	24	1100	AW/ST	2	✓	✓	60 mins	KK
2021/03/31	25	0930	KK	2	✓	✓	60mins	AW
2021/04/01	26	1130	MF/MW	2	✓	✓	60 mins	AW
2021/04/02	27	0930	SC/MF	2	✓	✓	60 mins	AW
2021/04/03	28	1200	MF/SC	2	✓	✓	60 mins	AW
2021/04/04	29	1130	MW/ST	2	✓	✓	60 mins	MW
2021/04/05	30	1125	ST/AW	2	✓	✓	60 mins	MW
2021/04/06	31	1100	MF/MW	2	✓	✓	60mins	AW
2021/04/07	32	0940	CB/MW	2	—	—	—	AW

Reviewed By: MG | Date Reviewed: 2021/05/11

NAUTILUS

Fathead Minnow Bench Sheet

Method FMD 32 Day ELS Client NAU104 Sample: 2021-0977, 2021-0980, 2021-0981, 2021-0982, 2021-0985, 2021-0986, 2021-0988 (20 ug/L Cu)

Control hatching success must be >66% (≥10 per replicate). Post hatch survival must be >70%.

Number of Alive Embryos and Hatched Organisms

replicate	2021-0977 Day 1 Alive Embryos	2021-0977 Day 1 Dead Embryos	2021-0980 Day 1 Alive Embryos	2021-0980 Day 1 Dead Embryos	2021-0981 Day 1 Alive Embryos	2021-0981 Day 1 Dead Embryos	2021-0982 Day 1 Alive Embryos	2021-0982 Day 1 Dead Embryos	2021-0985 Day 1 Alive Embryos	2021-0985 Day 1 Dead Embryos	2021-0986 Day 1 Alive Embryos	2021-0986 Day 1 Dead Embryos	2021-0988 Day 1 Alive Embryos	2021-0988 Day 1 Dead Embryos
a	15	0	15	0	14	0	14	1	15	0	14	1	15	6
b	14	1	15	0	15	0	14	0	14	1	15	0	15	0
c	13	2	15	0	15	0	15	0	15	0	15	0	15	0
d	14	1	14	1	15	0	14	1	13	0	14	1	15	0
e	~~27~~ 28	~~1~~ 2	30	0	30	0	30	0	30	0	30	0	30	0
f	27	03	30	0	30	0	30	0	29	1	29	1	28	2

Comments/Observations:

Number of Alive Embryos and Hatched Organisms

replicate	2021-0977 Day 2 Alive Embryos	2021-0977 Day 2 Dead Embryos	2021-0977 Day 2 Cull to 15	2021-0980 Day 2 Alive Embryos	2021-0980 Day 2 Dead Embryos	2021-0980 Day 2 Cull to 15	2021-0981 Day 2 Alive Embryos	2021-0981 Day 2 Dead Embryos	2021-0981 Day 2 Cull to 15	2021-0982 Day 2 Alive Embryos	2021-0982 Day 2 Dead Embryos	2021-0982 Day 2 Cull to 15
a	15	0	15	15	0	15	14	0	15	14	0	15
b	14	0	15	15	0	15	15	0	15	14	0	15
c	13	0	15	15	0	15	15	0	15	15	0	15
d	15	0	15	13	1	15	14	1	15	14	0	15
e	27	1		30	0		29	1		30	0	
f	27	0		30	0		29	1		26	4	

replicate	2021-0985 Day 2 Alive Embryos	2021-0985 Day 2 Dead Embryos	2021-0985 Day 2 Cull to 15	2021-0986 Day 2 Alive Embryos	2021-0986 Day 2 Dead Embryos	2021-0986 Day 2 Cull to 15	2021-0988 Day 2 Alive Embryos	2021-0988 Day 2 Dead Embryos	2021-0988 Day 2 Cull to 15
a	15	0	15	14	0	15	15	0	15
b	14	0	15	15	0	15	15	0	15
c	15	0	15	15	0	15	14	1 mb	15
d	13 ~~14~~	mb 0	15	14	0	15	15	0	15
e	29	1		29	1		30	0	
f	29	0		24	0		28	3	

Day 2 - Poor looking and dead embryos in replicates a, b, c and d are replaced with healthy embryos from replicates e and f. Replicates e and f are discarded after day 2

Comments/Observations:

Reviewed By: MG Date Reviewed: 2021/05/11

NAUTILUS ENVIRONMENTAL

Fathead Minnow Bench Sheet

Method FMD 32 Day ELS Client NAU104 Sample: 2021-0977, 2021-0980, 2021-0981, 2021-0982, 2021-0985, 2021-0986, 2021-0988 (20 ug/L Cu)

Control hatching success must be >66% (≥10 per replicate). Post hatch survival must be >70%.

2021-0977

Day 3

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	13	0	2	0
b	11	1	3	0
c	6	0	9	0
d	6	0	9	0

2021-0980

Day 3

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	14	0	1	0
b	15	0	0	0
c	15	0	0	0
d	8	1	5	1

2021-0981

Day 3

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	14	1	0	0
b	13	0	2	0
c	14	0	1	0
d	14	0	1	0

2021-0982

Day 3

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	10	0	5	0
b	14	0	1	0
c	14	0	1	0
d	14	1	0	0

2021-0985

Day 3

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	13	0	2	0
b	15	0	0	0
c	11	0	4	0
d	12	0	3	0

2021-0986

Day 3

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	6	0	8	1
b	15	0	0	0
c	11	0	4	0
d	9	0	6	0

2021-0988

Day 3

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	12	0	3	0
b	14	0	1	0
c	11	0	4	0
d	10	2	3	0

[redacted]

2021-0977

Day 4

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	5	0	9	1
b	2	0	12	0
c	1	0	14(11)	0
d	1	0	13	1

2021-0980

Day 4

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	7	0	8	0
b	9	0	6	0
c	2	0	13	0
d	~~4~~ 3	0	10	0

2021-0981

Day 4

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	0	0	14	0
b	5	23	6	1
c	1	0	14	0
d	4	0	11	0

2021-0982

Day 4

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	1	0	14	0
b	4	0	11	0
c	0	0	15	0
d	8	0	5	1

2021-0985

Day 4

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	1	0	14	0
b	8	0	7	0
c	6	0	9	0
d	10	0	8	1

2021-0986

Day 4

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	1	0	13(14)	0
b	12	0	3	0
c	0	0	15	0
d	3	0	11	0

2021-0988

Day 4

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	3	0	12	0
b	3	0	12	0
c	2	0	13	0
d	3	0	10(11)	0

Comments/Observations

Reviewed By: MG Date Reviewed: 2021/05/11

NAUTILUS

Fathead Minnow Bench Sheet

Method FMD 32 Day ELS Client NAU104 Sample: 2021-0977, 2021-0980, 2021-0981, 2021-0982, 2021-0985, 2021-0986, 2021-0988 (20 ug/L Cu)

Control hatching success must be >66% (≥10 per replicate). Post hatch survival must be >70%.

2021-0977

Day 5

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	32	0	12	0
b	2	0	13	0
c	0	0	15	0
d	1	0	13	0

2021-0980

Day 5

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	0	0	15	0
b	2	0	13	0
c	0	0	15	0
d	0	0	13	0

2021-0981

Day 5

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	0	0	14	0
b	1	0	10	0
c	0	0	15	0
d	0	0	15	0

2021-0982

Day 5

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	0	0	15	0
b	0	0	15	0
c	0	0	15	0
d	1	0	12	0

2021-0985

Day 5

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	0	0	15	0
b	5	0	10	0
c	0	0	14	1
d	0	0	14	0

2021-0986

Day 5

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	0	0	14	0
b	2	0	13	0
c	0	0	15	0
d	0	0	14	0

2021-0988

Day 5

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	1	0	14	0
b	0	0	15	0
c	0	0	15	0
d	0	0	13	0

[redacted]

2021-0977

Day 6

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	1	0	13	0
b	2	0	12	0
c	0	0	15	0
d	1	0	13	0

2021-0980

Day 6

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	0	0	15	0
b	0	1	13	1
c	0	0	14	1
d	0	0	13	0

2021-0981

Day 6

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	0	0	14	0
b	0	0	10	1
c	0	0	15	0
d	0	0	14	1

2021-0982

Day 6

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	0	0	15	0
b	0	0	15	0
c	0	0	15	0
d	0	0	13	0

2021-0985

Day 6

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	0	0	14	1
b	0	0	14	1
c	0	0	14	0
d	0	0	14	0

2021-0986

Day 6

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	0	0	14	0
b	0	0	15	0
c	0	0	14	1
d	0	0	14	0

2021-0988

Day 6

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	1	0	12	2
b	0	0	14	1
c	0	0	15	0
d	0	0	10	3

Comments/Observations

Reviewed By: MG Date Reviewed: 2021/05/11

NAUTILUS ENVIRONMENTAL

Fathead Minnow Bench Sheet

Method FMD 32 Day ELS Client NAU104 Sample: 2021-0977, 2021-0980, 2021-0981, 2021-0982, 2021-0985, 2021-0986, 2021-0988 (20 ug/L Cu)

Number of Alive Embryos and Hatched Organisms

	2021-0977 Day 7	2021-0980 Day 7	2021-0981 Day 7	2021-0982 Day 7	2021-0985 Day 7	2021-0986 Day 7	2021-0988 Day 7
replicate	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched
a	12*	15	14	15	14	14	11
b	13	13	10(2)	15	13	15(1)	14
c	15(1)	14	15	15	14	14	15
d	13*	13	14	13	14	14	10

Comments/Observations:
0977A: 12 Hatched
1 alive embryo
0977D: 13 Hatched
1 alive Embryo

	2021-0977 Day 8	2021-0980 Day 8	2021-0981 Day 8	2021-0982 Day 8	2021-0985 Day 8	2021-0986 Day 8	2021-0988 Day 8
replicate	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched
a	12	14	14	15	14	14	11
b	13	13	10	15	13	15(1)	14
c	14	14	15	15	14	14	15
d	13	13	14	13	14	14	10

Comments/Observations:

	2021-0977 Day 9	2021-0980 Day 9	2021-0981 Day 9	2021-0982 Day 9	2021-0985 Day 9	2021-0986 Day 9	2021-0988 Day 9
replicate	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched
a	12	14	14	14	14	14	10(1)
b	13	13	10	15	13	15(1)	14
c	14	14	15	15	14	14(1)	15
d	13	13	14	13	14	14	10

Comments/Observations:

	2021-0977 Day 10	2021-0980 Day 10	2021-0981 Day 10	2021-0982 Day 10	2021-0985 Day 10	2021-0986 Day 10	2021-0988 Day 10
replicate	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched
a	12	14	13	14	14	14	10(1)
b	13	13	10	15	13	15(1)	14
c	14	14	15	15	14	14	15
d	13	13	14	13	14	14	10

Comments/Observations:

Reviewed By: MG Date Reviewed: 2021/05/11

NAUTILUS

Fathead Minnow Bench Sheet

Method FMD 32 Day ELS Client NAU104 Sample: 2021-0977, 2021-0980, 2021-0981, 2021-0982, 2021-0985, 2021-0986, 2021-0988 (20 ug/L Cu)

Number of Alive Embryos and Hatched Organisms

replicate	2021-0977 Day 11 Alive Hatched	2021-0980 Day 11 Alive Hatched	2021-0981 Day 11 Alive Hatched	2021-0982 Day 11 Alive Hatched	2021-0985 Day 11 Alive Hatched	2021-0986 Day 11 Alive Hatched	2021-0988 Day 11 Alive Hatched
a	12	14	13	14	14	14	10(1)
b	13	13	10(1)	15	13	15(1)	14
c	14	14	15	15	14(1)	14	15
d	13	13	13	13	14	14	10

Comments/Observations:

replicate	2021-0977 Day 12 Alive Hatched	2021-0980 Day 12 Alive Hatched	2021-0981 Day 12 Alive Hatched	2021-0982 Day 12 Alive Hatched	2021-0985 Day 12 Alive Hatched	2021-0986 Day 12 Alive Hatched	2021-0988 Day 12 Alive Hatched
a	12(1)	14(1)	13	14	14	~~14~~13	9
b	13(1)	13	10	15	13	15(1)	14
c	14	14	15	15	14(1)	14	15
d	13	13	13	13	14	14	10

Comments/Observations:

replicate	2021-0977 Day 13 Alive Hatched	2021-0980 Day 13 Alive Hatched	2021-0981 Day 13 Alive Hatched	2021-0982 Day 13 Alive Hatched	2021-0985 Day 13 Alive Hatched	2021-0986 Day 13 Alive Hatched	2021-0988 Day 13 Alive Hatched
a	11	14(1)	13	14	14	13	9
b	13(1)	13	10	15	12	15(1)	12
c	14	14	15	15	14(1)	14	15(1)
d	13	13	12	13	14	14	10

Comments/Observations:

replicate	2021-0977 Day 14 Alive Hatched	2021-0980 Day 14 Alive Hatched	2021-0981 Day 14 Alive Hatched	2021-0982 Day 14 Alive Hatched	2021-0985 Day 14 Alive Hatched	2021-0986 Day 14 Alive Hatched	2021-0988 Day 14 Alive Hatched
a	11	14(1)	13	14	14	13	9(1)
b	13(1)	13	9	15(1)	12	15(1)	12
c	14	14	15	15	14(1)	14	15(1)
d	13	13	12	13	14	14(1)	10

Comments/Observations:

Reviewed By: MG Date Reviewed: 2021/05/11

NAUTILUS ENVIRONMENTAL

Fathead Minnow Bench Sheet

Method FMD 32 Day ELS Client NAU104 Sample: 2021-0977, 2021-0980, 2021-0981, 2021-0982, 2021-0985, 2021-0986, 2021-0988 (20 ug/L Cu)

Number of Alive Embryos and Hatched Organisms

replicate	2021-0977 Day 15 Alive Hatched	2021-0980 Day 15 Alive Hatched	2021-0981 Day 15 Alive Hatched	2021-0982 Day 15 Alive Hatched	2021-0985 Day 15 Alive Hatched	2021-0986 Day 15 Alive Hatched	2021-0988 Day 15 Alive Hatched
a	11	13	13	14	14	13	9(1)
b	12	13	9	15(1)	12	15(1)	12
c	14	14	15	15	13	14	14
d	13	13	12	13	14	13	10

Comments/Observations:

replicate	2021-0977 Day 15 Alive Hatched	2021-0980 Day 16 Alive Hatched	2021-0981 Day 16 Alive Hatched	2021-0982 Day 16 Alive Hatched	2021-0985 Day 16 Alive Hatched	2021-0986 Day 16 Alive Hatched	2021-0988 Day 16 Alive Hatched
a	11	13	13	14	14	13	9(1)
b	12	12	9	15(1)	12	15(1)	12
c	14	14	15	15	13(1)	14	14
d	13	13	12	13*	14	13	10

Comments/Observations: * Microbial growth in jar 0985 C-1AS 0988 A-1AS

replicate	2021-0977 Day 17 Alive Hatched	2021-0980 Day 17 Alive Hatched	2021-0981 Day 17 Alive Hatched	2021-0982 Day 17 Alive Hatched	2021-0985 Day 17 Alive Hatched	2021-0986 Day 17 Alive Hatched	2021-0988 Day 17 Alive Hatched
a	11	13	13	14	14	13	9
b	12	12	9	15(1)	12	15(1)	12
c	14	14	15	15	13	14	14
d	13	13	12	13*	14	13	10

Comments/Observations: *Microbial in 0982-D Jar | 0985 C-1AS | 0988 A-1AS

replicate	2021-0977 Day 18 Alive Hatched	2021-0980 Day 18 Alive Hatched	2021-0981 Day 18 Alive Hatched	2021-0982 Day 18 Alive Hatched	2021-0985 Day 18 Alive Hatched	2021-0986 Day 18 Alive Hatched	2021-0988 Day 18 Alive Hatched
a	11	13	13	14	14	13	9
b	12	12	9	15(1)	12	15(1)	12
c	14	14	15	15	13	14	14
d	13	13	12	13*	14	13	10

Comments/Observations: *Microbial in 0982-D Jar 0985C-1AS

MG 2021/05/11

NAUTILUS

Fathead Minnow Bench Sheet

Method FMD 32 Day ELS Client NAU104 Sample 2021-0977, 2021-0980, 2021-0981, 2021-0982, 2021-0985, 2021-0986, 2021-0988 (20 ug/L Cu)

New Solutions

Conc (%)	2021-0977	2021-0980	2021-0981	2021-0982	2021-0985	2021-0986	2021-0988
Day							

pH (units)

Day							
0	8.2	8.4	8.1	8.3	8.3	8.3	8.2
1	8.3	8.4	8.4	8.2	8.3	8.0	8.2
2	8.3	8.3	8.3	8.3	8.2	8.0	8.1
3	8.2	8.3	8.3	8.3	8.2	8.2	8.2
4	8.2	8.3	8.3	8.2	8.2	8.1	8.1
5	8.3	8.3	8.3	8.2	8.3	8.2	8.2
6	8.2	8.3	8.3	8.2	8.1	8.1	8.2
7	8.2	8.2	8.3	7.9	8.2	8.0	8.1
8	8.2	8.2	8.3	8.1	8.2	8.2	8.1

Conductance (µS/cm)

Day							
0	852	720	635	998	1042	1326	997
1	939	730	669	991	1049	1341	1030
2	859	700	626	960	1011	1286	973
3	864	707	631	946	1006	1294	979
4	643	1001	602	929	969	1245	917
5	935	680	676	1280	1017	1263	851
6	932	700	641	1173	1020	1258	851
7	801	691	626	1241	1004	1231	854
8	964	699	639	1195	1006	1257	838

Dissolved Oxygen (mg/L) (60-100% saturation)

Day							
0	7.3	7.3	7.3	7.3	7.3	7.3	7.3
1	7.3	7.3	7.3	7.3	7.3	7.3	7.3
2	7.3	7.3	7.3	7.3	7.3	7.3	7.3
3	7.3	7.3	7.3	7.3	7.3	7.3	7.3
4	7.3	7.3	7.3	7.3	7.3	7.3	7.3
5	7.3	7.3	7.3	7.3	7.3	7.3	7.3
6	7.3	7.3	7.3	7.3	7.3	7.3	7.3
7	7.3	7.3	7.3	7.3	7.3	7.3	7.3
8	7.3	7.3	7.3	7.3	7.3	7.3	7.3

Temperature (°C)

Day							
0	24	24	24	24	24	24	24
1	24	24	24	24	24	24	24
2	24	24	24	24	24	24	24
3	24	24	24	24	24	24	24
4	24	24	24	24	24	24	24
5	24	24	24	24	24	24	24
6	24	24	24	24	24	24	24
7	24	24	24	24	24	24	24
8	24	24	24	24	24	24	24

Old Solutions

Conc (%)	2021-0977	2021-0980	2021-0981	2021-0982	2021-0985	2021-0986	2021-0988
Day							

pH (units)

Day							
0							
1	8.1	8.3	8.2	8.2	8.2	8.2	8.2
2	8.2	8.4	8.4	8.2	8.3	8.3	8.3
3	8.1	8.4	8.3	8.1	8.1	8.2	8.2
4	8.1	8.4	8.3	8.2	8.1	8.3	8.3
5	8.1	8.3	8.3	8.2	8.1	8.2	8.3
6	8.0	8.2	8.2	8.2	8.2	8.2	8.2
7	8.1	8.2	8.1	8.0	8.1	8.2	8.2
8	8.0	8.2	8.2	8.0	8.0	8.2	8.2

Conductance (µS/cm)

Day							
0							
1	924	763	674	984	1063	1337	1008
2	892	741	654	945	1022	1302	1024
3	896	739	648	955	1019	1301	1024
4	884	742	645	999	1085	1312	1024
5	891	754	650	931	1011	1338	1020
6	857	663	635	1162	1014	1277	826
7	871	677	602	1169	1013	1280	882
8	961	742	652	1212	1048	1295	930

Dissolved Oxygen (mg/L) (60-100% saturation)

Day							
0							
1	7.2	7.3	7.2	7.1	7.3	7.2	7.0
2	7.1	7.2	7.2	7.2	7.1	7.1	7.1
3	7.3	7.3	7.3	7.2	7.2	7.2	7.3
4	7.3	7.3	7.2	7.2	7.2	7.2	7.2
5	7.2	7.2	7.2	7.1	7.1	7.1	7.1
6	7.1	7.2	7.2	7.1	7.1	7.1	7.1
7	7.1	7.2	7.2	7.2	7.1	7.1	7.1
8	7.2	7.1	7.1	7.1	7.2	7.2	7.2

Temperature (°C)

Day							
0							
1	24	24	24	24	24	24	24
2	24	24	24	24	24	24	24
3	24	24	24	24	24	24	24
4	24	24	24	24	24	24	24
5	24	24	24	24	24	24	24
6	24	24	24	24	24	24	24
7	24	24	24	24	24	24	24
8	24	24	24	24	24	24	24

DO Levels (60-100% saturation) -
4.4 to 7.3 mg/L at 24°C
4.3 to 7.2 mg/L at 25°C
4.2 to 7.0 mg/L at 26°C

Comments:

Reviewed By: MH Date Reviewed: 2021/05/06

NAUTILUS ENVIRONMENTAL

Fathead Minnow Bench Sheet

Method: FMD 32 Day ELS Client: NAU104 Sample: 2021-0977, 2021-0980, 2021-0981, 2021-0982, 2021-0985, 2021-0986, 2021-0988 (20 ug/L Cu)

pH (units)

Conc (%) / Day	New Solutions 2021-0977	2021-0980	2021-0981	2021-0982	2021-0985	2021-0986	2021-0988	Old Solutions 2021-0977	2021-0980	2021-0981	2021-0982	2021-0985	2021-0986	2021-0988
9	8.2	8.1	8.2	8.1	8.2	8.1	8.1	8.0	8.3	8.2	8.0	8.1	8.2	8.3
10	8.2	8.2	8.2	8.2	8.2	8.0	8.0	7.9	8.2	8.1	7.9	8.0	8.2	8.1
11	8.3	8.2	8.2	8.1	8.0	8.1	8.1	7.9	8.2	8.1	7.9	8.0	8.1	8.1
12	8.2	8.03	8.3	8.2	8.3	7.8	8.1	8.0	8.3	8.2	8.0	8.1	8.2	8.2
13	8.2	8.4	8.2	8.2	8.3	8.0	8.3	8.0	8.3	8.2	8.0	8.0	8.0	8.2
14	8.0	8.2	8.2	8.3	8.2	8.1	8.2	8.0	8.3	8.2	8.0	8.0	8.1	8.1
15	8.2	8.2	8.3	8.3	8.1	8.2	8.2	8.0	8.2	8.2	8.0	8.0	8.1	8.1
16	8.2	8.3	8.3	8.2	8.1	8.2	8.2	8.0	8.1	8.1	8.0	8.0	8.1	8.1
17	8.2	8.3	8.3	8.2	8.4	8.3	8.2	8.0	8.2	8.2	8.0	8.1	8.1	8.1

Conductance (µS/cm)

Conc (%) / Day	New Solutions 2021-0977	2021-0980	2021-0981	2021-0982	2021-0985	2021-0986	2021-0988	Old Solutions 2021-0977	2021-0980	2021-0981	2021-0982	2021-0985	2021-0986	2021-0988
9	947	703	630	1182	1012	1263	875	973	741	649	1209	1048	1283	917
10	964	676	616	1211	1010	1230	880	965	751	655	1217	1050	1287	927
11	991	692	641	1222	1025	1241	892	955	740	651	1200	1035	1260	913
12	1027	647	624	1048	1019	1209	917	943	738	646	1179	1056	1283	916
13	1020	620	630	1078	1005	1227	902	1036	714	655	1113	1036	1242	902
14	1052	626	600	1075	976	1185	890	1021	688	635	1052	1023	1244	885
15	1031	646	630	1062	972	1182	874	1046	701	643	1068	1027	1231	878
16	1077	676	655	1148	1054	1211	917	1165	766	708	1329	1120	1340	928
17	1071	701	678	1141	1070	1258	967	1138	769	716	1170	1116	1331	927

Dissolved Oxygen (mg/L) (60-100% saturation)

Conc (%) / Day	New Solutions 2021-0977	2021-0980	2021-0981	2021-0982	2021-0985	2021-0986	2021-0988	Old Solutions 2021-0977	2021-0980	2021-0981	2021-0982	2021-0985	2021-0986	2021-0988
9	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.0	6.9	6.9	6.9	6.9	6.9	6.9
10	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.2	7.3	7.2	7.2	7.0	7.2	7.2
11	7.3	7.3	7.3	7.3	7.3	7.3	7.3	6.9	6.9	6.9	6.9	6.9	6.9	6.9
12	7.3	7.35	7.3	7.3	7.3	7.3	7.3	7.1	6.9	6.9	6.9	6.9	6.9	6.9
13	7.32	7.31	7.1	7.1	7.3	7.3	7.3	6.8	6.8	6.8	6.8	6.8	6.8	6.8
14	7.3	7.3	7.3	7.3	7.3	7.3	7.3	6.3	6.3	6.6	6.5	6.3	6.5	6.3
15	7.3	7.3	7.3	7.3	7.3	7.3	7.3	6.8	6.8	6.7	6.7	6.7	6.6	6.5
16	7.3	7.3	7.3	7.3	7.3	7.3	7.3	6.1	6.3	6.3	6.2	6.2	6.2	6.2
17	7.0	7.2	7.2	7.2	7.3	7.3	7.3	6.2	6.3	6.2	6.2	6.1	6.3	6.3

Temperature (°C)

Conc (%) / Day	New Solutions 2021-0977	2021-0980	2021-0981	2021-0982	2021-0985	2021-0986	2021-0988	Old Solutions 2021-0977	2021-0980	2021-0981	2021-0982	2021-0985	2021-0986	2021-0988
9	24	24	24	24	24	24	24	24	24	24	24	24	24	24
10	24	24	24	24	24	24	24	24	24	24	24	24	24	24
11	24	24	24	24	24	24	24	24	24	24	24	24	24	24
12	24	24	24	24	24	24	24	24	24	24	24	24	24	24
13	26	26	26	26	24	24	24	24	24	24	24	24	24	24
14	24	24	24	24	24	24	24	24	24	24	24	24	24	24
15	24	24	24	24	24	24	24	24	24	24	24	24	24	24
16	24	24	24	24	24	24	24	24	24	24	24	24	24	24
17	24	25	25	25	24	24	24	24	24	24	24	24	24	24

DO Levels (60-100% saturation) -
- 7.4 to 7.3 mg/L at 24°C
- 7.3 to 7.2 mg/L at 25°C
- 7.2 to 7.0 mg/L at 26°C

Comments:

Reviewed By: MG Date Reviewed: 2021/05/11

NAUTILUS ENVIRONMENTAL

Fathead Minnow Bench Sheet

Method: FMD 32 Day ELS Client: NAU104 Sample: 2021-0977, 2021-0980, 2021-0981, 2021-0982, 2021-0985, 2021-0986, 2021-0988 (20 ug/L Cu)

New Solutions

Conc (%) / Day	2021-0977	2021-0980	2021-0981	2021-0982	2021-0985	2021-0986	2021-0988
pH (units)							
18	8.1	8.2	8.2	8.2	8.1	8.0	8.2
19	8.3	8.3	8.3	8.2	8.3	8.2	8.3
20	8.3	8.3	8.3	8.2	8.2	8.1	8.2
21	8.3	8.4	8.3	8.2	8.2	8.2	8.2
22	8.3	8.4	8.3	8.2	8.4	8.2	8.4
23	8.1	8.2	8.2	8.1	8.3	8.2	8.2
24	8.3	8.3	8.3	8.2	8.3	8.3	8.3
25	8.4	8.5	8.3	8.4	8.4	8.3	8.4
26	8.2	8.3	8.3	8.1	8.2	8.2	8.2
Conductance (µS/cm)							
18	1110	685	672	1161	1037	1296	645
19	1026	720	641	1191	1057	1215	642
20	1032	733	642	1184	1053	1223	641
21	1090	727	644	1171	1056	1275	635
22	1009	722	643	1180	1042	1196	625
23	991	817	634	1160	1032	1210	636
24	1011	732	633	1158	1031	1192	637
25	1026	723	634	1180	1050	1207	630
26	1038	835	636	1204	1076	1157	686
Dissolved Oxygen (mg/L) (60-100% saturation)							
18	7.3	7.3	7.3	7.3	7.2	7.3	7.3
19	7.3	7.3	7.3	7.3	7.3	7.3	7.3
20	7.3	7.3	7.3	7.3	7.3	7.3	7.3
21	7.3	7.3	7.3	7.3	7.3	7.3	7.3
22	6.9	7.2	7.1	7.1	7.3	7.3	7.3
23	7.3	7.3	7.3	7.3	7.3	7.3	7.3
24	7.3	7.3	7.3	7.3	7.3	7.3	7.3
25	7.3	7.3	7.3	7.3	7.3	7.3	7.3
26	7.3	7.3	7.3	7.3	7.3	7.3	7.3
Temperature (°C)							
18	24	24	24	24	24	24	24
19	24	24	24	24	24	24	24
20	24	24	24	24	24	24	24
21	24	24	24	24	24	24	24
22	25	25	26	26	24	24	24
23	24	24	24	24	24	24	24
24	24	24	24	24	24	24	24
25	24	24	24	24	24	24	24
26	24	24	24	24	24	24	24

Old Solutions

Conc (%) / Day	2021-0977	2021-0980	2021-0981	2021-0982	2021-0985	2021-0986	2021-0988
pH (units)							
18	7.9	8.1	8.1	8.0	8.0	8.1	8.1
19	8.0	8.1	8.1	8.0	7.9	8.0	8.0
20	8.1	8.1	8.1	8.0	8.0	8.2	8.1
21	8.1	8.2	8.2	8.1	8.1	8.2	8.2
22	8.1	8.3	8.3	8.0	8.0	8.1	8.1
23	8.0	8.3	8.2	8.0	8.0	8.2	8.1
24	8.1	8.2	8.2	8.1	8.0	8.2	8.2
25	8.1	8.3	8.3	8.2	8.2	8.2	8.3
26	8.0	8.1	8.0	7.9	8.0	8.1	7.9
Conductance (µS/cm)							
18	1102	769	703	1157	1129	1356	733
19	1127	757	697	1169	1136	1327	776
20	1097	765	677	1162	1085	1356	734
21	1083	740	669	1174	1090	1221	628
22	1065	782	672	1152	1046	1257	636
23	1046	772	691	1134	1000	1246	647
24	1030	776	671	1149	1058	1223	655
25	1057	779	690	1174	1094	1221	625
26	1056	767	671	1171	1072	1222	630
Dissolved Oxygen (mg/L) (60-100% saturation)							
18	6.5	6.4	6.4	6.4	6.2	6.1	6.1
19	6.0	6.5	5.8	5.4	5.3	5.1	5.7
20	6.1	6.2	6.2	5.8	5.8	5.8	5.7
21	6.0	6.0	6.5	6.5	6.6	6.3	6.3
22	6.0	6.0	6.1	6.1	6.2	6.1	6.2
23	5.7	6.1	6.0	6.0	6.1	6.2	6.0
24	5.8	5.8	5.9	5.9	5.9	5.9	5.9
25	5.8	5.9	6.5	6.6	6.6	6.5	6.7
26	5.7	5.9	6.2	6.2	6.0	5.9	6.3
Temperature (°C)							
18	24	24	24	24	24	24	24
19	24	24	24	24	24	24	24
20	24	24	24	24	24	24	24
21	24	24	24	24	24	24	24
22	24	24	24	24	24	24	24
23	24	24	24	24	24	24	24
24	24	24	24	24	24	24	24
25	24	24	24	24	24	24	24
26	24	24	24	24	24	24	24

DO Levels (60-100% saturation) -
4.4 to 7.3 mg/L at 24°C
4.3 to 7.2 mg/L at 25°C
4.2 to 7.0 mg/L at 26°C

Comments:

Reviewed By: MG Date Reviewed: 2021/05/14

NAUTILUS

Fathead Minnow Bench Sheet

Method FMD 32 Day ELS Client NAU104 Sample 2021-0977, 2021-0980, 2021-0981, 2021-0982, 2021-0985, 2021-0986, 2021-0988 (20 ug/L Cu)

New Solutions

Conc (%)	2021-0977	2021-0980	2021-0981	2021-0982	2021-0985	2021-0986	2021-0988
Day							

Old Solutions

2021-0977	2021-0980	2021-0981	2021-0982	2021-0985	2021-0986	2021-0988

pH (units)

Day							
27	8.3	8.2	8.2	8.2	8.1	8.2	8.3
28	8.2	8.3	8.3	8.1	8.1	8.2	8.1
29	8.3	8.3	8.3	8.1	8.2	8.2	8.1
30	8.1	8.3	8.2	8.1	8.2	8.2	8.2
31	8.1	8.3	8.0	8.1	8.3	8.1	8.2
32							

pH (units)

Day							
27	8.0	8.2	8.2	8.0	8.0	8.1	8.1
28	7.9	8.0	8.1	7.9	7.9	8.1	8.1
29	8.0	8.2	8.2	7.9	8.0	8.1	8.0
30	8.0	8.2	8.1	7.9	8.0	8.1	8.0
31	7.9	8.1	8.1	7.9	8.0	8.1	8.0
32	8.0	8.1	8.1	8.0	8.0	8.1	8.1

Conductance (µS/cm)

Day							
27	1032	811	1034	1196	1010	1164	1015
28	1046	857	1040	1178	1197	1173	1062
29	991	838	643	1270	1007	1166	677
30	1164	871	633	1199	1017	1158	701
31	1034	817	1044	1185	1016	1154	1003
32							

Conductance (µS/cm)

Day							
27	1107	855	1098	1195	1044	1110	731
28	1091	861	694	1185	1057	1191	750
29	1083	776	703	1163	1051	1199	783
30	1061	862	683	1182	1043	1182	741
31	1050	882	1002	1100	1028	1175	725
32	1057	874	682	1174	1034	1185	746

Dissolved Oxygen (mg/L) (**60-100% saturation**)

Day							
27	7.3	7.3	7.3	7.3	7.3	7.3	7.3
28	7.3	7.3	7.3	7.3	7.3	7.3	7.3
29	7.3	7.3	7.3	7.3	7.3	7.3	7.3
30	7.3	7.3	7.3	7.3	7.3	7.3	7.3
31	7.3	7.3	7.3	7.3	7.3	7.3	7.3
32							

Dissolved Oxygen (mg/L) (**60-100% saturation**)

Day							
27	6.4	6.4	6.6	6.6	6.5	6.6	6.7
28	6.1	6.1	6.4	6.2	6.2	6.4	6.7
29	5.9	6.0	5.9	5.9	5.8	5.8	5.8
30	6.2	6.2	6.1	6.1	6.0	6.0	6.1
31	6.0	6.0	6.5	6.5	6.1	6.0	6.0
32	6.1	6.1	6.2	6.2	6.2	6.3	6.2

Temperature (°C)

Day							
27	24	24	24	24	24	24	24
28	24	24	24	24	24	24	24
29	24	24	24	24	24	24	24
30	24	24	24	24	24	24	24
31	24	24	24	24	24	24	24
32							

Temperature (°C)

Day							
27	24	24	24	24	24	24	24
28	24	24	24	24	24	24	24
29	24	24	24	24	24	24	24
30	24	24	24	24	24	24	24
31	24	24	24	24	24	24	24
32	24	24	24	24	24	24	24

DO Levels (60-100% saturation) -
4.4 to 7.3 mg/L at 24°C
4.3 to 7.2 mg/L at 25°C
4.2 to 7.0 mg/L at 26°C

Comments:

Reviewed By: ML Date Reviewed: 2021/05/06

NAUTILUS ENVIRONMENTAL

Fathead Minnow Bench Sheet

Method FMD 32 Day ELS Client NAU104 Sample: 2021-0977, 2021-0980, 2021-0981, 2021-0982, 2021-0985, 2021-0986, 2021-0988 (20 ug/L Cu)

Test Termination

For normal/abnormal column, use the following notation:

N=Normal, A= Abnormal And note location: H=head, O=oral, E=eyes, G=gills, F=fins, S=spine

Conc **2021-0977**

Fish	Replicate # A Length (mm)	Normal/ Abnormal	Replicate # B Length (mm)	Normal/ Abnormal	Replicate # C Length (mm)	Normal/ Abnormal	Replicate # D Length (mm)	Normal/ Abnormal
1	10	N	10	N	8	AS	11	AS
2	11	↓	9	↓	9	N	10	AS
3	12		11		10	↓	12	N
4	10		8		9		13	↓
5	11		9		11		12	
6	10		11		10		12	
7	14		11		12		11	
8	11		13		10		13	
9	11		13		10		10	
10	11		12		11		9	
11	12	↓	10		10		11	
12	—	—	8	↓	9		11	↓
13	—	—	—	—	9	↓	—	—
14	—	—	—	—	—	—	—	—
15	—	—	—	—	—	—	—	—

Comments

2021-0980

Fish	Replicate # A Length (mm)	Normal/ Abnormal	Replicate # B Length (mm)	Normal/ Abnormal	Replicate # C Length (mm)	Normal/ Abnormal	Replicate # D Length (mm)	Normal/ Abnormal
1	12	N	7	N	13	N	11	N
2	11	↓	7	↓	11	↓	10	↓
3	11		7		7		11	
4	12		12		11		11	
5	12		11		11		12	
6	11		11		9		10	
7	11		12		12		12	
8	11		11		13		11	
9	10		11		11		11	
10	10		11		4		10	↓
11	9	↓	10		4		—	—
12	9	AS	—	↓	9		—	—
13	—	—	—	—	9	↓	—	—
14	—	—	—	—	—	—	—	—
15	—	—	—	—	—	—	—	—

Comments

Reviewed By: MG Date Reviewed: 2021/05/04

NAUTILUS

Fathead Minnow Bench Sheet

Method FMD 32 Day ELS Client NAU104 Sample: 2021-0977, 2021-0980, 2021-0981, 2021-0982, 2021-0985, 2021-0986, 2021-0988 (20 ug/L Cu)

Test Termination

For normal/abnormal column, use the following notation:

N=Normal, A= Abnormal And note location: H=head, O=oral, E=eyes, G=gills, F=fins, S=spine

Conc

2021-0981

Replicate # A			Replicate # B			Replicate # C			Replicate # D		
Fish	Length (mm)	Normal/ Abnormal	Fish	Length (mm)	Normal/ Abnormal	Fish	Length (mm)	Normal/ Abnormal	Fish	Length (mm)	Normal/ Abnormal
1	10	AS	1	11	N	1	9	N	1	11	N
2	11	N	2	10		2	9		2	13	
3	12		3	12		3	11		3	13	
4	7		4	9		4	12		4	10	
5	10		5	11		5	12		5	10	
6	9		6	12		6	9		6	10	
7	6		7	10		7	11		7	9	
8	13		8	13		8	13		8	12	
9	11		9	12		9	9		9	13	
10	10		10	—	—	10	10		10	13	
11	9		11	—	—	11	10		11	11	
12	10		12	—	—	12	10		12	~~11~~	*
13	9		13	—	—	13	—	—	13	—	—
14	—	—	14	—	—	14	—	—	14	—	—
15	—	—	15	—	—	15	—	—	15	—	—

lost by tech.

Comments

2021-0982

Replicate # A			Replicate # B			Replicate # C			Replicate # D		
Fish	Length (mm)	Normal/ Abnormal	Fish	Length (mm)	Normal/ Abnormal	Fish	Length (mm)	Normal/ Abnormal	Fish	Length (mm)	Normal/ Abnormal
1	7	N	1	10	N	1	10	AS	1	14	N
2	10		2	10		2	10	N	2	11	
3	8		3	10		3	10		3	13	
4	11		4	10		4	9		4	11	
5	10		5	10		5	12		5	12	
6	8		6	9		6	10		6	12	
7	10		7	9		7	10		7	12	
8	11		8	13		8	9		8	10	
9	12		9	9		9	9		9	11	
10	9		10	9		10	13		10	11	
11	9		11	10		11	10		11	8	
12	9		12	9		12	10		12	11	
13	9		13	11		13	11		13	8	
14	9		14	6		14	11	N	14	—	—
15	—	—	15	~~A~~ 11	AS	15	—	~~N~~	15	—	—

Comments

Reviewed By: MG Date Reviewed: 2021/05/04

NAUTILUS ENVIRONMENTAL

Fathead Minnow Bench Sheet

Method FMD 32 Day ELS Client NAU104 Sample: 2021-0977, 2021-0980, 2021-0981, 2021-0982, 2021-0985, 2021-0986, 2021-0988 (20 ug/L Cu)

Test Termination

For normal/abnormal column, use the following notation:

N=Normal, A= Abnormal And note location: H=head, O=oral, E=eyes, G=gills, F=fins, S=spine

Conc. **2021-0985**

Fish	Replicate # A Length (mm)	Normal/ Abnormal	Replicate # B Length (mm)	Normal/ Abnormal	Replicate # C Length (mm)	Normal/ Abnormal	Replicate # D Length (mm)	Normal/ Abnormal
1	10	V	10	N	9	N	11	N
2	12	|	11	|	14	|	9	|
3	12	|	11	|	11	|	10	|
4	13	|	11	|	12	|	11	|
5	9	|	10	|	12	|	11	|
6	9	|	10	|	12	|	10	|
7	10	|	11	|	11	|	11	|
8	10	|	10	|	11	|	13	|
9	13	|	10	|	10	|	10	|
10	9	|	11	|	10	|	12	|
11	11	|	11	V	10	|	12	|
12	11	|	10	AS	8	|	11	|
13	10	|	—	|	8	V	13	|
14	11	V	—	|	—	—	10	V
15	—	—	—	—	—	—	—	—

Comments

2021-0986

Fish	Replicate # A Length (mm)	Normal/ Abnormal	Replicate # B Length (mm)	Normal/ Abnormal	Replicate # C Length (mm)	Normal/ Abnormal	Replicate # D Length (mm)	Normal/ Abnormal
1	11	N	7	AF	12	N	12	AS
2	12	|	12	N	11	|	11	N
3	13	|	11	|	9	|	13	|
4	10	|	9	|	7	|	13	|
5	10	|	7	|	10	|	10	|
6	10	|	10	|	13	|	10	|
7	12	|	12	|	12	|	11	|
8	12	|	11	|	12	|	11	|
9	10	|	13	|	11	|	12	|
10	11	|	10	|	10	|	12	|
11	10	|	10	|	10	|	10	|
12	13	|	11	|	12	|	10	V
13	8	V	11	|	9	V	—	—
14	—	—	9	|	—	—	—	—
15	—	—	9	V	—	—	—	—

Comments

Reviewed By: ML Date Reviewed: 2021/05/04

NAUTILUS

Fathead Minnow Bench Sheet

Method FMD 32 Day ELS Client NAU104 Sample: 2021-0977, 2021-0980, 2021-0981, 2021-0982, 2021-0985, 2021-0986, 2021-0988 (20 ug/L Cu)

Test Termination

For normal/abnormal column, use the following notation:

N=Normal, A= Abnormal And note location: H=head, O=oral, E=eyes, G=gills, F=fins, S=spine

Conc 2021-0988

Replicate # A			Replicate # B			Replicate # C			Replicate # D		
Fish	Length (mm)	Normal/ Abnormal	Fish	Length (mm)	Normal/ Abnormal	Fish	Length (mm)	Normal/ Abnormal	Fish	Length (mm)	Normal/ Abnormal
1	13	N	1	8	AG	1	9	AG	1	9	N
2	13		2	11	N	2	10	N	2	10	
3	15		3	10		3	10		3	15	
4	15		4	10		4	12		4	13	
5	13		5	13		5	13		5	13	
6	9		6	10		6	13		6	12	
7	10		7	12		7	11		7	12	
8	11		8	9		8	10		8	10	
9	–	–	9	9		9	9		9	12	
10	–	–	10	10		10	9		10	10	
11	–	–	11	10		11	10		11	–	–
12	–	–	12	–	–	12	11		12	–	–
13	–	–	13	–	–	13	11		13	–	–
14	–	–	14	–	–	14	12		14	–	–
15	–	–	15	–	–	15	–	–	15	–	–

Comments

Reviewed By: MG Date Reviewed: 2021/05/04

NAUTILUS ENVIRONMENTAL

Fathead Minnow Bench Sheet

Method FMD 32 Day ELS Client NAU104 Sample 2021-0977, 2021-0980, 2021-0981, 2021-0982, 2021-0985, 2021-0986, 2021-0988 (20 ug/L Cu)

Date of change 2021/03/11 (PM) **Day of change** +5

Volume (mL) of *Artemia* Fed to Each Test Replicate of Each Sample / Concentration							
Replicate	2021-0977	2021-0980	2021-0981	2021-0982	2021-0985	2021-0986	2021-0988
A	0.5	0.5	0.5	0.5	0.5	0.5	0.5
B	↓	↓	↓	↓	↓	↓	↓
C	↓	↓	↓	↓	↓	↓	↓
D	↓	↓	↓	↓	↓	↓	↓

Date of change 2021/03/14 (PM) **Day of change** 7

Volume (mL) of *Artemia* Fed to Each Test Replicate of Each Sample / Concentration							
Replicate	2021-0977	2021-0980	2021-0981	2021-0982	2021-0985	2021-0986	2021-0988
A	1.5	1.5	1.5	1.5	1.5	1.5	1.5
B	↓	↓	↓	↓	↓	↓	↓
C	↓	↓	↓	↓	↓	↓	↓
D	↓	↓	↓	↓	↓	↓	↓

Date of change 2021/03/17 **Day of change** +2 11 ST

Volume (mL) of *Artemia* Fed to Each Test Replicate of Each Sample / Concentration							
Replicate	2021-0977	2021-0980	2021-0981	2021-0982	2021-0985	2021-0986	2021-0988
A	2.0	2.0	2.0	2.0	2.0	2.0	2.0
B	↓	↓	↓	↓	↓	↓	↓
C	↓	↓	↓	↓	↓	↓	↓
D	↓	↓	↓	↓	↓	↓	↓

Date of change 2021/03/20 (PM) **Day of change** 14

Volume (mL) of *Artemia* Fed to Each Test Replicate of Each Sample / Concentration							
Replicate	2021-0977	2021-0980	2021-0981	2021-0982	2021-0985	2021-0986	2021-0988
A	2.5	2.5	2.5	2.5	2.5	2.5	2.5
B	↓	↓	↓	↓	↓	↓	↓
C	↓	↓	↓	↓	↓	↓	↓
D	↓	↓	↓	↓	↓	↓	↓

***Feeding volume is maintained following a feeding change until a new feeding regime is recorded**

Fathead Minnow Bench Sheet

Method FMD 32 Day ELS Client NAU104 Sample 2021-0977, 2021-0980, 2021-0981, 2021-0982, 2021-0985, 2021-0986, 2021-0988 (20 ug/L Cu)

Date of change 20211031 30 (PM) **Day of change** 24

Volume (mL) of *Artemia* Fed to Each Test Replicate of Each Sample / Concentration							
Replicate	2021-0977	2021-0980	2021-0981	2021-0982	2021-0985	2021-0986	2021-0988
A	3.0	3.0	3.0	3.0	3.0	3.0	~~2.5~~ 3.0 ST
B	↓	↓	↓	↓	↓	↓	3.0
C	↓	↓	↓	↓	↓	↓	↓
D	↓	↓	↓	↓	↓	↓	↓

Date of change _____ **Day of change** _____

Volume (mL) of *Artemia* Fed to Each Test Replicate of Each Sample / Concentration							
Replicate	2021-0977	2021-0980	2021-0981	2021-0982	2021-0985	2021-0986	2021-0988
A							
B							
C							
D							

Date of change _____ **Day of change** _____

Volume (mL) of *Artemia* Fed to Each Test Replicate of Each Sample / Concentration							
Replicate	2021-0977	2021-0980	2021-0981	2021-0982	2021-0985	2021-0986	2021-0988
A							
B							
C							
D							

Date of change _____ **Day of change** _____

Volume (mL) of *Artemia* Fed to Each Test Replicate of Each Sample / Concentration							
Replicate	2021-0977	2021-0980	2021-0981	2021-0982	2021-0985	2021-0986	2021-0988
A							
B							
C							
D							

***Feeding volume is maintained following a feeding change until a new feeding regime is recorded**

NAUTILUS ENVIRONMENTAL

Fathead Minnow Bench Sheet

Method FMD 32 Day ELS Client NAU104 Sample: 2021-0978 (10ug Cu), 2021-0979, 2021-0983, 2021-0984, 2021-0987 (15ug Cu), 2021-0989 (20ug/L Cu)

Organism Information

Source: Aquatox Batch: 20210306FM-ELS Egg Stage: 16 Somites Organisms Received in Good Condition: (Yes) or No

Test Log

Date	Day	Time	Technicians	Chem Cart Used	Fed AM	Fed PM	Sample Pre-Aeration Time	Bench Sheet Review First
2021/03/04	0	1515	KL/ST	2	—	—	60 mins	
2021/03/05	1	1035	CB	2	—	—	60 mins	
2021/03/08	2	1045	ST	2	—	—	60 mins	SC
2021/03/09	3	1000	ST	2	—	—	60 mins	AW
2021/03/10	4	1000	KL	2	—	—	60 mins	AW
2021/03/11	5	0945	ST	2	—	✓	60 mins	MF
2021/03/12	6	1030	ST	2	✓	✓	60 mins	AW
2021/03/13	7	1115	KL	2	✓	✓	60 mins	AW
2021/03/14	8	1138	CB	2	✓	✓	60 mins	SC
2021/03/15	9	1100	ST	2	✓	✓	60 mins	SC
2021/03/16	10	1130	KL	2	✓	✓	60 mins	SC
2021/03/17	11	1135	ST/KL	2	✓	✓	60 mins	SC
2021/03/18	12	1145	ST	2	✓	✓	60 mins	SC
2021/03/19	13	1140	ST	2	✓	✓	60 mins	AW
2021/03/20	14	1130	AW	2	✓	✓	60 mins	AW
2021/03/21	15	1330	MW	2	✓	✓	60 mins	ST
2021/03/22	16	1155	ST	2	✓	✓	60 mins	MW
2021/03/23	17	1130	MW	2	✓	✓	60 mins	AW
2021/03/24	18	1100	SC/ST	2	✓	✓	60 mins	KL
2021/03/25	19	0935	SC	2	✓	✓	60 mins	ST
2021/03/26	20	1200	AW/MF	2	✓	✓	60 mins	AW
2021/03/27	21	1130	SC/MF	2	✓	✓	60 mins	AW
2021/03/28	22	1150	MW	2	✓	✓	60 mins	CB
2021/03/29	23	1100	KL	2	✓	✓	60 mins	AW
2021/03/30	24	1120	ST/AW	2	✓	✓	60 mins	KL
2021/03/31	25	1000	KL	2	✓	✓	60 mins	AW
2021/04/01	26	1130	MF/AW	2	✓	✓	60 mins	AW
2021/04/02	27	1000	SC	2	✓	✓	60 mins	CB
2021/04/03	28	1145	SC/MF	2	✓	✓	60 mins	AW
2021/04/04	29	1055	ST/MW	2	✓	—	60 mins	MW
2021/04/05	30	1150	ST/AW	2	✓	✓	60 mins	MW
2021/04/06	31	1000	MF/MW	2	✓	✓	60 mins	AW
2021/04/07	32	1120	CB	2	—	—	—	AW

Reviewed By: MG Date Reviewed: 2021/05/06

NAUTILUS

Fathead Minnow Bench Sheet

Method FMD 32 Day ELS Client NAU104 Sample: 2021-0978 (10ug Cu), 2021-0979, 2021-0983, 2021-0984, 2021-0987 (15ug Cu), 2021-0989 (20ug/L C

Control hatching success must be >66% (≥10 per replicate). Post hatch survival must be >70%.

Number of Alive Embryos and Hatched Organisms

replicate	2021-0978 Day 1 Alive Embryos	2021-0978 Day 1 Dead Embryos	2021-0979 Day 1 Alive Embryos	2021-0979 Day 1 Dead Embryos	2021-0983 Day 1 Alive Embryos	2021-0983 Day 1 Dead Embryos	2021-0984 Day 1 Alive Embryos	2021-0984 Day 1 Dead Embryos	2021-0987 Day 1 Alive Embryos	2021-0987 Day 1 Dead Embryos	2021-0989 Day 1 Alive Embryos	2021-0989 Day 1 Dead Embryos	Day 1 Alive Embryos	Day 1 Dead Embryos
a	10	5	15	0	15	0	15	0	15	0	15	0		
b	15	0	13	2	15	0	15	0	15	0	14	1		
c	14	1	14	1	15	0	13	1	15	0	15	0		
d	15	0	14	1	15	0	15	0	14	1	15	0		
e	29	1	28	2	29	1	30	0	30	0	30	0		
f	30	0	30	0	21	0	30	0	30	0	28	2		

Comments/Observations:

Number of Alive Embryos and Hatched Organisms

replicate	2021-0978 Day 2 Alive Embryos	2021-0978 Day 2 Dead Embryos	2021-0978 Day 2 Cull to 15	2021-0979 Day 2 Alive Embryos	2021-0979 Day 2 Dead Embryos	2021-0979 Day 2 Cull to 15	2021-0983 Day 2 Alive Embryos	2021-0983 Day 2 Dead Embryos	2021-0983 Day 2 Cull to 15	2021-0984 Day 2 Alive Embryos	2021-0984 Day 2 Dead Embryos	2021-0984 Day 2 Cull to 15
a	9	1	15	14	1	15	14	1	15	15	0	15
b	15	0	15	12	1	15	15	0	15	14	1	15
c	14	0	15	14	0	15	15	0	15	13	0	15
d	15	0	15	10	4	15	15	0	15	13	2	15
e	29	0		27	1		29	0		30	0	
f	28	2		30	0		30	0		30	0	

replicate	2021-0987 Day 2 Alive Embryos	2021-0987 Day 2 Dead Embryos	2021-0987 Day 2 Cull to 15	2021-0989 Day 2 Alive Embryos	2021-0989 Day 2 Dead Embryos	2021-0989 Day 2 Cull to 15	Day 2 Alive Embryos	Day 2 Dead Embryos	Day 2 Cull to 15
a	15	0	15	15	0	15			
b	15	0	15	14	0	15			
c	15	0	15	15	0	15			
d	14	0	15	15	0	15			
e	30	0		30	0				
f	30	0		28	0				

Day 2 - Poor looking and dead embryos in replicates a, b, c and d are replaced with healthy embryos from replicates e and f. Replicates e and f are discarded after day 2

Comments/Observations:

Reviewed By: MG Date Reviewed: 2021/05/11

Fathead Minnow Bench Sheet

Method FMD 32 Day ELS Client NAU104 Sample: 2021-0978 (10ug Cu), 2021-0979, 2021-0983, 2021-0984, 2021-0987 (15ug Cu), 2021-0989 (20ug/L C

Control hatching success must be >66% (≥10 per replicate). Post hatch survival must be >70%.

2021-0978

Day 3

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	9	0	6	0
b	14	0	1	0
c	11	1	3	0
d	14	0	1	0

2021-0979

Day 3

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	13	0	2	0
b	13	0	2	0
c	15	0	0	0
d	11	1	3	0

2021-0983

Day 3

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	15	0	0	0
b	13	0	2	0
c	12	1	2	0
d	15	0	0	0

2021-0984

Day 3

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	14	0	1	0
b	13	1	1	0
c	12	0	3	0
d	10	0	5	0

2021-0987

Day 3

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	14	1	0	0
b	11	0	3	1
c	10	0	5	0
d	12	0	3	0

2021-0989

Day 3

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	14	0	11	0
b	6	0	9	0
c	7	0	8	0
d	11	0	4	0

Day 3

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a				
b				
c				
d				

[redacted]

2021-0978

Day 4

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	1	0	14	0
b	1	0	14	0
c	6	0	8	0
d	2	0	13	0

2021-0979

Day 4

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	4	0	11	0
b	4	0	11	0
c	1	0	13	1
d	56	0	8	0

2021-0983

Day 4

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	0	0	15	0
b	1	0	14	0
c	0	0	8	0
d	1	0	14	0

2021-0984

Day 4

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	1	0	13	1
b	4	0	10	0
c	4	0	11	0
d	4	0	11	0

2021-0987

Day 4

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	1	0	13	0
b	7	0	7	0
c	1	0	13	0
d	5	0	10	0

2021-0989

Day 4

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	0	0	15	0
b	0	0	15	0
c	1	0	14	0
d	4	0	4	0

Day 4

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a				
b				
c				
d				

Comments/Observations

Reviewed By: MG Date Reviewed: 2021/05/11

NAUTILUS

Fathead Minnow Bench Sheet

Method FMD 32 Day ELS Client NAU104 Sample: 2021-0978 (10ug Cu), 2021-0979, 2021-0983, 2021-0984, 2021-0987 (15ug Cu), 2021-0989 (20ug/L C

Control hatching success must be >66% (≥10 per replicate). Post hatch survival must be >70%.

2021-0978

Day 5

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	1	0	14	0
b	0	0	15	0
c	0	0	14	0
d	0	0	15	0

2021-0979

Day 5

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	0	0	15	0
b	0	0	15	0
c	0	0	14	0
d	2	0	12	0

2021-0983

Day 5

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	0	0	15	0
b	0	0	13	2
c	0	0	14(1)	0
d	0	0	14	1

2021-0984

Day 5

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	0	0	14	0
b	1	0	12	1
c	0	0	15	0
d	0	0	15	0

2021-0987

Day 5

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	21	0	+213	0
b	0	0	14	0
c	0	0	15	0
d	0	0	14	1

2021-0989

Day 5

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	0	0	15	0
b	0	0	15	0
c	0	0	14	1
d	1	0	14	0

[redacted]

2021-0978

Day 6

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	0	0	15(1)	0
b	0	0	15(1)	0
c	0	0	14	0
d	0	0	15	0

2021-0979

Day 6

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	0	0	14(2)	1
b	0	0	14(1)	1
c	0	0	13(4)	1
d	0	0	14(3)	1

2021-0983

Day 6

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	0	0	15(2)	0
b	0	0	14(1)	2
c	0	0	14(1)	0
d	0	0	13	1

2021-0984

Day 6

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	0	0	14	0
b	0	0	12	1
c	0	0	14	1
d	0	0	15(1)	0

2021-0987

Day 6

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	1	0	12	1
b	0	0	12	2
c	0	0	15	0
d	0	0	14	0

2021-0989

Day 6

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	0	0	15	0
b	0	0	14	1
c	0	0	14	0
d	1	0	14	0

Day 6

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a				
b				
c				
d				

Comments/Observations

Reviewed By: ML Date Reviewed: 2021/05/11

NAUTILUS ENVIRONMENTAL

Fathead Minnow Bench Sheet

Method FMD 32 Day ELS Client NAU104 Sample: 2021-0978 (10ug Cu), 2021-0979, 2021-0983, 2021-0984, 2021-0987 (15ug Cu), 2021-0989 (20ug/L C

Number of Alive Embryos and Hatched Organisms

	2021-0978	2021-0979	2021-0983	2021-0984	2021-0987	2021-0989	
	Day 7	Day 7	Day 7	Day 7	Day 7	Day 7	Day 7
replicate	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched
a	15(1)	14(3)	13	14	*	15	
b	14(1)	14(1)	11(1)	12(1)		14	
c	14	13(3)	13(3)	14	15	14	
d	15	13(3)	13	15(1)	14	14*	

Comments/Observations:
0976 A : 1 AS
* 0987 A : 11 hatched alive 1 alive embryo
* 0989 D 14 Alive hatched 1 Alive embryo

	2021-0978	2021-0979	2021-0983	2021-0984	2021-0987	2021-0989	
	Day 8	Day 8	Day 8	Day 8	Day 8	Day 8	Day 8
replicate	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched
a	15(1)		13	14	12	15	
b	14		11	12(1)	11	14	
c	14		13(1)	14	15	14 ST	
d	15		13		14	+3/14	

Comments/Observations:

	2021-0978	2021-0979	2021-0983	2021-0984	2021-0987	2021-0989	
	Day 9	Day 9	Day 9	Day 9	Day 9	Day 9	Day 9
replicate	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched
a	15(1)	14(1)	13	14	12	15	
b	14	13	11	12(1)	11	14	
c	14	13	13(1)	14	15	14	
d	15	12(1)	13	14	14	14(2)	

Comments/Observations:

	2021-0978	2021-0979	2021-0983	2021-0984	2021-0987	2021-0989	
	Day 10	Day 10	Day 10	Day 10	Day 10	Day 10	Day 10
replicate	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched
a	15	14(2)	13	14	12	15	
b	14	13	11	12	11	14	
c	13	13	12(1)	14	15	14	
d	15	12(1)	13	14	14	14(2)	

Comments/Observations:
0978 A: 1 AS
0989 B: 1 AS

Reviewed By: MG Date Reviewed: 2021/05/11

NAUTILUS

Fathead Minnow Bench Sheet

Method FMD 32 Day ELS Client NAU104 Sample: 2021-0978 (10ug Cu), 2021-0979, 2021-0983, 2021-0984, 2021-0987 (15ug Cu), 2021-0989 (20ug/L C

Number of Alive Embryos and Hatched Organisms

	2021-0978	2021-0979	2021-0983	2021-0984	2021-0987	2021-0989	
	Day 11	Day 11	Day 11	Day 11	Day 11	Day 11	Day 11
replicate	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched
a	15(1)	14(7)	13	14	12	15	
b	14	13	11	13(1)	11	14	
c	13	13	13	14	15	13	
d	15	12(1)	13	14	14	14(2)	

Comments/Observations:

	2021-0978	2021-0979	2021-0983	2021-0984	2021-0987	2021-0989	
	Day 12	Day 12	Day 12	Day 12	Day 12	Day 12	Day 12
replicate	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched
a	14	12(3)	13	14	10	15	
b	14	12	11	12(1)	11	14	
c	13	13	12	13	14	13	
d	15	12	13	14	14	14(2)	

Comments/Observations:

	2021-0978	2021-0979	2021-0983	2021-0984	2021-0987	2021-0989	
	Day 13	Day 13	Day 13	Day 13	Day 13	Day 13	Day 13
replicate	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched
a	14	11(3)	13	14	9	15	
b	14	12	11	12(1)	10	14	
c	13	13	11	13	14	13	
d	(SO)	11(1)	13	14	14	13(2)	

Comments/Observations:

	2021-0978	2021-0979	2021-0983	2021-0984	2021-0987	2021-0989	
	Day 14	Day 14	Day 14	Day 14	Day 14	Day 14	Day 14
replicate	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched
a	14(1)	11(3)	13	14(1)	9	15	
b	14	12 13 MG	10	12(1)	10	MG 14	
c	13	13 12 MG	11	13	14	13	
d	14	11(1)	13	14	14	11(1)	

Comments/Observations:

Reviewed By: MG Date Reviewed: 2021/05/11

NAUTILUS ENVIRONMENTAL

Fathead Minnow Bench Sheet

Method FMD 32 Day ELS Client NAU104 Sample: 2021-0978 (10ug Cu), 2021-0979, 2021-0983, 2021-0984, 2021-0987 (15ug Cu), 2021-0989 (20ug/L C

Number of Alive Embryos and Hatched Organisms

	2021-0978	2021-0979	2021-0983	2021-0984	2021-0987	2021-0989	
	Day 15	Day 15	Day 15	Day 15	Day 15	Day 15	Day 15
replicate	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched
a	14(1)	9(1)	13	14(1)	9	15	
b	14	12	9	12(1)	10	14	
c	13	12	11	13	14	13	
d	13	11(1)	13	14	14	10	

Comments/Observations:

	2021-0978	2021-0979	2021-0983	2021-0984	2021-0987	2021-0989	
	Day 16	Day 16	Day 16	Day 16	Day 16	Day 16	Day 16
replicate	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched
a	14(1)	9(1)	13	14(1)	9	15	
b	14	12	9	12(1)	10	14	
c	13	12	11	13	14	13	
d	13	11	13	14	14	10	

Comments/Observations: 0424A - 1AS +B

	2021-0978	2021-0979	2021-0983	2021-0984	2021-0987	2021-0989	
	Day 17	Day 17	Day 17	Day 17	Day 17	Day 17	Day 17
replicate	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched
a	14(1)	9(1)	13	14(1)	9	15	
b	14	11	9	11	10	14	
c	13	12	11	13	14	13	
d	13	11	12	14	14	10	

Comments/Observations: 0484 B-1AS

	2021-0978	2021-0979	2021-0983	2021-0984	2021-0987	2021-0989	
	Day 18	Day 18	Day 18	Day 18	Day 18	Day 18	Day 18
replicate	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched
a	14(1)	9(1)	13	14(1)	9	15	
b	14	11	9	11	10	14	
c	13	12	11	13	14	17	
d	13	11	12	14	14	10	

Comments/Observations: 0984 B-1AS

MG 2021/05/11

NAUTILUS

Fathead Minnow Bench Sheet

Method FMD 32 Day ELS Client NAU104 Sample: 2021-0978 (10ug Cu), 2021-0979, 2021-0983, 2021-0984, 2021-0987 (15ug Cu), 2021-0989 (20ug/L C

Number of Alive Embryos and Hatched Organisms

replicate	2021-0978 Day 19 Alive Hatched	2021-0979 Day 19 Alive Hatched	2021-0983 Day 19 Alive Hatched	2021-0984 Day 19 Alive Hatched	2021-0987 Day 19 Alive Hatched	2021-0989 Day 19 Alive Hatched	Day 19 Alive Hatched
a	14(1)	9(1)	13	14	9	15	
b	14	9	9	11	10	14	
c	13	12	11	13	14	13	
d	13	11(1)	12	14	14	10	

Comments/Observations: 0984 B-IAS

replicate	2021-0978 Day 20 Alive Hatched	2021-0979 Day 20 Alive Hatched	2021-0983 Day 20 Alive Hatched	2021-0984 Day 20 Alive Hatched	2021-0987 Day 20 Alive Hatched	2021-0989 Day 20 Alive Hatched	Day 20 Alive Hatched
a	14(1)	9(1)	13	~~15~~ 14	9	15	
b	14	9	9	~~10~~ 11(1)	10	14	
c	13	12(1)	11	13	14	13	
d	13	11(2)	12	14	14	10	

Comments/Observations:

replicate	2021-0978 Day 21 Alive Hatched	2021-0979 Day 21 Alive Hatched	2021-0983 Day 21 Alive Hatched	2021-0984 Day 21 Alive Hatched	2021-0987 Day 21 Alive Hatched	2021-0989 Day 21 Alive Hatched	Day 21 Alive Hatched
a	14	8	13	14	9	15	
b	14	9	9	11	10	15	
c	13	11	11	12	14	13	
d	13	10(1)	12	14	14	10	

Comments/Observations: 0979 O-IAS 0984 B-IAS

replicate	2021-0978 Day 22 Alive Hatched	2021-0979 Day 22 Alive Hatched	2021-0983 Day 22 Alive Hatched	2021-0984 Day 22 Alive Hatched	2021-0987 Day 22 Alive Hatched	2021-0989 Day 22 Alive Hatched	Day 22 Alive Hatched
a	14	7	13	14	9	15	
b	13	9(1)	9(1)	10	10	14	
c	13	10	11	12	14	13	
d	13	16(1)	12	14	14	10	

Comments/Observations:

MG 2021/05/11

NAUTILUS

Fathead Minnow Bench Sheet

Method FMD 32 Day ELS Client NAU104 Sample: 2021-0978 (10ug Cu) 2021-0979, 2021-0983, 2021-0984, 2021-0987 (15ug Cu), 2021-0989 (20ug/L C

Number of Alive Embryos and Hatched Organisms

	2021-0978	2021-0979	2021-0983	2021-0984	2021-0987	2021-0989	
	Day 23	Day 23	Day 23	Day 23	Day 23	Day 23	Day 23
replicate	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched
a	14	6	13	14	9	15	
b	13	9	9	10	10	14	
c	13	8(1)	10	12	14	13	
d	13	7	12	14	14	10	

Comments/Observations:

	2021-0978	2021-0979	2021-0983	2021-0984	2021-0987	2021-0989	
	Day 24	Day 24	Day 24	Day 24	Day 24	Day 24	Day 24
replicate	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched
a	14	6	13	14(1)	9	15	
b	13	9(2)	9(1)	10	10	14	
c	13	7	10	12	14	13	
d	13	7	12	14	14	10	

Comments/Observations:

	2021-0978	2021-0979	2021-0983	2021-0984	2021-0987	2021-0989	
	Day 25	Day 25	Day 25	Day 25	Day 25	Day 25	Day 25
replicate	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched
a	14	6	13	14(1)	9	15	
b	13	8(1)	9	10	10	14	
c	13	6	9	12	14	13	
d	13	6	11	14	14	10	

Comments/Observations:

	2021-0978	2021-0979	2021-0983	2021-0984	2021-0987	2021-0989	
	Day 26	Day 26	Day 26	Day 26	Day 26	Day 25	Day 26
replicate	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched
a	14	5	12	12	9	15	
b	13	7	9	10	10	14	
c	13	6	8	12	14	13	
d	13	5	11	14	14	10	

Comments/Observations:

MG 2021/05/11

NAUTILUS ENVIRONMENTAL

Fathead Minnow Bench Sheet

Method FMD 32 Day ELS Client NAU104 Sample: 2021-0978 (10ug Cu), 2021-0979, 2021-0983, 2021-0984, 2021-0987 (15ug Cu), 2021-0989 (20ug/L C

Number of Alive Embryos and Hatched Organisms

	2021-0978 Day 27	2021-0979 Day 27	2021-0983 Day 27	2021-0984 Day 27	2021-0987 Day 27	2021-0989 Day 27	Day 27
replicate	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched
a	14	5	11	12	9	15	
b	13	7	8	10	10	14	
c	13	5	6	12	14	13	
d	13	5	9	14	14	10	

Comments/Observations:

	2021-0978 Day 28	2021-0979 Day 28	2021-0983 Day 28	2021-0984 Day 28	2021-0987 Day 28	2021-0989 Day 28	Day 28
replicate	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched
a	14	5	11	12	9	15	
b	13	7	8	10	10	14	
c	13	4	6	12	14	13	
d	13	5	8	14	14	10	

Comments/Observations:

	2021-0978 Day 29	2021-0979 Day 29	2021-0983 Day 29	2021-0984 Day 29	2021-0987 Day 29	2021-0989 Day 29	Day 29
replicate	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched
a	14	4	10	10	9	15	
b	13	7	8	10	10	14	
c	13	4	6	12	14	13	
d	13	5	6	13	14	10	

Comments/Observations:

	2021-0978 Day 30	2021-0979 Day 30	2021-0983 Day 30	2021-0984 Day 30	2021-0987 Day 30	2021-0989 Day 30	Day 30
replicate	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched
a	14	4	9	10	9	15	
b	13	7	8	10	10	14	
c	13	4	6	12	14	13	
d	13	5	6	12	14	10	

Comments/Observations:

MG 2021/05/11

NAUTILUS

Fathead Minnow Bench Sheet

Method FMD 32 Day ELS Client NAU104 Sample: 2021-0978 (10ug Cu), 2021-0979, 2021-0983, 2021-0984, 2021-0987 (15ug Cu), 2021-0989 (20ug/L C

Number of Alive Embryos and Hatched Organisms

replicate	2021-0978 Day 31 Alive Hatched	2021-0979 Day 31 Alive Hatched	2021-0983 Day 31 Alive Hatched	2021-0984 Day 31 Alive Hatched	2021-0987 Day 31 Alive Hatched	2021-0989 Day 31 Alive Hatched	Day 31 Alive Hatched
a	14	4	8	10	9	15	
b	13	7	8	10	10	13 14	
c	13	4	6	12	14	13	
d	13	5	6	12	14	10	

Comments/Observations:

replicate	2021-0978 Day 32 Alive Hatched	2021-0979 Day 32 Alive Hatched	2021-0983 Day 32 Alive Hatched	2021-0984 Day 32 Alive Hatched	2021-0987 Day 32 Alive Hatched	2021-0989 Day 32 Alive Hatched	Day 32 Alive Hatched
a	14	4	8	10	9	15	
b	13	7	8	10	10	14	
c	13	3	6	12	14	13	
d	13	5	6	12	14	10	

Comments/Observations:

Reviewed By: MG Date Reviewed: 2021/05/11

NAUTILUS ENVIRONMENTAL

Fathead Minnow Bench Sheet

Method FMD 32 Day ELS Client NAU104 Sample 2021-0978 (10ug Cu), 2021-0979, 2021-0983, 2021-0984, 2021-0987 (15ug Cu), 2021-0989 (20ug/L Cu)

Date of change 2021/03/11 (PM) **Day of change** 5

Volume (mL) of *Artemia* Fed to Each Test Replicate of Each Sample / Concentration							
Replicate	2021-0978	2021-0979	2021-0983	2021-0984	2021-0987	2021-0989	
A	0.5mL	0.5	0.5	0.5	0.5	0.5	
B	↓	↓	↓	↓	↓	↓	
C	↓	↓	↓	↓	↓	↓	
D	↓	↓	↓	↓	↓	↓	

Date of change 2021/03/15 (PM) **Day of change** 9

Volume (mL) of *Artemia* Fed to Each Test Replicate of Each Sample / Concentration							
Replicate	2021-0978	2021-0979	2021-0983	2021-0984	2021-0987	2021-0989	
A	1.5	1.5	1.5	1.5	1.5	1.5	
B	↓	↓	↓	↓	↓	↓	
C	↓	↓	↓	↓	↓	↓	
D	↓	↓	↓	↓	↓	↓	

Date of change 2021/03/17 (PM) **Day of change** 11

Volume (mL) of *Artemia* Fed to Each Test Replicate of Each Sample / Concentration							
Replicate	2021-0978	2021-0979	2021-0983	2021-0984	2021-0987	2021-0989	
A	2.0	2.0	2.0	2.0	2.0	2.0	
B	↓	↓	↓	↓	↓	↓	
C	↓	↓	↓	↓	↓	↓	
D	↓	↓	↓	↓	↓	↓	

Date of change 2021/03/20 (PM) **Day of change** 14

Volume (mL) of *Artemia* Fed to Each Test Replicate of Each Sample / Concentration							
Replicate	2021-0978	2021-0979	2021-0983	2021-0984	2021-0987	2021-0989	
A	2.5	2.5	2.5	2.5	2.5	2.5	
B	↓	↓	↓	↓	↓	↓	
C	↓	↓	↓	↓	↓	↓	
D	↓	↓	↓	↓	↓	↓	

***Feeding volume is maintained following a feeding change until a new feeding regime is recorded**

NAUTILUS

Fathead Minnow Bench Sheet

Method: FMD 32 Day ELS Client: NAU104 Sample: 2021-0978 (10ug Cu), 2021-0979, 2021-0983, 2021-0984, 2021-0987 (15ug Cu), 2021-0989 (20ug/L Cu)

New Solutions

Conc (%)	2021-0978	2021-0979	2021-0983	2021-0984	2021-0987	2021-0989
Day						

pH (units)

Day						
0	8.3	8.3	8.3	8.1	8.3	8.2
1	8.2	8.4	8.2	8.0	8.2	8.2
2	8.2	8.3	8.3	8.3	8.2	8.3
3	7.2	8.2	7.3	7.2	8.2	8.2
4	8.3	8.1	8.2	8.0	8.2	8.2
5	8.2	8.2	8.3	8.3	8.2	8.3
6	8.3	8.3	8.2	8.1	8.1	8.2
7	8.3	8.3	8.2	8.0	8.2	8.2
8	8.2	8.1	8.3	7.9	8.2	8.1

Conductance (µS/cm)

Day						
0	363	313	298	731	414	817
1	313	330	309	736	427	840
2	343	313	316	702	420	805
3	384	314	305	698	425	790
4	425	300	267	699	390	606
5	379	320	332	700	434	837
6	357	314	305	697	430	831
7	355	306	288	699	397	807
8	385	325	304	713	459	836

Dissolved Oxygen (mg/L) (60-100% saturation)

Day						
0	7.3	7.3	7.3	7.3	7.3	7.3
1	7.3	7.3	7.3	7.3	7.3	7.3
2	7.3	7.3	7.3	7.3	7.3	7.3
3	7.3	7.3	7.3	7.3	7.3	7.3
4	7.3	7.3	7.3	7.3	7.3	7.3
5	7.3	7.3	7.3	7.3	7.3	7.3
6	7.3	7.3	7.3	7.3	7.3	7.3
7	7.3	7.3	7.3	7.3	7.3	7.3
8	7.3	7.3	7.3	7.3	7.3	7.3

Temperature (°C)

Day						
0	24	24	24	24	24	24
1	24	24	24	24	24	24
2	24	24	24	24	24	24
3	24	24	24	24	24	24
4	24	24	24	24	24	24
5	24	24	24	24	24	24
6	24	24	24	24	24	24
7	24	24	24	24	24	24
8	24	24	24	24	24	24

Old Solutions

	2021-0978	2021-0979	2021-0983	2021-0984	2021-0987	2021-0989

pH (units)

Day						
0						
1	8.3	8.3	8.2	8.1	8.3	8.2
2	8.3	8.4	8.3	8.3	8.3	8.1
3	8.3	8.3	8.3	8.3	8.3	8.0
4	8.3	8.3	8.3	8.2	8.2	8.1
5	8.3	8.3	8.3	8.2	8.3	8.1
6	8.2	8.2	8.2	8.1	8.3	8.0
7	8.2	8.3	8.2	8.1	8.2	8.0
8	8.3	8.3	8.3	8.3	8.2	8.0

Conductance (µS/cm)

Day						
0						
1	403	341	323	726	476	826
2	425	357	309	701	435	791
3	425	337	305	698	433	785
4	422	327	300	701	457	781
5	500	331	307	703	440	777
6	405	327	306	688	482	800
7	355	303	307	712	420	772
8	451	344	316	700	438	800

Dissolved Oxygen (mg/L) (60-100% saturation)

Day						
0						
1	7.0	7.0	7.0	7.2	7.0	7.0
2	7.0	7.1	7.1	7.2	7.1	7.1
3	7.3	7.2	7.2	7.2	7.2	7.1
4	7.2	7.2	7.2	7.2	7.2	7.2
5	7.1	7.1	7.1	7.1	7.2	7.1
6	7.1	7.1	7.1	7.1	7.1	7.1
7	7.2	7.2	7.2	7.1	7.1	7.1
8	7.1	7.1	7.2	7.1	7.1	7.1

Temperature (°C)

Day						
0						
1	24	24	24	24	24	24
2	24	24	24	24	24	24
3	24	24	24	24	24	24
4	24	24	24	24	24	24
5	24	24	24	24	24	24
6	24	24	24	24	24	24
7	24	24	24	24	24	24
8	24	24	24	24	24	24

DO Levels (60-100% saturation) -
4.4 to 7.3 mg/L at 24°C
4.3 to 7.2 mg/L at 25°C
4.2 to 7.0 mg/L at 26°C

Comments:

Reviewed By: ML Date Reviewed: 2021/05/06

NAUTILUS

Fathead Minnow Bench Sheet

Method FMD 32 Day ELS Client NAU104

Sample 2021-0978 (10ug Cu), 2021-0979, 2021-0983, 2021-0984, 2021-0987 (15ug Cu), 2021-0989 (20ug/L Cu)

New Solutions

Conc. (%) / Day	2021-0978	2021-0979	2021-0983	2021-0984	2021-0987	2021-0989
pH (units)						
9	8.1	8.2	8.1	8.2	8.2	8.1
10	8.3	8.1	8.2	8.2	8.2	8.1
11	8.1	8.1	8.1	8.1	8.2	8.0
12	8.0	8.1	8.1	8.2	8.3	8.2
13	8.2	8.3	8.3	8.3	8.3	8.2
14	8.0	8.2	8.3	8.2	8.2	8.1
15	8.3	8.4	8.4	8.1	8.2	8.2
16	8.3	8.3	8.3	8.2	8.2	8.2
17	8.3	8.4	8.5	8.3	8.2	8.2
Conductance (µS/cm)						
9	324	312	313	710	430	840
10	351	310	294	706	403	800
11	303	303	305	711	412	835
12	283	221	316	719	431	832
13	370	311	320	730	446	846
14	353	309	301	709	397	833
15	388	314	303	722	401	835
16	379	330	323	769	442	875
17	382	341	325	811	435	901
Dissolved Oxygen (mg/L) (60-100% saturation)						
9	7.3	7.3	7.3	7.3	7.3	7.3
10	7.3	7.3	7.3	7.3	7.3	7.3
11	7.3	7.3	7.3	7.3	7.3	7.3
12	7.3	7.3	7.3	7.3	7.3	7.3
13	7.1	7.1	7.1	7.2	7.3	7.3
14	7.3	7.3	7.3	7.3	7.3	7.3
15	7.3	7.3	7.3	7.3	7.3	7.3
16	7.3	7.3	7.3	7.3	7.3	7.3
17	6.9	7.0	7.3	7.1	7.3	7.3
Temperature (°C)						
9	24	24	24	24	24	24
10	24	24	24	24	24	24
11	24	24	24	24	24	24
12	24	24	24	24	24	24
13	26	26	26	25	24	24
14	24	24	24	24	24	24
15	24	24	24	24	24	24
16	24	24	24	24	24	24
17	26	25	24	26	24	24

Old Solutions

Conc. (%) / Day	2021-0978	2021-0979	2021-0983	2021-0984	2021-0987	2021-0989
pH (units)						
9	8.3	8.2	8.2	8.2	8.2	8.1
10	8.2	8.2	8.2	8.2	8.1	7.9
11	8.2	8.2	8.1	8.0	8.1	8.0
12	8.2	8.2	8.2	8.1	8.1	8.0
13	8.1	8.2	8.1	8.0	8.2	7.9
14	8.1	8.2	8.2	8.0	8.1	7.9
15	8.1	8.1	8.1	8.1	8.1	7.9
16	8.1	8.1	8.1	8.0	8.0	8.0
17	8.2	8.2	8.2	8.1	8.1	8.0
Conductance (µS/cm)						
9	441	347	316	701	444	796
10	455	337	315	712	440	817
11	403	335	312	694	445	800
12	406	341	312	711	459	821
13	420	342	321	722	458	849
14	359	332	321	713	446	834
15	391	333	318	736	458	842
16	467	361	345	799	502	874
17	465	369	349	798	509	914
Dissolved Oxygen (mg/L) (60-100% saturation)						
9	7.6	6.9	6.9	6.9	6.9	6.9
10	7.2	7.1	7.2	7.1	7.0	7.0
11	7.0	6.9	7.0	6.9	6.9	6.9
12	6.9	6.9	6.9	6.9	6.9	6.9
13	6.9	6.9	6.9	6.9	6.8	6.8
14	6.1	6.0	6.1	6.0	6.0	6.2
15	6.7	6.7	6.8	6.8	6.7	6.7
16	6.1	6.3	6.3	6.2	6.2	6.2
17	6.2	6.2	6.1	6.5	6.4	6.3
Temperature (°C)						
9	24	24	24	24	24	24
10	24	24	24	24	24	24
11	24	24	24	24	24	24
12	24	24	24	24	24	24
13	24	24	24	24	24	24
14	24	24	24	24	24	24
15	24	24	24	24	24	24
16	24	24	24	24	24	24
17	24	24	24	24	24	24

DO Levels (60-100% saturation) -
4.4 to 7.3 mg/L at 24°C
4.3 to 7.2 mg/L at 25°C
4.2 to 7.0 mg/L at 26°C

Comments:

Reviewed By: MH Date Reviewed: 2021/05/06

NAUTILUS ENVIRONMENTAL

Fathead Minnow Bench Sheet

Method: FMD 32 Day ELS Client: NAU104 Sample: 2021-0978 (10ug Cu), 2021-0979, 2021-0983, 2021-0984, 2021-0987 (15ug Cu), 2021-0989 (20ug/L Cu)

pH (units)

Conc (%)	New Solutions						Old Solutions:					
Day	2021-0978	2021-0979	2021-0983	2021-0984	2021-0987	2021-0989	2021-0978	2021-0979	2021-0983	2021-0984	2021-0987	2021-0989
18	8.12	8.1	8.3	8.1	8.2	8.1	8.0	8.0	8.1	8.0	8.0	7.8
19	8.3	8.2	8.3	8.2	8.3	8.1	8.0	8.0	8.0	8.0	8.0	7.9
20	8.3	8.3	8.3	8.2	8.3	8.2	8.1	8.0	8.1	8.1	8.1	7.9
21	8.2	8.3	8.3	8.3	8.3	8.2	8.2	8.2	8.2	8.2	8.2	8.0
22	8.3	8.4	8.5	8.4	8.4	8.3	8.2	8.2	8.1	8.1	8.1	8.0
23	8.1	8.2	8.3	8.2	8.3	8.2	8.2	8.2	8.2	8.1	8.1	8.0
24	8.3	8.3	8.3	8.3	8.3	8.2	8.1	8.2	8.2	8.0	8.1	8.0
25	8.3	8.4	8.4	8.4	8.4	8.2	8.2	8.2	8.2	8.1	8.2	8.0
26	8.3	8.3	8.3	8.3	8.3	8.2	7.9	8.0	8.0	7.9	8.0	7.9

Conductance (µS/cm)

Day												
18	347	348	358	801	1168	907	443	372	345	805	483	905
19	345	328	328	822	434	957	417	359	339	945	439	911
20	405	381	341	818	457	948	421	358	347	909	489	920
21	400	337	340	814	473	947	440	360	353	818	492	953
22	385	330	331	748	476	922	442	351	346	805	484	946
23	393	320	320	799	450	897	441	353	350	793	494	925
24	391	330	325	803	427	921	419	356	346	782	473	928
25	400	331	341	803	483	936	430	360	353	803	512	950
26	396	339	337	775	435	935	429	355	348	805	499	925

Dissolved Oxygen (mg/L) (60-100% saturation)

Day												
18	7.3	7.3	7.3	7.3	7.3	7.3	6.1	6.1	6.1	6.1	5.9	5.7
19	7.3	7.3	7.3	7.3	7.3	7.3	5.5	5.5	5.4	6.1	6.1	5.8
20	7.3	7.3	7.3	7.3	7.3	7.3	5.7	5.8	5.9	5.9	5.9	5.6
21	7.3	7.3	7.3	7.3	7.3	7.3	6.4	6.4	6.5	6.5	6.6	6.4
22	7.0	7.2	7.3	7.2	7.3	7.3	6.2	6.3	6.3	6.2	6.7	6.2
23	7.1	7.3	7.3	7.3	7.3	7.3	6.0	6.1	6.1	6.1	6.2	6.2
24	7.3	7.3	7.3	7.3	7.3	7.3	5.9	5.9	6.0	5.9	6.0	5.9
25	7.3	7.3	7.3	7.3	7.3	7.3	6.4	6.3	6.3	6.4	6.3	6.2
26	7.3	7.3	7.3	7.3	7.3	7.3	6.2	6.3	6.2	6.0	6.0	6.0

Temperature (°C)

Day												
18	24	24	24	24	24	24	24	24	24	24	24	24
19	24	24	24	24	24	24	24	24	24	24	24	24
20	24	24	24	24	24	24	24	24	24	24	24	24
21	24	24	24	24	24	24	24	24	24	24	24	24
22	24	24	24	24	24	24	24	24	24	24	24	24
23	24	24	24	24	24	24	24	24	24	24	24	24
24	24	24	24	24	24	24	24	24	24	24	24	24
25	24	24	24	24	24	24	24	24	24	24	24	24
26	24	24	24	24	24	24	24	24	24	24	24	24

DO Levels (60-100% saturation) -
4.4 to 7.3 mg/L at 24°C
4.3 to 7.2 mg/L at 25°C
4.2 to 7.0 mg/L at 26°C

Comments:

Reviewed By: MG Date Reviewed: 2021/05/06

NAUTILUS

Fathead Minnow Bench Sheet

Method FMD 32 Day ELS Client NAU104 Sample 2021-0978 (10ug Cu), 2021-0979, 2021-0983, 2021-0984, 2021-0987 (15ug Cu), 2021-0989 (20ug/L Cu)

New Solutions

Conc (%)	2021-0978	2021-0979	2021-0983	2021-0984	2021-0987	2021-0989	
Day							

pH (units)

Day							
27	8.2	8.2	8.4	8.3	8.3	8.2	
28	8.1	8.1	8.2	8.2	8.1	8.1	
29	8.3	8.3	8.4	8.3	8.2	8.2	
30	8.1	8.2	8.2	8.2	8.2	8.1	
31	8.1	8.2	8.2	8.3	8.3	8.2	
32							

Conductance (µS/cm)

Day							
27	418	341	342	774	438	932	
28	414	359	330	769	451	914	
29	417	329	339	764	455	920	
30	408	333	335	769	417	921	
31	416	337	337	786	435	916	
32							

Dissolved Oxygen (mg/L) (60-100% saturation)

Day							
27	7.3	7.3	7.3	7.3	7.3	7.3	
28	7.3	7.3	7.3	7.3	7.3	7.3	
29	7.3	7.3	7.3	7.3	7.3	7.3	
30	7.3	7.3	7.3	7.3	7.3	7.3	
31	7.3	7.3	7.3	7.3	7.3	7.3	
32							

Temperature (°C)

Day							
27	24	24	24	24	24	24	24 MF
28	24	24	24	24	24	24	
29	24	24	24	24	24	24	
30	24	24	24	24	24	24	
31	24	24	24	24	24	24	
32							

Old Solutions

Conc (%)	2021-0978	2021-0979	2021-0983	2021-0984	2021-0987	2021-0989	
Day							

pH (units)

Day							
27	8.1	8.2	8.1	8.0	8.1	7.9	
28	8.1	8.1	8.1	8.1	8.1	7.9	
29	8.1	8.2	8.1	8.1	8.1	7.9	
30	8.0	8.1	8.1	8.0	8.0	7.9	
31	8.0	8.1	8.1	8.0	8.0	7.9	
32	8.0	8.1	8.0	7.9	7.9	7.9	

Conductance (µS/cm)

Day							
27	443	358	349	769	517	915	
28	467	376	342	742	478	936	
29	469	376	353	730	448	941	
30	454	368	349	770	468	912	
31	450	358	343	770	450	899	
32	423	359	344	744	444	935	

Dissolved Oxygen (mg/L) (60-100% saturation)

Day							
27	6.7	6.4	6.5	6.4	6.4	6.5	
28	6.6	6.4	6.6	6.4	6.6	6.5	
29	5.6	5.6	5.8	5.9	5.9	6.0	
30	6.0	6.1	6.1	6.1	6.2	6.2	
31	6.0	6.1	6.2	6.4	6.3	6.1	
32	6.1	6.1	6.1	6.1	6.2	6.2	

Temperature (°C)

Day							
27	24	24	24	24	24	24	
28	24	24	24	24	24	24	
29	24	24	24	24	24	24	
30	24	24	24	24	24	24	
31	24	24	24	24	24	24	
32	24	24	24	24	24	24	

DO Levels (60-100% saturation) -
4.4 to 7.3 mg/L at 24°C
4.3 to 7.2 mg/L at 25°C
4.2 to 7.0 mg/L at 26°C

Comments:

Reviewed By: MG Date Reviewed: 2021/05/06

NAUTILUS ENVIRONMENTAL

Fathead Minnow Bench Sheet

Method FMD 32 Day ELS Client NAU104 Sample: 2021-0978 (10ug Cu), 2021-0979, 2021-0983, 2021-0984, 2021-0987 (15ug Cu), 2021-0989 (20ug/L Cu)

Test Termination

For normal/abnormal column, use the following notation:

N=Normal, A= Abnormal And note location: H=head, O=oral, E=eyes, G=gills, F=fins, S=spine

Conc

2021-0978

Fish	Replicate # A Length (mm)	Normal/ Abnormal	Replicate # B Length (mm)	Normal/ Abnormal	Replicate # C Length (mm)	Normal/ Abnormal	Replicate # D Length (mm)	Normal/ Abnormal
1	9	AG	7	AG	9 Kge	AG	11	N
2	7	AH	7	AG	11	N	11	"
3	7	AH	9	AG	11	"	10	"
4	12	N	12	N	11	"	12	"
5	10	"	12	"	12	"	12	"
6	9	"	12	"	12	"	13	"
7	12	"	11	"	11	"	7	AG
8	13	"	11	"	10	"	11	N
9	12	"	11	"	10	"	8	"
10	12	"	12	"	11	"	9	"
11	12	"	9	"	12	"	10	"
12	10	"	10	"	10	"	11	"
13	9	"	11	"	9	"	11	"
14	13	"	—	—	—	—	—	—
15	—	—	—	—	—	—	—	—

Comments

2021-0979

Fish	Replicate # A Length (mm)	Normal/ Abnormal	Replicate # B Length (mm)	Normal/ Abnormal	Replicate # C Length (mm)	Normal/ Abnormal	Replicate # D Length (mm)	Normal/ Abnormal
1	8	AS	9	AS	11	N	12	AS
2	10	N	15	N	10	"	9	AS
3	11	"	10	"	12	"	8	AG
4	13	"	13	"	—	—	13	N
5	—	—	12	"			11	N
6			10	"			—	—
7			10	"				
8			—	—				
9								
10								
11								
12								
13								
14								
15								

Comments

Reviewed By: MG Date Reviewed: 2021/05/04

NAUTILUS

Fathead Minnow Bench Sheet

Method FMD 32 Day ELS Client NAU104 Sample: 2021-0978 (10ug Cu), 2021-0979, 2021-0983, 2021-0984, 2021-0987 (15ug Cu), 2021-0989 (20ug/L Cu)

Test Termination

For normal/abnormal column, use the following notation:

N=Normal, A= Abnormal And note location: H=head, O=oral, E=eyes, G=gills, F=fins, S=spine

Conc 2021-0983

Replicate # A		
Fish	Length (mm)	Normal/ Abnormal
1	12	N
2	12	↓
3	13	↓
4	9	AG
5	9	AG
6	9	AG
7	10	N
8	10	N
9	–	–
10		
11		
12		
13		
14		
15		

Replicate # B		
Fish	Length (mm)	Normal/ Abnormal
1	9	AG
2	13	N
3	11	↓
4	11	↓
5	15	↓
6	13	↓
7	17	↓
8	12	↓
9	–	–
10		
11		
12		
13		
14		
15		

Replicate # C		
Fish	Length (mm)	Normal/ Abnormal
1	7	AG
2	7	AG
3	11	N
4	11	↓
5	12	↓
6	13	↓
7	–	–
8		
9		
10		
11		
12		
13		
14		
15		

Replicate # D		
Fish	Length (mm)	Normal/ Abnormal
1	11	N
2	17	↓
3	10	↓
4	17	↓
5	11	↓
6	11	↓
7	–	–
8		
9		
10		
11		
12		
13		
14		
15		

Comments

2021-0984

Replicate # A		
Fish	Length (mm)	Normal/ Abnormal
1	10	AS
2	11	N
3	11	↓
4	8	↓
5	12	↓
6	11	↓
7	12	↓
8	9	↓
9	10	↓
10	10	↓
11	–	–
12		
13		
14		
15		

Replicate # B		
Fish	Length (mm)	Normal/ Abnormal
1	12	N
2	12	↓
3	12	↓
4	12	↓
5	13	↓
6	10	↓
7	8	↓
8	9	↓
9	9	↓
10	9	↓
11	–	–
12		
13		
14		
15		

Replicate # C		
Fish	Length (mm)	Normal/ Abnormal
1	12	N
2	12	↓
3	12	↓
4	12	↓
5	11	↓
6	9	↓
7	9	↓
8	9	↓
9	11	↓
10	11	↓
11	12	↓
12	10	↓
13	–	–
14		
15		

Replicate # D		
Fish	Length (mm)	Normal/ Abnormal
1	13	N
2	13	↓
3	12	↓
4	12	↓
5	11	↓
6	11	↓
7	11	↓
8	10	↓
9	10	↓
10	11	↓
11	11	↓
12	10	AS
13	–	–
14		
15		

Comments

Reviewed By: MG Date Reviewed: 2021/05/04

NAUTILUS

Fathead Minnow Bench Sheet

Method FMD 32 Day ELS Client NAU104 Sample: 2021-0978 (10ug Cu), 2021-0979, 2021-0983, 2021-0984, 2021-0987 (15ug Cu), 2021-0989 (20ug/L Cu)

Test Termination

For normal/abnormal column, use the following notation:

N=Normal, A= Abnormal And note location: H=head, O=oral, E=eyes, G=gills, F=fins, S=spine

Conc

2021-0987

Replicate # A		
Fish	Length (mm)	Normal/ Abnormal
1	12	N
2	13	
3	12	
4	12	
5	12	
6	13	
7	10	
8	12	
9	12	
10	—	—
11		
12		
13		
14		
15		

Replicate # B		
Fish	Length (mm)	Normal/ Abnormal
1	13	N
2	14	
3	13	
4	13	
5	13	
6	11	
7	11	
8	10	
9	11	
10	10	
11	—	—
12		
13		
14		
15		

Replicate # C		
Fish	Length (mm)	Normal/ Abnormal
1	12	N
2	12	
3	12	
4	13	
5	13	
6	11	
7	11	
8	11	
9	11	
10	10	
11	10	
12	9	
13	9	
14	9	
15	—	—

Replicate # D		
Fish	Length (mm)	Normal/ Abnormal
1	12	N
2	12	
3	12	
4	13	
5	13	
6	12	
7	12	
8	11	
9	11	
10	9	
11	9	
12	9	
13	10	
14	11	
15	—	—

Comments

2021-0989

Replicate # A		
Fish	Length (mm)	Normal/ Abnormal
1	11	N
2	11	
3	11	
4	11	
5	11	
6	10	
7	10	
8	10	
9	10	
10	10	
11	11	
12	10	
13	9	
14	8	
15	8	

Replicate # B		
Fish	Length (mm)	Normal/ Abnormal
1	12	N
2	12	
3	12	
4	12	
5	11	
6	11	
7	11	
8	11	
9	10	
10	13	
11	10	
12	10	
13	10	
14	10	
15	—	—

Replicate # C		
Fish	Length (mm)	Normal/ Abnormal
1	12	N
2	11	
3	12	
4	12	
5	12	
6	12	
7	13	
8	10	
9	10	
10	11	
11	9	
12	9	
13	10	
14	—	—
15	—	—

Replicate # D		
Fish	Length (mm)	Normal/ Abnormal
1	11	N
2	13	
3	14	
4	13	
5	13	
6	13	
7	13	
8	10	
9	11	
10	12	
11	—	—
12		
13		
14		
15		

Comments

Reviewed By: ML Date Reviewed: 2021/05/04

NAUTILUS ENVIRONMENTAL

Fathead Minnow Bench Sheet

Method FMD 32 Day ELS Client NAU104 Sample 2021-0978 (10ug Cu), 2021-0979, 2021-0983, 2021-0984, 2021-0987 (15ug Cu), 2021-0989 (20ug/L Cu)

Date of change 20211031 30 **Day of change** 24

Volume (mL) of *Artemia* Fed to Each Test Replicate of Each Sample / Concentration							
Replicate	2021-0978	2021-0979	2021-0983	2021-0984	2021-0987	2021-0989	
A	3.0	7.5	3.0	3.8	3.8	3.0	
B	↓	3.0	↓	↓	↓	↓	
C	↓	7.5	↓	↓	↓	↓	
D	↓	7.5	↓	↓	↓	↓	

Date of change _____ **Day of change** _____

Volume (mL) of *Artemia* Fed to Each Test Replicate of Each Sample / Concentration							
Replicate	2021-0978	2021-0979	2021-0983	2021-0984	2021-0987	2021-0989	
A							
B							
C							
D							

Date of change _____ **Day of change** _____

Volume (mL) of *Artemia* Fed to Each Test Replicate of Each Sample / Concentration							
Replicate	2021-0978	2021-0979	2021-0983	2021-0984	2021-0987	2021-0989	
A							
B							
C							
D							

Date of change _____ **Day of change** _____

Volume (mL) of *Artemia* Fed to Each Test Replicate of Each Sample / Concentration							
Replicate	2021-0978	2021-0979	2021-0983	2021-0984	2021-0987	2021-0989	
A							
B							
C							
D							

***Feeding volume is maintained following a feeding change until a new feeding regime is recorded**

NAUTILUS ENVIRONMENTAL

Organism Weights Bench Sheet

Client TEC164 Sample CTL 2021-0978 Organism FMD-32d Batch 2021 ELS

	Item Weighed	Date	Initials	Balance*
Initial Weight (mg):	dried pan	2021/03/30	KL	Mettler #1
Final Weight (mg):	dried pan + organisms	2021/04/14	KL	Mettler #1

* same balance must be used for initial and final weights
* for FM/HA/CT, must use scale with 0.01 mg accuracy

Concentration

Replicate	LAB CTL		10 µS Cu CTL		15 µS Cu CTL		20 µS Cu CTL		2021-0970		2021-0971	
	Initial	Final	Initial	Final	Initial	Final	Initial	Final	Initial	Final	Initial	Final
a	784.89	813.22	814.79	846.42	812.10	846.50	784.78	819.23	804.60	830.17	798.32	829.49
b	782.36	812.19	812.09	842.86	819.52	850.96	792.47	823.74	798.16	819.53	808.72	839.44
c	803.72	836.86	819.84	850.56	815.97	~~846.50~~	800.46	835.15	790.52	820.22	813.25	843.33
d	823.42	863.64	816.08	852.83	786.09	830.72	800.66	840.81	799.83	826.13	802.17	845.10
e					c:	850.53						

Concentration

Replicate	2021-0972		2021-0973		2021-0974		2021-0975		2021-0976		2021-0977	
	Initial	Final	Initial	Final	Initial	Final	Initial	Final	Initial	Final	Initial	Final
a	811.01	838.83	775.56	801.87	799.67	814.15	795.04	829.47	781.00	811.24	794.48	830.97
b	810.82	838.03	785.19	812.76	784.94	799.34	794.64	824.93	783.61	816.33	791.00	823.71
c	804.54	834.58	790.22	818.16	791.21	817.08	796.69	829.76	799.42	835.82	813.96	842.71
d	803.00	843.74	~~740.22~~	—	787.64	807.05	791.10	834.42	806.41	847.35	793.13	836.99
e			d: 809.44	848.42								

Balance Calibration Check:

	Initial	Final
first pan weighed:	LAB CTLA	LAB CTLA
weight of first pan:	784.89	813.22
first pan after all other pans weighed:	784.78	813.67
% difference <5%:	(Yes)/No	(Yes)/No

Test Validity Met: (Yes)/No/NA

Results are Logical:** (Yes)/No

** no negative numbers, consistent values across replicates

$$\% \text{ difference} = \frac{\text{(initial weight - reweight)}}{\text{(initial weight + reweight) / 2)}} \times 100\%$$

If "no" is circled for any parameter, notify Lab Supervisor/ QA Group to determine appropriate action

Reviewed By: MG Date Reviewed: 2021/05/04

NAUTILUS ENVIRONMENTAL

Organism Weights Bench Sheet

Client TEC164 Sample CTL 2021-0978 Organism FMD-3221 Batch 2021 ELS

	Item Weighed	Date	Initials	Balance*
Initial Weight (mg):	dried pan	2021/03/30	KL	Mettler #1
Final Weight (mg):	dried pan + organisms	2021/04/14	KL	Mettler #1

* same balance must be used for initial and final weights
* for FM/HA/CT, must use scale with 0.01 mg accuracy

Concentration

Replicate	2021-0978 Initial	2021-0978 Final										
	Initial	Final	Initial	Final	Initial	Final	Initial	Final	Initial	Final	Initial	Final
a	794.57	826.00										
b KL	~~748.74~~	~~329.96~~ **										
c	799.84	831.31										
d	799.14	833.27										
e b.	791.12	328.06										

Concentration

Replicate	Initial	Final	Initial	Final	Initial	Final	Initial	Final	Initial	Final	Initial	Final
a												
b												
c												
d												
e												

Balance Calibration Check:

	Initial	Final
first pan weighed:		
weight of first pan:		
first pan after all other pans weighed:		

Test Validity Met: (Yes) No/NA

Results are Logical:** (Yes) No

** no negative numbers, consistent values across replicates

% difference <5%: Yes/No Yes/No

$$\% \text{ difference} = \frac{\text{(initial weight - reweight)}}{\text{(initial weight + reweight) / 2)}} \times 100\%$$

If "no" is circled for any parameter, notify Lab Supervisor/ QA Group to determine appropriate action

Reviewed By: MG Date Reviewed: 2021/05/04

NAUTILUS ENVIRONMENTAL

Organism Weights Bench Sheet

Client TEC164 Sample 2021-0979 - 2021-0989 Organism FHO-32d Batch 2021 ELS

	Item Weighed	Date	Initials	Balance*
Initial Weight (mg):	dried pan	2021/04/02	JCC	METTLER 1
Final Weight (mg):	dried pan + organisms	2021/04/14	KL	Mettler 1

* same balance must be used for initial and final weights
* for FM/HA/CT, must use scale with 0.01 mg accuracy

Concentration

Replicate	2021-0979 Initial	2021-0979 Final	2021-0980 Initial	2021-0980 Final	2021-0981 Initial	2021-0981 Final	2021-0982 Initial	2021-0982 Final	2021-0983 Initial	2021-0983 Final	2021-0984 Initial	2021-0984 Final
a	804.11	821.66	785.50	817.32	795.63	825.14	802.60	832.05	783.64	~~825~~ 805.03	777.77	802.93
b	812.95	839.60	811.48	841.84	789.84	819.45	793.31	818.37	788.37	819.75	805.94	832.25
c	803.66	813.71	780.90	813.72	787.98	814.46	788.22	820.52	783.32	803.83	819.40	853.03
d	789.61	806.10	798.28	834.77	801.43	834.49	797.26	833.39	783.86	806.77	793.48	822.86
e												

Concentration

Replicate	2021-0985 Initial	2021-0985 Final	2021-0986 Initial	2021-0986 Final	~~2021-0988~~ JCC Initial	~~2021-0988~~ JCC Final	2021-0987 Initial	2021-0987 Final	2021-0988 Initial	2021-0988 Final	2021-0989 Initial	2021-0989 Final
a	828.54	857.39	808.26	841.76	778.45	JCC	778.45	809.52	798.15	831.83	799.24	827.93
b	824.70	853.69	809.55	838.76	801.60		801.60	830.59	798.98	827.11	803.45	833.88
c	824.65	857.08	823.16	852.35			809.22	837.94	803.40	835.09	799.29	833.85
d	801.26	836.71	821.98	854.40			805.26	836.97	818.23	851.47	794.57	832.41
e												

Balance Calibration Check:

	Initial	Final
first pan weighed:	2021-0979A	LAB CTLA
weight of first pan:	804.11	813.22
first pan after all other pans weighed:	804.08	813.67

% difference <5%: (Yes)/No Yes/No

% difference = (initial weight - reweight) / (initial weight + reweight) / 2) × 100%

Test Validity Met: Yes/No/NA

Results are Logical:** Yes/No

** no negative numbers, consistent values across replicates

If "no" is circled for any parameter, notify Lab Supervisor/ QA Group to determine appropriate action

Reviewed By: MG Date Reviewed: 2021/05/04

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Batch ID:	16-2689-7673	**Test Type:**	32 Day Fathead Minnow Test	**Analyst:**	Kayla Knol		
Start Date:	06 Mar-21	**Protocol:**	ASTM E1241-05 (2013)	**Diluent:**	Dechlorinated Tap Water		
Ending Date:	07 Apr-21	**Species:**	Pimephales promelas	**Brine:**			
Test Length:	32d 0h	**Taxon:**	Actinopterygii	**Source:**	Aquatox, AR	**Age:**	

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
Lab Control	08-8280-1106	02 Mar-21	03 Mar-21	96h	Teck Coal Ltd	
10Cu Control	01-9333-5370	02 Mar-21	03 Mar-21	96h		
15Cu Control	19-6548-0518	02 Mar-21	03 Mar-21	96h		
20Cu Control	00-8675-6744	02 Mar-21	03 Mar-21	96h		
FR_UFR1 + 20Cu	20-4721-8257	02 Mar-21	03 Mar-21	96h (4.6 °C)		
GH_ER2 +15Cu	01-1137-9253	02 Mar-21	03 Mar-21	96h (4.2 °C)		
CM_MC1 + 15Cu	01-3772-5048	02 Mar-21	03 Mar-21	96h (1 °C)		
LC_SLC + 15Cu	01-2380-6574	02 Mar-21	03 Mar-21	96h (3.1 °C)		
FR_FRABCH + 20C	08-4134-0746	02 Mar-21	03 Mar-21	96h (3.8 °C)		
FR_FRCP1 + 20Cu	11-2694-6466	02 Mar-21	03 Mar-21	96h (3 °C)		
GH_FR1 + 20Cu	20-1635-3152	02 Mar-21	03 Mar-21	96h (2.4 °C)		
GH_ERC + 10Cu	05-1950-5597	02 Mar-21	03 Mar-21	96h (4.1 °C)		
CM_MC2 + 20Cu	14-4685-1067	02 Mar-21	03 Mar-21	96h (0.3 °C)		
RG_MIDAG + 15Cu	21-3889-1829	02 Mar-21	03 Mar-21	96h (0.6 °C)		
EV_MC2 + 20Cu	05-6103-5191	02 Mar-21	03 Mar-21	96h (4.4 °C)		
EV_HC1 + 20Cu	12-5501-3302	02 Mar-21	03 Mar-21	96h (3.4 °C)		
LC_DCDS + 20Cu	04-1088-5978	02 Mar-21	03 Mar-21	96h (0.6 °C)		
LC_LC3 + 20Cu	14-7773-4190	02 Mar-21	03 Mar-21	96h (2.3 °C)		
LC_LC5 + 20Cu	01-7235-6798	02 Mar-21	03 Mar-21	96h (0.6 °C)		
LC_LCDSSLCC20C	06-4197-2641	02 Mar-21	03 Mar-21	96h (2.4 °C)		
FR_FR4 + 20Cu	10-9481-5020	02 Mar-21	03 Mar-21	96h (5.4 °C)		
FR_FR2 + 20Cu	00-3159-8672	02 Mar-21	03 Mar-21	96h (4.4 °C)		
FR_MULTIPLATE2	02-2179-0364	02 Mar-21	03 Mar-21	96h (2.9 °C)		
FR_FRRD + 20Cu	19-5167-8345	02 Mar-21	03 Mar-21	96h (6.2 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
Lab Control	Ambient Sample	Teck Coal Ltd	Lab Control	
10Cu Control	Ambient Sample	Teck Coal Ltd	10Cu Control	
15Cu Control	Ambient Sample	Teck Coal Ltd	15Cu Control	
20Cu Control	Ambient Sample	Teck Coal Ltd	20Cu Control	
FR_UFR1 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_UFR1_MON_2021-03-0	
GH_ER2 +15Cu	Ambient Sample	Teck Coal Ltd	GH_ER2_WS_2021-03-02_	
CM_MC1 + 15Cu	Ambient Sample	Teck Coal Ltd	CM_MC1_WS_2021-03-02	
LC_SLC + 15Cu	Ambient Sample	Teck Coal Ltd	LC_SLC_WS_2021-03-02_	
FR_FRABCH + 20C	Ambient Sample	Teck Coal Ltd	FR_FRABCH_MON_2021-	
FR_FRCP1 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FRCP1_MON_2021-03	
GH_FR1 + 20Cu	Ambient Sample	Teck Coal Ltd	GH_FR1_WS_2021-03-02_	
GH_ERC + 10Cu	Ambient Sample	Teck Coal Ltd	GH_ERC_WS_2021-03-02	
CM_MC2 + 20Cu	Ambient Sample	Teck Coal Ltd	CM_MC2_WS_2021-03-02	
RG_MIDAG + 15Cu	Ambient Sample	Teck Coal Ltd	RG_MIDAG_WS_2021-03-	
EV_MC2 + 20Cu	Ambient Sample	Teck Coal Ltd	EV_MC2_WS_2021_Q1_W	
EV_HC1 + 20Cu	Ambient Sample	Teck Coal Ltd	EV_HC1_WS_2021_Q1_W	
LC_DCDS + 20Cu	Ambient Sample	Teck Coal Ltd	LC_DCDS_WS_2021-03-02	
LC_LC3 + 20Cu	Ambient Sample	Teck Coal Ltd	LC_LC3_WS_2021-03-02_	
LC_LC5 + 20Cu	Ambient Sample	Teck Coal Ltd	LC_LC5_WS_2021-03-02_	
LC_LCDSSLCC20C	Ambient Sample	Teck Coal Ltd	LC_LCDSSLCC_WS_2021-	
FR_FR4 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FR4_WS_2021-03-02_	
FR_FR2 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FR2_WS_2021-03-02_	
FR_MULTIPLATE2	Ambient Sample	Teck Coal Ltd	FR_MULTIPLATE_WS_202	
FR_FRRD + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FRRD_WS_2021-03-02	

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Fathead minnow 32-d (Pimephales promelas) survival and growth test **Nautilus Environmental Calgary**

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	GH_FR1 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC2 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC3 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	10Cu Control passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	20Cu Control passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_MULTIPLATE20 passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRCP1 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR2 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC1 + 15Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR4 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	EV_HC1 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRABCH + 20C passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_DCDS + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRRD + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_UFR1 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	Lab Control passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ERC + 10Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	15Cu Control passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LCDSSLCC20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_SLC + 15Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC5 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ER2 +15Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	EV_MC2 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	RG_MIDAG + 15Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	15Cu Control passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	EV_MC2 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	GH_FR1 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC1 + 15Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR2 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRABCH + 20C passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC3 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC2 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR4 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	EV_HC1 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_UFR1 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LCDSSLCC20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC5 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ER2 +15Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_SLC + 15Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	20Cu Control passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRRD + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	RG_MIDAG + 15Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRCP1 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_DCDS + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ERC + 10Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	10Cu Control passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_MULTIPLATE20 passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	Lab Control passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ERC + 10Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC3 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_UFR1 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LCDSSLCC20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRRD + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR4 + 20Cu passed hatch rate	1

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	10Cu Control passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRABCH + 20C passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	EV_HC1 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	GH_FR1 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR2 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_SLC + 15Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	20Cu Control passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC5 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_MULTIPLATE20 passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ER2 +15Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	EV_MC2 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	Lab Control passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	15Cu Control passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_DCDS + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC2 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	RG_MIDAG + 15Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRCP1 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC1 + 15Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	RG_MIDAG + 15Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ER2 +15Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRCP1 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	EV_HC1 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_UFR1 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ERC + 10Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	Lab Control passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	GH_FR1 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_SLC + 15Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC5 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC2 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LCDSSLCC20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	20Cu Control passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_MULTIPLATE20 passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR4 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRRD + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC1 + 15Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_DCDS + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	15Cu Control passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC3 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR2 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	10Cu Control passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRABCH + 20C passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	EV_MC2 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_SLC + 15Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_DCDS + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	EV_MC2 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	RG_MIDAG + 15Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	15Cu Control passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	Lab Control passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC1 + 15Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_MULTIPLATE20 passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ER2 +15Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC5 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC3 + 20Cu passed hatch rate	1

Fathead minnow 32-d (Pimephales promelas) survival and growth test **Nautilus Environmental Calgary**

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	10Cu Control passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRABCH + 20C passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC2 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ERC + 10Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_UFR1 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	20Cu Control passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	GH_FR1 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRRD + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR2 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LCDSSLCC20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRCP1 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	EV_HC1 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR4 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC3 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC1 + 15Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR4 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	Lab Control passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRCP1 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRRD + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	10Cu Control passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ERC + 10Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	RG_MIDAG + 15Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_MULTIPLATE20 passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	15Cu Control passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	EV_MC2 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR2 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ER2 +15Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_UFR1 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	GH_FR1 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_SLC + 15Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC2 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRABCH + 20C passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	EV_HC1 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC5 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LCDSSLCC20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_DCDS + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	20Cu Control passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC2 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRABCH + 20C passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	EV_HC1 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	EV_MC2 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_SLC + 15Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRCP1 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	RG_MIDAG + 15Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	20Cu Control passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	Lab Control passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRRD + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	10Cu Control passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_MULTIPLATE20 passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ERC + 10Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	15Cu Control passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR2 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR4 + 20Cu passed hatch rate	1

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

SIngle Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_DCDS + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LCDSSLCC20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_UFR1 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	GH_FR1 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC5 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC1 + 15Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ER2 +15Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC3 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	20Cu Control passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ERC + 10Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	10Cu Control passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC5 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_MULTIPLATE20 passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC3 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRABCH + 20C passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR4 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	EV_MC2 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	RG_MIDAG + 15Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	15Cu Control passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR2 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC1 + 15Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRCP1 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_DCDS + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	GH_FR1 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_SLC + 15Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	Lab Control passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	EV_HC1 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ER2 +15Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC2 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LCDSSLCC20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRRD + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_UFR1 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_MULTIPLATE20 passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC1 + 15Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	Lab Control passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRCP1 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	RG_MIDAG + 15Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	10Cu Control passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRRD + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_DCDS + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	EV_HC1 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC5 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_SLC + 15Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_UFR1 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ER2 +15Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LCDSSLCC20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	GH_FR1 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRABCH + 20C passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	EV_MC2 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC3 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR4 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ERC + 10Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC2 + 20Cu passed hatch rate	1

Analyst: KK QA: MG

JUN 10 2021

SIngle Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	15Cu Control passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR2 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	20Cu Control passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	0.6591	CM_MC2 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	0.6591	GH_FR1 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	0.6591	GH_ERC + 10Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	0.6591	LC_LC5 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	0.6591	Lab Control passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	0.6591	FR_FRRD + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	0.6591	10Cu Control passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	0.6591	FR_FR2 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	0.6591	15Cu Control passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	0.6591	FR_FR4 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	0.6591	20Cu Control passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	0.6591	LC_LCDSSLCC20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	0.6591	FR_UFR1 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	0.6591	FR_FRCP1 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	0.6591	GH_ER2 +15Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	0.6591	FR_MULTIPLATE20 passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	0.6591	RG_MIDAG + 15Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	0.6591	CM_MC1 + 15Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	0.6591	LC_DCDS + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	0.6591	EV_HC1 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	0.6591	LC_SLC + 15Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	0.6591	LC_LC3 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	0.6591	EV_MC2 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	0.6591	FR_FRABCH + 20C passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	EV_MC2 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRRD + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC2 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_MULTIPLATE20 passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	RG_MIDAG + 15Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR2 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC5 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ERC + 10Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LCDSSLCC20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC3 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	EV_HC1 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_DCDS + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR4 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_SLC + 15Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_UFR1 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC1 + 15Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	GH_FR1 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	10Cu Control passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ER2 +15Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRCP1 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	15Cu Control passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRABCH + 20C passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	Lab Control passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	20Cu Control passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	EV_HC1 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_DCDS + 20Cu passed hatch rate	1

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC5 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	RG_MIDAG + 15Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC3 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ER2 +15Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRABCH + 20C passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC1 + 15Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRCP1 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_SLC + 15Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	Lab Control passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	EV_MC2 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRRD + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC2 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ERC + 10Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR2 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	15Cu Control passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR4 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	10Cu Control passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	20Cu Control passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_MULTIPLATE20 passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	GH_FR1 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LCDSSLCC20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_UFR1 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	RG_MIDAG + 15Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRABCH + 20C passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR2 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_UFR1 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	15Cu Control passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRRD + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	10Cu Control passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR4 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_SLC + 15Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	Lab Control passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ER2 +15Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC3 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC5 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	EV_HC1 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC1 + 15Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	20Cu Control passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_MULTIPLATE20 passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LCDSSLCC20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_DCDS + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	EV_MC2 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRCP1 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	GH_FR1 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC2 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ERC + 10Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_MULTIPLATE20 passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	EV_MC2 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR4 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	GH_FR1 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ERC + 10Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_SLC + 15Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	10Cu Control passed hatch rate	1

Analyst: KK QA: MG

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SIngle Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	EV_HC1 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	20Cu Control passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LCDSSLCC20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC1 + 15Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC2 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC5 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_UFR1 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_DCDS + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC3 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ER2 +15Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	Lab Control passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	RG_MIDAG + 15Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRCP1 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR2 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRABCH + 20C passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	15Cu Control passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRRD + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_MULTIPLATE20 passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC5 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRRD + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	Lab Control passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_SLC + 15Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC2 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	EV_HC1 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR2 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	10Cu Control passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC1 + 15Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	20Cu Control passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRCP1 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_UFR1 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ERC + 10Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	RG_MIDAG + 15Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRABCH + 20C passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	GH_FR1 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ER2 +15Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR4 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LCDSSLCC20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC3 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_DCDS + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	EV_MC2 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	15Cu Control passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	0.0325	FR_MULTIPLATE20 failed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	0.0325	CM_MC1 + 15Cu failed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	0.0325	FR_FR2 + 20Cu failed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	0.0325	RG_MIDAG + 15Cu failed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	0.0325	LC_LC5 + 20Cu failed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	0.0325	FR_FRCP1 + 20Cu failed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	0.0325	LC_DCDS + 20Cu failed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	0.0325	FR_UFR1 + 20Cu failed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	0.0325	LC_LC3 + 20Cu failed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	0.0325	GH_FR1 + 20Cu failed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	0.0325	EV_MC2 + 20Cu failed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	0.0325	FR_FR4 + 20Cu failed hatch rate	1

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Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	0.0325	FR_FRRD + 20Cu failed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	0.0325	FR_FRABCH + 20C failed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	0.0325	GH_ERC + 10Cu failed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	0.0325	GH_ER2 +15Cu failed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	0.0325	CM_MC2 + 20Cu failed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	0.0325	Lab Control failed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	0.0325	EV_HC1 + 20Cu failed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	0.0325	15Cu Control failed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	0.0325	LC_LCDSSLCC20Cu failed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	0.0325	10Cu Control failed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	0.0325	20Cu Control failed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	0.0325	LC_SLC + 15Cu failed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	15Cu Control passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	10Cu Control passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRCP1 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR2 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC3 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR4 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_MULTIPLATE20 passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	GH_FR1 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LCDSSLCC20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	20Cu Control passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ERC + 10Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC5 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_UFR1 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	EV_HC1 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	Lab Control passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRABCH + 20C passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ER2 +15Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	EV_MC2 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC1 + 15Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	RG_MIDAG + 15Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_SLC + 15Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_DCDS + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC2 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRRD + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	20Cu Control passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_SLC + 15Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_DCDS + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC2 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	15Cu Control passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC5 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_UFR1 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LCDSSLCC20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_MULTIPLATE20 passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC3 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC1 + 15Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ERC + 10Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	Lab Control passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	RG_MIDAG + 15Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ER2 +15Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	EV_MC2 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR4 + 20Cu passed hatch rate	1

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Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	10Cu Control passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRCP1 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRRD + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	GH_FR1 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	EV_HC1 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR2 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRABCH + 20C passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ERC + 10Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR2 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	EV_HC1 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRABCH + 20C passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	15Cu Control passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	RG_MIDAG + 15Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	GH_FR1 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_SLC + 15Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR4 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC2 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRRD + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	EV_MC2 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LCDSSLCC20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC5 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_UFR1 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	20Cu Control passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_DCDS + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	10Cu Control passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC3 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_MULTIPLATE20 passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	Lab Control passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC1 + 15Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ER2 +15Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRCP1 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_UFR1 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ER2 +15Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_MULTIPLATE20 passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	EV_HC1 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR2 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	RG_MIDAG + 15Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_SLC + 15Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	Lab Control passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC3 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	EV_MC2 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRCP1 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRABCH + 20C passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	10Cu Control passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	GH_FR1 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR4 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRRD + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC5 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LCDSSLCC20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ERC + 10Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC2 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	20Cu Control passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	15Cu Control passed hatch rate	1

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Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_DCDS + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC1 + 15Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR2 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	20Cu Control passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC1 + 15Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ER2 +15Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ERC + 10Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	Lab Control passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	GH_FR1 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC5 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	10Cu Control passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	EV_HC1 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_SLC + 15Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_DCDS + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	15Cu Control passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC2 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRCP1 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR4 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_MULTIPLATE20 passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRRD + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_UFR1 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC3 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRABCH + 20C passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	RG_MIDAG + 15Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	EV_MC2 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LCDSSLCC20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_MULTIPLATE20 passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRRD + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	Lab Control passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC2 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	GH_FR1 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRCP1 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRABCH + 20C passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	RG_MIDAG + 15Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_SLC + 15Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	EV_MC2 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC1 + 15Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	EV_HC1 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_DCDS + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ER2 +15Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC3 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_UFR1 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC5 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ERC + 10Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR2 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	20Cu Control passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LCDSSLCC20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR4 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	10Cu Control passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	15Cu Control passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_SLC + 15Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR4 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRABCH + 20C passed hatch rate	1

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Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC2 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ERC + 10Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	20Cu Control passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	RG_MIDAG + 15Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRCP1 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR2 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_MULTIPLATE20 passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	GH_FR1 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRRD + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ER2 +15Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	10Cu Control passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC3 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	EV_MC2 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_DCDS + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	Lab Control passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LCDSSLCC20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_UFR1 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	EV_HC1 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	15Cu Control passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC5 + 20Cu passed hatch rate	1
20-3856-5716	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC1 + 15Cu passed hatch rate	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.8957	LC_LC3 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.8957	FR_FRRD + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.8957	20Cu Control passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.8957	FR_MULTIPLATE20 passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.8957	LC_LC5 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.8957	LC_SLC + 15Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.8957	GH_FR1 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.8957	EV_HC1 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.8957	FR_FRABCH + 20C passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.8957	15Cu Control passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.8957	FR_FRCP1 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.8957	CM_MC1 + 15Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.8957	FR_UFR1 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.8957	LC_DCDS + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.8957	CM_MC2 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.8957	FR_FR4 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.8957	RG_MIDAG + 15Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.8957	EV_MC2 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.8957	GH_ERC + 10Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.8957	10Cu Control passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.8957	FR_FR2 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.8957	LC_LCDSSLCC20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.8957	GH_ER2 +15Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.8957	Lab Control passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9904	FR_FR4 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9904	15Cu Control passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9904	FR_FRABCH + 20C passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9904	FR_MULTIPLATE20 passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9904	LC_LC3 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9904	LC_SLC + 15Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9904	GH_ER2 +15Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9904	LC_LCDSSLCC20Cu passed length	1

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Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9904	LC_LC5 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9904	FR_FR2 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9904	20Cu Control passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9904	CM_MC1 + 15Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9904	FR_UFR1 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9904	10Cu Control passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9904	GH_ERC + 10Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9904	FR_FRRD + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9904	GH_FR1 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9904	EV_MC2 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9904	RG_MIDAG + 15Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9904	EV_HC1 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9904	Lab Control passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9904	CM_MC2 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9904	FR_FRCP1 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9904	LC_DCDS + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9952	20Cu Control passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9952	CM_MC1 + 15Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9952	EV_MC2 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9952	FR_MULTIPLATE20 passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9952	10Cu Control passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9952	LC_LCDSSLCC20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9952	FR_FRRD + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9952	RG_MIDAG + 15Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9952	FR_FR4 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9952	Lab Control passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9952	FR_UFR1 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9952	CM_MC2 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9952	GH_ERC + 10Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9952	LC_SLC + 15Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9952	LC_LC5 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9952	FR_FRABCH + 20C passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9952	EV_HC1 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9952	LC_LC3 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9952	15Cu Control passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9952	FR_FRCP1 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9952	GH_FR1 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9952	LC_DCDS + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9952	GH_ER2 +15Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9952	FR_FR2 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.7251	LC_LCDSSLCC20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.7251	FR_FRCP1 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.7251	CM_MC2 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.7251	FR_FRABCH + 20C passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.7251	LC_DCDS + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.7251	EV_HC1 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.7251	RG_MIDAG + 15Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.7251	GH_ERC + 10Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.7251	GH_FR1 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.7251	LC_LC3 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.7251	LC_SLC + 15Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.7251	EV_MC2 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.7251	CM_MC1 + 15Cu passed length	1

Analyst: Ed QA: MG

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SIngle Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.7251	LC_LC5 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.7251	GH_ER2 +15Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.7251	FR_FR4 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.7251	FR_MULTIPLATE20 passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.7251	Lab Control passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.7251	FR_UFR1 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.7251	15Cu Control passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.7251	FR_FRRD + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.7251	20Cu Control passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.7251	10Cu Control passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.7251	FR_FR2 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9576	GH_FR1 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9576	CM_MC1 + 15Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9576	LC_SLC + 15Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9576	20Cu Control passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9576	FR_FR2 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9576	RG_MIDAG + 15Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9576	FR_FRCP1 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9576	LC_LC5 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9576	LC_LC3 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9576	FR_FRRD + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9576	EV_MC2 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9576	15Cu Control passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9576	FR_FRABCH + 20C passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9576	FR_MULTIPLATE20 passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9576	GH_ER2 +15Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9576	LC_DCDS + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9576	GH_ERC + 10Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9576	Lab Control passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9576	FR_FR4 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9576	FR_UFR1 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9576	EV_HC1 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9576	CM_MC2 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9576	10Cu Control passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9576	LC_LCDSSLCC20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9734	FR_FRCP1 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9734	FR_FR2 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9734	10Cu Control passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9734	LC_SLC + 15Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9734	LC_LC3 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9734	GH_ERC + 10Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9734	FR_FRRD + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9734	CM_MC2 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9734	EV_MC2 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9734	FR_MULTIPLATE20 passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9734	15Cu Control passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9734	FR_FRABCH + 20C passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9734	FR_UFR1 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9734	LC_DCDS + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9734	LC_LCDSSLCC20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9734	GH_FR1 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9734	FR_FR4 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9734	GH_ER2 +15Cu passed length	1

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Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9734	RG_MIDAG + 15Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9734	Lab Control passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9734	CM_MC1 + 15Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9734	LC_LC5 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9734	EV_HC1 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9734	20Cu Control passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9995	20Cu Control passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9995	15Cu Control passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9995	LC_LC5 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9995	CM_MC2 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9995	LC_DCDS + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9995	FR_FRABCH + 20C passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9995	RG_MIDAG + 15Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9995	EV_MC2 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9995	FR_UFR1 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9995	10Cu Control passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9995	EV_HC1 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9995	GH_FR1 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9995	FR_FR4 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9995	LC_LC3 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9995	GH_ER2 +15Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9995	FR_FR2 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9995	Lab Control passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9995	FR_FRCP1 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9995	LC_LCDSSLCC20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9995	LC_SLC + 15Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9995	FR_FRRD + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9995	CM_MC1 + 15Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9995	FR_MULTIPLATE20 passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9995	GH_ERC + 10Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.7972	GH_FR1 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.7972	FR_MULTIPLATE20 passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.7972	FR_FRCP1 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.7972	EV_MC2 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.7972	EV_HC1 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.7972	10Cu Control passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.7972	LC_LC3 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.7972	CM_MC2 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.7972	LC_LCDSSLCC20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.7972	FR_FR4 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.7972	GH_ER2 +15Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.7972	RG_MIDAG + 15Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.7972	LC_LC5 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.7972	20Cu Control passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.7972	CM_MC1 + 15Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.7972	Lab Control passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.7972	GH_ERC + 10Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.7972	FR_UFR1 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.7972	FR_FR2 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.7972	LC_SLC + 15Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.7972	FR_FRRD + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.7972	LC_DCDS + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.7972	15Cu Control passed length	1

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SIngle Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.7972	FR_FRABCH + 20C passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9952	Lab Control passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9952	FR_FRRD + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9952	RG_MIDAG + 15Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9952	GH_FR1 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9952	EV_MC2 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9952	CM_MC2 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9952	GH_ERC + 10Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9952	FR_FRABCH + 20C passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9952	CM_MC1 + 15Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9952	FR_FR2 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9952	LC_SLC + 15Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9952	20Cu Control passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9952	LC_LC5 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9952	15Cu Control passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9952	LC_DCDS + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9952	LC_LC3 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9952	FR_FRCP1 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9952	10Cu Control passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9952	FR_MULTIPLATE20 passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9952	GH_ER2 +15Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9952	FR_UFR1 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9952	EV_HC1 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9952	FR_FR4 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9952	LC_LCDSSLCC20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.8752	CM_MC2 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.8752	GH_ERC + 10Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.8752	RG_MIDAG + 15Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.8752	LC_LCDSSLCC20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.8752	20Cu Control passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.8752	FR_FR4 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.8752	CM_MC1 + 15Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.8752	GH_ER2 +15Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.8752	FR_UFR1 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.8752	FR_FRRD + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.8752	LC_LC5 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.8752	10Cu Control passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.8752	EV_HC1 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.8752	FR_MULTIPLATE20 passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.8752	FR_FRCP1 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.8752	FR_FRABCH + 20C passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.8752	GH_FR1 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.8752	15Cu Control passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.8752	LC_DCDS + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.8752	FR_FR2 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.8752	LC_SLC + 15Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.8752	Lab Control passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.8752	EV_MC2 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.8752	LC_LC3 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.7870	FR_MULTIPLATE20 passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.7870	EV_MC2 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.7870	LC_LCDSSLCC20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.7870	FR_FRRD + 20Cu passed length	1

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Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.7870	LC_LC3 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.7870	LC_DCDS + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.7870	FR_FR4 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.7870	LC_LC5 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.7870	FR_FR2 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.7870	RG_MIDAG + 15Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.7870	EV_HC1 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.7870	CM_MC2 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.7870	GH_ERC + 10Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.7870	FR_FRABCH + 20C passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.7870	LC_SLC + 15Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.7870	FR_FRCP1 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.7870	GH_ER2 +15Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.7870	CM_MC1 + 15Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.7870	10Cu Control passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.7870	FR_UFR1 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.7870	Lab Control passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.7870	20Cu Control passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.7870	15Cu Control passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.7870	GH_FR1 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.4514	Lab Control passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.4514	FR_UFR1 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.4514	EV_MC2 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.4514	EV_HC1 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.4514	FR_FRABCH + 20C passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.4514	FR_FRRD + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.4514	LC_DCDS + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.4514	FR_FRCP1 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.4514	LC_SLC + 15Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.4514	LC_LC3 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.4514	GH_FR1 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.4514	CM_MC2 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.4514	LC_LC5 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.4514	FR_MULTIPLATE20 passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.4514	GH_ER2 +15Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.4514	10Cu Control passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.4514	LC_LCDSSLCC20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.4514	20Cu Control passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.4514	FR_FR4 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.4514	15Cu Control passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.4514	FR_FR2 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.4514	CM_MC1 + 15Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.4514	RG_MIDAG + 15Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.4514	GH_ERC + 10Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9365	FR_MULTIPLATE20 passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9365	FR_FRABCH + 20C passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9365	LC_DCDS + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9365	RG_MIDAG + 15Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9365	LC_LC3 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9365	GH_FR1 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9365	CM_MC1 + 15Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9365	LC_SLC + 15Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9365	EV_HC1 + 20Cu passed length	1

Analyst: KBL QA: MG

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SIngle Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9365	LC_LC5 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9365	GH_ER2 +15Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9365	LC_LCDSSLCC20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9365	10Cu Control passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9365	FR_UFR1 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9365	20Cu Control passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9365	FR_FR4 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9365	15Cu Control passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9365	CM_MC2 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9365	FR_FR2 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9365	GH_ERC + 10Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9365	Lab Control passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9365	EV_MC2 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9365	FR_FRRD + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9365	FR_FRCP1 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9266	LC_LC3 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9266	10Cu Control passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9266	EV_MC2 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9266	FR_FRRD + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9266	RG_MIDAG + 15Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9266	FR_FRABCH + 20C passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9266	LC_DCDS + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9266	FR_UFR1 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9266	LC_SLC + 15Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9266	GH_ER2 +15Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9266	CM_MC1 + 15Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9266	LC_LC5 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9266	CM_MC2 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9266	Lab Control passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9266	FR_FR2 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9266	GH_FR1 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9266	FR_FRCP1 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9266	EV_HC1 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9266	LC_LCDSSLCC20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9266	15Cu Control passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9266	FR_MULTIPLATE20 passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9266	FR_FR4 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9266	20Cu Control passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9266	GH_ERC + 10Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.8437	CM_MC1 + 15Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.8437	LC_LC3 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.8437	GH_ER2 +15Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.8437	FR_MULTIPLATE20 passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.8437	GH_ERC + 10Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.8437	LC_LC5 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.8437	FR_UFR1 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.8437	LC_LCDSSLCC20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.8437	10Cu Control passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.8437	20Cu Control passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.8437	FR_FR4 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.8437	15Cu Control passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.8437	CM_MC2 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.8437	GH_FR1 + 20Cu passed length	1

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Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.8437	FR_FR2 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.8437	EV_MC2 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.8437	FR_FRCP1 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.8437	RG_MIDAG + 15Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.8437	LC_DCDS + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.8437	LC_SLC + 15Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.8437	FR_FRRD + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.8437	EV_HC1 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.8437	Lab Control passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.8437	FR_FRABCH + 20C passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9948	10Cu Control passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9948	FR_FRCP1 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9948	LC_LC5 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9948	GH_ERC + 10Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9948	FR_FRABCH + 20C passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9948	EV_MC2 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9948	Lab Control passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9948	FR_FRRD + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9948	FR_FR4 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9948	FR_UFR1 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9948	LC_DCDS + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9948	RG_MIDAG + 15Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9948	20Cu Control passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9948	GH_FR1 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9948	LC_SLC + 15Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9948	GH_ER2 +15Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9948	CM_MC1 + 15Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9948	LC_LC3 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9948	CM_MC2 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9948	FR_FR2 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9948	15Cu Control passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9948	LC_LCDSSLCC20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9948	FR_MULTIPLATE20 passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9948	EV_HC1 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9223	Lab Control passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9223	FR_FR2 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9223	RG_MIDAG + 15Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9223	FR_FR4 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9223	EV_HC1 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9223	15Cu Control passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9223	10Cu Control passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9223	GH_FR1 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9223	CM_MC2 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9223	FR_FRABCH + 20C passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9223	20Cu Control passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9223	FR_FRRD + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9223	LC_LCDSSLCC20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9223	CM_MC1 + 15Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9223	EV_MC2 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9223	LC_DCDS + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9223	GH_ER2 +15Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9223	GH_ERC + 10Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9223	LC_LC5 + 20Cu passed length	1

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SIngle Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9223	FR_UFR1 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9223	LC_LC3 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9223	LC_SLC + 15Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9223	FR_MULTIPLATE20 passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9223	FR_FRCP1 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9884	GH_FR1 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9884	FR_MULTIPLATE20 passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9884	EV_HC1 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9884	15Cu Control passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9884	FR_FRCP1 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9884	RG_MIDAG + 15Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9884	GH_ER2 +15Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9884	10Cu Control passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9884	FR_FR2 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9884	LC_SLC + 15Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9884	FR_FRABCH + 20C passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9884	CM_MC1 + 15Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9884	LC_LC3 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9884	FR_FR4 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9884	LC_LC5 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9884	CM_MC2 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9884	GH_ERC + 10Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9884	20Cu Control passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9884	FR_UFR1 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9884	FR_FRRD + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9884	Lab Control passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9884	LC_LCDSSLCC20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9884	EV_MC2 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9884	LC_DCDS + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9055	FR_FR2 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9055	10Cu Control passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9055	Lab Control passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9055	GH_FR1 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9055	FR_FRRD + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9055	FR_MULTIPLATE20 passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9055	FR_FRCP1 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9055	FR_FRABCH + 20C passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9055	LC_SLC + 15Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9055	15Cu Control passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9055	EV_MC2 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9055	CM_MC1 + 15Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9055	LC_LC3 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9055	GH_ER2 +15Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9055	EV_HC1 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9055	LC_LC5 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9055	LC_DCDS + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9055	FR_UFR1 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9055	LC_LCDSSLCC20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9055	RG_MIDAG + 15Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9055	20Cu Control passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9055	FR_FR4 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9055	GH_ERC + 10Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9055	CM_MC2 + 20Cu passed length	1

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Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9926	GH_FR1 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9926	RG_MIDAG + 15Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9926	FR_FRRD + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9926	GH_ERC + 10Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9926	EV_MC2 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9926	FR_FRABCH + 20C passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9926	CM_MC2 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9926	FR_FRCP1 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9926	Lab Control passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9926	FR_FR2 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9926	10Cu Control passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9926	15Cu Control passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9926	FR_FR4 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9926	20Cu Control passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9926	FR_MULTIPLATE20 passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9926	FR_UFR1 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9926	EV_HC1 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9926	LC_LC5 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9926	LC_LC3 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9926	CM_MC1 + 15Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9926	LC_DCDS + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9926	GH_ER2 +15Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9926	LC_SLC + 15Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9926	LC_LCDSSLCC20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.7525	15Cu Control passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.7525	20Cu Control passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.7525	EV_MC2 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.7525	10Cu Control passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.7525	FR_FRRD + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.7525	FR_MULTIPLATE20 passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.7525	GH_ERC + 10Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.7525	EV_HC1 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.7525	LC_DCDS + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.7525	GH_ER2 +15Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.7525	Lab Control passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.7525	FR_FRCP1 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.7525	LC_LCDSSLCC20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.7525	RG_MIDAG + 15Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.7525	LC_LC3 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.7525	FR_FR2 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.7525	LC_SLC + 15Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.7525	LC_LC5 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.7525	CM_MC2 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.7525	CM_MC1 + 15Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.7525	FR_UFR1 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.7525	FR_FR4 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.7525	GH_FR1 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.7525	FR_FRABCH + 20C passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9669	EV_MC2 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9669	FR_FR4 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9669	20Cu Control passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9669	FR_MULTIPLATE20 passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9669	RG_MIDAG + 15Cu passed length	1

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SIngle Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9669	Lab Control passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9669	FR_FR2 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9669	FR_UFR1 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9669	CM_MC2 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9669	GH_ERC + 10Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9669	LC_LC5 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9669	FR_FRABCH + 20C passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9669	LC_LCDSSLCC20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9669	LC_SLC + 15Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9669	GH_FR1 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9669	10Cu Control passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9669	LC_LC3 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9669	15Cu Control passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9669	FR_FRCP1 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9669	LC_DCDS + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9669	CM_MC1 + 15Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9669	GH_ER2 +15Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9669	EV_HC1 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9669	FR_FRRD + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9489	10Cu Control passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9489	EV_HC1 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9489	FR_FR2 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9489	LC_LC3 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9489	LC_LC5 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9489	LC_LCDSSLCC20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9489	15Cu Control passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9489	20Cu Control passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9489	LC_DCDS + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9489	CM_MC2 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9489	EV_MC2 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9489	FR_FR4 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9489	RG_MIDAG + 15Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9489	FR_MULTIPLATE20 passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9489	GH_FR1 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9489	GH_ER2 +15Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9489	FR_FRCP1 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9489	FR_FRRD + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9489	CM_MC1 + 15Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9489	GH_ERC + 10Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9489	Lab Control passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9489	LC_SLC + 15Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9489	FR_UFR1 + 20Cu passed length	1
10-1215-9981	Length	Dunnett Multiple Comparison Test	0.9489	FR_FRABCH + 20C passed length	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.8837	CM_MC2 + 20Cu passed mean dry bioma	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.8837	GH_ERC + 10Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.8837	EV_HC1 + 20Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.8837	FR_FRABCH + 20C passed mean dry bio	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.8837	LC_LC3 + 20Cu passed mean dry biomass	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.8837	GH_FR1 + 20Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.8837	FR_UFR1 + 20Cu passed mean dry bioma	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.8837	FR_FRCP1 + 20Cu passed mean dry biom	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.8837	FR_FR4 + 20Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.8837	GH_ER2 +15Cu passed mean dry biomas	1

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Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.8837	LC_SLC + 15Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.8837	15Cu Control passed mean dry biomass-m	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.8837	RG_MIDAG + 15Cu passed mean dry bio	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.8837	20Cu Control passed mean dry biomass-m	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.8837	10Cu Control passed mean dry biomass-m	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.8837	EV_MC2 + 20Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.8837	LC_LC5 + 20Cu passed mean dry biomass	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.8837	LC_LCDSSLCC20Cu passed mean dry bio	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.8837	Lab Control passed mean dry biomass-mg	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.8837	LC_DCDS + 20Cu passed mean dry bioma	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.8837	CM_MC1 + 15Cu passed mean dry bioma	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.8837	FR_MULTIPLATE20 passed mean dry bio	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.8837	FR_FR2 + 20Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.8837	FR_FRRD + 20Cu passed mean dry bioma	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9890	FR_FR4 + 20Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9890	LC_SLC + 15Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9890	EV_MC2 + 20Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9890	LC_LC3 + 20Cu passed mean dry biomass	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9890	FR_FRCP1 + 20Cu passed mean dry biom	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9890	GH_FR1 + 20Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9890	10Cu Control passed mean dry biomass-m	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9890	Lab Control passed mean dry biomass-mg	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9890	GH_ERC + 10Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9890	LC_LC5 + 20Cu passed mean dry biomass	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9890	LC_DCDS + 20Cu passed mean dry bioma	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9890	20Cu Control passed mean dry biomass-m	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9890	CM_MC1 + 15Cu passed mean dry bioma	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9890	CM_MC2 + 20Cu passed mean dry bioma	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9890	15Cu Control passed mean dry biomass-m	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9890	FR_FRABCH + 20C passed mean dry bio	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9890	FR_UFR1 + 20Cu passed mean dry bioma	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9890	GH_ER2 +15Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9890	RG_MIDAG + 15Cu passed mean dry bio	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9890	EV_HC1 + 20Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9890	LC_LCDSSLCC20Cu passed mean dry bio	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9890	FR_FR2 + 20Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9890	FR_MULTIPLATE20 passed mean dry bio	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9890	FR_FRRD + 20Cu passed mean dry bioma	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9845	CM_MC1 + 15Cu passed mean dry bioma	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9845	EV_HC1 + 20Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9845	GH_ER2 +15Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9845	EV_MC2 + 20Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9845	LC_SLC + 15Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9845	RG_MIDAG + 15Cu passed mean dry bio	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9845	GH_FR1 + 20Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9845	FR_FRABCH + 20C passed mean dry bio	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9845	FR_UFR1 + 20Cu passed mean dry bioma	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9845	CM_MC2 + 20Cu passed mean dry bioma	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9845	FR_FRCP1 + 20Cu passed mean dry biom	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9845	20Cu Control passed mean dry biomass-m	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9845	GH_ERC + 10Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9845	15Cu Control passed mean dry biomass-m	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9845	LC_LC5 + 20Cu passed mean dry biomass	1

Analyst: KCL QA: MG

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SIngle Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9845	LC_DCDS + 20Cu passed mean dry bioma	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9845	LC_LC3 + 20Cu passed mean dry biomass	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9845	Lab Control passed mean dry biomass-mg	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9845	FR_FR4 + 20Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9845	LC_LCDSSLCC20Cu passed mean dry bio	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9845	10Cu Control passed mean dry biomass-m	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9845	FR_MULTIPLATE20 passed mean dry bio	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9845	FR_FRRD + 20Cu passed mean dry bioma	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9845	FR_FR2 + 20Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.8837	FR_FR4 + 20Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.8837	GH_ERC + 10Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.8837	CM_MC1 + 15Cu passed mean dry bioma	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.8837	LC_LC5 + 20Cu passed mean dry biomass	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.8837	GH_ER2 +15Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.8837	FR_FRABCH + 20C passed mean dry bio	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.8837	20Cu Control passed mean dry biomass-m	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.8837	EV_MC2 + 20Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.8837	LC_SLC + 15Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.8837	LC_LC3 + 20Cu passed mean dry biomass	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.8837	15Cu Control passed mean dry biomass-m	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.8837	FR_FRCP1 + 20Cu passed mean dry biom	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.8837	CM_MC2 + 20Cu passed mean dry bioma	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.8837	FR_UFR1 + 20Cu passed mean dry bioma	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.8837	LC_LCDSSLCC20Cu passed mean dry bio	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.8837	RG_MIDAG + 15Cu passed mean dry bio	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.8837	10Cu Control passed mean dry biomass-m	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.8837	LC_DCDS + 20Cu passed mean dry bioma	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.8837	GH_FR1 + 20Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.8837	Lab Control passed mean dry biomass-mg	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.8837	EV_HC1 + 20Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.8837	FR_FR2 + 20Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.8837	FR_MULTIPLATE20 passed mean dry bio	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.8837	FR_FRRD + 20Cu passed mean dry bioma	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.0215	LC_DCDS + 20Cu failed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.0215	FR_FRABCH + 20C failed mean dry bioma	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.0215	GH_ER2 +15Cu failed mean dry biomass-	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.0215	FR_FR2 + 20Cu failed mean dry biomass-	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.0215	20Cu Control failed mean dry biomass-mg	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.0215	LC_LC3 + 20Cu failed mean dry biomass-	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.0215	EV_HC1 + 20Cu failed mean dry biomass-	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.0215	GH_FR1 + 20Cu failed mean dry biomass-	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.0215	LC_LC5 + 20Cu failed mean dry biomass-	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.0215	10Cu Control failed mean dry biomass-mg	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.0215	GH_ERC + 10Cu failed mean dry biomass-	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.0215	Lab Control failed mean dry biomass-mg	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.0215	LC_LCDSSLCC20Cu failed mean dry biom	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.0215	FR_FRCP1 + 20Cu failed mean dry bioma	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.0215	CM_MC1 + 15Cu failed mean dry biomass	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.0215	15Cu Control failed mean dry biomass-mg	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.0215	LC_SLC + 15Cu failed mean dry biomass-	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.0215	FR_UFR1 + 20Cu failed mean dry biomass	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.0215	FR_FR4 + 20Cu failed mean dry biomass-	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.0215	CM_MC2 + 20Cu failed mean dry biomass	1

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Fathead minnow 32-d (Pimephales promelas) survival and growth test **Nautilus Environmental Calgary**

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.0215	EV_MC2 + 20Cu failed mean dry biomass-	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.0215	RG_MIDAG + 15Cu failed mean dry bioma	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.0215	FR_FRRD + 20Cu failed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.0215	FR_MULTIPLATE20 failed mean dry biom	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.1028	LC_LC5 + 20Cu passed mean dry biomass	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.1028	EV_MC2 + 20Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.1028	15Cu Control passed mean dry biomass-m	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.1028	FR_FRABCH + 20C passed mean dry bio	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.1028	GH_FR1 + 20Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.1028	FR_FR4 + 20Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.1028	20Cu Control passed mean dry biomass-m	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.1028	10Cu Control passed mean dry biomass-m	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.1028	LC_SLC + 15Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.1028	CM_MC2 + 20Cu passed mean dry bioma	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.1028	FR_FRCP1 + 20Cu passed mean dry biom	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.1028	CM_MC1 + 15Cu passed mean dry bioma	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.1028	FR_UFR1 + 20Cu passed mean dry bioma	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.1028	LC_LC3 + 20Cu passed mean dry biomass	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.1028	GH_ER2 +15Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.1028	GH_ERC + 10Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.1028	EV_HC1 + 20Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.1028	LC_LCDSSLCC20Cu passed mean dry bio	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.1028	LC_DCDS + 20Cu passed mean dry bioma	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.1028	RG_MIDAG + 15Cu passed mean dry bio	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.1028	FR_FR2 + 20Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.1028	Lab Control passed mean dry biomass-mg	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.1028	FR_MULTIPLATE20 passed mean dry bio	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.1028	FR_FRRD + 20Cu passed mean dry bioma	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.5317	RG_MIDAG + 15Cu passed mean dry bio	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.5317	GH_ER2 +15Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.5317	FR_FR4 + 20Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.5317	GH_ERC + 10Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.5317	10Cu Control passed mean dry biomass-m	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.5317	FR_FRCP1 + 20Cu passed mean dry biom	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.5317	FR_UFR1 + 20Cu passed mean dry bioma	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.5317	CM_MC2 + 20Cu passed mean dry bioma	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.5317	LC_LCDSSLCC20Cu passed mean dry bio	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.5317	GH_FR1 + 20Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.5317	EV_HC1 + 20Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.5317	FR_FRABCH + 20C passed mean dry bio	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.5317	EV_MC2 + 20Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.5317	FR_FR2 + 20Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.5317	LC_SLC + 15Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.5317	Lab Control passed mean dry biomass-mg	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.5317	20Cu Control passed mean dry biomass-m	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.5317	15Cu Control passed mean dry biomass-m	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.5317	LC_LC3 + 20Cu passed mean dry biomass	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.5317	CM_MC1 + 15Cu passed mean dry bioma	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.5317	LC_DCDS + 20Cu passed mean dry bioma	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.5317	LC_LC5 + 20Cu passed mean dry biomass	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.5317	FR_FRRD + 20Cu passed mean dry bioma	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.5317	FR_MULTIPLATE20 passed mean dry bio	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.5948	FR_FRABCH + 20C passed mean dry bio	1

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SIngle Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.5948	10Cu Control passed mean dry biomass-m	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.5948	LC_LCDSSLCC20Cu passed mean dry bio	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.5948	EV_HC1 + 20Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.5948	EV_MC2 + 20Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.5948	LC_LC3 + 20Cu passed mean dry biomass	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.5948	FR_FR2 + 20Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.5948	LC_SLC + 15Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.5948	CM_MC2 + 20Cu passed mean dry bioma	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.5948	Lab Control passed mean dry biomass-mg	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.5948	15Cu Control passed mean dry biomass-m	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.5948	20Cu Control passed mean dry biomass-m	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.5948	FR_FRCP1 + 20Cu passed mean dry biom	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.5948	GH_ERC + 10Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.5948	GH_ER2 +15Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.5948	LC_LC5 + 20Cu passed mean dry biomass	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.5948	LC_DCDS + 20Cu passed mean dry bioma	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.5948	RG_MIDAG + 15Cu passed mean dry bio	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.5948	CM_MC1 + 15Cu passed mean dry bioma	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.5948	FR_FR4 + 20Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.5948	GH_FR1 + 20Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.5948	FR_UFR1 + 20Cu passed mean dry bioma	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.5948	FR_FRRD + 20Cu passed mean dry bioma	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.5948	FR_MULTIPLATE20 passed mean dry bio	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.0846	CM_MC1 + 15Cu passed mean dry bioma	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.0846	LC_DCDS + 20Cu passed mean dry bioma	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.0846	LC_LC3 + 20Cu passed mean dry biomass	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.0846	LC_LCDSSLCC20Cu passed mean dry bio	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.0846	GH_ERC + 10Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.0846	LC_SLC + 15Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.0846	15Cu Control passed mean dry biomass-m	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.0846	Lab Control passed mean dry biomass-mg	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.0846	RG_MIDAG + 15Cu passed mean dry bio	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.0846	FR_UFR1 + 20Cu passed mean dry bioma	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.0846	FR_FR4 + 20Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.0846	LC_LC5 + 20Cu passed mean dry biomass	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.0846	GH_ER2 +15Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.0846	10Cu Control passed mean dry biomass-m	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.0846	EV_MC2 + 20Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.0846	20Cu Control passed mean dry biomass-m	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.0846	GH_FR1 + 20Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.0846	FR_FRCP1 + 20Cu passed mean dry biom	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.0846	EV_HC1 + 20Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.0846	CM_MC2 + 20Cu passed mean dry bioma	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.0846	FR_FR2 + 20Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.0846	FR_FRABCH + 20C passed mean dry bio	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.0846	FR_FRRD + 20Cu passed mean dry bioma	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.0846	FR_MULTIPLATE20 passed mean dry bio	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9530	FR_FR4 + 20Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9530	FR_FRCP1 + 20Cu passed mean dry biom	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9530	GH_ERC + 10Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9530	CM_MC1 + 15Cu passed mean dry bioma	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9530	GH_FR1 + 20Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9530	FR_FRABCH + 20C passed mean dry bio	1

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Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9530	LC_SLC + 15Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9530	FR_FR2 + 20Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9530	Lab Control passed mean dry biomass-mg	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9530	GH_ER2 +15Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9530	LC_LC5 + 20Cu passed mean dry biomass	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9530	20Cu Control passed mean dry biomass-m	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9530	15Cu Control passed mean dry biomass-m	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9530	CM_MC2 + 20Cu passed mean dry bioma	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9530	LC_LC3 + 20Cu passed mean dry biomass	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9530	LC_DCDS + 20Cu passed mean dry bioma	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9530	10Cu Control passed mean dry biomass-m	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9530	EV_MC2 + 20Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9530	EV_HC1 + 20Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9530	LC_LCDSSLCC20Cu passed mean dry bio	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9530	RG_MIDAG + 15Cu passed mean dry bio	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9530	FR_UFR1 + 20Cu passed mean dry bioma	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9530	FR_FRRD + 20Cu passed mean dry bioma	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9530	FR_MULTIPLATE20 passed mean dry bio	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9651	FR_UFR1 + 20Cu passed mean dry bioma	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9651	EV_MC2 + 20Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9651	20Cu Control passed mean dry biomass-m	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9651	FR_FR4 + 20Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9651	EV_HC1 + 20Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9651	FR_FRABCH + 20C passed mean dry bio	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9651	LC_SLC + 15Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9651	LC_LC3 + 20Cu passed mean dry biomass	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9651	GH_FR1 + 20Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9651	FR_FRCP1 + 20Cu passed mean dry biom	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9651	LC_DCDS + 20Cu passed mean dry bioma	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9651	RG_MIDAG + 15Cu passed mean dry bio	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9651	CM_MC2 + 20Cu passed mean dry bioma	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9651	10Cu Control passed mean dry biomass-m	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9651	15Cu Control passed mean dry biomass-m	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9651	FR_FR2 + 20Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9651	LC_LCDSSLCC20Cu passed mean dry bio	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9651	LC_LC5 + 20Cu passed mean dry biomass	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9651	Lab Control passed mean dry biomass-mg	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9651	GH_ERC + 10Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9651	CM_MC1 + 15Cu passed mean dry bioma	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9651	GH_ER2 +15Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9651	FR_MULTIPLATE20 passed mean dry bio	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9651	FR_FRRD + 20Cu passed mean dry bioma	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.6616	FR_FR4 + 20Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.6616	20Cu Control passed mean dry biomass-m	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.6616	GH_ER2 +15Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.6616	FR_FRABCH + 20C passed mean dry bio	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.6616	FR_FRCP1 + 20Cu passed mean dry biom	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.6616	EV_MC2 + 20Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.6616	CM_MC2 + 20Cu passed mean dry bioma	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.6616	GH_ERC + 10Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.6616	CM_MC1 + 15Cu passed mean dry bioma	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.6616	LC_LCDSSLCC20Cu passed mean dry bio	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.6616	LC_DCDS + 20Cu passed mean dry bioma	1

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14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.6616	FR_UFR1 + 20Cu passed mean dry bioma	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.6616	FR_FR2 + 20Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.6616	15Cu Control passed mean dry biomass-m	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.6616	RG_MIDAG + 15Cu passed mean dry bio	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.6616	GH_FR1 + 20Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.6616	LC_LC5 + 20Cu passed mean dry biomass	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.6616	LC_LC3 + 20Cu passed mean dry biomass	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.6616	Lab Control passed mean dry biomass-mg	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.6616	EV_HC1 + 20Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.6616	10Cu Control passed mean dry biomass-m	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.6616	LC_SLC + 15Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.6616	FR_MULTIPLATE20 passed mean dry bio	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.6616	FR_FRRD + 20Cu passed mean dry bioma	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.3134	10Cu Control passed mean dry biomass-m	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.3134	LC_DCDS + 20Cu passed mean dry bioma	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.3134	LC_LC3 + 20Cu passed mean dry biomass	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.3134	15Cu Control passed mean dry biomass-m	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.3134	FR_FRABCH + 20C passed mean dry bio	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.3134	FR_FR2 + 20Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.3134	EV_MC2 + 20Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.3134	EV_HC1 + 20Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.3134	LC_SLC + 15Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.3134	GH_ER2 +15Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.3134	CM_MC1 + 15Cu passed mean dry bioma	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.3134	RG_MIDAG + 15Cu passed mean dry bio	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.3134	LC_LCDSSLCC20Cu passed mean dry bio	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.3134	LC_LC5 + 20Cu passed mean dry biomass	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.3134	Lab Control passed mean dry biomass-mg	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.3134	20Cu Control passed mean dry biomass-m	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.3134	FR_UFR1 + 20Cu passed mean dry bioma	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.3134	FR_FR4 + 20Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.3134	GH_FR1 + 20Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.3134	GH_ERC + 10Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.3134	CM_MC2 + 20Cu passed mean dry bioma	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.3134	FR_FRCP1 + 20Cu passed mean dry biom	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.3134	FR_FRRD + 20Cu passed mean dry bioma	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.3134	FR_MULTIPLATE20 passed mean dry bio	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.4998	LC_SLC + 15Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.4998	Lab Control passed mean dry biomass-mg	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.4998	GH_FR1 + 20Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.4998	LC_LC3 + 20Cu passed mean dry biomass	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.4998	FR_UFR1 + 20Cu passed mean dry bioma	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.4998	LC_LC5 + 20Cu passed mean dry biomass	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.4998	CM_MC2 + 20Cu passed mean dry bioma	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.4998	FR_FR2 + 20Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.4998	RG_MIDAG + 15Cu passed mean dry bio	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.4998	LC_DCDS + 20Cu passed mean dry bioma	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.4998	CM_MC1 + 15Cu passed mean dry bioma	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.4998	GH_ERC + 10Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.4998	FR_FR4 + 20Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.4998	GH_ER2 +15Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.4998	FR_FRABCH + 20C passed mean dry bio	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.4998	FR_FRCP1 + 20Cu passed mean dry biom	1

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Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.4998	15Cu Control passed mean dry biomass-m	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.4998	20Cu Control passed mean dry biomass-m	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.4998	EV_MC2 + 20Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.4998	10Cu Control passed mean dry biomass-m	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.4998	EV_HC1 + 20Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.4998	LC_LCDSSLCC20Cu passed mean dry bio	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.4998	FR_FRRD + 20Cu passed mean dry bioma	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.4998	FR_MULTIPLATE20 passed mean dry bio	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9282	LC_LCDSSLCC20Cu passed mean dry bio	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9282	GH_ERC + 10Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9282	GH_FR1 + 20Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9282	LC_DCDS + 20Cu passed mean dry bioma	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9282	FR_FR2 + 20Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9282	FR_UFR1 + 20Cu passed mean dry bioma	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9282	GH_ER2 +15Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9282	CM_MC1 + 15Cu passed mean dry bioma	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9282	Lab Control passed mean dry biomass-mg	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9282	FR_FR4 + 20Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9282	FR_FRABCH + 20C passed mean dry bio	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9282	FR_FRCP1 + 20Cu passed mean dry biom	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9282	EV_MC2 + 20Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9282	RG_MIDAG + 15Cu passed mean dry bio	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9282	10Cu Control passed mean dry biomass-m	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9282	20Cu Control passed mean dry biomass-m	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9282	LC_LC3 + 20Cu passed mean dry biomass	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9282	15Cu Control passed mean dry biomass-m	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9282	LC_LC5 + 20Cu passed mean dry biomass	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9282	EV_HC1 + 20Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9282	LC_SLC + 15Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9282	CM_MC2 + 20Cu passed mean dry bioma	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9282	FR_MULTIPLATE20 passed mean dry bio	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9282	FR_FRRD + 20Cu passed mean dry bioma	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.8330	GH_ER2 +15Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.8330	FR_UFR1 + 20Cu passed mean dry bioma	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.8330	Lab Control passed mean dry biomass-mg	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.8330	20Cu Control passed mean dry biomass-m	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.8330	15Cu Control passed mean dry biomass-m	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.8330	10Cu Control passed mean dry biomass-m	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.8330	FR_FR2 + 20Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.8330	FR_FR4 + 20Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.8330	GH_FR1 + 20Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.8330	FR_FRABCH + 20C passed mean dry bio	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.8330	GH_ERC + 10Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.8330	RG_MIDAG + 15Cu passed mean dry bio	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.8330	FR_FRCP1 + 20Cu passed mean dry biom	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.8330	EV_MC2 + 20Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.8330	CM_MC2 + 20Cu passed mean dry bioma	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.8330	LC_LCDSSLCC20Cu passed mean dry bio	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.8330	EV_HC1 + 20Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.8330	LC_LC3 + 20Cu passed mean dry biomass	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.8330	LC_SLC + 15Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.8330	LC_DCDS + 20Cu passed mean dry bioma	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.8330	CM_MC1 + 15Cu passed mean dry bioma	1

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Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.8330	LC_LC5 + 20Cu passed mean dry biomass	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.8330	FR_MULTIPLATE20 passed mean dry bio	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.8330	FR_FRRD + 20Cu passed mean dry bioma	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.7345	FR_FRCP1 + 20Cu passed mean dry biom	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.7345	FR_FR4 + 20Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.7345	Lab Control passed mean dry biomass-mg	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.7345	FR_UFR1 + 20Cu passed mean dry bioma	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.7345	10Cu Control passed mean dry biomass-m	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.7345	GH_FR1 + 20Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.7345	LC_LC3 + 20Cu passed mean dry biomass	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.7345	EV_MC2 + 20Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.7345	CM_MC2 + 20Cu passed mean dry bioma	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.7345	15Cu Control passed mean dry biomass-m	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.7345	20Cu Control passed mean dry biomass-m	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.7345	RG_MIDAG + 15Cu passed mean dry bio	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.7345	LC_LC5 + 20Cu passed mean dry biomass	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.7345	LC_DCDS + 20Cu passed mean dry bioma	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.7345	LC_LCDSSLCC20Cu passed mean dry bio	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.7345	EV_HC1 + 20Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.7345	GH_ERC + 10Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.7345	FR_FRABCH + 20C passed mean dry bio	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.7345	CM_MC1 + 15Cu passed mean dry bioma	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.7345	FR_FR2 + 20Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.7345	GH_ER2 +15Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.7345	LC_SLC + 15Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.7345	FR_MULTIPLATE20 passed mean dry bio	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.7345	FR_FRRD + 20Cu passed mean dry bioma	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.8805	LC_LCDSSLCC20Cu passed mean dry bio	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.8805	15Cu Control passed mean dry biomass-m	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.8805	GH_ERC + 10Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.8805	LC_SLC + 15Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.8805	EV_HC1 + 20Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.8805	GH_ER2 +15Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.8805	RG_MIDAG + 15Cu passed mean dry bio	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.8805	FR_FR2 + 20Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.8805	GH_FR1 + 20Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.8805	EV_MC2 + 20Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.8805	CM_MC1 + 15Cu passed mean dry bioma	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.8805	FR_FRCP1 + 20Cu passed mean dry biom	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.8805	10Cu Control passed mean dry biomass-m	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.8805	20Cu Control passed mean dry biomass-m	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.8805	FR_FR4 + 20Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.8805	FR_FRABCH + 20C passed mean dry bio	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.8805	LC_LC3 + 20Cu passed mean dry biomass	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.8805	CM_MC2 + 20Cu passed mean dry bioma	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.8805	LC_LC5 + 20Cu passed mean dry biomass	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.8805	LC_DCDS + 20Cu passed mean dry bioma	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.8805	FR_UFR1 + 20Cu passed mean dry bioma	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.8805	Lab Control passed mean dry biomass-mg	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.8805	FR_MULTIPLATE20 passed mean dry bio	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.8805	FR_FRRD + 20Cu passed mean dry bioma	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.7552	LC_LCDSSLCC20Cu passed mean dry bio	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.7552	RG_MIDAG + 15Cu passed mean dry bio	1

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Fathead minnow 32-d (Pimephales promelas) survival and growth test — Nautilus Environmental Calgary

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.7552	GH_ER2 +15Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.7552	FR_FR4 + 20Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.7552	EV_MC2 + 20Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.7552	15Cu Control passed mean dry biomass-m	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.7552	LC_SLC + 15Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.7552	LC_LC5 + 20Cu passed mean dry biomass	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.7552	FR_FR2 + 20Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.7552	LC_DCDS + 20Cu passed mean dry bioma	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.7552	CM_MC1 + 15Cu passed mean dry bioma	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.7552	LC_LC3 + 20Cu passed mean dry biomass	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.7552	10Cu Control passed mean dry biomass-m	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.7552	EV_HC1 + 20Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.7552	FR_UFR1 + 20Cu passed mean dry bioma	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.7552	GH_ERC + 10Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.7552	CM_MC2 + 20Cu passed mean dry bioma	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.7552	Lab Control passed mean dry biomass-mg	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.7552	FR_FRABCH + 20C passed mean dry bio	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.7552	20Cu Control passed mean dry biomass-m	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.7552	FR_FRCP1 + 20Cu passed mean dry biom	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.7552	GH_FR1 + 20Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.7552	FR_MULTIPLATE20 passed mean dry bio	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.7552	FR_FRRD + 20Cu passed mean dry bioma	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.4458	EV_HC1 + 20Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.4458	EV_MC2 + 20Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.4458	LC_LC5 + 20Cu passed mean dry biomass	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.4458	GH_ERC + 10Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.4458	FR_UFR1 + 20Cu passed mean dry bioma	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.4458	LC_DCDS + 20Cu passed mean dry bioma	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.4458	15Cu Control passed mean dry biomass-m	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.4458	LC_SLC + 15Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.4458	GH_FR1 + 20Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.4458	GH_ER2 +15Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.4458	RG_MIDAG + 15Cu passed mean dry bio	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.4458	Lab Control passed mean dry biomass-mg	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.4458	CM_MC2 + 20Cu passed mean dry bioma	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.4458	FR_FR2 + 20Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.4458	LC_LCDSSLCC20Cu passed mean dry bio	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.4458	20Cu Control passed mean dry biomass-m	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.4458	FR_FR4 + 20Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.4458	LC_LC3 + 20Cu passed mean dry biomass	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.4458	FR_FRABCH + 20C passed mean dry bio	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.4458	FR_FRCP1 + 20Cu passed mean dry biom	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.4458	CM_MC1 + 15Cu passed mean dry bioma	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.4458	10Cu Control passed mean dry biomass-m	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.4458	FR_MULTIPLATE20 passed mean dry bio	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.4458	FR_FRRD + 20Cu passed mean dry bioma	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.0185	FR_FRCP1 + 20Cu failed mean dry bioma	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.0185	FR_UFR1 + 20Cu failed mean dry biomass	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.0185	FR_FRABCH + 20C failed mean dry bioma	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.0185	CM_MC1 + 15Cu failed mean dry biomass	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.0185	LC_LC3 + 20Cu failed mean dry biomass-	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.0185	10Cu Control failed mean dry biomass-mg	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.0185	Lab Control failed mean dry biomass-mg	1

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Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.0185	CM_MC2 + 20Cu failed mean dry biomass	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.0185	LC_LCDSSLCC20Cu failed mean dry biom	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.0185	20Cu Control failed mean dry biomass-mg	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.0185	RG_MIDAG + 15Cu failed mean dry bioma	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.0185	GH_ER2 +15Cu failed mean dry biomass-	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.0185	LC_DCDS + 20Cu failed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.0185	EV_HC1 + 20Cu failed mean dry biomass-	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.0185	EV_MC2 + 20Cu failed mean dry biomass-	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.0185	LC_SLC + 15Cu failed mean dry biomass-	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.0185	15Cu Control failed mean dry biomass-mg	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.0185	GH_ERC + 10Cu failed mean dry biomass-	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.0185	LC_LC5 + 20Cu failed mean dry biomass-	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.0185	FR_FR4 + 20Cu failed mean dry biomass-	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.0185	GH_FR1 + 20Cu failed mean dry biomass-	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.0185	FR_MULTIPLATE20 failed mean dry biom	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.0185	FR_FR2 + 20Cu failed mean dry biomass-	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.0185	FR_FRRD + 20Cu failed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9699	FR_FR4 + 20Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9699	Lab Control passed mean dry biomass-mg	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9699	LC_LC5 + 20Cu passed mean dry biomass	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9699	LC_LCDSSLCC20Cu passed mean dry bio	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9699	LC_LC3 + 20Cu passed mean dry biomass	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9699	15Cu Control passed mean dry biomass-m	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9699	GH_FR1 + 20Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9699	GH_ERC + 10Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9699	FR_FRCP1 + 20Cu passed mean dry biom	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9699	20Cu Control passed mean dry biomass-m	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9699	CM_MC2 + 20Cu passed mean dry bioma	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9699	RG_MIDAG + 15Cu passed mean dry bio	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9699	FR_UFR1 + 20Cu passed mean dry bioma	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9699	FR_FRABCH + 20C passed mean dry bio	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9699	LC_SLC + 15Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9699	EV_MC2 + 20Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9699	EV_HC1 + 20Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9699	GH_ER2 +15Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9699	LC_DCDS + 20Cu passed mean dry bioma	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9699	CM_MC1 + 15Cu passed mean dry bioma	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9699	10Cu Control passed mean dry biomass-m	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9699	FR_FRRD + 20Cu passed mean dry bioma	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9699	FR_FR2 + 20Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9699	FR_MULTIPLATE20 passed mean dry bio	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9741	GH_ER2 +15Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9741	FR_FR4 + 20Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9741	FR_FRABCH + 20C passed mean dry bio	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9741	CM_MC1 + 15Cu passed mean dry bioma	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9741	FR_FRCP1 + 20Cu passed mean dry biom	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9741	FR_UFR1 + 20Cu passed mean dry bioma	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9741	LC_LCDSSLCC20Cu passed mean dry bio	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9741	LC_DCDS + 20Cu passed mean dry bioma	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9741	LC_SLC + 15Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9741	EV_MC2 + 20Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9741	LC_LC3 + 20Cu passed mean dry biomass	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9741	GH_FR1 + 20Cu passed mean dry biomas	1

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Fathead minnow 32-d (Pimephales promelas) survival and growth test **Nautilus Environmental Calgary**

SIngle Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9741	EV_HC1 + 20Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9741	LC_LC5 + 20Cu passed mean dry biomass	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9741	15Cu Control passed mean dry biomass-m	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9741	RG_MIDAG + 15Cu passed mean dry bio	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9741	CM_MC2 + 20Cu passed mean dry bioma	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9741	Lab Control passed mean dry biomass-mg	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9741	20Cu Control passed mean dry biomass-m	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9741	GH_ERC + 10Cu passed mean dry biomas	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9741	10Cu Control passed mean dry biomass-m	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9741	FR_MULTIPLATE20 passed mean dry bio	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9741	FR_FRRD + 20Cu passed mean dry bioma	1
14-4740-5688	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9741	FR_FR2 + 20Cu passed mean dry biomas	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	15Cu Control passed post hatch survival	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_MULTIPLATE20 passed post hatch su	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	LC_DCDS + 20Cu passed post hatch survi	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	20Cu Control passed post hatch survival	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LCDSSLCC20Cu passed post hatch s	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ERC + 10Cu passed post hatch surviv	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRRD + 20Cu passed post hatch survi	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	LC_SLC + 15Cu passed post hatch surviva	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	GH_FR1 + 20Cu passed post hatch surviv	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRABCH + 20C passed post hatch sur	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	10Cu Control passed post hatch survival	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	EV_MC2 + 20Cu passed post hatch surviv	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC5 + 20Cu passed post hatch surviva	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC3 + 20Cu passed post hatch surviva	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_UFR1 + 20Cu passed post hatch survi	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	Lab Control passed post hatch survival	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC1 + 15Cu passed post hatch surviv	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR4 + 20Cu passed post hatch surviva	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC2 + 20Cu passed post hatch surviv	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	EV_HC1 + 20Cu passed post hatch surviv	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	RG_MIDAG + 15Cu passed post hatch sur	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR2 + 20Cu passed post hatch surviva	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRCP1 + 20Cu passed post hatch sur	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ER2 +15Cu passed post hatch surviva	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC5 + 20Cu passed post hatch surviva	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRABCH + 20C passed post hatch sur	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	LC_SLC + 15Cu passed post hatch surviva	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ER2 +15Cu passed post hatch surviva	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC1 + 15Cu passed post hatch surviv	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_MULTIPLATE20 passed post hatch su	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	20Cu Control passed post hatch survival	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR2 + 20Cu passed post hatch surviva	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR4 + 20Cu passed post hatch surviva	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LCDSSLCC20Cu passed post hatch s	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_UFR1 + 20Cu passed post hatch survi	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	GH_FR1 + 20Cu passed post hatch surviv	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	EV_HC1 + 20Cu passed post hatch surviv	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRCP1 + 20Cu passed post hatch sur	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	LC_DCDS + 20Cu passed post hatch survi	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	RG_MIDAG + 15Cu passed post hatch sur	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ERC + 10Cu passed post hatch surviv	1

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Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

SIngle Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	10Cu Control passed post hatch survival	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRRD + 20Cu passed post hatch survi	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC2 + 20Cu passed post hatch surviv	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC3 + 20Cu passed post hatch surviva	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	Lab Control passed post hatch survival	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	15Cu Control passed post hatch survival	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	EV_MC2 + 20Cu passed post hatch surviv	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	EV_MC2 + 20Cu passed post hatch surviv	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_UFR1 + 20Cu passed post hatch survi	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR2 + 20Cu passed post hatch surviva	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ER2 +15Cu passed post hatch surviva	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR4 + 20Cu passed post hatch surviva	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	RG_MIDAG + 15Cu passed post hatch sur	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	EV_HC1 + 20Cu passed post hatch surviv	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC2 + 20Cu passed post hatch surviv	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ERC + 10Cu passed post hatch surviv	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LCDSSLCC20Cu passed post hatch s	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	LC_DCDS + 20Cu passed post hatch survi	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	GH_FR1 + 20Cu passed post hatch surviv	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	LC_SLC + 15Cu passed post hatch surviva	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC3 + 20Cu passed post hatch surviva	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRCP1 + 20Cu passed post hatch sur	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRABCH + 20C passed post hatch sur	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC5 + 20Cu passed post hatch surviva	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC1 + 15Cu passed post hatch surviv	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	Lab Control passed post hatch survival	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_MULTIPLATE20 passed post hatch su	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	20Cu Control passed post hatch survival	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	15Cu Control passed post hatch survival	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRRD + 20Cu passed post hatch survi	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	10Cu Control passed post hatch survival	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC1 + 15Cu passed post hatch surviv	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRCP1 + 20Cu passed post hatch sur	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR4 + 20Cu passed post hatch surviva	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	GH_FR1 + 20Cu passed post hatch surviv	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC3 + 20Cu passed post hatch surviva	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	15Cu Control passed post hatch survival	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRRD + 20Cu passed post hatch survi	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	20Cu Control passed post hatch survival	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC5 + 20Cu passed post hatch surviva	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRABCH + 20C passed post hatch sur	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	LC_SLC + 15Cu passed post hatch surviva	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_MULTIPLATE20 passed post hatch su	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LCDSSLCC20Cu passed post hatch s	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR2 + 20Cu passed post hatch surviva	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ER2 +15Cu passed post hatch surviva	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	Lab Control passed post hatch survival	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	RG_MIDAG + 15Cu passed post hatch sur	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC2 + 20Cu passed post hatch surviv	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	EV_HC1 + 20Cu passed post hatch surviv	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_UFR1 + 20Cu passed post hatch survi	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	10Cu Control passed post hatch survival	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ERC + 10Cu passed post hatch surviv	1

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SIngle Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	EV_MC2 + 20Cu passed post hatch surviv	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	LC_DCDS + 20Cu passed post hatch survi	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	7.5E-10	EV_MC2 + 20Cu failed post hatch survival	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	7.5E-10	FR_FRABCH + 20C failed post hatch survi	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	7.5E-10	RG_MIDAG + 15Cu failed post hatch survi	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	7.5E-10	LC_SLC + 15Cu failed post hatch survival	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	7.5E-10	LC_LC5 + 20Cu failed post hatch survival	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	7.5E-10	FR_MULTIPLATE20 failed post hatch survi	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	7.5E-10	15Cu Control failed post hatch survival	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	7.5E-10	GH_FR1 + 20Cu failed post hatch survival	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	7.5E-10	EV_HC1 + 20Cu failed post hatch survival	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	7.5E-10	LC_DCDS + 20Cu failed post hatch surviv	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	7.5E-10	CM_MC2 + 20Cu failed post hatch survival	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	7.5E-10	FR_FRCP1 + 20Cu failed post hatch surviv	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	7.5E-10	LC_LC3 + 20Cu failed post hatch survival	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	7.5E-10	10Cu Control failed post hatch survival	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	7.5E-10	GH_ERC + 10Cu failed post hatch survival	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	7.5E-10	FR_FRRD + 20Cu failed post hatch surviv	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	7.5E-10	Lab Control failed post hatch survival	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	7.5E-10	GH_ER2 +15Cu failed post hatch survival	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	7.5E-10	LC_LCDSSLCC20Cu failed post hatch sur	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	7.5E-10	CM_MC1 + 15Cu failed post hatch survival	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	7.5E-10	FR_FR2 + 20Cu failed post hatch survival	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	7.5E-10	20Cu Control failed post hatch survival	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	7.5E-10	FR_FR4 + 20Cu failed post hatch survival	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	7.5E-10	FR_UFR1 + 20Cu failed post hatch surviva	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	8.2E-06	FR_FRCP1 + 20Cu failed post hatch surviv	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	8.2E-06	15Cu Control failed post hatch survival	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	8.2E-06	CM_MC1 + 15Cu failed post hatch survival	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	8.2E-06	20Cu Control failed post hatch survival	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	8.2E-06	RG_MIDAG + 15Cu failed post hatch survi	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	8.2E-06	LC_LC3 + 20Cu failed post hatch survival	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	8.2E-06	CM_MC2 + 20Cu failed post hatch survival	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	8.2E-06	FR_UFR1 + 20Cu failed post hatch surviva	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	8.2E-06	Lab Control failed post hatch survival	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	8.2E-06	FR_FRABCH + 20C failed post hatch survi	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	8.2E-06	GH_FR1 + 20Cu failed post hatch survival	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	8.2E-06	LC_DCDS + 20Cu failed post hatch surviv	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	8.2E-06	FR_FR4 + 20Cu failed post hatch survival	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	8.2E-06	FR_FRRD + 20Cu failed post hatch surviv	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	8.2E-06	GH_ER2 +15Cu failed post hatch survival	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	8.2E-06	GH_ERC + 10Cu failed post hatch survival	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	8.2E-06	EV_HC1 + 20Cu failed post hatch survival	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	8.2E-06	10Cu Control failed post hatch survival	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	8.2E-06	LC_LC5 + 20Cu failed post hatch survival	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	8.2E-06	EV_MC2 + 20Cu failed post hatch survival	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	8.2E-06	FR_FR2 + 20Cu failed post hatch survival	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	8.2E-06	FR_MULTIPLATE20 failed post hatch survi	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	8.2E-06	LC_SLC + 15Cu failed post hatch survival	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	8.2E-06	LC_LCDSSLCC20Cu failed post hatch sur	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR2 + 20Cu passed post hatch surviva	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_MULTIPLATE20 passed post hatch su	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	EV_HC1 + 20Cu passed post hatch surviv	1

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Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

SIngle Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ER2 +15Cu passed post hatch surviva	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	20Cu Control passed post hatch survival	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC1 + 15Cu passed post hatch surviv	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	GH_FR1 + 20Cu passed post hatch surviv	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC2 + 20Cu passed post hatch surviv	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	Lab Control passed post hatch survival	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRRD + 20Cu passed post hatch survi	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	10Cu Control passed post hatch survival	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ERC + 10Cu passed post hatch surviv	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	LC_DCDS + 20Cu passed post hatch survi	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	LC_SLC + 15Cu passed post hatch surviva	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR4 + 20Cu passed post hatch surviva	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LCDSSLCC20Cu passed post hatch s	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC3 + 20Cu passed post hatch surviva	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC5 + 20Cu passed post hatch surviva	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_UFR1 + 20Cu passed post hatch survi	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	15Cu Control passed post hatch survival	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	EV_MC2 + 20Cu passed post hatch surviv	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRABCH + 20C passed post hatch sur	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	RG_MIDAG + 15Cu passed post hatch sur	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRCP1 + 20Cu passed post hatch sur	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR4 + 20Cu passed post hatch surviva	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	15Cu Control passed post hatch survival	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	RG_MIDAG + 15Cu passed post hatch sur	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRRD + 20Cu passed post hatch survi	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	20Cu Control passed post hatch survival	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRABCH + 20C passed post hatch sur	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	LC_SLC + 15Cu passed post hatch surviva	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ERC + 10Cu passed post hatch surviv	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	EV_HC1 + 20Cu passed post hatch surviv	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR2 + 20Cu passed post hatch surviva	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LCDSSLCC20Cu passed post hatch s	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC3 + 20Cu passed post hatch surviva	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_MULTIPLATE20 passed post hatch su	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	10Cu Control passed post hatch survival	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ER2 +15Cu passed post hatch surviva	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC5 + 20Cu passed post hatch surviva	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	GH_FR1 + 20Cu passed post hatch surviv	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC1 + 15Cu passed post hatch surviv	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC2 + 20Cu passed post hatch surviv	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRCP1 + 20Cu passed post hatch sur	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	Lab Control passed post hatch survival	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	LC_DCDS + 20Cu passed post hatch survi	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	EV_MC2 + 20Cu passed post hatch surviv	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_UFR1 + 20Cu passed post hatch survi	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	2.0E-05	Lab Control failed post hatch survival	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	2.0E-05	EV_MC2 + 20Cu failed post hatch survival	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	2.0E-05	FR_UFR1 + 20Cu failed post hatch surviva	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	2.0E-05	CM_MC2 + 20Cu failed post hatch survival	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	2.0E-05	EV_HC1 + 20Cu failed post hatch survival	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	2.0E-05	RG_MIDAG + 15Cu failed post hatch survi	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	2.0E-05	10Cu Control failed post hatch survival	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	2.0E-05	15Cu Control failed post hatch survival	1

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	2.0E-05	LC_LCDSSLCC20Cu failed post hatch sur	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	2.0E-05	LC_SLC + 15Cu failed post hatch survival	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	2.0E-05	LC_LC5 + 20Cu failed post hatch survival	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	2.0E-05	CM_MC1 + 15Cu failed post hatch survival	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	2.0E-05	FR_MULTIPLATE20 failed post hatch survi	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	2.0E-05	FR_FRABCH + 20C failed post hatch survi	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	2.0E-05	LC_LC3 + 20Cu failed post hatch survival	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	2.0E-05	GH_ER2 +15Cu failed post hatch survival	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	2.0E-05	FR_FR2 + 20Cu failed post hatch survival	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	2.0E-05	FR_FRCP1 + 20Cu failed post hatch surviv	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	2.0E-05	FR_FR4 + 20Cu failed post hatch survival	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	2.0E-05	FR_FRRD + 20Cu failed post hatch surviv	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	2.0E-05	GH_FR1 + 20Cu failed post hatch survival	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	2.0E-05	20Cu Control failed post hatch survival	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	2.0E-05	LC_DCDS + 20Cu failed post hatch surviv	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	2.0E-05	GH_ERC + 10Cu failed post hatch survival	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	20Cu Control passed post hatch survival	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ERC + 10Cu passed post hatch surviv	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	LC_SLC + 15Cu passed post hatch surviva	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC1 + 15Cu passed post hatch surviv	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_UFR1 + 20Cu passed post hatch survi	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	10Cu Control passed post hatch survival	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	RG_MIDAG + 15Cu passed post hatch sur	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC2 + 20Cu passed post hatch surviv	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRABCH + 20C passed post hatch sur	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ER2 +15Cu passed post hatch surviva	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	GH_FR1 + 20Cu passed post hatch surviv	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	15Cu Control passed post hatch survival	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRCP1 + 20Cu passed post hatch sur	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	Lab Control passed post hatch survival	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LCDSSLCC20Cu passed post hatch s	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC3 + 20Cu passed post hatch surviva	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR4 + 20Cu passed post hatch surviva	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	EV_MC2 + 20Cu passed post hatch surviv	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_MULTIPLATE20 passed post hatch su	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR2 + 20Cu passed post hatch surviva	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRRD + 20Cu passed post hatch survi	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	LC_DCDS + 20Cu passed post hatch survi	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	EV_HC1 + 20Cu passed post hatch surviv	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC5 + 20Cu passed post hatch surviva	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	EV_HC1 + 20Cu passed post hatch surviv	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC1 + 15Cu passed post hatch surviv	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	LC_SLC + 15Cu passed post hatch surviva	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_UFR1 + 20Cu passed post hatch survi	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC3 + 20Cu passed post hatch surviva	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	15Cu Control passed post hatch survival	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC5 + 20Cu passed post hatch surviva	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR4 + 20Cu passed post hatch surviva	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRCP1 + 20Cu passed post hatch sur	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LCDSSLCC20Cu passed post hatch s	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_MULTIPLATE20 passed post hatch su	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR2 + 20Cu passed post hatch surviva	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ER2 +15Cu passed post hatch surviva	1

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Fathead minnow 32-d (Pimephales promelas) survival and growth test **Nautilus Environmental Calgary**

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	20Cu Control passed post hatch survival	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC2 + 20Cu passed post hatch surviv	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	GH_FR1 + 20Cu passed post hatch surviv	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	EV_MC2 + 20Cu passed post hatch surviv	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	RG_MIDAG + 15Cu passed post hatch sur	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRABCH + 20C passed post hatch sur	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	Lab Control passed post hatch survival	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	LC_DCDS + 20Cu passed post hatch survi	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	10Cu Control passed post hatch survival	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRRD + 20Cu passed post hatch survi	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ERC + 10Cu passed post hatch surviv	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRABCH + 20C passed post hatch sur	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRCP1 + 20Cu passed post hatch sur	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC3 + 20Cu passed post hatch surviva	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	LC_DCDS + 20Cu passed post hatch survi	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	GH_FR1 + 20Cu passed post hatch surviv	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC5 + 20Cu passed post hatch surviva	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	LC_SLC + 15Cu passed post hatch surviva	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC1 + 15Cu passed post hatch surviv	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ERC + 10Cu passed post hatch surviv	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ER2 +15Cu passed post hatch surviva	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR4 + 20Cu passed post hatch surviva	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_UFR1 + 20Cu passed post hatch survi	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	20Cu Control passed post hatch survival	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR2 + 20Cu passed post hatch surviva	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	15Cu Control passed post hatch survival	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_MULTIPLATE20 passed post hatch su	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	10Cu Control passed post hatch survival	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRRD + 20Cu passed post hatch survi	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	Lab Control passed post hatch survival	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LCDSSLCC20Cu passed post hatch s	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	EV_MC2 + 20Cu passed post hatch surviv	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	RG_MIDAG + 15Cu passed post hatch sur	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC2 + 20Cu passed post hatch surviv	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	EV_HC1 + 20Cu passed post hatch surviv	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.5478	LC_LC5 + 20Cu passed post hatch surviva	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.5478	LC_DCDS + 20Cu passed post hatch survi	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.5478	FR_UFR1 + 20Cu passed post hatch survi	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.5478	FR_FRRD + 20Cu passed post hatch survi	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.5478	FR_FRCP1 + 20Cu passed post hatch sur	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.5478	EV_HC1 + 20Cu passed post hatch surviv	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.5478	LC_LC3 + 20Cu passed post hatch surviva	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.5478	15Cu Control passed post hatch survival	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.5478	FR_FR2 + 20Cu passed post hatch surviva	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.5478	FR_FRABCH + 20C passed post hatch sur	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.5478	Lab Control passed post hatch survival	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.5478	10Cu Control passed post hatch survival	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.5478	EV_MC2 + 20Cu passed post hatch surviv	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.5478	GH_ER2 +15Cu passed post hatch surviva	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.5478	LC_SLC + 15Cu passed post hatch surviva	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.5478	CM_MC2 + 20Cu passed post hatch surviv	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.5478	FR_MULTIPLATE20 passed post hatch su	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.5478	RG_MIDAG + 15Cu passed post hatch sur	1

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

SIngle Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.5478	CM_MC1 + 15Cu passed post hatch surviv	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.5478	LC_LCDSSLCC20Cu passed post hatch s	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.5478	FR_FR4 + 20Cu passed post hatch surviva	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.5478	20Cu Control passed post hatch survival	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.5478	GH_ERC + 10Cu passed post hatch surviv	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.5478	GH_FR1 + 20Cu passed post hatch surviv	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	EV_MC2 + 20Cu passed post hatch surviv	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR4 + 20Cu passed post hatch surviva	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	20Cu Control passed post hatch survival	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC3 + 20Cu passed post hatch surviva	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC5 + 20Cu passed post hatch surviva	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRABCH + 20C passed post hatch sur	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ER2 +15Cu passed post hatch surviva	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	EV_HC1 + 20Cu passed post hatch surviv	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR2 + 20Cu passed post hatch surviva	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRCP1 + 20Cu passed post hatch sur	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	LC_SLC + 15Cu passed post hatch surviva	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	10Cu Control passed post hatch survival	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRRD + 20Cu passed post hatch survi	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC1 + 15Cu passed post hatch surviv	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	GH_FR1 + 20Cu passed post hatch surviv	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	RG_MIDAG + 15Cu passed post hatch sur	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_UFR1 + 20Cu passed post hatch survi	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	15Cu Control passed post hatch survival	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	Lab Control passed post hatch survival	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LCDSSLCC20Cu passed post hatch s	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	LC_DCDS + 20Cu passed post hatch survi	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_MULTIPLATE20 passed post hatch su	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ERC + 10Cu passed post hatch surviv	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC2 + 20Cu passed post hatch surviv	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LCDSSLCC20Cu passed post hatch s	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	RG_MIDAG + 15Cu passed post hatch sur	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	20Cu Control passed post hatch survival	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC2 + 20Cu passed post hatch surviv	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC5 + 20Cu passed post hatch surviva	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR4 + 20Cu passed post hatch surviva	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC1 + 15Cu passed post hatch surviv	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR2 + 20Cu passed post hatch surviva	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_MULTIPLATE20 passed post hatch su	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	LC_SLC + 15Cu passed post hatch surviva	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	15Cu Control passed post hatch survival	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRABCH + 20C passed post hatch sur	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ER2 +15Cu passed post hatch surviva	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	10Cu Control passed post hatch survival	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRRD + 20Cu passed post hatch survi	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	EV_MC2 + 20Cu passed post hatch surviv	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	Lab Control passed post hatch survival	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	GH_FR1 + 20Cu passed post hatch surviv	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	LC_DCDS + 20Cu passed post hatch survi	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ERC + 10Cu passed post hatch surviv	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRCP1 + 20Cu passed post hatch sur	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_UFR1 + 20Cu passed post hatch survi	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	EV_HC1 + 20Cu passed post hatch surviv	1

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Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

SIngle Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC3 + 20Cu passed post hatch surviva	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	EV_HC1 + 20Cu passed post hatch surviv	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_UFR1 + 20Cu passed post hatch survi	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC5 + 20Cu passed post hatch surviva	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC1 + 15Cu passed post hatch surviv	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	15Cu Control passed post hatch survival	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	EV_MC2 + 20Cu passed post hatch surviv	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	10Cu Control passed post hatch survival	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ERC + 10Cu passed post hatch surviv	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ER2 +15Cu passed post hatch surviva	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRCP1 + 20Cu passed post hatch sur	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	Lab Control passed post hatch survival	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR4 + 20Cu passed post hatch surviva	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	LC_DCDS + 20Cu passed post hatch survi	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC2 + 20Cu passed post hatch surviv	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LCDSSLCC20Cu passed post hatch s	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	GH_FR1 + 20Cu passed post hatch surviv	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	RG_MIDAG + 15Cu passed post hatch sur	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	20Cu Control passed post hatch survival	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR2 + 20Cu passed post hatch surviva	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC3 + 20Cu passed post hatch surviva	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_MULTIPLATE20 passed post hatch su	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRRD + 20Cu passed post hatch survi	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRABCH + 20C passed post hatch sur	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	LC_SLC + 15Cu passed post hatch surviva	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	LC_SLC + 15Cu passed post hatch surviva	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	Lab Control passed post hatch survival	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRABCH + 20C passed post hatch sur	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRCP1 + 20Cu passed post hatch sur	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC3 + 20Cu passed post hatch surviva	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	LC_DCDS + 20Cu passed post hatch survi	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LCDSSLCC20Cu passed post hatch s	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	15Cu Control passed post hatch survival	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRRD + 20Cu passed post hatch survi	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC1 + 15Cu passed post hatch surviv	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC2 + 20Cu passed post hatch surviv	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_UFR1 + 20Cu passed post hatch survi	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	EV_MC2 + 20Cu passed post hatch surviv	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	20Cu Control passed post hatch survival	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR2 + 20Cu passed post hatch surviva	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ER2 +15Cu passed post hatch surviva	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC5 + 20Cu passed post hatch surviva	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	RG_MIDAG + 15Cu passed post hatch sur	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	GH_FR1 + 20Cu passed post hatch surviv	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	EV_HC1 + 20Cu passed post hatch surviv	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_MULTIPLATE20 passed post hatch su	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ERC + 10Cu passed post hatch surviv	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	10Cu Control passed post hatch survival	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR4 + 20Cu passed post hatch surviva	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	EV_MC2 + 20Cu passed post hatch surviv	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_UFR1 + 20Cu passed post hatch survi	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR4 + 20Cu passed post hatch surviva	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR2 + 20Cu passed post hatch surviva	1

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	20Cu Control passed post hatch survival	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	15Cu Control passed post hatch survival	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ER2 +15Cu passed post hatch surviva	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_MULTIPLATE20 passed post hatch su	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	EV_HC1 + 20Cu passed post hatch surviv	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRRD + 20Cu passed post hatch survi	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ERC + 10Cu passed post hatch surviv	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	GH_FR1 + 20Cu passed post hatch surviv	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	LC_DCDS + 20Cu passed post hatch survi	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	Lab Control passed post hatch survival	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRCP1 + 20Cu passed post hatch sur	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	RG_MIDAG + 15Cu passed post hatch sur	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRABCH + 20C passed post hatch sur	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC3 + 20Cu passed post hatch surviva	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	10Cu Control passed post hatch survival	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	LC_SLC + 15Cu passed post hatch surviva	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC2 + 20Cu passed post hatch surviv	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LCDSSLCC20Cu passed post hatch s	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC5 + 20Cu passed post hatch surviva	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC1 + 15Cu passed post hatch surviv	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC1 + 15Cu passed post hatch surviv	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	EV_MC2 + 20Cu passed post hatch surviv	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	LC_DCDS + 20Cu passed post hatch survi	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	Lab Control passed post hatch survival	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR4 + 20Cu passed post hatch surviva	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRCP1 + 20Cu passed post hatch sur	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ERC + 10Cu passed post hatch surviv	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ER2 +15Cu passed post hatch surviva	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	15Cu Control passed post hatch survival	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRRD + 20Cu passed post hatch survi	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	EV_HC1 + 20Cu passed post hatch surviv	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	GH_FR1 + 20Cu passed post hatch surviv	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	20Cu Control passed post hatch survival	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_MULTIPLATE20 passed post hatch su	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	10Cu Control passed post hatch survival	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC3 + 20Cu passed post hatch surviva	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC2 + 20Cu passed post hatch surviv	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR2 + 20Cu passed post hatch surviva	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRABCH + 20C passed post hatch sur	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LCDSSLCC20Cu passed post hatch s	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	LC_SLC + 15Cu passed post hatch surviva	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_UFR1 + 20Cu passed post hatch survi	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	RG_MIDAG + 15Cu passed post hatch sur	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC5 + 20Cu passed post hatch surviva	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.0177	Lab Control failed post hatch survival	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.0177	15Cu Control failed post hatch survival	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.0177	FR_MULTIPLATE20 failed post hatch survi	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.0177	10Cu Control failed post hatch survival	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.0177	FR_FRRD + 20Cu failed post hatch surviv	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.0177	FR_FR2 + 20Cu failed post hatch survival	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.0177	RG_MIDAG + 15Cu failed post hatch survi	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.0177	LC_LC5 + 20Cu failed post hatch survival	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.0177	FR_FRABCH + 20C failed post hatch survi	1

JUN 10 2021

Fathead minnow 32-d (Pimephales promelas) survival and growth test **Nautilus Environmental Calgary**

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.0177	GH_ER2 +15Cu failed post hatch survival	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.0177	CM_MC2 + 20Cu failed post hatch survival	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.0177	CM_MC1 + 15Cu failed post hatch survival	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.0177	GH_FR1 + 20Cu failed post hatch survival	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.0177	LC_DCDS + 20Cu failed post hatch surviv	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.0177	LC_LCDSSLCC20Cu failed post hatch sur	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.0177	FR_FRCP1 + 20Cu failed post hatch surviv	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.0177	GH_ERC + 10Cu failed post hatch survival	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.0177	EV_HC1 + 20Cu failed post hatch survival	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.0177	FR_FR4 + 20Cu failed post hatch survival	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.0177	LC_LC3 + 20Cu failed post hatch survival	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.0177	FR_UFR1 + 20Cu failed post hatch surviva	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.0177	20Cu Control failed post hatch survival	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.0177	EV_MC2 + 20Cu failed post hatch survival	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.0177	LC_SLC + 15Cu failed post hatch survival	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	3.3E-06	EV_MC2 + 20Cu failed post hatch survival	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	3.3E-06	FR_FRABCH + 20C failed post hatch survi	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	3.3E-06	LC_LC5 + 20Cu failed post hatch survival	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	3.3E-06	10Cu Control failed post hatch survival	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	3.3E-06	LC_DCDS + 20Cu failed post hatch surviv	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	3.3E-06	FR_FRCP1 + 20Cu failed post hatch surviv	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	3.3E-06	Lab Control failed post hatch survival	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	3.3E-06	LC_LC3 + 20Cu failed post hatch survival	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	3.3E-06	LC_SLC + 15Cu failed post hatch survival	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	3.3E-06	CM_MC1 + 15Cu failed post hatch survival	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	3.3E-06	EV_HC1 + 20Cu failed post hatch survival	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	3.3E-06	20Cu Control failed post hatch survival	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	3.3E-06	FR_MULTIPLATE20 failed post hatch survi	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	3.3E-06	FR_FR4 + 20Cu failed post hatch survival	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	3.3E-06	FR_UFR1 + 20Cu failed post hatch surviva	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	3.3E-06	GH_ERC + 10Cu failed post hatch survival	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	3.3E-06	FR_FRRD + 20Cu failed post hatch surviv	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	3.3E-06	GH_ER2 +15Cu failed post hatch survival	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	3.3E-06	CM_MC2 + 20Cu failed post hatch survival	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	3.3E-06	15Cu Control failed post hatch survival	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	3.3E-06	GH_FR1 + 20Cu failed post hatch survival	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	3.3E-06	RG_MIDAG + 15Cu failed post hatch survi	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	3.3E-06	LC_LCDSSLCC20Cu failed post hatch sur	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	3.3E-06	FR_FR2 + 20Cu failed post hatch survival	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_MULTIPLATE20 passed post hatch su	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	RG_MIDAG + 15Cu passed post hatch sur	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	EV_MC2 + 20Cu passed post hatch surviv	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRRD + 20Cu passed post hatch survi	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	EV_HC1 + 20Cu passed post hatch surviv	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRABCH + 20C passed post hatch sur	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	Lab Control passed post hatch survival	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	LC_DCDS + 20Cu passed post hatch survi	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRCP1 + 20Cu passed post hatch sur	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	GH_FR1 + 20Cu passed post hatch surviv	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ERC + 10Cu passed post hatch surviv	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	LC_SLC + 15Cu passed post hatch surviva	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC1 + 15Cu passed post hatch surviv	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	15Cu Control passed post hatch survival	1

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR2 + 20Cu passed post hatch surviva	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LCDSSLCC20Cu passed post hatch s	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC3 + 20Cu passed post hatch surviva	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC5 + 20Cu passed post hatch surviva	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ER2 +15Cu passed post hatch surviva	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC2 + 20Cu passed post hatch surviv	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_UFR1 + 20Cu passed post hatch survi	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR4 + 20Cu passed post hatch surviva	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	10Cu Control passed post hatch survival	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	20Cu Control passed post hatch survival	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.6598	FR_UFR1 + 20Cu passed post hatch survi	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.6598	LC_LCDSSLCC20Cu passed post hatch s	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.6598	EV_MC2 + 20Cu passed post hatch surviv	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.6598	GH_FR1 + 20Cu passed post hatch surviv	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.6598	FR_FRRD + 20Cu passed post hatch survi	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.6598	FR_FR4 + 20Cu passed post hatch surviva	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.6598	RG_MIDAG + 15Cu passed post hatch sur	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.6598	15Cu Control passed post hatch survival	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.6598	20Cu Control passed post hatch survival	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.6598	CM_MC2 + 20Cu passed post hatch surviv	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.6598	10Cu Control passed post hatch survival	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.6598	LC_LC3 + 20Cu passed post hatch surviva	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.6598	EV_HC1 + 20Cu passed post hatch surviv	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.6598	GH_ER2 +15Cu passed post hatch surviva	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.6598	FR_FRABCH + 20C passed post hatch sur	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.6598	FR_MULTIPLATE20 passed post hatch su	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.6598	LC_DCDS + 20Cu passed post hatch survi	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.6598	GH_ERC + 10Cu passed post hatch surviv	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.6598	FR_FRCP1 + 20Cu passed post hatch sur	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.6598	LC_LC5 + 20Cu passed post hatch surviva	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.6598	CM_MC1 + 15Cu passed post hatch surviv	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.6598	FR_FR2 + 20Cu passed post hatch surviva	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.6598	Lab Control passed post hatch survival	1
02-3112-5014	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.6598	LC_SLC + 15Cu passed post hatch surviva	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRABCH + 20C passed proportion nor	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR2 + 20Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	Lab Control passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRRD + 20Cu passed proportion norm	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	EV_HC1 + 20Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ER2 +15Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_SLC + 15Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	EV_MC2 + 20Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ERC + 10Cu passed proportion norma	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC1 + 15Cu passed proportion norma	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LCDSSLCC20Cu passed proportion no	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	15Cu Control passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRCP1 + 20Cu passed proportion nor	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_DCDS + 20Cu passed proportion norm	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	GH_FR1 + 20Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_UFR1 + 20Cu passed proportion norm	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC5 + 20Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC2 + 20Cu passed proportion norma	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	10Cu Control passed proportion normal	1

SIngle Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	RG_MIDAG + 15Cu passed proportion nor	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC3 + 20Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR4 + 20Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_MULTIPLATE20 passed proportion nor	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	20Cu Control passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LCDSSLCC20Cu passed proportion no	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC1 + 15Cu passed proportion norma	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_SLC + 15Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR2 + 20Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRABCH + 20C passed proportion nor	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	EV_MC2 + 20Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR4 + 20Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_MULTIPLATE20 passed proportion nor	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	Lab Control passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRCP1 + 20Cu passed proportion nor	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_DCDS + 20Cu passed proportion norm	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	GH_FR1 + 20Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ERC + 10Cu passed proportion norma	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC5 + 20Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC2 + 20Cu passed proportion norma	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC3 + 20Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	15Cu Control passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	10Cu Control passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	EV_HC1 + 20Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	RG_MIDAG + 15Cu passed proportion nor	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ER2 +15Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_UFR1 + 20Cu passed proportion norm	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	20Cu Control passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRRD + 20Cu passed proportion norm	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_MULTIPLATE20 passed proportion nor	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	EV_MC2 + 20Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	Lab Control passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_SLC + 15Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC3 + 20Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR2 + 20Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_DCDS + 20Cu passed proportion norm	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	15Cu Control passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	20Cu Control passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_UFR1 + 20Cu passed proportion norm	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRABCH + 20C passed proportion nor	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	10Cu Control passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRCP1 + 20Cu passed proportion nor	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	EV_HC1 + 20Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LCDSSLCC20Cu passed proportion no	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRRD + 20Cu passed proportion norm	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC2 + 20Cu passed proportion norma	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC5 + 20Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC1 + 15Cu passed proportion norma	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ER2 +15Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	GH_FR1 + 20Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR4 + 20Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ERC + 10Cu passed proportion norma	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	RG_MIDAG + 15Cu passed proportion nor	1

Fathead minnow 32-d (Pimephales promelas) survival and growth test **Nautilus Environmental Calgary**

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR4 + 20Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	10Cu Control passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRCP1 + 20Cu passed proportion nor	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ERC + 10Cu passed proportion norma	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRRD + 20Cu passed proportion norm	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC2 + 20Cu passed proportion norma	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	15Cu Control passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LCDSSLCC20Cu passed proportion no	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_DCDS + 20Cu passed proportion norm	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	GH_FR1 + 20Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC5 + 20Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	EV_HC1 + 20Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	EV_MC2 + 20Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_MULTIPLATE20 passed proportion nor	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR2 + 20Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_SLC + 15Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	Lab Control passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC3 + 20Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC1 + 15Cu passed proportion norma	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_UFR1 + 20Cu passed proportion norm	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ER2 +15Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	RG_MIDAG + 15Cu passed proportion nor	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRABCH + 20C passed proportion nor	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	20Cu Control passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	0.0178	GH_FR1 + 20Cu failed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	0.0178	EV_MC2 + 20Cu failed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	0.0178	RG_MIDAG + 15Cu failed proportion norm	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	0.0178	LC_LC5 + 20Cu failed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	0.0178	EV_HC1 + 20Cu failed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	0.0178	LC_DCDS + 20Cu failed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	0.0178	LC_LCDSSLCC20Cu failed proportion nor	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	0.0178	10Cu Control failed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	0.0178	Lab Control failed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	0.0178	15Cu Control failed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	0.0178	CM_MC1 + 15Cu failed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	0.0178	LC_LC3 + 20Cu failed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	0.0178	CM_MC2 + 20Cu failed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	0.0178	20Cu Control failed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	0.0178	FR_FRABCH + 20C failed proportion norm	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	0.0178	FR_MULTIPLATE20 failed proportion norm	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	0.0178	FR_FR4 + 20Cu failed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	0.0178	FR_FRRD + 20Cu failed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	0.0178	FR_FRCP1 + 20Cu failed proportion norm	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	0.0178	GH_ERC + 10Cu failed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	0.0178	LC_SLC + 15Cu failed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	0.0178	FR_FR2 + 20Cu failed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	0.0178	GH_ER2 +15Cu failed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	0.0178	FR_UFR1 + 20Cu failed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	0.0247	FR_UFR1 + 20Cu failed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	0.0247	CM_MC2 + 20Cu failed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	0.0247	GH_ERC + 10Cu failed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	0.0247	Lab Control failed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	0.0247	20Cu Control failed proportion normal	1

Analyst: Kee QA: MG

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Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

SIngle Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	0.0247	LC_LC3 + 20Cu failed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	0.0247	LC_LC5 + 20Cu failed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	0.0247	EV_HC1 + 20Cu failed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	0.0247	RG_MIDAG + 15Cu failed proportion norm	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	0.0247	FR_FRCP1 + 20Cu failed proportion norm	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	0.0247	FR_FRABCH + 20C failed proportion norm	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	0.0247	10Cu Control failed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	0.0247	LC_SLC + 15Cu failed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	0.0247	FR_MULTIPLATE20 failed proportion norm	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	0.0247	FR_FR2 + 20Cu failed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	0.0247	EV_MC2 + 20Cu failed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	0.0247	FR_FRRD + 20Cu failed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	0.0247	FR_FR4 + 20Cu failed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	0.0247	CM_MC1 + 15Cu failed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	0.0247	LC_LCDSSLCC20Cu failed proportion nor	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	0.0247	15Cu Control failed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	0.0247	GH_FR1 + 20Cu failed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	0.0247	LC_DCDS + 20Cu failed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	0.0247	GH_ER2 +15Cu failed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC2 + 20Cu passed proportion norma	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	EV_MC2 + 20Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC3 + 20Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_MULTIPLATE20 passed proportion nor	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR2 + 20Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ER2 +15Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	EV_HC1 + 20Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_SLC + 15Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC1 + 15Cu passed proportion norma	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ERC + 10Cu passed proportion norma	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_DCDS + 20Cu passed proportion norm	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC5 + 20Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	GH_FR1 + 20Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	15Cu Control passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	Lab Control passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	10Cu Control passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRCP1 + 20Cu passed proportion nor	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRABCH + 20C passed proportion nor	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	RG_MIDAG + 15Cu passed proportion nor	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	20Cu Control passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRRD + 20Cu passed proportion norm	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_UFR1 + 20Cu passed proportion norm	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LCDSSLCC20Cu passed proportion no	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR4 + 20Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	RG_MIDAG + 15Cu passed proportion nor	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	EV_HC1 + 20Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	EV_MC2 + 20Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_DCDS + 20Cu passed proportion norm	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR4 + 20Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	15Cu Control passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_MULTIPLATE20 passed proportion nor	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	20Cu Control passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRRD + 20Cu passed proportion norm	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_UFR1 + 20Cu passed proportion norm	1

Fathead minnow 32-d (Pimephales promelas) survival and growth test **Nautilus Environmental Calgary**

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ER2 +15Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC1 + 15Cu passed proportion norma	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR2 + 20Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_SLC + 15Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRABCH + 20C passed proportion nor	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRCP1 + 20Cu passed proportion nor	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC2 + 20Cu passed proportion norma	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC3 + 20Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	10Cu Control passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LCDSSLCC20Cu passed proportion no	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	Lab Control passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	GH_FR1 + 20Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ERC + 10Cu passed proportion norma	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC5 + 20Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ER2 +15Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	15Cu Control passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ERC + 10Cu passed proportion norma	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	20Cu Control passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_UFR1 + 20Cu passed proportion norm	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_SLC + 15Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	GH_FR1 + 20Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRCP1 + 20Cu passed proportion nor	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC1 + 15Cu passed proportion norma	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC2 + 20Cu passed proportion norma	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	RG_MIDAG + 15Cu passed proportion nor	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRABCH + 20C passed proportion nor	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	10Cu Control passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	EV_MC2 + 20Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC5 + 20Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC3 + 20Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_DCDS + 20Cu passed proportion norm	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRRD + 20Cu passed proportion norm	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR2 + 20Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	Lab Control passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LCDSSLCC20Cu passed proportion no	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_MULTIPLATE20 passed proportion nor	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	EV_HC1 + 20Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR4 + 20Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR4 + 20Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	RG_MIDAG + 15Cu passed proportion nor	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR2 + 20Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC3 + 20Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_SLC + 15Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC2 + 20Cu passed proportion norma	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRCP1 + 20Cu passed proportion nor	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	GH_FR1 + 20Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC1 + 15Cu passed proportion norma	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LCDSSLCC20Cu passed proportion no	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	10Cu Control passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRABCH + 20C passed proportion nor	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	Lab Control passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_DCDS + 20Cu passed proportion norm	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC5 + 20Cu passed proportion normal	1

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Fathead minnow 32-d (Pimephales promelas) survival and growth test **Nautilus Environmental Calgary**

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	EV_MC2 + 20Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_UFR1 + 20Cu passed proportion norm	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	20Cu Control passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ERC + 10Cu passed proportion norma	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_MULTIPLATE20 passed proportion nor	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRRD + 20Cu passed proportion norm	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ER2 +15Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	15Cu Control passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	EV_HC1 + 20Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	0.0625	GH_ERC + 10Cu passed proportion norma	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	0.0625	15Cu Control passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	0.0625	EV_HC1 + 20Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	0.0625	FR_FRCP1 + 20Cu passed proportion nor	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	0.0625	20Cu Control passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	0.0625	EV_MC2 + 20Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	0.0625	LC_LCDSSLCC20Cu passed proportion no	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	0.0625	FR_FR4 + 20Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	0.0625	FR_MULTIPLATE20 passed proportion nor	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	0.0625	LC_SLC + 15Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	0.0625	FR_FR2 + 20Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	0.0625	GH_ER2 +15Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	0.0625	CM_MC1 + 15Cu passed proportion norma	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	0.0625	LC_LC5 + 20Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	0.0625	CM_MC2 + 20Cu passed proportion norma	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	0.0625	10Cu Control passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	0.0625	FR_UFR1 + 20Cu passed proportion norm	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	0.0625	LC_LC3 + 20Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	0.0625	RG_MIDAG + 15Cu passed proportion nor	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	0.0625	FR_FRABCH + 20C passed proportion nor	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	0.0625	GH_FR1 + 20Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	0.0625	FR_FRRD + 20Cu passed proportion norm	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	0.0625	LC_DCDS + 20Cu passed proportion norm	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	0.0625	Lab Control passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC5 + 20Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	GH_FR1 + 20Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC1 + 15Cu passed proportion norma	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	15Cu Control passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_MULTIPLATE20 passed proportion nor	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	20Cu Control passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_UFR1 + 20Cu passed proportion norm	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRRD + 20Cu passed proportion norm	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	10Cu Control passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR2 + 20Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRCP1 + 20Cu passed proportion nor	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	Lab Control passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_SLC + 15Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ERC + 10Cu passed proportion norma	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR4 + 20Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRABCH + 20C passed proportion nor	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LCDSSLCC20Cu passed proportion no	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ER2 +15Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	RG_MIDAG + 15Cu passed proportion nor	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_DCDS + 20Cu passed proportion norm	1

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC2 + 20Cu passed proportion norma	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	EV_HC1 + 20Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	EV_MC2 + 20Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC3 + 20Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	GH_FR1 + 20Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	15Cu Control passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC1 + 15Cu passed proportion norma	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	Lab Control passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRRD + 20Cu passed proportion norm	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ER2 +15Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LCDSSLCC20Cu passed proportion no	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR4 + 20Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC2 + 20Cu passed proportion norma	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	EV_MC2 + 20Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	20Cu Control passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR2 + 20Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	EV_HC1 + 20Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	10Cu Control passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ERC + 10Cu passed proportion norma	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC5 + 20Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	RG_MIDAG + 15Cu passed proportion nor	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC3 + 20Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_MULTIPLATE20 passed proportion nor	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_SLC + 15Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRCP1 + 20Cu passed proportion nor	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_UFR1 + 20Cu passed proportion norm	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_DCDS + 20Cu passed proportion norm	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRABCH + 20C passed proportion nor	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC2 + 20Cu passed proportion norma	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LCDSSLCC20Cu passed proportion no	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRCP1 + 20Cu passed proportion nor	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	10Cu Control passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ER2 +15Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	20Cu Control passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	Lab Control passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRABCH + 20C passed proportion nor	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR2 + 20Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_DCDS + 20Cu passed proportion norm	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR4 + 20Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC1 + 15Cu passed proportion norma	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_SLC + 15Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_MULTIPLATE20 passed proportion nor	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	RG_MIDAG + 15Cu passed proportion nor	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	EV_MC2 + 20Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	GH_FR1 + 20Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_UFR1 + 20Cu passed proportion norm	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRRD + 20Cu passed proportion norm	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC5 + 20Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	15Cu Control passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC3 + 20Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	EV_HC1 + 20Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ERC + 10Cu passed proportion norma	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	EV_HC1 + 20Cu passed proportion normal	1

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Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRABCH + 20C passed proportion nor	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_SLC + 15Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	10Cu Control passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	GH_FR1 + 20Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	20Cu Control passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC1 + 15Cu passed proportion norma	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC3 + 20Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	EV_MC2 + 20Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_UFR1 + 20Cu passed proportion norm	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR4 + 20Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR2 + 20Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRRD + 20Cu passed proportion norm	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRCP1 + 20Cu passed proportion nor	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	15Cu Control passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	RG_MIDAG + 15Cu passed proportion nor	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC2 + 20Cu passed proportion norma	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC5 + 20Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_MULTIPLATE20 passed proportion nor	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_DCDS + 20Cu passed proportion norm	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LCDSSLCC20Cu passed proportion no	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ER2 +15Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	Lab Control passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ERC + 10Cu passed proportion norma	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_SLC + 15Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_MULTIPLATE20 passed proportion nor	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC1 + 15Cu passed proportion norma	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	EV_HC1 + 20Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	Lab Control passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	RG_MIDAG + 15Cu passed proportion nor	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC3 + 20Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ERC + 10Cu passed proportion norma	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	10Cu Control passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRCP1 + 20Cu passed proportion nor	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	20Cu Control passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	EV_MC2 + 20Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRRD + 20Cu passed proportion norm	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LCDSSLCC20Cu passed proportion no	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ER2 +15Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_DCDS + 20Cu passed proportion norm	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC5 + 20Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR4 + 20Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRABCH + 20C passed proportion nor	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR2 + 20Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	GH_FR1 + 20Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC2 + 20Cu passed proportion norma	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_UFR1 + 20Cu passed proportion norm	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	15Cu Control passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	EV_HC1 + 20Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	10Cu Control passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC1 + 15Cu passed proportion norma	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ER2 +15Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	20Cu Control passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_UFR1 + 20Cu passed proportion norm	1

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Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRRD + 20Cu passed proportion norm	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_MULTIPLATE20 passed proportion nor	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ERC + 10Cu passed proportion norma	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_DCDS + 20Cu passed proportion norm	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRCP1 + 20Cu passed proportion nor	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	RG_MIDAG + 15Cu passed proportion nor	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	15Cu Control passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC2 + 20Cu passed proportion norma	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC5 + 20Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRABCH + 20C passed proportion nor	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	Lab Control passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LCDSSLCC20Cu passed proportion no	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	GH_FR1 + 20Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_SLC + 15Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC3 + 20Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	EV_MC2 + 20Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR4 + 20Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR2 + 20Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_MULTIPLATE20 passed proportion nor	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRCP1 + 20Cu passed proportion nor	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ERC + 10Cu passed proportion norma	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_DCDS + 20Cu passed proportion norm	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRRD + 20Cu passed proportion norm	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	20Cu Control passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC3 + 20Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	Lab Control passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	10Cu Control passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR2 + 20Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	EV_HC1 + 20Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_UFR1 + 20Cu passed proportion norm	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	GH_FR1 + 20Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC5 + 20Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC1 + 15Cu passed proportion norma	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LCDSSLCC20Cu passed proportion no	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC2 + 20Cu passed proportion norma	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	RG_MIDAG + 15Cu passed proportion nor	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRABCH + 20C passed proportion nor	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_SLC + 15Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	EV_MC2 + 20Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR4 + 20Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	15Cu Control passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ER2 +15Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ERC + 10Cu passed proportion norma	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	Lab Control passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC1 + 15Cu passed proportion norma	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	10Cu Control passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	20Cu Control passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_MULTIPLATE20 passed proportion nor	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR2 + 20Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	RG_MIDAG + 15Cu passed proportion nor	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR4 + 20Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	GH_FR1 + 20Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC3 + 20Cu passed proportion normal	1

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Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

SIngle Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_DCDS + 20Cu passed proportion norm	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LCDSSLCC20Cu passed proportion no	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRCP1 + 20Cu passed proportion nor	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ER2 +15Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_SLC + 15Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRRD + 20Cu passed proportion norm	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_UFR1 + 20Cu passed proportion norm	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	15Cu Control passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	EV_HC1 + 20Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC5 + 20Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRABCH + 20C passed proportion nor	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC2 + 20Cu passed proportion norma	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	EV_MC2 + 20Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	Lab Control passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR2 + 20Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	20Cu Control passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	15Cu Control passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	EV_MC2 + 20Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	RG_MIDAG + 15Cu passed proportion nor	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRABCH + 20C passed proportion nor	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC2 + 20Cu passed proportion norma	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRCP1 + 20Cu passed proportion nor	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	10Cu Control passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC5 + 20Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_SLC + 15Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	EV_HC1 + 20Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR4 + 20Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LCDSSLCC20Cu passed proportion no	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC1 + 15Cu passed proportion norma	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRRD + 20Cu passed proportion norm	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ERC + 10Cu passed proportion norma	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_MULTIPLATE20 passed proportion nor	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC3 + 20Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ER2 +15Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	GH_FR1 + 20Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_UFR1 + 20Cu passed proportion norm	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_DCDS + 20Cu passed proportion norm	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRCP1 + 20Cu passed proportion nor	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC5 + 20Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	EV_MC2 + 20Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ERC + 10Cu passed proportion norma	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	GH_FR1 + 20Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR2 + 20Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC2 + 20Cu passed proportion norma	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_DCDS + 20Cu passed proportion norm	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC3 + 20Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR4 + 20Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	20Cu Control passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_MULTIPLATE20 passed proportion nor	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_UFR1 + 20Cu passed proportion norm	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	Lab Control passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ER2 +15Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRRD + 20Cu passed proportion norm	1

Fathead minnow 32-d (Pimephales promelas) survival and growth test **Nautilus Environmental Calgary**

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	RG_MIDAG + 15Cu passed proportion nor	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LCDSSLCC20Cu passed proportion no	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_SLC + 15Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	EV_HC1 + 20Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	10Cu Control passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC1 + 15Cu passed proportion norma	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	15Cu Control passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRABCH + 20C passed proportion nor	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	10Cu Control passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	Lab Control passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRABCH + 20C passed proportion nor	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_DCDS + 20Cu passed proportion norm	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	EV_MC2 + 20Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC3 + 20Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC5 + 20Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC2 + 20Cu passed proportion norma	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LCDSSLCC20Cu passed proportion no	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ERC + 10Cu passed proportion norma	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	GH_FR1 + 20Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR4 + 20Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	EV_HC1 + 20Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRCP1 + 20Cu passed proportion nor	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	RG_MIDAG + 15Cu passed proportion nor	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_MULTIPLATE20 passed proportion nor	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	15Cu Control passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR2 + 20Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	20Cu Control passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_UFR1 + 20Cu passed proportion norm	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ER2 +15Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC1 + 15Cu passed proportion norma	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_SLC + 15Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LCDSSLCC20Cu passed proportion no	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRRD + 20Cu passed proportion norm	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_MULTIPLATE20 passed proportion nor	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR4 + 20Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC3 + 20Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_DCDS + 20Cu passed proportion norm	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR2 + 20Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	GH_FR1 + 20Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	15Cu Control passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	20Cu Control passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_UFR1 + 20Cu passed proportion norm	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ER2 +15Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC1 + 15Cu passed proportion norma	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_SLC + 15Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	Lab Control passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRCP1 + 20Cu passed proportion nor	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	EV_HC1 + 20Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ERC + 10Cu passed proportion norma	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	10Cu Control passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC2 + 20Cu passed proportion norma	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC5 + 20Cu passed proportion normal	1

JUN 10 2021

Fathead minnow 32-d (Pimephales promelas) survival and growth test **Nautilus Environmental Calgary**

SIngle Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	RG_MIDAG + 15Cu passed proportion nor	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	EV_MC2 + 20Cu passed proportion normal	1
20-6902-8854	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRABCH + 20C passed proportion nor	1

JUN 10 2021

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Hatch Rate Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
Lab Control		4	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
10Cu Control		4	0.9833	0.9303	1.0000	0.9333	1.0000	0.0167	0.0333	3.39%	1.67%
15Cu Control		4	0.9833	0.9303	1.0000	0.9333	1.0000	0.0167	0.0333	3.39%	1.67%
20Cu Control		4	0.9500	0.8484	1.0000	0.8667	1.0000	0.0319	0.0638	6.72%	5.00%
FR_UFR1 + 20Cu		4	0.9500	0.8484	1.0000	0.8667	1.0000	0.0319	0.0638	6.72%	5.00%
GH_ER2 +15Cu		4	0.9833	0.9303	1.0000	0.9333	1.0000	0.0167	0.0333	3.39%	1.67%
CM_MC1 + 15Cu		4	0.9833	0.9303	1.0000	0.9333	1.0000	0.0167	0.0333	3.39%	1.67%
LC_SLC + 15Cu	XC	4	0.9833	0.9303	1.0000	0.9333	1.0000	0.0167	0.0333	3.39%	1.67%
FR_FRABCH + 20C		4	0.9833	0.9303	1.0000	0.9333	1.0000	0.0167	0.0333	3.39%	1.67%
FR_FRCP1 + 20Cu		4	0.9833	0.9303	1.0000	0.9333	1.0000	0.0167	0.0333	3.39%	1.67%
GH_FR1 + 20Cu		4	0.9167	0.7832	1.0000	0.8000	1.0000	0.0419	0.0839	9.15%	8.33%
GH_ERC + 10Cu		4	0.9833	0.9303	1.0000	0.9333	1.0000	0.0167	0.0333	3.39%	1.67%
CM_MC2 + 20Cu		4	0.9833	0.9303	1.0000	0.9333	1.0000	0.0167	0.0333	3.39%	1.67%
RG_MIDAG + 15Cu		4	0.9833	0.9303	1.0000	0.9333	1.0000	0.0167	0.0333	3.39%	1.67%
EV_MC2 + 20Cu		4	0.9512	0.7674	1.0000	0.8000	1.0710	0.0578	0.1155	12.14%	4.88%
EV_HC1 + 20Cu		4	0.9667	0.9054	1.0000	0.9333	1.0000	0.0193	0.0385	3.98%	3.33%
LC_DCDS + 20Cu		4	0.8500	0.6148	1.0000	0.6667	1.0000	0.0739	0.1478	17.39%	15.00%
LC_LC3 + 20Cu		4	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
LC_LC5 + 20Cu		4	0.9833	0.9303	1.0000	0.9333	1.0000	0.0167	0.0333	3.39%	1.67%
LC_LCDSSLCC20C		4	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
FR_FR4 + 20Cu		4	0.9833	0.9303	1.0000	0.9333	1.0000	0.0167	0.0333	3.39%	1.67%
FR_FR2 + 20Cu		4	0.9833	0.9303	1.0000	0.9333	1.0000	0.0167	0.0333	3.39%	1.67%
FR_MULTIPLATE2		4	0.9833	0.9303	1.0000	0.9333	1.0000	0.0167	0.0333	3.39%	1.67%
FR_FRRD + 20Cu		4	0.9333	0.8467	1.0000	0.8667	1.0000	0.0272	0.0544	5.83%	6.67%

Length Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
Lab Control		4	10.85	10.2	11.5	10.5	11.42	0.2039	0.4078	3.76%	0.00%
10Cu Control		4	10.67	10.19	11.15	10.29	11	0.1513	0.3027	2.84%	1.68%
15Cu Control		4	11.08	9.919	12.25	10.33	12	0.3658	0.7317	6.60%	-2.15%
20Cu Control		4	11.18	10.17	12.19	10.69	12.11	0.3171	0.6342	5.67%	-3.04%
FR_UFR1 + 20Cu		4	10.41	9.005	11.82	9.857	11.73	0.4425	0.885	8.50%	4.02%
GH_ER2 +15Cu		4	10.85	10.27	11.43	10.5	11.29	0.182	0.3639	3.36%	0.03%
CM_MC1 + 15Cu		4	10.93	9.723	12.13	10.17	11.88	0.3782	0.7564	6.92%	-0.71%
LC_SLC + 15Cu	XC	4	11.46	10.55	12.37	10.93	12	0.2857	0.5713	4.99%	-5.60%
FR_FRABCH + 20C		4	10.5	9.776	11.23	10	11.08	0.2288	0.4575	4.36%	3.18%
FR_FRCP1 + 20Cu		4	11.18	10.1	12.26	10.45	12	0.3392	0.6784	6.07%	-3.04%
GH_FR1 + 20Cu		4	10.63	9.531	11.72	9.846	11.23	0.3445	0.689	6.48%	2.05%
GH_ERC + 10Cu		4	10.49	10.24	10.74	10.31	10.69	0.0791	0.1582	1.51%	3.31%
CM_MC2 + 20Cu		4	10.13	8.98	11.28	9.429	11.08	0.3617	0.7235	7.14%	6.62%
RG_MIDAG + 15Cu		4	10.77	10.19	11.35	10.4	11.25	0.1826	0.3652	3.39%	0.73%
EV_MC2 + 20Cu		4	10.74	9.791	11.69	10.08	11.36	0.2987	0.5975	5.56%	0.99%
EV_HC1 + 20Cu		4	10.57	10.15	10.99	10.31	10.9	0.1325	0.2649	2.51%	2.55%
LC_DCDS + 20Cu		4	11.17	9.661	12.67	10.18	12.38	0.4734	0.9468	8.48%	-2.93%
LC_LC3 + 20Cu		4	10.73	9.975	11.49	10.13	11.25	0.2375	0.475	4.43%	1.10%
LC_LC5 + 20Cu		4	11.06	9.583	12.53	10.07	12.3	0.4627	0.9254	8.37%	-1.90%
LC_LCDSSLCC20C		4	10.69	10.4	10.98	10.5	10.93	0.09091	0.1818	1.70%	1.48%
FR_FR4 + 20Cu		4	11.12	10.17	12.07	10.45	11.9	0.298	0.596	5.36%	-2.49%
FR_FR2 + 20Cu		4	10.45	7.854	13.04	9	12.5	0.8146	1.629	15.60%	3.72%
FR_MULTIPLATE2		4	10.89	9.947	11.83	10.23	11.55	0.2964	0.5928	5.44%	-0.37%
FR_FRRD + 20Cu		4	10.81	9.242	12.38	9.917	11.67	0.4934	0.9869	9.13%	0.34%

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Mean Dry Biomass-mg Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
Lab Control		4	2.276	1.813	2.739	1.989	2.681	0.1455	0.291	12.79%	0.00%
10Cu Control		4	2.164	1.858	2.471	2.048	2.45	0.09618	0.1924	8.89%	4.89%
15Cu Control		4	2.423	1.816	3.031	2.096	2.975	0.191	0.382	15.76%	-6.49%
20Cu Control		4	2.343	1.952	2.734	2.085	2.677	0.1229	0.2457	10.49%	-2.94%
FR_UFR1 + 20Cu		4	2.254	1.609	2.9	2.035	2.862	0.2028	0.4057	18.00%	0.94%
GH_ER2 +15Cu		4	1.181	0.4596	1.902	0.6767	1.777	0.2266	0.4531	38.38%	48.12%
CM_MC1 + 15Cu		4	1.604	1.076	2.132	1.367	2.092	0.166	0.3319	20.69%	29.52%
LC_SLC + 15Cu	XC	4	2.008	1.849	2.167	1.908	2.114	0.04997	0.09994	4.98%	11.75%
FR_FRABCH + 20C		4	2.097	1.427	2.766	1.814	2.716	0.2103	0.4207	20.06%	7.86%
FR_FRCP1 + 20Cu		4	1.699	1.29	2.108	1.358	1.98	0.1285	0.2571	15.13%	25.34%
GH_FR1 + 20Cu		4	2.278	1.812	2.745	1.917	2.584	0.1465	0.293	12.86%	-0.12%
GH_ERC + 10Cu		4	2.248	1.979	2.517	2.095	2.463	0.08461	0.1692	7.53%	1.22%
CM_MC2 + 20Cu		4	2.049	1.554	2.544	1.671	2.409	0.1556	0.3113	15.19%	9.96%
RG_MIDAG + 15Cu		4	1.9	1.521	2.278	1.677	2.209	0.1189	0.2378	12.52%	16.52%
EV_MC2 + 20Cu		4	2	1.594	2.406	1.765	2.361	0.1276	0.2552	12.76%	12.10%
EV_HC1 + 20Cu		4	2.2	1.928	2.471	2.024	2.433	0.0853	0.1706	7.75%	3.33%
LC_DCDS + 20Cu		4	2.111	1.845	2.377	1.875	2.245	0.08356	0.1671	7.92%	7.22%
LC_LC3 + 20Cu		4	2.076	1.846	2.306	1.927	2.233	0.0723	0.1446	6.96%	8.76%
LC_LC5 + 20Cu		4	2.19	1.749	2.631	1.906	2.523	0.1385	0.2771	12.65%	3.75%
LC_LCDSSLCC20C		4	2.097	1.762	2.432	1.923	2.363	0.1054	0.2107	10.05%	7.85%
FR_FR4 + 20Cu		4	2.013	1.388	2.639	1.754	2.599	0.1965	0.393	19.52%	11.53%
FR_FR2 + 20Cu		4	1.239	0.6549	1.824	0.96	1.738	0.1837	0.3673	29.64%	45.54%
FR_MULTIPLATE2		4	2.352	1.754	2.949	2.019	2.888	0.1877	0.3754	15.96%	-3.35%
FR_FRRD + 20Cu		4	2.338	1.844	2.832	2.016	2.729	0.1553	0.3105	13.28%	-2.75%

Post Hatch Survival Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
Lab Control		4	0.9000	0.7630	1.0000	0.8000	1.0000	0.0430	0.0861	9.56%	0.00%
10Cu Control		4	0.9500	0.8484	1.0000	0.8667	1.0000	0.0319	0.0638	6.72%	-5.56%
15Cu Control		4	0.8488	0.5710	1.0000	0.6000	1.0000	0.0873	0.1746	20.57%	5.69%
20Cu Control		4	0.8476	0.5690	1.0000	0.6000	1.0000	0.0876	0.1751	20.66%	5.82%
FR_UFR1 + 20Cu		4	0.8772	0.7695	0.9849	0.7857	0.9333	0.0338	0.0677	7.71%	2.53%
GH_ER2 +15Cu		4	0.3226	0.1386	0.5066	0.2000	0.4667	0.0578	0.1156	35.84%	64.15%
CM_MC1 + 15Cu		4	0.4738	0.3629	0.5847	0.4000	0.5333	0.0349	0.0697	14.71%	47.35%
LC_SLC + 15Cu	XC	4	0.7940	0.5377	1.0000	0.6429	0.9333	0.0806	0.1611	20.29%	11.77%
FR_FRABCH + 20C		4	0.7952	0.6959	0.8946	0.7143	0.8667	0.0312	0.0625	7.85%	11.64%
FR_FRCP1 + 20Cu		4	0.4893	0.2206	0.7579	0.3571	0.7333	0.0844	0.1688	34.50%	45.63%
GH_FR1 + 20Cu		4	0.8952	0.7503	1.0000	0.7857	1.0000	0.0456	0.0911	10.18%	0.53%
GH_ERC + 10Cu		4	0.8988	0.8397	0.9579	0.8667	0.9333	0.0186	0.0372	4.14%	0.13%
CM_MC2 + 20Cu		4	0.9488	0.8944	1.0000	0.9286	1.0000	0.0171	0.0342	3.60%	-5.42%
RG_MIDAG + 15Cu		4	0.7452	0.6400	0.8505	0.6667	0.8000	0.0331	0.0662	8.88%	17.20%
EV_MC2 + 20Cu		4	0.8196	0.6982	0.9411	0.7500	0.9286	0.0382	0.0764	9.31%	8.93%
EV_HC1 + 20Cu		4	0.8095	0.6982	0.9209	0.7143	0.8667	0.0350	0.0700	8.65%	10.05%
LC_DCDS + 20Cu		4	0.8464	0.6084	1.0000	0.6667	1.0000	0.0748	0.1496	17.67%	5.95%
LC_LC3 + 20Cu		4	0.8833	0.7499	1.0000	0.8000	1.0000	0.0419	0.0839	9.50%	1.85%
LC_LC5 + 20Cu		4	0.8786	0.6840	1.0000	0.7143	1.0000	0.0612	0.1223	13.92%	2.38%
LC_LCDSSLCC20C		4	0.8833	0.7818	0.9849	0.8000	0.9333	0.0319	0.0638	7.23%	1.85%
FR_FR4 + 20Cu		4	0.6452	0.4940	0.7965	0.5333	0.7333	0.0475	0.0950	14.73%	28.31%
FR_FR2 + 20Cu		4	0.4607	0.2161	0.7053	0.2667	0.6429	0.0769	0.1537	33.37%	48.81%
FR_MULTIPLATE2		4	0.7786	0.6683	0.8888	0.7143	0.8667	0.0346	0.0693	8.90%	13.49%
FR_FRRD + 20Cu		4	0.7516	0.5488	0.9545	0.6000	0.8571	0.0638	0.1275	16.96%	16.48%

Fathead minnow 32-d (Pimephales promelas) survival and growth test

Nautilus Environmental Calgary

Proportion Normal Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
Lab Control		4	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
10Cu Control		4	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
15Cu Control		4	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
20Cu Control		4	0.9792	0.9129	1.0000	0.9167	1.0000	0.0208	0.0417	4.26%	2.08%
FR_UFR1 + 20Cu		4	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
GH_ER2 +15Cu		3	0.8690	0.5575	1.0000	0.7500	1.0000	0.0724	0.1254	14.43%	13.10%
CM_MC1 + 15Cu		4	0.7917	0.5104	1.0000	0.6250	1.0000	0.0884	0.1768	22.33%	20.83%
LC_SLC + 15Cu	XC	4	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
FR_FRABCH + 20C		4	0.9500	0.7909	1.0000	0.8000	1.0000	0.0500	0.1000	10.53%	5.00%
FR_FRCP1 + 20Cu		4	0.9583	0.8257	1.0000	0.8333	1.0000	0.0417	0.0833	8.70%	4.17%
GH_FR1 + 20Cu		4	0.9423	0.8251	1.0000	0.8462	1.0000	0.0368	0.0737	7.82%	5.77%
GH_ERC + 10Cu		4	0.8503	0.7161	0.9845	0.7692	0.9231	0.0422	0.0843	9.92%	14.97%
CM_MC2 + 20Cu		4	0.9655	0.9020	1.0000	0.9286	1.0000	0.0200	0.0399	4.13%	3.45%
RG_MIDAG + 15Cu		4	0.9542	0.8693	1.0000	0.9000	1.0000	0.0267	0.0534	5.59%	4.58%
EV_MC2 + 20Cu		4	0.9808	0.9196	1.0000	0.9231	1.0000	0.0192	0.0385	3.92%	1.92%
EV_HC1 + 20Cu		4	0.9792	0.9129	1.0000	0.9167	1.0000	0.0208	0.0417	4.26%	2.08%
LC_DCDS + 20Cu		4	0.9594	0.8838	1.0000	0.9091	1.0000	0.0238	0.0475	4.95%	4.06%
LC_LC3 + 20Cu		4	0.9625	0.8928	1.0000	0.9167	1.0000	0.0219	0.0438	4.55%	3.75%
LC_LC5 + 20Cu		4	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
LC_LCDSSLCC20C		4	0.9792	0.9129	1.0000	0.9167	1.0000	0.0208	0.0417	4.26%	2.08%
FR_FR4 + 20Cu		4	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
FR_FR2 + 20Cu		4	0.9286	0.7973	1.0000	0.8571	1.0000	0.0412	0.0825	8.88%	7.14%
FR_MULTIPLATE2		4	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
FR_FRRD + 20Cu		4	0.9583	0.8818	1.0000	0.9167	1.0000	0.0241	0.0481	5.02%	4.17%

Analyst: KdL QA: MG

JUN 10 2021

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Hatch Rate Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Lab Control		1.0000	1.0000	1.0000	1.0000
10Cu Control		0.9333	1.0000	1.0000	1.0000
15Cu Control		1.0000	1.0000	1.0000	0.9333
20Cu Control		0.9333	0.8667	1.0000	1.0000
FR_UFR1 + 20Cu		0.8667	1.0000	1.0000	0.9333
GH_ER2 +15Cu		1.0000	1.0000	1.0000	0.9333
CM_MC1 + 15Cu		1.0000	1.0000	0.9333	1.0000
LC_SLC + 15Cu	XC	0.9333	1.0000	1.0000	1.0000
FR_FRABCH + 20C		1.0000	1.0000	0.9333	1.0000
FR_FRCP1 + 20Cu		0.9333	1.0000	1.0000	1.0000
GH_FR1 + 20Cu		0.9333	0.8000	1.0000	0.9333
GH_ERC + 10Cu		1.0000	1.0000	0.9333	1.0000
CM_MC2 + 20Cu		1.0000	1.0000	1.0000	0.9333
RG_MIDAG + 15Cu		1.0000	0.9333	1.0000	1.0000
EV_MC2 + 20Cu		0.9333	0.8000	1.0000	1.0710
EV_HC1 + 20Cu		1.0000	0.9333	1.0000	0.9333
LC_DCDS + 20Cu		0.8000	0.9333	1.0000	0.6667
LC_LC3 + 20Cu		1.0000	1.0000	1.0000	1.0000
LC_LC5 + 20Cu		1.0000	1.0000	1.0000	0.9333
LC_LCDSSLCC20C		1.0000	1.0000	1.0000	1.0000
FR_FR4 + 20Cu		1.0000	1.0000	1.0000	0.9333
FR_FR2 + 20Cu		1.0000	1.0000	0.9333	1.0000
FR_MULTIPLATE2		0.9333	1.0000	1.0000	1.0000
FR_FRRD + 20Cu		0.9333	0.9333	1.0000	0.8667

Length Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Lab Control		10.5	10.62	11.42	10.87
10Cu Control		10.79	11	10.29	10.6
15Cu Control		10.69	10.33	12	11.31
20Cu Control		10.92	10.69	12.11	11
FR_UFR1 + 20Cu		9.917	9.857	10.15	11.73
GH_ER2 +15Cu		10.5	11.29	11	10.6
CM_MC1 + 15Cu		10.5	11.88	10.17	11.17
LC_SLC + 15Cu	XC	12	11.9	10.93	11
FR_FRABCH + 20C		10.33	10	10.6	11.08
FR_FRCP1 + 20Cu		12	10.83	10.45	11.43
GH_FR1 + 20Cu		11.18	10.25	9.846	11.23
GH_ERC + 10Cu		10.5	10.31	10.69	10.46
CM_MC2 + 20Cu		9.429	9.733	10.29	11.08
RG_MIDAG + 15Cu		10.4	10.6	10.83	11.25
EV_MC2 + 20Cu		10.08	11.11	10.42	11.36
EV_HC1 + 20Cu		10.67	10.42	10.31	10.9
LC_DCDS + 20Cu		12.38	10.18	10.71	11.4
LC_LC3 + 20Cu		10.92	10.13	10.62	11.25
LC_LC5 + 20Cu		10.07	10.86	11	12.3
LC_LCDSSLCC20C		10.71	10.5	10.62	10.93
FR_FR4 + 20Cu		11	10.45	11.12	11.9
FR_FR2 + 20Cu		9.286	9	11	12.5
FR_MULTIPLATE2		11.2	10.58	10.23	11.55
FR_FRRD + 20Cu		9.917	10	11.67	11.67

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Mean Dry Biomass-mg Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Lab Control		2.222	1.989	2.211	2.681
10Cu Control		2.109	2.051	2.048	2.45
15Cu Control		2.293	2.096	2.329	2.975
20Cu Control		2.297	2.085	2.313	2.677
FR_UFR1 + 20Cu		2.078	2.035	2.042	2.862
GH_ER2 +15Cu		1.17	1.777	0.6767	1.099
CM_MC1 + 15Cu		1.429	2.092	1.367	1.527
LC_SLC + 15Cu	XC	2.071	1.939	1.908	2.114
FR_FRABCH + 20C		1.855	1.814	2.003	2.716
FR_FRCP1 + 20Cu		1.705	1.358	1.98	1.753
GH_FR1 + 20Cu		2.433	2.181	1.917	2.584
GH_ERC + 10Cu		2.095	2.463	2.131	2.302
CM_MC2 + 20Cu		1.963	1.671	2.153	2.409
RG_MIDAG + 15Cu		1.677	1.754	2.209	1.959
EV_MC2 + 20Cu		1.967	1.907	1.765	2.361
EV_HC1 + 20Cu		2.155	2.024	2.188	2.433
LC_DCDS + 20Cu		2.245	1.875	2.113	2.212
LC_LC3 + 20Cu		2.233	1.927	1.983	2.161
LC_LC5 + 20Cu		1.906	2.029	2.304	2.523
LC_LCDSSLCC20C		1.923	1.933	2.169	2.363
FR_FR4 + 20Cu		1.754	1.838	1.863	2.599
FR_FR2 + 20Cu		0.9653	0.96	1.738	1.294
FR_MULTIPLATE2		2.295	2.019	2.205	2.888
FR_FRRD + 20Cu		2.016	2.181	2.427	2.729

Post Hatch Survival Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Lab Control		0.9333	0.8667	0.8000	1.0000
10Cu Control		1.0000	0.8667	0.9333	1.0000
15Cu Control		0.8667	1.0000	0.6000	0.9286
20Cu Control		0.8571	1.0000	0.6000	0.9333
FR_UFR1 + 20Cu		0.9231	0.9333	0.8667	0.7857
GH_ER2 +15Cu		0.2667	0.4667	0.2000	0.3571
CM_MC1 + 15Cu		0.5333	0.5333	0.4286	0.4000
LC_SLC + 15Cu	XC	0.6429	0.6667	0.9333	0.9333
FR_FRABCH + 20C		0.8000	0.8667	0.7143	0.8000
FR_FRCP1 + 20Cu		0.3571	0.4000	0.7333	0.4667
GH_FR1 + 20Cu		0.7857	1.0000	0.8667	0.9286
GH_ERC + 10Cu		0.9333	0.8667	0.9286	0.8667
CM_MC2 + 20Cu		0.9333	1.0000	0.9333	0.9286
RG_MIDAG + 15Cu		0.6667	0.7143	0.8000	0.8000
EV_MC2 + 20Cu		0.9286	0.7500	0.8000	0.8000
EV_HC1 + 20Cu		0.8000	0.8571	0.8667	0.7143
LC_DCDS + 20Cu		0.6667	0.7857	0.9333	1.0000
LC_LC3 + 20Cu		0.8667	1.0000	0.8667	0.8000
LC_LC5 + 20Cu		1.0000	0.9333	0.8667	0.7143
LC_LCDSSLCC20C		0.9333	0.8000	0.8667	0.9333
FR_FR4 + 20Cu		0.6000	0.7333	0.5333	0.7143
FR_FR2 + 20Cu		0.4667	0.4667	0.6429	0.2667
FR_MULTIPLATE2		0.7143	0.8000	0.8667	0.7333
FR_FRRD + 20Cu		0.8571	0.8571	0.6000	0.6923

Fathead minnow 32-d (Pimephales promelas) survival and growth test **Nautilus Environmental Calgary**

Proportion Normal Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Lab Control		1.0000	1.0000	1.0000	1.0000
10Cu Control		1.0000	1.0000	1.0000	1.0000
15Cu Control		1.0000	1.0000	1.0000	1.0000
20Cu Control		0.9167	1.0000	1.0000	1.0000
FR_UFR1 + 20Cu		1.0000	1.0000	1.0000	1.0000
GH_ER2 +15Cu		0.7500	0.8571	1.0000	
CM_MC1 + 15Cu		0.6250	0.8750	0.6667	1.0000
LC_SLC + 15Cu	XC	1.0000	1.0000	1.0000	1.0000
FR_FRABCH + 20C		1.0000	1.0000	0.8000	1.0000
FR_FRCP1 + 20Cu		1.0000	0.8333	1.0000	1.0000
GH_FR1 + 20Cu		1.0000	1.0000	0.9231	0.8462
GH_ERC + 10Cu		0.7857	0.7692	0.9231	0.9231
CM_MC2 + 20Cu		1.0000	0.9333	0.9286	1.0000
RG_MIDAG + 15Cu		0.9000	1.0000	1.0000	0.9167
EV_MC2 + 20Cu		0.9231	1.0000	1.0000	1.0000
EV_HC1 + 20Cu		0.9167	1.0000	1.0000	1.0000
LC_DCDS + 20Cu		1.0000	0.9091	0.9286	1.0000
LC_LC3 + 20Cu		1.0000	0.9333	1.0000	0.9167
LC_LC5 + 20Cu		1.0000	1.0000	1.0000	1.0000
LC_LCDSSLCC20C		1.0000	0.9167	1.0000	1.0000
FR_FR4 + 20Cu		1.0000	1.0000	1.0000	1.0000
FR_FR2 + 20Cu		0.8571	0.8571	1.0000	1.0000
FR_MULTIPLATE2		1.0000	1.0000	1.0000	1.0000
FR_FRRD + 20Cu		0.9167	0.9167	1.0000	1.0000

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Hatch Rate Binomials

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Lab Control		15/15	15/15	15/15	15/15
10Cu Control		14/15	15/15	15/15	15/15
15Cu Control		15/15	15/15	15/15	14/15
20Cu Control		14/15	13/15	15/15	15/15
FR_UFR1 + 20Cu		13/15	15/15	15/15	14/15
GH_ER2 +15Cu		15/15	15/15	15/15	14/15
CM_MC1 + 15Cu		15/15	15/15	14/15	15/15
LC_SLC + 15Cu	XC	14/15	15/15	15/15	15/15
FR_FRABCH + 20C		15/15	15/15	14/15	15/15
FR_FRCP1 + 20Cu		14/15	15/15	15/15	15/15
GH_FR1 + 20Cu		14/15	12/15	15/15	14/15
GH_ERC + 10Cu		15/15	15/15	14/15	15/15
CM_MC2 + 20Cu		15/15	15/15	15/15	14/15
RG_MIDAG + 15Cu		15/15	14/15	15/15	15/15
EV_MC2 + 20Cu		14/15	12/15	15/15	15/14
EV_HC1 + 20Cu		15/15	14/15	15/15	14/15
LC_DCDS + 20Cu		12/15	14/15	15/15	10/15
LC_LC3 + 20Cu		15/15	15/15	15/15	15/15
LC_LC5 + 20Cu		15/15	15/15	15/15	14/15
LC_LCDSSLCC20C		15/15	15/15	15/15	15/15
FR_FR4 + 20Cu		15/15	15/15	15/15	14/15
FR_FR2 + 20Cu		15/15	15/15	14/15	15/15
FR_MULTIPLATE2		14/15	15/15	15/15	15/15
FR_FRRD + 20Cu		14/15	14/15	15/15	13/15

Post Hatch Survival Binomials

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Lab Control		14/15	13/15	12/15	15/15
10Cu Control		14/14	13/15	14/15	15/15
15Cu Control		13/15	15/15	9/15	13/14
20Cu Control		12/14	13/13	9/15	14/15
FR_UFR1 + 20Cu		12/13	14/15	13/15	11/14
GH_ER2 +15Cu		4/15	7/15	3/15	5/14
CM_MC1 + 15Cu		8/15	8/15	6/14	6/15
LC_SLC + 15Cu	XC	9/14	10/15	14/15	14/15
FR_FRABCH + 20C		12/15	13/15	10/14	12/15
FR_FRCP1 + 20Cu		5/14	6/15	11/15	7/15
GH_FR1 + 20Cu		11/14	12/12	13/15	13/14
GH_ERC + 10Cu		14/15	13/15	13/14	13/15
CM_MC2 + 20Cu		14/15	15/15	14/15	13/14
RG_MIDAG + 15Cu		10/15	10/14	12/15	12/15
EV_MC2 + 20Cu		13/14	9/12	12/15	12/15
EV_HC1 + 20Cu		12/15	12/14	13/15	10/14
LC_DCDS + 20Cu		8/12	11/14	14/15	10/10
LC_LC3 + 20Cu		13/15	15/15	13/15	12/15
LC_LC5 + 20Cu		15/15	14/15	13/15	10/14
LC_LCDSSLCC20C		14/15	12/15	13/15	14/15
FR_FR4 + 20Cu		9/15	11/15	8/15	10/14
FR_FR2 + 20Cu		7/15	7/15	9/14	4/15
FR_MULTIPLATE2		10/14	12/15	13/15	11/15
FR_FRRD + 20Cu		12/14	12/14	9/15	9/13

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Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Proportion Normal Binomials

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Lab Control		14/14	13/13	12/12	15/15
10Cu Control		14/14	13/13	14/14	15/15
15Cu Control		13/13	15/15	9/9	13/13
20Cu Control		11/12	13/13	9/9	14/14
FR_UFR1 + 20Cu		12/12	14/14	13/13	11/11
GH_ER2 +15Cu		3/4	6/7	3/3	2/5
CM_MC1 + 15Cu		5/8	7/8	4/6	6/6
LC_SLC + 15Cu	XC	9/9	10/10	14/14	14/14
FR_FRABCH + 20C		12/12	13/13	8/10	12/12
FR_FRCP1 + 20Cu		5/5	5/6	11/11	7/7
GH_FR1 + 20Cu		11/11	12/12	12/13	11/13
GH_ERC + 10Cu		11/14	10/13	12/13	12/13
CM_MC2 + 20Cu		14/14	14/15	13/14	13/13
RG_MIDAG + 15Cu		9/10	10/10	12/12	11/12
EV_MC2 + 20Cu		12/13	9/9	12/12	11/11
EV_HC1 + 20Cu		11/12	12/12	13/13	10/10
LC_DCDS + 20Cu		8/8	10/11	13/14	10/10
LC_LC3 + 20Cu		13/13	14/15	13/13	11/12
LC_LC5 + 20Cu		15/15	14/14	13/13	10/10
LC_LCDSSLCC20C		14/14	11/12	13/13	14/14
FR_FR4 + 20Cu		9/9	11/11	8/8	10/10
FR_FR2 + 20Cu		6/7	6/7	9/9	4/4
FR_MULTIPLATE2		10/10	12/12	13/13	11/11
FR_FRRD + 20Cu		11/12	11/12	9/9	9/9

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID:	14-4740-5688	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.9.4
Analyzed:	01 Jun-21 8:04	**Analysis:**	Nonparametric-Control vs Treatments	**Status Level:**	1
Batch ID:	16-2689-7673	**Test Type:**	32 Day Fathead Minnow Test	**Analyst:**	Kayla Knol
Start Date:	06 Mar-21	**Protocol:**	ASTM E1241-05 (2013)	**Diluent:**	Dechlorinated Tap Water
Ending Date:	07 Apr-21	**Species:**	Pimephales promelas	**Brine:**	
Test Length:	32d 0h	**Taxon:**	Actinopterygii	**Source:**	Aquatox, AR **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
Lab Control	08-8280-1106	02 Mar-21	03 Mar-21	96h	Teck Coal Ltd	
10Cu Control	01-9333-5370	02 Mar-21	03 Mar-21	96h		
15Cu Control	19-6548-0518	02 Mar-21	03 Mar-21	96h		
20Cu Control	00-8675-6744	02 Mar-21	03 Mar-21	96h		
FR_UFR1 + 20Cu	20-4721-8257	02 Mar-21	03 Mar-21	96h (4.6 °C)		
GH_ER2 +15Cu	01-1137-9253	02 Mar-21	03 Mar-21	96h (4.2 °C)		
CM_MC1 + 15Cu	01-3772-5048	02 Mar-21	03 Mar-21	96h (1 °C)		
LC_SLC + 15Cu	01-2380-6574	02 Mar-21	03 Mar-21	96h (3.1 °C)		
FR_FRABCH + 20C	08-4134-0746	02 Mar-21	03 Mar-21	96h (3.8 °C)		
FR_FRCP1 + 20Cu	11-2694-6466	02 Mar-21	03 Mar-21	96h (3 °C)		
GH_FR1 + 20Cu	20-1635-3152	02 Mar-21	03 Mar-21	96h (2.4 °C)		
GH_ERC + 10Cu	05-1950-5597	02 Mar-21	03 Mar-21	96h (4.1 °C)		
CM_MC2 + 20Cu	14-4685-1067	02 Mar-21	03 Mar-21	96h (0.3 °C)		
RG_MIDAG + 15Cu	21-3889-1829	02 Mar-21	03 Mar-21	96h (0.6 °C)		
EV_MC2 + 20Cu	05-6103-5191	02 Mar-21	03 Mar-21	96h (4.4 °C)		
EV_HC1 + 20Cu	12-5501-3302	02 Mar-21	03 Mar-21	96h (3.4 °C)		
LC_DCDS + 20Cu	04-1088-5978	02 Mar-21	03 Mar-21	96h (0.6 °C)		
LC_LC3 + 20Cu	14-7773-4190	02 Mar-21	03 Mar-21	96h (2.3 °C)		
LC_LC5 + 20Cu	01-7235-6798	02 Mar-21	03 Mar-21	96h (0.6 °C)		
LC_LCDSSLCC20C	06-4197-2641	02 Mar-21	03 Mar-21	96h (2.4 °C)		
FR_FR4 + 20Cu	10-9481-5020	02 Mar-21	03 Mar-21	96h (5.4 °C)		
FR_FR2 + 20Cu	00-3159-8672	02 Mar-21	03 Mar-21	96h (4.4 °C)		
FR_MULTIPLATE2	02-2179-0364	02 Mar-21	03 Mar-21	96h (2.9 °C)		
FR_FRRD + 20Cu	19-5167-8345	02 Mar-21	03 Mar-21	96h (6.2 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
Lab Control	Ambient Sample	Teck Coal Ltd	Lab Control	
10Cu Control	Ambient Sample	Teck Coal Ltd	10Cu Control	
15Cu Control	Ambient Sample	Teck Coal Ltd	15Cu Control	
20Cu Control	Ambient Sample	Teck Coal Ltd	20Cu Control	
FR_UFR1 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_UFR1_MON_2021-03-0	
GH_ER2 +15Cu	Ambient Sample	Teck Coal Ltd	GH_ER2_WS_2021-03-02_	
CM_MC1 + 15Cu	Ambient Sample	Teck Coal Ltd	CM_MC1_WS_2021-03-02	
LC_SLC + 15Cu	Ambient Sample	Teck Coal Ltd	LC_SLC_WS_2021-03-02_	
FR_FRABCH + 20C	Ambient Sample	Teck Coal Ltd	FR_FRABCH_MON_2021-	
FR_FRCP1 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FRCP1_MON_2021-03	
GH_FR1 + 20Cu	Ambient Sample	Teck Coal Ltd	GH_FR1_WS_2021-03-02_	
GH_ERC + 10Cu	Ambient Sample	Teck Coal Ltd	GH_ERC_WS_2021-03-02	
CM_MC2 + 20Cu	Ambient Sample	Teck Coal Ltd	CM_MC2_WS_2021-03-02	
RG_MIDAG + 15Cu	Ambient Sample	Teck Coal Ltd	RG_MIDAG_WS_2021-03-	
EV_MC2 + 20Cu	Ambient Sample	Teck Coal Ltd	EV_MC2_WS_2021_Q1_W	
EV_HC1 + 20Cu	Ambient Sample	Teck Coal Ltd	EV_HC1_WS_2021_Q1_W	
LC_DCDS + 20Cu	Ambient Sample	Teck Coal Ltd	LC_DCDS_WS_2021-03-02	
LC_LC3 + 20Cu	Ambient Sample	Teck Coal Ltd	LC_LC3_WS_2021-03-02_	
LC_LC5 + 20Cu	Ambient Sample	Teck Coal Ltd	LC_LC5_WS_2021-03-02_	
LC_LCDSSLCC20C	Ambient Sample	Teck Coal Ltd	LC_LCDSSLCC_WS_2021-	
FR_FR4 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FR4_WS_2021-03-02_	
FR_FR2 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FR2_WS_2021-03-02_	

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Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 14-4740-5688 **Endpoint:** Mean Dry Biomass-mg **CETIS Version:** CETISv1.9.4
Analyzed: 01 Jun-21 8:04 **Analysis:** Nonparametric-Control vs Treatments **Status Level:** 1

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_MULTIPLATE2	Ambient Sample	Teck Coal Ltd	FR_MULTIPLATE_WS_202	
FR_FRRD + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FRRD_WS_2021-03-02	

Nemenyi-Damico-Wolfe Test

Sample I	vs	Sample II	Test Stat	Critical	Ties	P-Type	P-Value	Decision(α:5%)
Negative Control		10Cu Control	33	211.4	2	CDF	0.8837	Non-Significant Effect
		15Cu Control	-34	211.4	2	CDF	0.9890	Non-Significant Effect
		20Cu Control	-26	211.4	2	CDF	0.9845	Non-Significant Effect
		FR_UFR1 + 20Cu	33	211.4	2	CDF	0.8837	Non-Significant Effect
		GH_ER2 +15Cu*	236	211.4	2	CDF	0.0215	Significant Effect
		CM_MC1 + 15Cu	187	211.4	2	CDF	0.1028	Non-Significant Effect
		LC_SLC + 15Cu	102	211.4	2	CDF	0.5317	Non-Significant Effect
		FR_FRABCH + 20C	92	211.4	2	CDF	0.5948	Non-Significant Effect
		FR_FRCP1 + 20Cu	194	211.4	2	CDF	0.0846	Non-Significant Effect
		GH_FR1 + 20Cu	3.5	211.4	2	CDF	0.9530	Non-Significant Effect
		GH_ERC + 10Cu	-5	211.4	2	CDF	0.9651	Non-Significant Effect
		CM_MC2 + 20Cu	81	211.4	2	CDF	0.6616	Non-Significant Effect
		RG_MIDAG + 15Cu	137.5	211.4	2	CDF	0.3134	Non-Significant Effect
		EV_MC2 + 20Cu	107	211.4	2	CDF	0.4998	Non-Significant Effect
		EV_HC1 + 20Cu	16.5	211.4	2	CDF	0.9282	Non-Significant Effect
		LC_DCDS + 20Cu	47	211.4	2	CDF	0.8330	Non-Significant Effect
		LC_LC3 + 20Cu	68	211.4	2	CDF	0.7345	Non-Significant Effect
		LC_LC5 + 20Cu	34	211.4	2	CDF	0.8805	Non-Significant Effect
		LC_LCDSSLCC20Cu	64	211.4	2	CDF	0.7552	Non-Significant Effect
		FR_FR4 + 20Cu	115.5	211.4	2	CDF	0.4458	Non-Significant Effect
		FR_FR2 + 20Cu*	240	211.4	2	CDF	0.0185	Significant Effect
		FR_MULTIPLATE20	-9	211.4	2	CDF	0.9699	Non-Significant Effect
		FR_FRRD + 20Cu	-13	211.4	2	CDF	0.9741	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	2.393	3.37	1.0000	No Outliers Detected
Treatment Effect	Fligner-Wolfe Omnibus Test	4533		0.1023	Non-Significant Overall Effect
Treatment Effect	Kruskal-Wallis Omnibus Test	48.55	35.17	0.0014	Significant Overall Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	9.6416	0.4192	23	4.746	1.9E-07	Significant Effect
Error	6.35993	0.0883324	72			
Total	16.0015		95			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Variances	Bartlett Equality of Variance Test	15.29	35.17	0.8840	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9376	0.9737	1.9E-04	Non-Normal Distribution

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 14-4740-5688 **Endpoint:** Mean Dry Biomass-mg **CETIS Version:** CETISv1.9.4
Analyzed: 01 Jun-21 8:04 **Analysis:** Nonparametric-Control vs Treatments **Status Level:** 1

Mean Dry Biomass-mg Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
Lab Control	N	4	2.276	1.813	2.739	2.216	1.989	2.681	0.1455	12.79%	0.00%
10Cu Control		4	2.164	1.858	2.471	2.08	2.048	2.45	0.09618	8.89%	4.89%
15Cu Control		4	2.423	1.816	3.031	2.311	2.096	2.975	0.191	15.76%	-6.49%
20Cu Control		4	2.343	1.952	2.734	2.305	2.085	2.677	0.1229	10.49%	-2.94%
FR_UFR1 + 20Cu		4	2.254	1.609	2.9	2.06	2.035	2.862	0.2028	18.00%	0.94%
GH_ER2 +15Cu		4	1.181	0.4596	1.902	1.135	0.6767	1.777	0.2266	38.38%	48.12%
CM_MC1 + 15Cu		4	1.604	1.076	2.132	1.478	1.367	2.092	0.166	20.69%	29.52%
LC_SLC + 15Cu		4	2.008	1.849	2.167	2.005	1.908	2.114	0.04997	4.98%	11.75%
FR_FRABCH + 20C		4	2.097	1.427	2.766	1.929	1.814	2.716	0.2103	20.06%	7.86%
FR_FRCP1 + 20Cu		4	1.699	1.29	2.108	1.729	1.358	1.98	0.1285	15.13%	25.34%
GH_FR1 + 20Cu		4	2.278	1.812	2.745	2.307	1.917	2.584	0.1465	12.86%	-0.12%
GH_ERC + 10Cu		4	2.248	1.979	2.517	2.217	2.095	2.463	0.08461	7.53%	1.22%
CM_MC2 + 20Cu		4	2.049	1.554	2.544	2.058	1.671	2.409	0.1556	15.19%	9.96%
RG_MIDAG + 15Cu		4	1.9	1.521	2.278	1.856	1.677	2.209	0.1189	12.52%	16.52%
EV_MC2 + 20Cu		4	2	1.594	2.406	1.937	1.765	2.361	0.1276	12.76%	12.10%
EV_HC1 + 20Cu		4	2.2	1.928	2.471	2.171	2.024	2.433	0.0853	7.75%	3.33%
LC_DCDS + 20Cu		4	2.111	1.845	2.377	2.162	1.875	2.245	0.08356	7.92%	7.22%
LC_LC3 + 20Cu		4	2.076	1.846	2.306	2.072	1.927	2.233	0.0723	6.96%	8.76%
LC_LC5 + 20Cu		4	2.19	1.749	2.631	2.166	1.906	2.523	0.1385	12.65%	3.75%
LC_LCDSSLCC20C		4	2.097	1.762	2.432	2.051	1.923	2.363	0.1054	10.05%	7.85%
FR_FR4 + 20Cu		4	2.013	1.388	2.639	1.85	1.754	2.599	0.1965	19.52%	11.53%
FR_FR2 + 20Cu		4	1.239	0.6549	1.824	1.13	0.96	1.738	0.1837	29.64%	45.54%
FR_MULTIPLATE2		4	2.352	1.754	2.949	2.25	2.019	2.888	0.1877	15.96%	-3.35%
FR_FRRD + 20Cu		4	2.338	1.844	2.832	2.304	2.016	2.729	0.1553	13.28%	-2.75%

Mean Dry Biomass-mg Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Lab Control	N	2.222	1.989	2.211	2.681
10Cu Control		2.109	2.051	2.048	2.45
15Cu Control		2.293	2.096	2.329	2.975
20Cu Control		2.297	2.085	2.313	2.677
FR_UFR1 + 20Cu		2.078	2.035	2.042	2.862
GH_ER2 +15Cu		1.17	1.777	0.6767	1.099
CM_MC1 + 15Cu		1.429	2.092	1.367	1.527
LC_SLC + 15Cu		2.071	1.939	1.908	2.114
FR_FRABCH + 20C		1.855	1.814	2.003	2.716
FR_FRCP1 + 20Cu		1.705	1.358	1.98	1.753
GH_FR1 + 20Cu		2.433	2.181	1.917	2.584
GH_ERC + 10Cu		2.095	2.463	2.131	2.302
CM_MC2 + 20Cu		1.963	1.671	2.153	2.409
RG_MIDAG + 15Cu		1.677	1.754	2.209	1.959
EV_MC2 + 20Cu		1.967	1.907	1.765	2.361
EV_HC1 + 20Cu		2.155	2.024	2.188	2.433
LC_DCDS + 20Cu		2.245	1.875	2.113	2.212
LC_LC3 + 20Cu		2.233	1.927	1.983	2.161
LC_LC5 + 20Cu		1.906	2.029	2.304	2.523
LC_LCDSSLCC20C		1.923	1.933	2.169	2.363
FR_FR4 + 20Cu		1.754	1.838	1.863	2.599
FR_FR2 + 20Cu		0.9653	0.96	1.738	1.294
FR_MULTIPLATE2		2.295	2.019	2.205	2.888
FR_FRRD + 20Cu		2.016	2.181	2.427	2.729

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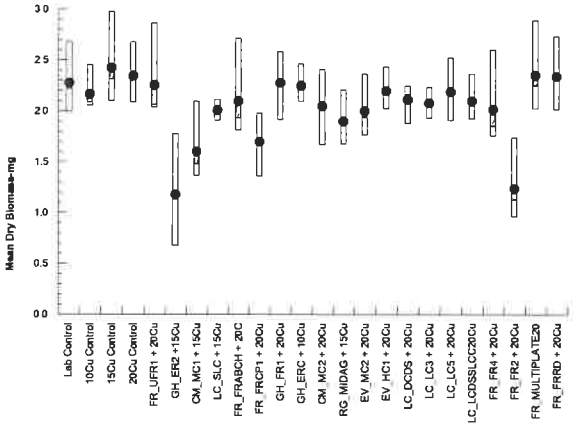
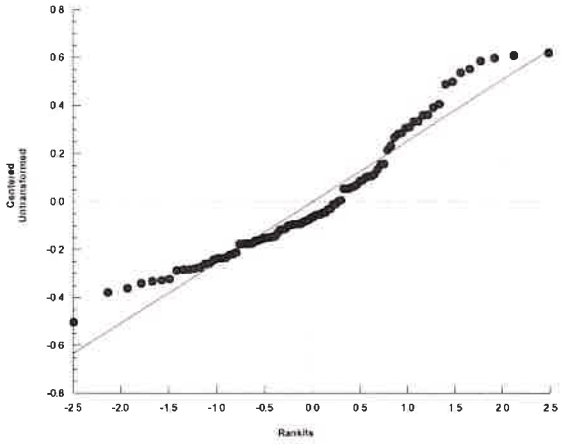
Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID:	14-4740-5688	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.9.4
Analyzed:	01 Jun-21 8:04	**Analysis:**	Nonparametric-Control vs Treatments	**Status Level:**	1

Graphics





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CETIS Analytical Report

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID:	20-3856-5716	**Endpoint:**	Hatch Rate	**CETIS Version:**	CETISv1.9.4
Analyzed:	21 May-21 11:51	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1
Batch ID:	16-2689-7673	**Test Type:**	32 Day Fathead Minnow Test	**Analyst:**	Kayla Knol
Start Date:	06 Mar-21	**Protocol:**	ASTM E1241-05 (2013)	**Diluent:**	Dechlorinated Tap Water
Ending Date:	07 Apr-21	**Species:**	Pimephales promelas	**Brine:**	
Test Length:	32d 0h	**Taxon:**	Actinopterygii	**Source:**	Aquatox, AR **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
Lab Control	08-8280-1106	02 Mar-21	03 Mar-21	96h	Teck Coal Ltd	
10Cu Control	01-9333-5370	02 Mar-21	03 Mar-21	96h		
15Cu Control	19-6548-0518	02 Mar-21	03 Mar-21	96h		
20Cu Control	00-8675-6744	02 Mar-21	03 Mar-21	96h		
FR_UFR1 + 20Cu	20-4721-8257	02 Mar-21	03 Mar-21	96h (4.6 °C)		
GH_ER2 +15Cu	01-1137-9253	02 Mar-21	03 Mar-21	96h (4.2 °C)		
CM_MC1 + 15Cu	01-3772-5048	02 Mar-21	03 Mar-21	96h (1 °C)		
LC_SLC + 15Cu	01-2380-6574	02 Mar-21	03 Mar-21	96h (3.1 °C)		
FR_FRABCH + 20C	08-4134-0746	02 Mar-21	03 Mar-21	96h (3.8 °C)		
FR_FRCP1 + 20Cu	11-2694-6466	02 Mar-21	03 Mar-21	96h (3 °C)		
GH_FR1 + 20Cu	20-1635-3152	02 Mar-21	03 Mar-21	96h (2.4 °C)		
GH_ERC + 10Cu	05-1950-5597	02 Mar-21	03 Mar-21	96h (4.1 °C)		
CM_MC2 + 20Cu	14-4685-1067	02 Mar-21	03 Mar-21	96h (0.3 °C)		
RG_MIDAG + 15Cu	21-3889-1829	02 Mar-21	03 Mar-21	96h (0.6 °C)		
EV_MC2 + 20Cu	05-6103-5191	02 Mar-21	03 Mar-21	96h (4.4 °C)		
EV_HC1 + 20Cu	12-5501-3302	02 Mar-21	03 Mar-21	96h (3.4 °C)		
LC_DCDS + 20Cu	04-1088-5978	02 Mar-21	03 Mar-21	96h (0.6 °C)		
LC_LC3 + 20Cu	14-7773-4190	02 Mar-21	03 Mar-21	96h (2.3 °C)		
LC_LC5 + 20Cu	01-7235-6798	02 Mar-21	03 Mar-21	96h (0.6 °C)		
LC_LCDSSLCC20C	06-4197-2641	02 Mar-21	03 Mar-21	96h (2.4 °C)		
FR_FR4 + 20Cu	10-9481-5020	02 Mar-21	03 Mar-21	96h (5.4 °C)		
FR_FR2 + 20Cu	00-3159-8672	02 Mar-21	03 Mar-21	96h (4.4 °C)		
FR_MULTIPLATE2	02-2179-0364	02 Mar-21	03 Mar-21	96h (2.9 °C)		
FR_FRRD + 20Cu	19-5167-8345	02 Mar-21	03 Mar-21	96h (6.2 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
Lab Control	Ambient Sample	Teck Coal Ltd	Lab Control	
10Cu Control	Ambient Sample	Teck Coal Ltd	10Cu Control	
15Cu Control	Ambient Sample	Teck Coal Ltd	15Cu Control	
20Cu Control	Ambient Sample	Teck Coal Ltd	20Cu Control	
FR_UFR1 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_UFR1_MON_2021-03-0	
GH_ER2 +15Cu	Ambient Sample	Teck Coal Ltd	GH_ER2_WS_2021-03-02_	
CM_MC1 + 15Cu	Ambient Sample	Teck Coal Ltd	CM_MC1_WS_2021-03-02	
LC_SLC + 15Cu	Ambient Sample	Teck Coal Ltd	LC_SLC_WS_2021-03-02_	
FR_FRABCH + 20C	Ambient Sample	Teck Coal Ltd	FR_FRABCH_MON_2021-	
FR_FRCP1 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FRCP1_MON_2021-03	
GH_FR1 + 20Cu	Ambient Sample	Teck Coal Ltd	GH_FR1_WS_2021-03-02_	
GH_ERC + 10Cu	Ambient Sample	Teck Coal Ltd	GH_ERC_WS_2021-03-02	
CM_MC2 + 20Cu	Ambient Sample	Teck Coal Ltd	CM_MC2_WS_2021-03-02	
RG_MIDAG + 15Cu	Ambient Sample	Teck Coal Ltd	RG_MIDAG_WS_2021-03-	
EV_MC2 + 20Cu	Ambient Sample	Teck Coal Ltd	EV_MC2_WS_2021_Q1_W	
EV_HC1 + 20Cu	Ambient Sample	Teck Coal Ltd	EV_HC1_WS_2021_Q1_W	
LC_DCDS + 20Cu	Ambient Sample	Teck Coal Ltd	LC_DCDS_WS_2021-03-02	
LC_LC3 + 20Cu	Ambient Sample	Teck Coal Ltd	LC_LC3_WS_2021-03-02_	
LC_LC5 + 20Cu	Ambient Sample	Teck Coal Ltd	LC_LC5_WS_2021-03-02_	
LC_LCDSSLCC20C	Ambient Sample	Teck Coal Ltd	LC_LCDSSLCC_WS_2021-	
FR_FR4 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FR4_WS_2021-03-02_	
FR_FR2 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FR2_WS_2021-03-02_	

JUN 10 2021

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID:	20-3856-5716	**Endpoint:**	Hatch Rate	**CETIS Version:**	CETISv1.9.4
Analyzed:	21 May-21 11:51	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_MULTIPLATE2	Ambient Sample	Teck Coal Ltd	FR_MULTIPLATE_WS_202	
FR_FRRD + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FRRD_WS_2021-03-02	

Fisher Exact/Bonferroni Adj Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
Negative Control		10Cu Control	0.5000	Exact	1.0000	Non-Significant Effect
		15Cu Control	0.5000	Exact	1.0000	Non-Significant Effect
		20Cu Control	0.1218	Exact	1.0000	Non-Significant Effect
		FR_UFR1 + 20Cu	0.1218	Exact	1.0000	Non-Significant Effect
		GH_ER2 +15Cu	0.5000	Exact	1.0000	Non-Significant Effect
		CM_MC1 + 15Cu	0.5000	Exact	1.0000	Non-Significant Effect
		LC_SLC + 15Cu	0.5000	Exact	1.0000	Non-Significant Effect
		FR_FRABCH + 20C	0.5000	Exact	1.0000	Non-Significant Effect
		FR_FRCP1 + 20Cu	0.5000	Exact	1.0000	Non-Significant Effect
		GH_FR1 + 20Cu	0.0287	Exact	0.6591	Non-Significant Effect
		GH_ERC + 10Cu	0.5000	Exact	1.0000	Non-Significant Effect
		CM_MC2 + 20Cu	0.5000	Exact	1.0000	Non-Significant Effect
		RG_MIDAG + 15Cu	0.5000	Exact	1.0000	Non-Significant Effect
		EV_MC2 + 20Cu	0.0594	Exact	1.0000	Non-Significant Effect
		EV_HC1 + 20Cu	0.2479	Exact	1.0000	Non-Significant Effect
		LC_DCDS + 20Cu*	0.0014	Exact	0.0325	Significant Effect
		LC_LC3 + 20Cu	1.0000	Exact	1.0000	Non-Significant Effect
		LC_LC5 + 20Cu	0.5000	Exact	1.0000	Non-Significant Effect
		LC_LCDSSLCC20Cu	1.0000	Exact	1.0000	Non-Significant Effect
		FR_FR4 + 20Cu	0.5000	Exact	1.0000	Non-Significant Effect
		FR_FR2 + 20Cu	0.5000	Exact	1.0000	Non-Significant Effect
		FR_MULTIPLATE20	0.5000	Exact	1.0000	Non-Significant Effect
		FR_FRRD + 20Cu	0.0594	Exact	1.0000	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	3.165	3.37	0.1123	No Outliers Detected

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 20-3856-5716 **Endpoint:** Hatch Rate **CETIS Version:** CETISv1.9.4
Analyzed: 21 May-21 11:51 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Data Summary

Sample	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
Lab Control	N	60	0	60	1	0	0.0%
10Cu Control		59	1	60	0.9833	0.01667	1.67%
15Cu Control		59	1	60	0.9833	0.01667	1.67%
20Cu Control		57	3	60	0.95	0.05	5.0%
FR_UFR1 + 20Cu		57	3	60	0.95	0.05	5.0%
GH_ER2 +15Cu		59	1	60	0.9833	0.01667	1.67%
CM_MC1 + 15Cu		59	1	60	0.9833	0.01667	1.67%
LC_SLC + 15Cu		59	1	60	0.9833	0.01667	1.67%
FR_FRABCH + 20C		59	1	60	0.9833	0.01667	1.67%
FR_FRCP1 + 20Cu		59	1	60	0.9833	0.01667	1.67%
GH_FR1 + 20Cu		55	5	60	0.9167	0.08333	8.33%
GH_ERC + 10Cu		59	1	60	0.9833	0.01667	1.67%
CM_MC2 + 20Cu		59	1	60	0.9833	0.01667	1.67%
RG_MIDAG + 15Cu		59	1	60	0.9833	0.01667	1.67%
EV_MC2 + 20Cu		56	4	60	0.9333	0.06667	6.67%
EV_HC1 + 20Cu		58	2	60	0.9667	0.03333	3.33%
LC_DCDS + 20Cu		51	9	60	0.85	0.15	15.0%
LC_LC3 + 20Cu		60	0	60	1	0	0.0%
LC_LC5 + 20Cu		59	1	60	0.9833	0.01667	1.67%
LC_LCDSSLCC20C		60	0	60	1	0	0.0%
FR_FR4 + 20Cu		59	1	60	0.9833	0.01667	1.67%
FR_FR2 + 20Cu		59	1	60	0.9833	0.01667	1.67%
FR_MULTIPLATE20		59	1	60	0.9833	0.01667	1.67%
FR_FRRD + 20Cu		56	4	60	0.9333	0.06667	6.67%

Hatch Rate Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Lab Control	N	1.0000	1.0000	1.0000	1.0000
10Cu Control		0.9333	1.0000	1.0000	1.0000
15Cu Control		1.0000	1.0000	1.0000	0.9333
20Cu Control		0.9333	0.8667	1.0000	1.0000
FR_UFR1 + 20Cu		0.8667	1.0000	1.0000	0.9333
GH_ER2 +15Cu		1.0000	1.0000	1.0000	0.9333
CM_MC1 + 15Cu		1.0000	1.0000	0.9333	1.0000
LC_SLC + 15Cu		0.9333	1.0000	1.0000	1.0000
FR_FRABCH + 20C		1.0000	1.0000	0.9333	1.0000
FR_FRCP1 + 20Cu		0.9333	1.0000	1.0000	1.0000
GH_FR1 + 20Cu		0.9333	0.8000	1.0000	0.9333
GH_ERC + 10Cu		1.0000	1.0000	0.9333	1.0000
CM_MC2 + 20Cu		1.0000	1.0000	1.0000	0.9333
RG_MIDAG + 15Cu		1.0000	0.9333	1.0000	1.0000
EV_MC2 + 20Cu		0.9333	0.8000	1.0000	1.0000
EV_HC1 + 20Cu		1.0000	0.9333	1.0000	0.9333
LC_DCDS + 20Cu		0.8000	0.9333	1.0000	0.6667
LC_LC3 + 20Cu		1.0000	1.0000	1.0000	1.0000
LC_LC5 + 20Cu		1.0000	1.0000	1.0000	0.9333
LC_LCDSSLCC20C		1.0000	1.0000	1.0000	1.0000
FR_FR4 + 20Cu		1.0000	1.0000	1.0000	0.9333
FR_FR2 + 20Cu		1.0000	1.0000	0.9333	1.0000
FR_MULTIPLATE2		0.9333	1.0000	1.0000	1.0000
FR_FRRD + 20Cu		0.9333	0.9333	1.0000	0.8667

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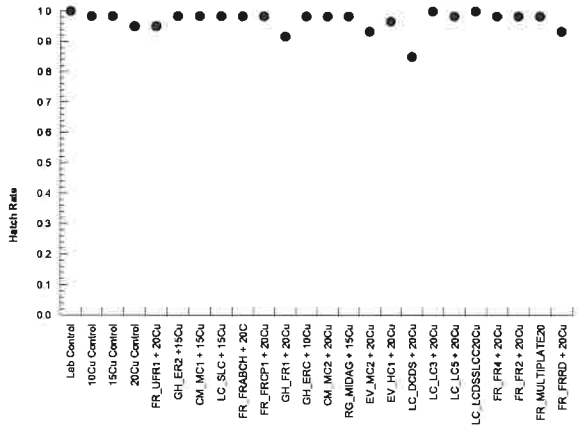
Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 20-3856-5716 **Endpoint:** Hatch Rate **CETIS Version:** CETISv1.9.4
Analyzed: 21 May-21 11:51 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Hatch Rate Binomials

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Lab Control	N	15/15	15/15	15/15	15/15
10Cu Control		14/15	15/15	15/15	15/15
15Cu Control		15/15	15/15	15/15	14/15
20Cu Control		14/15	13/15	15/15	15/15
FR_UFR1 + 20Cu		13/15	15/15	15/15	14/15
GH_ER2 +15Cu		15/15	15/15	15/15	14/15
CM_MC1 + 15Cu		15/15	15/15	14/15	15/15
LC_SLC + 15Cu		14/15	15/15	15/15	15/15
FR_FRABCH + 20C		15/15	15/15	14/15	15/15
FR_FRCP1 + 20Cu		14/15	15/15	15/15	15/15
GH_FR1 + 20Cu		14/15	12/15	15/15	14/15
GH_ERC + 10Cu		15/15	15/15	14/15	15/15
CM_MC2 + 20Cu		15/15	15/15	15/15	14/15
RG_MIDAG + 15Cu		15/15	14/15	15/15	15/15
EV_MC2 + 20Cu		14/15	12/15	15/15	15/15
EV_HC1 + 20Cu		15/15	14/15	15/15	14/15
LC_DCDS + 20Cu		12/15	14/15	15/15	10/15
LC_LC3 + 20Cu		15/15	15/15	15/15	15/15
LC_LC5 + 20Cu		15/15	15/15	15/15	14/15
LC_LCDSSLCC20C		15/15	15/15	15/15	15/15
FR_FR4 + 20Cu		15/15	15/15	15/15	14/15
FR_FR2 + 20Cu		15/15	15/15	14/15	15/15
FR_MULTIPLATE2		14/15	15/15	15/15	15/15
FR_FRRD + 20Cu		14/15	14/15	15/15	13/15

Graphics



Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID:	10-1215-9981	**Endpoint:**	Length	**CETIS Version:**	CETISv1.9.4
Analyzed:	21 May-21 12:13	**Analysis:**	Parametric-Control vs Treatments	**Status Level:**	1
Batch ID:	16-2689-7673	**Test Type:**	32 Day Fathead Minnow Test	**Analyst:**	Kayla Knol
Start Date:	06 Mar-21	**Protocol:**	ASTM E1241-05 (2013)	**Diluent:**	Dechlorinated Tap Water
Ending Date:	07 Apr-21	**Species:**	Pimephales promelas	**Brine:**	
Test Length:	32d 0h	**Taxon:**	Actinopterygii	**Source:**	Aquatox, AR

Age:

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
Lab Control	08-8280-1106	02 Mar-21	03 Mar-21	96h	Teck Coal Ltd	
10Cu Control	01-9333-5370	02 Mar-21	03 Mar-21	96h		
15Cu Control	19-6548-0518	02 Mar-21	03 Mar-21	96h		
20Cu Control	00-8675-6744	02 Mar-21	03 Mar-21	96h		
FR_UFR1 + 20Cu	20-4721-8257	02 Mar-21	03 Mar-21	96h (4.6 °C)		
GH_ER2 +15Cu	01-1137-9253	02 Mar-21	03 Mar-21	96h (4.2 °C)		
CM_MC1 + 15Cu	01-3772-5048	02 Mar-21	03 Mar-21	96h (1 °C)		
LC_SLC + 15Cu	01-2380-6574	02 Mar-21	03 Mar-21	96h (3.1 °C)		
FR_FRABCH + 20C	08-4134-0746	02 Mar-21	03 Mar-21	96h (3.8 °C)		
FR_FRCP1 + 20Cu	11-2694-6466	02 Mar-21	03 Mar-21	96h (3 °C)		
GH_FR1 + 20Cu	20-1635-3152	02 Mar-21	03 Mar-21	96h (2.4 °C)		
GH_ERC + 10Cu	05-1950-5597	02 Mar-21	03 Mar-21	96h (4.1 °C)		
CM_MC2 + 20Cu	14-4685-1067	02 Mar-21	03 Mar-21	96h (0.3 °C)		
RG_MIDAG + 15Cu	21-3889-1829	02 Mar-21	03 Mar-21	96h (0.6 °C)		
EV_MC2 + 20Cu	05-6103-5191	02 Mar-21	03 Mar-21	96h (4.4 °C)		
EV_HC1 + 20Cu	12-5501-3302	02 Mar-21	03 Mar-21	96h (3.4 °C)		
LC_DCDS + 20Cu	04-1088-5978	02 Mar-21	03 Mar-21	96h (0.6 °C)		
LC_LC3 + 20Cu	14-7773-4190	02 Mar-21	03 Mar-21	96h (2.3 °C)		
LC_LC5 + 20Cu	01-7235-6798	02 Mar-21	03 Mar-21	96h (0.6 °C)		
LC_LCDSSLCC20C	06-4197-2641	02 Mar-21	03 Mar-21	96h (2.4 °C)		
FR_FR4 + 20Cu	10-9481-5020	02 Mar-21	03 Mar-21	96h (5.4 °C)		
FR_FR2 + 20Cu	00-3159-8672	02 Mar-21	03 Mar-21	96h (4.4 °C)		
FR_MULTIPLATE2	02-2179-0364	02 Mar-21	03 Mar-21	96h (2.9 °C)		
FR_FRRD + 20Cu	19-5167-8345	02 Mar-21	03 Mar-21	96h (6.2 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
Lab Control	Ambient Sample	Teck Coal Ltd	Lab Control	
10Cu Control	Ambient Sample	Teck Coal Ltd	10Cu Control	
15Cu Control	Ambient Sample	Teck Coal Ltd	15Cu Control	
20Cu Control	Ambient Sample	Teck Coal Ltd	20Cu Control	
FR_UFR1 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_UFR1_MON_2021-03-0	
GH_ER2 +15Cu	Ambient Sample	Teck Coal Ltd	GH_ER2_WS_2021-03-02_	
CM_MC1 + 15Cu	Ambient Sample	Teck Coal Ltd	CM_MC1_WS_2021-03-02	
LC_SLC + 15Cu	Ambient Sample	Teck Coal Ltd	LC_SLC_WS_2021-03-02_	
FR_FRABCH + 20C	Ambient Sample	Teck Coal Ltd	FR_FRABCH_MON_2021-	
FR_FRCP1 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FRCP1_MON_2021-03	
GH_FR1 + 20Cu	Ambient Sample	Teck Coal Ltd	GH_FR1_WS_2021-03-02_	
GH_ERC + 10Cu	Ambient Sample	Teck Coal Ltd	GH_ERC_WS_2021-03-02	
CM_MC2 + 20Cu	Ambient Sample	Teck Coal Ltd	CM_MC2_WS_2021-03-02	
RG_MIDAG + 15Cu	Ambient Sample	Teck Coal Ltd	RG_MIDAG_WS_2021-03-	
EV_MC2 + 20Cu	Ambient Sample	Teck Coal Ltd	EV_MC2_WS_2021_Q1_W	
EV_HC1 + 20Cu	Ambient Sample	Teck Coal Ltd	EV_HC1_WS_2021_Q1_W	
LC_DCDS + 20Cu	Ambient Sample	Teck Coal Ltd	LC_DCDS_WS_2021-03-02	
LC_LC3 + 20Cu	Ambient Sample	Teck Coal Ltd	LC_LC3_WS_2021-03-02_	
LC_LC5 + 20Cu	Ambient Sample	Teck Coal Ltd	LC_LC5_WS_2021-03-02_	
LC_LCDSSLCC20C	Ambient Sample	Teck Coal Ltd	LC_LCDSSLCC_WS_2021-	
FR_FR4 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FR4_WS_2021-03-02_	
FR_FR2 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FR2_WS_2021-03-02_	

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Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 10-1215-9981 **Endpoint:** Length **CETIS Version:** CETISv1.9.4
Analyzed: 21 May-21 12:13 **Analysis:** Parametric-Control vs Treatments **Status Level:** 1

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_MULTIPLATE2	Ambient Sample	Teck Coal Ltd	FR_MULTIPLATE_WS_202	
FR_FRRD + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FRRD_WS_2021-03-02	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	10Cu Control passed length	12.44%
		15Cu Control passed length	12.44%
		20Cu Control passed length	12.44%
		FR_UFR1 + 20Cu passed length	12.44%
		GH_ER2 +15Cu passed length	12.44%
		CM_MC1 + 15Cu passed length	12.44%
		LC_SLC + 15Cu passed length	12.44%
		FR_FRABCH + 20C passed length	12.44%
		FR_FRCP1 + 20Cu passed length	12.44%
		GH_FR1 + 20Cu passed length	12.44%
		GH_ERC + 10Cu passed length	12.44%
		CM_MC2 + 20Cu passed length	12.44%
		RG_MIDAG + 15Cu passed length	12.44%
		EV_MC2 + 20Cu passed length	12.44%
		EV_HC1 + 20Cu passed length	12.44%
		LC_DCDS + 20Cu passed length	12.44%
		LC_LC3 + 20Cu passed length	12.44%
		LC_LC5 + 20Cu passed length	12.44%
		LC_LCDSSLCC20Cu passed length	12.44%
		FR_FR4 + 20Cu passed length	12.44%
		FR_FR2 + 20Cu passed length	12.44%
		FR_MULTIPLATE20 passed length	12.44%
		FR_FRRD + 20Cu passed length	12.44%

Dunnett Multiple Comparison Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Negative Control		10Cu Control	0.3697	2.744	1.349	6	CDF	0.8957	Non-Significant Effect
		15Cu Control	-0.4751	2.744	1.349	6	CDF	0.9904	Non-Significant Effect
		20Cu Control	-0.6717	2.744	1.349	6	CDF	0.9952	Non-Significant Effect
		FR_UFR1 + 20Cu	0.8864	2.744	1.349	6	CDF	0.7251	Non-Significant Effect
		GH_ER2 +15Cu	0.006611	2.744	1.349	6	CDF	0.9576	Non-Significant Effect
		CM_MC1 + 15Cu	-0.1574	2.744	1.349	6	CDF	0.9734	Non-Significant Effect
		LC_SLC + 15Cu	-1.235	2.744	1.349	6	CDF	0.9995	Non-Significant Effect
		FR_FRABCH + 20C	0.7026	2.744	1.349	6	CDF	0.7972	Non-Significant Effect
		FR_FRCP1 + 20Cu	-0.6699	2.744	1.349	6	CDF	0.9952	Non-Significant Effect
		GH_FR1 + 20Cu	0.4524	2.744	1.349	6	CDF	0.8752	Non-Significant Effect
		GH_ERC + 10Cu	0.7306	2.744	1.349	6	CDF	0.7870	Non-Significant Effect
		CM_MC2 + 20Cu	1.461	2.744	1.349	6	CDF	0.4514	Non-Significant Effect
		RG_MIDAG + 15Cu	0.1603	2.744	1.349	6	CDF	0.9365	Non-Significant Effect
		EV_MC2 + 20Cu	0.2188	2.744	1.349	6	CDF	0.9266	Non-Significant Effect
		EV_HC1 + 20Cu	0.5631	2.744	1.349	6	CDF	0.8437	Non-Significant Effect
		LC_DCDS + 20Cu	-0.6468	2.744	1.349	6	CDF	0.9948	Non-Significant Effect
		LC_LC3 + 20Cu	0.2424	2.744	1.349	6	CDF	0.9223	Non-Significant Effect
		LC_LC5 + 20Cu	-0.4194	2.744	1.349	6	CDF	0.9884	Non-Significant Effect
		LC_LCDSSLCC20Cu	0.3256	2.744	1.349	6	CDF	0.9055	Non-Significant Effect
		FR_FR4 + 20Cu	-0.5494	2.744	1.349	6	CDF	0.9926	Non-Significant Effect
		FR_FR2 + 20Cu	0.82	2.744	1.349	6	CDF	0.7525	Non-Significant Effect
		FR_MULTIPLATE20	-0.08176	2.744	1.349	6	CDF	0.9669	Non-Significant Effect
		FR_FRRD + 20Cu	0.0756	2.744	1.349	6	CDF	0.9489	Non-Significant Effect

Auxiliary Tests

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 10-1215-9981 **Endpoint:** Length **CETIS Version:** CETISv1.9.4
Analyzed: 21 May-21 12:13 **Analysis:** Parametric-Control vs Treatments **Status Level:** 1

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	3.392	3.37	0.0458	Outlier Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	8.62615	0.37505	23	0.7753	0.7491	Non-Significant Effect
Error	34.8279	0.483721	72			
Total	43.4541		95			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Variances	Bartlett Equality of Variance Test	31.32	35.17	0.1151	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9841	0.9737	0.3005	Normal Distribution

Length Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
Lab Control	N	4	10.85	10.2	11.5	10.74	10.5	11.42	0.2039	3.76%	0.00%
10Cu Control		4	10.67	10.19	11.15	10.69	10.29	11	0.1513	2.84%	1.68%
15Cu Control		4	11.08	9.919	12.25	11	10.33	12	0.3658	6.60%	-2.15%
20Cu Control		4	11.18	10.17	12.19	10.96	10.69	12.11	0.3171	5.67%	-3.04%
FR_UFR1 + 20Cu		4	10.41	9.005	11.82	10.04	9.857	11.73	0.4425	8.50%	4.02%
GH_ER2 +15Cu		4	10.85	10.27	11.43	10.8	10.5	11.29	0.182	3.36%	0.03%
CM_MC1 + 15Cu		4	10.93	9.723	12.13	10.83	10.17	11.88	0.3782	6.92%	-0.71%
LC_SLC + 15Cu		4	11.46	10.55	12.37	11.45	10.93	12	0.2857	4.99%	-5.60%
FR_FRABCH + 20C		4	10.5	9.776	11.23	10.47	10	11.08	0.2288	4.36%	3.18%
FR_FRCP1 + 20Cu		4	11.18	10.1	12.26	11.13	10.45	12	0.3392	6.07%	-3.04%
GH_FR1 + 20Cu		4	10.63	9.531	11.72	10.72	9.846	11.23	0.3445	6.48%	2.05%
GH_ERC + 10Cu		4	10.49	10.24	10.74	10.48	10.31	10.69	0.0791	1.51%	3.31%
CM_MC2 + 20Cu		4	10.13	8.98	11.28	10.01	9.429	11.08	0.3617	7.14%	6.62%
RG_MIDAG + 15Cu		4	10.77	10.19	11.35	10.72	10.4	11.25	0.1826	3.39%	0.73%
EV_MC2 + 20Cu		4	10.74	9.791	11.69	10.76	10.08	11.36	0.2987	5.56%	0.99%
EV_HC1 + 20Cu		4	10.57	10.15	10.99	10.54	10.31	10.9	0.1325	2.51%	2.55%
LC_DCDS + 20Cu		4	11.17	9.661	12.67	11.06	10.18	12.38	0.4734	8.48%	-2.93%
LC_LC3 + 20Cu		4	10.73	9.975	11.49	10.77	10.13	11.25	0.2375	4.43%	1.10%
LC_LC5 + 20Cu		4	11.06	9.583	12.53	10.93	10.07	12.3	0.4627	8.37%	-1.90%
LC_LCDSSLCC20C		4	10.69	10.4	10.98	10.66	10.5	10.93	0.09091	1.70%	1.48%
FR_FR4 + 20Cu		4	11.12	10.17	12.07	11.06	10.45	11.9	0.298	5.36%	-2.49%
FR_FR2 + 20Cu		4	10.45	7.854	13.04	10.14	9	12.5	0.8146	15.60%	3.72%
FR_MULTIPLATE2		4	10.89	9.947	11.83	10.89	10.23	11.55	0.2964	5.44%	-0.37%
FR_FRRD + 20Cu		4	10.81	9.242	12.38	10.83	9.917	11.67	0.4934	9.13%	0.34%

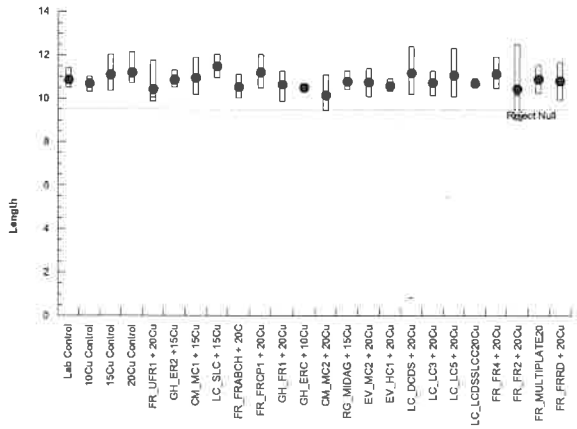
Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

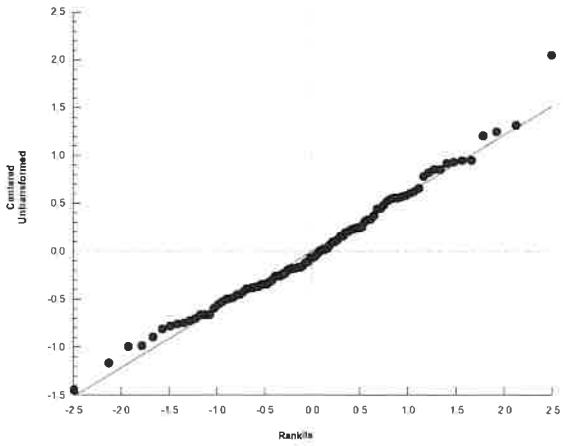
Analysis ID: 10-1215-9981 **Endpoint:** Length **CETIS Version:** CETISv1.9.4
Analyzed: 21 May-21 12:13 **Analysis:** Parametric-Control vs Treatments **Status Level:** 1

Length Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Lab Control	N	10.5	10.62	11.42	10.87
10Cu Control		10.79	11	10.29	10.6
15Cu Control		10.69	10.33	12	11.31
20Cu Control		10.92	10.69	12.11	11
FR_UFR1 + 20Cu		9.917	9.857	10.15	11.73
GH_ER2 +15Cu		10.5	11.29	11	10.6
CM_MC1 + 15Cu		10.5	11.88	10.17	11.17
LC_SLC + 15Cu		12	11.9	10.93	11
FR_FRABCH + 20C		10.33	10	10.6	11.08
FR_FRCP1 + 20Cu		12	10.83	10.45	11.43
GH_FR1 + 20Cu		11.18	10.25	9.846	11.23
GH_ERC + 10Cu		10.5	10.31	10.69	10.46
CM_MC2 + 20Cu		9.429	9.733	10.29	11.08
RG_MIDAG + 15Cu		10.4	10.6	10.83	11.25
EV_MC2 + 20Cu		10.08	11.11	10.42	11.36
EV_HC1 + 20Cu		10.67	10.42	10.31	10.9
LC_DCDS + 20Cu		12.38	10.18	10.71	11.4
LC_LC3 + 20Cu		10.92	10.13	10.62	11.25
LC_LC5 + 20Cu		10.07	10.86	11	12.3
LC_LCDSSLCC20C		10.71	10.5	10.62	10.93
FR_FR4 + 20Cu		11	10.45	11.12	11.9
FR_FR2 + 20Cu		9.286	9	11	12.5
FR_MULTIPLATE2		11.2	10.58	10.23	11.55
FR_FRRD + 20Cu		9.917	10	11.67	11.67

Graphics





Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID:	20-6902-8854	**Endpoint:**	Proportion Normal	**CETIS Version:**	CETISv1.9.4
Analyzed:	01 Jun-21 8:01	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1
Batch ID:	16-2689-7673	**Test Type:**	32 Day Fathead Minnow Test	**Analyst:**	Kayla Knol
Start Date:	06 Mar-21	**Protocol:**	ASTM E1241-05 (2013)	**Diluent:**	Dechlorinated Tap Water
Ending Date:	07 Apr-21	**Species:**	Pimephales promelas	**Brine:**	
Test Length:	32d 0h	**Taxon:**	Actinopterygii	**Source:**	Aquatox, AR **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
Lab Control	08-8280-1106	02 Mar-21	03 Mar-21	96h	Teck Coal Ltd	
10Cu Control	01-9333-5370	02 Mar-21	03 Mar-21	96h		
15Cu Control	19-6548-0518	02 Mar-21	03 Mar-21	96h		
20Cu Control	00-8675-6744	02 Mar-21	03 Mar-21	96h		
FR_UFR1 + 20Cu	20-4721-8257	02 Mar-21	03 Mar-21	96h (4.6 °C)		
GH_ER2 +15Cu	01-1137-9253	02 Mar-21	03 Mar-21	96h (4.2 °C)		
CM_MC1 + 15Cu	01-3772-5048	02 Mar-21	03 Mar-21	96h (1 °C)		
LC_SLC + 15Cu	01-2380-6574	02 Mar-21	03 Mar-21	96h (3.1 °C)		
FR_FRABCH + 20C	08-4134-0746	02 Mar-21	03 Mar-21	96h (3.8 °C)		
FR_FRCP1 + 20Cu	11-2694-6466	02 Mar-21	03 Mar-21	96h (3 °C)		
GH_FR1 + 20Cu	20-1635-3152	02 Mar-21	03 Mar-21	96h (2.4 °C)		
GH_ERC + 10Cu	05-1950-5597	02 Mar-21	03 Mar-21	96h (4.1 °C)		
CM_MC2 + 20Cu	14-4685-1067	02 Mar-21	03 Mar-21	96h (0.3 °C)		
RG_MIDAG + 15Cu	21-3889-1829	02 Mar-21	03 Mar-21	96h (0.6 °C)		
EV_MC2 + 20Cu	05-6103-5191	02 Mar-21	03 Mar-21	96h (4.4 °C)		
EV_HC1 + 20Cu	12-5501-3302	02 Mar-21	03 Mar-21	96h (3.4 °C)		
LC_DCDS + 20Cu	04-1088-5978	02 Mar-21	03 Mar-21	96h (0.6 °C)		
LC_LC3 + 20Cu	14-7773-4190	02 Mar-21	03 Mar-21	96h (2.3 °C)		
LC_LC5 + 20Cu	01-7235-6798	02 Mar-21	03 Mar-21	96h (0.6 °C)		
LC_LCDSSLCC20C	06-4197-2641	02 Mar-21	03 Mar-21	96h (2.4 °C)		
FR_FR4 + 20Cu	10-9481-5020	02 Mar-21	03 Mar-21	96h (5.4 °C)		
FR_FR2 + 20Cu	00-3159-8672	02 Mar-21	03 Mar-21	96h (4.4 °C)		
FR_MULTIPLATE2	02-2179-0364	02 Mar-21	03 Mar-21	96h (2.9 °C)		
FR_FRRD + 20Cu	19-5167-8345	02 Mar-21	03 Mar-21	96h (6.2 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
Lab Control	Ambient Sample	Teck Coal Ltd	Lab Control	
10Cu Control	Ambient Sample	Teck Coal Ltd	10Cu Control	
15Cu Control	Ambient Sample	Teck Coal Ltd	15Cu Control	
20Cu Control	Ambient Sample	Teck Coal Ltd	20Cu Control	
FR_UFR1 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_UFR1_MON_2021-03-0	
GH_ER2 +15Cu	Ambient Sample	Teck Coal Ltd	GH_ER2_WS_2021-03-02_	
CM_MC1 + 15Cu	Ambient Sample	Teck Coal Ltd	CM_MC1_WS_2021-03-02	
LC_SLC + 15Cu	Ambient Sample	Teck Coal Ltd	LC_SLC_WS_2021-03-02_	
FR_FRABCH + 20C	Ambient Sample	Teck Coal Ltd	FR_FRABCH_MON_2021-	
FR_FRCP1 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FRCP1_MON_2021-03	
GH_FR1 + 20Cu	Ambient Sample	Teck Coal Ltd	GH_FR1_WS_2021-03-02_	
GH_ERC + 10Cu	Ambient Sample	Teck Coal Ltd	GH_ERC_WS_2021-03-02	
CM_MC2 + 20Cu	Ambient Sample	Teck Coal Ltd	CM_MC2_WS_2021-03-02	
RG_MIDAG + 15Cu	Ambient Sample	Teck Coal Ltd	RG_MIDAG_WS_2021-03-	
EV_MC2 + 20Cu	Ambient Sample	Teck Coal Ltd	EV_MC2_WS_2021_Q1_W	
EV_HC1 + 20Cu	Ambient Sample	Teck Coal Ltd	EV_HC1_WS_2021_Q1_W	
LC_DCDS + 20Cu	Ambient Sample	Teck Coal Ltd	LC_DCDS_WS_2021-03-02	
LC_LC3 + 20Cu	Ambient Sample	Teck Coal Ltd	LC_LC3_WS_2021-03-02_	
LC_LC5 + 20Cu	Ambient Sample	Teck Coal Ltd	LC_LC5_WS_2021-03-02_	
LC_LCDSSLCC20C	Ambient Sample	Teck Coal Ltd	LC_LCDSSLCC_WS_2021-	
FR_FR4 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FR4_WS_2021-03-02_	
FR_FR2 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FR2_WS_2021-03-02_	

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Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID:	20-6902-8854	**Endpoint:**	Proportion Normal	**CETIS Version:**	CETISv1.9.4
Analyzed:	01 Jun-21 8:01	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_MULTIPLATE2	Ambient Sample	Teck Coal Ltd	FR_MULTIPLATE_WS_202	
FR_FRRD + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FRRD_WS_2021-03-02	

Fisher Exact/Bonferroni Adj Test

Sample I vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
Negative Control	10Cu Control	1.0000	Exact	1.0000	Non-Significant Effect
	15Cu Control	1.0000	Exact	1.0000	Non-Significant Effect
	20Cu Control	0.4706	Exact	1.0000	Non-Significant Effect
	FR_UFR1 + 20Cu	1.0000	Exact	1.0000	Non-Significant Effect
	GH_ER2 +15Cu*	0.0008	Exact	0.0178	Significant Effect
	CM_MC1 + 15Cu*	0.0011	Exact	0.0247	Significant Effect
	LC_SLC + 15Cu	1.0000	Exact	1.0000	Non-Significant Effect
	FR_FRABCH + 20C	0.2141	Exact	1.0000	Non-Significant Effect
	FR_FRCP1 + 20Cu	0.3494	Exact	1.0000	Non-Significant Effect
	GH_FR1 + 20Cu	0.1042	Exact	1.0000	Non-Significant Effect
	GH_ERC + 10Cu	0.0027	Exact	0.0625	Non-Significant Effect
	CM_MC2 + 20Cu	0.2569	Exact	1.0000	Non-Significant Effect
	RG_MIDAG + 15Cu	0.1990	Exact	1.0000	Non-Significant Effect
	EV_MC2 + 20Cu	0.4600	Exact	1.0000	Non-Significant Effect
	EV_HC1 + 20Cu	0.4653	Exact	1.0000	Non-Significant Effect
	LC_DCDS + 20Cu	0.1939	Exact	1.0000	Non-Significant Effect
	LC_LC3 + 20Cu	0.2430	Exact	1.0000	Non-Significant Effect
	LC_LC5 + 20Cu	1.0000	Exact	1.0000	Non-Significant Effect
	LC_LCDSSLCC20Cu	0.4953	Exact	1.0000	Non-Significant Effect
	FR_FR4 + 20Cu	1.0000	Exact	1.0000	Non-Significant Effect
	FR_FR2 + 20Cu	0.1083	Exact	1.0000	Non-Significant Effect
	FR_MULTIPLATE20	1.0000	Exact	1.0000	Non-Significant Effect
	FR_FRRD + 20Cu	0.1888	Exact	1.0000	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	4.105	3.37	0.0017	Outlier Detected

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 20-6902-8854 **Endpoint:** Proportion Normal **CETIS Version:** CETISv1.9.4
Analyzed: 01 Jun-21 8:01 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Data Summary

Sample	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
Lab Control	N	54	0	54	1	0	0.0%
10Cu Control		56	0	56	1	0	0.0%
15Cu Control		50	0	50	1	0	0.0%
20Cu Control		47	1	48	0.9792	0.02083	2.08%
FR_UFR1 + 20Cu		50	0	50	1	0	0.0%
GH_ER2 +15Cu		14	5	19	0.7368	0.2632	26.32%
CM_MC1 + 15Cu		22	6	28	0.7857	0.2143	21.43%
LC_SLC + 15Cu		47	0	47	1	0	0.0%
FR_FRABCH + 20C		45	2	47	0.9574	0.04255	4.26%
FR_FRCP1 + 20Cu		28	1	29	0.9655	0.03448	3.45%
GH_FR1 + 20Cu		46	3	49	0.9388	0.06122	6.12%
GH_ERC + 10Cu		45	8	53	0.8491	0.1509	15.09%
CM_MC2 + 20Cu		54	2	56	0.9643	0.03571	3.57%
RG_MIDAG + 15Cu		42	2	44	0.9545	0.04545	4.55%
EV_MC2 + 20Cu		45	1	46	0.9783	0.02174	2.17%
EV_HC1 + 20Cu		46	1	47	0.9787	0.02128	2.13%
LC_DCDS + 20Cu		41	2	43	0.9535	0.04651	4.65%
LC_LC3 + 20Cu		51	2	53	0.9623	0.03774	3.77%
LC_LC5 + 20Cu		52	0	52	1	0	0.0%
LC_LCDSSLCC20C		52	1	53	0.9811	0.01887	1.89%
FR_FR4 + 20Cu		38	0	38	1	0	0.0%
FR_FR2 + 20Cu		25	2	27	0.9259	0.07407	7.41%
FR_MULTIPLATE20		46	0	46	1	0	0.0%
FR_FRRD + 20Cu		40	2	42	0.9524	0.04762	4.76%

Proportion Normal Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Lab Control	N	1.0000	1.0000	1.0000	1.0000
10Cu Control		1.0000	1.0000	1.0000	1.0000
15Cu Control		1.0000	1.0000	1.0000	1.0000
20Cu Control		0.9167	1.0000	1.0000	1.0000
FR_UFR1 + 20Cu		1.0000	1.0000	1.0000	1.0000
GH_ER2 +15Cu		0.7500	0.8571	1.0000	0.4000
CM_MC1 + 15Cu		0.6250	0.8750	0.6667	1.0000
LC_SLC + 15Cu		1.0000	1.0000	1.0000	1.0000
FR_FRABCH + 20C		1.0000	1.0000	0.8000	1.0000
FR_FRCP1 + 20Cu		1.0000	0.8333	1.0000	1.0000
GH_FR1 + 20Cu		1.0000	1.0000	0.9231	0.8462
GH_ERC + 10Cu		0.7857	0.7692	0.9231	0.9231
CM_MC2 + 20Cu		1.0000	0.9333	0.9286	1.0000
RG_MIDAG + 15Cu		0.9000	1.0000	1.0000	0.9167
EV_MC2 + 20Cu		0.9231	1.0000	1.0000	1.0000
EV_HC1 + 20Cu		0.9167	1.0000	1.0000	1.0000
LC_DCDS + 20Cu		1.0000	0.9091	0.9286	1.0000
LC_LC3 + 20Cu		1.0000	0.9333	1.0000	0.9167
LC_LC5 + 20Cu		1.0000	1.0000	1.0000	1.0000
LC_LCDSSLCC20C		1.0000	0.9167	1.0000	1.0000
FR_FR4 + 20Cu		1.0000	1.0000	1.0000	1.0000
FR_FR2 + 20Cu		0.8571	0.8571	1.0000	1.0000
FR_MULTIPLATE2		1.0000	1.0000	1.0000	1.0000
FR_FRRD + 20Cu		0.9167	0.9167	1.0000	1.0000

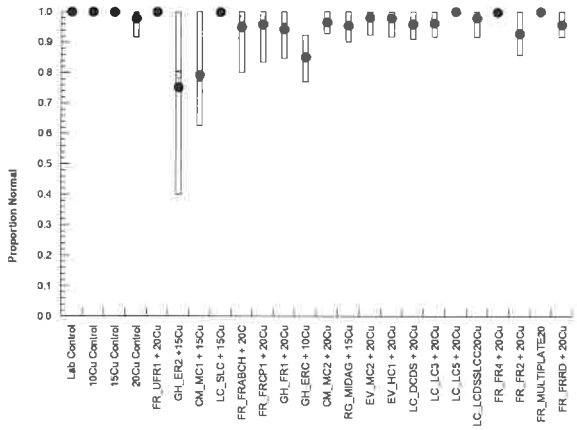
Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID:	20-6902-8854	**Endpoint:**	Proportion Normal	**CETIS Version:**	CETISv1.9.4
Analyzed:	01 Jun-21 8:01	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1

Proportion Normal Binomials

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Lab Control	N	14/14	13/13	12/12	15/15
10Cu Control		14/14	13/13	14/14	15/15
15Cu Control		13/13	15/15	9/9	13/13
20Cu Control		11/12	13/13	9/9	14/14
FR_UFR1 + 20Cu		12/12	14/14	13/13	11/11
GH_ER2 +15Cu		3/4	6/7	3/3	2/5
CM_MC1 + 15Cu		5/8	7/8	4/6	6/6
LC_SLC + 15Cu		9/9	10/10	14/14	14/14
FR_FRABCH + 20C		12/12	13/13	8/10	12/12
FR_FRCP1 + 20Cu		5/5	5/6	11/11	7/7
GH_FR1 + 20Cu		11/11	12/12	12/13	11/13
GH_ERC + 10Cu		11/14	10/13	12/13	12/13
CM_MC2 + 20Cu		14/14	14/15	13/14	13/13
RG_MIDAG + 15Cu		9/10	10/10	12/12	11/12
EV_MC2 + 20Cu		12/13	9/9	12/12	11/11
EV_HC1 + 20Cu		11/12	12/12	13/13	10/10
LC_DCDS + 20Cu		8/8	10/11	13/14	10/10
LC_LC3 + 20Cu		13/13	14/15	13/13	11/12
LC_LC5 + 20Cu		15/15	14/14	13/13	10/10
LC_LCDSSLCC20C		14/14	11/12	13/13	14/14
FR_FR4 + 20Cu		9/9	11/11	8/8	10/10
FR_FR2 + 20Cu		6/7	6/7	9/9	4/4
FR_MULTIPLATE2		10/10	12/12	13/13	11/11
FR_FRRD + 20Cu		11/12	11/12	9/9	9/9

Graphics



CETIS Analytical Report

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID:	02-3112-5014	**Endpoint:**	Post Hatch Survival	**CETIS Version:**	CETISv1.9.4
Analyzed:	21 May-21 11:53	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1
Batch ID:	16-2689-7673	**Test Type:**	32 Day Fathead Minnow Test	**Analyst:**	Kayla Knol
Start Date:	06 Mar-21	**Protocol:**	ASTM E1241-05 (2013)	**Diluent:**	Dechlorinated Tap Water
Ending Date:	07 Apr-21	**Species:**	Pimephales promelas	**Brine:**	
Test Length:	32d 0h	**Taxon:**	Actinopterygii	**Source:**	Aquatox, AR **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
Lab Control	08-8280-1106	02 Mar-21	03 Mar-21	96h	Teck Coal Ltd	
10Cu Control	01-9333-5370	02 Mar-21	03 Mar-21	96h		
15Cu Control	19-6548-0518	02 Mar-21	03 Mar-21	96h		
20Cu Control	00-8675-6744	02 Mar-21	03 Mar-21	96h		
FR_UFR1 + 20Cu	20-4721-8257	02 Mar-21	03 Mar-21	96h (4.6 °C)		
GH_ER2 +15Cu	01-1137-9253	02 Mar-21	03 Mar-21	96h (4.2 °C)		
CM_MC1 + 15Cu	01-3772-5048	02 Mar-21	03 Mar-21	96h (1 °C)		
LC_SLC + 15Cu	01-2380-6574	02 Mar-21	03 Mar-21	96h (3.1 °C)		
FR_FRABCH + 20C	08-4134-0746	02 Mar-21	03 Mar-21	96h (3.8 °C)		
FR_FRCP1 + 20Cu	11-2694-6466	02 Mar-21	03 Mar-21	96h (3 °C)		
GH_FR1 + 20Cu	20-1635-3152	02 Mar-21	03 Mar-21	96h (2.4 °C)		
GH_ERC + 10Cu	05-1950-5597	02 Mar-21	03 Mar-21	96h (4.1 °C)		
CM_MC2 + 20Cu	14-4685-1067	02 Mar-21	03 Mar-21	96h (0.3 °C)		
RG_MIDAG + 15Cu	21-3889-1829	02 Mar-21	03 Mar-21	96h (0.6 °C)		
EV_MC2 + 20Cu	05-6103-5191	02 Mar-21	03 Mar-21	96h (4.4 °C)		
EV_HC1 + 20Cu	12-5501-3302	02 Mar-21	03 Mar-21	96h (3.4 °C)		
LC_DCDS + 20Cu	04-1088-5978	02 Mar-21	03 Mar-21	96h (0.6 °C)		
LC_LC3 + 20Cu	14-7773-4190	02 Mar-21	03 Mar-21	96h (2.3 °C)		
LC_LC5 + 20Cu	01-7235-6798	02 Mar-21	03 Mar-21	96h (0.6 °C)		
LC_LCDSSLCC20C	06-4197-2641	02 Mar-21	03 Mar-21	96h (2.4 °C)		
FR_FR4 + 20Cu	10-9481-5020	02 Mar-21	03 Mar-21	96h (5.4 °C)		
FR_FR2 + 20Cu	00-3159-8672	02 Mar-21	03 Mar-21	96h (4.4 °C)		
FR_MULTIPLATE2	02-2179-0364	02 Mar-21	03 Mar-21	96h (2.9 °C)		
FR_FRRD + 20Cu	19-5167-8345	02 Mar-21	03 Mar-21	96h (6.2 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
Lab Control	Ambient Sample	Teck Coal Ltd	Lab Control	
10Cu Control	Ambient Sample	Teck Coal Ltd	10Cu Control	
15Cu Control	Ambient Sample	Teck Coal Ltd	15Cu Control	
20Cu Control	Ambient Sample	Teck Coal Ltd	20Cu Control	
FR_UFR1 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_UFR1_MON_2021-03-0	
GH_ER2 +15Cu	Ambient Sample	Teck Coal Ltd	GH_ER2_WS_2021-03-02_	
CM_MC1 + 15Cu	Ambient Sample	Teck Coal Ltd	CM_MC1_WS_2021-03-02	
LC_SLC + 15Cu	Ambient Sample	Teck Coal Ltd	LC_SLC_WS_2021-03-02_	
FR_FRABCH + 20C	Ambient Sample	Teck Coal Ltd	FR_FRABCH_MON_2021-	
FR_FRCP1 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FRCP1_MON_2021-03	
GH_FR1 + 20Cu	Ambient Sample	Teck Coal Ltd	GH_FR1_WS_2021-03-02_	
GH_ERC + 10Cu	Ambient Sample	Teck Coal Ltd	GH_ERC_WS_2021-03-02	
CM_MC2 + 20Cu	Ambient Sample	Teck Coal Ltd	CM_MC2_WS_2021-03-02	
RG_MIDAG + 15Cu	Ambient Sample	Teck Coal Ltd	RG_MIDAG_WS_2021-03-	
EV_MC2 + 20Cu	Ambient Sample	Teck Coal Ltd	EV_MC2_WS_2021_Q1_W	
EV_HC1 + 20Cu	Ambient Sample	Teck Coal Ltd	EV_HC1_WS_2021_Q1_W	
LC_DCDS + 20Cu	Ambient Sample	Teck Coal Ltd	LC_DCDS_WS_2021-03-02	
LC_LC3 + 20Cu	Ambient Sample	Teck Coal Ltd	LC_LC3_WS_2021-03-02_	
LC_LC5 + 20Cu	Ambient Sample	Teck Coal Ltd	LC_LC5_WS_2021-03-02_	
LC_LCDSSLCC20C	Ambient Sample	Teck Coal Ltd	LC_LCDSSLCC_WS_2021-	
FR_FR4 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FR4_WS_2021-03-02_	
FR_FR2 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FR2_WS_2021-03-02_	

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Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 02-3112-5014 **Endpoint:** Post Hatch Survival **CETIS Version:** CETISv1.9.4
Analyzed: 21 May-21 11:53 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_MULTIPLATE2	Ambient Sample	Teck Coal Ltd	FR_MULTIPLATE_WS_202	
FR_FRRD + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FRRD_WS_2021-03-02	

Fisher Exact/Bonferroni Adj Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
Negative Control		10Cu Control	0.9145	Exact	1.0000	Non-Significant Effect
		15Cu Control	0.2790	Exact	1.0000	Non-Significant Effect
		20Cu Control	0.2550	Exact	1.0000	Non-Significant Effect
		FR_UFR1 + 20Cu	0.4604	Exact	1.0000	Non-Significant Effect
		GH_ER2 +15Cu*	0.0000	Exact	7.5E-10	Significant Effect
		CM_MC1 + 15Cu*	0.0000	Exact	8.2E-06	Significant Effect
		LC_SLC + 15Cu	0.0933	Exact	1.0000	Non-Significant Effect
		FR_FRABCH + 20C	0.0933	Exact	1.0000	Non-Significant Effect
		FR_FRCP1 + 20Cu*	0.0000	Exact	2.0E-05	Significant Effect
		GH_FR1 + 20Cu	0.5563	Exact	1.0000	Non-Significant Effect
		GH_ERC + 10Cu	0.6070	Exact	1.0000	Non-Significant Effect
		CM_MC2 + 20Cu	0.9145	Exact	1.0000	Non-Significant Effect
		RG_MIDAG + 15Cu	0.0238	Exact	0.5478	Non-Significant Effect
		EV_MC2 + 20Cu	0.1694	Exact	1.0000	Non-Significant Effect
		EV_HC1 + 20Cu	0.1304	Exact	1.0000	Non-Significant Effect
		LC_DCDS + 20Cu	0.2695	Exact	1.0000	Non-Significant Effect
		LC_LC3 + 20Cu	0.5000	Exact	1.0000	Non-Significant Effect
		LC_LC5 + 20Cu	0.4870	Exact	1.0000	Non-Significant Effect
		LC_LCDSSLCC20Cu	0.5000	Exact	1.0000	Non-Significant Effect
		FR_FR4 + 20Cu*	0.0008	Exact	0.0177	Significant Effect
		FR_FR2 + 20Cu*	0.0000	Exact	3.3E-06	Significant Effect
		FR_MULTIPLATE20	0.0609	Exact	1.0000	Non-Significant Effect
		FR_FRRD + 20Cu	0.0287	Exact	0.6598	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	2.592	3.37	0.8135	No Outliers Detected

JUN 10 2021

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 02-3112-5014 **Endpoint:** Post Hatch Survival **CETIS Version:** CETISv1.9.4
Analyzed: 21 May-21 11:53 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Data Summary

Sample	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
Lab Control	N	54	6	60	0.9	0.1	0.0%
10Cu Control		56	3	59	0.9492	0.05085	-5.46%
15Cu Control		50	9	59	0.8475	0.1525	5.84%
20Cu Control		48	9	57	0.8421	0.1579	6.43%
FR_UFR1 + 20Cu		50	7	57	0.8772	0.1228	2.53%
GH_ER2 +15Cu		19	40	59	0.322	0.678	64.22%
CM_MC1 + 15Cu		28	31	59	0.4746	0.5254	47.27%
LC_SLC + 15Cu		47	12	59	0.7966	0.2034	11.49%
FR_FRABCH + 20C		47	12	59	0.7966	0.2034	11.49%
FR_FRCP1 + 20Cu		29	30	59	0.4915	0.5085	45.39%
GH_FR1 + 20Cu		49	6	55	0.8909	0.1091	1.01%
GH_ERC + 10Cu		53	6	59	0.8983	0.1017	0.19%
CM_MC2 + 20Cu		56	3	59	0.9492	0.05085	-5.46%
RG_MIDAG + 15Cu		44	15	59	0.7458	0.2542	17.14%
EV_MC2 + 20Cu		46	10	56	0.8214	0.1786	8.73%
EV_HC1 + 20Cu		47	11	58	0.8103	0.1897	9.96%
LC_DCDS + 20Cu		43	8	51	0.8431	0.1569	6.32%
LC_LC3 + 20Cu		53	7	60	0.8833	0.1167	1.85%
LC_LC5 + 20Cu		52	7	59	0.8814	0.1186	2.07%
LC_LCDSSLCC20C		53	7	60	0.8833	0.1167	1.85%
FR_FR4 + 20Cu		38	21	59	0.6441	0.3559	28.44%
FR_FR2 + 20Cu		27	32	59	0.4576	0.5424	49.15%
FR_MULTIPLATE20		46	13	59	0.7797	0.2203	13.37%
FR_FRRD + 20Cu		42	14	56	0.75	0.25	16.67%

Post Hatch Survival Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Lab Control	N	0.9333	0.8667	0.8000	1.0000
10Cu Control		1.0000	0.8667	0.9333	1.0000
15Cu Control		0.8667	1.0000	0.6000	0.9286
20Cu Control		0.8571	1.0000	0.6000	0.9333
FR_UFR1 + 20Cu		0.9231	0.9333	0.8667	0.7857
GH_ER2 +15Cu		0.2667	0.4667	0.2000	0.3571
CM_MC1 + 15Cu		0.5333	0.5333	0.4286	0.4000
LC_SLC + 15Cu		0.6429	0.6667	0.9333	0.9333
FR_FRABCH + 20C		0.8000	0.8667	0.7143	0.8000
FR_FRCP1 + 20Cu		0.3571	0.4000	0.7333	0.4667
GH_FR1 + 20Cu		0.7857	1.0000	0.8667	0.9286
GH_ERC + 10Cu		0.9333	0.8667	0.9286	0.8667
CM_MC2 + 20Cu		0.9333	1.0000	0.9333	0.9286
RG_MIDAG + 15Cu		0.6667	0.7143	0.8000	0.8000
EV_MC2 + 20Cu		0.9286	0.7500	0.8000	0.8000
EV_HC1 + 20Cu		0.8000	0.8571	0.8667	0.7143
LC_DCDS + 20Cu		0.6667	0.7857	0.9333	1.0000
LC_LC3 + 20Cu		0.8667	1.0000	0.8667	0.8000
LC_LC5 + 20Cu		1.0000	0.9333	0.8667	0.7143
LC_LCDSSLCC20C		0.9333	0.8000	0.8667	0.9333
FR_FR4 + 20Cu		0.6000	0.7333	0.5333	0.7143
FR_FR2 + 20Cu		0.4667	0.4667	0.6429	0.2667
FR_MULTIPLATE2		0.7143	0.8000	0.8667	0.7333
FR_FRRD + 20Cu		0.8571	0.8571	0.6000	0.6923

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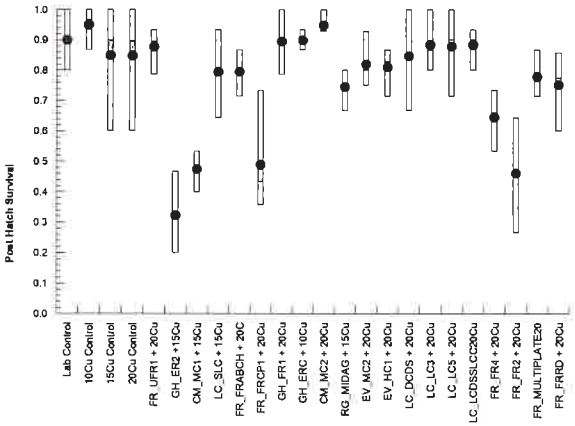
Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 02-3112-5014 **Endpoint:** Post Hatch Survival **CETIS Version:** CETISv1.9.4
Analyzed: 21 May-21 11:53 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Post Hatch Survival Binomials

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Lab Control	N	14/15	13/15	12/15	15/15
10Cu Control		14/14	13/15	14/15	15/15
15Cu Control		13/15	15/15	9/15	13/14
20Cu Control		12/14	13/13	9/15	14/15
FR_UFR1 + 20Cu		12/13	14/15	13/15	11/14
GH_ER2 +15Cu		4/15	7/15	3/15	5/14
CM_MC1 + 15Cu		8/15	8/15	6/14	6/15
LC_SLC + 15Cu		9/14	10/15	14/15	14/15
FR_FRABCH + 20C		12/15	13/15	10/14	12/15
FR_FRCP1 + 20Cu		5/14	6/15	11/15	7/15
GH_FR1 + 20Cu		11/14	12/12	13/15	13/14
GH_ERC + 10Cu		14/15	13/15	13/14	13/15
CM_MC2 + 20Cu		14/15	15/15	14/15	13/14
RG_MIDAG + 15Cu		10/15	10/14	12/15	12/15
EV_MC2 + 20Cu		13/14	9/12	12/15	12/15
EV_HC1 + 20Cu		12/15	12/14	13/15	10/14
LC_DCDS + 20Cu		8/12	11/14	14/15	10/10
LC_LC3 + 20Cu		13/15	15/15	13/15	12/15
LC_LC5 + 20Cu		15/15	14/15	13/15	10/14
LC_LCDSSLCC20C		14/15	12/15	13/15	14/15
FR_FR4 + 20Cu		9/15	11/15	8/15	10/14
FR_FR2 + 20Cu		7/15	7/15	9/14	4/15
FR_MULTIPLATE2		10/14	12/15	13/15	11/15
FR_FRRD + 20Cu		12/14	12/14	9/15	9/13

Graphics



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CETIS Analytical Report

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID:	12-1849-7512	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.9.4
Analyzed:	01 Jun-21 8:19	**Analysis:**	Nonparametric-Control vs Treatments	**Status Level:**	1
Batch ID:	16-2689-7673	**Test Type:**	32 Day Fathead Minnow Test	**Analyst:**	Kayla Knol
Start Date:	06 Mar-21	**Protocol:**	ASTM E1241-05 (2013)	**Diluent:**	Dechlorinated Tap Water
Ending Date:	07 Apr-21	**Species:**	Pimephales promelas	**Brine:**	
Test Length:	32d 0h	**Taxon:**	Actinopterygii	**Source:**	Aquatox, AR **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
Lab Control	08-8280-1106	02 Mar-21	03 Mar-21	96h	Teck Coal Ltd	
10Cu Control	01-9333-5370	02 Mar-21	03 Mar-21	96h		
15Cu Control	19-6548-0518	02 Mar-21	03 Mar-21	96h		
20Cu Control	00-8675-6744	02 Mar-21	03 Mar-21	96h		
FR_UFR1 + 20Cu	20-4721-8257	02 Mar-21	03 Mar-21	96h (4.6 °C)		
GH_ER2 +15Cu	01-1137-9253	02 Mar-21	03 Mar-21	96h (4.2 °C)		
CM_MC1 + 15Cu	01-3772-5048	02 Mar-21	03 Mar-21	96h (1 °C)		
LC_SLC + 15Cu	01-2380-6574	02 Mar-21	03 Mar-21	96h (3.1 °C)		
FR_FRABCH + 20C	08-4134-0746	02 Mar-21	03 Mar-21	96h (3.8 °C)		
FR_FRCP1 + 20Cu	11-2694-6466	02 Mar-21	03 Mar-21	96h (3 °C)		
GH_FR1 + 20Cu	20-1635-3152	02 Mar-21	03 Mar-21	96h (2.4 °C)		
GH_ERC + 10Cu	05-1950-5597	02 Mar-21	03 Mar-21	96h (4.1 °C)		
CM_MC2 + 20Cu	14-4685-1067	02 Mar-21	03 Mar-21	96h (0.3 °C)		
RG_MIDAG + 15Cu	21-3889-1829	02 Mar-21	03 Mar-21	96h (0.6 °C)		
EV_MC2 + 20Cu	05-6103-5191	02 Mar-21	03 Mar-21	96h (4.4 °C)		
EV_HC1 + 20Cu	12-5501-3302	02 Mar-21	03 Mar-21	96h (3.4 °C)		
LC_DCDS + 20Cu	04-1088-5978	02 Mar-21	03 Mar-21	96h (0.6 °C)		
LC_LC3 + 20Cu	14-7773-4190	02 Mar-21	03 Mar-21	96h (2.3 °C)		
LC_LC5 + 20Cu	01-7235-6798	02 Mar-21	03 Mar-21	96h (0.6 °C)		
LC_LCDSSLCC20C	06-4197-2641	02 Mar-21	03 Mar-21	96h (2.4 °C)		
FR_FR4 + 20Cu	10-9481-5020	02 Mar-21	03 Mar-21	96h (5.4 °C)		
FR_FR2 + 20Cu	00-3159-8672	02 Mar-21	03 Mar-21	96h (4.4 °C)		
FR_MULTIPLATE2	02-2179-0364	02 Mar-21	03 Mar-21	96h (2.9 °C)		
FR_FRRD + 20Cu	19-5167-8345	02 Mar-21	03 Mar-21	96h (6.2 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
Lab Control	Ambient Sample	Teck Coal Ltd	Lab Control	
10Cu Control	Ambient Sample	Teck Coal Ltd	10Cu Control	
15Cu Control	Ambient Sample	Teck Coal Ltd	15Cu Control	
20Cu Control	Ambient Sample	Teck Coal Ltd	20Cu Control	
FR_UFR1 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_UFR1_MON_2021-03-0	
GH_ER2 +15Cu	Ambient Sample	Teck Coal Ltd	GH_ER2_WS_2021-03-02_	
CM_MC1 + 15Cu	Ambient Sample	Teck Coal Ltd	CM_MC1_WS_2021-03-02	
LC_SLC + 15Cu	Ambient Sample	Teck Coal Ltd	LC_SLC_WS_2021-03-02_	
FR_FRABCH + 20C	Ambient Sample	Teck Coal Ltd	FR_FRABCH_MON_2021-	
FR_FRCP1 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FRCP1_MON_2021-03	
GH_FR1 + 20Cu	Ambient Sample	Teck Coal Ltd	GH_FR1_WS_2021-03-02_	
GH_ERC + 10Cu	Ambient Sample	Teck Coal Ltd	GH_ERC_WS_2021-03-02	
CM_MC2 + 20Cu	Ambient Sample	Teck Coal Ltd	CM_MC2_WS_2021-03-02	
RG_MIDAG + 15Cu	Ambient Sample	Teck Coal Ltd	RG_MIDAG_WS_2021-03-	
EV_MC2 + 20Cu	Ambient Sample	Teck Coal Ltd	EV_MC2_WS_2021_Q1_W	
EV_HC1 + 20Cu	Ambient Sample	Teck Coal Ltd	EV_HC1_WS_2021_Q1_W	
LC_DCDS + 20Cu	Ambient Sample	Teck Coal Ltd	LC_DCDS_WS_2021-03-02	
LC_LC3 + 20Cu	Ambient Sample	Teck Coal Ltd	LC_LC3_WS_2021-03-02_	
LC_LC5 + 20Cu	Ambient Sample	Teck Coal Ltd	LC_LC5_WS_2021-03-02_	
LC_LCDSSLCC20C	Ambient Sample	Teck Coal Ltd	LC_LCDSSLCC_WS_2021-	
FR_FR4 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FR4_WS_2021-03-02_	
FR_FR2 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FR2_WS_2021-03-02_	

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 12-1849-7512 **Endpoint:** Mean Dry Biomass-mg **CETIS Version:** CETISv1.9.4
Analyzed: 01 Jun-21 8:19 **Analysis:** Nonparametric-Control vs Treatments **Status Level:** 1

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_MULTIPLATE2	Ambient Sample	Teck Coal Ltd	FR_MULTIPLATE_WS_202	
FR_FRRD + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FRRD_WS_2021-03-02	

Nemenyi-Damico-Wolfe Test

Sample I	vs	Sample II	Test Stat	Critical	Ties	P-Type	P-Value	Decision(α:5%)
10Cu Control		Lab Control	-33	211.4	2	CDF	0.9885	Non-Significant Effect
		15Cu Control	-67	211.4	2	CDF	0.9977	Non-Significant Effect
		20Cu Control	-59	211.4	2	CDF	0.9965	Non-Significant Effect
		FR_UFR1 + 20Cu	0	211.4	2	CDF	0.9583	Non-Significant Effect
		GH_ER2 +15Cu	203	211.4	2	CDF	0.0649	Non-Significant Effect
		CM_MC1 + 15Cu	154	211.4	2	CDF	0.2274	Non-Significant Effect
		LC_SLC + 15Cu	69	211.4	2	CDF	0.7292	Non-Significant Effect
		FR_FRABCH + 20C	59	211.4	2	CDF	0.7799	Non-Significant Effect
		FR_FRCP1 + 20Cu	161	211.4	2	CDF	0.1955	Non-Significant Effect
		GH_FR1 + 20Cu	-29.5	211.4	2	CDF	0.9866	Non-Significant Effect
		GH_ERC + 10Cu	-38	211.4	2	CDF	0.9907	Non-Significant Effect
		CM_MC2 + 20Cu	48	211.4	2	CDF	0.8290	Non-Significant Effect
		RG_MIDAG + 15Cu	104.5	211.4	2	CDF	0.5158	Non-Significant Effect
		EV_MC2 + 20Cu	74	211.4	2	CDF	0.7018	Non-Significant Effect
		EV_HC1 + 20Cu	-16.5	211.4	2	CDF	0.9773	Non-Significant Effect
		LC_DCDS + 20Cu	14	211.4	2	CDF	0.9336	Non-Significant Effect
		LC_LC3 + 20Cu	35	211.4	2	CDF	0.8772	Non-Significant Effect
		LC_LC5 + 20Cu	1	211.4	2	CDF	0.9569	Non-Significant Effect
		LC_LCDSSLCC20Cu	31	211.4	2	CDF	0.8899	Non-Significant Effect
		FR_FR4 + 20Cu	82.5	211.4	2	CDF	0.6527	Non-Significant Effect
		FR_FR2 + 20Cu	207	211.4	2	CDF	0.0574	Non-Significant Effect
		FR_MULTIPLATE20	-42	211.4	2	CDF	0.9923	Non-Significant Effect
		FR_FRRD + 20Cu	-46	211.4	2	CDF	0.9935	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	2.393	3.37	1.0000	No Outliers Detected
Treatment Effect	Fligner-Wolfe Omnibus Test	4500		0.2531	Non-Significant Overall Effect
Treatment Effect	Kruskal-Wallis Omnibus Test	48.55	35.17	0.0014	Significant Overall Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	9.6416	0.4192	23	4.746	1.9E-07	Significant Effect
Error	6.35993	0.0883324	72			
Total	16.0015		95			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Variances	Bartlett Equality of Variance Test	15.29	35.17	0.8840	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9376	0.9737	1.9E-04	Non-Normal Distribution

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Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 12-1849-7512 **Endpoint:** Mean Dry Biomass-mg **CETIS Version:** CETISv1.9.4
Analyzed: 01 Jun-21 8:19 **Analysis:** Nonparametric-Control vs Treatments **Status Level:** 1

Mean Dry Biomass-mg Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
Lab Control		4	2.276	1.813	2.739	2.216	1.989	2.681	0.1455	12.79%	0.00%
10Cu Control	10	4	2.164	1.858	2.471	2.08	2.048	2.45	0.09618	8.89%	4.89%
15Cu Control		4	2.423	1.816	3.031	2.311	2.096	2.975	0.191	15.76%	-6.49%
20Cu Control		4	2.343	1.952	2.734	2.305	2.085	2.677	0.1229	10.49%	-2.94%
FR_UFR1 + 20Cu		4	2.254	1.609	2.9	2.06	2.035	2.862	0.2028	18.00%	0.94%
GH_ER2 +15Cu		4	1.181	0.4596	1.902	1.135	0.6767	1.777	0.2266	38.38%	48.12%
CM_MC1 + 15Cu		4	1.604	1.076	2.132	1.478	1.367	2.092	0.166	20.69%	29.52%
LC_SLC + 15Cu		4	2.008	1.849	2.167	2.005	1.908	2.114	0.04997	4.98%	11.75%
FR_FRABCH + 20C		4	2.097	1.427	2.766	1.929	1.814	2.716	0.2103	20.06%	7.86%
FR_FRCP1 + 20Cu		4	1.699	1.29	2.108	1.729	1.358	1.98	0.1285	15.13%	25.34%
GH_FR1 + 20Cu		4	2.278	1.812	2.745	2.307	1.917	2.584	0.1465	12.86%	-0.12%
GH_ERC + 10Cu		4	2.248	1.979	2.517	2.217	2.095	2.463	0.08461	7.53%	1.22%
CM_MC2 + 20Cu		4	2.049	1.554	2.544	2.058	1.671	2.409	0.1556	15.19%	9.96%
RG_MIDAG + 15Cu		4	1.9	1.521	2.278	1.856	1.677	2.209	0.1189	12.52%	16.52%
EV_MC2 + 20Cu		4	2	1.594	2.406	1.937	1.765	2.361	0.1276	12.76%	12.10%
EV_HC1 + 20Cu		4	2.2	1.928	2.471	2.171	2.024	2.433	0.0853	7.75%	3.33%
LC_DCDS + 20Cu		4	2.111	1.845	2.377	2.162	1.875	2.245	0.08356	7.92%	7.22%
LC_LC3 + 20Cu		4	2.076	1.846	2.306	2.072	1.927	2.233	0.0723	6.96%	8.76%
LC_LC5 + 20Cu		4	2.19	1.749	2.631	2.166	1.906	2.523	0.1385	12.65%	3.75%
LC_LCDSSLCC20C		4	2.097	1.762	2.432	2.051	1.923	2.363	0.1054	10.05%	7.85%
FR_FR4 + 20Cu		4	2.013	1.388	2.639	1.85	1.754	2.599	0.1965	19.52%	11.53%
FR_FR2 + 20Cu		4	1.239	0.6549	1.824	1.13	0.96	1.738	0.1837	29.64%	45.54%
FR_MULTIPLATE2		4	2.352	1.754	2.949	2.25	2.019	2.888	0.1877	15.96%	-3.35%
FR_FRRD + 20Cu		4	2.338	1.844	2.832	2.304	2.016	2.729	0.1553	13.28%	-2.75%

Mean Dry Biomass-mg Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Lab Control		2.222	1.989	2.211	2.681
10Cu Control	10	2.109	2.051	2.048	2.45
15Cu Control		2.293	2.096	2.329	2.975
20Cu Control		2.297	2.085	2.313	2.677
FR_UFR1 + 20Cu		2.078	2.035	2.042	2.862
GH_ER2 +15Cu		1.17	1.777	0.6767	1.099
CM_MC1 + 15Cu		1.429	2.092	1.367	1.527
LC_SLC + 15Cu		2.071	1.939	1.908	2.114
FR_FRABCH + 20C		1.855	1.814	2.003	2.716
FR_FRCP1 + 20Cu		1.705	1.358	1.98	1.753
GH_FR1 + 20Cu		2.433	2.181	1.917	2.584
GH_ERC + 10Cu		2.095	2.463	2.131	2.302
CM_MC2 + 20Cu		1.963	1.671	2.153	2.409
RG_MIDAG + 15Cu		1.677	1.754	2.209	1.959
EV_MC2 + 20Cu		1.967	1.907	1.765	2.361
EV_HC1 + 20Cu		2.155	2.024	2.188	2.433
LC_DCDS + 20Cu		2.245	1.875	2.113	2.212
LC_LC3 + 20Cu		2.233	1.927	1.983	2.161
LC_LC5 + 20Cu		1.906	2.029	2.304	2.523
LC_LCDSSLCC20C		1.923	1.933	2.169	2.363
FR_FR4 + 20Cu		1.754	1.838	1.863	2.599
FR_FR2 + 20Cu		0.9653	0.96	1.738	1.294
FR_MULTIPLATE2		2.295	2.019	2.205	2.888
FR_FRRD + 20Cu		2.016	2.181	2.427	2.729

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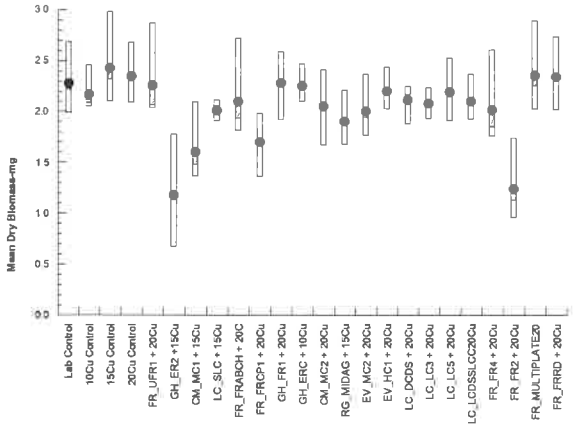
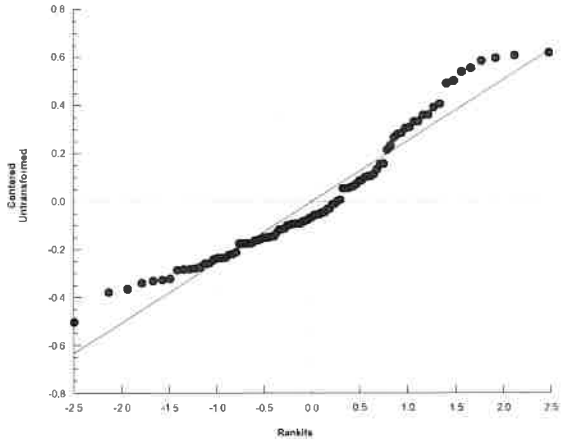
Fathead minnow 32-d (Pimephales promelas) survival and growth test **Nautilus Environmental Calgary**

Analysis ID:	12-1849-7512	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.9.4
Analyzed:	01 Jun-21 8:19	**Analysis:**	Nonparametric-Control vs Treatments	**Status Level:**	1

Graphics





Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID:	19-6086-4164	**Endpoint:**	Hatch Rate	**CETIS Version:**	CETISv1.9.4
Analyzed:	21 May-21 12:26	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1
Batch ID:	16-2689-7673	**Test Type:**	32 Day Fathead Minnow Test	**Analyst:**	Kayla Knol
Start Date:	06 Mar-21	**Protocol:**	ASTM E1241-05 (2013)	**Diluent:**	Dechlorinated Tap Water
Ending Date:	07 Apr-21	**Species:**	Pimephales promelas	**Brine:**	
Test Length:	32d 0h	**Taxon:**	Actinopterygii	**Source:**	Aquatox, AR **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
Lab Control	08-8280-1106	02 Mar-21	03 Mar-21	96h	Teck Coal Ltd	
10Cu Control	01-9333-5370	02 Mar-21	03 Mar-21	96h		
15Cu Control	19-6548-0518	02 Mar-21	03 Mar-21	96h		
20Cu Control	00-8675-6744	02 Mar-21	03 Mar-21	96h		
FR_UFR1 + 20Cu	20-4721-8257	02 Mar-21	03 Mar-21	96h (4.6 °C)		
GH_ER2 +15Cu	01-1137-9253	02 Mar-21	03 Mar-21	96h (4.2 °C)		
CM_MC1 + 15Cu	01-3772-5048	02 Mar-21	03 Mar-21	96h (1 °C)		
LC_SLC + 15Cu	01-2380-6574	02 Mar-21	03 Mar-21	96h (3.1 °C)		
FR_FRABCH + 20C	08-4134-0746	02 Mar-21	03 Mar-21	96h (3.8 °C)		
FR_FRCP1 + 20Cu	11-2694-6466	02 Mar-21	03 Mar-21	96h (3 °C)		
GH_FR1 + 20Cu	20-1635-3152	02 Mar-21	03 Mar-21	96h (2.4 °C)		
GH_ERC + 10Cu	05-1950-5597	02 Mar-21	03 Mar-21	96h (4.1 °C)		
CM_MC2 + 20Cu	14-4685-1067	02 Mar-21	03 Mar-21	96h (0.3 °C)		
RG_MIDAG + 15Cu	21-3889-1829	02 Mar-21	03 Mar-21	96h (0.6 °C)		
EV_MC2 + 20Cu	05-6103-5191	02 Mar-21	03 Mar-21	96h (4.4 °C)		
EV_HC1 + 20Cu	12-5501-3302	02 Mar-21	03 Mar-21	96h (3.4 °C)		
LC_DCDS + 20Cu	04-1088-5978	02 Mar-21	03 Mar-21	96h (0.6 °C)		
LC_LC3 + 20Cu	14-7773-4190	02 Mar-21	03 Mar-21	96h (2.3 °C)		
LC_LC5 + 20Cu	01-7235-6798	02 Mar-21	03 Mar-21	96h (0.6 °C)		
LC_LCDSSLCC20C	06-4197-2641	02 Mar-21	03 Mar-21	96h (2.4 °C)		
FR_FR4 + 20Cu	10-9481-5020	02 Mar-21	03 Mar-21	96h (5.4 °C)		
FR_FR2 + 20Cu	00-3159-8672	02 Mar-21	03 Mar-21	96h (4.4 °C)		
FR_MULTIPLATE2	02-2179-0364	02 Mar-21	03 Mar-21	96h (2.9 °C)		
FR_FRRD + 20Cu	19-5167-8345	02 Mar-21	03 Mar-21	96h (6.2 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
Lab Control	Ambient Sample	Teck Coal Ltd	Lab Control	
10Cu Control	Ambient Sample	Teck Coal Ltd	10Cu Control	
15Cu Control	Ambient Sample	Teck Coal Ltd	15Cu Control	
20Cu Control	Ambient Sample	Teck Coal Ltd	20Cu Control	
FR_UFR1 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_UFR1_MON_2021-03-0	
GH_ER2 +15Cu	Ambient Sample	Teck Coal Ltd	GH_ER2_WS_2021-03-02_	
CM_MC1 + 15Cu	Ambient Sample	Teck Coal Ltd	CM_MC1_WS_2021-03-02	
LC_SLC + 15Cu	Ambient Sample	Teck Coal Ltd	LC_SLC_WS_2021-03-02_	
FR_FRABCH + 20C	Ambient Sample	Teck Coal Ltd	FR_FRABCH_MON_2021-	
FR_FRCP1 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FRCP1_MON_2021-03	
GH_FR1 + 20Cu	Ambient Sample	Teck Coal Ltd	GH_FR1_WS_2021-03-02_	
GH_ERC + 10Cu	Ambient Sample	Teck Coal Ltd	GH_ERC_WS_2021-03-02	
CM_MC2 + 20Cu	Ambient Sample	Teck Coal Ltd	CM_MC2_WS_2021-03-02	
RG_MIDAG + 15Cu	Ambient Sample	Teck Coal Ltd	RG_MIDAG_WS_2021-03-	
EV_MC2 + 20Cu	Ambient Sample	Teck Coal Ltd	EV_MC2_WS_2021_Q1_W	
EV_HC1 + 20Cu	Ambient Sample	Teck Coal Ltd	EV_HC1_WS_2021_Q1_W	
LC_DCDS + 20Cu	Ambient Sample	Teck Coal Ltd	LC_DCDS_WS_2021-03-02	
LC_LC3 + 20Cu	Ambient Sample	Teck Coal Ltd	LC_LC3_WS_2021-03-02_	
LC_LC5 + 20Cu	Ambient Sample	Teck Coal Ltd	LC_LC5_WS_2021-03-02_	
LC_LCDSSLCC20C	Ambient Sample	Teck Coal Ltd	LC_LCDSSLCC_WS_2021-	
FR_FR4 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FR4_WS_2021-03-02_	
FR_FR2 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FR2_WS_2021-03-02_	

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Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 19-6086-4164 **Endpoint:** Hatch Rate **CETIS Version:** CETISv1.9.4
Analyzed: 21 May-21 12:26 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_MULTIPLATE2	Ambient Sample	Teck Coal Ltd	FR_MULTIPLATE_WS_202	
FR_FRRD + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FRRD_WS_2021-03-02	

Fisher Exact/Bonferroni Adj Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
10Cu Control		Lab Control	1.0000	Exact	1.0000	Non-Significant Effect
		15Cu Control	0.7521	Exact	1.0000	Non-Significant Effect
		20Cu Control	0.3093	Exact	1.0000	Non-Significant Effect
		FR_UFR1 + 20Cu	0.3093	Exact	1.0000	Non-Significant Effect
		GH_ER2 +15Cu	0.7521	Exact	1.0000	Non-Significant Effect
		CM_MC1 + 15Cu	0.7521	Exact	1.0000	Non-Significant Effect
		LC_SLC + 15Cu	0.7521	Exact	1.0000	Non-Significant Effect
		FR_FRABCH + 20C	0.7521	Exact	1.0000	Non-Significant Effect
		FR_FRCP1 + 20Cu	0.7521	Exact	1.0000	Non-Significant Effect
		GH_FR1 + 20Cu	0.1034	Exact	1.0000	Non-Significant Effect
		GH_ERC + 10Cu	0.7521	Exact	1.0000	Non-Significant Effect
		CM_MC2 + 20Cu	0.7521	Exact	1.0000	Non-Significant Effect
		RG_MIDAG + 15Cu	0.7521	Exact	1.0000	Non-Significant Effect
		EV_MC2 + 20Cu	0.1822	Exact	1.0000	Non-Significant Effect
		EV_HC1 + 20Cu	0.5000	Exact	1.0000	Non-Significant Effect
		LC_DCDS + 20Cu	0.0083	Exact	0.1907	Non-Significant Effect
		LC_LC3 + 20Cu	1.0000	Exact	1.0000	Non-Significant Effect
		LC_LC5 + 20Cu	0.7521	Exact	1.0000	Non-Significant Effect
		LC_LCDSSLCC20Cu	1.0000	Exact	1.0000	Non-Significant Effect
		FR_FR4 + 20Cu	0.7521	Exact	1.0000	Non-Significant Effect
		FR_FR2 + 20Cu	0.7521	Exact	1.0000	Non-Significant Effect
		FR_MULTIPLATE20	0.7521	Exact	1.0000	Non-Significant Effect
		FR_FRRD + 20Cu	0.1822	Exact	1.0000	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	3.165	3.37	0.1123	No Outliers Detected

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 19-6086-4164 **Endpoint:** Hatch Rate **CETIS Version:** CETISv1.9.4
Analyzed: 21 May-21 12:26 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Data Summary

Sample	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
Lab Control		60	0	60	1	0	-1.7%
10Cu Control	10	59	1	60	0.9833	0.01667	0.0%
15Cu Control		59	1	60	0.9833	0.01667	0.0%
20Cu Control		57	3	60	0.95	0.05	3.39%
FR_UFR1 + 20Cu		57	3	60	0.95	0.05	3.39%
GH_ER2 +15Cu		59	1	60	0.9833	0.01667	0.0%
CM_MC1 + 15Cu		59	1	60	0.9833	0.01667	0.0%
LC_SLC + 15Cu		59	1	60	0.9833	0.01667	0.0%
FR_FRABCH + 20C		59	1	60	0.9833	0.01667	0.0%
FR_FRCP1 + 20Cu		59	1	60	0.9833	0.01667	0.0%
GH_FR1 + 20Cu		55	5	60	0.9167	0.08333	6.78%
GH_ERC + 10Cu		59	1	60	0.9833	0.01667	0.0%
CM_MC2 + 20Cu		59	1	60	0.9833	0.01667	0.0%
RG_MIDAG + 15Cu		59	1	60	0.9833	0.01667	0.0%
EV_MC2 + 20Cu		56	4	60	0.9333	0.06667	5.09%
EV_HC1 + 20Cu		58	2	60	0.9667	0.03333	1.7%
LC_DCDS + 20Cu		51	9	60	0.85	0.15	13.56%
LC_LC3 + 20Cu		60	0	60	1	0	-1.7%
LC_LC5 + 20Cu		59	1	60	0.9833	0.01667	0.0%
LC_LCDSSLCC20C		60	0	60	1	0	-1.7%
FR_FR4 + 20Cu		59	1	60	0.9833	0.01667	0.0%
FR_FR2 + 20Cu		59	1	60	0.9833	0.01667	0.0%
FR_MULTIPLATE20		59	1	60	0.9833	0.01667	0.0%
FR_FRRD + 20Cu		56	4	60	0.9333	0.06667	5.09%

Hatch Rate Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Lab Control		1.0000	1.0000	1.0000	1.0000
10Cu Control	10	0.9333	1.0000	1.0000	1.0000
15Cu Control		1.0000	1.0000	1.0000	0.9333
20Cu Control		0.9333	0.8667	1.0000	1.0000
FR_UFR1 + 20Cu		0.8667	1.0000	1.0000	0.9333
GH_ER2 +15Cu		1.0000	1.0000	1.0000	0.9333
CM_MC1 + 15Cu		1.0000	1.0000	0.9333	1.0000
LC_SLC + 15Cu		0.9333	1.0000	1.0000	1.0000
FR_FRABCH + 20C		1.0000	1.0000	0.9333	1.0000
FR_FRCP1 + 20Cu		0.9333	1.0000	1.0000	1.0000
GH_FR1 + 20Cu		0.9333	0.8000	1.0000	0.9333
GH_ERC + 10Cu		1.0000	1.0000	0.9333	1.0000
CM_MC2 + 20Cu		1.0000	1.0000	1.0000	0.9333
RG_MIDAG + 15Cu		1.0000	0.9333	1.0000	1.0000
EV_MC2 + 20Cu		0.9333	0.8000	1.0000	1.0000
EV_HC1 + 20Cu		1.0000	0.9333	1.0000	0.9333
LC_DCDS + 20Cu		0.8000	0.9333	1.0000	0.6667
LC_LC3 + 20Cu		1.0000	1.0000	1.0000	1.0000
LC_LC5 + 20Cu		1.0000	1.0000	1.0000	0.9333
LC_LCDSSLCC20C		1.0000	1.0000	1.0000	1.0000
FR_FR4 + 20Cu		1.0000	1.0000	1.0000	0.9333
FR_FR2 + 20Cu		1.0000	1.0000	0.9333	1.0000
FR_MULTIPLATE2		0.9333	1.0000	1.0000	1.0000
FR_FRRD + 20Cu		0.9333	0.9333	1.0000	0.8667

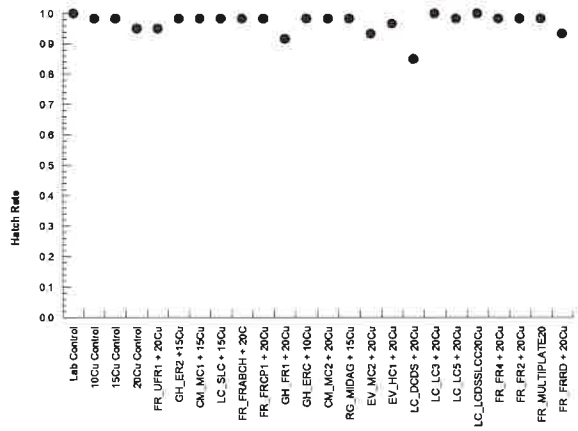
Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 19-6086-4164 **Endpoint:** Hatch Rate **CETIS Version:** CETISv1.9.4
Analyzed: 21 May-21 12:26 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Hatch Rate Binomials

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Lab Control		15/15	15/15	15/15	15/15
10Cu Control	10	14/15	15/15	15/15	15/15
15Cu Control		15/15	15/15	15/15	14/15
20Cu Control		14/15	13/15	15/15	15/15
FR_UFR1 + 20Cu		13/15	15/15	15/15	14/15
GH_ER2 +15Cu		15/15	15/15	15/15	14/15
CM_MC1 + 15Cu		15/15	15/15	14/15	15/15
LC_SLC + 15Cu		14/15	15/15	15/15	15/15
FR_FRABCH + 20C		15/15	15/15	14/15	15/15
FR_FRCP1 + 20Cu		14/15	15/15	15/15	15/15
GH_FR1 + 20Cu		14/15	12/15	15/15	14/15
GH_ERC + 10Cu		15/15	15/15	14/15	15/15
CM_MC2 + 20Cu		15/15	15/15	15/15	14/15
RG_MIDAG + 15Cu		15/15	14/15	15/15	15/15
EV_MC2 + 20Cu		14/15	12/15	15/15	15/15
EV_HC1 + 20Cu		15/15	14/15	15/15	14/15
LC_DCDS + 20Cu		12/15	14/15	15/15	10/15
LC_LC3 + 20Cu		15/15	15/15	15/15	15/15
LC_LC5 + 20Cu		15/15	15/15	15/15	14/15
LC_LCDSSLCC20C		15/15	15/15	15/15	15/15
FR_FR4 + 20Cu		15/15	15/15	15/15	14/15
FR_FR2 + 20Cu		15/15	15/15	14/15	15/15
FR_MULTIPLATE2		14/15	15/15	15/15	15/15
FR_FRRD + 20Cu		14/15	14/15	15/15	13/15

Graphics



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Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID:	18-6517-2076	**Endpoint:**	Length	**CETIS Version:**	CETISv1.9.4
Analyzed:	21 May-21 12:31	**Analysis:**	Parametric-Control vs Treatments	**Status Level:**	1
Batch ID:	16-2689-7673	**Test Type:**	32 Day Fathead Minnow Test	**Analyst:**	Kayla Knol
Start Date:	06 Mar-21	**Protocol:**	ASTM E1241-05 (2013)	**Diluent:**	Dechlorinated Tap Water
Ending Date:	07 Apr-21	**Species:**	Pimephales promelas	**Brine:**	
Test Length:	32d 0h	**Taxon:**	Actinopterygii	**Source:**	Aquatox, AR **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
Lab Control	08-8280-1106	02 Mar-21	03 Mar-21	96h	Teck Coal Ltd	
10Cu Control	01-9333-5370	02 Mar-21	03 Mar-21	96h		
15Cu Control	19-6548-0518	02 Mar-21	03 Mar-21	96h		
20Cu Control	00-8675-6744	02 Mar-21	03 Mar-21	96h		
FR_UFR1 + 20Cu	20-4721-8257	02 Mar-21	03 Mar-21	96h (4.6 °C)		
GH_ER2 +15Cu	01-1137-9253	02 Mar-21	03 Mar-21	96h (4.2 °C)		
CM_MC1 + 15Cu	01-3772-5048	02 Mar-21	03 Mar-21	96h (1 °C)		
LC_SLC + 15Cu	01-2380-6574	02 Mar-21	03 Mar-21	96h (3.1 °C)		
FR_FRABCH + 20C	08-4134-0746	02 Mar-21	03 Mar-21	96h (3.8 °C)		
FR_FRCP1 + 20Cu	11-2694-6466	02 Mar-21	03 Mar-21	96h (3 °C)		
GH_FR1 + 20Cu	20-1635-3152	02 Mar-21	03 Mar-21	96h (2.4 °C)		
GH_ERC + 10Cu	05-1950-5597	02 Mar-21	03 Mar-21	96h (4.1 °C)		
CM_MC2 + 20Cu	14-4685-1067	02 Mar-21	03 Mar-21	96h (0.3 °C)		
RG_MIDAG + 15Cu	21-3889-1829	02 Mar-21	03 Mar-21	96h (0.6 °C)		
EV_MC2 + 20Cu	05-6103-5191	02 Mar-21	03 Mar-21	96h (4.4 °C)		
EV_HC1 + 20Cu	12-5501-3302	02 Mar-21	03 Mar-21	96h (3.4 °C)		
LC_DCDS + 20Cu	04-1088-5978	02 Mar-21	03 Mar-21	96h (0.6 °C)		
LC_LC3 + 20Cu	14-7773-4190	02 Mar-21	03 Mar-21	96h (2.3 °C)		
LC_LC5 + 20Cu	01-7235-6798	02 Mar-21	03 Mar-21	96h (0.6 °C)		
LC_LCDSSLCC20C	06-4197-2641	02 Mar-21	03 Mar-21	96h (2.4 °C)		
FR_FR4 + 20Cu	10-9481-5020	02 Mar-21	03 Mar-21	96h (5.4 °C)		
FR_FR2 + 20Cu	00-3159-8672	02 Mar-21	03 Mar-21	96h (4.4 °C)		
FR_MULTIPLATE2	02-2179-0364	02 Mar-21	03 Mar-21	96h (2.9 °C)		
FR_FRRD + 20Cu	19-5167-8345	02 Mar-21	03 Mar-21	96h (6.2 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
Lab Control	Ambient Sample	Teck Coal Ltd	Lab Control	
10Cu Control	Ambient Sample	Teck Coal Ltd	10Cu Control	
15Cu Control	Ambient Sample	Teck Coal Ltd	15Cu Control	
20Cu Control	Ambient Sample	Teck Coal Ltd	20Cu Control	
FR_UFR1 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_UFR1_MON_2021-03-0	
GH_ER2 +15Cu	Ambient Sample	Teck Coal Ltd	GH_ER2_WS_2021-03-02_	
CM_MC1 + 15Cu	Ambient Sample	Teck Coal Ltd	CM_MC1_WS_2021-03-02	
LC_SLC + 15Cu	Ambient Sample	Teck Coal Ltd	LC_SLC_WS_2021-03-02_	
FR_FRABCH + 20C	Ambient Sample	Teck Coal Ltd	FR_FRABCH_MON_2021-	
FR_FRCP1 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FRCP1_MON_2021-03	
GH_FR1 + 20Cu	Ambient Sample	Teck Coal Ltd	GH_FR1_WS_2021-03-02_	
GH_ERC + 10Cu	Ambient Sample	Teck Coal Ltd	GH_ERC_WS_2021-03-02	
CM_MC2 + 20Cu	Ambient Sample	Teck Coal Ltd	CM_MC2_WS_2021-03-02	
RG_MIDAG + 15Cu	Ambient Sample	Teck Coal Ltd	RG_MIDAG_WS_2021-03-	
EV_MC2 + 20Cu	Ambient Sample	Teck Coal Ltd	EV_MC2_WS_2021_Q1_W	
EV_HC1 + 20Cu	Ambient Sample	Teck Coal Ltd	EV_HC1_WS_2021_Q1_W	
LC_DCDS + 20Cu	Ambient Sample	Teck Coal Ltd	LC_DCDS_WS_2021-03-02	
LC_LC3 + 20Cu	Ambient Sample	Teck Coal Ltd	LC_LC3_WS_2021-03-02_	
LC_LC5 + 20Cu	Ambient Sample	Teck Coal Ltd	LC_LC5_WS_2021-03-02_	
LC_LCDSSLCC20C	Ambient Sample	Teck Coal Ltd	LC_LCDSSLCC_WS_2021-	
FR_FR4 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FR4_WS_2021-03-02_	
FR_FR2 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FR2_WS_2021-03-02_	

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Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID:	18-6517-2076	**Endpoint:**	Length	**CETIS Version:**	CETISv1.9.4
Analyzed:	21 May-21 12:31	**Analysis:**	Parametric-Control vs Treatments	**Status Level:**	1

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_MULTIPLATE2	Ambient Sample	Teck Coal Ltd	FR_MULTIPLATE_WS_202	
FR_FRRD + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FRRD_WS_2021-03-02	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	Lab Control passed length	12.65%
		15Cu Control passed length	12.65%
		20Cu Control passed length	12.65%
		FR_UFR1 + 20Cu passed length	12.65%
		GH_ER2 +15Cu passed length	12.65%
		CM_MC1 + 15Cu passed length	12.65%
		LC_SLC + 15Cu passed length	12.65%
		FR_FRABCH + 20C passed length	12.65%
		FR_FRCP1 + 20Cu passed length	12.65%
		GH_FR1 + 20Cu passed length	12.65%
		GH_ERC + 10Cu passed length	12.65%
		CM_MC2 + 20Cu passed length	12.65%
		RG_MIDAG + 15Cu passed length	12.65%
		EV_MC2 + 20Cu passed length	12.65%
		EV_HC1 + 20Cu passed length	12.65%
		LC_DCDS + 20Cu passed length	12.65%
		LC_LC3 + 20Cu passed length	12.65%
		LC_LC5 + 20Cu passed length	12.65%
		LC_LCDSSLCC20Cu passed length	12.65%
		FR_FR4 + 20Cu passed length	12.65%
		FR_FR2 + 20Cu passed length	12.65%
		FR_MULTIPLATE20 passed length	12.65%
		FR_FRRD + 20Cu passed length	12.65%

Dunnett Multiple Comparison Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
10Cu Control		Lab Control	-0.3697	2.744	1.349	6	CDF	0.9863	Non-Significant Effect
		15Cu Control	-0.8448	2.744	1.349	6	CDF	0.9975	Non-Significant Effect
		20Cu Control	-1.041	2.744	1.349	6	CDF	0.9989	Non-Significant Effect
		FR_UFR1 + 20Cu	0.5167	2.744	1.349	6	CDF	0.8574	Non-Significant Effect
		GH_ER2 +15Cu	-0.3631	2.744	1.349	6	CDF	0.9860	Non-Significant Effect
		CM_MC1 + 15Cu	-0.5271	2.744	1.349	6	CDF	0.9920	Non-Significant Effect
		LC_SLC + 15Cu	-1.605	2.744	1.349	6	CDF	0.9999	Non-Significant Effect
		FR_FRABCH + 20C	0.3328	2.744	1.349	6	CDF	0.9040	Non-Significant Effect
		FR_FRCP1 + 20Cu	-1.04	2.744	1.349	6	CDF	0.9989	Non-Significant Effect
		GH_FR1 + 20Cu	0.0827	2.744	1.349	6	CDF	0.9480	Non-Significant Effect
		GH_ERC + 10Cu	0.3609	2.744	1.349	6	CDF	0.8977	Non-Significant Effect
		CM_MC2 + 20Cu	1.091	2.744	1.349	6	CDF	0.6328	Non-Significant Effect
		RG_MIDAG + 15Cu	-0.2094	2.744	1.349	6	CDF	0.9773	Non-Significant Effect
		EV_MC2 + 20Cu	-0.1509	2.744	1.349	6	CDF	0.9729	Non-Significant Effect
		EV_HC1 + 20Cu	0.1934	2.744	1.349	6	CDF	0.9310	Non-Significant Effect
		LC_DCDS + 20Cu	-1.017	2.744	1.349	6	CDF	0.9988	Non-Significant Effect
		LC_LC3 + 20Cu	-0.1273	2.744	1.349	6	CDF	0.9710	Non-Significant Effect
		LC_LC5 + 20Cu	-0.7891	2.744	1.349	6	CDF	0.9969	Non-Significant Effect
		LC_LCDSSLCC20Cu	-0.04413	2.744	1.349	6	CDF	0.9631	Non-Significant Effect
		FR_FR4 + 20Cu	-0.9191	2.744	1.349	6	CDF	0.9982	Non-Significant Effect
		FR_FR2 + 20Cu	0.4502	2.744	1.349	6	CDF	0.8757	Non-Significant Effect
		FR_MULTIPLATE20	-0.4515	2.744	1.349	6	CDF	0.9896	Non-Significant Effect
		FR_FRRD + 20Cu	-0.2941	2.744	1.349	6	CDF	0.9825	Non-Significant Effect

Auxiliary Tests

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 18-6517-2076 **Endpoint:** Length **CETIS Version:** CETISv1.9.4
Analyzed: 21 May-21 12:31 **Analysis:** Parametric-Control vs Treatments **Status Level:** 1

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	3.392	3.37	0.0458	Outlier Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	8.62615	0.37505	23	0.7753	0.7491	Non-Significant Effect
Error	34.8279	0.483721	72			
Total	43.4541		95			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Variances	Bartlett Equality of Variance Test	31.32	35.17	0.1151	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9841	0.9737	0.3005	Normal Distribution

Length Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
Lab Control		4	10.85	10.2	11.5	10.74	10.5	11.42	0.2039	3.76%	0.00%
10Cu Control	10	4	10.67	10.19	11.15	10.69	10.29	11	0.1513	2.84%	1.68%
15Cu Control		4	11.08	9.919	12.25	11	10.33	12	0.3658	6.60%	-2.15%
20Cu Control		4	11.18	10.17	12.19	10.96	10.69	12.11	0.3171	5.67%	-3.04%
FR_UFR1 + 20Cu		4	10.41	9.005	11.82	10.04	9.857	11.73	0.4425	8.50%	4.02%
GH_ER2 +15Cu		4	10.85	10.27	11.43	10.8	10.5	11.29	0.182	3.36%	0.03%
CM_MC1 + 15Cu		4	10.93	9.723	12.13	10.83	10.17	11.88	0.3782	6.92%	-0.71%
LC_SLC + 15Cu		4	11.46	10.55	12.37	11.45	10.93	12	0.2857	4.99%	-5.60%
FR_FRABCH + 20C		4	10.5	9.776	11.23	10.47	10	11.08	0.2288	4.36%	3.18%
FR_FRCP1 + 20Cu		4	11.18	10.1	12.26	11.13	10.45	12	0.3392	6.07%	-3.04%
GH_FR1 + 20Cu		4	10.63	9.531	11.72	10.72	9.846	11.23	0.3445	6.48%	2.05%
GH_ERC + 10Cu		4	10.49	10.24	10.74	10.48	10.31	10.69	0.0791	1.51%	3.31%
CM_MC2 + 20Cu		4	10.13	8.98	11.28	10.01	9.429	11.08	0.3617	7.14%	6.62%
RG_MIDAG + 15Cu		4	10.77	10.19	11.35	10.72	10.4	11.25	0.1826	3.39%	0.73%
EV_MC2 + 20Cu		4	10.74	9.791	11.69	10.76	10.08	11.36	0.2987	5.56%	0.99%
EV_HC1 + 20Cu		4	10.57	10.15	10.99	10.54	10.31	10.9	0.1325	2.51%	2.55%
LC_DCDS + 20Cu		4	11.17	9.661	12.67	11.06	10.18	12.38	0.4734	8.48%	-2.93%
LC_LC3 + 20Cu		4	10.73	9.975	11.49	10.77	10.13	11.25	0.2375	4.43%	1.10%
LC_LC5 + 20Cu		4	11.06	9.583	12.53	10.93	10.07	12.3	0.4627	8.37%	-1.90%
LC_LCDSSLCC20C		4	10.69	10.4	10.98	10.66	10.5	10.93	0.09091	1.70%	1.48%
FR_FR4 + 20Cu		4	11.12	10.17	12.07	11.06	10.45	11.9	0.298	5.36%	-2.49%
FR_FR2 + 20Cu		4	10.45	7.854	13.04	10.14	9	12.5	0.8146	15.60%	3.72%
FR_MULTIPLATE2		4	10.89	9.947	11.83	10.89	10.23	11.55	0.2964	5.44%	-0.37%
FR_FRRD + 20Cu		4	10.81	9.242	12.38	10.83	9.917	11.67	0.4934	9.13%	0.34%

JUN 10 2021

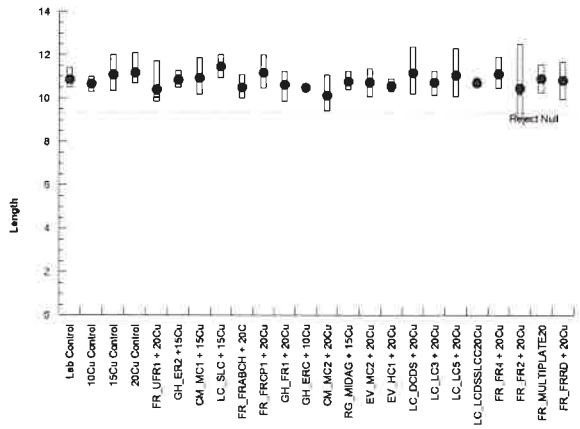
Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

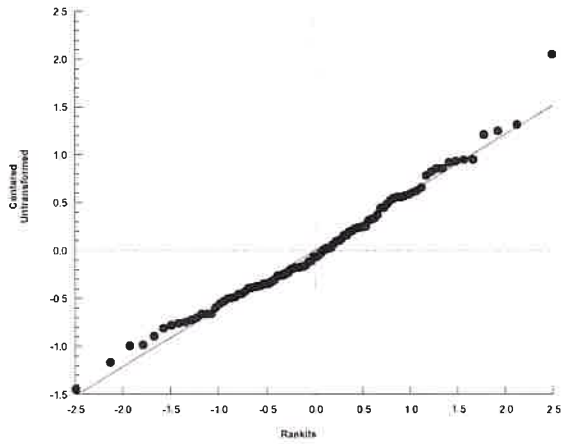
Analysis ID: 18-6517-2076 **Endpoint:** Length **CETIS Version:** CETISv1.9.4
Analyzed: 21 May-21 12:31 **Analysis:** Parametric-Control vs Treatments **Status Level:** 1

Length Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Lab Control		10.5	10.62	11.42	10.87
10Cu Control	10	10.79	11	10.29	10.6
15Cu Control		10.69	10.33	12	11.31
20Cu Control		10.92	10.69	12.11	11
FR_UFR1 + 20Cu		9.917	9.857	10.15	11.73
GH_ER2 +15Cu		10.5	11.29	11	10.6
CM_MC1 + 15Cu		10.5	11.88	10.17	11.17
LC_SLC + 15Cu		12	11.9	10.93	11
FR_FRABCH + 20C		10.33	10	10.6	11.08
FR_FRCP1 + 20Cu		12	10.83	10.45	11.43
GH_FR1 + 20Cu		11.18	10.25	9.846	11.23
GH_ERC + 10Cu		10.5	10.31	10.69	10.46
CM_MC2 + 20Cu		9.429	9.733	10.29	11.08
RG_MIDAG + 15Cu		10.4	10.6	10.83	11.25
EV_MC2 + 20Cu		10.08	11.11	10.42	11.36
EV_HC1 + 20Cu		10.67	10.42	10.31	10.9
LC_DCDS + 20Cu		12.38	10.18	10.71	11.4
LC_LC3 + 20Cu		10.92	10.13	10.62	11.25
LC_LC5 + 20Cu		10.07	10.86	11	12.3
LC_LCDSSLCC20C		10.71	10.5	10.62	10.93
FR_FR4 + 20Cu		11	10.45	11.12	11.9
FR_FR2 + 20Cu		9.286	9	11	12.5
FR_MULTIPLATE2		11.2	10.58	10.23	11.55
FR_FRRD + 20Cu		9.917	10	11.67	11.67

Graphics





Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID:	20-5304-5909	**Endpoint:**	Proportion Normal	**CETIS Version:**	CETISv1.9.4
Analyzed:	01 Jun-21 8:07	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1
Batch ID:	16-2689-7673	**Test Type:**	32 Day Fathead Minnow Test	**Analyst:**	Kayla Knol
Start Date:	06 Mar-21	**Protocol:**	ASTM E1241-05 (2013)	**Diluent:**	Dechlorinated Tap Water
Ending Date:	07 Apr-21	**Species:**	Pimephales promelas	**Brine:**	
Test Length:	32d 0h	**Taxon:**	Actinopterygii	**Source:**	Aquatox, AR **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
Lab Control	08-8280-1106	02 Mar-21	03 Mar-21	96h	Teck Coal Ltd	
10Cu Control	01-9333-5370	02 Mar-21	03 Mar-21	96h		
15Cu Control	19-6548-0518	02 Mar-21	03 Mar-21	96h		
20Cu Control	00-8675-6744	02 Mar-21	03 Mar-21	96h		
FR_UFR1 + 20Cu	20-4721-8257	02 Mar-21	03 Mar-21	96h (4.6 °C)		
GH_ER2 +15Cu	01-1137-9253	02 Mar-21	03 Mar-21	96h (4.2 °C)		
CM_MC1 + 15Cu	01-3772-5048	02 Mar-21	03 Mar-21	96h (1 °C)		
LC_SLC + 15Cu	01-2380-6574	02 Mar-21	03 Mar-21	96h (3.1 °C)		
FR_FRABCH + 20C	08-4134-0746	02 Mar-21	03 Mar-21	96h (3.8 °C)		
FR_FRCP1 + 20Cu	11-2694-6466	02 Mar-21	03 Mar-21	96h (3 °C)		
GH_FR1 + 20Cu	20-1635-3152	02 Mar-21	03 Mar-21	96h (2.4 °C)		
GH_ERC + 10Cu	05-1950-5597	02 Mar-21	03 Mar-21	96h (4.1 °C)		
CM_MC2 + 20Cu	14-4685-1067	02 Mar-21	03 Mar-21	96h (0.3 °C)		
RG_MIDAG + 15Cu	21-3889-1829	02 Mar-21	03 Mar-21	96h (0.6 °C)		
EV_MC2 + 20Cu	05-6103-5191	02 Mar-21	03 Mar-21	96h (4.4 °C)		
EV_HC1 + 20Cu	12-5501-3302	02 Mar-21	03 Mar-21	96h (3.4 °C)		
LC_DCDS + 20Cu	04-1088-5978	02 Mar-21	03 Mar-21	96h (0.6 °C)		
LC_LC3 + 20Cu	14-7773-4190	02 Mar-21	03 Mar-21	96h (2.3 °C)		
LC_LC5 + 20Cu	01-7235-6798	02 Mar-21	03 Mar-21	96h (0.6 °C)		
LC_LCDSSLCC20C	06-4197-2641	02 Mar-21	03 Mar-21	96h (2.4 °C)		
FR_FR4 + 20Cu	10-9481-5020	02 Mar-21	03 Mar-21	96h (5.4 °C)		
FR_FR2 + 20Cu	00-3159-8672	02 Mar-21	03 Mar-21	96h (4.4 °C)		
FR_MULTIPLATE2	02-2179-0364	02 Mar-21	03 Mar-21	96h (2.9 °C)		
FR_FRRD + 20Cu	19-5167-8345	02 Mar-21	03 Mar-21	96h (6.2 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
Lab Control	Ambient Sample	Teck Coal Ltd	Lab Control	
10Cu Control	Ambient Sample	Teck Coal Ltd	10Cu Control	
15Cu Control	Ambient Sample	Teck Coal Ltd	15Cu Control	
20Cu Control	Ambient Sample	Teck Coal Ltd	20Cu Control	
FR_UFR1 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_UFR1_MON_2021-03-0	
GH_ER2 +15Cu	Ambient Sample	Teck Coal Ltd	GH_ER2_WS_2021-03-02_	
CM_MC1 + 15Cu	Ambient Sample	Teck Coal Ltd	CM_MC1_WS_2021-03-02	
LC_SLC + 15Cu	Ambient Sample	Teck Coal Ltd	LC_SLC_WS_2021-03-02_	
FR_FRABCH + 20C	Ambient Sample	Teck Coal Ltd	FR_FRABCH_MON_2021-	
FR_FRCP1 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FRCP1_MON_2021-03	
GH_FR1 + 20Cu	Ambient Sample	Teck Coal Ltd	GH_FR1_WS_2021-03-02_	
GH_ERC + 10Cu	Ambient Sample	Teck Coal Ltd	GH_ERC_WS_2021-03-02	
CM_MC2 + 20Cu	Ambient Sample	Teck Coal Ltd	CM_MC2_WS_2021-03-02	
RG_MIDAG + 15Cu	Ambient Sample	Teck Coal Ltd	RG_MIDAG_WS_2021-03-	
EV_MC2 + 20Cu	Ambient Sample	Teck Coal Ltd	EV_MC2_WS_2021_Q1_W	
EV_HC1 + 20Cu	Ambient Sample	Teck Coal Ltd	EV_HC1_WS_2021_Q1_W	
LC_DCDS + 20Cu	Ambient Sample	Teck Coal Ltd	LC_DCDS_WS_2021-03-02	
LC_LC3 + 20Cu	Ambient Sample	Teck Coal Ltd	LC_LC3_WS_2021-03-02_	
LC_LC5 + 20Cu	Ambient Sample	Teck Coal Ltd	LC_LC5_WS_2021-03-02_	
LC_LCDSSLCC20C	Ambient Sample	Teck Coal Ltd	LC_LCDSSLCC_WS_2021-	
FR_FR4 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FR4_WS_2021-03-02_	
FR_FR2 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FR2_WS_2021-03-02_	

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 20-5304-5909 **Endpoint:** Proportion Normal **CETIS Version:** CETISv1.9.4
Analyzed: 01 Jun-21 8:07 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_MULTIPLATE2	Ambient Sample	Teck Coal Ltd	FR_MULTIPLATE_WS_202	
FR_FRRD + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FRRD_WS_2021-03-02	

Fisher Exact/Bonferroni Adj Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
10Cu Control		Lab Control	1.0000	Exact	1.0000	Non-Significant Effect
		15Cu Control	1.0000	Exact	1.0000	Non-Significant Effect
		20Cu Control	0.4615	Exact	1.0000	Non-Significant Effect
		FR_UFR1 + 20Cu	1.0000	Exact	1.0000	Non-Significant Effect
		GH_ER2 +15Cu*	0.0007	Exact	0.0155	Significant Effect
		CM_MC1 + 15Cu*	0.0009	Exact	0.0213	Significant Effect
		LC_SLC + 15Cu	1.0000	Exact	1.0000	Non-Significant Effect
		FR_FRABCH + 20C	0.2058	Exact	1.0000	Non-Significant Effect
		FR_FRCP1 + 20Cu	0.3412	Exact	1.0000	Non-Significant Effect
		GH_FR1 + 20Cu	0.0983	Exact	1.0000	Non-Significant Effect
		GH_ERC + 10Cu	0.0023	Exact	0.0537	Non-Significant Effect
		CM_MC2 + 20Cu	0.2477	Exact	1.0000	Non-Significant Effect
		RG_MIDAG + 15Cu	0.1911	Exact	1.0000	Non-Significant Effect
		EV_MC2 + 20Cu	0.4510	Exact	1.0000	Non-Significant Effect
		EV_HC1 + 20Cu	0.4563	Exact	1.0000	Non-Significant Effect
		LC_DCDS + 20Cu	0.1861	Exact	1.0000	Non-Significant Effect
		LC_LC3 + 20Cu	0.2341	Exact	1.0000	Non-Significant Effect
		LC_LC5 + 20Cu	1.0000	Exact	1.0000	Non-Significant Effect
		LC_LCDSSLCC20Cu	0.4862	Exact	1.0000	Non-Significant Effect
		FR_FR4 + 20Cu	1.0000	Exact	1.0000	Non-Significant Effect
		FR_FR2 + 20Cu	0.1031	Exact	1.0000	Non-Significant Effect
		FR_MULTIPLATE20	1.0000	Exact	1.0000	Non-Significant Effect
		FR_FRRD + 20Cu	0.1811	Exact	1.0000	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	4.105	3.37	0.0017	Outlier Detected

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 20-5304-5909 **Endpoint:** Proportion Normal **CETIS Version:** CETISv1.9.4
Analyzed: 01 Jun-21 8:07 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Data Summary

Sample	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
Lab Control		54	0	54	1	0	0.0%
10Cu Control	10	56	0	56	1	0	0.0%
15Cu Control		50	0	50	1	0	0.0%
20Cu Control		47	1	48	0.9792	0.02083	2.08%
FR_UFR1 + 20Cu		50	0	50	1	0	0.0%
GH_ER2 +15Cu		14	5	19	0.7368	0.2632	26.32%
CM_MC1 + 15Cu		22	6	28	0.7857	0.2143	21.43%
LC_SLC + 15Cu		47	0	47	1	0	0.0%
FR_FRABCH + 20C		45	2	47	0.9574	0.04255	4.26%
FR_FRCP1 + 20Cu		28	1	29	0.9655	0.03448	3.45%
GH_FR1 + 20Cu		46	3	49	0.9388	0.06122	6.12%
GH_ERC + 10Cu		45	8	53	0.8491	0.1509	15.09%
CM_MC2 + 20Cu		54	2	56	0.9643	0.03571	3.57%
RG_MIDAG + 15Cu		42	2	44	0.9545	0.04545	4.55%
EV_MC2 + 20Cu		45	1	46	0.9783	0.02174	2.17%
EV_HC1 + 20Cu		46	1	47	0.9787	0.02128	2.13%
LC_DCDS + 20Cu		41	2	43	0.9535	0.04651	4.65%
LC_LC3 + 20Cu		51	2	53	0.9623	0.03774	3.77%
LC_LC5 + 20Cu		52	0	52	1	0	0.0%
LC_LCDSSLCC20C		52	1	53	0.9811	0.01887	1.89%
FR_FR4 + 20Cu		38	0	38	1	0	0.0%
FR_FR2 + 20Cu		25	2	27	0.9259	0.07407	7.41%
FR_MULTIPLATE20		46	0	46	1	0	0.0%
FR_FRRD + 20Cu		40	2	42	0.9524	0.04762	4.76%

Proportion Normal Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Lab Control		1.0000	1.0000	1.0000	1.0000
10Cu Control	10	1.0000	1.0000	1.0000	1.0000
15Cu Control		1.0000	1.0000	1.0000	1.0000
20Cu Control		0.9167	1.0000	1.0000	1.0000
FR_UFR1 + 20Cu		1.0000	1.0000	1.0000	1.0000
GH_ER2 +15Cu		0.7500	0.8571	1.0000	0.4000
CM_MC1 + 15Cu		0.6250	0.8750	0.6667	1.0000
LC_SLC + 15Cu		1.0000	1.0000	1.0000	1.0000
FR_FRABCH + 20C		1.0000	1.0000	0.8000	1.0000
FR_FRCP1 + 20Cu		1.0000	0.8333	1.0000	1.0000
GH_FR1 + 20Cu		1.0000	1.0000	0.9231	0.8462
GH_ERC + 10Cu		0.7857	0.7692	0.9231	0.9231
CM_MC2 + 20Cu		1.0000	0.9333	0.9286	1.0000
RG_MIDAG + 15Cu		0.9000	1.0000	1.0000	0.9167
EV_MC2 + 20Cu		0.9231	1.0000	1.0000	1.0000
EV_HC1 + 20Cu		0.9167	1.0000	1.0000	1.0000
LC_DCDS + 20Cu		1.0000	0.9091	0.9286	1.0000
LC_LC3 + 20Cu		1.0000	0.9333	1.0000	0.9167
LC_LC5 + 20Cu		1.0000	1.0000	1.0000	1.0000
LC_LCDSSLCC20C		1.0000	0.9167	1.0000	1.0000
FR_FR4 + 20Cu		1.0000	1.0000	1.0000	1.0000
FR_FR2 + 20Cu		0.8571	0.8571	1.0000	1.0000
FR_MULTIPLATE2		1.0000	1.0000	1.0000	1.0000
FR_FRRD + 20Cu		0.9167	0.9167	1.0000	1.0000

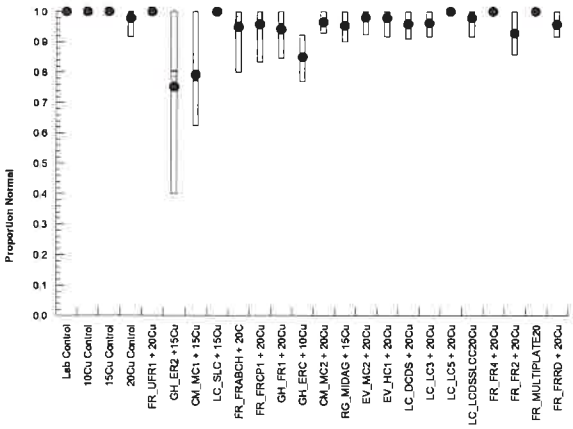
Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 20-5304-5909 **Endpoint:** Proportion Normal **CETIS Version:** CETISv1.9.4
Analyzed: 01 Jun-21 8:07 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Proportion Normal Binomials

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Lab Control		14/14	13/13	12/12	15/15
10Cu Control	10	14/14	13/13	14/14	15/15
15Cu Control		13/13	15/15	9/9	13/13
20Cu Control		11/12	13/13	9/9	14/14
FR_UFR1 + 20Cu		12/12	14/14	13/13	11/11
GH_ER2 +15Cu		3/4	6/7	3/3	2/5
CM_MC1 + 15Cu		5/8	7/8	4/6	6/6
LC_SLC + 15Cu		9/9	10/10	14/14	14/14
FR_FRABCH + 20C		12/12	13/13	8/10	12/12
FR_FRCP1 + 20Cu		5/5	5/6	11/11	7/7
GH_FR1 + 20Cu		11/11	12/12	12/13	11/13
GH_ERC + 10Cu		11/14	10/13	12/13	12/13
CM_MC2 + 20Cu		14/14	14/15	13/14	13/13
RG_MIDAG + 15Cu		9/10	10/10	12/12	11/12
EV_MC2 + 20Cu		12/13	9/9	12/12	11/11
EV_HC1 + 20Cu		11/12	12/12	13/13	10/10
LC_DCDS + 20Cu		8/8	10/11	13/14	10/10
LC_LC3 + 20Cu		13/13	14/15	13/13	11/12
LC_LC5 + 20Cu		15/15	14/14	13/13	10/10
LC_LCDSSLCC20C		14/14	11/12	13/13	14/14
FR_FR4 + 20Cu		9/9	11/11	8/8	10/10
FR_FR2 + 20Cu		6/7	6/7	9/9	4/4
FR_MULTIPLATE2		10/10	12/12	13/13	11/11
FR_FRRD + 20Cu		11/12	11/12	9/9	9/9

Graphics



CETIS Analytical Report

Test Code/ID: Lab Control FM / 11-1126-9670

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID:	16-5720-3903	**Endpoint:**	Post Hatch Survival	**CETIS Version:**	CETISv1.9.4
Analyzed:	21 May-21 12:29	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1
Batch ID:	16-2689-7673	**Test Type:**	32 Day Fathead Minnow Test	**Analyst:**	Kayla Knol
Start Date:	06 Mar-21	**Protocol:**	ASTM E1241-05 (2013)	**Diluent:**	Dechlorinated Tap Water
Ending Date:	07 Apr-21	**Species:**	Pimephales promelas	**Brine:**	
Test Length:	32d 0h	**Taxon:**	Actinopterygii	**Source:**	Aquatox, AR **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
Lab Control	08-8280-1106	02 Mar-21	03 Mar-21	96h	Teck Coal Ltd	
10Cu Control	01-9333-5370	02 Mar-21	03 Mar-21	96h		
15Cu Control	19-6548-0518	02 Mar-21	03 Mar-21	96h		
20Cu Control	00-8675-6744	02 Mar-21	03 Mar-21	96h		
FR_UFR1 + 20Cu	20-4721-8257	02 Mar-21	03 Mar-21	96h (4.6 °C)		
GH_ER2 +15Cu	01-1137-9253	02 Mar-21	03 Mar-21	96h (4.2 °C)		
CM_MC1 + 15Cu	01-3772-5048	02 Mar-21	03 Mar-21	96h (1 °C)		
LC_SLC + 15Cu	01-2380-6574	02 Mar-21	03 Mar-21	96h (3.1 °C)		
FR_FRABCH + 20C	08-4134-0746	02 Mar-21	03 Mar-21	96h (3.8 °C)		
FR_FRCP1 + 20Cu	11-2694-6466	02 Mar-21	03 Mar-21	96h (3 °C)		
GH_FR1 + 20Cu	20-1635-3152	02 Mar-21	03 Mar-21	96h (2.4 °C)		
GH_ERC + 10Cu	05-1950-5597	02 Mar-21	03 Mar-21	96h (4.1 °C)		
CM_MC2 + 20Cu	14-4685-1067	02 Mar-21	03 Mar-21	96h (0.3 °C)		
RG_MIDAG + 15Cu	21-3889-1829	02 Mar-21	03 Mar-21	96h (0.6 °C)		
EV_MC2 + 20Cu	05-6103-5191	02 Mar-21	03 Mar-21	96h (4.4 °C)		
EV_HC1 + 20Cu	12-5501-3302	02 Mar-21	03 Mar-21	96h (3.4 °C)		
LC_DCDS + 20Cu	04-1088-5978	02 Mar-21	03 Mar-21	96h (0.6 °C)		
LC_LC3 + 20Cu	14-7773-4190	02 Mar-21	03 Mar-21	96h (2.3 °C)		
LC_LC5 + 20Cu	01-7235-6798	02 Mar-21	03 Mar-21	96h (0.6 °C)		
LC_LCDSSLCC20C	06-4197-2641	02 Mar-21	03 Mar-21	96h (2.4 °C)		
FR_FR4 + 20Cu	10-9481-5020	02 Mar-21	03 Mar-21	96h (5.4 °C)		
FR_FR2 + 20Cu	00-3159-8672	02 Mar-21	03 Mar-21	96h (4.4 °C)		
FR_MULTIPLATE2	02-2179-0364	02 Mar-21	03 Mar-21	96h (2.9 °C)		
FR_FRRD + 20Cu	19-5167-8345	02 Mar-21	03 Mar-21	96h (6.2 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
Lab Control	Ambient Sample	Teck Coal Ltd	Lab Control	
10Cu Control	Ambient Sample	Teck Coal Ltd	10Cu Control	
15Cu Control	Ambient Sample	Teck Coal Ltd	15Cu Control	
20Cu Control	Ambient Sample	Teck Coal Ltd	20Cu Control	
FR_UFR1 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_UFR1_MON_2021-03-0	
GH_ER2 +15Cu	Ambient Sample	Teck Coal Ltd	GH_ER2_WS_2021-03-02_	
CM_MC1 + 15Cu	Ambient Sample	Teck Coal Ltd	CM_MC1_WS_2021-03-02	
LC_SLC + 15Cu	Ambient Sample	Teck Coal Ltd	LC_SLC_WS_2021-03-02_	
FR_FRABCH + 20C	Ambient Sample	Teck Coal Ltd	FR_FRABCH_MON_2021-	
FR_FRCP1 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FRCP1_MON_2021-03	
GH_FR1 + 20Cu	Ambient Sample	Teck Coal Ltd	GH_FR1_WS_2021-03-02_	
GH_ERC + 10Cu	Ambient Sample	Teck Coal Ltd	GH_ERC_WS_2021-03-02	
CM_MC2 + 20Cu	Ambient Sample	Teck Coal Ltd	CM_MC2_WS_2021-03-02	
RG_MIDAG + 15Cu	Ambient Sample	Teck Coal Ltd	RG_MIDAG_WS_2021-03-	
EV_MC2 + 20Cu	Ambient Sample	Teck Coal Ltd	EV_MC2_WS_2021_Q1_W	
EV_HC1 + 20Cu	Ambient Sample	Teck Coal Ltd	EV_HC1_WS_2021_Q1_W	
LC_DCDS + 20Cu	Ambient Sample	Teck Coal Ltd	LC_DCDS_WS_2021-03-02	
LC_LC3 + 20Cu	Ambient Sample	Teck Coal Ltd	LC_LC3_WS_2021-03-02_	
LC_LC5 + 20Cu	Ambient Sample	Teck Coal Ltd	LC_LC5_WS_2021-03-02_	
LC_LCDSSLCC20C	Ambient Sample	Teck Coal Ltd	LC_LCDSSLCC_WS_2021-	
FR_FR4 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FR4_WS_2021-03-02_	
FR_FR2 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FR2_WS_2021-03-02_	

Analyst: KSC QA: MG

JUN 10 2021

Fathead minnow 32-d (Pimephales promelas) survival and growth test **Nautilus Environmental Calgary**

Analysis ID: 16-5720-3903 **Endpoint:** Post Hatch Survival **CETIS Version:** CETISv1.9.4
Analyzed: 21 May-21 12:29 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_MULTIPLATE2	Ambient Sample	Teck Coal Ltd	FR_MULTIPLATE_WS_202	
FR_FRRD + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FRRD_WS_2021-03-02	

Fisher Exact/Bonferroni Adj Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
10Cu Control		Lab Control	0.2537	Exact	1.0000	Non-Significant Effect
		15Cu Control	0.0625	Exact	1.0000	Non-Significant Effect
		20Cu Control	0.0549	Exact	1.0000	Non-Significant Effect
		FR_UFR1 + 20Cu	0.1471	Exact	1.0000	Non-Significant Effect
		GH_ER2 +15Cu*	0.0000	Exact	3.4E-12	Significant Effect
		CM_MC1 + 15Cu*	0.0000	Exact	9.0E-08	Significant Effect
		LC_SLC + 15Cu	0.0122	Exact	0.2807	Non-Significant Effect
		FR_FRABCH + 20C	0.0122	Exact	0.2807	Non-Significant Effect
		FR_FRCP1 + 20Cu*	0.0000	Exact	2.4E-07	Significant Effect
		GH_FR1 + 20Cu	0.2110	Exact	1.0000	Non-Significant Effect
		GH_ERC + 10Cu	0.2452	Exact	1.0000	Non-Significant Effect
		CM_MC2 + 20Cu	0.6604	Exact	1.0000	Non-Significant Effect
		RG_MIDAG + 15Cu*	0.0019	Exact	0.0441	Significant Effect
		EV_MC2 + 20Cu	0.0296	Exact	0.6813	Non-Significant Effect
		EV_HC1 + 20Cu	0.0198	Exact	0.4564	Non-Significant Effect
		LC_DCDS + 20Cu	0.0626	Exact	1.0000	Non-Significant Effect
		LC_LC3 + 20Cu	0.1681	Exact	1.0000	Non-Significant Effect
		LC_LC5 + 20Cu	0.1610	Exact	1.0000	Non-Significant Effect
		LC_LCDSSLCC20Cu	0.1681	Exact	1.0000	Non-Significant Effect
		FR_FR4 + 20Cu*	0.0000	Exact	6.1E-04	Significant Effect
		FR_FR2 + 20Cu*	0.0000	Exact	3.3E-08	Significant Effect
		FR_MULTIPLATE20	0.0067	Exact	0.1549	Non-Significant Effect
		FR_FRRD + 20Cu	0.0025	Exact	0.0578	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	2.592	3.37	0.8135	No Outliers Detected

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 16-5720-3903 **Endpoint:** Post Hatch Survival **CETIS Version:** CETISv1.9.4
Analyzed: 21 May-21 12:29 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Data Summary

Sample	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
Lab Control		54	6	60	0.9	0.1	5.18%
10Cu Control	10	56	3	59	0.9492	0.05085	0.0%
15Cu Control		50	9	59	0.8475	0.1525	10.71%
20Cu Control		48	9	57	0.8421	0.1579	11.28%
FR_UFR1 + 20Cu		50	7	57	0.8772	0.1228	7.58%
GH_ER2 +15Cu		19	40	59	0.322	0.678	66.07%
CM_MC1 + 15Cu		28	31	59	0.4746	0.5254	50.0%
LC_SLC + 15Cu		47	12	59	0.7966	0.2034	16.07%
FR_FRABCH + 20C		47	12	59	0.7966	0.2034	16.07%
FR_FRCP1 + 20Cu		29	30	59	0.4915	0.5085	48.21%
GH_FR1 + 20Cu		49	6	55	0.8909	0.1091	6.14%
GH_ERC + 10Cu		53	6	59	0.8983	0.1017	5.36%
CM_MC2 + 20Cu		56	3	59	0.9492	0.05085	0.0%
RG_MIDAG + 15Cu		44	15	59	0.7458	0.2542	21.43%
EV_MC2 + 20Cu		46	10	56	0.8214	0.1786	13.46%
EV_HC1 + 20Cu		47	11	58	0.8103	0.1897	14.62%
LC_DCDS + 20Cu		43	8	51	0.8431	0.1569	11.17%
LC_LC3 + 20Cu		53	7	60	0.8833	0.1167	6.94%
LC_LC5 + 20Cu		52	7	59	0.8814	0.1186	7.14%
LC_LCDSSLCC20C		53	7	60	0.8833	0.1167	6.94%
FR_FR4 + 20Cu		38	21	59	0.6441	0.3559	32.14%
FR_FR2 + 20Cu		27	32	59	0.4576	0.5424	51.79%
FR_MULTIPLATE20		46	13	59	0.7797	0.2203	17.86%
FR_FRRD + 20Cu		42	14	56	0.75	0.25	20.98%

Post Hatch Survival Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Lab Control		0.9333	0.8667	0.8000	1.0000
10Cu Control	10	1.0000	0.8667	0.9333	1.0000
15Cu Control		0.8667	1.0000	0.6000	0.9286
20Cu Control		0.8571	1.0000	0.6000	0.9333
FR_UFR1 + 20Cu		0.9231	0.9333	0.8667	0.7857
GH_ER2 +15Cu		0.2667	0.4667	0.2000	0.3571
CM_MC1 + 15Cu		0.5333	0.5333	0.4286	0.4000
LC_SLC + 15Cu		0.6429	0.6667	0.9333	0.9333
FR_FRABCH + 20C		0.8000	0.8667	0.7143	0.8000
FR_FRCP1 + 20Cu		0.3571	0.4000	0.7333	0.4667
GH_FR1 + 20Cu		0.7857	1.0000	0.8667	0.9286
GH_ERC + 10Cu		0.9333	0.8667	0.9286	0.8667
CM_MC2 + 20Cu		0.9333	1.0000	0.9333	0.9286
RG_MIDAG + 15Cu		0.6667	0.7143	0.8000	0.8000
EV_MC2 + 20Cu		0.9286	0.7500	0.8000	0.8000
EV_HC1 + 20Cu		0.8000	0.8571	0.8667	0.7143
LC_DCDS + 20Cu		0.6667	0.7857	0.9333	1.0000
LC_LC3 + 20Cu		0.8667	1.0000	0.8667	0.8000
LC_LC5 + 20Cu		1.0000	0.9333	0.8667	0.7143
LC_LCDSSLCC20C		0.9333	0.8000	0.8667	0.9333
FR_FR4 + 20Cu		0.6000	0.7333	0.5333	0.7143
FR_FR2 + 20Cu		0.4667	0.4667	0.6429	0.2667
FR_MULTIPLATE2		0.7143	0.8000	0.8667	0.7333
FR_FRRD + 20Cu		0.8571	0.8571	0.6000	0.6923

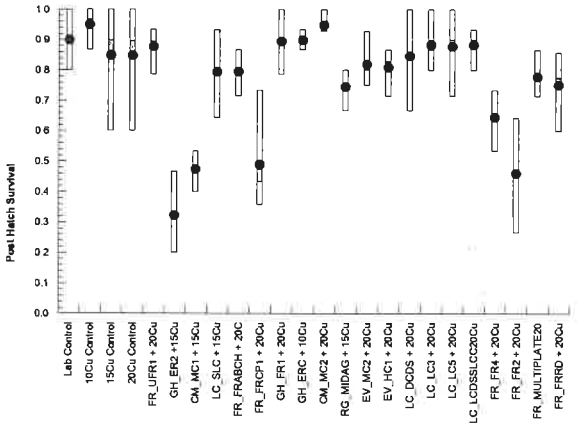
Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 16-5720-3903 **Endpoint:** Post Hatch Survival **CETIS Version:** CETISv1.9.4
Analyzed: 21 May-21 12:29 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Post Hatch Survival Binomials

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Lab Control		14/15	13/15	12/15	15/15
10Cu Control	10	14/14	13/15	14/15	15/15
15Cu Control		13/15	15/15	9/15	13/14
20Cu Control		12/14	13/13	9/15	14/15
FR_UFR1 + 20Cu		12/13	14/15	13/15	11/14
GH_ER2 +15Cu		4/15	7/15	3/15	5/14
CM_MC1 + 15Cu		8/15	8/15	6/14	6/15
LC_SLC + 15Cu		9/14	10/15	14/15	14/15
FR_FRABCH + 20C		12/15	13/15	10/14	12/15
FR_FRCP1 + 20Cu		5/14	6/15	11/15	7/15
GH_FR1 + 20Cu		11/14	12/12	13/15	13/14
GH_ERC + 10Cu		14/15	13/15	13/14	13/15
CM_MC2 + 20Cu		14/15	15/15	14/15	13/14
RG_MIDAG + 15Cu		10/15	10/14	12/15	12/15
EV_MC2 + 20Cu		13/14	9/12	12/15	12/15
EV_HC1 + 20Cu		12/15	12/14	13/15	10/14
LC_DCDS + 20Cu		8/12	11/14	14/15	10/10
LC_LC3 + 20Cu		13/15	15/15	13/15	12/15
LC_LC5 + 20Cu		15/15	14/15	13/15	10/14
LC_LCDSSLCC20C		14/15	12/15	13/15	14/15
FR_FR4 + 20Cu		9/15	11/15	8/15	10/14
FR_FR2 + 20Cu		7/15	7/15	9/14	4/15
FR_MULTIPLATE2		10/14	12/15	13/15	11/15
FR_FRRD + 20Cu		12/14	12/14	9/15	9/13

Graphics



Analyst: KK QA: MG

JUN 10 2021

CETIS Analytical Report

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID:	20-7593-3127	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.9.4
Analyzed:	01 Jun-21 8:21	**Analysis:**	Nonparametric-Control vs Treatments	**Status Level:**	1
Batch ID:	16-2689-7673	**Test Type:**	32 Day Fathead Minnow Test	**Analyst:**	Kayla Knol
Start Date:	06 Mar-21	**Protocol:**	ASTM E1241-05 (2013)	**Diluent:**	Dechlorinated Tap Water
Ending Date:	07 Apr-21	**Species:**	Pimephales promelas	**Brine:**	
Test Length:	32d 0h	**Taxon:**	Actinopterygii	**Source:**	Aquatox, AR **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
Lab Control	08-8280-1106	02 Mar-21	03 Mar-21	96h	Teck Coal Ltd	
10Cu Control	01-9333-5370	02 Mar-21	03 Mar-21	96h		
15Cu Control	19-6548-0518	02 Mar-21	03 Mar-21	96h		
20Cu Control	00-8675-6744	02 Mar-21	03 Mar-21	96h		
FR_UFR1 + 20Cu	20-4721-8257	02 Mar-21	03 Mar-21	96h (4.6 °C)		
GH_ER2 +15Cu	01-1137-9253	02 Mar-21	03 Mar-21	96h (4.2 °C)		
CM_MC1 + 15Cu	01-3772-5048	02 Mar-21	03 Mar-21	96h (1 °C)		
LC_SLC + 15Cu	01-2380-6574	02 Mar-21	03 Mar-21	96h (3.1 °C)		
FR_FRABCH + 20C	08-4134-0746	02 Mar-21	03 Mar-21	96h (3.8 °C)		
FR_FRCP1 + 20Cu	11-2694-6466	02 Mar-21	03 Mar-21	96h (3 °C)		
GH_FR1 + 20Cu	20-1635-3152	02 Mar-21	03 Mar-21	96h (2.4 °C)		
GH_ERC + 10Cu	05-1950-5597	02 Mar-21	03 Mar-21	96h (4.1 °C)		
CM_MC2 + 20Cu	14-4685-1067	02 Mar-21	03 Mar-21	96h (0.3 °C)		
RG_MIDAG + 15Cu	21-3889-1829	02 Mar-21	03 Mar-21	96h (0.6 °C)		
EV_MC2 + 20Cu	05-6103-5191	02 Mar-21	03 Mar-21	96h (4.4 °C)		
EV_HC1 + 20Cu	12-5501-3302	02 Mar-21	03 Mar-21	96h (3.4 °C)		
LC_DCDS + 20Cu	04-1088-5978	02 Mar-21	03 Mar-21	96h (0.6 °C)		
LC_LC3 + 20Cu	14-7773-4190	02 Mar-21	03 Mar-21	96h (2.3 °C)		
LC_LC5 + 20Cu	01-7235-6798	02 Mar-21	03 Mar-21	96h (0.6 °C)		
LC_LCDSSLCC20C	06-4197-2641	02 Mar-21	03 Mar-21	96h (2.4 °C)		
FR_FR4 + 20Cu	10-9481-5020	02 Mar-21	03 Mar-21	96h (5.4 °C)		
FR_FR2 + 20Cu	00-3159-8672	02 Mar-21	03 Mar-21	96h (4.4 °C)		
FR_MULTIPLATE2	02-2179-0364	02 Mar-21	03 Mar-21	96h (2.9 °C)		
FR_FRRD + 20Cu	19-5167-8345	02 Mar-21	03 Mar-21	96h (6.2 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
Lab Control	Ambient Sample	Teck Coal Ltd	Lab Control	
10Cu Control	Ambient Sample	Teck Coal Ltd	10Cu Control	
15Cu Control	Ambient Sample	Teck Coal Ltd	15Cu Control	
20Cu Control	Ambient Sample	Teck Coal Ltd	20Cu Control	
FR_UFR1 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_UFR1_MON_2021-03-0	
GH_ER2 +15Cu	Ambient Sample	Teck Coal Ltd	GH_ER2_WS_2021-03-02_	
CM_MC1 + 15Cu	Ambient Sample	Teck Coal Ltd	CM_MC1_WS_2021-03-02	
LC_SLC + 15Cu	Ambient Sample	Teck Coal Ltd	LC_SLC_WS_2021-03-02_	
FR_FRABCH + 20C	Ambient Sample	Teck Coal Ltd	FR_FRABCH_MON_2021-	
FR_FRCP1 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FRCP1_MON_2021-03	
GH_FR1 + 20Cu	Ambient Sample	Teck Coal Ltd	GH_FR1_WS_2021-03-02_	
GH_ERC + 10Cu	Ambient Sample	Teck Coal Ltd	GH_ERC_WS_2021-03-02	
CM_MC2 + 20Cu	Ambient Sample	Teck Coal Ltd	CM_MC2_WS_2021-03-02	
RG_MIDAG + 15Cu	Ambient Sample	Teck Coal Ltd	RG_MIDAG_WS_2021-03-	
EV_MC2 + 20Cu	Ambient Sample	Teck Coal Ltd	EV_MC2_WS_2021_Q1_W	
EV_HC1 + 20Cu	Ambient Sample	Teck Coal Ltd	EV_HC1_WS_2021_Q1_W	
LC_DCDS + 20Cu	Ambient Sample	Teck Coal Ltd	LC_DCDS_WS_2021-03-02	
LC_LC3 + 20Cu	Ambient Sample	Teck Coal Ltd	LC_LC3_WS_2021-03-02_	
LC_LC5 + 20Cu	Ambient Sample	Teck Coal Ltd	LC_LC5_WS_2021-03-02_	
LC_LCDSSLCC20C	Ambient Sample	Teck Coal Ltd	LC_LCDSSLCC_WS_2021-	
FR_FR4 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FR4_WS_2021-03-02_	
FR_FR2 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FR2_WS_2021-03-02_	

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 20-7593-3127 **Endpoint:** Mean Dry Biomass-mg **CETIS Version:** CETISv1.9.4
Analyzed: 01 Jun-21 8:21 **Analysis:** Nonparametric-Control vs Treatments **Status Level:** 1

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_MULTIPLATE2	Ambient Sample	Teck Coal Ltd	FR_MULTIPLATE_WS_202	
FR_FRRD + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FRRD_WS_2021-03-02	

Nemenyi-Damico-Wolfe Test

Sample I	vs	Sample II	Test Stat	Critical	Ties	P-Type	P-Value	Decision(α:5%)
15Cu Control		Lab Control	34	211.4	2	CDF	0.8805	Non-Significant Effect
		10Cu Control	67	211.4	2	CDF	0.7398	Non-Significant Effect
		20Cu Control	8	211.4	2	CDF	0.9453	Non-Significant Effect
		FR_UFR1 + 20Cu	67	211.4	2	CDF	0.7398	Non-Significant Effect
		GH_ER2 +15Cu*	270	211.4	2	CDF	0.0055	Significant Effect
		CM_MC1 + 15Cu*	221	211.4	2	CDF	0.0364	Significant Effect
		LC_SLC + 15Cu	136	211.4	2	CDF	0.3218	Non-Significant Effect
		FR_FRABCH + 20C	126	211.4	2	CDF	0.3807	Non-Significant Effect
		FR_FRCP1 + 20Cu*	228	211.4	2	CDF	0.0286	Significant Effect
		GH_FR1 + 20Cu	37.5	211.4	2	CDF	0.8687	Non-Significant Effect
		GH_ERC + 10Cu	29	211.4	2	CDF	0.8959	Non-Significant Effect
		CM_MC2 + 20Cu	115	211.4	2	CDF	0.4490	Non-Significant Effect
		RG_MIDAG + 15Cu	171.5	211.4	2	CDF	0.1531	Non-Significant Effect
		EV_MC2 + 20Cu	141	211.4	2	CDF	0.2940	Non-Significant Effect
		EV_HC1 + 20Cu	50.5	211.4	2	CDF	0.8185	Non-Significant Effect
		LC_DCDS + 20Cu	81	211.4	2	CDF	0.6616	Non-Significant Effect
		LC_LC3 + 20Cu	102	211.4	2	CDF	0.5317	Non-Significant Effect
		LC_LC5 + 20Cu	68	211.4	2	CDF	0.7345	Non-Significant Effect
		LC_LCDSSLCC20Cu	98	211.4	2	CDF	0.5572	Non-Significant Effect
		FR_FR4 + 20Cu	149.5	211.4	2	CDF	0.2494	Non-Significant Effect
		FR_FR2 + 20Cu*	274	211.4	2	CDF	0.0046	Significant Effect
		FR_MULTIPLATE20	25	211.4	2	CDF	0.9072	Non-Significant Effect
		FR_FRRD + 20Cu	21	211.4	2	CDF	0.9176	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	2.393	3.37	1.0000	No Outliers Detected
Treatment Effect	Fligner-Wolfe Omnibus Test	4567		0.0266	Significant Overall Effect
Treatment Effect	Kruskal-Wallis Omnibus Test	48.55	35.17	0.0014	Significant Overall Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	9.6416	0.4192	23	4.746	1.9E-07	Significant Effect
Error	6.35993	0.0883324	72			
Total	16.0015		95			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Variances	Bartlett Equality of Variance Test	15.29	35.17	0.8840	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9376	0.9737	1.9E-04	Non-Normal Distribution

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 20-7593-3127 **Endpoint:** Mean Dry Biomass-mg **CETIS Version:** CETISv1.9.4
Analyzed: 01 Jun-21 8:21 **Analysis:** Nonparametric-Control vs Treatments **Status Level:** 1

Mean Dry Biomass-mg Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
Lab Control		4	2.276	1.813	2.739	2.216	1.989	2.681	0.1455	12.79%	0.00%
10Cu Control		4	2.164	1.858	2.471	2.08	2.048	2.45	0.09618	8.89%	4.89%
15Cu Control	15	4	2.423	1.816	3.031	2.311	2.096	2.975	0.191	15.76%	-6.49%
20Cu Control		4	2.343	1.952	2.734	2.305	2.085	2.677	0.1229	10.49%	-2.94%
FR_UFR1 + 20Cu		4	2.254	1.609	2.9	2.06	2.035	2.862	0.2028	18.00%	0.94%
GH_ER2 +15Cu		4	1.181	0.4596	1.902	1.135	0.6767	1.777	0.2266	38.38%	48.12%
CM_MC1 + 15Cu		4	1.604	1.076	2.132	1.478	1.367	2.092	0.166	20.69%	29.52%
LC_SLC + 15Cu		4	2.008	1.849	2.167	2.005	1.908	2.114	0.04997	4.98%	11.75%
FR_FRABCH + 20C		4	2.097	1.427	2.766	1.929	1.814	2.716	0.2103	20.06%	7.86%
FR_FRCP1 + 20Cu		4	1.699	1.29	2.108	1.729	1.358	1.98	0.1285	15.13%	25.34%
GH_FR1 + 20Cu		4	2.278	1.812	2.745	2.307	1.917	2.584	0.1465	12.86%	-0.12%
GH_ERC + 10Cu		4	2.248	1.979	2.517	2.217	2.095	2.463	0.08461	7.53%	1.22%
CM_MC2 + 20Cu		4	2.049	1.554	2.544	2.058	1.671	2.409	0.1556	15.19%	9.96%
RG_MIDAG + 15Cu		4	1.9	1.521	2.278	1.856	1.677	2.209	0.1189	12.52%	16.52%
EV_MC2 + 20Cu		4	2	1.594	2.406	1.937	1.765	2.361	0.1276	12.76%	12.10%
EV_HC1 + 20Cu		4	2.2	1.928	2.471	2.171	2.024	2.433	0.0853	7.75%	3.33%
LC_DCDS + 20Cu		4	2.111	1.845	2.377	2.162	1.875	2.245	0.08356	7.92%	7.22%
LC_LC3 + 20Cu		4	2.076	1.846	2.306	2.072	1.927	2.233	0.0723	6.96%	8.76%
LC_LC5 + 20Cu		4	2.19	1.749	2.631	2.166	1.906	2.523	0.1385	12.65%	3.75%
LC_LCDSSLCC20C		4	2.097	1.762	2.432	2.051	1.923	2.363	0.1054	10.05%	7.85%
FR_FR4 + 20Cu		4	2.013	1.388	2.639	1.85	1.754	2.599	0.1965	19.52%	11.53%
FR_FR2 + 20Cu		4	1.239	0.6549	1.824	1.13	0.96	1.738	0.1837	29.64%	45.54%
FR_MULTIPLATE2		4	2.352	1.754	2.949	2.25	2.019	2.888	0.1877	15.96%	-3.35%
FR_FRRD + 20Cu		4	2.338	1.844	2.832	2.304	2.016	2.729	0.1553	13.28%	-2.75%

Mean Dry Biomass-mg Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Lab Control		2.222	1.989	2.211	2.681
10Cu Control		2.109	2.051	2.048	2.45
15Cu Control	15	2.293	2.096	2.329	2.975
20Cu Control		2.297	2.085	2.313	2.677
FR_UFR1 + 20Cu		2.078	2.035	2.042	2.862
GH_ER2 +15Cu		1.17	1.777	0.6767	1.099
CM_MC1 + 15Cu		1.429	2.092	1.367	1.527
LC_SLC + 15Cu		2.071	1.939	1.908	2.114
FR_FRABCH + 20C		1.855	1.814	2.003	2.716
FR_FRCP1 + 20Cu		1.705	1.358	1.98	1.753
GH_FR1 + 20Cu		2.433	2.181	1.917	2.584
GH_ERC + 10Cu		2.095	2.463	2.131	2.302
CM_MC2 + 20Cu		1.963	1.671	2.153	2.409
RG_MIDAG + 15Cu		1.677	1.754	2.209	1.959
EV_MC2 + 20Cu		1.967	1.907	1.765	2.361
EV_HC1 + 20Cu		2.155	2.024	2.188	2.433
LC_DCDS + 20Cu		2.245	1.875	2.113	2.212
LC_LC3 + 20Cu		2.233	1.927	1.983	2.161
LC_LC5 + 20Cu		1.906	2.029	2.304	2.523
LC_LCDSSLCC20C		1.923	1.933	2.169	2.363
FR_FR4 + 20Cu		1.754	1.838	1.863	2.599
FR_FR2 + 20Cu		0.9653	0.96	1.738	1.294
FR_MULTIPLATE2		2.295	2.019	2.205	2.888
FR_FRRD + 20Cu		2.016	2.181	2.427	2.729

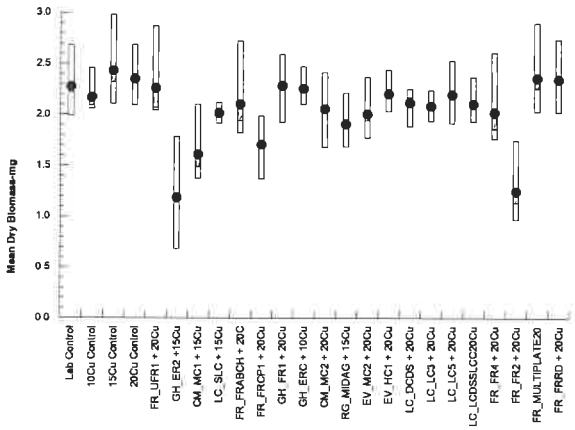
Analyst: KC QA: MG

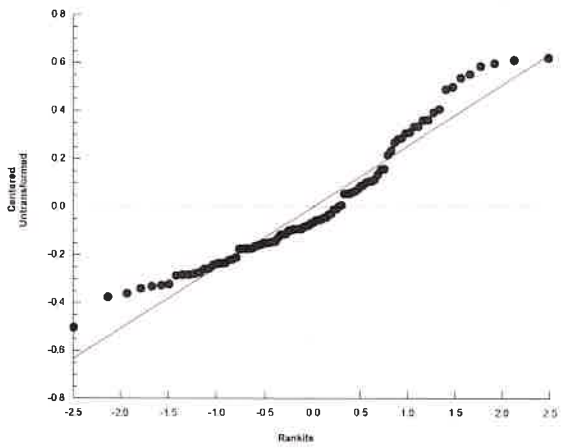
JUN 10 2021

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID:	20-7593-3127	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.9.4
Analyzed:	01 Jun-21 8:21	**Analysis:**	Nonparametric-Control vs Treatments	**Status Level:**	1

Graphics





Analyst: KL QA: MG

JUN 10 2021

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID:	00-7237-5326	**Endpoint:**	Hatch Rate	**CETIS Version:**	CETISv1.9.4
Analyzed:	21 May-21 12:37	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1
Batch ID:	16-2689-7673	**Test Type:**	32 Day Fathead Minnow Test	**Analyst:**	Kayla Knol
Start Date:	06 Mar-21	**Protocol:**	ASTM E1241-05 (2013)	**Diluent:**	Dechlorinated Tap Water
Ending Date:	07 Apr-21	**Species:**	Pimephales promelas	**Brine:**	
Test Length:	32d 0h	**Taxon:**	Actinopterygii	**Source:**	Aquatox, AR **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
Lab Control	08-8280-1106	02 Mar-21	03 Mar-21	96h	Teck Coal Ltd	
10Cu Control	01-9333-5370	02 Mar-21	03 Mar-21	96h		
15Cu Control	19-6548-0518	02 Mar-21	03 Mar-21	96h		
20Cu Control	00-8675-6744	02 Mar-21	03 Mar-21	96h		
FR_UFR1 + 20Cu	20-4721-8257	02 Mar-21	03 Mar-21	96h (4.6 °C)		
GH_ER2 +15Cu	01-1137-9253	02 Mar-21	03 Mar-21	96h (4.2 °C)		
CM_MC1 + 15Cu	01-3772-5048	02 Mar-21	03 Mar-21	96h (1 °C)		
LC_SLC + 15Cu	01-2380-6574	02 Mar-21	03 Mar-21	96h (3.1 °C)		
FR_FRABCH + 20C	08-4134-0746	02 Mar-21	03 Mar-21	96h (3.8 °C)		
FR_FRCP1 + 20Cu	11-2694-6466	02 Mar-21	03 Mar-21	96h (3 °C)		
GH_FR1 + 20Cu	20-1635-3152	02 Mar-21	03 Mar-21	96h (2.4 °C)		
GH_ERC + 10Cu	05-1950-5597	02 Mar-21	03 Mar-21	96h (4.1 °C)		
CM_MC2 + 20Cu	14-4685-1067	02 Mar-21	03 Mar-21	96h (0.3 °C)		
RG_MIDAG + 15Cu	21-3889-1829	02 Mar-21	03 Mar-21	96h (0.6 °C)		
EV_MC2 + 20Cu	05-6103-5191	02 Mar-21	03 Mar-21	96h (4.4 °C)		
EV_HC1 + 20Cu	12-5501-3302	02 Mar-21	03 Mar-21	96h (3.4 °C)		
LC_DCDS + 20Cu	04-1088-5978	02 Mar-21	03 Mar-21	96h (0.6 °C)		
LC_LC3 + 20Cu	14-7773-4190	02 Mar-21	03 Mar-21	96h (2.3 °C)		
LC_LC5 + 20Cu	01-7235-6798	02 Mar-21	03 Mar-21	96h (0.6 °C)		
LC_LCDSSLCC20C	06-4197-2641	02 Mar-21	03 Mar-21	96h (2.4 °C)		
FR_FR4 + 20Cu	10-9481-5020	02 Mar-21	03 Mar-21	96h (5.4 °C)		
FR_FR2 + 20Cu	00-3159-8672	02 Mar-21	03 Mar-21	96h (4.4 °C)		
FR_MULTIPLATE2	02-2179-0364	02 Mar-21	03 Mar-21	96h (2.9 °C)		
FR_FRRD + 20Cu	19-5167-8345	02 Mar-21	03 Mar-21	96h (6.2 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
Lab Control	Ambient Sample	Teck Coal Ltd	Lab Control	
10Cu Control	Ambient Sample	Teck Coal Ltd	10Cu Control	
15Cu Control	Ambient Sample	Teck Coal Ltd	15Cu Control	
20Cu Control	Ambient Sample	Teck Coal Ltd	20Cu Control	
FR_UFR1 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_UFR1_MON_2021-03-0	
GH_ER2 +15Cu	Ambient Sample	Teck Coal Ltd	GH_ER2_WS_2021-03-02_	
CM_MC1 + 15Cu	Ambient Sample	Teck Coal Ltd	CM_MC1_WS_2021-03-02	
LC_SLC + 15Cu	Ambient Sample	Teck Coal Ltd	LC_SLC_WS_2021-03-02_	
FR_FRABCH + 20C	Ambient Sample	Teck Coal Ltd	FR_FRABCH_MON_2021-	
FR_FRCP1 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FRCP1_MON_2021-03	
GH_FR1 + 20Cu	Ambient Sample	Teck Coal Ltd	GH_FR1_WS_2021-03-02_	
GH_ERC + 10Cu	Ambient Sample	Teck Coal Ltd	GH_ERC_WS_2021-03-02	
CM_MC2 + 20Cu	Ambient Sample	Teck Coal Ltd	CM_MC2_WS_2021-03-02	
RG_MIDAG + 15Cu	Ambient Sample	Teck Coal Ltd	RG_MIDAG_WS_2021-03-	
EV_MC2 + 20Cu	Ambient Sample	Teck Coal Ltd	EV_MC2_WS_2021_Q1_W	
EV_HC1 + 20Cu	Ambient Sample	Teck Coal Ltd	EV_HC1_WS_2021_Q1_W	
LC_DCDS + 20Cu	Ambient Sample	Teck Coal Ltd	LC_DCDS_WS_2021-03-02	
LC_LC3 + 20Cu	Ambient Sample	Teck Coal Ltd	LC_LC3_WS_2021-03-02_	
LC_LC5 + 20Cu	Ambient Sample	Teck Coal Ltd	LC_LC5_WS_2021-03-02_	
LC_LCDSSLCC20C	Ambient Sample	Teck Coal Ltd	LC_LCDSSLCC_WS_2021-	
FR_FR4 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FR4_WS_2021-03-02_	
FR_FR2 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FR2_WS_2021-03-02_	

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Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID:	00-7237-5326	**Endpoint:**	Hatch Rate	**CETIS Version:**	CETISv1.9.4
Analyzed:	21 May-21 12:37	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_MULTIPLATE2	Ambient Sample	Teck Coal Ltd	FR_MULTIPLATE_WS_202	
FR_FRRD + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FRRD_WS_2021-03-02	

Fisher Exact/Bonferroni Adj Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
15Cu Control		Lab Control	1.0000	Exact	1.0000	Non-Significant Effect
		10Cu Control	0.7521	Exact	1.0000	Non-Significant Effect
		20Cu Control	0.3093	Exact	1.0000	Non-Significant Effect
		FR_UFR1 + 20Cu	0.3093	Exact	1.0000	Non-Significant Effect
		GH_ER2 +15Cu	0.7521	Exact	1.0000	Non-Significant Effect
		CM_MC1 + 15Cu	0.7521	Exact	1.0000	Non-Significant Effect
		LC_SLC + 15Cu	0.7521	Exact	1.0000	Non-Significant Effect
		FR_FRABCH + 20C	0.7521	Exact	1.0000	Non-Significant Effect
		FR_FRCP1 + 20Cu	0.7521	Exact	1.0000	Non-Significant Effect
		GH_FR1 + 20Cu	0.1034	Exact	1.0000	Non-Significant Effect
		GH_ERC + 10Cu	0.7521	Exact	1.0000	Non-Significant Effect
		CM_MC2 + 20Cu	0.7521	Exact	1.0000	Non-Significant Effect
		RG_MIDAG + 15Cu	0.7521	Exact	1.0000	Non-Significant Effect
		EV_MC2 + 20Cu	0.1822	Exact	1.0000	Non-Significant Effect
		EV_HC1 + 20Cu	0.5000	Exact	1.0000	Non-Significant Effect
		LC_DCDS + 20Cu	0.0083	Exact	0.1907	Non-Significant Effect
		LC_LC3 + 20Cu	1.0000	Exact	1.0000	Non-Significant Effect
		LC_LC5 + 20Cu	0.7521	Exact	1.0000	Non-Significant Effect
		LC_LCDSSLCC20Cu	1.0000	Exact	1.0000	Non-Significant Effect
		FR_FR4 + 20Cu	0.7521	Exact	1.0000	Non-Significant Effect
		FR_FR2 + 20Cu	0.7521	Exact	1.0000	Non-Significant Effect
		FR_MULTIPLATE20	0.7521	Exact	1.0000	Non-Significant Effect
		FR_FRRD + 20Cu	0.1822	Exact	1.0000	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	3.165	3.37	0.1123	No Outliers Detected

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 00-7237-5326 **Endpoint:** Hatch Rate **CETIS Version:** CETISv1.9.4
Analyzed: 21 May-21 12:37 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Data Summary

Sample	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
Lab Control		60	0	60	1	0	-1.7%
10Cu Control		59	1	60	0.9833	0.01667	0.0%
15Cu Control	15	59	1	60	0.9833	0.01667	0.0%
20Cu Control		57	3	60	0.95	0.05	3.39%
FR_UFR1 + 20Cu		57	3	60	0.95	0.05	3.39%
GH_ER2 +15Cu		59	1	60	0.9833	0.01667	0.0%
CM_MC1 + 15Cu		59	1	60	0.9833	0.01667	0.0%
LC_SLC + 15Cu		59	1	60	0.9833	0.01667	0.0%
FR_FRABCH + 20C		59	1	60	0.9833	0.01667	0.0%
FR_FRCP1 + 20Cu		59	1	60	0.9833	0.01667	0.0%
GH_FR1 + 20Cu		55	5	60	0.9167	0.08333	6.78%
GH_ERC + 10Cu		59	1	60	0.9833	0.01667	0.0%
CM_MC2 + 20Cu		59	1	60	0.9833	0.01667	0.0%
RG_MIDAG + 15Cu		59	1	60	0.9833	0.01667	0.0%
EV_MC2 + 20Cu		56	4	60	0.9333	0.06667	5.09%
EV_HC1 + 20Cu		58	2	60	0.9667	0.03333	1.7%
LC_DCDS + 20Cu		51	9	60	0.85	0.15	13.56%
LC_LC3 + 20Cu		60	0	60	1	0	-1.7%
LC_LC5 + 20Cu		59	1	60	0.9833	0.01667	0.0%
LC_LCDSSLCC20C		60	0	60	1	0	-1.7%
FR_FR4 + 20Cu		59	1	60	0.9833	0.01667	0.0%
FR_FR2 + 20Cu		59	1	60	0.9833	0.01667	0.0%
FR_MULTIPLATE20		59	1	60	0.9833	0.01667	0.0%
FR_FRRD + 20Cu		56	4	60	0.9333	0.06667	5.09%

Hatch Rate Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Lab Control		1.0000	1.0000	1.0000	1.0000
10Cu Control		0.9333	1.0000	1.0000	1.0000
15Cu Control	15	1.0000	1.0000	1.0000	0.9333
20Cu Control		0.9333	0.8667	1.0000	1.0000
FR_UFR1 + 20Cu		0.8667	1.0000	1.0000	0.9333
GH_ER2 +15Cu		1.0000	1.0000	1.0000	0.9333
CM_MC1 + 15Cu		1.0000	1.0000	0.9333	1.0000
LC_SLC + 15Cu		0.9333	1.0000	1.0000	1.0000
FR_FRABCH + 20C		1.0000	1.0000	0.9333	1.0000
FR_FRCP1 + 20Cu		0.9333	1.0000	1.0000	1.0000
GH_FR1 + 20Cu		0.9333	0.8000	1.0000	0.9333
GH_ERC + 10Cu		1.0000	1.0000	0.9333	1.0000
CM_MC2 + 20Cu		1.0000	1.0000	1.0000	0.9333
RG_MIDAG + 15Cu		1.0000	0.9333	1.0000	1.0000
EV_MC2 + 20Cu		0.9333	0.8000	1.0000	1.0000
EV_HC1 + 20Cu		1.0000	0.9333	1.0000	0.9333
LC_DCDS + 20Cu		0.8000	0.9333	1.0000	0.6667
LC_LC3 + 20Cu		1.0000	1.0000	1.0000	1.0000
LC_LC5 + 20Cu		1.0000	1.0000	1.0000	0.9333
LC_LCDSSLCC20C		1.0000	1.0000	1.0000	1.0000
FR_FR4 + 20Cu		1.0000	1.0000	1.0000	0.9333
FR_FR2 + 20Cu		1.0000	1.0000	0.9333	1.0000
FR_MULTIPLATE2		0.9333	1.0000	1.0000	1.0000
FR_FRRD + 20Cu		0.9333	0.9333	1.0000	0.8667

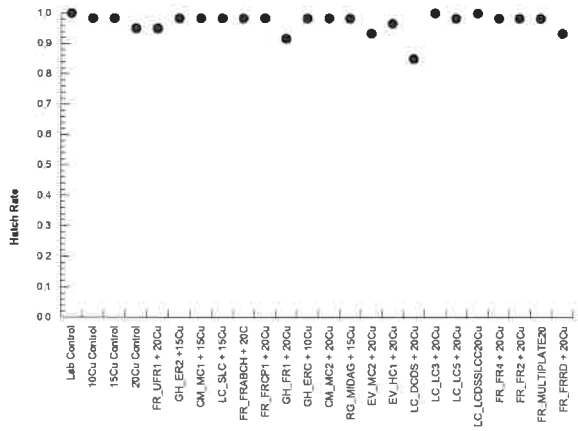
Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 00-7237-5326 **Endpoint:** Hatch Rate **CETIS Version:** CETISv1.9.4
Analyzed: 21 May-21 12:37 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Hatch Rate Binomials

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Lab Control		15/15	15/15	15/15	15/15
10Cu Control		14/15	15/15	15/15	15/15
15Cu Control	15	15/15	15/15	15/15	14/15
20Cu Control		14/15	13/15	15/15	15/15
FR_UFR1 + 20Cu		13/15	15/15	15/15	14/15
GH_ER2 +15Cu		15/15	15/15	15/15	14/15
CM_MC1 + 15Cu		15/15	15/15	14/15	15/15
LC_SLC + 15Cu		14/15	15/15	15/15	15/15
FR_FRABCH + 20C		15/15	15/15	14/15	15/15
FR_FRCP1 + 20Cu		14/15	15/15	15/15	15/15
GH_FR1 + 20Cu		14/15	12/15	15/15	14/15
GH_ERC + 10Cu		15/15	15/15	14/15	15/15
CM_MC2 + 20Cu		15/15	15/15	15/15	14/15
RG_MIDAG + 15Cu		15/15	14/15	15/15	15/15
EV_MC2 + 20Cu		14/15	12/15	15/15	15/15
EV_HC1 + 20Cu		15/15	14/15	15/15	14/15
LC_DCDS + 20Cu		12/15	14/15	15/15	10/15
LC_LC3 + 20Cu		15/15	15/15	15/15	15/15
LC_LC5 + 20Cu		15/15	15/15	15/15	14/15
LC_LCDSSLCC20C		15/15	15/15	15/15	15/15
FR_FR4 + 20Cu		15/15	15/15	15/15	14/15
FR_FR2 + 20Cu		15/15	15/15	14/15	15/15
FR_MULTIPLATE2		14/15	15/15	15/15	15/15
FR_FRRD + 20Cu		14/15	14/15	15/15	13/15

Graphics



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Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID:	02-4649-6369	**Endpoint:**	Length	**CETIS Version:**	CETISv1.9.4
Analyzed:	21 May-21 12:40	**Analysis:**	Parametric-Control vs Treatments	**Status Level:**	1
Batch ID:	16-2689-7673	**Test Type:**	32 Day Fathead Minnow Test	**Analyst:**	Kayla Knol
Start Date:	06 Mar-21	**Protocol:**	ASTM E1241-05 (2013)	**Diluent:**	Dechlorinated Tap Water
Ending Date:	07 Apr-21	**Species:**	Pimephales promelas	**Brine:**	
Test Length:	32d 0h	**Taxon:**	Actinopterygii	**Source:**	Aquatox, AR **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
Lab Control	08-8280-1106	02 Mar-21	03 Mar-21	96h	Teck Coal Ltd	
10Cu Control	01-9333-5370	02 Mar-21	03 Mar-21	96h		
15Cu Control	19-6548-0518	02 Mar-21	03 Mar-21	96h		
20Cu Control	00-8675-6744	02 Mar-21	03 Mar-21	96h		
FR_UFR1 + 20Cu	20-4721-8257	02 Mar-21	03 Mar-21	96h (4.6 °C)		
GH_ER2 +15Cu	01-1137-9253	02 Mar-21	03 Mar-21	96h (4.2 °C)		
CM_MC1 + 15Cu	01-3772-5048	02 Mar-21	03 Mar-21	96h (1 °C)		
LC_SLC + 15Cu	01-2380-6574	02 Mar-21	03 Mar-21	96h (3.1 °C)		
FR_FRABCH + 20C	08-4134-0746	02 Mar-21	03 Mar-21	96h (3.8 °C)		
FR_FRCP1 + 20Cu	11-2694-6466	02 Mar-21	03 Mar-21	96h (3 °C)		
GH_FR1 + 20Cu	20-1635-3152	02 Mar-21	03 Mar-21	96h (2.4 °C)		
GH_ERC + 10Cu	05-1950-5597	02 Mar-21	03 Mar-21	96h (4.1 °C)		
CM_MC2 + 20Cu	14-4685-1067	02 Mar-21	03 Mar-21	96h (0.3 °C)		
RG_MIDAG + 15Cu	21-3889-1829	02 Mar-21	03 Mar-21	96h (0.6 °C)		
EV_MC2 + 20Cu	05-6103-5191	02 Mar-21	03 Mar-21	96h (4.4 °C)		
EV_HC1 + 20Cu	12-5501-3302	02 Mar-21	03 Mar-21	96h (3.4 °C)		
LC_DCDS + 20Cu	04-1088-5978	02 Mar-21	03 Mar-21	96h (0.6 °C)		
LC_LC3 + 20Cu	14-7773-4190	02 Mar-21	03 Mar-21	96h (2.3 °C)		
LC_LC5 + 20Cu	01-7235-6798	02 Mar-21	03 Mar-21	96h (0.6 °C)		
LC_LCDSSLCC20C	06-4197-2641	02 Mar-21	03 Mar-21	96h (2.4 °C)		
FR_FR4 + 20Cu	10-9481-5020	02 Mar-21	03 Mar-21	96h (5.4 °C)		
FR_FR2 + 20Cu	00-3159-8672	02 Mar-21	03 Mar-21	96h (4.4 °C)		
FR_MULTIPLATE2	02-2179-0364	02 Mar-21	03 Mar-21	96h (2.9 °C)		
FR_FRRD + 20Cu	19-5167-8345	02 Mar-21	03 Mar-21	96h (6.2 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
Lab Control	Ambient Sample	Teck Coal Ltd	Lab Control	
10Cu Control	Ambient Sample	Teck Coal Ltd	10Cu Control	
15Cu Control	Ambient Sample	Teck Coal Ltd	15Cu Control	
20Cu Control	Ambient Sample	Teck Coal Ltd	20Cu Control	
FR_UFR1 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_UFR1_MON_2021-03-0	
GH_ER2 +15Cu	Ambient Sample	Teck Coal Ltd	GH_ER2_WS_2021-03-02_	
CM_MC1 + 15Cu	Ambient Sample	Teck Coal Ltd	CM_MC1_WS_2021-03-02	
LC_SLC + 15Cu	Ambient Sample	Teck Coal Ltd	LC_SLC_WS_2021-03-02_	
FR_FRABCH + 20C	Ambient Sample	Teck Coal Ltd	FR_FRABCH_MON_2021-	
FR_FRCP1 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FRCP1_MON_2021-03	
GH_FR1 + 20Cu	Ambient Sample	Teck Coal Ltd	GH_FR1_WS_2021-03-02_	
GH_ERC + 10Cu	Ambient Sample	Teck Coal Ltd	GH_ERC_WS_2021-03-02	
CM_MC2 + 20Cu	Ambient Sample	Teck Coal Ltd	CM_MC2_WS_2021-03-02	
RG_MIDAG + 15Cu	Ambient Sample	Teck Coal Ltd	RG_MIDAG_WS_2021-03-	
EV_MC2 + 20Cu	Ambient Sample	Teck Coal Ltd	EV_MC2_WS_2021_Q1_W	
EV_HC1 + 20Cu	Ambient Sample	Teck Coal Ltd	EV_HC1_WS_2021_Q1_W	
LC_DCDS + 20Cu	Ambient Sample	Teck Coal Ltd	LC_DCDS_WS_2021-03-02	
LC_LC3 + 20Cu	Ambient Sample	Teck Coal Ltd	LC_LC3_WS_2021-03-02_	
LC_LC5 + 20Cu	Ambient Sample	Teck Coal Ltd	LC_LC5_WS_2021-03-02_	
LC_LCDSSLCC20C	Ambient Sample	Teck Coal Ltd	LC_LCDSSLCC_WS_2021-	
FR_FR4 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FR4_WS_2021-03-02_	
FR_FR2 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FR2_WS_2021-03-02_	

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 02-4649-6369 **Endpoint:** Length **CETIS Version:** CETISv1.9.4
Analyzed: 21 May-21 12:40 **Analysis:** Parametric-Control vs Treatments **Status Level:** 1

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_MULTIPLATE2	Ambient Sample	Teck Coal Ltd	FR_MULTIPLATE_WS_202	
FR_FRRD + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FRRD_WS_2021-03-02	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	Lab Control passed length	12.17%
		10Cu Control passed length	12.17%
		20Cu Control passed length	12.17%
		FR_UFR1 + 20Cu passed length	12.17%
		GH_ER2 +15Cu passed length	12.17%
		CM_MC1 + 15Cu passed length	12.17%
		LC_SLC + 15Cu passed length	12.17%
		FR_FRABCH + 20C passed length	12.17%
		FR_FRCP1 + 20Cu passed length	12.17%
		GH_FR1 + 20Cu passed length	12.17%
		GH_ERC + 10Cu passed length	12.17%
		CM_MC2 + 20Cu passed length	12.17%
		RG_MIDAG + 15Cu passed length	12.17%
		EV_MC2 + 20Cu passed length	12.17%
		EV_HC1 + 20Cu passed length	12.17%
		LC_DCDS + 20Cu passed length	12.17%
		LC_LC3 + 20Cu passed length	12.17%
		LC_LC5 + 20Cu passed length	12.17%
		LC_LCDSSLCC20Cu passed length	12.17%
		FR_FR4 + 20Cu passed length	12.17%
		FR_FR2 + 20Cu passed length	12.17%
		FR_MULTIPLATE20 passed length	12.17%
		FR_FRRD + 20Cu passed length	12.17%

Dunnett Multiple Comparison Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
15Cu Control		Lab Control	0.4751	2.744	1.349	6	CDF	0.8691	Non-Significant Effect
		10Cu Control	0.8448	2.744	1.349	6	CDF	0.7424	Non-Significant Effect
		20Cu Control	-0.1966	2.744	1.349	6	CDF	0.9764	Non-Significant Effect
		FR_UFR1 + 20Cu	1.362	2.744	1.349	6	CDF	0.5005	Non-Significant Effect
		GH_ER2 +15Cu	0.4817	2.744	1.349	6	CDF	0.8673	Non-Significant Effect
		CM_MC1 + 15Cu	0.3177	2.744	1.349	6	CDF	0.9072	Non-Significant Effect
		LC_SLC + 15Cu	-0.7601	2.744	1.349	6	CDF	0.9966	Non-Significant Effect
		FR_FRABCH + 20C	1.178	2.744	1.349	6	CDF	0.5913	Non-Significant Effect
		FR_FRCP1 + 20Cu	-0.1948	2.744	1.349	6	CDF	0.9762	Non-Significant Effect
		GH_FR1 + 20Cu	0.9275	2.744	1.349	6	CDF	0.7075	Non-Significant Effect
		GH_ERC + 10Cu	1.206	2.744	1.349	6	CDF	0.5776	Non-Significant Effect
		CM_MC2 + 20Cu	1.936	2.744	1.349	6	CDF	0.2414	Non-Significant Effect
		RG_MIDAG + 15Cu	0.6354	2.744	1.349	6	CDF	0.8205	Non-Significant Effect
		EV_MC2 + 20Cu	0.6939	2.744	1.349	6	CDF	0.8003	Non-Significant Effect
		EV_HC1 + 20Cu	1.038	2.744	1.349	6	CDF	0.6577	Non-Significant Effect
		LC_DCDS + 20Cu	-0.1717	2.744	1.349	6	CDF	0.9745	Non-Significant Effect
		LC_LC3 + 20Cu	0.7175	2.744	1.349	6	CDF	0.7918	Non-Significant Effect
		LC_LC5 + 20Cu	0.05568	2.744	1.349	6	CDF	0.9516	Non-Significant Effect
		LC_LCDSSLCC20Cu	0.8007	2.744	1.349	6	CDF	0.7602	Non-Significant Effect
		FR_FR4 + 20Cu	-0.07433	2.744	1.349	6	CDF	0.9662	Non-Significant Effect
		FR_FR2 + 20Cu	1.295	2.744	1.349	6	CDF	0.5335	Non-Significant Effect
		FR_MULTIPLATE20	0.3933	2.744	1.349	6	CDF	0.8901	Non-Significant Effect
		FR_FRRD + 20Cu	0.5507	2.744	1.349	6	CDF	0.8474	Non-Significant Effect

Auxiliary Tests

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 02-4649-6369 **Endpoint:** Length **CETIS Version:** CETISv1.9.4
Analyzed: 21 May-21 12:40 **Analysis:** Parametric-Control vs Treatments **Status Level:** 1

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	3.392	3.37	0.0458	Outlier Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	8.62615	0.37505	23	0.7753	0.7491	Non-Significant Effect
Error	34.8279	0.483721	72			
Total	43.4541		95			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Variances	Bartlett Equality of Variance Test	31.32	35.17	0.1151	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9841	0.9737	0.3005	Normal Distribution

Length Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
Lab Control		4	10.85	10.2	11.5	10.74	10.5	11.42	0.2039	3.76%	0.00%
10Cu Control		4	10.67	10.19	11.15	10.69	10.29	11	0.1513	2.84%	1.68%
15Cu Control	15	4	11.08	9.919	12.25	11	10.33	12	0.3658	6.60%	-2.15%
20Cu Control		4	11.18	10.17	12.19	10.96	10.69	12.11	0.3171	5.67%	-3.04%
FR_UFR1 + 20Cu		4	10.41	9.005	11.82	10.04	9.857	11.73	0.4425	8.50%	4.02%
GH_ER2 +15Cu		4	10.85	10.27	11.43	10.8	10.5	11.29	0.182	3.36%	0.03%
CM_MC1 + 15Cu		4	10.93	9.723	12.13	10.83	10.17	11.88	0.3782	6.92%	-0.71%
LC_SLC + 15Cu		4	11.46	10.55	12.37	11.45	10.93	12	0.2857	4.99%	-5.60%
FR_FRABCH + 20C		4	10.5	9.776	11.23	10.47	10	11.08	0.2288	4.36%	3.18%
FR_FRCP1 + 20Cu		4	11.18	10.1	12.26	11.13	10.45	12	0.3392	6.07%	-3.04%
GH_FR1 + 20Cu		4	10.63	9.531	11.72	10.72	9.846	11.23	0.3445	6.48%	2.05%
GH_ERC + 10Cu		4	10.49	10.24	10.74	10.48	10.31	10.69	0.0791	1.51%	3.31%
CM_MC2 + 20Cu		4	10.13	8.98	11.28	10.01	9.429	11.08	0.3617	7.14%	6.62%
RG_MIDAG + 15Cu		4	10.77	10.19	11.35	10.72	10.4	11.25	0.1826	3.39%	0.73%
EV_MC2 + 20Cu		4	10.74	9.791	11.69	10.76	10.08	11.36	0.2987	5.56%	0.99%
EV_HC1 + 20Cu		4	10.57	10.15	10.99	10.54	10.31	10.9	0.1325	2.51%	2.55%
LC_DCDS + 20Cu		4	11.17	9.661	12.67	11.06	10.18	12.38	0.4734	8.48%	-2.93%
LC_LC3 + 20Cu		4	10.73	9.975	11.49	10.77	10.13	11.25	0.2375	4.43%	1.10%
LC_LC5 + 20Cu		4	11.06	9.583	12.53	10.93	10.07	12.3	0.4627	8.37%	-1.90%
LC_LCDSSLCC20C		4	10.69	10.4	10.98	10.66	10.5	10.93	0.09091	1.70%	1.48%
FR_FR4 + 20Cu		4	11.12	10.17	12.07	11.06	10.45	11.9	0.298	5.36%	-2.49%
FR_FR2 + 20Cu		4	10.45	7.854	13.04	10.14	9	12.5	0.8146	15.60%	3.72%
FR_MULTIPLATE2		4	10.89	9.947	11.83	10.89	10.23	11.55	0.2964	5.44%	-0.37%
FR_FRRD + 20Cu		4	10.81	9.242	12.38	10.83	9.917	11.67	0.4934	9.13%	0.34%

JUN 10 2021

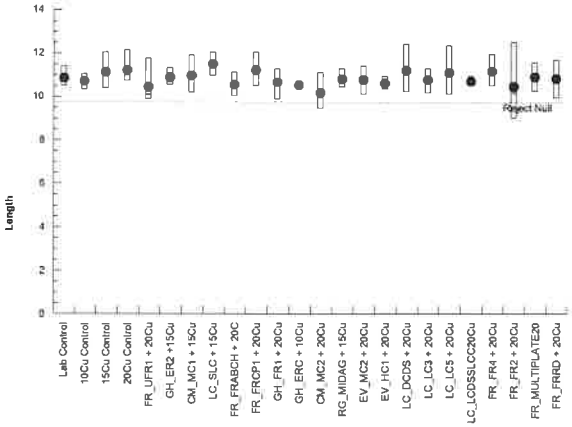
Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

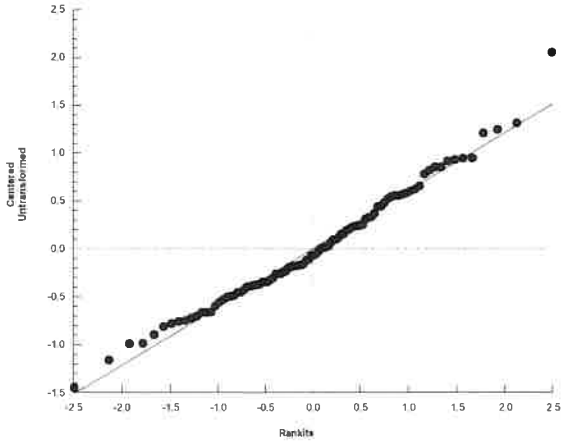
Analysis ID: 02-4649-6369 **Endpoint:** Length **CETIS Version:** CETISv1.9.4
Analyzed: 21 May-21 12:40 **Analysis:** Parametric-Control vs Treatments **Status Level:** 1

Length Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Lab Control		10.5	10.62	11.42	10.87
10Cu Control		10.79	11	10.29	10.6
15Cu Control	15	10.69	10.33	12	11.31
20Cu Control		10.92	10.69	12.11	11
FR_UFR1 + 20Cu		9.917	9.857	10.15	11.73
GH_ER2 +15Cu		10.5	11.29	11	10.6
CM_MC1 + 15Cu		10.5	11.88	10.17	11.17
LC_SLC + 15Cu		12	11.9	10.93	11
FR_FRABCH + 20C		10.33	10	10.6	11.08
FR_FRCP1 + 20Cu		12	10.83	10.45	11.43
GH_FR1 + 20Cu		11.18	10.25	9.846	11.23
GH_ERC + 10Cu		10.5	10.31	10.69	10.46
CM_MC2 + 20Cu		9.429	9.733	10.29	11.08
RG_MIDAG + 15Cu		10.4	10.6	10.83	11.25
EV_MC2 + 20Cu		10.08	11.11	10.42	11.36
EV_HC1 + 20Cu		10.67	10.42	10.31	10.9
LC_DCDS + 20Cu		12.38	10.18	10.71	11.4
LC_LC3 + 20Cu		10.92	10.13	10.62	11.25
LC_LC5 + 20Cu		10.07	10.86	11	12.3
LC_LCDSSLCC20C		10.71	10.5	10.62	10.93
FR_FR4 + 20Cu		11	10.45	11.12	11.9
FR_FR2 + 20Cu		9.286	9	11	12.5
FR_MULTIPLATE2		11.2	10.58	10.23	11.55
FR_FRRD + 20Cu		9.917	10	11.67	11.67

Graphics





CETIS Analytical Report

Test Code/ID: Lab Control FM / 11-1126-9670

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID:	00-9236-2226	**Endpoint:**	Proportion Normal	**CETIS Version:**	CETISv1.9.4
Analyzed:	01 Jun-21 8:20	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1
Batch ID:	16-2689-7673	**Test Type:**	32 Day Fathead Minnow Test	**Analyst:**	Kayla Knol
Start Date:	06 Mar-21	**Protocol:**	ASTM E1241-05 (2013)	**Diluent:**	Dechlorinated Tap Water
Ending Date:	07 Apr-21	**Species:**	Pimephales promelas	**Brine:**	
Test Length:	32d 0h	**Taxon:**	Actinopterygii	**Source:**	Aquatox, AR **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
Lab Control	08-8280-1106	02 Mar-21	03 Mar-21	96h	Teck Coal Ltd	
10Cu Control	01-9333-5370	02 Mar-21	03 Mar-21	96h		
15Cu Control	19-6548-0518	02 Mar-21	03 Mar-21	96h		
20Cu Control	00-8675-6744	02 Mar-21	03 Mar-21	96h		
FR_UFR1 + 20Cu	20-4721-8257	02 Mar-21	03 Mar-21	96h (4.6 °C)		
GH_ER2 +15Cu	01-1137-9253	02 Mar-21	03 Mar-21	96h (4.2 °C)		
CM_MC1 + 15Cu	01-3772-5048	02 Mar-21	03 Mar-21	96h (1 °C)		
LC_SLC + 15Cu	01-2380-6574	02 Mar-21	03 Mar-21	96h (3.1 °C)		
FR_FRABCH + 20C	08-4134-0746	02 Mar-21	03 Mar-21	96h (3.8 °C)		
FR_FRCP1 + 20Cu	11-2694-6466	02 Mar-21	03 Mar-21	96h (3 °C)		
GH_FR1 + 20Cu	20-1635-3152	02 Mar-21	03 Mar-21	96h (2.4 °C)		
GH_ERC + 10Cu	05-1950-5597	02 Mar-21	03 Mar-21	96h (4.1 °C)		
CM_MC2 + 20Cu	14-4685-1067	02 Mar-21	03 Mar-21	96h (0.3 °C)		
RG_MIDAG + 15Cu	21-3889-1829	02 Mar-21	03 Mar-21	96h (0.6 °C)		
EV_MC2 + 20Cu	05-6103-5191	02 Mar-21	03 Mar-21	96h (4.4 °C)		
EV_HC1 + 20Cu	12-5501-3302	02 Mar-21	03 Mar-21	96h (3.4 °C)		
LC_DCDS + 20Cu	04-1088-5978	02 Mar-21	03 Mar-21	96h (0.6 °C)		
LC_LC3 + 20Cu	14-7773-4190	02 Mar-21	03 Mar-21	96h (2.3 °C)		
LC_LC5 + 20Cu	01-7235-6798	02 Mar-21	03 Mar-21	96h (0.6 °C)		
LC_LCDSSLCC20C	06-4197-2641	02 Mar-21	03 Mar-21	96h (2.4 °C)		
FR_FR4 + 20Cu	10-9481-5020	02 Mar-21	03 Mar-21	96h (5.4 °C)		
FR_FR2 + 20Cu	00-3159-8672	02 Mar-21	03 Mar-21	96h (4.4 °C)		
FR_MULTIPLATE2	02-2179-0364	02 Mar-21	03 Mar-21	96h (2.9 °C)		
FR_FRRD + 20Cu	19-5167-8345	02 Mar-21	03 Mar-21	96h (6.2 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
Lab Control	Ambient Sample	Teck Coal Ltd	Lab Control	
10Cu Control	Ambient Sample	Teck Coal Ltd	10Cu Control	
15Cu Control	Ambient Sample	Teck Coal Ltd	15Cu Control	
20Cu Control	Ambient Sample	Teck Coal Ltd	20Cu Control	
FR_UFR1 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_UFR1_MON_2021-03-0	
GH_ER2 +15Cu	Ambient Sample	Teck Coal Ltd	GH_ER2_WS_2021-03-02_	
CM_MC1 + 15Cu	Ambient Sample	Teck Coal Ltd	CM_MC1_WS_2021-03-02	
LC_SLC + 15Cu	Ambient Sample	Teck Coal Ltd	LC_SLC_WS_2021-03-02_	
FR_FRABCH + 20C	Ambient Sample	Teck Coal Ltd	FR_FRABCH_MON_2021-	
FR_FRCP1 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FRCP1_MON_2021-03	
GH_FR1 + 20Cu	Ambient Sample	Teck Coal Ltd	GH_FR1_WS_2021-03-02_	
GH_ERC + 10Cu	Ambient Sample	Teck Coal Ltd	GH_ERC_WS_2021-03-02	
CM_MC2 + 20Cu	Ambient Sample	Teck Coal Ltd	CM_MC2_WS_2021-03-02	
RG_MIDAG + 15Cu	Ambient Sample	Teck Coal Ltd	RG_MIDAG_WS_2021-03-	
EV_MC2 + 20Cu	Ambient Sample	Teck Coal Ltd	EV_MC2_WS_2021_Q1_W	
EV_HC1 + 20Cu	Ambient Sample	Teck Coal Ltd	EV_HC1_WS_2021_Q1_W	
LC_DCDS + 20Cu	Ambient Sample	Teck Coal Ltd	LC_DCDS_WS_2021-03-02	
LC_LC3 + 20Cu	Ambient Sample	Teck Coal Ltd	LC_LC3_WS_2021-03-02_	
LC_LC5 + 20Cu	Ambient Sample	Teck Coal Ltd	LC_LC5_WS_2021-03-02_	
LC_LCDSSLCC20C	Ambient Sample	Teck Coal Ltd	LC_LCDSSLCC_WS_2021-	
FR_FR4 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FR4_WS_2021-03-02_	
FR_FR2 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FR2_WS_2021-03-02_	

Analyst: KSC QA: MG

JUN 10 2021

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID:	00-9236-2226	**Endpoint:**	Proportion Normal	**CETIS Version:**	CETISv1.9.4
Analyzed:	01 Jun-21 8:20	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_MULTIPLATE2	Ambient Sample	Teck Coal Ltd	FR_MULTIPLATE_WS_202	
FR_FRRD + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FRRD_WS_2021-03-02	

Fisher Exact/Bonferroni Adj Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
15Cu Control		Lab Control	1.0000	Exact	1.0000	Non-Significant Effect
		10Cu Control	1.0000	Exact	1.0000	Non-Significant Effect
		20Cu Control	0.4898	Exact	1.0000	Non-Significant Effect
		FR_UFR1 + 20Cu	1.0000	Exact	1.0000	Non-Significant Effect
		GH_ER2 +15Cu*	0.0010	Exact	0.0238	Significant Effect
		CM_MC1 + 15Cu*	0.0015	Exact	0.0337	Significant Effect
		LC_SLC + 15Cu	1.0000	Exact	1.0000	Non-Significant Effect
		FR_FRABCH + 20C	0.2322	Exact	1.0000	Non-Significant Effect
		FR_FRCP1 + 20Cu	0.3671	Exact	1.0000	Non-Significant Effect
		GH_FR1 + 20Cu	0.1175	Exact	1.0000	Non-Significant Effect
		GH_ERC + 10Cu	0.0037	Exact	0.0857	Non-Significant Effect
		CM_MC2 + 20Cu	0.2767	Exact	1.0000	Non-Significant Effect
		RG_MIDAG + 15Cu	0.2164	Exact	1.0000	Non-Significant Effect
		EV_MC2 + 20Cu	0.4792	Exact	1.0000	Non-Significant Effect
		EV_HC1 + 20Cu	0.4845	Exact	1.0000	Non-Significant Effect
		LC_DCDS + 20Cu	0.2111	Exact	1.0000	Non-Significant Effect
		LC_LC3 + 20Cu	0.2623	Exact	1.0000	Non-Significant Effect
		LC_LC5 + 20Cu	1.0000	Exact	1.0000	Non-Significant Effect
		LC_LCDSSLCC20Cu	0.5146	Exact	1.0000	Non-Significant Effect
		FR_FR4 + 20Cu	1.0000	Exact	1.0000	Non-Significant Effect
		FR_FR2 + 20Cu	0.1200	Exact	1.0000	Non-Significant Effect
		FR_MULTIPLATE20	1.0000	Exact	1.0000	Non-Significant Effect
		FR_FRRD + 20Cu	0.2057	Exact	1.0000	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	4.105	3.37	0.0017	Outlier Detected

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 00-9236-2226 **Endpoint:** Proportion Normal **CETIS Version:** CETISv1.9.4
Analyzed: 01 Jun-21 8:20 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Data Summary

Sample	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
Lab Control		54	0	54	1	0	0.0%
10Cu Control		56	0	56	1	0	0.0%
15Cu Control	15	50	0	50	1	0	0.0%
20Cu Control		47	1	48	0.9792	0.02083	2.08%
FR_UFR1 + 20Cu		50	0	50	1	0	0.0%
GH_ER2 +15Cu		14	5	19	0.7368	0.2632	26.32%
CM_MC1 + 15Cu		22	6	28	0.7857	0.2143	21.43%
LC_SLC + 15Cu		47	0	47	1	0	0.0%
FR_FRABCH + 20C		45	2	47	0.9574	0.04255	4.26%
FR_FRCP1 + 20Cu		28	1	29	0.9655	0.03448	3.45%
GH_FR1 + 20Cu		46	3	49	0.9388	0.06122	6.12%
GH_ERC + 10Cu		45	8	53	0.8491	0.1509	15.09%
CM_MC2 + 20Cu		54	2	56	0.9643	0.03571	3.57%
RG_MIDAG + 15Cu		42	2	44	0.9545	0.04545	4.55%
EV_MC2 + 20Cu		45	1	46	0.9783	0.02174	2.17%
EV_HC1 + 20Cu		46	1	47	0.9787	0.02128	2.13%
LC_DCDS + 20Cu		41	2	43	0.9535	0.04651	4.65%
LC_LC3 + 20Cu		51	2	53	0.9623	0.03774	3.77%
LC_LC5 + 20Cu		52	0	52	1	0	0.0%
LC_LCDSSLCC20C		52	1	53	0.9811	0.01887	1.89%
FR_FR4 + 20Cu		38	0	38	1	0	0.0%
FR_FR2 + 20Cu		25	2	27	0.9259	0.07407	7.41%
FR_MULTIPLATE20		46	0	46	1	0	0.0%
FR_FRRD + 20Cu		40	2	42	0.9524	0.04762	4.76%

Proportion Normal Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Lab Control		1.0000	1.0000	1.0000	1.0000
10Cu Control		1.0000	1.0000	1.0000	1.0000
15Cu Control	15	1.0000	1.0000	1.0000	1.0000
20Cu Control		0.9167	1.0000	1.0000	1.0000
FR_UFR1 + 20Cu		1.0000	1.0000	1.0000	1.0000
GH_ER2 +15Cu		0.7500	0.8571	1.0000	0.4000
CM_MC1 + 15Cu		0.6250	0.8750	0.6667	1.0000
LC_SLC + 15Cu		1.0000	1.0000	1.0000	1.0000
FR_FRABCH + 20C		1.0000	1.0000	0.8000	1.0000
FR_FRCP1 + 20Cu		1.0000	0.8333	1.0000	1.0000
GH_FR1 + 20Cu		1.0000	1.0000	0.9231	0.8462
GH_ERC + 10Cu		0.7857	0.7692	0.9231	0.9231
CM_MC2 + 20Cu		1.0000	0.9333	0.9286	1.0000
RG_MIDAG + 15Cu		0.9000	1.0000	1.0000	0.9167
EV_MC2 + 20Cu		0.9231	1.0000	1.0000	1.0000
EV_HC1 + 20Cu		0.9167	1.0000	1.0000	1.0000
LC_DCDS + 20Cu		1.0000	0.9091	0.9286	1.0000
LC_LC3 + 20Cu		1.0000	0.9333	1.0000	0.9167
LC_LC5 + 20Cu		1.0000	1.0000	1.0000	1.0000
LC_LCDSSLCC20C		1.0000	0.9167	1.0000	1.0000
FR_FR4 + 20Cu		1.0000	1.0000	1.0000	1.0000
FR_FR2 + 20Cu		0.8571	0.8571	1.0000	1.0000
FR_MULTIPLATE2		1.0000	1.0000	1.0000	1.0000
FR_FRRD + 20Cu		0.9167	0.9167	1.0000	1.0000

JUN 10 2021

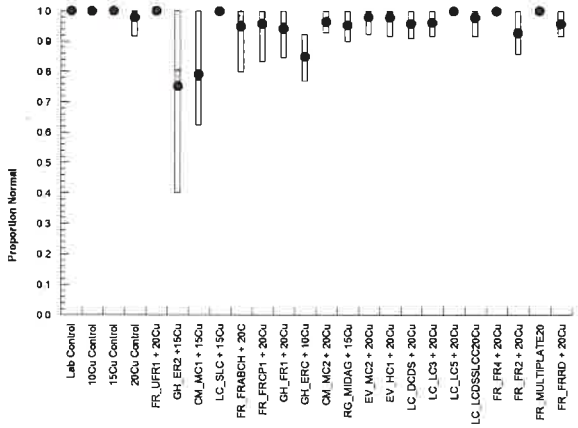
Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 00-9236-2226 **Endpoint:** Proportion Normal **CETIS Version:** CETISv1.9.4
Analyzed: 01 Jun-21 8:20 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Proportion Normal Binomials

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Lab Control		14/14	13/13	12/12	15/15
10Cu Control		14/14	13/13	14/14	15/15
15Cu Control	15	13/13	15/15	9/9	13/13
20Cu Control		11/12	13/13	9/9	14/14
FR_UFR1 + 20Cu		12/12	14/14	13/13	11/11
GH_ER2 +15Cu		3/4	6/7	3/3	2/5
CM_MC1 + 15Cu		5/8	7/8	4/6	6/6
LC_SLC + 15Cu		9/9	10/10	14/14	14/14
FR_FRABCH + 20C		12/12	13/13	8/10	12/12
FR_FRCP1 + 20Cu		5/5	5/6	11/11	7/7
GH_FR1 + 20Cu		11/11	12/12	12/13	11/13
GH_ERC + 10Cu		11/14	10/13	12/13	12/13
CM_MC2 + 20Cu		14/14	14/15	13/14	13/13
RG_MIDAG + 15Cu		9/10	10/10	12/12	11/12
EV_MC2 + 20Cu		12/13	9/9	12/12	11/11
EV_HC1 + 20Cu		11/12	12/12	13/13	10/10
LC_DCDS + 20Cu		8/8	10/11	13/14	10/10
LC_LC3 + 20Cu		13/13	14/15	13/13	11/12
LC_LC5 + 20Cu		15/15	14/14	13/13	10/10
LC_LCDSSLCC20C		14/14	11/12	13/13	14/14
FR_FR4 + 20Cu		9/9	11/11	8/8	10/10
FR_FR2 + 20Cu		6/7	6/7	9/9	4/4
FR_MULTIPLATE2		10/10	12/12	13/13	11/11
FR_FRRD + 20Cu		11/12	11/12	9/9	9/9

Graphics



JUN 10 2021

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID:	06-0570-6724	**Endpoint:**	Post Hatch Survival	**CETIS Version:**	CETISv1.9.4
Analyzed:	21 May-21 12:37	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1
Batch ID:	16-2689-7673	**Test Type:**	32 Day Fathead Minnow Test	**Analyst:**	Kayla Knol
Start Date:	06 Mar-21	**Protocol:**	ASTM E1241-05 (2013)	**Diluent:**	Dechlorinated Tap Water
Ending Date:	07 Apr-21	**Species:**	Pimephales promelas	**Brine:**	
Test Length:	32d 0h	**Taxon:**	Actinopterygii	**Source:**	Aquatox, AR **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
Lab Control	08-8280-1106	02 Mar-21	03 Mar-21	96h	Teck Coal Ltd	
10Cu Control	01-9333-5370	02 Mar-21	03 Mar-21	96h		
15Cu Control	19-6548-0518	02 Mar-21	03 Mar-21	96h		
20Cu Control	00-8675-6744	02 Mar-21	03 Mar-21	96h		
FR_UFR1 + 20Cu	20-4721-8257	02 Mar-21	03 Mar-21	96h (4.6 °C)		
GH_ER2 +15Cu	01-1137-9253	02 Mar-21	03 Mar-21	96h (4.2 °C)		
CM_MC1 + 15Cu	01-3772-5048	02 Mar-21	03 Mar-21	96h (1 °C)		
LC_SLC + 15Cu	01-2380-6574	02 Mar-21	03 Mar-21	96h (3.1 °C)		
FR_FRABCH + 20C	08-4134-0746	02 Mar-21	03 Mar-21	96h (3.8 °C)		
FR_FRCP1 + 20Cu	11-2694-6466	02 Mar-21	03 Mar-21	96h (3 °C)		
GH_FR1 + 20Cu	20-1635-3152	02 Mar-21	03 Mar-21	96h (2.4 °C)		
GH_ERC + 10Cu	05-1950-5597	02 Mar-21	03 Mar-21	96h (4.1 °C)		
CM_MC2 + 20Cu	14-4685-1067	02 Mar-21	03 Mar-21	96h (0.3 °C)		
RG_MIDAG + 15Cu	21-3889-1829	02 Mar-21	03 Mar-21	96h (0.6 °C)		
EV_MC2 + 20Cu	05-6103-5191	02 Mar-21	03 Mar-21	96h (4.4 °C)		
EV_HC1 + 20Cu	12-5501-3302	02 Mar-21	03 Mar-21	96h (3.4 °C)		
LC_DCDS + 20Cu	04-1088-5978	02 Mar-21	03 Mar-21	96h (0.6 °C)		
LC_LC3 + 20Cu	14-7773-4190	02 Mar-21	03 Mar-21	96h (2.3 °C)		
LC_LC5 + 20Cu	01-7235-6798	02 Mar-21	03 Mar-21	96h (0.6 °C)		
LC_LCDSSLCC20C	06-4197-2641	02 Mar-21	03 Mar-21	96h (2.4 °C)		
FR_FR4 + 20Cu	10-9481-5020	02 Mar-21	03 Mar-21	96h (5.4 °C)		
FR_FR2 + 20Cu	00-3159-8672	02 Mar-21	03 Mar-21	96h (4.4 °C)		
FR_MULTIPLATE2	02-2179-0364	02 Mar-21	03 Mar-21	96h (2.9 °C)		
FR_FRRD + 20Cu	19-5167-8345	02 Mar-21	03 Mar-21	96h (6.2 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
Lab Control	Ambient Sample	Teck Coal Ltd	Lab Control	
10Cu Control	Ambient Sample	Teck Coal Ltd	10Cu Control	
15Cu Control	Ambient Sample	Teck Coal Ltd	15Cu Control	
20Cu Control	Ambient Sample	Teck Coal Ltd	20Cu Control	
FR_UFR1 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_UFR1_MON_2021-03-0	
GH_ER2 +15Cu	Ambient Sample	Teck Coal Ltd	GH_ER2_WS_2021-03-02_	
CM_MC1 + 15Cu	Ambient Sample	Teck Coal Ltd	CM_MC1_WS_2021-03-02	
LC_SLC + 15Cu	Ambient Sample	Teck Coal Ltd	LC_SLC_WS_2021-03-02_	
FR_FRABCH + 20C	Ambient Sample	Teck Coal Ltd	FR_FRABCH_MON_2021-	
FR_FRCP1 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FRCP1_MON_2021-03	
GH_FR1 + 20Cu	Ambient Sample	Teck Coal Ltd	GH_FR1_WS_2021-03-02_	
GH_ERC + 10Cu	Ambient Sample	Teck Coal Ltd	GH_ERC_WS_2021-03-02	
CM_MC2 + 20Cu	Ambient Sample	Teck Coal Ltd	CM_MC2_WS_2021-03-02	
RG_MIDAG + 15Cu	Ambient Sample	Teck Coal Ltd	RG_MIDAG_WS_2021-03-	
EV_MC2 + 20Cu	Ambient Sample	Teck Coal Ltd	EV_MC2_WS_2021_Q1_W	
EV_HC1 + 20Cu	Ambient Sample	Teck Coal Ltd	EV_HC1_WS_2021_Q1_W	
LC_DCDS + 20Cu	Ambient Sample	Teck Coal Ltd	LC_DCDS_WS_2021-03-02	
LC_LC3 + 20Cu	Ambient Sample	Teck Coal Ltd	LC_LC3_WS_2021-03-02_	
LC_LC5 + 20Cu	Ambient Sample	Teck Coal Ltd	LC_LC5_WS_2021-03-02_	
LC_LCDSSLCC20C	Ambient Sample	Teck Coal Ltd	LC_LCDSSLCC_WS_2021-	
FR_FR4 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FR4_WS_2021-03-02_	
FR_FR2 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FR2_WS_2021-03-02_	

JUN 10 2021

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID:	06-0570-6724	**Endpoint:**	Post Hatch Survival	**CETIS Version:**	CETISv1.9.4
Analyzed:	21 May-21 12:37	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_MULTIPLATE2	Ambient Sample	Teck Coal Ltd	FR_MULTIPLATE_WS_202	
FR_FRRD + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FRRD_WS_2021-03-02	

Fisher Exact/Bonferroni Adj Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
15Cu Control		Lab Control	0.8729	Exact	1.0000	Non-Significant Effect
		10Cu Control	0.9853	Exact	1.0000	Non-Significant Effect
		20Cu Control	0.5696	Exact	1.0000	Non-Significant Effect
		FR_UFR1 + 20Cu	0.7677	Exact	1.0000	Non-Significant Effect
		GH_ER2 +15Cu*	0.0000	Exact	9.8E-08	Significant Effect
		CM_MC1 + 15Cu*	0.0000	Exact	3.7E-04	Significant Effect
		LC_SLC + 15Cu	0.3155	Exact	1.0000	Non-Significant Effect
		FR_FRABCH + 20C	0.3155	Exact	1.0000	Non-Significant Effect
		FR_FRCP1 + 20Cu*	0.0000	Exact	7.9E-04	Significant Effect
		GH_FR1 + 20Cu	0.8320	Exact	1.0000	Non-Significant Effect
		GH_ERC + 10Cu	0.8656	Exact	1.0000	Non-Significant Effect
		CM_MC2 + 20Cu	0.9853	Exact	1.0000	Non-Significant Effect
		RG_MIDAG + 15Cu	0.1263	Exact	1.0000	Non-Significant Effect
		EV_MC2 + 20Cu	0.4500	Exact	1.0000	Non-Significant Effect
		EV_HC1 + 20Cu	0.3870	Exact	1.0000	Non-Significant Effect
		LC_DCDS + 20Cu	0.5780	Exact	1.0000	Non-Significant Effect
		LC_LC3 + 20Cu	0.7999	Exact	1.0000	Non-Significant Effect
		LC_LC5 + 20Cu	0.7897	Exact	1.0000	Non-Significant Effect
		LC_LCDSSLCC20Cu	0.7999	Exact	1.0000	Non-Significant Effect
		FR_FR4 + 20Cu	0.0096	Exact	0.2202	Non-Significant Effect
		FR_FR2 + 20Cu*	0.0000	Exact	1.7E-04	Significant Effect
		FR_MULTIPLATE20	0.2395	Exact	1.0000	Non-Significant Effect
		FR_FRRD + 20Cu	0.1417	Exact	1.0000	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	2.592	3.37	0.8135	No Outliers Detected

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 06-0570-6724 **Endpoint:** Post Hatch Survival **CETIS Version:** CETISv1.9.4
Analyzed: 21 May-21 12:37 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Data Summary

Sample	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
Lab Control		54	6	60	0.9	0.1	-6.2%
10Cu Control		56	3	59	0.9492	0.05085	-12.0%
15Cu Control	15	50	9	59	0.8475	0.1525	0.0%
20Cu Control		48	9	57	0.8421	0.1579	0.63%
FR_UFR1 + 20Cu		50	7	57	0.8772	0.1228	-3.51%
GH_ER2 +15Cu		19	40	59	0.322	0.678	62.0%
CM_MC1 + 15Cu		28	31	59	0.4746	0.5254	44.0%
LC_SLC + 15Cu		47	12	59	0.7966	0.2034	6.0%
FR_FRABCH + 20C		47	12	59	0.7966	0.2034	6.0%
FR_FRCP1 + 20Cu		29	30	59	0.4915	0.5085	42.0%
GH_FR1 + 20Cu		49	6	55	0.8909	0.1091	-5.13%
GH_ERC + 10Cu		53	6	59	0.8983	0.1017	-6.0%
CM_MC2 + 20Cu		56	3	59	0.9492	0.05085	-12.0%
RG_MIDAG + 15Cu		44	15	59	0.7458	0.2542	12.0%
EV_MC2 + 20Cu		46	10	56	0.8214	0.1786	3.07%
EV_HC1 + 20Cu		47	11	58	0.8103	0.1897	4.38%
LC_DCDS + 20Cu		43	8	51	0.8431	0.1569	0.51%
LC_LC3 + 20Cu		53	7	60	0.8833	0.1167	-4.23%
LC_LC5 + 20Cu		52	7	59	0.8814	0.1186	-4.0%
LC_LCDSSLCC20C		53	7	60	0.8833	0.1167	-4.23%
FR_FR4 + 20Cu		38	21	59	0.6441	0.3559	24.0%
FR_FR2 + 20Cu		27	32	59	0.4576	0.5424	46.0%
FR_MULTIPLATE20		46	13	59	0.7797	0.2203	8.0%
FR_FRRD + 20Cu		42	14	56	0.75	0.25	11.5%

Post Hatch Survival Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Lab Control		0.9333	0.8667	0.8000	1.0000
10Cu Control		1.0000	0.8667	0.9333	1.0000
15Cu Control	15	0.8667	1.0000	0.6000	0.9286
20Cu Control		0.8571	1.0000	0.6000	0.9333
FR_UFR1 + 20Cu		0.9231	0.9333	0.8667	0.7857
GH_ER2 +15Cu		0.2667	0.4667	0.2000	0.3571
CM_MC1 + 15Cu		0.5333	0.5333	0.4286	0.4000
LC_SLC + 15Cu		0.6429	0.6667	0.9333	0.9333
FR_FRABCH + 20C		0.8000	0.8667	0.7143	0.8000
FR_FRCP1 + 20Cu		0.3571	0.4000	0.7333	0.4667
GH_FR1 + 20Cu		0.7857	1.0000	0.8667	0.9286
GH_ERC + 10Cu		0.9333	0.8667	0.9286	0.8667
CM_MC2 + 20Cu		0.9333	1.0000	0.9333	0.9286
RG_MIDAG + 15Cu		0.6667	0.7143	0.8000	0.8000
EV_MC2 + 20Cu		0.9286	0.7500	0.8000	0.8000
EV_HC1 + 20Cu		0.8000	0.8571	0.8667	0.7143
LC_DCDS + 20Cu		0.6667	0.7857	0.9333	1.0000
LC_LC3 + 20Cu		0.8667	1.0000	0.8667	0.8000
LC_LC5 + 20Cu		1.0000	0.9333	0.8667	0.7143
LC_LCDSSLCC20C		0.9333	0.8000	0.8667	0.9333
FR_FR4 + 20Cu		0.6000	0.7333	0.5333	0.7143
FR_FR2 + 20Cu		0.4667	0.4667	0.6429	0.2667
FR_MULTIPLATE2		0.7143	0.8000	0.8667	0.7333
FR_FRRD + 20Cu		0.8571	0.8571	0.6000	0.6923

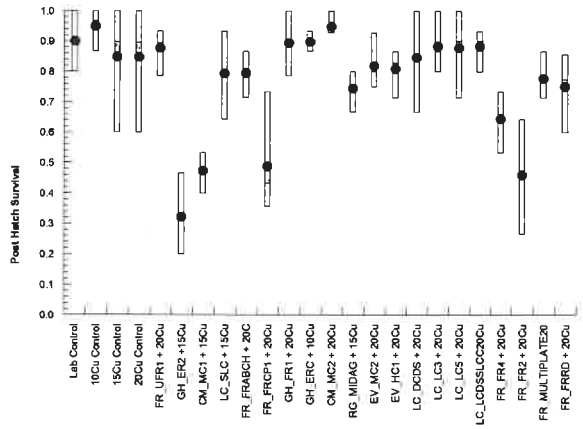
Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 06-0570-6724 **Endpoint:** Post Hatch Survival **CETIS Version:** CETISv1.9.4
Analyzed: 21 May-21 12:37 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Post Hatch Survival Binomials

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Lab Control		14/15	13/15	12/15	15/15
10Cu Control		14/14	13/15	14/15	15/15
15Cu Control	15	13/15	15/15	9/15	13/14
20Cu Control		12/14	13/13	9/15	14/15
FR_UFR1 + 20Cu		12/13	14/15	13/15	11/14
GH_ER2 +15Cu		4/15	7/15	3/15	5/14
CM_MC1 + 15Cu		8/15	8/15	6/14	6/15
LC_SLC + 15Cu		9/14	10/15	14/15	14/15
FR_FRABCH + 20C		12/15	13/15	10/14	12/15
FR_FRCP1 + 20Cu		5/14	6/15	11/15	7/15
GH_FR1 + 20Cu		11/14	12/12	13/15	13/14
GH_ERC + 10Cu		14/15	13/15	13/14	13/15
CM_MC2 + 20Cu		14/15	15/15	14/15	13/14
RG_MIDAG + 15Cu		10/15	10/14	12/15	12/15
EV_MC2 + 20Cu		13/14	9/12	12/15	12/15
EV_HC1 + 20Cu		12/15	12/14	13/15	10/14
LC_DCDS + 20Cu		8/12	11/14	14/15	10/10
LC_LC3 + 20Cu		13/15	15/15	13/15	12/15
LC_LC5 + 20Cu		15/15	14/15	13/15	10/14
LC_LCDSSLCC20C		14/15	12/15	13/15	14/15
FR_FR4 + 20Cu		9/15	11/15	8/15	10/14
FR_FR2 + 20Cu		7/15	7/15	9/14	4/15
FR_MULTIPLATE2		10/14	12/15	13/15	11/15
FR_FRRD + 20Cu		12/14	12/14	9/15	9/13

Graphics



CETIS Analytical Report

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID:	13-1189-0298	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.9.4
Analyzed:	01 Jun-21 8:23	**Analysis:**	Nonparametric-Control vs Treatments	**Status Level:**	1
Batch ID:	16-2689-7673	**Test Type:**	32 Day Fathead Minnow Test	**Analyst:**	Kayla Knol
Start Date:	06 Mar-21	**Protocol:**	ASTM E1241-05 (2013)	**Diluent:**	Dechlorinated Tap Water
Ending Date:	07 Apr-21	**Species:**	Pimephales promelas	**Brine:**	
Test Length:	32d 0h	**Taxon:**	Actinopterygii	**Source:**	Aquatox, AR **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
Lab Control	08-8280-1106	02 Mar-21	03 Mar-21	96h	Teck Coal Ltd	
10Cu Control	01-9333-5370	02 Mar-21	03 Mar-21	96h		
15Cu Control	19-6548-0518	02 Mar-21	03 Mar-21	96h		
20Cu Control	00-8675-6744	02 Mar-21	03 Mar-21	96h		
FR_UFR1 + 20Cu	20-4721-8257	02 Mar-21	03 Mar-21	96h (4.6 °C)		
GH_ER2 +15Cu	01-1137-9253	02 Mar-21	03 Mar-21	96h (4.2 °C)		
CM_MC1 + 15Cu	01-3772-5048	02 Mar-21	03 Mar-21	96h (1 °C)		
LC_SLC + 15Cu	01-2380-6574	02 Mar-21	03 Mar-21	96h (3.1 °C)		
FR_FRABCH + 20C	08-4134-0746	02 Mar-21	03 Mar-21	96h (3.8 °C)		
FR_FRCP1 + 20Cu	11-2694-6466	02 Mar-21	03 Mar-21	96h (3 °C)		
GH_FR1 + 20Cu	20-1635-3152	02 Mar-21	03 Mar-21	96h (2.4 °C)		
GH_ERC + 10Cu	05-1950-5597	02 Mar-21	03 Mar-21	96h (4.1 °C)		
CM_MC2 + 20Cu	14-4685-1067	02 Mar-21	03 Mar-21	96h (0.3 °C)		
RG_MIDAG + 15Cu	21-3889-1829	02 Mar-21	03 Mar-21	96h (0.6 °C)		
EV_MC2 + 20Cu	05-6103-5191	02 Mar-21	03 Mar-21	96h (4.4 °C)		
EV_HC1 + 20Cu	12-5501-3302	02 Mar-21	03 Mar-21	96h (3.4 °C)		
LC_DCDS + 20Cu	04-1088-5978	02 Mar-21	03 Mar-21	96h (0.6 °C)		
LC_LC3 + 20Cu	14-7773-4190	02 Mar-21	03 Mar-21	96h (2.3 °C)		
LC_LC5 + 20Cu	01-7235-6798	02 Mar-21	03 Mar-21	96h (0.6 °C)		
LC_LCDSSLCC20C	06-4197-2641	02 Mar-21	03 Mar-21	96h (2.4 °C)		
FR_FR4 + 20Cu	10-9481-5020	02 Mar-21	03 Mar-21	96h (5.4 °C)		
FR_FR2 + 20Cu	00-3159-8672	02 Mar-21	03 Mar-21	96h (4.4 °C)		
FR_MULTIPLATE2	02-2179-0364	02 Mar-21	03 Mar-21	96h (2.9 °C)		
FR_FRRD + 20Cu	19-5167-8345	02 Mar-21	03 Mar-21	96h (6.2 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
Lab Control	Ambient Sample	Teck Coal Ltd	Lab Control	
10Cu Control	Ambient Sample	Teck Coal Ltd	10Cu Control	
15Cu Control	Ambient Sample	Teck Coal Ltd	15Cu Control	
20Cu Control	Ambient Sample	Teck Coal Ltd	20Cu Control	
FR_UFR1 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_UFR1_MON_2021-03-0	
GH_ER2 +15Cu	Ambient Sample	Teck Coal Ltd	GH_ER2_WS_2021-03-02_	
CM_MC1 + 15Cu	Ambient Sample	Teck Coal Ltd	CM_MC1_WS_2021-03-02	
LC_SLC + 15Cu	Ambient Sample	Teck Coal Ltd	LC_SLC_WS_2021-03-02_	
FR_FRABCH + 20C	Ambient Sample	Teck Coal Ltd	FR_FRABCH_MON_2021-	
FR_FRCP1 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FRCP1_MON_2021-03	
GH_FR1 + 20Cu	Ambient Sample	Teck Coal Ltd	GH_FR1_WS_2021-03-02_	
GH_ERC + 10Cu	Ambient Sample	Teck Coal Ltd	GH_ERC_WS_2021-03-02	
CM_MC2 + 20Cu	Ambient Sample	Teck Coal Ltd	CM_MC2_WS_2021-03-02	
RG_MIDAG + 15Cu	Ambient Sample	Teck Coal Ltd	RG_MIDAG_WS_2021-03-	
EV_MC2 + 20Cu	Ambient Sample	Teck Coal Ltd	EV_MC2_WS_2021_Q1_W	
EV_HC1 + 20Cu	Ambient Sample	Teck Coal Ltd	EV_HC1_WS_2021_Q1_W	
LC_DCDS + 20Cu	Ambient Sample	Teck Coal Ltd	LC_DCDS_WS_2021-03-02	
LC_LC3 + 20Cu	Ambient Sample	Teck Coal Ltd	LC_LC3_WS_2021-03-02_	
LC_LC5 + 20Cu	Ambient Sample	Teck Coal Ltd	LC_LC5_WS_2021-03-02_	
LC_LCDSSLCC20C	Ambient Sample	Teck Coal Ltd	LC_LCDSSLCC_WS_2021-	
FR_FR4 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FR4_WS_2021-03-02_	
FR_FR2 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FR2_WS_2021-03-02_	

Analyst: KRC QA: MG

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Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 13-1189-0298 **Endpoint:** Mean Dry Biomass-mg **CETIS Version:** CETISv1.9.4
Analyzed: 01 Jun-21 8:23 **Analysis:** Nonparametric-Control vs Treatments **Status Level:** 1

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_MULTIPLATE2	Ambient Sample	Teck Coal Ltd	FR_MULTIPLATE_WS_202	
FR_FRRD + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FRRD_WS_2021-03-02	

Nemenyi-Damico-Wolfe Test

Sample I	vs	Sample II	Test Stat	Critical	Ties	P-Type	P-Value	Decision(α:5%)
20Cu Control		Lab Control	26	211.4	2	CDF	0.9045	Non-Significant Effect
		10Cu Control	59	211.4	2	CDF	0.7799	Non-Significant Effect
		15Cu Control	-8	211.4	2	CDF	0.9687	Non-Significant Effect
		FR_UFR1 + 20Cu	59	211.4	2	CDF	0.7799	Non-Significant Effect
		GH_ER2 +15Cu*	262	211.4	2	CDF	0.0077	Significant Effect
		CM_MC1 + 15Cu*	213	211.4	2	CDF	0.0474	Significant Effect
		LC_SLC + 15Cu	128	211.4	2	CDF	0.3686	Non-Significant Effect
		FR_FRABCH + 20C	118	211.4	2	CDF	0.4301	Non-Significant Effect
		FR_FRCP1 + 20Cu*	220	211.4	2	CDF	0.0377	Significant Effect
		GH_FR1 + 20Cu	29.5	211.4	2	CDF	0.8944	Non-Significant Effect
		GH_ERC + 10Cu	21	211.4	2	CDF	0.9176	Non-Significant Effect
		CM_MC2 + 20Cu	107	211.4	2	CDF	0.4998	Non-Significant Effect
		RG_MIDAG + 15Cu	163.5	211.4	2	CDF	0.1848	Non-Significant Effect
		EV_MC2 + 20Cu	133	211.4	2	CDF	0.3391	Non-Significant Effect
		EV_HC1 + 20Cu	42.5	211.4	2	CDF	0.8507	Non-Significant Effect
		LC_DCDS + 20Cu	73	211.4	2	CDF	0.7074	Non-Significant Effect
		LC_LC3 + 20Cu	94	211.4	2	CDF	0.5824	Non-Significant Effect
		LC_LC5 + 20Cu	60	211.4	2	CDF	0.7751	Non-Significant Effect
		LC_LCDSSLCC20Cu	90	211.4	2	CDF	0.6072	Non-Significant Effect
		FR_FR4 + 20Cu	141.5	211.4	2	CDF	0.2912	Non-Significant Effect
		FR_FR2 + 20Cu*	266	211.4	2	CDF	0.0065	Significant Effect
		FR_MULTIPLATE20	17	211.4	2	CDF	0.9270	Non-Significant Effect
		FR_FRRD + 20Cu	13	211.4	2	CDF	0.9357	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	2.393	3.37	1.0000	No Outliers Detected
Treatment Effect	Fligner-Wolfe Omnibus Test	4559		0.0382	Significant Overall Effect
Treatment Effect	Kruskal-Wallis Omnibus Test	48.55	35.17	0.0014	Significant Overall Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	9.6416	0.4192	23	4.746	1.9E-07	Significant Effect
Error	6.35993	0.0883324	72			
Total	16.0015		95			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Variances	Bartlett Equality of Variance Test	15.29	35.17	0.8840	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9376	0.9737	1.9E-04	Non-Normal Distribution

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 13-1189-0298 **Endpoint:** Mean Dry Biomass-mg **CETIS Version:** CETISv1.9.4
Analyzed: 01 Jun-21 8:23 **Analysis:** Nonparametric-Control vs Treatments **Status Level:** 1

Mean Dry Biomass-mg Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
Lab Control		4	2.276	1.813	2.739	2.216	1.989	2.681	0.1455	12.79%	0.00%
10Cu Control		4	2.164	1.858	2.471	2.08	2.048	2.45	0.09618	8.89%	4.89%
15Cu Control		4	2.423	1.816	3.031	2.311	2.096	2.975	0.191	15.76%	-6.49%
20Cu Control	20	4	2.343	1.952	2.734	2.305	2.085	2.677	0.1229	10.49%	-2.94%
FR_UFR1 + 20Cu		4	2.254	1.609	2.9	2.06	2.035	2.862	0.2028	18.00%	0.94%
GH_ER2 +15Cu		4	1.181	0.4596	1.902	1.135	0.6767	1.777	0.2266	38.38%	48.12%
CM_MC1 + 15Cu		4	1.604	1.076	2.132	1.478	1.367	2.092	0.166	20.69%	29.52%
LC_SLC + 15Cu		4	2.008	1.849	2.167	2.005	1.908	2.114	0.04997	4.98%	11.75%
FR_FRABCH + 20C		4	2.097	1.427	2.766	1.929	1.814	2.716	0.2103	20.06%	7.86%
FR_FRCP1 + 20Cu		4	1.699	1.29	2.108	1.729	1.358	1.98	0.1285	15.13%	25.34%
GH_FR1 + 20Cu		4	2.278	1.812	2.745	2.307	1.917	2.584	0.1465	12.86%	-0.12%
GH_ERC + 10Cu		4	2.248	1.979	2.517	2.217	2.095	2.463	0.08461	7.53%	1.22%
CM_MC2 + 20Cu		4	2.049	1.554	2.544	2.058	1.671	2.409	0.1556	15.19%	9.96%
RG_MIDAG + 15Cu		4	1.9	1.521	2.278	1.856	1.677	2.209	0.1189	12.52%	16.52%
EV_MC2 + 20Cu		4	2	1.594	2.406	1.937	1.765	2.361	0.1276	12.76%	12.10%
EV_HC1 + 20Cu		4	2.2	1.928	2.471	2.171	2.024	2.433	0.0853	7.75%	3.33%
LC_DCDS + 20Cu		4	2.111	1.845	2.377	2.162	1.875	2.245	0.08356	7.92%	7.22%
LC_LC3 + 20Cu		4	2.076	1.846	2.306	2.072	1.927	2.233	0.0723	6.96%	8.76%
LC_LC5 + 20Cu		4	2.19	1.749	2.631	2.166	1.906	2.523	0.1385	12.65%	3.75%
LC_LCDSSLCC20C		4	2.097	1.762	2.432	2.051	1.923	2.363	0.1054	10.05%	7.85%
FR_FR4 + 20Cu		4	2.013	1.388	2.639	1.85	1.754	2.599	0.1965	19.52%	11.53%
FR_FR2 + 20Cu		4	1.239	0.6549	1.824	1.13	0.96	1.738	0.1837	29.64%	45.54%
FR_MULTIPLATE2		4	2.352	1.754	2.949	2.25	2.019	2.888	0.1877	15.96%	-3.35%
FR_FRRD + 20Cu		4	2.338	1.844	2.832	2.304	2.016	2.729	0.1553	13.28%	-2.75%

Mean Dry Biomass-mg Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Lab Control		2.222	1.989	2.211	2.681
10Cu Control		2.109	2.051	2.048	2.45
15Cu Control		2.293	2.096	2.329	2.975
20Cu Control	20	2.297	2.085	2.313	2.677
FR_UFR1 + 20Cu		2.078	2.035	2.042	2.862
GH_ER2 +15Cu		1.17	1.777	0.6767	1.099
CM_MC1 + 15Cu		1.429	2.092	1.367	1.527
LC_SLC + 15Cu		2.071	1.939	1.908	2.114
FR_FRABCH + 20C		1.855	1.814	2.003	2.716
FR_FRCP1 + 20Cu		1.705	1.358	1.98	1.753
GH_FR1 + 20Cu		2.433	2.181	1.917	2.584
GH_ERC + 10Cu		2.095	2.463	2.131	2.302
CM_MC2 + 20Cu		1.963	1.671	2.153	2.409
RG_MIDAG + 15Cu		1.677	1.754	2.209	1.959
EV_MC2 + 20Cu		1.967	1.907	1.765	2.361
EV_HC1 + 20Cu		2.155	2.024	2.188	2.433
LC_DCDS + 20Cu		2.245	1.875	2.113	2.212
LC_LC3 + 20Cu		2.233	1.927	1.983	2.161
LC_LC5 + 20Cu		1.906	2.029	2.304	2.523
LC_LCDSSLCC20C		1.923	1.933	2.169	2.363
FR_FR4 + 20Cu		1.754	1.838	1.863	2.599
FR_FR2 + 20Cu		0.9653	0.96	1.738	1.294
FR_MULTIPLATE2		2.295	2.019	2.205	2.888
FR_FRRD + 20Cu		2.016	2.181	2.427	2.729

Analyst: KLC QA: MC1

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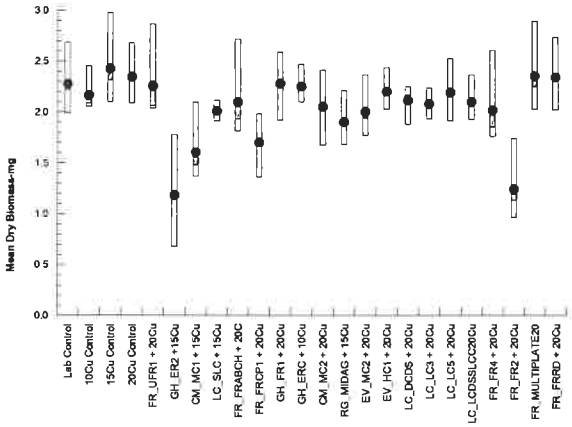
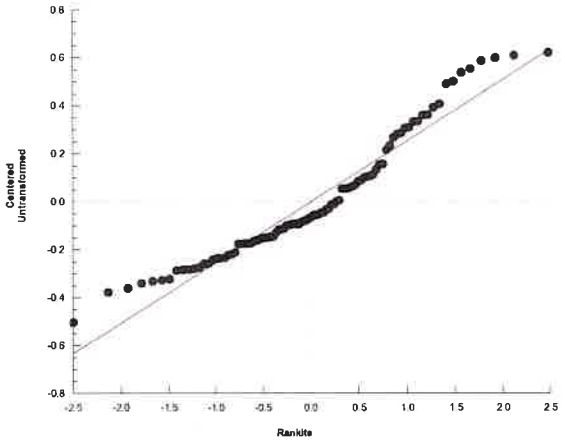
Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID:	13-1189-0298	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.9.4
Analyzed:	01 Jun-21 8:23	**Analysis:**	Nonparametric-Control vs Treatments	**Status Level:**	1

Graphics





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Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID:	14-7033-0434	**Endpoint:**	Hatch Rate	**CETIS Version:**	CETISv1.9.4
Analyzed:	22 May-21 10:42	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1
Batch ID:	16-2689-7673	**Test Type:**	32 Day Fathead Minnow Test	**Analyst:**	Kayla Knol
Start Date:	06 Mar-21	**Protocol:**	ASTM E1241-05 (2013)	**Diluent:**	Dechlorinated Tap Water
Ending Date:	07 Apr-21	**Species:**	Pimephales promelas	**Brine:**	
Test Length:	32d 0h	**Taxon:**	Actinopterygii	**Source:**	Aquatox, AR **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
Lab Control	08-8280-1106	02 Mar-21	03 Mar-21	96h	Teck Coal Ltd	
10Cu Control	01-9333-5370	02 Mar-21	03 Mar-21	96h		
15Cu Control	19-6548-0518	02 Mar-21	03 Mar-21	96h		
20Cu Control	00-8675-6744	02 Mar-21	03 Mar-21	96h		
FR_UFR1 + 20Cu	20-4721-8257	02 Mar-21	03 Mar-21	96h (4.6 °C)		
GH_ER2 +15Cu	01-1137-9253	02 Mar-21	03 Mar-21	96h (4.2 °C)		
CM_MC1 + 15Cu	01-3772-5048	02 Mar-21	03 Mar-21	96h (1 °C)		
LC_SLC + 15Cu	01-2380-6574	02 Mar-21	03 Mar-21	96h (3.1 °C)		
FR_FRABCH + 20C	08-4134-0746	02 Mar-21	03 Mar-21	96h (3.8 °C)		
FR_FRCP1 + 20Cu	11-2694-6466	02 Mar-21	03 Mar-21	96h (3 °C)		
GH_FR1 + 20Cu	20-1635-3152	02 Mar-21	03 Mar-21	96h (2.4 °C)		
GH_ERC + 10Cu	05-1950-5597	02 Mar-21	03 Mar-21	96h (4.1 °C)		
CM_MC2 + 20Cu	14-4685-1067	02 Mar-21	03 Mar-21	96h (0.3 °C)		
RG_MIDAG + 15Cu	21-3889-1829	02 Mar-21	03 Mar-21	96h (0.6 °C)		
EV_MC2 + 20Cu	05-6103-5191	02 Mar-21	03 Mar-21	96h (4.4 °C)		
EV_HC1 + 20Cu	12-5501-3302	02 Mar-21	03 Mar-21	96h (3.4 °C)		
LC_DCDS + 20Cu	04-1088-5978	02 Mar-21	03 Mar-21	96h (0.6 °C)		
LC_LC3 + 20Cu	14-7773-4190	02 Mar-21	03 Mar-21	96h (2.3 °C)		
LC_LC5 + 20Cu	01-7235-6798	02 Mar-21	03 Mar-21	96h (0.6 °C)		
LC_LCDSSLCC20C	06-4197-2641	02 Mar-21	03 Mar-21	96h (2.4 °C)		
FR_FR4 + 20Cu	10-9481-5020	02 Mar-21	03 Mar-21	96h (5.4 °C)		
FR_FR2 + 20Cu	00-3159-8672	02 Mar-21	03 Mar-21	96h (4.4 °C)		
FR_MULTIPLATE2	02-2179-0364	02 Mar-21	03 Mar-21	96h (2.9 °C)		
FR_FRRD + 20Cu	19-5167-8345	02 Mar-21	03 Mar-21	96h (6.2 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
Lab Control	Ambient Sample	Teck Coal Ltd	Lab Control	
10Cu Control	Ambient Sample	Teck Coal Ltd	10Cu Control	
15Cu Control	Ambient Sample	Teck Coal Ltd	15Cu Control	
20Cu Control	Ambient Sample	Teck Coal Ltd	20Cu Control	
FR_UFR1 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_UFR1_MON_2021-03-0	
GH_ER2 +15Cu	Ambient Sample	Teck Coal Ltd	GH_ER2_WS_2021-03-02_	
CM_MC1 + 15Cu	Ambient Sample	Teck Coal Ltd	CM_MC1_WS_2021-03-02	
LC_SLC + 15Cu	Ambient Sample	Teck Coal Ltd	LC_SLC_WS_2021-03-02_	
FR_FRABCH + 20C	Ambient Sample	Teck Coal Ltd	FR_FRABCH_MON_2021-	
FR_FRCP1 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FRCP1_MON_2021-03	
GH_FR1 + 20Cu	Ambient Sample	Teck Coal Ltd	GH_FR1_WS_2021-03-02_	
GH_ERC + 10Cu	Ambient Sample	Teck Coal Ltd	GH_ERC_WS_2021-03-02	
CM_MC2 + 20Cu	Ambient Sample	Teck Coal Ltd	CM_MC2_WS_2021-03-02	
RG_MIDAG + 15Cu	Ambient Sample	Teck Coal Ltd	RG_MIDAG_WS_2021-03-	
EV_MC2 + 20Cu	Ambient Sample	Teck Coal Ltd	EV_MC2_WS_2021_Q1_W	
EV_HC1 + 20Cu	Ambient Sample	Teck Coal Ltd	EV_HC1_WS_2021_Q1_W	
LC_DCDS + 20Cu	Ambient Sample	Teck Coal Ltd	LC_DCDS_WS_2021-03-02	
LC_LC3 + 20Cu	Ambient Sample	Teck Coal Ltd	LC_LC3_WS_2021-03-02_	
LC_LC5 + 20Cu	Ambient Sample	Teck Coal Ltd	LC_LC5_WS_2021-03-02_	
LC_LCDSSLCC20C	Ambient Sample	Teck Coal Ltd	LC_LCDSSLCC_WS_2021-	
FR_FR4 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FR4_WS_2021-03-02_	
FR_FR2 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FR2_WS_2021-03-02_	

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Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 14-7033-0434 **Endpoint:** Hatch Rate **CETIS Version:** CETISv1.9.4
Analyzed: 22 May-21 10:42 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_MULTIPLATE2	Ambient Sample	Teck Coal Ltd	FR_MULTIPLATE_WS_202	
FR_FRRD + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FRRD_WS_2021-03-02	

Fisher Exact/Bonferroni Adj Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
20Cu Control		Lab Control	1.0000	Exact	1.0000	Non-Significant Effect
		10Cu Control	0.9406	Exact	1.0000	Non-Significant Effect
		15Cu Control	0.9406	Exact	1.0000	Non-Significant Effect
		FR_UFR1 + 20Cu	0.6603	Exact	1.0000	Non-Significant Effect
		GH_ER2 +15Cu	0.9406	Exact	1.0000	Non-Significant Effect
		CM_MC1 + 15Cu	0.9406	Exact	1.0000	Non-Significant Effect
		LC_SLC + 15Cu	0.9406	Exact	1.0000	Non-Significant Effect
		FR_FRABCH + 20C	0.9406	Exact	1.0000	Non-Significant Effect
		FR_FRCP1 + 20Cu	0.9406	Exact	1.0000	Non-Significant Effect
		GH_FR1 + 20Cu	0.3585	Exact	1.0000	Non-Significant Effect
		GH_ERC + 10Cu	0.9406	Exact	1.0000	Non-Significant Effect
		CM_MC2 + 20Cu	0.9406	Exact	1.0000	Non-Significant Effect
		RG_MIDAG + 15Cu	0.9406	Exact	1.0000	Non-Significant Effect
		EV_MC2 + 20Cu	0.5000	Exact	1.0000	Non-Significant Effect
		EV_HC1 + 20Cu	0.8178	Exact	1.0000	Non-Significant Effect
		LC_DCDS + 20Cu	0.0627	Exact	1.0000	Non-Significant Effect
		LC_LC3 + 20Cu	1.0000	Exact	1.0000	Non-Significant Effect
		LC_LC5 + 20Cu	0.9406	Exact	1.0000	Non-Significant Effect
		LC_LCDSSLCC20Cu	1.0000	Exact	1.0000	Non-Significant Effect
		FR_FR4 + 20Cu	0.9406	Exact	1.0000	Non-Significant Effect
		FR_FR2 + 20Cu	0.9406	Exact	1.0000	Non-Significant Effect
		FR_MULTIPLATE20	0.9406	Exact	1.0000	Non-Significant Effect
		FR_FRRD + 20Cu	0.5000	Exact	1.0000	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	3.165	3.37	0.1123	No Outliers Detected

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Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 14-7033-0434 **Endpoint:** Hatch Rate **CETIS Version:** CETISv1.9.4
Analyzed: 22 May-21 10:42 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Data Summary

Sample	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
Lab Control		60	0	60	1	0	-5.26%
10Cu Control		59	1	60	0.9833	0.01667	-3.51%
15Cu Control		59	1	60	0.9833	0.01667	-3.51%
20Cu Control	20	57	3	60	0.95	0.05	0.0%
FR_UFR1 + 20Cu		57	3	60	0.95	0.05	0.0%
GH_ER2 +15Cu		59	1	60	0.9833	0.01667	-3.51%
CM_MC1 + 15Cu		59	1	60	0.9833	0.01667	-3.51%
LC_SLC + 15Cu		59	1	60	0.9833	0.01667	-3.51%
FR_FRABCH + 20C		59	1	60	0.9833	0.01667	-3.51%
FR_FRCP1 + 20Cu		59	1	60	0.9833	0.01667	-3.51%
GH_FR1 + 20Cu		55	5	60	0.9167	0.08333	3.51%
GH_ERC + 10Cu		59	1	60	0.9833	0.01667	-3.51%
CM_MC2 + 20Cu		59	1	60	0.9833	0.01667	-3.51%
RG_MIDAG + 15Cu		59	1	60	0.9833	0.01667	-3.51%
EV_MC2 + 20Cu		56	4	60	0.9333	0.06667	1.75%
EV_HC1 + 20Cu		58	2	60	0.9667	0.03333	-1.75%
LC_DCDS + 20Cu		51	9	60	0.85	0.15	10.53%
LC_LC3 + 20Cu		60	0	60	1	0	-5.26%
LC_LC5 + 20Cu		59	1	60	0.9833	0.01667	-3.51%
LC_LCDSSLCC20C		60	0	60	1	0	-5.26%
FR_FR4 + 20Cu		59	1	60	0.9833	0.01667	-3.51%
FR_FR2 + 20Cu		59	1	60	0.9833	0.01667	-3.51%
FR_MULTIPLATE20		59	1	60	0.9833	0.01667	-3.51%
FR_FRRD + 20Cu		56	4	60	0.9333	0.06667	1.75%

Hatch Rate Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Lab Control		1.0000	1.0000	1.0000	1.0000
10Cu Control		0.9333	1.0000	1.0000	1.0000
15Cu Control		1.0000	1.0000	1.0000	0.9333
20Cu Control	20	0.9333	0.8667	1.0000	1.0000
FR_UFR1 + 20Cu		0.8667	1.0000	1.0000	0.9333
GH_ER2 +15Cu		1.0000	1.0000	1.0000	0.9333
CM_MC1 + 15Cu		1.0000	1.0000	0.9333	1.0000
LC_SLC + 15Cu		0.9333	1.0000	1.0000	1.0000
FR_FRABCH + 20C		1.0000	1.0000	0.9333	1.0000
FR_FRCP1 + 20Cu		0.9333	1.0000	1.0000	1.0000
GH_FR1 + 20Cu		0.9333	0.8000	1.0000	0.9333
GH_ERC + 10Cu		1.0000	1.0000	0.9333	1.0000
CM_MC2 + 20Cu		1.0000	1.0000	1.0000	0.9333
RG_MIDAG + 15Cu		1.0000	0.9333	1.0000	1.0000
EV_MC2 + 20Cu		0.9333	0.8000	1.0000	1.0000
EV_HC1 + 20Cu		1.0000	0.9333	1.0000	0.9333
LC_DCDS + 20Cu		0.8000	0.9333	1.0000	0.6667
LC_LC3 + 20Cu		1.0000	1.0000	1.0000	1.0000
LC_LC5 + 20Cu		1.0000	1.0000	1.0000	0.9333
LC_LCDSSLCC20C		1.0000	1.0000	1.0000	1.0000
FR_FR4 + 20Cu		1.0000	1.0000	1.0000	0.9333
FR_FR2 + 20Cu		1.0000	1.0000	0.9333	1.0000
FR_MULTIPLATE2		0.9333	1.0000	1.0000	1.0000
FR_FRRD + 20Cu		0.9333	0.9333	1.0000	0.8667

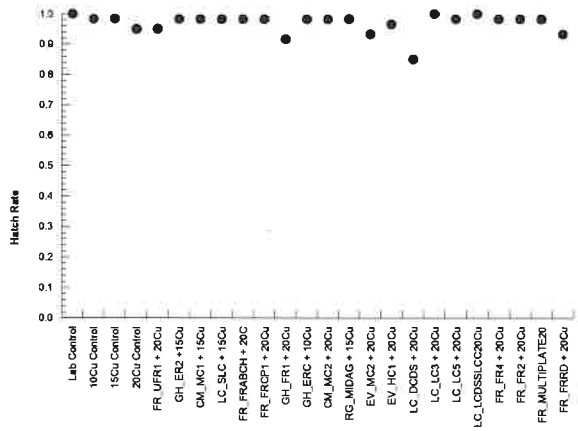
Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 14-7033-0434 **Endpoint:** Hatch Rate **CETIS Version:** CETISv1.9.4
Analyzed: 22 May-21 10:42 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Hatch Rate Binomials

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Lab Control		15/15	15/15	15/15	15/15
10Cu Control		14/15	15/15	15/15	15/15
15Cu Control		15/15	15/15	15/15	14/15
20Cu Control	20	14/15	13/15	15/15	15/15
FR_UFR1 + 20Cu		13/15	15/15	15/15	14/15
GH_ER2 +15Cu		15/15	15/15	15/15	14/15
CM_MC1 + 15Cu		15/15	15/15	14/15	15/15
LC_SLC + 15Cu		14/15	15/15	15/15	15/15
FR_FRABCH + 20C		15/15	15/15	14/15	15/15
FR_FRCP1 + 20Cu		14/15	15/15	15/15	15/15
GH_FR1 + 20Cu		14/15	12/15	15/15	14/15
GH_ERC + 10Cu		15/15	15/15	14/15	15/15
CM_MC2 + 20Cu		15/15	15/15	15/15	14/15
RG_MIDAG + 15Cu		15/15	14/15	15/15	15/15
EV_MC2 + 20Cu		14/15	12/15	15/15	15/15
EV_HC1 + 20Cu		15/15	14/15	15/15	14/15
LC_DCDS + 20Cu		12/15	14/15	15/15	10/15
LC_LC3 + 20Cu		15/15	15/15	15/15	15/15
LC_LC5 + 20Cu		15/15	15/15	15/15	14/15
LC_LCDSSLCC20C		15/15	15/15	15/15	15/15
FR_FR4 + 20Cu		15/15	15/15	15/15	14/15
FR_FR2 + 20Cu		15/15	15/15	14/15	15/15
FR_MULTIPLATE2		14/15	15/15	15/15	15/15
FR_FRRD + 20Cu		14/15	14/15	15/15	13/15

Graphics



Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID:	07-0650-2028	**Endpoint:**	Length	**CETIS Version:**	CETISv1.9.4
Analyzed:	22 May-21 10:49	**Analysis:**	Parametric-Control vs Treatments	**Status Level:**	1
Batch ID:	16-2689-7673	**Test Type:**	32 Day Fathead Minnow Test	**Analyst:**	Kayla Knol
Start Date:	06 Mar-21	**Protocol:**	ASTM E1241-05 (2013)	**Diluent:**	Dechlorinated Tap Water
Ending Date:	07 Apr-21	**Species:**	Pimephales promelas	**Brine:**	
Test Length:	32d 0h	**Taxon:**	Actinopterygii	**Source:**	Aquatox, AR **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
Lab Control	08-8280-1106	02 Mar-21	03 Mar-21	96h	Teck Coal Ltd	
10Cu Control	01-9333-5370	02 Mar-21	03 Mar-21	96h		
15Cu Control	19-6548-0518	02 Mar-21	03 Mar-21	96h		
20Cu Control	00-8675-6744	02 Mar-21	03 Mar-21	96h		
FR_UFR1 + 20Cu	20-4721-8257	02 Mar-21	03 Mar-21	96h (4.6 °C)		
GH_ER2 +15Cu	01-1137-9253	02 Mar-21	03 Mar-21	96h (4.2 °C)		
CM_MC1 + 15Cu	01-3772-5048	02 Mar-21	03 Mar-21	96h (1 °C)		
LC_SLC + 15Cu	01-2380-6574	02 Mar-21	03 Mar-21	96h (3.1 °C)		
FR_FRABCH + 20C	08-4134-0746	02 Mar-21	03 Mar-21	96h (3.8 °C)		
FR_FRCP1 + 20Cu	11-2694-6466	02 Mar-21	03 Mar-21	96h (3 °C)		
GH_FR1 + 20Cu	20-1635-3152	02 Mar-21	03 Mar-21	96h (2.4 °C)		
GH_ERC + 10Cu	05-1950-5597	02 Mar-21	03 Mar-21	96h (4.1 °C)		
CM_MC2 + 20Cu	14-4685-1067	02 Mar-21	03 Mar-21	96h (0.3 °C)		
RG_MIDAG + 15Cu	21-3889-1829	02 Mar-21	03 Mar-21	96h (0.6 °C)		
EV_MC2 + 20Cu	05-6103-5191	02 Mar-21	03 Mar-21	96h (4.4 °C)		
EV_HC1 + 20Cu	12-5501-3302	02 Mar-21	03 Mar-21	96h (3.4 °C)		
LC_DCDS + 20Cu	04-1088-5978	02 Mar-21	03 Mar-21	96h (0.6 °C)		
LC_LC3 + 20Cu	14-7773-4190	02 Mar-21	03 Mar-21	96h (2.3 °C)		
LC_LC5 + 20Cu	01-7235-6798	02 Mar-21	03 Mar-21	96h (0.6 °C)		
LC_LCDSSLCC20C	06-4197-2641	02 Mar-21	03 Mar-21	96h (2.4 °C)		
FR_FR4 + 20Cu	10-9481-5020	02 Mar-21	03 Mar-21	96h (5.4 °C)		
FR_FR2 + 20Cu	00-3159-8672	02 Mar-21	03 Mar-21	96h (4.4 °C)		
FR_MULTIPLATE2	02-2179-0364	02 Mar-21	03 Mar-21	96h (2.9 °C)		
FR_FRRD + 20Cu	19-5167-8345	02 Mar-21	03 Mar-21	96h (6.2 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
Lab Control	Ambient Sample	Teck Coal Ltd	Lab Control	
10Cu Control	Ambient Sample	Teck Coal Ltd	10Cu Control	
15Cu Control	Ambient Sample	Teck Coal Ltd	15Cu Control	
20Cu Control	Ambient Sample	Teck Coal Ltd	20Cu Control	
FR_UFR1 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_UFR1_MON_2021-03-0	
GH_ER2 +15Cu	Ambient Sample	Teck Coal Ltd	GH_ER2_WS_2021-03-02_	
CM_MC1 + 15Cu	Ambient Sample	Teck Coal Ltd	CM_MC1_WS_2021-03-02	
LC_SLC + 15Cu	Ambient Sample	Teck Coal Ltd	LC_SLC_WS_2021-03-02_	
FR_FRABCH + 20C	Ambient Sample	Teck Coal Ltd	FR_FRABCH_MON_2021-	
FR_FRCP1 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FRCP1_MON_2021-03	
GH_FR1 + 20Cu	Ambient Sample	Teck Coal Ltd	GH_FR1_WS_2021-03-02_	
GH_ERC + 10Cu	Ambient Sample	Teck Coal Ltd	GH_ERC_WS_2021-03-02	
CM_MC2 + 20Cu	Ambient Sample	Teck Coal Ltd	CM_MC2_WS_2021-03-02	
RG_MIDAG + 15Cu	Ambient Sample	Teck Coal Ltd	RG_MIDAG_WS_2021-03-	
EV_MC2 + 20Cu	Ambient Sample	Teck Coal Ltd	EV_MC2_WS_2021_Q1_W	
EV_HC1 + 20Cu	Ambient Sample	Teck Coal Ltd	EV_HC1_WS_2021_Q1_W	
LC_DCDS + 20Cu	Ambient Sample	Teck Coal Ltd	LC_DCDS_WS_2021-03-02	
LC_LC3 + 20Cu	Ambient Sample	Teck Coal Ltd	LC_LC3_WS_2021-03-02_	
LC_LC5 + 20Cu	Ambient Sample	Teck Coal Ltd	LC_LC5_WS_2021-03-02_	
LC_LCDSSLCC20C	Ambient Sample	Teck Coal Ltd	LC_LCDSSLCC_WS_2021-	
FR_FR4 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FR4_WS_2021-03-02_	
FR_FR2 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FR2_WS_2021-03-02_	

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Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 07-0650-2028 **Endpoint:** Length **CETIS Version:** CETISv1.9.4
Analyzed: 22 May-21 10:49 **Analysis:** Parametric-Control vs Treatments **Status Level:** 1

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_MULTIPLATE2	Ambient Sample	Teck Coal Ltd	FR_MULTIPLATE_WS_202	
FR_FRRD + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FRRD_WS_2021-03-02	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	Lab Control passed length	12.07%
		10Cu Control passed length	12.07%
		15Cu Control passed length	12.07%
		FR_UFR1 + 20Cu passed length	12.07%
		GH_ER2 +15Cu passed length	12.07%
		CM_MC1 + 15Cu passed length	12.07%
		LC_SLC + 15Cu passed length	12.07%
		FR_FRABCH + 20C passed length	12.07%
		FR_FRCP1 + 20Cu passed length	12.07%
		GH_FR1 + 20Cu passed length	12.07%
		GH_ERC + 10Cu passed length	12.07%
		CM_MC2 + 20Cu passed length	12.07%
		RG_MIDAG + 15Cu passed length	12.07%
		EV_MC2 + 20Cu passed length	12.07%
		EV_HC1 + 20Cu passed length	12.07%
		LC_DCDS + 20Cu passed length	12.07%
		LC_LC3 + 20Cu passed length	12.07%
		LC_LC5 + 20Cu passed length	12.07%
		LC_LCDSSLCC20Cu passed length	12.07%
		FR_FR4 + 20Cu passed length	12.07%
		FR_FR2 + 20Cu passed length	12.07%
		FR_MULTIPLATE20 passed length	12.07%
		FR_FRRD + 20Cu passed length	12.07%

Dunnett Multiple Comparison Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
20Cu Control		Lab Control	0.6717	2.744	1.349	6	CDF	0.8081	Non-Significant Effect
		10Cu Control	1.041	2.744	1.349	6	CDF	0.6562	Non-Significant Effect
		15Cu Control	0.1966	2.744	1.349	6	CDF	0.9305	Non-Significant Effect
		FR_UFR1 + 20Cu	1.558	2.744	1.349	6	CDF	0.4044	Non-Significant Effect
		GH_ER2 +15Cu	0.6783	2.744	1.349	6	CDF	0.8058	Non-Significant Effect
		CM_MC1 + 15Cu	0.5143	2.744	1.349	6	CDF	0.8581	Non-Significant Effect
		LC_SLC + 15Cu	-0.5635	2.744	1.349	6	CDF	0.9929	Non-Significant Effect
		FR_FRABCH + 20C	1.374	2.744	1.349	6	CDF	0.4942	Non-Significant Effect
		FR_FRCP1 + 20Cu	0.001848	2.744	1.349	6	CDF	0.9581	Non-Significant Effect
		GH_FR1 + 20Cu	1.124	2.744	1.349	6	CDF	0.6172	Non-Significant Effect
		GH_ERC + 10Cu	1.402	2.744	1.349	6	CDF	0.4803	Non-Significant Effect
		CM_MC2 + 20Cu	2.133	2.744	1.349	6	CDF	0.1744	Non-Significant Effect
		RG_MIDAG + 15Cu	0.832	2.744	1.349	6	CDF	0.7476	Non-Significant Effect
		EV_MC2 + 20Cu	0.8905	2.744	1.349	6	CDF	0.7234	Non-Significant Effect
		EV_HC1 + 20Cu	1.235	2.744	1.349	6	CDF	0.5633	Non-Significant Effect
		LC_DCDS + 20Cu	0.0249	2.744	1.349	6	CDF	0.9554	Non-Significant Effect
		LC_LC3 + 20Cu	0.9141	2.744	1.349	6	CDF	0.7133	Non-Significant Effect
		LC_LC5 + 20Cu	0.2523	2.744	1.349	6	CDF	0.9204	Non-Significant Effect
		LC_LCDSSLCC20Cu	0.9973	2.744	1.349	6	CDF	0.6765	Non-Significant Effect
		FR_FR4 + 20Cu	0.1223	2.744	1.349	6	CDF	0.9423	Non-Significant Effect
		FR_FR2 + 20Cu	1.492	2.744	1.349	6	CDF	0.4365	Non-Significant Effect
		FR_MULTIPLATE20	0.5899	2.744	1.349	6	CDF	0.8353	Non-Significant Effect
		FR_FRRD + 20Cu	0.7473	2.744	1.349	6	CDF	0.7808	Non-Significant Effect

Auxiliary Tests

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 07-0650-2028 **Endpoint:** Length **CETIS Version:** CETISv1.9.4
Analyzed: 22 May-21 10:49 **Analysis:** Parametric-Control vs Treatments **Status Level:** 1

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	3.392	3.37	0.0458	Outlier Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	8.62615	0.37505	23	0.7753	0.7491	Non-Significant Effect
Error	34.8279	0.483721	72			
Total	43.4541		95			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Variances	Bartlett Equality of Variance Test	31.32	35.17	0.1151	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9841	0.9737	0.3005	Normal Distribution

Length Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
Lab Control		4	10.85	10.2	11.5	10.74	10.5	11.42	0.2039	3.76%	0.00%
10Cu Control		4	10.67	10.19	11.15	10.69	10.29	11	0.1513	2.84%	1.68%
15Cu Control		4	11.08	9.919	12.25	11	10.33	12	0.3658	6.60%	-2.15%
20Cu Control	20	4	11.18	10.17	12.19	10.96	10.69	12.11	0.3171	5.67%	-3.04%
FR_UFR1 + 20Cu		4	10.41	9.005	11.82	10.04	9.857	11.73	0.4425	8.50%	4.02%
GH_ER2 +15Cu		4	10.85	10.27	11.43	10.8	10.5	11.29	0.182	3.36%	0.03%
CM_MC1 + 15Cu		4	10.93	9.723	12.13	10.83	10.17	11.88	0.3782	6.92%	-0.71%
LC_SLC + 15Cu		4	11.46	10.55	12.37	11.45	10.93	12	0.2857	4.99%	-5.60%
FR_FRABCH + 20C		4	10.5	9.776	11.23	10.47	10	11.08	0.2288	4.36%	3.18%
FR_FRCP1 + 20Cu		4	11.18	10.1	12.26	11.13	10.45	12	0.3392	6.07%	-3.04%
GH_FR1 + 20Cu		4	10.63	9.531	11.72	10.72	9.846	11.23	0.3445	6.48%	2.05%
GH_ERC + 10Cu		4	10.49	10.24	10.74	10.48	10.31	10.69	0.0791	1.51%	3.31%
CM_MC2 + 20Cu		4	10.13	8.98	11.28	10.01	9.429	11.08	0.3617	7.14%	6.62%
RG_MIDAG + 15Cu		4	10.77	10.19	11.35	10.72	10.4	11.25	0.1826	3.39%	0.73%
EV_MC2 + 20Cu		4	10.74	9.791	11.69	10.76	10.08	11.36	0.2987	5.56%	0.99%
EV_HC1 + 20Cu		4	10.57	10.15	10.99	10.54	10.31	10.9	0.1325	2.51%	2.55%
LC_DCDS + 20Cu		4	11.17	9.661	12.67	11.06	10.18	12.38	0.4734	8.48%	-2.93%
LC_LC3 + 20Cu		4	10.73	9.975	11.49	10.77	10.13	11.25	0.2375	4.43%	1.10%
LC_LC5 + 20Cu		4	11.06	9.583	12.53	10.93	10.07	12.3	0.4627	8.37%	-1.90%
LC_LCDSSLCC20C		4	10.69	10.4	10.98	10.66	10.5	10.93	0.09091	1.70%	1.48%
FR_FR4 + 20Cu		4	11.12	10.17	12.07	11.06	10.45	11.9	0.298	5.36%	-2.49%
FR_FR2 + 20Cu		4	10.45	7.854	13.04	10.14	9	12.5	0.8146	15.60%	3.72%
FR_MULTIPLATE2		4	10.89	9.947	11.83	10.89	10.23	11.55	0.2964	5.44%	-0.37%
FR_FRRD + 20Cu		4	10.81	9.242	12.38	10.83	9.917	11.67	0.4934	9.13%	0.34%

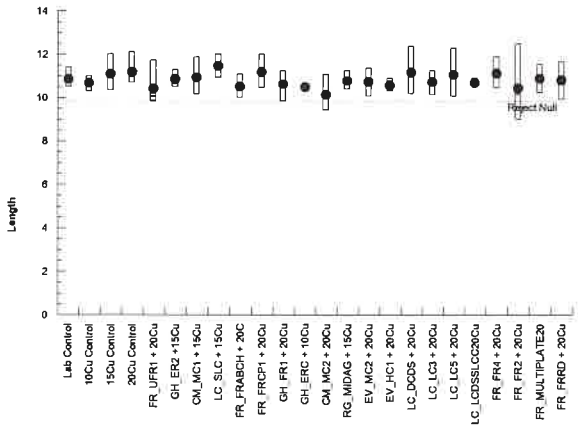
Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

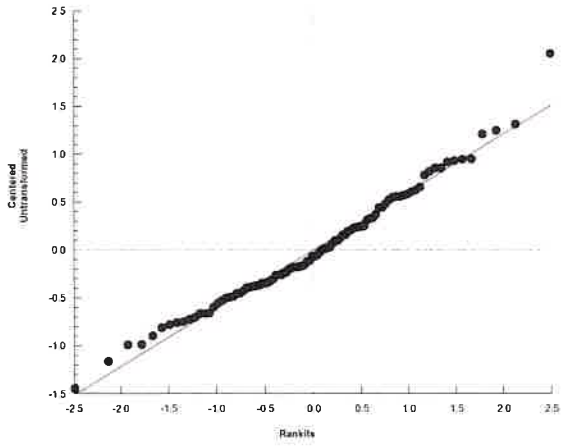
Analysis ID:	07-0650-2028	**Endpoint:**	Length	**CETIS Version:**	CETISv1.9.4
Analyzed:	22 May-21 10:49	**Analysis:**	Parametric-Control vs Treatments	**Status Level:**	1

Length Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Lab Control		10.5	10.62	11.42	10.87
10Cu Control		10.79	11	10.29	10.6
15Cu Control		10.69	10.33	12	11.31
20Cu Control	20	10.92	10.69	12.11	11
FR_UFR1 + 20Cu		9.917	9.857	10.15	11.73
GH_ER2 +15Cu		10.5	11.29	11	10.6
CM_MC1 + 15Cu		10.5	11.88	10.17	11.17
LC_SLC + 15Cu		12	11.9	10.93	11
FR_FRABCH + 20C		10.33	10	10.6	11.08
FR_FRCP1 + 20Cu		12	10.83	10.45	11.43
GH_FR1 + 20Cu		11.18	10.25	9.846	11.23
GH_ERC + 10Cu		10.5	10.31	10.69	10.46
CM_MC2 + 20Cu		9.429	9.733	10.29	11.08
RG_MIDAG + 15Cu		10.4	10.6	10.83	11.25
EV_MC2 + 20Cu		10.08	11.11	10.42	11.36
EV_HC1 + 20Cu		10.67	10.42	10.31	10.9
LC_DCDS + 20Cu		12.38	10.18	10.71	11.4
LC_LC3 + 20Cu		10.92	10.13	10.62	11.25
LC_LC5 + 20Cu		10.07	10.86	11	12.3
LC_LCDSSLCC20C		10.71	10.5	10.62	10.93
FR_FR4 + 20Cu		11	10.45	11.12	11.9
FR_FR2 + 20Cu		9.286	9	11	12.5
FR_MULTIPLATE2		11.2	10.58	10.23	11.55
FR_FRRD + 20Cu		9.917	10	11.67	11.67

Graphics





CETIS Analytical Report

Test Code/ID: Lab Control FM / 11-1126-9670

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID:	08-9585-7377	**Endpoint:**	Proportion Normal	**CETIS Version:**	CETISv1.9.4
Analyzed:	01 Jun-21 8:23	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1
Batch ID:	16-2689-7673	**Test Type:**	32 Day Fathead Minnow Test	**Analyst:**	Kayla Knol
Start Date:	06 Mar-21	**Protocol:**	ASTM E1241-05 (2013)	**Diluent:**	Dechlorinated Tap Water
Ending Date:	07 Apr-21	**Species:**	Pimephales promelas	**Brine:**	
Test Length:	32d 0h	**Taxon:**	Actinopterygii	**Source:**	Aquatox, AR **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
Lab Control	08-8280-1106	02 Mar-21	03 Mar-21	96h	Teck Coal Ltd	
10Cu Control	01-9333-5370	02 Mar-21	03 Mar-21	96h		
15Cu Control	19-6548-0518	02 Mar-21	03 Mar-21	96h		
20Cu Control	00-8675-6744	02 Mar-21	03 Mar-21	96h		
FR_UFR1 + 20Cu	20-4721-8257	02 Mar-21	03 Mar-21	96h (4.6 °C)		
GH_ER2 +15Cu	01-1137-9253	02 Mar-21	03 Mar-21	96h (4.2 °C)		
CM_MC1 + 15Cu	01-3772-5048	02 Mar-21	03 Mar-21	96h (1 °C)		
LC_SLC + 15Cu	01-2380-6574	02 Mar-21	03 Mar-21	96h (3.1 °C)		
FR_FRABCH + 20C	08-4134-0746	02 Mar-21	03 Mar-21	96h (3.8 °C)		
FR_FRCP1 + 20Cu	11-2694-6466	02 Mar-21	03 Mar-21	96h (3 °C)		
GH_FR1 + 20Cu	20-1635-3152	02 Mar-21	03 Mar-21	96h (2.4 °C)		
GH_ERC + 10Cu	05-1950-5597	02 Mar-21	03 Mar-21	96h (4.1 °C)		
CM_MC2 + 20Cu	14-4685-1067	02 Mar-21	03 Mar-21	96h (0.3 °C)		
RG_MIDAG + 15Cu	21-3889-1829	02 Mar-21	03 Mar-21	96h (0.6 °C)		
EV_MC2 + 20Cu	05-6103-5191	02 Mar-21	03 Mar-21	96h (4.4 °C)		
EV_HC1 + 20Cu	12-5501-3302	02 Mar-21	03 Mar-21	96h (3.4 °C)		
LC_DCDS + 20Cu	04-1088-5978	02 Mar-21	03 Mar-21	96h (0.6 °C)		
LC_LC3 + 20Cu	14-7773-4190	02 Mar-21	03 Mar-21	96h (2.3 °C)		
LC_LC5 + 20Cu	01-7235-6798	02 Mar-21	03 Mar-21	96h (0.6 °C)		
LC_LCDSSLCC20C	06-4197-2641	02 Mar-21	03 Mar-21	96h (2.4 °C)		
FR_FR4 + 20Cu	10-9481-5020	02 Mar-21	03 Mar-21	96h (5.4 °C)		
FR_FR2 + 20Cu	00-3159-8672	02 Mar-21	03 Mar-21	96h (4.4 °C)		
FR_MULTIPLATE2	02-2179-0364	02 Mar-21	03 Mar-21	96h (2.9 °C)		
FR_FRRD + 20Cu	19-5167-8345	02 Mar-21	03 Mar-21	96h (6.2 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
Lab Control	Ambient Sample	Teck Coal Ltd	Lab Control	
10Cu Control	Ambient Sample	Teck Coal Ltd	10Cu Control	
15Cu Control	Ambient Sample	Teck Coal Ltd	15Cu Control	
20Cu Control	Ambient Sample	Teck Coal Ltd	20Cu Control	
FR_UFR1 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_UFR1_MON_2021-03-0	
GH_ER2 +15Cu	Ambient Sample	Teck Coal Ltd	GH_ER2_WS_2021-03-02_	
CM_MC1 + 15Cu	Ambient Sample	Teck Coal Ltd	CM_MC1_WS_2021-03-02	
LC_SLC + 15Cu	Ambient Sample	Teck Coal Ltd	LC_SLC_WS_2021-03-02_	
FR_FRABCH + 20C	Ambient Sample	Teck Coal Ltd	FR_FRABCH_MON_2021-	
FR_FRCP1 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FRCP1_MON_2021-03	
GH_FR1 + 20Cu	Ambient Sample	Teck Coal Ltd	GH_FR1_WS_2021-03-02_	
GH_ERC + 10Cu	Ambient Sample	Teck Coal Ltd	GH_ERC_WS_2021-03-02	
CM_MC2 + 20Cu	Ambient Sample	Teck Coal Ltd	CM_MC2_WS_2021-03-02	
RG_MIDAG + 15Cu	Ambient Sample	Teck Coal Ltd	RG_MIDAG_WS_2021-03-	
EV_MC2 + 20Cu	Ambient Sample	Teck Coal Ltd	EV_MC2_WS_2021_Q1_W	
EV_HC1 + 20Cu	Ambient Sample	Teck Coal Ltd	EV_HC1_WS_2021_Q1_W	
LC_DCDS + 20Cu	Ambient Sample	Teck Coal Ltd	LC_DCDS_WS_2021-03-02	
LC_LC3 + 20Cu	Ambient Sample	Teck Coal Ltd	LC_LC3_WS_2021-03-02_	
LC_LC5 + 20Cu	Ambient Sample	Teck Coal Ltd	LC_LC5_WS_2021-03-02_	
LC_LCDSSLCC20C	Ambient Sample	Teck Coal Ltd	LC_LCDSSLCC_WS_2021-	
FR_FR4 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FR4_WS_2021-03-02_	
FR_FR2 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FR2_WS_2021-03-02_	

Analyst: KK QA: MG

JUN 10 2021

Fathead minnow 32-d (Pimephales promelas) survival and growth test **Nautilus Environmental Calgary**

Analysis ID: 08-9585-7377 **Endpoint:** Proportion Normal **CETIS Version:** CETISv1.9.4
Analyzed: 01 Jun-21 8:23 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_MULTIPLATE2	Ambient Sample	Teck Coal Ltd	FR_MULTIPLATE_WS_202	
FR_FRRD + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FRRD_WS_2021-03-02	

Fisher Exact/Bonferroni Adj Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
20Cu Control		Lab Control	1.0000	Exact	1.0000	Non-Significant Effect
		10Cu Control	1.0000	Exact	1.0000	Non-Significant Effect
		15Cu Control	1.0000	Exact	1.0000	Non-Significant Effect
		FR_UFR1 + 20Cu	1.0000	Exact	1.0000	Non-Significant Effect
		GH_ER2 +15Cu	0.0059	Exact	0.1349	Non-Significant Effect
		CM_MC1 + 15Cu	0.0088	Exact	0.2027	Non-Significant Effect
		LC_SLC + 15Cu	1.0000	Exact	1.0000	Non-Significant Effect
		FR_FRABCH + 20C	0.4920	Exact	1.0000	Non-Significant Effect
		FR_FRCP1 + 20Cu	0.6145	Exact	1.0000	Non-Significant Effect
		GH_FR1 + 20Cu	0.3164	Exact	1.0000	Non-Significant Effect
		GH_ERC + 10Cu	0.0225	Exact	0.5174	Non-Significant Effect
		CM_MC2 + 20Cu	0.5581	Exact	1.0000	Non-Significant Effect
		RG_MIDAG + 15Cu	0.4670	Exact	1.0000	Non-Significant Effect
		EV_MC2 + 20Cu	0.7419	Exact	1.0000	Non-Significant Effect
		EV_HC1 + 20Cu	0.7474	Exact	1.0000	Non-Significant Effect
		LC_DCDS + 20Cu	0.4584	Exact	1.0000	Non-Significant Effect
		LC_LC3 + 20Cu	0.5375	Exact	1.0000	Non-Significant Effect
		LC_LC5 + 20Cu	1.0000	Exact	1.0000	Non-Significant Effect
		LC_LCDSSLCC20Cu	0.7766	Exact	1.0000	Non-Significant Effect
		FR_FR4 + 20Cu	1.0000	Exact	1.0000	Non-Significant Effect
		FR_FR2 + 20Cu	0.2928	Exact	1.0000	Non-Significant Effect
		FR_MULTIPLATE20	1.0000	Exact	1.0000	Non-Significant Effect
		FR_FRRD + 20Cu	0.4495	Exact	1.0000	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	4.105	3.37	0.0017	Outlier Detected

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 08-9585-7377 **Endpoint:** Proportion Normal **CETIS Version:** CETISv1.9.4
Analyzed: 01 Jun-21 8:23 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Data Summary

Sample	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
Lab Control		54	0	54	1	0	-2.13%
10Cu Control		56	0	56	1	0	-2.13%
15Cu Control		50	0	50	1	0	-2.13%
20Cu Control	20	47	1	48	0.9792	0.02083	0.0%
FR_UFR1 + 20Cu		50	0	50	1	0	-2.13%
GH_ER2 +15Cu		14	5	19	0.7368	0.2632	24.75%
CM_MC1 + 15Cu		22	6	28	0.7857	0.2143	19.76%
LC_SLC + 15Cu		47	0	47	1	0	-2.13%
FR_FRABCH + 20C		45	2	47	0.9574	0.04255	2.22%
FR_FRCP1 + 20Cu		28	1	29	0.9655	0.03448	1.39%
GH_FR1 + 20Cu		46	3	49	0.9388	0.06122	4.13%
GH_ERC + 10Cu		45	8	53	0.8491	0.1509	13.29%
CM_MC2 + 20Cu		54	2	56	0.9643	0.03571	1.52%
RG_MIDAG + 15Cu		42	2	44	0.9545	0.04545	2.52%
EV_MC2 + 20Cu		45	1	46	0.9783	0.02174	0.09%
EV_HC1 + 20Cu		46	1	47	0.9787	0.02128	0.05%
LC_DCDS + 20Cu		41	2	43	0.9535	0.04651	2.62%
LC_LC3 + 20Cu		51	2	53	0.9623	0.03774	1.73%
LC_LC5 + 20Cu		52	0	52	1	0	-2.13%
LC_LCDSSLCC20C		52	1	53	0.9811	0.01887	-0.2%
FR_FR4 + 20Cu		38	0	38	1	0	-2.13%
FR_FR2 + 20Cu		25	2	27	0.9259	0.07407	5.44%
FR_MULTIPLATE20		46	0	46	1	0	-2.13%
FR_FRRD + 20Cu		40	2	42	0.9524	0.04762	2.74%

Proportion Normal Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Lab Control		1.0000	1.0000	1.0000	1.0000
10Cu Control		1.0000	1.0000	1.0000	1.0000
15Cu Control		1.0000	1.0000	1.0000	1.0000
20Cu Control	20	0.9167	1.0000	1.0000	1.0000
FR_UFR1 + 20Cu		1.0000	1.0000	1.0000	1.0000
GH_ER2 +15Cu		0.7500	0.8571	1.0000	0.4000
CM_MC1 + 15Cu		0.6250	0.8750	0.6667	1.0000
LC_SLC + 15Cu		1.0000	1.0000	1.0000	1.0000
FR_FRABCH + 20C		1.0000	1.0000	0.8000	1.0000
FR_FRCP1 + 20Cu		1.0000	0.8333	1.0000	1.0000
GH_FR1 + 20Cu		1.0000	1.0000	0.9231	0.8462
GH_ERC + 10Cu		0.7857	0.7692	0.9231	0.9231
CM_MC2 + 20Cu		1.0000	0.9333	0.9286	1.0000
RG_MIDAG + 15Cu		0.9000	1.0000	1.0000	0.9167
EV_MC2 + 20Cu		0.9231	1.0000	1.0000	1.0000
EV_HC1 + 20Cu		0.9167	1.0000	1.0000	1.0000
LC_DCDS + 20Cu		1.0000	0.9091	0.9286	1.0000
LC_LC3 + 20Cu		1.0000	0.9333	1.0000	0.9167
LC_LC5 + 20Cu		1.0000	1.0000	1.0000	1.0000
LC_LCDSSLCC20C		1.0000	0.9167	1.0000	1.0000
FR_FR4 + 20Cu		1.0000	1.0000	1.0000	1.0000
FR_FR2 + 20Cu		0.8571	0.8571	1.0000	1.0000
FR_MULTIPLATE2		1.0000	1.0000	1.0000	1.0000
FR_FRRD + 20Cu		0.9167	0.9167	1.0000	1.0000

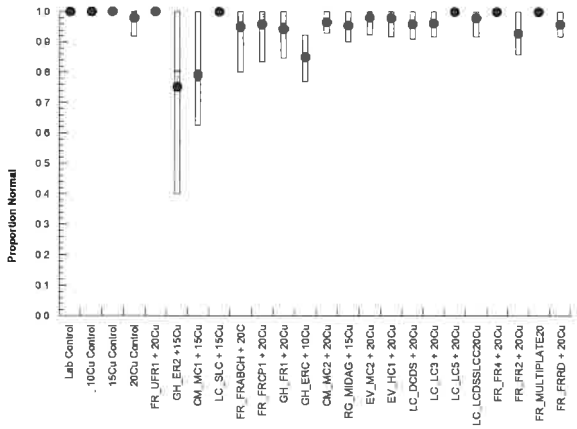
Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 08-9585-7377 **Endpoint:** Proportion Normal **CETIS Version:** CETISv1.9.4
Analyzed: 01 Jun-21 8:23 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Proportion Normal Binomials

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Lab Control		14/14	13/13	12/12	15/15
10Cu Control		14/14	13/13	14/14	15/15
15Cu Control		13/13	15/15	9/9	13/13
20Cu Control	20	11/12	13/13	9/9	14/14
FR_UFR1 + 20Cu		12/12	14/14	13/13	11/11
GH_ER2 +15Cu		3/4	6/7	3/3	2/5
CM_MC1 + 15Cu		5/8	7/8	4/6	6/6
LC_SLC + 15Cu		9/9	10/10	14/14	14/14
FR_FRABCH + 20C		12/12	13/13	8/10	12/12
FR_FRCP1 + 20Cu		5/5	5/6	11/11	7/7
GH_FR1 + 20Cu		11/11	12/12	12/13	11/13
GH_ERC + 10Cu		11/14	10/13	12/13	12/13
CM_MC2 + 20Cu		14/14	14/15	13/14	13/13
RG_MIDAG + 15Cu		9/10	10/10	12/12	11/12
EV_MC2 + 20Cu		12/13	9/9	12/12	11/11
EV_HC1 + 20Cu		11/12	12/12	13/13	10/10
LC_DCDS + 20Cu		8/8	10/11	13/14	10/10
LC_LC3 + 20Cu		13/13	14/15	13/13	11/12
LC_LC5 + 20Cu		15/15	14/14	13/13	10/10
LC_LCDSSLCC20C		14/14	11/12	13/13	14/14
FR_FR4 + 20Cu		9/9	11/11	8/8	10/10
FR_FR2 + 20Cu		6/7	6/7	9/9	4/4
FR_MULTIPLATE2		10/10	12/12	13/13	11/11
FR_FRRD + 20Cu		11/12	11/12	9/9	9/9

Graphics



Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID:	05-6427-6213	**Endpoint:**	Post Hatch Survival	**CETIS Version:**	CETISv1.9.4
Analyzed:	22 May-21 10:43	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1
Batch ID:	16-2689-7673	**Test Type:**	32 Day Fathead Minnow Test	**Analyst:**	Kayla Knol
Start Date:	06 Mar-21	**Protocol:**	ASTM E1241-05 (2013)	**Diluent:**	Dechlorinated Tap Water
Ending Date:	07 Apr-21	**Species:**	Pimephales promelas	**Brine:**	
Test Length:	32d 0h	**Taxon:**	Actinopterygii	**Source:**	Aquatox, AR **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
Lab Control	08-8280-1106	02 Mar-21	03 Mar-21	96h	Teck Coal Ltd	
10Cu Control	01-9333-5370	02 Mar-21	03 Mar-21	96h		
15Cu Control	19-6548-0518	02 Mar-21	03 Mar-21	96h		
20Cu Control	00-8675-6744	02 Mar-21	03 Mar-21	96h		
FR_UFR1 + 20Cu	20-4721-8257	02 Mar-21	03 Mar-21	96h (4.6 °C)		
GH_ER2 +15Cu	01-1137-9253	02 Mar-21	03 Mar-21	96h (4.2 °C)		
CM_MC1 + 15Cu	01-3772-5048	02 Mar-21	03 Mar-21	96h (1 °C)		
LC_SLC + 15Cu	01-2380-6574	02 Mar-21	03 Mar-21	96h (3.1 °C)		
FR_FRABCH + 20C	08-4134-0746	02 Mar-21	03 Mar-21	96h (3.8 °C)		
FR_FRCP1 + 20Cu	11-2694-6466	02 Mar-21	03 Mar-21	96h (3 °C)		
GH_FR1 + 20Cu	20-1635-3152	02 Mar-21	03 Mar-21	96h (2.4 °C)		
GH_ERC + 10Cu	05-1950-5597	02 Mar-21	03 Mar-21	96h (4.1 °C)		
CM_MC2 + 20Cu	14-4685-1067	02 Mar-21	03 Mar-21	96h (0.3 °C)		
RG_MIDAG + 15Cu	21-3889-1829	02 Mar-21	03 Mar-21	96h (0.6 °C)		
EV_MC2 + 20Cu	05-6103-5191	02 Mar-21	03 Mar-21	96h (4.4 °C)		
EV_HC1 + 20Cu	12-5501-3302	02 Mar-21	03 Mar-21	96h (3.4 °C)		
LC_DCDS + 20Cu	04-1088-5978	02 Mar-21	03 Mar-21	96h (0.6 °C)		
LC_LC3 + 20Cu	14-7773-4190	02 Mar-21	03 Mar-21	96h (2.3 °C)		
LC_LC5 + 20Cu	01-7235-6798	02 Mar-21	03 Mar-21	96h (0.6 °C)		
LC_LCDSSLCC20C	06-4197-2641	02 Mar-21	03 Mar-21	96h (2.4 °C)		
FR_FR4 + 20Cu	10-9481-5020	02 Mar-21	03 Mar-21	96h (5.4 °C)		
FR_FR2 + 20Cu	00-3159-8672	02 Mar-21	03 Mar-21	96h (4.4 °C)		
FR_MULTIPLATE2	02-2179-0364	02 Mar-21	03 Mar-21	96h (2.9 °C)		
FR_FRRD + 20Cu	19-5167-8345	02 Mar-21	03 Mar-21	96h (6.2 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
Lab Control	Ambient Sample	Teck Coal Ltd	Lab Control	
10Cu Control	Ambient Sample	Teck Coal Ltd	10Cu Control	
15Cu Control	Ambient Sample	Teck Coal Ltd	15Cu Control	
20Cu Control	Ambient Sample	Teck Coal Ltd	20Cu Control	
FR_UFR1 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_UFR1_MON_2021-03-0	
GH_ER2 +15Cu	Ambient Sample	Teck Coal Ltd	GH_ER2_WS_2021-03-02_	
CM_MC1 + 15Cu	Ambient Sample	Teck Coal Ltd	CM_MC1_WS_2021-03-02	
LC_SLC + 15Cu	Ambient Sample	Teck Coal Ltd	LC_SLC_WS_2021-03-02_	
FR_FRABCH + 20C	Ambient Sample	Teck Coal Ltd	FR_FRABCH_MON_2021-	
FR_FRCP1 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FRCP1_MON_2021-03	
GH_FR1 + 20Cu	Ambient Sample	Teck Coal Ltd	GH_FR1_WS_2021-03-02_	
GH_ERC + 10Cu	Ambient Sample	Teck Coal Ltd	GH_ERC_WS_2021-03-02	
CM_MC2 + 20Cu	Ambient Sample	Teck Coal Ltd	CM_MC2_WS_2021-03-02	
RG_MIDAG + 15Cu	Ambient Sample	Teck Coal Ltd	RG_MIDAG_WS_2021-03-	
EV_MC2 + 20Cu	Ambient Sample	Teck Coal Ltd	EV_MC2_WS_2021_Q1_W	
EV_HC1 + 20Cu	Ambient Sample	Teck Coal Ltd	EV_HC1_WS_2021_Q1_W	
LC_DCDS + 20Cu	Ambient Sample	Teck Coal Ltd	LC_DCDS_WS_2021-03-02	
LC_LC3 + 20Cu	Ambient Sample	Teck Coal Ltd	LC_LC3_WS_2021-03-02_	
LC_LC5 + 20Cu	Ambient Sample	Teck Coal Ltd	LC_LC5_WS_2021-03-02_	
LC_LCDSSLCC20C	Ambient Sample	Teck Coal Ltd	LC_LCDSSLCC_WS_2021-	
FR_FR4 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FR4_WS_2021-03-02_	
FR_FR2 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FR2_WS_2021-03-02_	

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Fathead minnow 32-d (Pimephales promelas) survival and growth test **Nautilus Environmental Calgary**

Analysis ID: 05-6427-6213 **Endpoint:** Post Hatch Survival **CETIS Version:** CETISv1.9.4
Analyzed: 22 May-21 10:43 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_MULTIPLATE2	Ambient Sample	Teck Coal Ltd	FR_MULTIPLATE_WS_202	
FR_FRRD + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FRRD_WS_2021-03-02	

Fisher Exact/Bonferroni Adj Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
20Cu Control		Lab Control	0.8876	Exact	1.0000	Non-Significant Effect
		10Cu Control	0.9876	Exact	1.0000	Non-Significant Effect
		15Cu Control	0.6315	Exact	1.0000	Non-Significant Effect
		FR_UFR1 + 20Cu	0.7903	Exact	1.0000	Non-Significant Effect
		GH_ER2 +15Cu*	0.0000	Exact	2.1E-07	Significant Effect
		CM_MC1 + 15Cu*	0.0000	Exact	6.1E-04	Significant Effect
		LC_SLC + 15Cu	0.3471	Exact	1.0000	Non-Significant Effect
		FR_FRABCH + 20C	0.3471	Exact	1.0000	Non-Significant Effect
		FR_FRCP1 + 20Cu*	0.0001	Exact	0.0013	Significant Effect
		GH_FR1 + 20Cu	0.8498	Exact	1.0000	Non-Significant Effect
		GH_ERC + 10Cu	0.8809	Exact	1.0000	Non-Significant Effect
		CM_MC2 + 20Cu	0.9876	Exact	1.0000	Non-Significant Effect
		RG_MIDAG + 15Cu	0.1465	Exact	1.0000	Non-Significant Effect
		EV_MC2 + 20Cu	0.4830	Exact	1.0000	Non-Significant Effect
		EV_HC1 + 20Cu	0.4199	Exact	1.0000	Non-Significant Effect
		LC_DCDS + 20Cu	0.6084	Exact	1.0000	Non-Significant Effect
		LC_LC3 + 20Cu	0.8205	Exact	1.0000	Non-Significant Effect
		LC_LC5 + 20Cu	0.8109	Exact	1.0000	Non-Significant Effect
		LC_LCDSSLCC20Cu	0.8205	Exact	1.0000	Non-Significant Effect
		FR_FR4 + 20Cu	0.0125	Exact	0.2886	Non-Significant Effect
		FR_FR2 + 20Cu*	0.0000	Exact	2.9E-04	Significant Effect
		FR_MULTIPLATE20	0.2679	Exact	1.0000	Non-Significant Effect
		FR_FRRD + 20Cu	0.1631	Exact	1.0000	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	2.592	3.37	0.8135	No Outliers Detected

JUN 10 2021

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 05-6427-6213 **Endpoint:** Post Hatch Survival **CETIS Version:** CETISv1.9.4
Analyzed: 22 May-21 10:43 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Data Summary

Sample	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
Lab Control		54	6	60	0.9	0.1	-6.88%
10Cu Control		56	3	59	0.9492	0.05085	-12.71%
15Cu Control		50	9	59	0.8475	0.1525	-0.64%
20Cu Control	20	48	9	57	0.8421	0.1579	0.0%
FR_UFR1 + 20Cu		50	7	57	0.8772	0.1228	-4.17%
GH_ER2 +15Cu		19	40	59	0.322	0.678	61.76%
CM_MC1 + 15Cu		28	31	59	0.4746	0.5254	43.64%
LC_SLC + 15Cu		47	12	59	0.7966	0.2034	5.4%
FR_FRABCH + 20C		47	12	59	0.7966	0.2034	5.4%
FR_FRCP1 + 20Cu		29	30	59	0.4915	0.5085	41.63%
GH_FR1 + 20Cu		49	6	55	0.8909	0.1091	-5.8%
GH_ERC + 10Cu		53	6	59	0.8983	0.1017	-6.67%
CM_MC2 + 20Cu		56	3	59	0.9492	0.05085	-12.71%
RG_MIDAG + 15Cu		44	15	59	0.7458	0.2542	11.44%
EV_MC2 + 20Cu		46	10	56	0.8214	0.1786	2.46%
EV_HC1 + 20Cu		47	11	58	0.8103	0.1897	3.77%
LC_DCDS + 20Cu		43	8	51	0.8431	0.1569	-0.12%
LC_LC3 + 20Cu		53	7	60	0.8833	0.1167	-4.9%
LC_LC5 + 20Cu		52	7	59	0.8814	0.1186	-4.66%
LC_LCDSSLCC20C		53	7	60	0.8833	0.1167	-4.9%
FR_FR4 + 20Cu		38	21	59	0.6441	0.3559	23.52%
FR_FR2 + 20Cu		27	32	59	0.4576	0.5424	45.66%
FR_MULTIPLATE20		46	13	59	0.7797	0.2203	7.42%
FR_FRRD + 20Cu		42	14	56	0.75	0.25	10.94%

Post Hatch Survival Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Lab Control		0.9333	0.8667	0.8000	1.0000
10Cu Control		1.0000	0.8667	0.9333	1.0000
15Cu Control		0.8667	1.0000	0.6000	0.9286
20Cu Control	20	0.8571	1.0000	0.6000	0.9333
FR_UFR1 + 20Cu		0.9231	0.9333	0.8667	0.7857
GH_ER2 +15Cu		0.2667	0.4667	0.2000	0.3571
CM_MC1 + 15Cu		0.5333	0.5333	0.4286	0.4000
LC_SLC + 15Cu		0.6429	0.6667	0.9333	0.9333
FR_FRABCH + 20C		0.8000	0.8667	0.7143	0.8000
FR_FRCP1 + 20Cu		0.3571	0.4000	0.7333	0.4667
GH_FR1 + 20Cu		0.7857	1.0000	0.8667	0.9286
GH_ERC + 10Cu		0.9333	0.8667	0.9286	0.8667
CM_MC2 + 20Cu		0.9333	1.0000	0.9333	0.9286
RG_MIDAG + 15Cu		0.6667	0.7143	0.8000	0.8000
EV_MC2 + 20Cu		0.9286	0.7500	0.8000	0.8000
EV_HC1 + 20Cu		0.8000	0.8571	0.8667	0.7143
LC_DCDS + 20Cu		0.6667	0.7857	0.9333	1.0000
LC_LC3 + 20Cu		0.8667	1.0000	0.8667	0.8000
LC_LC5 + 20Cu		1.0000	0.9333	0.8667	0.7143
LC_LCDSSLCC20C		0.9333	0.8000	0.8667	0.9333
FR_FR4 + 20Cu		0.6000	0.7333	0.5333	0.7143
FR_FR2 + 20Cu		0.4667	0.4667	0.6429	0.2667
FR_MULTIPLATE2		0.7143	0.8000	0.8667	0.7333
FR_FRRD + 20Cu		0.8571	0.8571	0.6000	0.6923

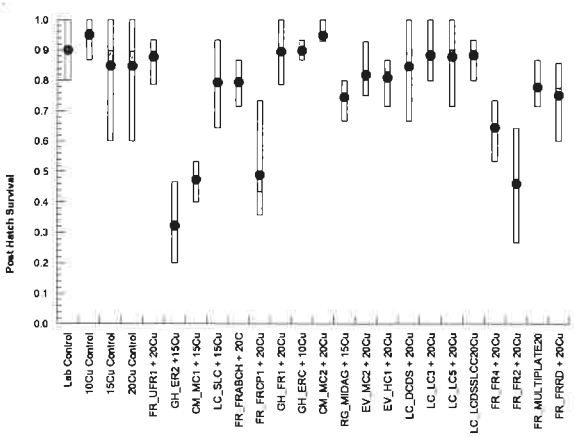
Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 05-6427-6213 **Endpoint:** Post Hatch Survival **CETIS Version:** CETISv1.9.4
Analyzed: 22 May-21 10:43 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Post Hatch Survival Binomials

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Lab Control		14/15	13/15	12/15	15/15
10Cu Control		14/14	13/15	14/15	15/15
15Cu Control		13/15	15/15	9/15	13/14
20Cu Control	20	12/14	13/13	9/15	14/15
FR_UFR1 + 20Cu		12/13	14/15	13/15	11/14
GH_ER2 +15Cu		4/15	7/15	3/15	5/14
CM_MC1 + 15Cu		8/15	8/15	6/14	6/15
LC_SLC + 15Cu		9/14	10/15	14/15	14/15
FR_FRABCH + 20C		12/15	13/15	10/14	12/15
FR_FRCP1 + 20Cu		5/14	6/15	11/15	7/15
GH_FR1 + 20Cu		11/14	12/12	13/15	13/14
GH_ERC + 10Cu		14/15	13/15	13/14	13/15
CM_MC2 + 20Cu		14/15	15/15	14/15	13/14
RG_MIDAG + 15Cu		10/15	10/14	12/15	12/15
EV_MC2 + 20Cu		13/14	9/12	12/15	12/15
EV_HC1 + 20Cu		12/15	12/14	13/15	10/14
LC_DCDS + 20Cu		8/12	11/14	14/15	10/10
LC_LC3 + 20Cu		13/15	15/15	13/15	12/15
LC_LC5 + 20Cu		15/15	14/15	13/15	10/14
LC_LCDSSLCC20C		14/15	12/15	13/15	14/15
FR_FR4 + 20Cu		9/15	11/15	8/15	10/14
FR_FR2 + 20Cu		7/15	7/15	9/14	4/15
FR_MULTIPLATE2		10/14	12/15	13/15	11/15
FR_FRRD + 20Cu		12/14	12/14	9/15	9/13

Graphics



JUN 10 2021

CETIS Analytical Report

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID:	16-6073-0468	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.9.4
Analyzed:	01 Jun-21 8:31	**Analysis:**	Nonparametric-Control vs Treatments	**Status Level:**	1
Batch ID:	16-2689-7673	**Test Type:**	32 Day Fathead Minnow Test	**Analyst:**	Kayla Knol
Start Date:	06 Mar-21	**Protocol:**	ASTM E1241-05 (2013)	**Diluent:**	Dechlorinated Tap Water
Ending Date:	07 Apr-21	**Species:**	Pimephales promelas	**Brine:**	
Test Length:	32d 0h	**Taxon:**	Actinopterygii	**Source:**	Aquatox, AR **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
Lab Control	08-8280-1106	02 Mar-21	03 Mar-21	96h	Teck Coal Ltd	
10Cu Control	01-9333-5370	02 Mar-21	03 Mar-21	96h		
15Cu Control	19-6548-0518	02 Mar-21	03 Mar-21	96h		
20Cu Control	00-8675-6744	02 Mar-21	03 Mar-21	96h		
FR_UFR1 + 20Cu	20-4721-8257	02 Mar-21	03 Mar-21	96h (4.6 °C)		
GH_ER2 +15Cu	01-1137-9253	02 Mar-21	03 Mar-21	96h (4.2 °C)		
CM_MC1 + 15Cu	01-3772-5048	02 Mar-21	03 Mar-21	96h (1 °C)		
LC_SLC + 15Cu	01-2380-6574	02 Mar-21	03 Mar-21	96h (3.1 °C)		
FR_FRABCH + 20C	08-4134-0746	02 Mar-21	03 Mar-21	96h (3.8 °C)		
FR_FRCP1 + 20Cu	11-2694-6466	02 Mar-21	03 Mar-21	96h (3 °C)		
GH_FR1 + 20Cu	20-1635-3152	02 Mar-21	03 Mar-21	96h (2.4 °C)		
GH_ERC + 10Cu	05-1950-5597	02 Mar-21	03 Mar-21	96h (4.1 °C)		
CM_MC2 + 20Cu	14-4685-1067	02 Mar-21	03 Mar-21	96h (0.3 °C)		
RG_MIDAG + 15Cu	21-3889-1829	02 Mar-21	03 Mar-21	96h (0.6 °C)		
EV_MC2 + 20Cu	05-6103-5191	02 Mar-21	03 Mar-21	96h (4.4 °C)		
EV_HC1 + 20Cu	12-5501-3302	02 Mar-21	03 Mar-21	96h (3.4 °C)		
LC_DCDS + 20Cu	04-1088-5978	02 Mar-21	03 Mar-21	96h (0.6 °C)		
LC_LC3 + 20Cu	14-7773-4190	02 Mar-21	03 Mar-21	96h (2.3 °C)		
LC_LC5 + 20Cu	01-7235-6798	02 Mar-21	03 Mar-21	96h (0.6 °C)		
LC_LCDSSLCC20C	06-4197-2641	02 Mar-21	03 Mar-21	96h (2.4 °C)		
FR_FR4 + 20Cu	10-9481-5020	02 Mar-21	03 Mar-21	96h (5.4 °C)		
FR_FR2 + 20Cu	00-3159-8672	02 Mar-21	03 Mar-21	96h (4.4 °C)		
FR_MULTIPLATE2	02-2179-0364	02 Mar-21	03 Mar-21	96h (2.9 °C)		
FR_FRRD + 20Cu	19-5167-8345	02 Mar-21	03 Mar-21	96h (6.2 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
Lab Control	Ambient Sample	Teck Coal Ltd	Lab Control	
10Cu Control	Ambient Sample	Teck Coal Ltd	10Cu Control	
15Cu Control	Ambient Sample	Teck Coal Ltd	15Cu Control	
20Cu Control	Ambient Sample	Teck Coal Ltd	20Cu Control	
FR_UFR1 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_UFR1_MON_2021-03-0	
GH_ER2 +15Cu	Ambient Sample	Teck Coal Ltd	GH_ER2_WS_2021-03-02_	
CM_MC1 + 15Cu	Ambient Sample	Teck Coal Ltd	CM_MC1_WS_2021-03-02	
LC_SLC + 15Cu	Ambient Sample	Teck Coal Ltd	LC_SLC_WS_2021-03-02_	
FR_FRABCH + 20C	Ambient Sample	Teck Coal Ltd	FR_FRABCH_MON_2021-	
FR_FRCP1 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FRCP1_MON_2021-03	
GH_FR1 + 20Cu	Ambient Sample	Teck Coal Ltd	GH_FR1_WS_2021-03-02_	
GH_ERC + 10Cu	Ambient Sample	Teck Coal Ltd	GH_ERC_WS_2021-03-02	
CM_MC2 + 20Cu	Ambient Sample	Teck Coal Ltd	CM_MC2_WS_2021-03-02	
RG_MIDAG + 15Cu	Ambient Sample	Teck Coal Ltd	RG_MIDAG_WS_2021-03-	
EV_MC2 + 20Cu	Ambient Sample	Teck Coal Ltd	EV_MC2_WS_2021_Q1_W	
EV_HC1 + 20Cu	Ambient Sample	Teck Coal Ltd	EV_HC1_WS_2021_Q1_W	
LC_DCDS + 20Cu	Ambient Sample	Teck Coal Ltd	LC_DCDS_WS_2021-03-02	
LC_LC3 + 20Cu	Ambient Sample	Teck Coal Ltd	LC_LC3_WS_2021-03-02_	
LC_LC5 + 20Cu	Ambient Sample	Teck Coal Ltd	LC_LC5_WS_2021-03-02_	
LC_LCDSSLCC20C	Ambient Sample	Teck Coal Ltd	LC_LCDSSLCC_WS_2021-	
FR_FR4 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FR4_WS_2021-03-02_	
FR_FR2 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FR2_WS_2021-03-02_	

Analyst: KSC QA: MG

JUN 10 2021

CETIS Analytical Report

Report Date: 01 Jun-21 08:31 (p 2 of 4)
Test Code/ID: Lab Control FM / 11-1126-9670

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID:	16-6073-0468	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.9.4
Analyzed:	01 Jun-21 8:31	**Analysis:**	Nonparametric-Control vs Treatments	**Status Level:**	1

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_MULTIPLATE2	Ambient Sample	Teck Coal Ltd	FR_MULTIPLATE_WS_202	
FR_FRRD + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FRRD_WS_2021-03-02	

Nemenyi-Damico-Wolfe Test

Sample I	vs	Sample II	Test Stat	Critical	Ties	P-Type	P-Value	Decision(α:5%)
Site Control		Lab Control	-33	211.4	2	CDF	0.9885	Non-Significant Effect
		10Cu Control	0	211.4	2	CDF	0.9583	Non-Significant Effect
		15Cu Control	-67	211.4	2	CDF	0.9977	Non-Significant Effect
		20Cu Control	-59	211.4	2	CDF	0.9965	Non-Significant Effect
		GH_ER2 +15Cu	203	211.4	2	CDF	0.0649	Non-Significant Effect
		CM_MC1 + 15Cu	154	211.4	2	CDF	0.2274	Non-Significant Effect
		LC_SLC + 15Cu	69	211.4	2	CDF	0.7292	Non-Significant Effect
		FR_FRABCH + 20C	59	211.4	2	CDF	0.7799	Non-Significant Effect
		FR_FRCP1 + 20Cu	161	211.4	2	CDF	0.1955	Non-Significant Effect
		GH_FR1 + 20Cu	-29.5	211.4	2	CDF	0.9866	Non-Significant Effect
		GH_ERC + 10Cu	-38	211.4	2	CDF	0.9907	Non-Significant Effect
		CM_MC2 + 20Cu	48	211.4	2	CDF	0.8290	Non-Significant Effect
		RG_MIDAG + 15Cu	104.5	211.4	2	CDF	0.5158	Non-Significant Effect
		EV_MC2 + 20Cu	74	211.4	2	CDF	0.7018	Non-Significant Effect
		EV_HC1 + 20Cu	-16.5	211.4	2	CDF	0.9773	Non-Significant Effect
		LC_DCDS + 20Cu	14	211.4	2	CDF	0.9336	Non-Significant Effect
		LC_LC3 + 20Cu	35	211.4	2	CDF	0.8772	Non-Significant Effect
		LC_LC5 + 20Cu	1	211.4	2	CDF	0.9569	Non-Significant Effect
		LC_LCDSSLCC20Cu	31	211.4	2	CDF	0.8899	Non-Significant Effect
		FR_FR4 + 20Cu	82.5	211.4	2	CDF	0.6527	Non-Significant Effect
		FR_FR2 + 20Cu	207	211.4	2	CDF	0.0574	Non-Significant Effect
		FR_MULTIPLATE20	-42	211.4	2	CDF	0.9923	Non-Significant Effect
		FR_FRRD + 20Cu	-46	211.4	2	CDF	0.9935	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	2.393	3.37	1.0000	No Outliers Detected
Treatment Effect	Fligner-Wolfe Omnibus Test	4500		0.2531	Non-Significant Overall Effect
Treatment Effect	Kruskal-Wallis Omnibus Test	48.55	35.17	0.0014	Significant Overall Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	9.6416	0.4192	23	4.746	1.9E-07	Significant Effect
Error	6.35993	0.0883324	72			
Total	16.0015		95			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Variances	Bartlett Equality of Variance Test	15.29	35.17	0.8840	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9376	0.9737	1.9E-04	Non-Normal Distribution

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 16-6073-0468 **Endpoint:** Mean Dry Biomass-mg **CETIS Version:** CETISv1.9.4
Analyzed: 01 Jun-21 8:31 **Analysis:** Nonparametric-Control vs Treatments **Status Level:** 1

Mean Dry Biomass-mg Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
Lab Control		4	2.276	1.813	2.739	2.216	1.989	2.681	0.1455	12.79%	0.00%
10Cu Control		4	2.164	1.858	2.471	2.08	2.048	2.45	0.09618	8.89%	4.89%
15Cu Control		4	2.423	1.816	3.031	2.311	2.096	2.975	0.191	15.76%	-6.49%
20Cu Control		4	2.343	1.952	2.734	2.305	2.085	2.677	0.1229	10.49%	-2.94%
FR_UFR1 + 20Cu	XC	4	2.254	1.609	2.9	2.06	2.035	2.862	0.2028	18.00%	0.94%
GH_ER2 +15Cu		4	1.181	0.4596	1.902	1.135	0.6767	1.777	0.2266	38.38%	48.12%
CM_MC1 + 15Cu		4	1.604	1.076	2.132	1.478	1.367	2.092	0.166	20.69%	29.52%
LC_SLC + 15Cu		4	2.008	1.849	2.167	2.005	1.908	2.114	0.04997	4.98%	11.75%
FR_FRABCH + 20C		4	2.097	1.427	2.766	1.929	1.814	2.716	0.2103	20.06%	7.86%
FR_FRCP1 + 20Cu		4	1.699	1.29	2.108	1.729	1.358	1.98	0.1285	15.13%	25.34%
GH_FR1 + 20Cu		4	2.278	1.812	2.745	2.307	1.917	2.584	0.1465	12.86%	-0.12%
GH_ERC + 10Cu		4	2.248	1.979	2.517	2.217	2.095	2.463	0.08461	7.53%	1.22%
CM_MC2 + 20Cu		4	2.049	1.554	2.544	2.058	1.671	2.409	0.1556	15.19%	9.96%
RG_MIDAG + 15Cu		4	1.9	1.521	2.278	1.856	1.677	2.209	0.1189	12.52%	16.52%
EV_MC2 + 20Cu		4	2	1.594	2.406	1.937	1.765	2.361	0.1276	12.76%	12.10%
EV_HC1 + 20Cu		4	2.2	1.928	2.471	2.171	2.024	2.433	0.0853	7.75%	3.33%
LC_DCDS + 20Cu		4	2.111	1.845	2.377	2.162	1.875	2.245	0.08356	7.92%	7.22%
LC_LC3 + 20Cu		4	2.076	1.846	2.306	2.072	1.927	2.233	0.0723	6.96%	8.76%
LC_LC5 + 20Cu		4	2.19	1.749	2.631	2.166	1.906	2.523	0.1385	12.65%	3.75%
LC_LCDSSLCC20C		4	2.097	1.762	2.432	2.051	1.923	2.363	0.1054	10.05%	7.85%
FR_FR4 + 20Cu		4	2.013	1.388	2.639	1.85	1.754	2.599	0.1965	19.52%	11.53%
FR_FR2 + 20Cu		4	1.239	0.6549	1.824	1.13	0.96	1.738	0.1837	29.64%	45.54%
FR_MULTIPLATE2		4	2.352	1.754	2.949	2.25	2.019	2.888	0.1877	15.96%	-3.35%
FR_FRRD + 20Cu		4	2.338	1.844	2.832	2.304	2.016	2.729	0.1553	13.28%	-2.75%

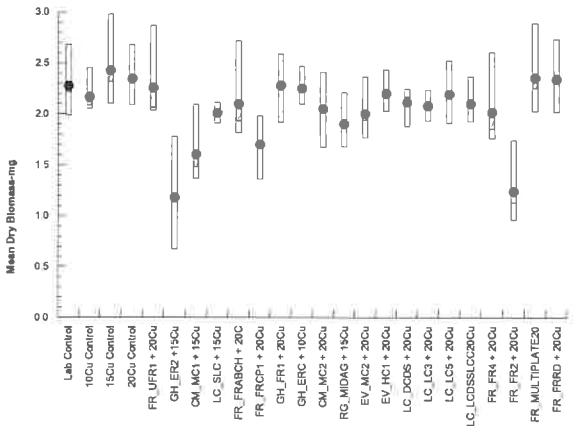
Mean Dry Biomass-mg Detail

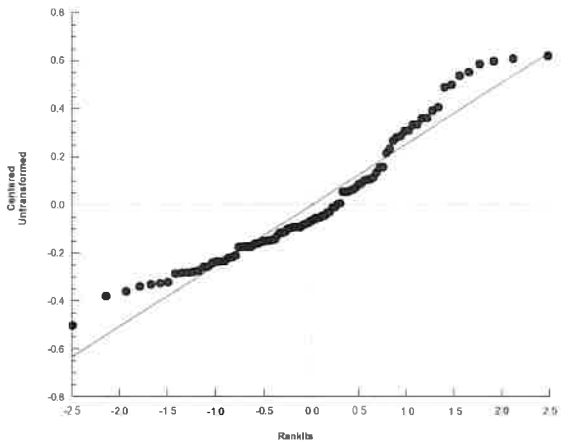
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Lab Control		2.222	1.989	2.211	2.681
10Cu Control		2.109	2.051	2.048	2.45
15Cu Control		2.293	2.096	2.329	2.975
20Cu Control		2.297	2.085	2.313	2.677
FR_UFR1 + 20Cu	XC	2.078	2.035	2.042	2.862
GH_ER2 +15Cu		1.17	1.777	0.6767	1.099
CM_MC1 + 15Cu		1.429	2.092	1.367	1.527
LC_SLC + 15Cu		2.071	1.939	1.908	2.114
FR_FRABCH + 20C		1.855	1.814	2.003	2.716
FR_FRCP1 + 20Cu		1.705	1.358	1.98	1.753
GH_FR1 + 20Cu		2.433	2.181	1.917	2.584
GH_ERC + 10Cu		2.095	2.463	2.131	2.302
CM_MC2 + 20Cu		1.963	1.671	2.153	2.409
RG_MIDAG + 15Cu		1.677	1.754	2.209	1.959
EV_MC2 + 20Cu		1.967	1.907	1.765	2.361
EV_HC1 + 20Cu		2.155	2.024	2.188	2.433
LC_DCDS + 20Cu		2.245	1.875	2.113	2.212
LC_LC3 + 20Cu		2.233	1.927	1.983	2.161
LC_LC5 + 20Cu		1.906	2.029	2.304	2.523
LC_LCDSSLCC20C		1.923	1.933	2.169	2.363
FR_FR4 + 20Cu		1.754	1.838	1.863	2.599
FR_FR2 + 20Cu		0.9653	0.96	1.738	1.294
FR_MULTIPLATE2		2.295	2.019	2.205	2.888
FR_FRRD + 20Cu		2.016	2.181	2.427	2.729

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID:	16-6073-0468	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.9.4
Analyzed:	01 Jun-21 8:31	**Analysis:**	Nonparametric-Control vs Treatments	**Status Level:**	1

Graphics





Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID:	07-6272-1169	**Endpoint:**	Hatch Rate	**CETIS Version:**	CETISv1.9.4
Analyzed:	22 May-21 11:12	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1
Batch ID:	16-2689-7673	**Test Type:**	32 Day Fathead Minnow Test	**Analyst:**	Kayla Knol
Start Date:	06 Mar-21	**Protocol:**	ASTM E1241-05 (2013)	**Diluent:**	Dechlorinated Tap Water
Ending Date:	07 Apr-21	**Species:**	Pimephales promelas	**Brine:**	
Test Length:	32d 0h	**Taxon:**	Actinopterygii	**Source:**	Aquatox, AR **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
Lab Control	08-8280-1106	02 Mar-21	03 Mar-21	96h	Teck Coal Ltd	
10Cu Control	01-9333-5370	02 Mar-21	03 Mar-21	96h		
15Cu Control	19-6548-0518	02 Mar-21	03 Mar-21	96h		
20Cu Control	00-8675-6744	02 Mar-21	03 Mar-21	96h		
FR_UFR1 + 20Cu	20-4721-8257	02 Mar-21	03 Mar-21	96h (4.6 °C)		
GH_ER2 +15Cu	01-1137-9253	02 Mar-21	03 Mar-21	96h (4.2 °C)		
CM_MC1 + 15Cu	01-3772-5048	02 Mar-21	03 Mar-21	96h (1 °C)		
LC_SLC + 15Cu	01-2380-6574	02 Mar-21	03 Mar-21	96h (3.1 °C)		
FR_FRABCH + 20C	08-4134-0746	02 Mar-21	03 Mar-21	96h (3.8 °C)		
FR_FRCP1 + 20Cu	11-2694-6466	02 Mar-21	03 Mar-21	96h (3 °C)		
GH_FR1 + 20Cu	20-1635-3152	02 Mar-21	03 Mar-21	96h (2.4 °C)		
GH_ERC + 10Cu	05-1950-5597	02 Mar-21	03 Mar-21	96h (4.1 °C)		
CM_MC2 + 20Cu	14-4685-1067	02 Mar-21	03 Mar-21	96h (0.3 °C)		
RG_MIDAG + 15Cu	21-3889-1829	02 Mar-21	03 Mar-21	96h (0.6 °C)		
EV_MC2 + 20Cu	05-6103-5191	02 Mar-21	03 Mar-21	96h (4.4 °C)		
EV_HC1 + 20Cu	12-5501-3302	02 Mar-21	03 Mar-21	96h (3.4 °C)		
LC_DCDS + 20Cu	04-1088-5978	02 Mar-21	03 Mar-21	96h (0.6 °C)		
LC_LC3 + 20Cu	14-7773-4190	02 Mar-21	03 Mar-21	96h (2.3 °C)		
LC_LC5 + 20Cu	01-7235-6798	02 Mar-21	03 Mar-21	96h (0.6 °C)		
LC_LCDSSLCC20C	06-4197-2641	02 Mar-21	03 Mar-21	96h (2.4 °C)		
FR_FR4 + 20Cu	10-9481-5020	02 Mar-21	03 Mar-21	96h (5.4 °C)		
FR_FR2 + 20Cu	00-3159-8672	02 Mar-21	03 Mar-21	96h (4.4 °C)		
FR_MULTIPLATE2	02-2179-0364	02 Mar-21	03 Mar-21	96h (2.9 °C)		
FR_FRRD + 20Cu	19-5167-8345	02 Mar-21	03 Mar-21	96h (6.2 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
Lab Control	Ambient Sample	Teck Coal Ltd	Lab Control	
10Cu Control	Ambient Sample	Teck Coal Ltd	10Cu Control	
15Cu Control	Ambient Sample	Teck Coal Ltd	15Cu Control	
20Cu Control	Ambient Sample	Teck Coal Ltd	20Cu Control	
FR_UFR1 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_UFR1_MON_2021-03-0	
GH_ER2 +15Cu	Ambient Sample	Teck Coal Ltd	GH_ER2_WS_2021-03-02_	
CM_MC1 + 15Cu	Ambient Sample	Teck Coal Ltd	CM_MC1_WS_2021-03-02	
LC_SLC + 15Cu	Ambient Sample	Teck Coal Ltd	LC_SLC_WS_2021-03-02_	
FR_FRABCH + 20C	Ambient Sample	Teck Coal Ltd	FR_FRABCH_MON_2021-	
FR_FRCP1 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FRCP1_MON_2021-03	
GH_FR1 + 20Cu	Ambient Sample	Teck Coal Ltd	GH_FR1_WS_2021-03-02_	
GH_ERC + 10Cu	Ambient Sample	Teck Coal Ltd	GH_ERC_WS_2021-03-02	
CM_MC2 + 20Cu	Ambient Sample	Teck Coal Ltd	CM_MC2_WS_2021-03-02	
RG_MIDAG + 15Cu	Ambient Sample	Teck Coal Ltd	RG_MIDAG_WS_2021-03-	
EV_MC2 + 20Cu	Ambient Sample	Teck Coal Ltd	EV_MC2_WS_2021_Q1_W	
EV_HC1 + 20Cu	Ambient Sample	Teck Coal Ltd	EV_HC1_WS_2021_Q1_W	
LC_DCDS + 20Cu	Ambient Sample	Teck Coal Ltd	LC_DCDS_WS_2021-03-02	
LC_LC3 + 20Cu	Ambient Sample	Teck Coal Ltd	LC_LC3_WS_2021-03-02_	
LC_LC5 + 20Cu	Ambient Sample	Teck Coal Ltd	LC_LC5_WS_2021-03-02_	
LC_LCDSSLCC20C	Ambient Sample	Teck Coal Ltd	LC_LCDSSLCC_WS_2021-	
FR_FR4 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FR4_WS_2021-03-02_	
FR_FR2 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FR2_WS_2021-03-02_	

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Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 07-6272-1169 **Endpoint:** Hatch Rate **CETIS Version:** CETISv1.9.4
Analyzed: 22 May-21 11:12 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_MULTIPLATE2	Ambient Sample	Teck Coal Ltd	FR_MULTIPLATE_WS_202	
FR_FRRD + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FRRD_WS_2021-03-02	

Fisher Exact/Bonferroni Adj Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
Site Control		Lab Control	1.0000	Exact	1.0000	Non-Significant Effect
		10Cu Control	0.9406	Exact	1.0000	Non-Significant Effect
		15Cu Control	0.9406	Exact	1.0000	Non-Significant Effect
		20Cu Control	0.6603	Exact	1.0000	Non-Significant Effect
		GH_ER2 +15Cu	0.9406	Exact	1.0000	Non-Significant Effect
		CM_MC1 + 15Cu	0.9406	Exact	1.0000	Non-Significant Effect
		LC_SLC + 15Cu	0.9406	Exact	1.0000	Non-Significant Effect
		FR_FRABCH + 20C	0.9406	Exact	1.0000	Non-Significant Effect
		FR_FRCP1 + 20Cu	0.9406	Exact	1.0000	Non-Significant Effect
		GH_FR1 + 20Cu	0.3585	Exact	1.0000	Non-Significant Effect
		GH_ERC + 10Cu	0.9406	Exact	1.0000	Non-Significant Effect
		CM_MC2 + 20Cu	0.9406	Exact	1.0000	Non-Significant Effect
		RG_MIDAG + 15Cu	0.9406	Exact	1.0000	Non-Significant Effect
		EV_MC2 + 20Cu	0.5000	Exact	1.0000	Non-Significant Effect
		EV_HC1 + 20Cu	0.8178	Exact	1.0000	Non-Significant Effect
		LC_DCDS + 20Cu	0.0627	Exact	1.0000	Non-Significant Effect
		LC_LC3 + 20Cu	1.0000	Exact	1.0000	Non-Significant Effect
		LC_LC5 + 20Cu	0.9406	Exact	1.0000	Non-Significant Effect
		LC_LCDSSLCC20Cu	1.0000	Exact	1.0000	Non-Significant Effect
		FR_FR4 + 20Cu	0.9406	Exact	1.0000	Non-Significant Effect
		FR_FR2 + 20Cu	0.9406	Exact	1.0000	Non-Significant Effect
		FR_MULTIPLATE20	0.9406	Exact	1.0000	Non-Significant Effect
		FR_FRRD + 20Cu	0.5000	Exact	1.0000	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	3.165	3.37	0.1123	No Outliers Detected

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 07-6272-1169 **Endpoint:** Hatch Rate **CETIS Version:** CETISv1.9.4
Analyzed: 22 May-21 11:12 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Data Summary

Sample	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
Lab Control		60	0	60	1	0	-5.26%
10Cu Control		59	1	60	0.9833	0.01667	-3.51%
15Cu Control		59	1	60	0.9833	0.01667	-3.51%
20Cu Control		57	3	60	0.95	0.05	0.0%
FR_UFR1 + 20Cu	XC	57	3	60	0.95	0.05	0.0%
GH_ER2 +15Cu		59	1	60	0.9833	0.01667	-3.51%
CM_MC1 + 15Cu		59	1	60	0.9833	0.01667	-3.51%
LC_SLC + 15Cu		59	1	60	0.9833	0.01667	-3.51%
FR_FRABCH + 20C		59	1	60	0.9833	0.01667	-3.51%
FR_FRCP1 + 20Cu		59	1	60	0.9833	0.01667	-3.51%
GH_FR1 + 20Cu		55	5	60	0.9167	0.08333	3.51%
GH_ERC + 10Cu		59	1	60	0.9833	0.01667	-3.51%
CM_MC2 + 20Cu		59	1	60	0.9833	0.01667	-3.51%
RG_MIDAG + 15Cu		59	1	60	0.9833	0.01667	-3.51%
EV_MC2 + 20Cu		56	4	60	0.9333	0.06667	1.75%
EV_HC1 + 20Cu		58	2	60	0.9667	0.03333	-1.75%
LC_DCDS + 20Cu		51	9	60	0.85	0.15	10.53%
LC_LC3 + 20Cu		60	0	60	1	0	-5.26%
LC_LC5 + 20Cu		59	1	60	0.9833	0.01667	-3.51%
LC_LCDSSLCC20C		60	0	60	1	0	-5.26%
FR_FR4 + 20Cu		59	1	60	0.9833	0.01667	-3.51%
FR_FR2 + 20Cu		59	1	60	0.9833	0.01667	-3.51%
FR_MULTIPLATE20		59	1	60	0.9833	0.01667	-3.51%
FR_FRRD + 20Cu		56	4	60	0.9333	0.06667	1.75%

Hatch Rate Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Lab Control		1.0000	1.0000	1.0000	1.0000
10Cu Control		0.9333	1.0000	1.0000	1.0000
15Cu Control		1.0000	1.0000	1.0000	0.9333
20Cu Control		0.9333	0.8667	1.0000	1.0000
FR_UFR1 + 20Cu	XC	0.8667	1.0000	1.0000	0.9333
GH_ER2 +15Cu		1.0000	1.0000	1.0000	0.9333
CM_MC1 + 15Cu		1.0000	1.0000	0.9333	1.0000
LC_SLC + 15Cu		0.9333	1.0000	1.0000	1.0000
FR_FRABCH + 20C		1.0000	1.0000	0.9333	1.0000
FR_FRCP1 + 20Cu		0.9333	1.0000	1.0000	1.0000
GH_FR1 + 20Cu		0.9333	0.8000	1.0000	0.9333
GH_ERC + 10Cu		1.0000	1.0000	0.9333	1.0000
CM_MC2 + 20Cu		1.0000	1.0000	1.0000	0.9333
RG_MIDAG + 15Cu		1.0000	0.9333	1.0000	1.0000
EV_MC2 + 20Cu		0.9333	0.8000	1.0000	1.0000
EV_HC1 + 20Cu		1.0000	0.9333	1.0000	0.9333
LC_DCDS + 20Cu		0.8000	0.9333	1.0000	0.6667
LC_LC3 + 20Cu		1.0000	1.0000	1.0000	1.0000
LC_LC5 + 20Cu		1.0000	1.0000	1.0000	0.9333
LC_LCDSSLCC20C		1.0000	1.0000	1.0000	1.0000
FR_FR4 + 20Cu		1.0000	1.0000	1.0000	0.9333
FR_FR2 + 20Cu		1.0000	1.0000	0.9333	1.0000
FR_MULTIPLATE2		0.9333	1.0000	1.0000	1.0000
FR_FRRD + 20Cu		0.9333	0.9333	1.0000	0.8667

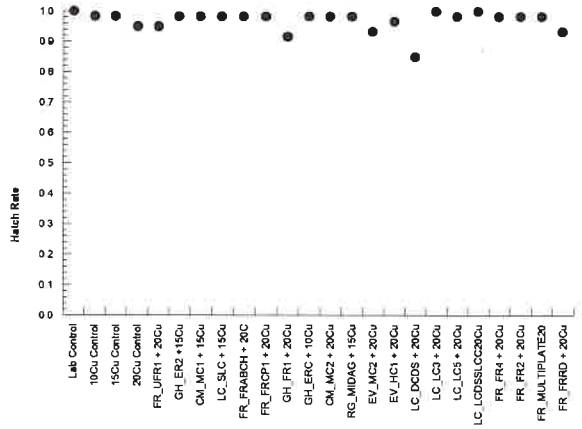
Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 07-6272-1169 **Endpoint:** Hatch Rate **CETIS Version:** CETISv1.9.4
Analyzed: 22 May-21 11:12 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Hatch Rate Binomials

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Lab Control		15/15	15/15	15/15	15/15
10Cu Control		14/15	15/15	15/15	15/15
15Cu Control		15/15	15/15	15/15	14/15
20Cu Control		14/15	13/15	15/15	15/15
FR_UFR1 + 20Cu	XC	13/15	15/15	15/15	14/15
GH_ER2 +15Cu		15/15	15/15	15/15	14/15
CM_MC1 + 15Cu		15/15	15/15	14/15	15/15
LC_SLC + 15Cu		14/15	15/15	15/15	15/15
FR_FRABCH + 20C		15/15	15/15	14/15	15/15
FR_FRCP1 + 20Cu		14/15	15/15	15/15	15/15
GH_FR1 + 20Cu		14/15	12/15	15/15	14/15
GH_ERC + 10Cu		15/15	15/15	14/15	15/15
CM_MC2 + 20Cu		15/15	15/15	15/15	14/15
RG_MIDAG + 15Cu		15/15	14/15	15/15	15/15
EV_MC2 + 20Cu		14/15	12/15	15/15	15/15
EV_HC1 + 20Cu		15/15	14/15	15/15	14/15
LC_DCDS + 20Cu		12/15	14/15	15/15	10/15
LC_LC3 + 20Cu		15/15	15/15	15/15	15/15
LC_LC5 + 20Cu		15/15	15/15	15/15	14/15
LC_LCDSSLCC20C		15/15	15/15	15/15	15/15
FR_FR4 + 20Cu		15/15	15/15	15/15	14/15
FR_FR2 + 20Cu		15/15	15/15	14/15	15/15
FR_MULTIPLATE2		14/15	15/15	15/15	15/15
FR_FRRD + 20Cu		14/15	14/15	15/15	13/15

Graphics



Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID:	10-5070-8819	**Endpoint:**	Length	**CETIS Version:**	CETISv1.9.4
Analyzed:	22 May-21 11:16	**Analysis:**	Parametric-Control vs Treatments	**Status Level:**	1
Batch ID:	16-2689-7673	**Test Type:**	32 Day Fathead Minnow Test	**Analyst:**	Kayla Knol
Start Date:	06 Mar-21	**Protocol:**	ASTM E1241-05 (2013)	**Diluent:**	Dechlorinated Tap Water
Ending Date:	07 Apr-21	**Species:**	Pimephales promelas	**Brine:**	
Test Length:	32d 0h	**Taxon:**	Actinopterygii	**Source:**	Aquatox, AR **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
Lab Control	08-8280-1106	02 Mar-21	03 Mar-21	96h	Teck Coal Ltd	
10Cu Control	01-9333-5370	02 Mar-21	03 Mar-21	96h		
15Cu Control	19-6548-0518	02 Mar-21	03 Mar-21	96h		
20Cu Control	00-8675-6744	02 Mar-21	03 Mar-21	96h		
FR_UFR1 + 20Cu	20-4721-8257	02 Mar-21	03 Mar-21	96h (4.6 °C)		
GH_ER2 +15Cu	01-1137-9253	02 Mar-21	03 Mar-21	96h (4.2 °C)		
CM_MC1 + 15Cu	01-3772-5048	02 Mar-21	03 Mar-21	96h (1 °C)		
LC_SLC + 15Cu	01-2380-6574	02 Mar-21	03 Mar-21	96h (3.1 °C)		
FR_FRABCH + 20C	08-4134-0746	02 Mar-21	03 Mar-21	96h (3.8 °C)		
FR_FRCP1 + 20Cu	11-2694-6466	02 Mar-21	03 Mar-21	96h (3 °C)		
GH_FR1 + 20Cu	20-1635-3152	02 Mar-21	03 Mar-21	96h (2.4 °C)		
GH_ERC + 10Cu	05-1950-5597	02 Mar-21	03 Mar-21	96h (4.1 °C)		
CM_MC2 + 20Cu	14-4685-1067	02 Mar-21	03 Mar-21	96h (0.3 °C)		
RG_MIDAG + 15Cu	21-3889-1829	02 Mar-21	03 Mar-21	96h (0.6 °C)		
EV_MC2 + 20Cu	05-6103-5191	02 Mar-21	03 Mar-21	96h (4.4 °C)		
EV_HC1 + 20Cu	12-5501-3302	02 Mar-21	03 Mar-21	96h (3.4 °C)		
LC_DCDS + 20Cu	04-1088-5978	02 Mar-21	03 Mar-21	96h (0.6 °C)		
LC_LC3 + 20Cu	14-7773-4190	02 Mar-21	03 Mar-21	96h (2.3 °C)		
LC_LC5 + 20Cu	01-7235-6798	02 Mar-21	03 Mar-21	96h (0.6 °C)		
LC_LCDSSLCC20C	06-4197-2641	02 Mar-21	03 Mar-21	96h (2.4 °C)		
FR_FR4 + 20Cu	10-9481-5020	02 Mar-21	03 Mar-21	96h (5.4 °C)		
FR_FR2 + 20Cu	00-3159-8672	02 Mar-21	03 Mar-21	96h (4.4 °C)		
FR_MULTIPLATE2	02-2179-0364	02 Mar-21	03 Mar-21	96h (2.9 °C)		
FR_FRRD + 20Cu	19-5167-8345	02 Mar-21	03 Mar-21	96h (6.2 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
Lab Control	Ambient Sample	Teck Coal Ltd	Lab Control	
10Cu Control	Ambient Sample	Teck Coal Ltd	10Cu Control	
15Cu Control	Ambient Sample	Teck Coal Ltd	15Cu Control	
20Cu Control	Ambient Sample	Teck Coal Ltd	20Cu Control	
FR_UFR1 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_UFR1_MON_2021-03-0	
GH_ER2 +15Cu	Ambient Sample	Teck Coal Ltd	GH_ER2_WS_2021-03-02_	
CM_MC1 + 15Cu	Ambient Sample	Teck Coal Ltd	CM_MC1_WS_2021-03-02	
LC_SLC + 15Cu	Ambient Sample	Teck Coal Ltd	LC_SLC_WS_2021-03-02_	
FR_FRABCH + 20C	Ambient Sample	Teck Coal Ltd	FR_FRABCH_MON_2021-	
FR_FRCP1 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FRCP1_MON_2021-03	
GH_FR1 + 20Cu	Ambient Sample	Teck Coal Ltd	GH_FR1_WS_2021-03-02_	
GH_ERC + 10Cu	Ambient Sample	Teck Coal Ltd	GH_ERC_WS_2021-03-02	
CM_MC2 + 20Cu	Ambient Sample	Teck Coal Ltd	CM_MC2_WS_2021-03-02	
RG_MIDAG + 15Cu	Ambient Sample	Teck Coal Ltd	RG_MIDAG_WS_2021-03-	
EV_MC2 + 20Cu	Ambient Sample	Teck Coal Ltd	EV_MC2_WS_2021_Q1_W	
EV_HC1 + 20Cu	Ambient Sample	Teck Coal Ltd	EV_HC1_WS_2021_Q1_W	
LC_DCDS + 20Cu	Ambient Sample	Teck Coal Ltd	LC_DCDS_WS_2021-03-02	
LC_LC3 + 20Cu	Ambient Sample	Teck Coal Ltd	LC_LC3_WS_2021-03-02_	
LC_LC5 + 20Cu	Ambient Sample	Teck Coal Ltd	LC_LC5_WS_2021-03-02_	
LC_LCDSSLCC20C	Ambient Sample	Teck Coal Ltd	LC_LCDSSLCC_WS_2021-	
FR_FR4 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FR4_WS_2021-03-02_	
FR_FR2 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FR2_WS_2021-03-02_	

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Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 10-5070-8819 **Endpoint:** Length **CETIS Version:** CETISv1.9.4
Analyzed: 22 May-21 11:16 **Analysis:** Parametric-Control vs Treatments **Status Level:** 1

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_MULTIPLATE2	Ambient Sample	Teck Coal Ltd	FR_MULTIPLATE_WS_202	
FR_FRRD + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FRRD_WS_2021-03-02	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	Lab Control passed length	12.96%
		10Cu Control passed length	12.96%
		15Cu Control passed length	12.96%
		20Cu Control passed length	12.96%
		GH_ER2 +15Cu passed length	12.96%
		CM_MC1 + 15Cu passed length	12.96%
		LC_SLC + 15Cu passed length	12.96%
		FR_FRABCH + 20C passed length	12.96%
		FR_FRCP1 + 20Cu passed length	12.96%
		GH_FR1 + 20Cu passed length	12.96%
		GH_ERC + 10Cu passed length	12.96%
		CM_MC2 + 20Cu passed length	12.96%
		RG_MIDAG + 15Cu passed length	12.96%
		EV_MC2 + 20Cu passed length	12.96%
		EV_HC1 + 20Cu passed length	12.96%
		LC_DCDS + 20Cu passed length	12.96%
		LC_LC3 + 20Cu passed length	12.96%
		LC_LC5 + 20Cu passed length	12.96%
		LC_LCDSSLCC20Cu passed length	12.96%
		FR_FR4 + 20Cu passed length	12.96%
		FR_FR2 + 20Cu passed length	12.96%
		FR_MULTIPLATE20 passed length	12.96%
		FR_FRRD + 20Cu passed length	12.96%

Dunnett Multiple Comparison Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Site Control		Lab Control	-0.8864	2.744	1.349	6	CDF	0.9979	Non-Significant Effect
		10Cu Control	-0.5167	2.744	1.349	6	CDF	0.9917	Non-Significant Effect
		15Cu Control	-1.362	2.744	1.349	6	CDF	0.9997	Non-Significant Effect
		20Cu Control	-1.558	2.744	1.349	6	CDF	0.9999	Non-Significant Effect
		GH_ER2 +15Cu	-0.8798	2.744	1.349	6	CDF	0.9978	Non-Significant Effect
		CM_MC1 + 15Cu	-1.044	2.744	1.349	6	CDF	0.9989	Non-Significant Effect
		LC_SLC + 15Cu	-2.122	2.744	1.349	6	CDF	1.0000	Non-Significant Effect
		FR_FRABCH + 20C	-0.1839	2.744	1.349	6	CDF	0.9754	Non-Significant Effect
		FR_FRCP1 + 20Cu	-1.556	2.744	1.349	6	CDF	0.9999	Non-Significant Effect
		GH_FR1 + 20Cu	-0.434	2.744	1.349	6	CDF	0.9889	Non-Significant Effect
		GH_ERC + 10Cu	-0.1559	2.744	1.349	6	CDF	0.9733	Non-Significant Effect
		CM_MC2 + 20Cu	0.5746	2.744	1.349	6	CDF	0.8401	Non-Significant Effect
		RG_MIDAG + 15Cu	-0.7261	2.744	1.349	6	CDF	0.9961	Non-Significant Effect
		EV_MC2 + 20Cu	-0.6677	2.744	1.349	6	CDF	0.9951	Non-Significant Effect
		EV_HC1 + 20Cu	-0.3234	2.744	1.349	6	CDF	0.9848	Non-Significant Effect
		LC_DCDS + 20Cu	-1.533	2.744	1.349	6	CDF	0.9999	Non-Significant Effect
		LC_LC3 + 20Cu	-0.644	2.744	1.349	6	CDF	0.9947	Non-Significant Effect
		LC_LC5 + 20Cu	-1.306	2.744	1.349	6	CDF	0.9996	Non-Significant Effect
		LC_LCDSSLCC20Cu	-0.5609	2.744	1.349	6	CDF	0.9929	Non-Significant Effect
		FR_FR4 + 20Cu	-1.436	2.744	1.349	6	CDF	0.9998	Non-Significant Effect
		FR_FR2 + 20Cu	-0.06648	2.744	1.349	6	CDF	0.9654	Non-Significant Effect
		FR_MULTIPLATE20	-0.9682	2.744	1.349	6	CDF	0.9985	Non-Significant Effect
		FR_FRRD + 20Cu	-0.8108	2.744	1.349	6	CDF	0.9972	Non-Significant Effect

Auxiliary Tests

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Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 10-5070-8819 **Endpoint:** Length **CETIS Version:** CETISv1.9.4
Analyzed: 22 May-21 11:16 **Analysis:** Parametric-Control vs Treatments **Status Level:** 1

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	3.392	3.37	0.0458	Outlier Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	8.62615	0.37505	23	0.7753	0.7491	Non-Significant Effect
Error	34.8279	0.483721	72			
Total	43.4541		95			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Variances	Bartlett Equality of Variance Test	31.32	35.17	0.1151	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9841	0.9737	0.3005	Normal Distribution

Length Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
Lab Control		4	10.85	10.2	11.5	10.74	10.5	11.42	0.2039	3.76%	0.00%
10Cu Control		4	10.67	10.19	11.15	10.69	10.29	11	0.1513	2.84%	1.68%
15Cu Control		4	11.08	9.919	12.25	11	10.33	12	0.3658	6.60%	-2.15%
20Cu Control		4	11.18	10.17	12.19	10.96	10.69	12.11	0.3171	5.67%	-3.04%
FR_UFR1 + 20Cu	XC	4	10.41	9.005	11.82	10.04	9.857	11.73	0.4425	8.50%	4.02%
GH_ER2 +15Cu		4	10.85	10.27	11.43	10.8	10.5	11.29	0.182	3.36%	0.03%
CM_MC1 + 15Cu		4	10.93	9.723	12.13	10.83	10.17	11.88	0.3782	6.92%	-0.71%
LC_SLC + 15Cu		4	11.46	10.55	12.37	11.45	10.93	12	0.2857	4.99%	-5.60%
FR_FRABCH + 20C		4	10.5	9.776	11.23	10.47	10	11.08	0.2288	4.36%	3.18%
FR_FRCP1 + 20Cu		4	11.18	10.1	12.26	11.13	10.45	12	0.3392	6.07%	-3.04%
GH_FR1 + 20Cu		4	10.63	9.531	11.72	10.72	9.846	11.23	0.3445	6.48%	2.05%
GH_ERC + 10Cu		4	10.49	10.24	10.74	10.48	10.31	10.69	0.0791	1.51%	3.31%
CM_MC2 + 20Cu		4	10.13	8.98	11.28	10.01	9.429	11.08	0.3617	7.14%	6.62%
RG_MIDAG + 15Cu		4	10.77	10.19	11.35	10.72	10.4	11.25	0.1826	3.39%	0.73%
EV_MC2 + 20Cu		4	10.74	9.791	11.69	10.76	10.08	11.36	0.2987	5.56%	0.99%
EV_HC1 + 20Cu		4	10.57	10.15	10.99	10.54	10.31	10.9	0.1325	2.51%	2.55%
LC_DCDS + 20Cu		4	11.17	9.661	12.67	11.06	10.18	12.38	0.4734	8.48%	-2.93%
LC_LC3 + 20Cu		4	10.73	9.975	11.49	10.77	10.13	11.25	0.2375	4.43%	1.10%
LC_LC5 + 20Cu		4	11.06	9.583	12.53	10.93	10.07	12.3	0.4627	8.37%	-1.90%
LC_LCDSSLCC20C		4	10.69	10.4	10.98	10.66	10.5	10.93	0.09091	1.70%	1.48%
FR_FR4 + 20Cu		4	11.12	10.17	12.07	11.06	10.45	11.9	0.298	5.36%	-2.49%
FR_FR2 + 20Cu		4	10.45	7.854	13.04	10.14	9	12.5	0.8146	15.60%	3.72%
FR_MULTIPLATE2		4	10.89	9.947	11.83	10.89	10.23	11.55	0.2964	5.44%	-0.37%
FR_FRRD + 20Cu		4	10.81	9.242	12.38	10.83	9.917	11.67	0.4934	9.13%	0.34%

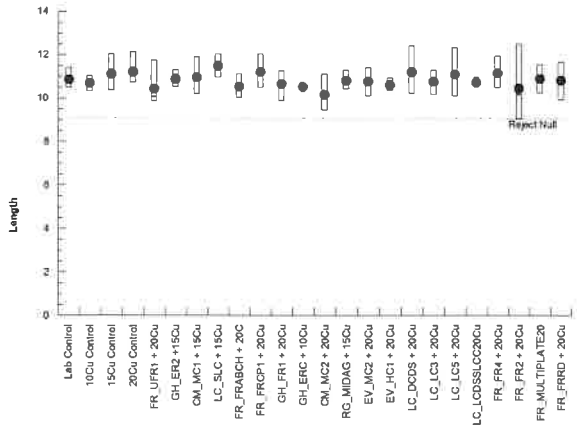
Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

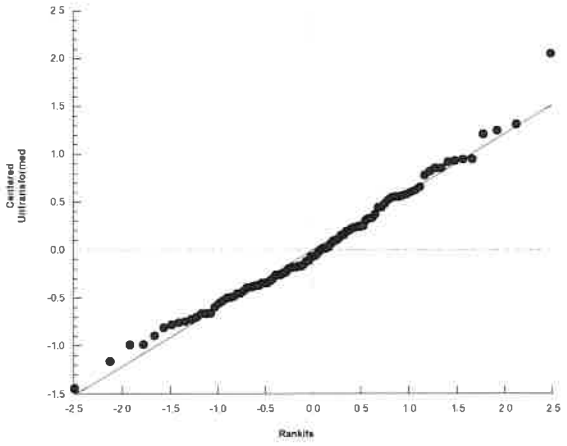
Analysis ID: 10-5070-8819 **Endpoint:** Length **CETIS Version:** CETISv1.9.4
Analyzed: 22 May-21 11:16 **Analysis:** Parametric-Control vs Treatments **Status Level:** 1

Length Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Lab Control		10.5	10.62	11.42	10.87
10Cu Control		10.79	11	10.29	10.6
15Cu Control		10.69	10.33	12	11.31
20Cu Control		10.92	10.69	12.11	11
FR_UFR1 + 20Cu	XC	9.917	9.857	10.15	11.73
GH_ER2 +15Cu		10.5	11.29	11	10.6
CM_MC1 + 15Cu		10.5	11.88	10.17	11.17
LC_SLC + 15Cu		12	11.9	10.93	11
FR_FRABCH + 20C		10.33	10	10.6	11.08
FR_FRCP1 + 20Cu		12	10.83	10.45	11.43
GH_FR1 + 20Cu		11.18	10.25	9.846	11.23
GH_ERC + 10Cu		10.5	10.31	10.69	10.46
CM_MC2 + 20Cu		9.429	9.733	10.29	11.08
RG_MIDAG + 15Cu		10.4	10.6	10.83	11.25
EV_MC2 + 20Cu		10.08	11.11	10.42	11.36
EV_HC1 + 20Cu		10.67	10.42	10.31	10.9
LC_DCDS + 20Cu		12.38	10.18	10.71	11.4
LC_LC3 + 20Cu		10.92	10.13	10.62	11.25
LC_LC5 + 20Cu		10.07	10.86	11	12.3
LC_LCDSSLCC20C		10.71	10.5	10.62	10.93
FR_FR4 + 20Cu		11	10.45	11.12	11.9
FR_FR2 + 20Cu		9.286	9	11	12.5
FR_MULTIPLATE2		11.2	10.58	10.23	11.55
FR_FRRD + 20Cu		9.917	10	11.67	11.67

Graphics





Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID:	17-4388-3495	**Endpoint:**	Proportion Normal	**CETIS Version:**	CETISv1.9.4
Analyzed:	01 Jun-21 8:24	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1
Batch ID:	16-2689-7673	**Test Type:**	32 Day Fathead Minnow Test	**Analyst:**	Kayla Knol
Start Date:	06 Mar-21	**Protocol:**	ASTM E1241-05 (2013)	**Diluent:**	Dechlorinated Tap Water
Ending Date:	07 Apr-21	**Species:**	Pimephales promelas	**Brine:**	
Test Length:	32d 0h	**Taxon:**	Actinopterygii	**Source:**	Aquatox, AR **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
Lab Control	08-8280-1106	02 Mar-21	03 Mar-21	96h	Teck Coal Ltd	
10Cu Control	01-9333-5370	02 Mar-21	03 Mar-21	96h		
15Cu Control	19-6548-0518	02 Mar-21	03 Mar-21	96h		
20Cu Control	00-8675-6744	02 Mar-21	03 Mar-21	96h		
FR_UFR1 + 20Cu	20-4721-8257	02 Mar-21	03 Mar-21	96h (4.6 °C)		
GH_ER2 +15Cu	01-1137-9253	02 Mar-21	03 Mar-21	96h (4.2 °C)		
CM_MC1 + 15Cu	01-3772-5048	02 Mar-21	03 Mar-21	96h (1 °C)		
LC_SLC + 15Cu	01-2380-6574	02 Mar-21	03 Mar-21	96h (3.1 °C)		
FR_FRABCH + 20C	08-4134-0746	02 Mar-21	03 Mar-21	96h (3.8 °C)		
FR_FRCP1 + 20Cu	11-2694-6466	02 Mar-21	03 Mar-21	96h (3 °C)		
GH_FR1 + 20Cu	20-1635-3152	02 Mar-21	03 Mar-21	96h (2.4 °C)		
GH_ERC + 10Cu	05-1950-5597	02 Mar-21	03 Mar-21	96h (4.1 °C)		
CM_MC2 + 20Cu	14-4685-1067	02 Mar-21	03 Mar-21	96h (0.3 °C)		
RG_MIDAG + 15Cu	21-3889-1829	02 Mar-21	03 Mar-21	96h (0.6 °C)		
EV_MC2 + 20Cu	05-6103-5191	02 Mar-21	03 Mar-21	96h (4.4 °C)		
EV_HC1 + 20Cu	12-5501-3302	02 Mar-21	03 Mar-21	96h (3.4 °C)		
LC_DCDS + 20Cu	04-1088-5978	02 Mar-21	03 Mar-21	96h (0.6 °C)		
LC_LC3 + 20Cu	14-7773-4190	02 Mar-21	03 Mar-21	96h (2.3 °C)		
LC_LC5 + 20Cu	01-7235-6798	02 Mar-21	03 Mar-21	96h (0.6 °C)		
LC_LCDSSLCC20C	06-4197-2641	02 Mar-21	03 Mar-21	96h (2.4 °C)		
FR_FR4 + 20Cu	10-9481-5020	02 Mar-21	03 Mar-21	96h (5.4 °C)		
FR_FR2 + 20Cu	00-3159-8672	02 Mar-21	03 Mar-21	96h (4.4 °C)		
FR_MULTIPLATE2	02-2179-0364	02 Mar-21	03 Mar-21	96h (2.9 °C)		
FR_FRRD + 20Cu	19-5167-8345	02 Mar-21	03 Mar-21	96h (6.2 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
Lab Control	Ambient Sample	Teck Coal Ltd	Lab Control	
10Cu Control	Ambient Sample	Teck Coal Ltd	10Cu Control	
15Cu Control	Ambient Sample	Teck Coal Ltd	15Cu Control	
20Cu Control	Ambient Sample	Teck Coal Ltd	20Cu Control	
FR_UFR1 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_UFR1_MON_2021-03-0	
GH_ER2 +15Cu	Ambient Sample	Teck Coal Ltd	GH_ER2_WS_2021-03-02_	
CM_MC1 + 15Cu	Ambient Sample	Teck Coal Ltd	CM_MC1_WS_2021-03-02	
LC_SLC + 15Cu	Ambient Sample	Teck Coal Ltd	LC_SLC_WS_2021-03-02_	
FR_FRABCH + 20C	Ambient Sample	Teck Coal Ltd	FR_FRABCH_MON_2021-	
FR_FRCP1 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FRCP1_MON_2021-03	
GH_FR1 + 20Cu	Ambient Sample	Teck Coal Ltd	GH_FR1_WS_2021-03-02_	
GH_ERC + 10Cu	Ambient Sample	Teck Coal Ltd	GH_ERC_WS_2021-03-02	
CM_MC2 + 20Cu	Ambient Sample	Teck Coal Ltd	CM_MC2_WS_2021-03-02	
RG_MIDAG + 15Cu	Ambient Sample	Teck Coal Ltd	RG_MIDAG_WS_2021-03-	
EV_MC2 + 20Cu	Ambient Sample	Teck Coal Ltd	EV_MC2_WS_2021_Q1_W	
EV_HC1 + 20Cu	Ambient Sample	Teck Coal Ltd	EV_HC1_WS_2021_Q1_W	
LC_DCDS + 20Cu	Ambient Sample	Teck Coal Ltd	LC_DCDS_WS_2021-03-02	
LC_LC3 + 20Cu	Ambient Sample	Teck Coal Ltd	LC_LC3_WS_2021-03-02_	
LC_LC5 + 20Cu	Ambient Sample	Teck Coal Ltd	LC_LC5_WS_2021-03-02_	
LC_LCDSSLCC20C	Ambient Sample	Teck Coal Ltd	LC_LCDSSLCC_WS_2021-	
FR_FR4 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FR4_WS_2021-03-02_	
FR_FR2 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FR2_WS_2021-03-02_	

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Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 17-4388-3495 **Endpoint:** Proportion Normal **CETIS Version:** CETISv1.9.4
Analyzed: 01 Jun-21 8:24 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_MULTIPLATE2	Ambient Sample	Teck Coal Ltd	FR_MULTIPLATE_WS_202	
FR_FRRD + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FRRD_WS_2021-03-02	

Fisher Exact/Bonferroni Adj Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
Site Control		Lab Control	1.0000	Exact	1.0000	Non-Significant Effect
		10Cu Control	1.0000	Exact	1.0000	Non-Significant Effect
		15Cu Control	1.0000	Exact	1.0000	Non-Significant Effect
		20Cu Control	0.4898	Exact	1.0000	Non-Significant Effect
		GH_ER2 +15Cu*	0.0010	Exact	0.0238	Significant Effect
		CM_MC1 + 15Cu*	0.0015	Exact	0.0337	Significant Effect
		LC_SLC + 15Cu	1.0000	Exact	1.0000	Non-Significant Effect
		FR_FRABCH + 20C	0.2322	Exact	1.0000	Non-Significant Effect
		FR_FRCP1 + 20Cu	0.3671	Exact	1.0000	Non-Significant Effect
		GH_FR1 + 20Cu	0.1175	Exact	1.0000	Non-Significant Effect
		GH_ERC + 10Cu	0.0037	Exact	0.0857	Non-Significant Effect
		CM_MC2 + 20Cu	0.2767	Exact	1.0000	Non-Significant Effect
		RG_MIDAG + 15Cu	0.2164	Exact	1.0000	Non-Significant Effect
		EV_MC2 + 20Cu	0.4792	Exact	1.0000	Non-Significant Effect
		EV_HC1 + 20Cu	0.4845	Exact	1.0000	Non-Significant Effect
		LC_DCDS + 20Cu	0.2111	Exact	1.0000	Non-Significant Effect
		LC_LC3 + 20Cu	0.2623	Exact	1.0000	Non-Significant Effect
		LC_LC5 + 20Cu	1.0000	Exact	1.0000	Non-Significant Effect
		LC_LCDSSLCC20Cu	0.5146	Exact	1.0000	Non-Significant Effect
		FR_FR4 + 20Cu	1.0000	Exact	1.0000	Non-Significant Effect
		FR_FR2 + 20Cu	0.1200	Exact	1.0000	Non-Significant Effect
		FR_MULTIPLATE20	1.0000	Exact	1.0000	Non-Significant Effect
		FR_FRRD + 20Cu	0.2057	Exact	1.0000	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	4.105	3.37	0.0017	Outlier Detected

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 17-4388-3495 **Endpoint:** Proportion Normal **CETIS Version:** CETISv1.9.4
Analyzed: 01 Jun-21 8:24 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Data Summary

Sample	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
Lab Control		54	0	54	1	0	-3.92%
10Cu Control		56	0	56	1	0	-3.92%
15Cu Control		50	0	50	1	0	-3.92%
20Cu Control		47	1	48	0.9792	0.02083	-1.76%
FR_UFR1 + 20Cu	XC	50	0	50	1	0	-3.92%
GH_ER2 +15Cu		14	5	19	0.7368	0.2632	23.43%
CM_MC1 + 15Cu		22	6	28	0.7857	0.2143	18.35%
LC_SLC + 15Cu		47	0	47	1	0	-3.92%
FR_FRABCH + 20C		45	2	47	0.9574	0.04255	0.5%
FR_FRCP1 + 20Cu		28	1	29	0.9655	0.03448	-0.34%
GH_FR1 + 20Cu		46	3	49	0.9388	0.06122	2.44%
GH_ERC + 10Cu		45	8	53	0.8491	0.1509	11.76%
CM_MC2 + 20Cu		54	2	56	0.9643	0.03571	-0.21%
RG_MIDAG + 15Cu		42	2	44	0.9545	0.04545	0.8%
EV_MC2 + 20Cu		45	1	46	0.9783	0.02174	-1.66%
EV_HC1 + 20Cu		46	1	47	0.9787	0.02128	-1.71%
LC_DCDS + 20Cu		41	2	43	0.9535	0.04651	0.91%
LC_LC3 + 20Cu		51	2	53	0.9623	0.03774	0.0%
LC_LC5 + 20Cu		52	0	52	1	0	-3.92%
LC_LCDSSLCC20C		52	1	53	0.9811	0.01887	-1.96%
FR_FR4 + 20Cu		38	0	38	1	0	-3.92%
FR_FR2 + 20Cu		25	2	27	0.9259	0.07407	3.78%
FR_MULTIPLATE20		46	0	46	1	0	-3.92%
FR_FRRD + 20Cu		40	2	42	0.9524	0.04762	1.03%

Proportion Normal Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Lab Control		1.0000	1.0000	1.0000	1.0000
10Cu Control		1.0000	1.0000	1.0000	1.0000
15Cu Control		1.0000	1.0000	1.0000	1.0000
20Cu Control		0.9167	1.0000	1.0000	1.0000
FR_UFR1 + 20Cu	XC	1.0000	1.0000	1.0000	1.0000
GH_ER2 +15Cu		0.7500	0.8571	1.0000	0.4000
CM_MC1 + 15Cu		0.6250	0.8750	0.6667	1.0000
LC_SLC + 15Cu		1.0000	1.0000	1.0000	1.0000
FR_FRABCH + 20C		1.0000	1.0000	0.8000	1.0000
FR_FRCP1 + 20Cu		1.0000	0.8333	1.0000	1.0000
GH_FR1 + 20Cu		1.0000	1.0000	0.9231	0.8462
GH_ERC + 10Cu		0.7857	0.7692	0.9231	0.9231
CM_MC2 + 20Cu		1.0000	0.9333	0.9286	1.0000
RG_MIDAG + 15Cu		0.9000	1.0000	1.0000	0.9167
EV_MC2 + 20Cu		0.9231	1.0000	1.0000	1.0000
EV_HC1 + 20Cu		0.9167	1.0000	1.0000	1.0000
LC_DCDS + 20Cu		1.0000	0.9091	0.9286	1.0000
LC_LC3 + 20Cu		1.0000	0.9333	1.0000	0.9167
LC_LC5 + 20Cu		1.0000	1.0000	1.0000	1.0000
LC_LCDSSLCC20C		1.0000	0.9167	1.0000	1.0000
FR_FR4 + 20Cu		1.0000	1.0000	1.0000	1.0000
FR_FR2 + 20Cu		0.8571	0.8571	1.0000	1.0000
FR_MULTIPLATE2		1.0000	1.0000	1.0000	1.0000
FR_FRRD + 20Cu		0.9167	0.9167	1.0000	1.0000

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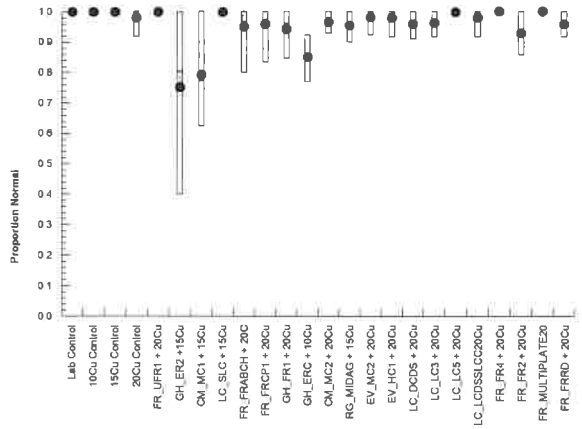
Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 17-4388-3495 **Endpoint:** Proportion Normal **CETIS Version:** CETISv1.9.4
Analyzed: 01 Jun-21 8:24 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Proportion Normal Binomials

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Lab Control		14/14	13/13	12/12	15/15
10Cu Control		14/14	13/13	14/14	15/15
15Cu Control		13/13	15/15	9/9	13/13
20Cu Control		11/12	13/13	9/9	14/14
FR_UFR1 + 20Cu	XC	12/12	14/14	13/13	11/11
GH_ER2 +15Cu		3/4	6/7	3/3	2/5
CM_MC1 + 15Cu		5/8	7/8	4/6	6/6
LC_SLC + 15Cu		9/9	10/10	14/14	14/14
FR_FRABCH + 20C		12/12	13/13	8/10	12/12
FR_FRCP1 + 20Cu		5/5	5/6	11/11	7/7
GH_FR1 + 20Cu		11/11	12/12	12/13	11/13
GH_ERC + 10Cu		11/14	10/13	12/13	12/13
CM_MC2 + 20Cu		14/14	14/15	13/14	13/13
RG_MIDAG + 15Cu		9/10	10/10	12/12	11/12
EV_MC2 + 20Cu		12/13	9/9	12/12	11/11
EV_HC1 + 20Cu		11/12	12/12	13/13	10/10
LC_DCDS + 20Cu		8/8	10/11	13/14	10/10
LC_LC3 + 20Cu		13/13	14/15	13/13	11/12
LC_LC5 + 20Cu		15/15	14/14	13/13	10/10
LC_LCDSSLCC20C		14/14	11/12	13/13	14/14
FR_FR4 + 20Cu		9/9	11/11	8/8	10/10
FR_FR2 + 20Cu		6/7	6/7	9/9	4/4
FR_MULTIPLATE2		10/10	12/12	13/13	11/11
FR_FRRD + 20Cu		11/12	11/12	9/9	9/9

Graphics



Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID:	01-3034-2024	**Endpoint:**	Post Hatch Survival	**CETIS Version:**	CETISv1.9.4
Analyzed:	22 May-21 11:13	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1
Batch ID:	16-2689-7673	**Test Type:**	32 Day Fathead Minnow Test	**Analyst:**	Kayla Knol
Start Date:	06 Mar-21	**Protocol:**	ASTM E1241-05 (2013)	**Diluent:**	Dechlorinated Tap Water
Ending Date:	07 Apr-21	**Species:**	Pimephales promelas	**Brine:**	
Test Length:	32d 0h	**Taxon:**	Actinopterygii	**Source:**	Aquatox, AR **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
Lab Control	08-8280-1106	02 Mar-21	03 Mar-21	96h	Teck Coal Ltd	
10Cu Control	01-9333-5370	02 Mar-21	03 Mar-21	96h		
15Cu Control	19-6548-0518	02 Mar-21	03 Mar-21	96h		
20Cu Control	00-8675-6744	02 Mar-21	03 Mar-21	96h		
FR_UFR1 + 20Cu	20-4721-8257	02 Mar-21	03 Mar-21	96h (4.6 °C)		
GH_ER2 +15Cu	01-1137-9253	02 Mar-21	03 Mar-21	96h (4.2 °C)		
CM_MC1 + 15Cu	01-3772-5048	02 Mar-21	03 Mar-21	96h (1 °C)		
LC_SLC + 15Cu	01-2380-6574	02 Mar-21	03 Mar-21	96h (3.1 °C)		
FR_FRABCH + 20C	08-4134-0746	02 Mar-21	03 Mar-21	96h (3.8 °C)		
FR_FRCP1 + 20Cu	11-2694-6466	02 Mar-21	03 Mar-21	96h (3 °C)		
GH_FR1 + 20Cu	20-1635-3152	02 Mar-21	03 Mar-21	96h (2.4 °C)		
GH_ERC + 10Cu	05-1950-5597	02 Mar-21	03 Mar-21	96h (4.1 °C)		
CM_MC2 + 20Cu	14-4685-1067	02 Mar-21	03 Mar-21	96h (0.3 °C)		
RG_MIDAG + 15Cu	21-3889-1829	02 Mar-21	03 Mar-21	96h (0.6 °C)		
EV_MC2 + 20Cu	05-6103-5191	02 Mar-21	03 Mar-21	96h (4.4 °C)		
EV_HC1 + 20Cu	12-5501-3302	02 Mar-21	03 Mar-21	96h (3.4 °C)		
LC_DCDS + 20Cu	04-1088-5978	02 Mar-21	03 Mar-21	96h (0.6 °C)		
LC_LC3 + 20Cu	14-7773-4190	02 Mar-21	03 Mar-21	96h (2.3 °C)		
LC_LC5 + 20Cu	01-7235-6798	02 Mar-21	03 Mar-21	96h (0.6 °C)		
LC_LCDSSLCC20C	06-4197-2641	02 Mar-21	03 Mar-21	96h (2.4 °C)		
FR_FR4 + 20Cu	10-9481-5020	02 Mar-21	03 Mar-21	96h (5.4 °C)		
FR_FR2 + 20Cu	00-3159-8672	02 Mar-21	03 Mar-21	96h (4.4 °C)		
FR_MULTIPLATE2	02-2179-0364	02 Mar-21	03 Mar-21	96h (2.9 °C)		
FR_FRRD + 20Cu	19-5167-8345	02 Mar-21	03 Mar-21	96h (6.2 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
Lab Control	Ambient Sample	Teck Coal Ltd	Lab Control	
10Cu Control	Ambient Sample	Teck Coal Ltd	10Cu Control	
15Cu Control	Ambient Sample	Teck Coal Ltd	15Cu Control	
20Cu Control	Ambient Sample	Teck Coal Ltd	20Cu Control	
FR_UFR1 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_UFR1_MON_2021-03-0	
GH_ER2 +15Cu	Ambient Sample	Teck Coal Ltd	GH_ER2_WS_2021-03-02_	
CM_MC1 + 15Cu	Ambient Sample	Teck Coal Ltd	CM_MC1_WS_2021-03-02	
LC_SLC + 15Cu	Ambient Sample	Teck Coal Ltd	LC_SLC_WS_2021-03-02_	
FR_FRABCH + 20C	Ambient Sample	Teck Coal Ltd	FR_FRABCH_MON_2021-	
FR_FRCP1 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FRCP1_MON_2021-03	
GH_FR1 + 20Cu	Ambient Sample	Teck Coal Ltd	GH_FR1_WS_2021-03-02_	
GH_ERC + 10Cu	Ambient Sample	Teck Coal Ltd	GH_ERC_WS_2021-03-02	
CM_MC2 + 20Cu	Ambient Sample	Teck Coal Ltd	CM_MC2_WS_2021-03-02	
RG_MIDAG + 15Cu	Ambient Sample	Teck Coal Ltd	RG_MIDAG_WS_2021-03-	
EV_MC2 + 20Cu	Ambient Sample	Teck Coal Ltd	EV_MC2_WS_2021_Q1_W	
EV_HC1 + 20Cu	Ambient Sample	Teck Coal Ltd	EV_HC1_WS_2021_Q1_W	
LC_DCDS + 20Cu	Ambient Sample	Teck Coal Ltd	LC_DCDS_WS_2021-03-02	
LC_LC3 + 20Cu	Ambient Sample	Teck Coal Ltd	LC_LC3_WS_2021-03-02_	
LC_LC5 + 20Cu	Ambient Sample	Teck Coal Ltd	LC_LC5_WS_2021-03-02_	
LC_LCDSSLCC20C	Ambient Sample	Teck Coal Ltd	LC_LCDSSLCC_WS_2021-	
FR_FR4 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FR4_WS_2021-03-02_	
FR_FR2 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FR2_WS_2021-03-02_	

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Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 01-3034-2024 **Endpoint:** Post Hatch Survival **CETIS Version:** CETISv1.9.4
Analyzed: 22 May-21 11:13 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_MULTIPLATE2	Ambient Sample	Teck Coal Ltd	FR_MULTIPLATE_WS_202	
FR_FRRD + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FRRD_WS_2021-03-02	

Fisher Exact/Bonferroni Adj Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
Site Control		Lab Control	0.7535	Exact	1.0000	Non-Significant Effect
		10Cu Control	0.9583	Exact	1.0000	Non-Significant Effect
		15Cu Control	0.4234	Exact	1.0000	Non-Significant Effect
		20Cu Control	0.3941	Exact	1.0000	Non-Significant Effect
		GH_ER2 +15Cu*	0.0000	Exact	1.2E-08	Significant Effect
		CM_MC1 + 15Cu*	0.0000	Exact	6.6E-05	Significant Effect
		LC_SLC + 15Cu	0.1786	Exact	1.0000	Non-Significant Effect
		FR_FRABCH + 20C	0.1786	Exact	1.0000	Non-Significant Effect
		FR_FRCP1 + 20Cu*	0.0000	Exact	1.5E-04	Significant Effect
		GH_FR1 + 20Cu	0.6979	Exact	1.0000	Non-Significant Effect
		GH_ERC + 10Cu	0.7432	Exact	1.0000	Non-Significant Effect
		CM_MC2 + 20Cu	0.9583	Exact	1.0000	Non-Significant Effect
		RG_MIDAG + 15Cu	0.0576	Exact	1.0000	Non-Significant Effect
		EV_MC2 + 20Cu	0.2861	Exact	1.0000	Non-Significant Effect
		EV_HC1 + 20Cu	0.2333	Exact	1.0000	Non-Significant Effect
		LC_DCDS + 20Cu	0.4072	Exact	1.0000	Non-Significant Effect
		LC_LC3 + 20Cu	0.6507	Exact	1.0000	Non-Significant Effect
		LC_LC5 + 20Cu	0.6381	Exact	1.0000	Non-Significant Effect
		LC_LCDSSLCC20Cu	0.6507	Exact	1.0000	Non-Significant Effect
		FR_FR4 + 20Cu	0.0029	Exact	0.0677	Non-Significant Effect
		FR_FR2 + 20Cu*	0.0000	Exact	2.9E-05	Significant Effect
		FR_MULTIPLATE20	0.1260	Exact	1.0000	Non-Significant Effect
		FR_FRRD + 20Cu	0.0668	Exact	1.0000	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	2.592	3.37	0.8135	No Outliers Detected

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 01-3034-2024 **Endpoint:** Post Hatch Survival **CETIS Version:** CETISv1.9.4
Analyzed: 22 May-21 11:13 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Data Summary

Sample	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
Lab Control		54	6	60	0.9	0.1	-2.6%
10Cu Control		56	3	59	0.9492	0.05085	-8.2%
15Cu Control		50	9	59	0.8475	0.1525	3.39%
20Cu Control		48	9	57	0.8421	0.1579	4.0%
FR_UFR1 + 20Cu	XC	50	7	57	0.8772	0.1228	0.0%
GH_ER2 +15Cu		19	40	59	0.322	0.678	63.29%
CM_MC1 + 15Cu		28	31	59	0.4746	0.5254	45.9%
LC_SLC + 15Cu		47	12	59	0.7966	0.2034	9.19%
FR_FRABCH + 20C		47	12	59	0.7966	0.2034	9.19%
FR_FRCP1 + 20Cu		29	30	59	0.4915	0.5085	43.97%
GH_FR1 + 20Cu		49	6	55	0.8909	0.1091	-1.56%
GH_ERC + 10Cu		53	6	59	0.8983	0.1017	-2.41%
CM_MC2 + 20Cu		56	3	59	0.9492	0.05085	-8.2%
RG_MIDAG + 15Cu		44	15	59	0.7458	0.2542	14.98%
EV_MC2 + 20Cu		46	10	56	0.8214	0.1786	6.36%
EV_HC1 + 20Cu		47	11	58	0.8103	0.1897	7.62%
LC_DCDS + 20Cu		43	8	51	0.8431	0.1569	3.88%
LC_LC3 + 20Cu		53	7	60	0.8833	0.1167	-0.7%
LC_LC5 + 20Cu		52	7	59	0.8814	0.1186	-0.47%
LC_LCDSSLCC20C		53	7	60	0.8833	0.1167	-0.7%
FR_FR4 + 20Cu		38	21	59	0.6441	0.3559	26.58%
FR_FR2 + 20Cu		27	32	59	0.4576	0.5424	47.83%
FR_MULTIPLATE20		46	13	59	0.7797	0.2203	11.12%
FR_FRRD + 20Cu		42	14	56	0.75	0.25	14.5%

Post Hatch Survival Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Lab Control		0.9333	0.8667	0.8000	1.0000
10Cu Control		1.0000	0.8667	0.9333	1.0000
15Cu Control		0.8667	1.0000	0.6000	0.9286
20Cu Control		0.8571	1.0000	0.6000	0.9333
FR_UFR1 + 20Cu	XC	0.9231	0.9333	0.8667	0.7857
GH_ER2 +15Cu		0.2667	0.4667	0.2000	0.3571
CM_MC1 + 15Cu		0.5333	0.5333	0.4286	0.4000
LC_SLC + 15Cu		0.6429	0.6667	0.9333	0.9333
FR_FRABCH + 20C		0.8000	0.8667	0.7143	0.8000
FR_FRCP1 + 20Cu		0.3571	0.4000	0.7333	0.4667
GH_FR1 + 20Cu		0.7857	1.0000	0.8667	0.9286
GH_ERC + 10Cu		0.9333	0.8667	0.9286	0.8667
CM_MC2 + 20Cu		0.9333	1.0000	0.9333	0.9286
RG_MIDAG + 15Cu		0.6667	0.7143	0.8000	0.8000
EV_MC2 + 20Cu		0.9286	0.7500	0.8000	0.8000
EV_HC1 + 20Cu		0.8000	0.8571	0.8667	0.7143
LC_DCDS + 20Cu		0.6667	0.7857	0.9333	1.0000
LC_LC3 + 20Cu		0.8667	1.0000	0.8667	0.8000
LC_LC5 + 20Cu		1.0000	0.9333	0.8667	0.7143
LC_LCDSSLCC20C		0.9333	0.8000	0.8667	0.9333
FR_FR4 + 20Cu		0.6000	0.7333	0.5333	0.7143
FR_FR2 + 20Cu		0.4667	0.4667	0.6429	0.2667
FR_MULTIPLATE2		0.7143	0.8000	0.8667	0.7333
FR_FRRD + 20Cu		0.8571	0.8571	0.6000	0.6923

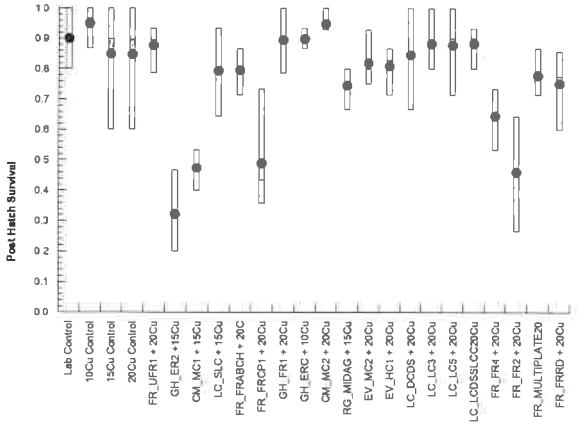
Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 01-3034-2024 **Endpoint:** Post Hatch Survival **CETIS Version:** CETISv1.9.4
Analyzed: 22 May-21 11:13 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Post Hatch Survival Binomials

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Lab Control		14/15	13/15	12/15	15/15
10Cu Control		14/14	13/15	14/15	15/15
15Cu Control		13/15	15/15	9/15	13/14
20Cu Control		12/14	13/13	9/15	14/15
FR_UFR1 + 20Cu	XC	12/13	14/15	13/15	11/14
GH_ER2 +15Cu		4/15	7/15	3/15	5/14
CM_MC1 + 15Cu		8/15	8/15	6/14	6/15
LC_SLC + 15Cu		9/14	10/15	14/15	14/15
FR_FRABCH + 20C		12/15	13/15	10/14	12/15
FR_FRCP1 + 20Cu		5/14	6/15	11/15	7/15
GH_FR1 + 20Cu		11/14	12/12	13/15	13/14
GH_ERC + 10Cu		14/15	13/15	13/14	13/15
CM_MC2 + 20Cu		14/15	15/15	14/15	13/14
RG_MIDAG + 15Cu		10/15	10/14	12/15	12/15
EV_MC2 + 20Cu		13/14	9/12	12/15	12/15
EV_HC1 + 20Cu		12/15	12/14	13/15	10/14
LC_DCDS + 20Cu		8/12	11/14	14/15	10/10
LC_LC3 + 20Cu		13/15	15/15	13/15	12/15
LC_LC5 + 20Cu		15/15	14/15	13/15	10/14
LC_LCDSSLCC20C		14/15	12/15	13/15	14/15
FR_FR4 + 20Cu		9/15	11/15	8/15	10/14
FR_FR2 + 20Cu		7/15	7/15	9/14	4/15
FR_MULTIPLATE2		10/14	12/15	13/15	11/15
FR_FRRD + 20Cu		12/14	12/14	9/15	9/13

Graphics



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CETIS Analytical Report

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID:	14-7634-3522	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.9.4
Analyzed:	01 Jun-21 8:34	**Analysis:**	Nonparametric-Control vs Treatments	**Status Level:**	1
Batch ID:	16-2689-7673	**Test Type:**	32 Day Fathead Minnow Test	**Analyst:**	Kayla Knol
Start Date:	06 Mar-21	**Protocol:**	ASTM E1241-05 (2013)	**Diluent:**	Dechlorinated Tap Water
Ending Date:	07 Apr-21	**Species:**	Pimephales promelas	**Brine:**	
Test Length:	32d 0h	**Taxon:**	Actinopterygii	**Source:**	Aquatox, AR **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
Lab Control	08-8280-1106	02 Mar-21	03 Mar-21	96h	Teck Coal Ltd	
10Cu Control	01-9333-5370	02 Mar-21	03 Mar-21	96h		
15Cu Control	19-6548-0518	02 Mar-21	03 Mar-21	96h		
20Cu Control	00-8675-6744	02 Mar-21	03 Mar-21	96h		
FR_UFR1 + 20Cu	20-4721-8257	02 Mar-21	03 Mar-21	96h (4.6 °C)		
GH_ER2 +15Cu	01-1137-9253	02 Mar-21	03 Mar-21	96h (4.2 °C)		
CM_MC1 + 15Cu	01-3772-5048	02 Mar-21	03 Mar-21	96h (1 °C)		
LC_SLC + 15Cu	01-2380-6574	02 Mar-21	03 Mar-21	96h (3.1 °C)		
FR_FRABCH + 20C	08-4134-0746	02 Mar-21	03 Mar-21	96h (3.8 °C)		
FR_FRCP1 + 20Cu	11-2694-6466	02 Mar-21	03 Mar-21	96h (3 °C)		
GH_FR1 + 20Cu	20-1635-3152	02 Mar-21	03 Mar-21	96h (2.4 °C)		
GH_ERC + 10Cu	05-1950-5597	02 Mar-21	03 Mar-21	96h (4.1 °C)		
CM_MC2 + 20Cu	14-4685-1067	02 Mar-21	03 Mar-21	96h (0.3 °C)		
RG_MIDAG + 15Cu	21-3889-1829	02 Mar-21	03 Mar-21	96h (0.6 °C)		
EV_MC2 + 20Cu	05-6103-5191	02 Mar-21	03 Mar-21	96h (4.4 °C)		
EV_HC1 + 20Cu	12-5501-3302	02 Mar-21	03 Mar-21	96h (3.4 °C)		
LC_DCDS + 20Cu	04-1088-5978	02 Mar-21	03 Mar-21	96h (0.6 °C)		
LC_LC3 + 20Cu	14-7773-4190	02 Mar-21	03 Mar-21	96h (2.3 °C)		
LC_LC5 + 20Cu	01-7235-6798	02 Mar-21	03 Mar-21	96h (0.6 °C)		
LC_LCDSSLCC20C	06-4197-2641	02 Mar-21	03 Mar-21	96h (2.4 °C)		
FR_FR4 + 20Cu	10-9481-5020	02 Mar-21	03 Mar-21	96h (5.4 °C)		
FR_FR2 + 20Cu	00-3159-8672	02 Mar-21	03 Mar-21	96h (4.4 °C)		
FR_MULTIPLATE2	02-2179-0364	02 Mar-21	03 Mar-21	96h (2.9 °C)		
FR_FRRD + 20Cu	19-5167-8345	02 Mar-21	03 Mar-21	96h (6.2 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
Lab Control	Ambient Sample	Teck Coal Ltd	Lab Control	
10Cu Control	Ambient Sample	Teck Coal Ltd	10Cu Control	
15Cu Control	Ambient Sample	Teck Coal Ltd	15Cu Control	
20Cu Control	Ambient Sample	Teck Coal Ltd	20Cu Control	
FR_UFR1 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_UFR1_MON_2021-03-0	
GH_ER2 +15Cu	Ambient Sample	Teck Coal Ltd	GH_ER2_WS_2021-03-02_	
CM_MC1 + 15Cu	Ambient Sample	Teck Coal Ltd	CM_MC1_WS_2021-03-02	
LC_SLC + 15Cu	Ambient Sample	Teck Coal Ltd	LC_SLC_WS_2021-03-02_	
FR_FRABCH + 20C	Ambient Sample	Teck Coal Ltd	FR_FRABCH_MON_2021-	
FR_FRCP1 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FRCP1_MON_2021-03	
GH_FR1 + 20Cu	Ambient Sample	Teck Coal Ltd	GH_FR1_WS_2021-03-02_	
GH_ERC + 10Cu	Ambient Sample	Teck Coal Ltd	GH_ERC_WS_2021-03-02	
CM_MC2 + 20Cu	Ambient Sample	Teck Coal Ltd	CM_MC2_WS_2021-03-02	
RG_MIDAG + 15Cu	Ambient Sample	Teck Coal Ltd	RG_MIDAG_WS_2021-03-	
EV_MC2 + 20Cu	Ambient Sample	Teck Coal Ltd	EV_MC2_WS_2021_Q1_W	
EV_HC1 + 20Cu	Ambient Sample	Teck Coal Ltd	EV_HC1_WS_2021_Q1_W	
LC_DCDS + 20Cu	Ambient Sample	Teck Coal Ltd	LC_DCDS_WS_2021-03-02	
LC_LC3 + 20Cu	Ambient Sample	Teck Coal Ltd	LC_LC3_WS_2021-03-02_	
LC_LC5 + 20Cu	Ambient Sample	Teck Coal Ltd	LC_LC5_WS_2021-03-02_	
LC_LCDSSLCC20C	Ambient Sample	Teck Coal Ltd	LC_LCDSSLCC_WS_2021-	
FR_FR4 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FR4_WS_2021-03-02_	
FR_FR2 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FR2_WS_2021-03-02_	

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Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 14-7634-3522 **Endpoint:** Mean Dry Biomass-mg **CETIS Version:** CETISv1.9.4
Analyzed: 01 Jun-21 8:34 **Analysis:** Nonparametric-Control vs Treatments **Status Level:** 1

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_MULTIPLATE2	Ambient Sample	Teck Coal Ltd	FR_MULTIPLATE_WS_202	
FR_FRRD + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FRRD_WS_2021-03-02	

Nemenyi-Damico-Wolfe Test

Sample I	vs	Sample II	Test Stat	Critical	Ties	P-Type	P-Value	Decision(α:5%)
Site Control		Lab Control	-236	211.4	2	CDF	1.0000	Non-Significant Effect
		10Cu Control	-203	211.4	2	CDF	1.0000	Non-Significant Effect
		15Cu Control	-270	211.4	2	CDF	1.0000	Non-Significant Effect
		20Cu Control	-262	211.4	2	CDF	1.0000	Non-Significant Effect
		FR_UFR1 + 20Cu	-203	211.4	2	CDF	1.0000	Non-Significant Effect
		CM_MC1 + 15Cu	-49	211.4	2	CDF	0.9944	Non-Significant Effect
		LC_SLC + 15Cu	-134	211.4	2	CDF	1.0000	Non-Significant Effect
		FR_FRABCH + 20C	-144	211.4	2	CDF	1.0000	Non-Significant Effect
		FR_FRCP1 + 20Cu	-42	211.4	2	CDF	0.9923	Non-Significant Effect
		GH_FR1 + 20Cu	-232.5	211.4	2	CDF	1.0000	Non-Significant Effect
		GH_ERC + 10Cu	-241	211.4	2	CDF	1.0000	Non-Significant Effect
		CM_MC2 + 20Cu	-155	211.4	2	CDF	1.0000	Non-Significant Effect
		RG_MIDAG + 15Cu	-98.5	211.4	2	CDF	0.9996	Non-Significant Effect
		EV_MC2 + 20Cu	-129	211.4	2	CDF	0.9999	Non-Significant Effect
		EV_HC1 + 20Cu	-219.5	211.4	2	CDF	1.0000	Non-Significant Effect
		LC_DCDS + 20Cu	-189	211.4	2	CDF	1.0000	Non-Significant Effect
		LC_LC3 + 20Cu	-168	211.4	2	CDF	1.0000	Non-Significant Effect
		LC_LC5 + 20Cu	-202	211.4	2	CDF	1.0000	Non-Significant Effect
		LC_LCDSSLCC20Cu	-172	211.4	2	CDF	1.0000	Non-Significant Effect
		FR_FR4 + 20Cu	-120.5	211.4	2	CDF	0.9999	Non-Significant Effect
		FR_FR2 + 20Cu	4	211.4	2	CDF	0.9522	Non-Significant Effect
		FR_MULTIPLATE20	-245	211.4	2	CDF	1.0000	Non-Significant Effect
		FR_FRRD + 20Cu	-249	211.4	2	CDF	1.0000	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	2.393	3.37	1.0000	No Outliers Detected
Treatment Effect	Fligner-Wolfe Omnibus Test	4297		0.9998	Non-Significant Overall Effect
Treatment Effect	Kruskal-Wallis Omnibus Test	48.55	35.17	0.0014	Significant Overall Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	9.6416	0.4192	23	4.746	1.9E-07	Significant Effect
Error	6.35993	0.0883324	72			
Total	16.0015		95			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Variances	Bartlett Equality of Variance Test	15.29	35.17	0.8840	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9376	0.9737	1.9E-04	Non-Normal Distribution

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 14-7634-3522 **Endpoint:** Mean Dry Biomass-mg **CETIS Version:** CETISv1.9.4
Analyzed: 01 Jun-21 8:34 **Analysis:** Nonparametric-Control vs Treatments **Status Level:** 1

Mean Dry Biomass-mg Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
Lab Control		4	2.276	1.813	2.739	2.216	1.989	2.681	0.1455	12.79%	0.00%
10Cu Control		4	2.164	1.858	2.471	2.08	2.048	2.45	0.09618	8.89%	4.89%
15Cu Control		4	2.423	1.816	3.031	2.311	2.096	2.975	0.191	15.76%	-6.49%
20Cu Control		4	2.343	1.952	2.734	2.305	2.085	2.677	0.1229	10.49%	-2.94%
FR_UFR1 + 20Cu		4	2.254	1.609	2.9	2.06	2.035	2.862	0.2028	18.00%	0.94%
GH_ER2 +15Cu	XC	4	1.181	0.4596	1.902	1.135	0.6767	1.777	0.2266	38.38%	48.12%
CM_MC1 + 15Cu		4	1.604	1.076	2.132	1.478	1.367	2.092	0.166	20.69%	29.52%
LC_SLC + 15Cu		4	2.008	1.849	2.167	2.005	1.908	2.114	0.04997	4.98%	11.75%
FR_FRABCH + 20C		4	2.097	1.427	2.766	1.929	1.814	2.716	0.2103	20.06%	7.86%
FR_FRCP1 + 20Cu		4	1.699	1.29	2.108	1.729	1.358	1.98	0.1285	15.13%	25.34%
GH_FR1 + 20Cu		4	2.278	1.812	2.745	2.307	1.917	2.584	0.1465	12.86%	-0.12%
GH_ERC + 10Cu		4	2.248	1.979	2.517	2.217	2.095	2.463	0.08461	7.53%	1.22%
CM_MC2 + 20Cu		4	2.049	1.554	2.544	2.058	1.671	2.409	0.1556	15.19%	9.96%
RG_MIDAG + 15Cu		4	1.9	1.521	2.278	1.856	1.677	2.209	0.1189	12.52%	16.52%
EV_MC2 + 20Cu		4	2	1.594	2.406	1.937	1.765	2.361	0.1276	12.76%	12.10%
EV_HC1 + 20Cu		4	2.2	1.928	2.471	2.171	2.024	2.433	0.0853	7.75%	3.33%
LC_DCDS + 20Cu		4	2.111	1.845	2.377	2.162	1.875	2.245	0.08356	7.92%	7.22%
LC_LC3 + 20Cu		4	2.076	1.846	2.306	2.072	1.927	2.233	0.0723	6.96%	8.76%
LC_LC5 + 20Cu		4	2.19	1.749	2.631	2.166	1.906	2.523	0.1385	12.65%	3.75%
LC_LCDSSLCC20C		4	2.097	1.762	2.432	2.051	1.923	2.363	0.1054	10.05%	7.85%
FR_FR4 + 20Cu		4	2.013	1.388	2.639	1.85	1.754	2.599	0.1965	19.52%	11.53%
FR_FR2 + 20Cu		4	1.239	0.6549	1.824	1.13	0.96	1.738	0.1837	29.64%	45.54%
FR_MULTIPLATE2		4	2.352	1.754	2.949	2.25	2.019	2.888	0.1877	15.96%	-3.35%
FR_FRRD + 20Cu		4	2.338	1.844	2.832	2.304	2.016	2.729	0.1553	13.28%	-2.75%

Mean Dry Biomass-mg Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Lab Control		2.222	1.989	2.211	2.681
10Cu Control		2.109	2.051	2.048	2.45
15Cu Control		2.293	2.096	2.329	2.975
20Cu Control		2.297	2.085	2.313	2.677
FR_UFR1 + 20Cu		2.078	2.035	2.042	2.862
GH_ER2 +15Cu	XC	1.17	1.777	0.6767	1.099
CM_MC1 + 15Cu		1.429	2.092	1.367	1.527
LC_SLC + 15Cu		2.071	1.939	1.908	2.114
FR_FRABCH + 20C		1.855	1.814	2.003	2.716
FR_FRCP1 + 20Cu		1.705	1.358	1.98	1.753
GH_FR1 + 20Cu		2.433	2.181	1.917	2.584
GH_ERC + 10Cu		2.095	2.463	2.131	2.302
CM_MC2 + 20Cu		1.963	1.671	2.153	2.409
RG_MIDAG + 15Cu		1.677	1.754	2.209	1.959
EV_MC2 + 20Cu		1.967	1.907	1.765	2.361
EV_HC1 + 20Cu		2.155	2.024	2.188	2.433
LC_DCDS + 20Cu		2.245	1.875	2.113	2.212
LC_LC3 + 20Cu		2.233	1.927	1.983	2.161
LC_LC5 + 20Cu		1.906	2.029	2.304	2.523
LC_LCDSSLCC20C		1.923	1.933	2.169	2.363
FR_FR4 + 20Cu		1.754	1.838	1.863	2.599
FR_FR2 + 20Cu		0.9653	0.96	1.738	1.294
FR_MULTIPLATE2		2.295	2.019	2.205	2.888
FR_FRRD + 20Cu		2.016	2.181	2.427	2.729

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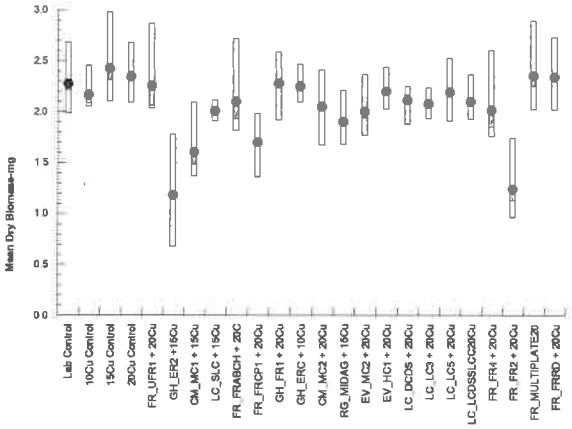
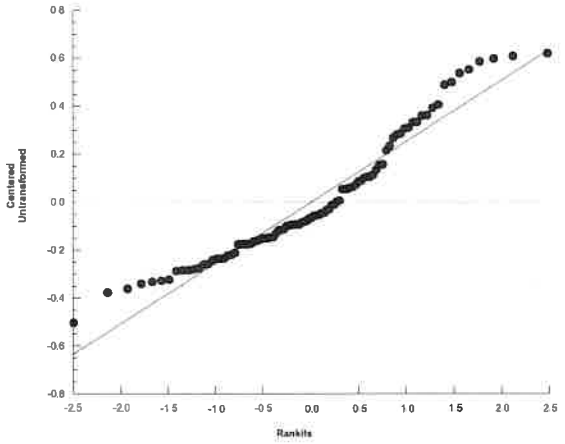
Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID:	14-7634-3522	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.9.4
Analyzed:	01 Jun-21 8:34	**Analysis:**	Nonparametric-Control vs Treatments	**Status Level:**	1

Graphics





CETIS Analytical Report

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID:	04-7396-4200	**Endpoint:**	Hatch Rate	**CETIS Version:**	CETISv1.9.4
Analyzed:	22 May-21 11:19	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1
Batch ID:	16-2689-7673	**Test Type:**	32 Day Fathead Minnow Test	**Analyst:**	Kayla Knol
Start Date:	06 Mar-21	**Protocol:**	ASTM E1241-05 (2013)	**Diluent:**	Dechlorinated Tap Water
Ending Date:	07 Apr-21	**Species:**	Pimephales promelas	**Brine:**	
Test Length:	32d 0h	**Taxon:**	Actinopterygii	**Source:**	Aquatox, AR **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
Lab Control	08-8280-1106	02 Mar-21	03 Mar-21	96h	Teck Coal Ltd	
10Cu Control	01-9333-5370	02 Mar-21	03 Mar-21	96h		
15Cu Control	19-6548-0518	02 Mar-21	03 Mar-21	96h		
20Cu Control	00-8675-6744	02 Mar-21	03 Mar-21	96h		
FR_UFR1 + 20Cu	20-4721-8257	02 Mar-21	03 Mar-21	96h (4.6 °C)		
GH_ER2 +15Cu	01-1137-9253	02 Mar-21	03 Mar-21	96h (4.2 °C)		
CM_MC1 + 15Cu	01-3772-5048	02 Mar-21	03 Mar-21	96h (1 °C)		
LC_SLC + 15Cu	01-2380-6574	02 Mar-21	03 Mar-21	96h (3.1 °C)		
FR_FRABCH + 20C	08-4134-0746	02 Mar-21	03 Mar-21	96h (3.8 °C)		
FR_FRCP1 + 20Cu	11-2694-6466	02 Mar-21	03 Mar-21	96h (3 °C)		
GH_FR1 + 20Cu	20-1635-3152	02 Mar-21	03 Mar-21	96h (2.4 °C)		
GH_ERC + 10Cu	05-1950-5597	02 Mar-21	03 Mar-21	96h (4.1 °C)		
CM_MC2 + 20Cu	14-4685-1067	02 Mar-21	03 Mar-21	96h (0.3 °C)		
RG_MIDAG + 15Cu	21-3889-1829	02 Mar-21	03 Mar-21	96h (0.6 °C)		
EV_MC2 + 20Cu	05-6103-5191	02 Mar-21	03 Mar-21	96h (4.4 °C)		
EV_HC1 + 20Cu	12-5501-3302	02 Mar-21	03 Mar-21	96h (3.4 °C)		
LC_DCDS + 20Cu	04-1088-5978	02 Mar-21	03 Mar-21	96h (0.6 °C)		
LC_LC3 + 20Cu	14-7773-4190	02 Mar-21	03 Mar-21	96h (2.3 °C)		
LC_LC5 + 20Cu	01-7235-6798	02 Mar-21	03 Mar-21	96h (0.6 °C)		
LC_LCDSSLCC20C	06-4197-2641	02 Mar-21	03 Mar-21	96h (2.4 °C)		
FR_FR4 + 20Cu	10-9481-5020	02 Mar-21	03 Mar-21	96h (5.4 °C)		
FR_FR2 + 20Cu	00-3159-8672	02 Mar-21	03 Mar-21	96h (4.4 °C)		
FR_MULTIPLATE2	02-2179-0364	02 Mar-21	03 Mar-21	96h (2.9 °C)		
FR_FRRD + 20Cu	19-5167-8345	02 Mar-21	03 Mar-21	96h (6.2 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
Lab Control	Ambient Sample	Teck Coal Ltd	Lab Control	
10Cu Control	Ambient Sample	Teck Coal Ltd	10Cu Control	
15Cu Control	Ambient Sample	Teck Coal Ltd	15Cu Control	
20Cu Control	Ambient Sample	Teck Coal Ltd	20Cu Control	
FR_UFR1 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_UFR1_MON_2021-03-0	
GH_ER2 +15Cu	Ambient Sample	Teck Coal Ltd	GH_ER2_WS_2021-03-02_	
CM_MC1 + 15Cu	Ambient Sample	Teck Coal Ltd	CM_MC1_WS_2021-03-02	
LC_SLC + 15Cu	Ambient Sample	Teck Coal Ltd	LC_SLC_WS_2021-03-02_	
FR_FRABCH + 20C	Ambient Sample	Teck Coal Ltd	FR_FRABCH_MON_2021-	
FR_FRCP1 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FRCP1_MON_2021-03	
GH_FR1 + 20Cu	Ambient Sample	Teck Coal Ltd	GH_FR1_WS_2021-03-02_	
GH_ERC + 10Cu	Ambient Sample	Teck Coal Ltd	GH_ERC_WS_2021-03-02	
CM_MC2 + 20Cu	Ambient Sample	Teck Coal Ltd	CM_MC2_WS_2021-03-02	
RG_MIDAG + 15Cu	Ambient Sample	Teck Coal Ltd	RG_MIDAG_WS_2021-03-	
EV_MC2 + 20Cu	Ambient Sample	Teck Coal Ltd	EV_MC2_WS_2021_Q1_W	
EV_HC1 + 20Cu	Ambient Sample	Teck Coal Ltd	EV_HC1_WS_2021_Q1_W	
LC_DCDS + 20Cu	Ambient Sample	Teck Coal Ltd	LC_DCDS_WS_2021-03-02	
LC_LC3 + 20Cu	Ambient Sample	Teck Coal Ltd	LC_LC3_WS_2021-03-02_	
LC_LC5 + 20Cu	Ambient Sample	Teck Coal Ltd	LC_LC5_WS_2021-03-02_	
LC_LCDSSLCC20C	Ambient Sample	Teck Coal Ltd	LC_LCDSSLCC_WS_2021-	
FR_FR4 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FR4_WS_2021-03-02_	
FR_FR2 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FR2_WS_2021-03-02_	

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 04-7396-4200 **Endpoint:** Hatch Rate **CETIS Version:** CETISv1.9.4
Analyzed: 22 May-21 11:19 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_MULTIPLATE2	Ambient Sample	Teck Coal Ltd	FR_MULTIPLATE_WS_202	
FR_FRRD + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FRRD_WS_2021-03-02	

Fisher Exact/Bonferroni Adj Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
Site Control		Lab Control	1.0000	Exact	1.0000	Non-Significant Effect
		10Cu Control	0.7521	Exact	1.0000	Non-Significant Effect
		15Cu Control	0.7521	Exact	1.0000	Non-Significant Effect
		20Cu Control	0.3093	Exact	1.0000	Non-Significant Effect
		FR_UFR1 + 20Cu	0.3093	Exact	1.0000	Non-Significant Effect
		CM_MC1 + 15Cu	0.7521	Exact	1.0000	Non-Significant Effect
		LC_SLC + 15Cu	0.7521	Exact	1.0000	Non-Significant Effect
		FR_FRABCH + 20C	0.7521	Exact	1.0000	Non-Significant Effect
		FR_FRCP1 + 20Cu	0.7521	Exact	1.0000	Non-Significant Effect
		GH_FR1 + 20Cu	0.1034	Exact	1.0000	Non-Significant Effect
		GH_ERC + 10Cu	0.7521	Exact	1.0000	Non-Significant Effect
		CM_MC2 + 20Cu	0.7521	Exact	1.0000	Non-Significant Effect
		RG_MIDAG + 15Cu	0.7521	Exact	1.0000	Non-Significant Effect
		EV_MC2 + 20Cu	0.1822	Exact	1.0000	Non-Significant Effect
		EV_HC1 + 20Cu	0.5000	Exact	1.0000	Non-Significant Effect
		LC_DCDS + 20Cu	0.0083	Exact	0.1907	Non-Significant Effect
		LC_LC3 + 20Cu	1.0000	Exact	1.0000	Non-Significant Effect
		LC_LC5 + 20Cu	0.7521	Exact	1.0000	Non-Significant Effect
		LC_LCDSSLCC20Cu	1.0000	Exact	1.0000	Non-Significant Effect
		FR_FR4 + 20Cu	0.7521	Exact	1.0000	Non-Significant Effect
		FR_FR2 + 20Cu	0.7521	Exact	1.0000	Non-Significant Effect
		FR_MULTIPLATE20	0.7521	Exact	1.0000	Non-Significant Effect
		FR_FRRD + 20Cu	0.1822	Exact	1.0000	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	3.165	3.37	0.1123	No Outliers Detected

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Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 04-7396-4200 **Endpoint:** Hatch Rate **CETIS Version:** CETISv1.9.4
Analyzed: 22 May-21 11:19 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Data Summary

Sample	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
Lab Control		60	0	60	1	0	-1.7%
10Cu Control		59	1	60	0.9833	0.01667	0.0%
15Cu Control		59	1	60	0.9833	0.01667	0.0%
20Cu Control		57	3	60	0.95	0.05	3.39%
FR_UFR1 + 20Cu		57	3	60	0.95	0.05	3.39%
GH_ER2 +15Cu	XC	59	1	60	0.9833	0.01667	0.0%
CM_MC1 + 15Cu		59	1	60	0.9833	0.01667	0.0%
LC_SLC + 15Cu		59	1	60	0.9833	0.01667	0.0%
FR_FRABCH + 20C		59	1	60	0.9833	0.01667	0.0%
FR_FRCP1 + 20Cu		59	1	60	0.9833	0.01667	0.0%
GH_FR1 + 20Cu		55	5	60	0.9167	0.08333	6.78%
GH_ERC + 10Cu		59	1	60	0.9833	0.01667	0.0%
CM_MC2 + 20Cu		59	1	60	0.9833	0.01667	0.0%
RG_MIDAG + 15Cu		59	1	60	0.9833	0.01667	0.0%
EV_MC2 + 20Cu		56	4	60	0.9333	0.06667	5.09%
EV_HC1 + 20Cu		58	2	60	0.9667	0.03333	1.7%
LC_DCDS + 20Cu		51	9	60	0.85	0.15	13.56%
LC_LC3 + 20Cu		60	0	60	1	0	-1.7%
LC_LC5 + 20Cu		59	1	60	0.9833	0.01667	0.0%
LC_LCDSSLCC20C		60	0	60	1	0	-1.7%
FR_FR4 + 20Cu		59	1	60	0.9833	0.01667	0.0%
FR_FR2 + 20Cu		59	1	60	0.9833	0.01667	0.0%
FR_MULTIPLATE20		59	1	60	0.9833	0.01667	0.0%
FR_FRRD + 20Cu		56	4	60	0.9333	0.06667	5.09%

Hatch Rate Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Lab Control		1.0000	1.0000	1.0000	1.0000
10Cu Control		0.9333	1.0000	1.0000	1.0000
15Cu Control		1.0000	1.0000	1.0000	0.9333
20Cu Control		0.9333	0.8667	1.0000	1.0000
FR_UFR1 + 20Cu		0.8667	1.0000	1.0000	0.9333
GH_ER2 +15Cu	XC	1.0000	1.0000	1.0000	0.9333
CM_MC1 + 15Cu		1.0000	1.0000	0.9333	1.0000
LC_SLC + 15Cu		0.9333	1.0000	1.0000	1.0000
FR_FRABCH + 20C		1.0000	1.0000	0.9333	1.0000
FR_FRCP1 + 20Cu		0.9333	1.0000	1.0000	1.0000
GH_FR1 + 20Cu		0.9333	0.8000	1.0000	0.9333
GH_ERC + 10Cu		1.0000	1.0000	0.9333	1.0000
CM_MC2 + 20Cu		1.0000	1.0000	1.0000	0.9333
RG_MIDAG + 15Cu		1.0000	0.9333	1.0000	1.0000
EV_MC2 + 20Cu		0.9333	0.8000	1.0000	1.0000
EV_HC1 + 20Cu		1.0000	0.9333	1.0000	0.9333
LC_DCDS + 20Cu		0.8000	0.9333	1.0000	0.6667
LC_LC3 + 20Cu		1.0000	1.0000	1.0000	1.0000
LC_LC5 + 20Cu		1.0000	1.0000	1.0000	0.9333
LC_LCDSSLCC20C		1.0000	1.0000	1.0000	1.0000
FR_FR4 + 20Cu		1.0000	1.0000	1.0000	0.9333
FR_FR2 + 20Cu		1.0000	1.0000	0.9333	1.0000
FR_MULTIPLATE2		0.9333	1.0000	1.0000	1.0000
FR_FRRD + 20Cu		0.9333	0.9333	1.0000	0.8667

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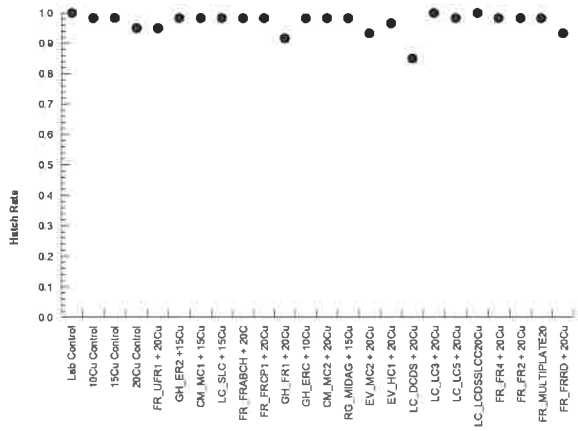
Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 04-7396-4200 **Endpoint:** Hatch Rate **CETIS Version:** CETISv1.9.4
Analyzed: 22 May-21 11:19 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Hatch Rate Binomials

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Lab Control		15/15	15/15	15/15	15/15
10Cu Control		14/15	15/15	15/15	15/15
15Cu Control		15/15	15/15	15/15	14/15
20Cu Control		14/15	13/15	15/15	15/15
FR_UFR1 + 20Cu		13/15	15/15	15/15	14/15
GH_ER2 +15Cu	XC	15/15	15/15	15/15	14/15
CM_MC1 + 15Cu		15/15	15/15	14/15	15/15
LC_SLC + 15Cu		14/15	15/15	15/15	15/15
FR_FRABCH + 20C		15/15	15/15	14/15	15/15
FR_FRCP1 + 20Cu		14/15	15/15	15/15	15/15
GH_FR1 + 20Cu		14/15	12/15	15/15	14/15
GH_ERC + 10Cu		15/15	15/15	14/15	15/15
CM_MC2 + 20Cu		15/15	15/15	15/15	14/15
RG_MIDAG + 15Cu		15/15	14/15	15/15	15/15
EV_MC2 + 20Cu		14/15	12/15	15/15	15/15
EV_HC1 + 20Cu		15/15	14/15	15/15	14/15
LC_DCDS + 20Cu		12/15	14/15	15/15	10/15
LC_LC3 + 20Cu		15/15	15/15	15/15	15/15
LC_LC5 + 20Cu		15/15	15/15	15/15	14/15
LC_LCDSSLCC20C		15/15	15/15	15/15	15/15
FR_FR4 + 20Cu		15/15	15/15	15/15	14/15
FR_FR2 + 20Cu		15/15	15/15	14/15	15/15
FR_MULTIPLATE2		14/15	15/15	15/15	15/15
FR_FRRD + 20Cu		14/15	14/15	15/15	13/15

Graphics



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Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID:	10-2567-5355	**Endpoint:**	Length	**CETIS Version:**	CETISv1.9.4
Analyzed:	22 May-21 11:23	**Analysis:**	Parametric-Control vs Treatments	**Status Level:**	1
Batch ID:	16-2689-7673	**Test Type:**	32 Day Fathead Minnow Test	**Analyst:**	Kayla Knol
Start Date:	06 Mar-21	**Protocol:**	ASTM E1241-05 (2013)	**Diluent:**	Dechlorinated Tap Water
Ending Date:	07 Apr-21	**Species:**	Pimephales promelas	**Brine:**	
Test Length:	32d 0h	**Taxon:**	Actinopterygii	**Source:**	Aquatox, AR **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
Lab Control	08-8280-1106	02 Mar-21	03 Mar-21	96h	Teck Coal Ltd	
10Cu Control	01-9333-5370	02 Mar-21	03 Mar-21	96h		
15Cu Control	19-6548-0518	02 Mar-21	03 Mar-21	96h		
20Cu Control	00-8675-6744	02 Mar-21	03 Mar-21	96h		
FR_UFR1 + 20Cu	20-4721-8257	02 Mar-21	03 Mar-21	96h (4.6 °C)		
GH_ER2 +15Cu	01-1137-9253	02 Mar-21	03 Mar-21	96h (4.2 °C)		
CM_MC1 + 15Cu	01-3772-5048	02 Mar-21	03 Mar-21	96h (1 °C)		
LC_SLC + 15Cu	01-2380-6574	02 Mar-21	03 Mar-21	96h (3.1 °C)		
FR_FRABCH + 20C	08-4134-0746	02 Mar-21	03 Mar-21	96h (3.8 °C)		
FR_FRCP1 + 20Cu	11-2694-6466	02 Mar-21	03 Mar-21	96h (3 °C)		
GH_FR1 + 20Cu	20-1635-3152	02 Mar-21	03 Mar-21	96h (2.4 °C)		
GH_ERC + 10Cu	05-1950-5597	02 Mar-21	03 Mar-21	96h (4.1 °C)		
CM_MC2 + 20Cu	14-4685-1067	02 Mar-21	03 Mar-21	96h (0.3 °C)		
RG_MIDAG + 15Cu	21-3889-1829	02 Mar-21	03 Mar-21	96h (0.6 °C)		
EV_MC2 + 20Cu	05-6103-5191	02 Mar-21	03 Mar-21	96h (4.4 °C)		
EV_HC1 + 20Cu	12-5501-3302	02 Mar-21	03 Mar-21	96h (3.4 °C)		
LC_DCDS + 20Cu	04-1088-5978	02 Mar-21	03 Mar-21	96h (0.6 °C)		
LC_LC3 + 20Cu	14-7773-4190	02 Mar-21	03 Mar-21	96h (2.3 °C)		
LC_LC5 + 20Cu	01-7235-6798	02 Mar-21	03 Mar-21	96h (0.6 °C)		
LC_LCDSSLCC20C	06-4197-2641	02 Mar-21	03 Mar-21	96h (2.4 °C)		
FR_FR4 + 20Cu	10-9481-5020	02 Mar-21	03 Mar-21	96h (5.4 °C)		
FR_FR2 + 20Cu	00-3159-8672	02 Mar-21	03 Mar-21	96h (4.4 °C)		
FR_MULTIPLATE2	02-2179-0364	02 Mar-21	03 Mar-21	96h (2.9 °C)		
FR_FRRD + 20Cu	19-5167-8345	02 Mar-21	03 Mar-21	96h (6.2 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
Lab Control	Ambient Sample	Teck Coal Ltd	Lab Control	
10Cu Control	Ambient Sample	Teck Coal Ltd	10Cu Control	
15Cu Control	Ambient Sample	Teck Coal Ltd	15Cu Control	
20Cu Control	Ambient Sample	Teck Coal Ltd	20Cu Control	
FR_UFR1 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_UFR1_MON_2021-03-0	
GH_ER2 +15Cu	Ambient Sample	Teck Coal Ltd	GH_ER2_WS_2021-03-02_	
CM_MC1 + 15Cu	Ambient Sample	Teck Coal Ltd	CM_MC1_WS_2021-03-02	
LC_SLC + 15Cu	Ambient Sample	Teck Coal Ltd	LC_SLC_WS_2021-03-02_	
FR_FRABCH + 20C	Ambient Sample	Teck Coal Ltd	FR_FRABCH_MON_2021-	
FR_FRCP1 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FRCP1_MON_2021-03	
GH_FR1 + 20Cu	Ambient Sample	Teck Coal Ltd	GH_FR1_WS_2021-03-02_	
GH_ERC + 10Cu	Ambient Sample	Teck Coal Ltd	GH_ERC_WS_2021-03-02	
CM_MC2 + 20Cu	Ambient Sample	Teck Coal Ltd	CM_MC2_WS_2021-03-02	
RG_MIDAG + 15Cu	Ambient Sample	Teck Coal Ltd	RG_MIDAG_WS_2021-03-	
EV_MC2 + 20Cu	Ambient Sample	Teck Coal Ltd	EV_MC2_WS_2021_Q1_W	
EV_HC1 + 20Cu	Ambient Sample	Teck Coal Ltd	EV_HC1_WS_2021_Q1_W	
LC_DCDS + 20Cu	Ambient Sample	Teck Coal Ltd	LC_DCDS_WS_2021-03-02	
LC_LC3 + 20Cu	Ambient Sample	Teck Coal Ltd	LC_LC3_WS_2021-03-02_	
LC_LC5 + 20Cu	Ambient Sample	Teck Coal Ltd	LC_LC5_WS_2021-03-02_	
LC_LCDSSLCC20C	Ambient Sample	Teck Coal Ltd	LC_LCDSSLCC_WS_2021-	
FR_FR4 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FR4_WS_2021-03-02_	
FR_FR2 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FR2_WS_2021-03-02_	

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Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID:	10-2567-5355	**Endpoint:**	Length	**CETIS Version:**	CETISv1.9.4
Analyzed:	22 May-21 11:23	**Analysis:**	Parametric-Control vs Treatments	**Status Level:**	1

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_MULTIPLATE2	Ambient Sample	Teck Coal Ltd	FR_MULTIPLATE_WS_202	
FR_FRRD + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FRRD_WS_2021-03-02	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	Lab Control passed length	12.44%
		10Cu Control passed length	12.44%
		15Cu Control passed length	12.44%
		20Cu Control passed length	12.44%
		FR_UFR1 + 20Cu passed length	12.44%
		CM_MC1 + 15Cu passed length	12.44%
		LC_SLC + 15Cu passed length	12.44%
		FR_FRABCH + 20C passed length	12.44%
		FR_FRCP1 + 20Cu passed length	12.44%
		GH_FR1 + 20Cu passed length	12.44%
		GH_ERC + 10Cu passed length	12.44%
		CM_MC2 + 20Cu passed length	12.44%
		RG_MIDAG + 15Cu passed length	12.44%
		EV_MC2 + 20Cu passed length	12.44%
		EV_HC1 + 20Cu passed length	12.44%
		LC_DCDS + 20Cu passed length	12.44%
		LC_LC3 + 20Cu passed length	12.44%
		LC_LC5 + 20Cu passed length	12.44%
		LC_LCDSSLCC20Cu passed length	12.44%
		FR_FR4 + 20Cu passed length	12.44%
		FR_FR2 + 20Cu passed length	12.44%
		FR_MULTIPLATE20 passed length	12.44%
		FR_FRRD + 20Cu passed length	12.44%

Dunnett Multiple Comparison Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Site Control		Lab Control	-0.006611	2.744	1.349	6	CDF	0.9591	Non-Significant Effect
		10Cu Control	0.3631	2.744	1.349	6	CDF	0.8972	Non-Significant Effect
		15Cu Control	-0.4817	2.744	1.349	6	CDF	0.9906	Non-Significant Effect
		20Cu Control	-0.6783	2.744	1.349	6	CDF	0.9953	Non-Significant Effect
		FR_UFR1 + 20Cu	0.8798	2.744	1.349	6	CDF	0.7279	Non-Significant Effect
		CM_MC1 + 15Cu	-0.164	2.744	1.349	6	CDF	0.9739	Non-Significant Effect
		LC_SLC + 15Cu	-1.242	2.744	1.349	6	CDF	0.9995	Non-Significant Effect
		FR_FRABCH + 20C	0.6959	2.744	1.349	6	CDF	0.7996	Non-Significant Effect
		FR_FRCP1 + 20Cu	-0.6765	2.744	1.349	6	CDF	0.9953	Non-Significant Effect
		GH_FR1 + 20Cu	0.4458	2.744	1.349	6	CDF	0.8769	Non-Significant Effect
		GH_ERC + 10Cu	0.724	2.744	1.349	6	CDF	0.7894	Non-Significant Effect
		CM_MC2 + 20Cu	1.454	2.744	1.349	6	CDF	0.4546	Non-Significant Effect
		RG_MIDAG + 15Cu	0.1537	2.744	1.349	6	CDF	0.9375	Non-Significant Effect
		EV_MC2 + 20Cu	0.2122	2.744	1.349	6	CDF	0.9278	Non-Significant Effect
		EV_HC1 + 20Cu	0.5565	2.744	1.349	6	CDF	0.8457	Non-Significant Effect
		LC_DCDS + 20Cu	-0.6534	2.744	1.349	6	CDF	0.9949	Non-Significant Effect
		LC_LC3 + 20Cu	0.2358	2.744	1.349	6	CDF	0.9235	Non-Significant Effect
		LC_LC5 + 20Cu	-0.426	2.744	1.349	6	CDF	0.9886	Non-Significant Effect
		LC_LCDSSLCC20Cu	0.319	2.744	1.349	6	CDF	0.9070	Non-Significant Effect
		FR_FR4 + 20Cu	-0.556	2.744	1.349	6	CDF	0.9927	Non-Significant Effect
		FR_FR2 + 20Cu	0.8134	2.744	1.349	6	CDF	0.7551	Non-Significant Effect
		FR_MULTIPLATE20	-0.08837	2.744	1.349	6	CDF	0.9675	Non-Significant Effect
		FR_FRRD + 20Cu	0.06899	2.744	1.349	6	CDF	0.9498	Non-Significant Effect

Auxiliary Tests

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 10-2567-5355 **Endpoint:** Length **CETIS Version:** CETISv1.9.4
Analyzed: 22 May-21 11:23 **Analysis:** Parametric-Control vs Treatments **Status Level:** 1

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	3.392	3.37	0.0458	Outlier Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	8.62615	0.37505	23	0.7753	0.7491	Non-Significant Effect
Error	34.8279	0.483721	72			
Total	43.4541		95			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Variances	Bartlett Equality of Variance Test	31.32	35.17	0.1151	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9841	0.9737	0.3005	Normal Distribution

Length Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
Lab Control		4	10.85	10.2	11.5	10.74	10.5	11.42	0.2039	3.76%	0.00%
10Cu Control		4	10.67	10.19	11.15	10.69	10.29	11	0.1513	2.84%	1.68%
15Cu Control		4	11.08	9.919	12.25	11	10.33	12	0.3658	6.60%	-2.15%
20Cu Control		4	11.18	10.17	12.19	10.96	10.69	12.11	0.3171	5.67%	-3.04%
FR_UFR1 + 20Cu		4	10.41	9.005	11.82	10.04	9.857	11.73	0.4425	8.50%	4.02%
GH_ER2 +15Cu	XC	4	10.85	10.27	11.43	10.8	10.5	11.29	0.182	3.36%	0.03%
CM_MC1 + 15Cu		4	10.93	9.723	12.13	10.83	10.17	11.88	0.3782	6.92%	-0.71%
LC_SLC + 15Cu		4	11.46	10.55	12.37	11.45	10.93	12	0.2857	4.99%	-5.60%
FR_FRABCH + 20C		4	10.5	9.776	11.23	10.47	10	11.08	0.2288	4.36%	3.18%
FR_FRCP1 + 20Cu		4	11.18	10.1	12.26	11.13	10.45	12	0.3392	6.07%	-3.04%
GH_FR1 + 20Cu		4	10.63	9.531	11.72	10.72	9.846	11.23	0.3445	6.48%	2.05%
GH_ERC + 10Cu		4	10.49	10.24	10.74	10.48	10.31	10.69	0.0791	1.51%	3.31%
CM_MC2 + 20Cu		4	10.13	8.98	11.28	10.01	9.429	11.08	0.3617	7.14%	6.62%
RG_MIDAG + 15Cu		4	10.77	10.19	11.35	10.72	10.4	11.25	0.1826	3.39%	0.73%
EV_MC2 + 20Cu		4	10.74	9.791	11.69	10.76	10.08	11.36	0.2987	5.56%	0.99%
EV_HC1 + 20Cu		4	10.57	10.15	10.99	10.54	10.31	10.9	0.1325	2.51%	2.55%
LC_DCDS + 20Cu		4	11.17	9.661	12.67	11.06	10.18	12.38	0.4734	8.48%	-2.93%
LC_LC3 + 20Cu		4	10.73	9.975	11.49	10.77	10.13	11.25	0.2375	4.43%	1.10%
LC_LC5 + 20Cu		4	11.06	9.583	12.53	10.93	10.07	12.3	0.4627	8.37%	-1.90%
LC_LCDSSLCC20C		4	10.69	10.4	10.98	10.66	10.5	10.93	0.09091	1.70%	1.48%
FR_FR4 + 20Cu		4	11.12	10.17	12.07	11.06	10.45	11.9	0.298	5.36%	-2.49%
FR_FR2 + 20Cu		4	10.45	7.854	13.04	10.14	9	12.5	0.8146	15.60%	3.72%
FR_MULTIPLATE2		4	10.89	9.947	11.83	10.89	10.23	11.55	0.2964	5.44%	-0.37%
FR_FRRD + 20Cu		4	10.81	9.242	12.38	10.83	9.917	11.67	0.4934	9.13%	0.34%

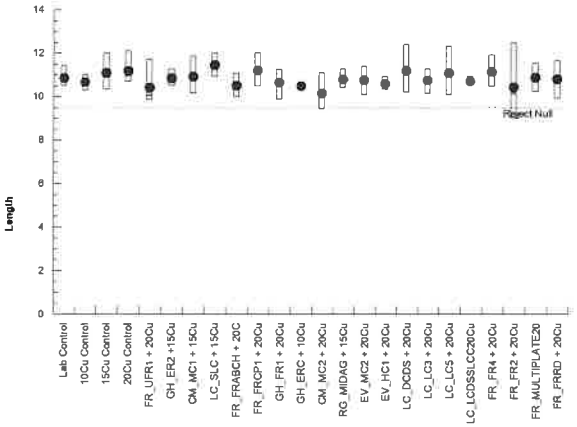
Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

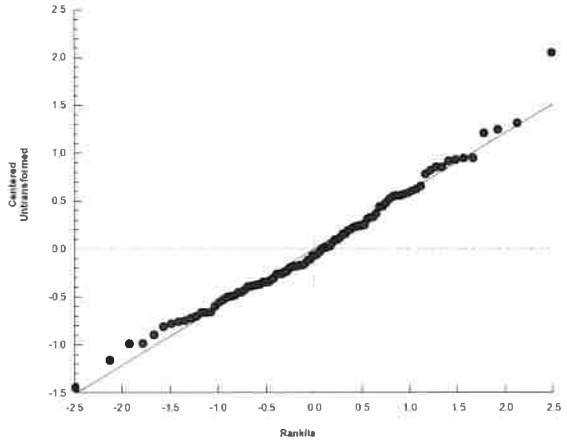
Analysis ID: 10-2567-5355 **Endpoint:** Length **CETIS Version:** CETISv1.9.4
Analyzed: 22 May-21 11:23 **Analysis:** Parametric-Control vs Treatments **Status Level:** 1

Length Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Lab Control		10.5	10.62	11.42	10.87
10Cu Control		10.79	11	10.29	10.6
15Cu Control		10.69	10.33	12	11.31
20Cu Control		10.92	10.69	12.11	11
FR_UFR1 + 20Cu		9.917	9.857	10.15	11.73
GH_ER2 +15Cu	XC	10.5	11.29	11	10.6
CM_MC1 + 15Cu		10.5	11.88	10.17	11.17
LC_SLC + 15Cu		12	11.9	10.93	11
FR_FRABCH + 20C		10.33	10	10.6	11.08
FR_FRCP1 + 20Cu		12	10.83	10.45	11.43
GH_FR1 + 20Cu		11.18	10.25	9.846	11.23
GH_ERC + 10Cu		10.5	10.31	10.69	10.46
CM_MC2 + 20Cu		9.429	9.733	10.29	11.08
RG_MIDAG + 15Cu		10.4	10.6	10.83	11.25
EV_MC2 + 20Cu		10.08	11.11	10.42	11.36
EV_HC1 + 20Cu		10.67	10.42	10.31	10.9
LC_DCDS + 20Cu		12.38	10.18	10.71	11.4
LC_LC3 + 20Cu		10.92	10.13	10.62	11.25
LC_LC5 + 20Cu		10.07	10.86	11	12.3
LC_LCDSSLCC20C		10.71	10.5	10.62	10.93
FR_FR4 + 20Cu		11	10.45	11.12	11.9
FR_FR2 + 20Cu		9.286	9	11	12.5
FR_MULTIPLATE2		11.2	10.58	10.23	11.55
FR_FRRD + 20Cu		9.917	10	11.67	11.67

Graphics





Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID:	14-9998-6206	**Endpoint:**	Proportion Normal	**CETIS Version:**	CETISv1.9.4
Analyzed:	01 Jun-21 8:33	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1
Batch ID:	16-2689-7673	**Test Type:**	32 Day Fathead Minnow Test	**Analyst:**	Kayla Knol
Start Date:	06 Mar-21	**Protocol:**	ASTM E1241-05 (2013)	**Diluent:**	Dechlorinated Tap Water
Ending Date:	07 Apr-21	**Species:**	Pimephales promelas	**Brine:**	
Test Length:	32d 0h	**Taxon:**	Actinopterygii	**Source:**	Aquatox, AR **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
Lab Control	08-8280-1106	02 Mar-21	03 Mar-21	96h	Teck Coal Ltd	
10Cu Control	01-9333-5370	02 Mar-21	03 Mar-21	96h		
15Cu Control	19-6548-0518	02 Mar-21	03 Mar-21	96h		
20Cu Control	00-8675-6744	02 Mar-21	03 Mar-21	96h		
FR_UFR1 + 20Cu	20-4721-8257	02 Mar-21	03 Mar-21	96h (4.6 °C)		
GH_ER2 +15Cu	01-1137-9253	02 Mar-21	03 Mar-21	96h (4.2 °C)		
CM_MC1 + 15Cu	01-3772-5048	02 Mar-21	03 Mar-21	96h (1 °C)		
LC_SLC + 15Cu	01-2380-6574	02 Mar-21	03 Mar-21	96h (3.1 °C)		
FR_FRABCH + 20C	08-4134-0746	02 Mar-21	03 Mar-21	96h (3.8 °C)		
FR_FRCP1 + 20Cu	11-2694-6466	02 Mar-21	03 Mar-21	96h (3 °C)		
GH_FR1 + 20Cu	20-1635-3152	02 Mar-21	03 Mar-21	96h (2.4 °C)		
GH_ERC + 10Cu	05-1950-5597	02 Mar-21	03 Mar-21	96h (4.1 °C)		
CM_MC2 + 20Cu	14-4685-1067	02 Mar-21	03 Mar-21	96h (0.3 °C)		
RG_MIDAG + 15Cu	21-3889-1829	02 Mar-21	03 Mar-21	96h (0.6 °C)		
EV_MC2 + 20Cu	05-6103-5191	02 Mar-21	03 Mar-21	96h (4.4 °C)		
EV_HC1 + 20Cu	12-5501-3302	02 Mar-21	03 Mar-21	96h (3.4 °C)		
LC_DCDS + 20Cu	04-1088-5978	02 Mar-21	03 Mar-21	96h (0.6 °C)		
LC_LC3 + 20Cu	14-7773-4190	02 Mar-21	03 Mar-21	96h (2.3 °C)		
LC_LC5 + 20Cu	01-7235-6798	02 Mar-21	03 Mar-21	96h (0.6 °C)		
LC_LCDSSLCC20C	06-4197-2641	02 Mar-21	03 Mar-21	96h (2.4 °C)		
FR_FR4 + 20Cu	10-9481-5020	02 Mar-21	03 Mar-21	96h (5.4 °C)		
FR_FR2 + 20Cu	00-3159-8672	02 Mar-21	03 Mar-21	96h (4.4 °C)		
FR_MULTIPLATE2	02-2179-0364	02 Mar-21	03 Mar-21	96h (2.9 °C)		
FR_FRRD + 20Cu	19-5167-8345	02 Mar-21	03 Mar-21	96h (6.2 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
Lab Control	Ambient Sample	Teck Coal Ltd	Lab Control	
10Cu Control	Ambient Sample	Teck Coal Ltd	10Cu Control	
15Cu Control	Ambient Sample	Teck Coal Ltd	15Cu Control	
20Cu Control	Ambient Sample	Teck Coal Ltd	20Cu Control	
FR_UFR1 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_UFR1_MON_2021-03-0	
GH_ER2 +15Cu	Ambient Sample	Teck Coal Ltd	GH_ER2_WS_2021-03-02_	
CM_MC1 + 15Cu	Ambient Sample	Teck Coal Ltd	CM_MC1_WS_2021-03-02	
LC_SLC + 15Cu	Ambient Sample	Teck Coal Ltd	LC_SLC_WS_2021-03-02_	
FR_FRABCH + 20C	Ambient Sample	Teck Coal Ltd	FR_FRABCH_MON_2021-	
FR_FRCP1 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FRCP1_MON_2021-03	
GH_FR1 + 20Cu	Ambient Sample	Teck Coal Ltd	GH_FR1_WS_2021-03-02_	
GH_ERC + 10Cu	Ambient Sample	Teck Coal Ltd	GH_ERC_WS_2021-03-02	
CM_MC2 + 20Cu	Ambient Sample	Teck Coal Ltd	CM_MC2_WS_2021-03-02	
RG_MIDAG + 15Cu	Ambient Sample	Teck Coal Ltd	RG_MIDAG_WS_2021-03-	
EV_MC2 + 20Cu	Ambient Sample	Teck Coal Ltd	EV_MC2_WS_2021_Q1_W	
EV_HC1 + 20Cu	Ambient Sample	Teck Coal Ltd	EV_HC1_WS_2021_Q1_W	
LC_DCDS + 20Cu	Ambient Sample	Teck Coal Ltd	LC_DCDS_WS_2021-03-02	
LC_LC3 + 20Cu	Ambient Sample	Teck Coal Ltd	LC_LC3_WS_2021-03-02_	
LC_LC5 + 20Cu	Ambient Sample	Teck Coal Ltd	LC_LC5_WS_2021-03-02_	
LC_LCDSSLCC20C	Ambient Sample	Teck Coal Ltd	LC_LCDSSLCC_WS_2021-	
FR_FR4 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FR4_WS_2021-03-02_	
FR_FR2 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FR2_WS_2021-03-02_	

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Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID:	14-9998-6206	**Endpoint:**	Proportion Normal	**CETIS Version:**	CETISv1.9.4
Analyzed:	01 Jun-21 8:33	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_MULTIPLATE2	Ambient Sample	Teck Coal Ltd	FR_MULTIPLATE_WS_202	
FR_FRRD + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FRRD_WS_2021-03-02	

Fisher Exact/Bonferroni Adj Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
Site Control		Lab Control	1.0000	Exact	1.0000	Non-Significant Effect
		10Cu Control	1.0000	Exact	1.0000	Non-Significant Effect
		15Cu Control	1.0000	Exact	1.0000	Non-Significant Effect
		20Cu Control	0.9997	Exact	1.0000	Non-Significant Effect
		FR_UFR1 + 20Cu	1.0000	Exact	1.0000	Non-Significant Effect
		CM_MC1 + 15Cu	0.7713	Exact	1.0000	Non-Significant Effect
		LC_SLC + 15Cu	1.0000	Exact	1.0000	Non-Significant Effect
		FR_FRABCH + 20C	0.9983	Exact	1.0000	Non-Significant Effect
		FR_FRCP1 + 20Cu	0.9978	Exact	1.0000	Non-Significant Effect
		GH_FR1 + 20Cu	0.9953	Exact	1.0000	Non-Significant Effect
		GH_ERC + 10Cu	0.9212	Exact	1.0000	Non-Significant Effect
		CM_MC2 + 20Cu	0.9992	Exact	1.0000	Non-Significant Effect
		RG_MIDAG + 15Cu	0.9978	Exact	1.0000	Non-Significant Effect
		EV_MC2 + 20Cu	0.9997	Exact	1.0000	Non-Significant Effect
		EV_HC1 + 20Cu	0.9997	Exact	1.0000	Non-Significant Effect
		LC_DCDS + 20Cu	0.9975	Exact	1.0000	Non-Significant Effect
		LC_LC3 + 20Cu	0.9990	Exact	1.0000	Non-Significant Effect
		LC_LC5 + 20Cu	1.0000	Exact	1.0000	Non-Significant Effect
		LC_LCDSSLCC20Cu	0.9998	Exact	1.0000	Non-Significant Effect
		FR_FR4 + 20Cu	1.0000	Exact	1.0000	Non-Significant Effect
		FR_FR2 + 20Cu	0.9854	Exact	1.0000	Non-Significant Effect
		FR_MULTIPLATE20	1.0000	Exact	1.0000	Non-Significant Effect
		FR_FRRD + 20Cu	0.9973	Exact	1.0000	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	4.105	3.37	0.0017	Outlier Detected

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 14-9998-6206 **Endpoint:** Proportion Normal **CETIS Version:** CETISv1.9.4
Analyzed: 01 Jun-21 8:33 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Data Summary

Sample	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
Lab Control		54	0	54	1	0	-35.71%
10Cu Control		56	0	56	1	0	-35.71%
15Cu Control		50	0	50	1	0	-35.71%
20Cu Control		47	1	48	0.9792	0.02083	-32.89%
FR_UFR1 + 20Cu		50	0	50	1	0	-35.71%
GH_ER2 +15Cu	XC	14	5	19	0.7368	0.2632	0.0%
CM_MC1 + 15Cu		22	6	28	0.7857	0.2143	-6.63%
LC_SLC + 15Cu		47	0	47	1	0	-35.71%
FR_FRABCH + 20C		45	2	47	0.9574	0.04255	-29.94%
FR_FRCP1 + 20Cu		28	1	29	0.9655	0.03448	-31.03%
GH_FR1 + 20Cu		46	3	49	0.9388	0.06122	-27.41%
GH_ERC + 10Cu		45	8	53	0.8491	0.1509	-15.23%
CM_MC2 + 20Cu		54	2	56	0.9643	0.03571	-30.87%
RG_MIDAG + 15Cu		42	2	44	0.9545	0.04545	-29.55%
EV_MC2 + 20Cu		45	1	46	0.9783	0.02174	-32.76%
EV_HC1 + 20Cu		46	1	47	0.9787	0.02128	-32.83%
LC_DCDS + 20Cu		41	2	43	0.9535	0.04651	-29.4%
LC_LC3 + 20Cu		51	2	53	0.9623	0.03774	-30.59%
LC_LC5 + 20Cu		52	0	52	1	0	-35.71%
LC_LCDSSLCC20C		52	1	53	0.9811	0.01887	-33.15%
FR_FR4 + 20Cu		38	0	38	1	0	-35.71%
FR_FR2 + 20Cu		25	2	27	0.9259	0.07407	-25.66%
FR_MULTIPLATE20		46	0	46	1	0	-35.71%
FR_FRRD + 20Cu		40	2	42	0.9524	0.04762	-29.25%

Proportion Normal Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Lab Control		1.0000	1.0000	1.0000	1.0000
10Cu Control		1.0000	1.0000	1.0000	1.0000
15Cu Control		1.0000	1.0000	1.0000	1.0000
20Cu Control		0.9167	1.0000	1.0000	1.0000
FR_UFR1 + 20Cu		1.0000	1.0000	1.0000	1.0000
GH_ER2 +15Cu	XC	0.7500	0.8571	1.0000	0.4000
CM_MC1 + 15Cu		0.6250	0.8750	0.6667	1.0000
LC_SLC + 15Cu		1.0000	1.0000	1.0000	1.0000
FR_FRABCH + 20C		1.0000	1.0000	0.8000	1.0000
FR_FRCP1 + 20Cu		1.0000	0.8333	1.0000	1.0000
GH_FR1 + 20Cu		1.0000	1.0000	0.9231	0.8462
GH_ERC + 10Cu		0.7857	0.7692	0.9231	0.9231
CM_MC2 + 20Cu		1.0000	0.9333	0.9286	1.0000
RG_MIDAG + 15Cu		0.9000	1.0000	1.0000	0.9167
EV_MC2 + 20Cu		0.9231	1.0000	1.0000	1.0000
EV_HC1 + 20Cu		0.9167	1.0000	1.0000	1.0000
LC_DCDS + 20Cu		1.0000	0.9091	0.9286	1.0000
LC_LC3 + 20Cu		1.0000	0.9333	1.0000	0.9167
LC_LC5 + 20Cu		1.0000	1.0000	1.0000	1.0000
LC_LCDSSLCC20C		1.0000	0.9167	1.0000	1.0000
FR_FR4 + 20Cu		1.0000	1.0000	1.0000	1.0000
FR_FR2 + 20Cu		0.8571	0.8571	1.0000	1.0000
FR_MULTIPLATE2		1.0000	1.0000	1.0000	1.0000
FR_FRRD + 20Cu		0.9167	0.9167	1.0000	1.0000

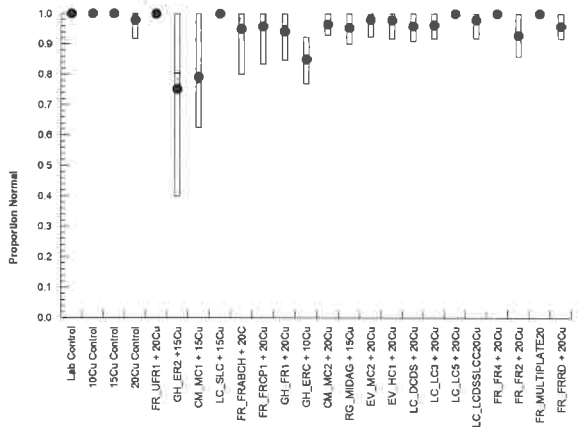
Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 14-9998-6206 **Endpoint:** Proportion Normal **CETIS Version:** CETISv1.9.4
Analyzed: 01 Jun-21 8:33 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Proportion Normal Binomials

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Lab Control		14/14	13/13	12/12	15/15
10Cu Control		14/14	13/13	14/14	15/15
15Cu Control		13/13	15/15	9/9	13/13
20Cu Control		11/12	13/13	9/9	14/14
FR_UFR1 + 20Cu		12/12	14/14	13/13	11/11
GH_ER2 +15Cu	XC	3/4	6/7	3/3	2/5
CM_MC1 + 15Cu		5/8	7/8	4/6	6/6
LC_SLC + 15Cu		9/9	10/10	14/14	14/14
FR_FRABCH + 20C		12/12	13/13	8/10	12/12
FR_FRCP1 + 20Cu		5/5	5/6	11/11	7/7
GH_FR1 + 20Cu		11/11	12/12	12/13	11/13
GH_ERC + 10Cu		11/14	10/13	12/13	12/13
CM_MC2 + 20Cu		14/14	14/15	13/14	13/13
RG_MIDAG + 15Cu		9/10	10/10	12/12	11/12
EV_MC2 + 20Cu		12/13	9/9	12/12	11/11
EV_HC1 + 20Cu		11/12	12/12	13/13	10/10
LC_DCDS + 20Cu		8/8	10/11	13/14	10/10
LC_LC3 + 20Cu		13/13	14/15	13/13	11/12
LC_LC5 + 20Cu		15/15	14/14	13/13	10/10
LC_LCDSSLCC20C		14/14	11/12	13/13	14/14
FR_FR4 + 20Cu		9/9	11/11	8/8	10/10
FR_FR2 + 20Cu		6/7	6/7	9/9	4/4
FR_MULTIPLATE2		10/10	12/12	13/13	11/11
FR_FRRD + 20Cu		11/12	11/12	9/9	9/9

Graphics



Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID:	18-5473-0339	**Endpoint:**	Post Hatch Survival	**CETIS Version:**	CETISv1.9.4
Analyzed:	22 May-21 11:20	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1
Batch ID:	16-2689-7673	**Test Type:**	32 Day Fathead Minnow Test	**Analyst:**	Kayla Knol
Start Date:	06 Mar-21	**Protocol:**	ASTM E1241-05 (2013)	**Diluent:**	Dechlorinated Tap Water
Ending Date:	07 Apr-21	**Species:**	Pimephales promelas	**Brine:**	
Test Length:	32d 0h	**Taxon:**	Actinopterygii	**Source:**	Aquatox, AR **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
Lab Control	08-8280-1106	02 Mar-21	03 Mar-21	96h	Teck Coal Ltd	
10Cu Control	01-9333-5370	02 Mar-21	03 Mar-21	96h		
15Cu Control	19-6548-0518	02 Mar-21	03 Mar-21	96h		
20Cu Control	00-8675-6744	02 Mar-21	03 Mar-21	96h		
FR_UFR1 + 20Cu	20-4721-8257	02 Mar-21	03 Mar-21	96h (4.6 °C)		
GH_ER2 +15Cu	01-1137-9253	02 Mar-21	03 Mar-21	96h (4.2 °C)		
CM_MC1 + 15Cu	01-3772-5048	02 Mar-21	03 Mar-21	96h (1 °C)		
LC_SLC + 15Cu	01-2380-6574	02 Mar-21	03 Mar-21	96h (3.1 °C)		
FR_FRABCH + 20C	08-4134-0746	02 Mar-21	03 Mar-21	96h (3.8 °C)		
FR_FRCP1 + 20Cu	11-2694-6466	02 Mar-21	03 Mar-21	96h (3 °C)		
GH_FR1 + 20Cu	20-1635-3152	02 Mar-21	03 Mar-21	96h (2.4 °C)		
GH_ERC + 10Cu	05-1950-5597	02 Mar-21	03 Mar-21	96h (4.1 °C)		
CM_MC2 + 20Cu	14-4685-1067	02 Mar-21	03 Mar-21	96h (0.3 °C)		
RG_MIDAG + 15Cu	21-3889-1829	02 Mar-21	03 Mar-21	96h (0.6 °C)		
EV_MC2 + 20Cu	05-6103-5191	02 Mar-21	03 Mar-21	96h (4.4 °C)		
EV_HC1 + 20Cu	12-5501-3302	02 Mar-21	03 Mar-21	96h (3.4 °C)		
LC_DCDS + 20Cu	04-1088-5978	02 Mar-21	03 Mar-21	96h (0.6 °C)		
LC_LC3 + 20Cu	14-7773-4190	02 Mar-21	03 Mar-21	96h (2.3 °C)		
LC_LC5 + 20Cu	01-7235-6798	02 Mar-21	03 Mar-21	96h (0.6 °C)		
LC_LCDSSLCC20C	06-4197-2641	02 Mar-21	03 Mar-21	96h (2.4 °C)		
FR_FR4 + 20Cu	10-9481-5020	02 Mar-21	03 Mar-21	96h (5.4 °C)		
FR_FR2 + 20Cu	00-3159-8672	02 Mar-21	03 Mar-21	96h (4.4 °C)		
FR_MULTIPLATE2	02-2179-0364	02 Mar-21	03 Mar-21	96h (2.9 °C)		
FR_FRRD + 20Cu	19-5167-8345	02 Mar-21	03 Mar-21	96h (6.2 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
Lab Control	Ambient Sample	Teck Coal Ltd	Lab Control	
10Cu Control	Ambient Sample	Teck Coal Ltd	10Cu Control	
15Cu Control	Ambient Sample	Teck Coal Ltd	15Cu Control	
20Cu Control	Ambient Sample	Teck Coal Ltd	20Cu Control	
FR_UFR1 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_UFR1_MON_2021-03-0	
GH_ER2 +15Cu	Ambient Sample	Teck Coal Ltd	GH_ER2_WS_2021-03-02_	
CM_MC1 + 15Cu	Ambient Sample	Teck Coal Ltd	CM_MC1_WS_2021-03-02	
LC_SLC + 15Cu	Ambient Sample	Teck Coal Ltd	LC_SLC_WS_2021-03-02_	
FR_FRABCH + 20C	Ambient Sample	Teck Coal Ltd	FR_FRABCH_MON_2021-	
FR_FRCP1 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FRCP1_MON_2021-03	
GH_FR1 + 20Cu	Ambient Sample	Teck Coal Ltd	GH_FR1_WS_2021-03-02_	
GH_ERC + 10Cu	Ambient Sample	Teck Coal Ltd	GH_ERC_WS_2021-03-02	
CM_MC2 + 20Cu	Ambient Sample	Teck Coal Ltd	CM_MC2_WS_2021-03-02	
RG_MIDAG + 15Cu	Ambient Sample	Teck Coal Ltd	RG_MIDAG_WS_2021-03-	
EV_MC2 + 20Cu	Ambient Sample	Teck Coal Ltd	EV_MC2_WS_2021_Q1_W	
EV_HC1 + 20Cu	Ambient Sample	Teck Coal Ltd	EV_HC1_WS_2021_Q1_W	
LC_DCDS + 20Cu	Ambient Sample	Teck Coal Ltd	LC_DCDS_WS_2021-03-02	
LC_LC3 + 20Cu	Ambient Sample	Teck Coal Ltd	LC_LC3_WS_2021-03-02_	
LC_LC5 + 20Cu	Ambient Sample	Teck Coal Ltd	LC_LC5_WS_2021-03-02_	
LC_LCDSSLCC20C	Ambient Sample	Teck Coal Ltd	LC_LCDSSLCC_WS_2021-	
FR_FR4 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FR4_WS_2021-03-02_	
FR_FR2 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FR2_WS_2021-03-02_	

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Fathead minnow 32-d (Pimephales promelas) survival and growth test **Nautilus Environmental Calgary**

Analysis ID: 18-5473-0339 **Endpoint:** Post Hatch Survival **CETIS Version:** CETISv1.9.4
Analyzed: 22 May-21 11:20 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_MULTIPLATE2	Ambient Sample	Teck Coal Ltd	FR_MULTIPLATE_WS_202	
FR_FRRD + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FRRD_WS_2021-03-02	

Fisher Exact/Bonferroni Adj Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
Site Control		Lab Control	1.0000	Exact	1.0000	Non-Significant Effect
		10Cu Control	1.0000	Exact	1.0000	Non-Significant Effect
		15Cu Control	1.0000	Exact	1.0000	Non-Significant Effect
		20Cu Control	1.0000	Exact	1.0000	Non-Significant Effect
		FR_UFR1 + 20Cu	1.0000	Exact	1.0000	Non-Significant Effect
		CM_MC1 + 15Cu	0.9702	Exact	1.0000	Non-Significant Effect
		LC_SLC + 15Cu	1.0000	Exact	1.0000	Non-Significant Effect
		FR_FRABCH + 20C	1.0000	Exact	1.0000	Non-Significant Effect
		FR_FRCP1 + 20Cu	0.9806	Exact	1.0000	Non-Significant Effect
		GH_FR1 + 20Cu	1.0000	Exact	1.0000	Non-Significant Effect
		GH_ERC + 10Cu	1.0000	Exact	1.0000	Non-Significant Effect
		CM_MC2 + 20Cu	1.0000	Exact	1.0000	Non-Significant Effect
		RG_MIDAG + 15Cu	1.0000	Exact	1.0000	Non-Significant Effect
		EV_MC2 + 20Cu	1.0000	Exact	1.0000	Non-Significant Effect
		EV_HC1 + 20Cu	1.0000	Exact	1.0000	Non-Significant Effect
		LC_DCDS + 20Cu	1.0000	Exact	1.0000	Non-Significant Effect
		LC_LC3 + 20Cu	1.0000	Exact	1.0000	Non-Significant Effect
		LC_LC5 + 20Cu	1.0000	Exact	1.0000	Non-Significant Effect
		LC_LCDSSLCC20Cu	1.0000	Exact	1.0000	Non-Significant Effect
		FR_FR4 + 20Cu	0.9999	Exact	1.0000	Non-Significant Effect
		FR_FR2 + 20Cu	0.9556	Exact	1.0000	Non-Significant Effect
		FR_MULTIPLATE20	1.0000	Exact	1.0000	Non-Significant Effect
		FR_FRRD + 20Cu	1.0000	Exact	1.0000	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	2.592	3.37	0.8135	No Outliers Detected

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 18-5473-0339 **Endpoint:** Post Hatch Survival **CETIS Version:** CETISv1.9.4
Analyzed: 22 May-21 11:20 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Data Summary

Sample	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
Lab Control		54	6	60	0.9	0.1	-179.5%
10Cu Control		56	3	59	0.9492	0.05085	-194.7%
15Cu Control		50	9	59	0.8475	0.1525	-163.2%
20Cu Control		48	9	57	0.8421	0.1579	-161.5%
FR_UFR1 + 20Cu		50	7	57	0.8772	0.1228	-172.4%
GH_ER2 +15Cu	XC	19	40	59	0.322	0.678	0.0%
CM_MC1 + 15Cu		28	31	59	0.4746	0.5254	-47.37%
LC_SLC + 15Cu		47	12	59	0.7966	0.2034	-147.4%
FR_FRABCH + 20C		47	12	59	0.7966	0.2034	-147.4%
FR_FRCP1 + 20Cu		29	30	59	0.4915	0.5085	-52.63%
GH_FR1 + 20Cu		49	6	55	0.8909	0.1091	-176.7%
GH_ERC + 10Cu		53	6	59	0.8983	0.1017	-178.9%
CM_MC2 + 20Cu		56	3	59	0.9492	0.05085	-194.7%
RG_MIDAG + 15Cu		44	15	59	0.7458	0.2542	-131.6%
EV_MC2 + 20Cu		46	10	56	0.8214	0.1786	-155.1%
EV_HC1 + 20Cu		47	11	58	0.8103	0.1897	-151.6%
LC_DCDS + 20Cu		43	8	51	0.8431	0.1569	-161.8%
LC_LC3 + 20Cu		53	7	60	0.8833	0.1167	-174.3%
LC_LC5 + 20Cu		52	7	59	0.8814	0.1186	-173.7%
LC_LCDSSLCC20C		53	7	60	0.8833	0.1167	-174.3%
FR_FR4 + 20Cu		38	21	59	0.6441	0.3559	-100.0%
FR_FR2 + 20Cu		27	32	59	0.4576	0.5424	-42.11%
FR_MULTIPLATE20		46	13	59	0.7797	0.2203	-142.1%
FR_FRRD + 20Cu		42	14	56	0.75	0.25	-132.9%

Post Hatch Survival Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Lab Control		0.9333	0.8667	0.8000	1.0000
10Cu Control		1.0000	0.8667	0.9333	1.0000
15Cu Control		0.8667	1.0000	0.6000	0.9286
20Cu Control		0.8571	1.0000	0.6000	0.9333
FR_UFR1 + 20Cu		0.9231	0.9333	0.8667	0.7857
GH_ER2 +15Cu	XC	0.2667	0.4667	0.2000	0.3571
CM_MC1 + 15Cu		0.5333	0.5333	0.4286	0.4000
LC_SLC + 15Cu		0.6429	0.6667	0.9333	0.9333
FR_FRABCH + 20C		0.8000	0.8667	0.7143	0.8000
FR_FRCP1 + 20Cu		0.3571	0.4000	0.7333	0.4667
GH_FR1 + 20Cu		0.7857	1.0000	0.8667	0.9286
GH_ERC + 10Cu		0.9333	0.8667	0.9286	0.8667
CM_MC2 + 20Cu		0.9333	1.0000	0.9333	0.9286
RG_MIDAG + 15Cu		0.6667	0.7143	0.8000	0.8000
EV_MC2 + 20Cu		0.9286	0.7500	0.8000	0.8000
EV_HC1 + 20Cu		0.8000	0.8571	0.8667	0.7143
LC_DCDS + 20Cu		0.6667	0.7857	0.9333	1.0000
LC_LC3 + 20Cu		0.8667	1.0000	0.8667	0.8000
LC_LC5 + 20Cu		1.0000	0.9333	0.8667	0.7143
LC_LCDSSLCC20C		0.9333	0.8000	0.8667	0.9333
FR_FR4 + 20Cu		0.6000	0.7333	0.5333	0.7143
FR_FR2 + 20Cu		0.4667	0.4667	0.6429	0.2667
FR_MULTIPLATE2		0.7143	0.8000	0.8667	0.7333
FR_FRRD + 20Cu		0.8571	0.8571	0.6000	0.6923

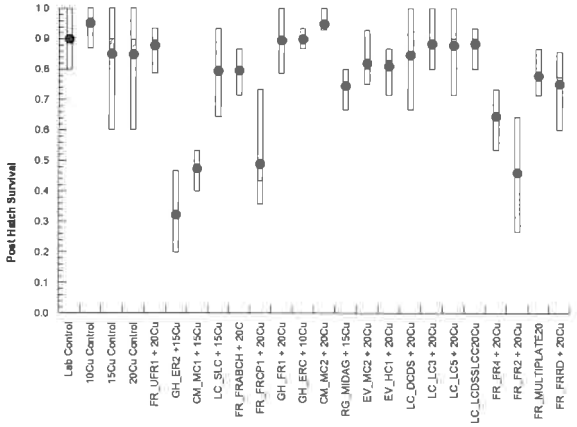
Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 18-5473-0339 **Endpoint:** Post Hatch Survival **CETIS Version:** CETISv1.9.4
Analyzed: 22 May-21 11:20 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Post Hatch Survival Binomials

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Lab Control		14/15	13/15	12/15	15/15
10Cu Control		14/14	13/15	14/15	15/15
15Cu Control		13/15	15/15	9/15	13/14
20Cu Control		12/14	13/13	9/15	14/15
FR_UFR1 + 20Cu		12/13	14/15	13/15	11/14
GH_ER2 +15Cu	XC	4/15	7/15	3/15	5/14
CM_MC1 + 15Cu		8/15	8/15	6/14	6/15
LC_SLC + 15Cu		9/14	10/15	14/15	14/15
FR_FRABCH + 20C		12/15	13/15	10/14	12/15
FR_FRCP1 + 20Cu		5/14	6/15	11/15	7/15
GH_FR1 + 20Cu		11/14	12/12	13/15	13/14
GH_ERC + 10Cu		14/15	13/15	13/14	13/15
CM_MC2 + 20Cu		14/15	15/15	14/15	13/14
RG_MIDAG + 15Cu		10/15	10/14	12/15	12/15
EV_MC2 + 20Cu		13/14	9/12	12/15	12/15
EV_HC1 + 20Cu		12/15	12/14	13/15	10/14
LC_DCDS + 20Cu		8/12	11/14	14/15	10/10
LC_LC3 + 20Cu		13/15	15/15	13/15	12/15
LC_LC5 + 20Cu		15/15	14/15	13/15	10/14
LC_LCDSSLCC20C		14/15	12/15	13/15	14/15
FR_FR4 + 20Cu		9/15	11/15	8/15	10/14
FR_FR2 + 20Cu		7/15	7/15	9/14	4/15
FR_MULTIPLATE2		10/14	12/15	13/15	11/15
FR_FRRD + 20Cu		12/14	12/14	9/15	9/13

Graphics



JUN 10 2021

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID:	08-9041-7720	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.9.4
Analyzed:	01 Jun-21 8:36	**Analysis:**	Nonparametric-Control vs Treatments	**Status Level:**	1
Batch ID:	16-2689-7673	**Test Type:**	32 Day Fathead Minnow Test	**Analyst:**	Kayla Knol
Start Date:	06 Mar-21	**Protocol:**	ASTM E1241-05 (2013)	**Diluent:**	Dechlorinated Tap Water
Ending Date:	07 Apr-21	**Species:**	Pimephales promelas	**Brine:**	
Test Length:	32d 0h	**Taxon:**	Actinopterygii	**Source:**	Aquatox, AR **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
Lab Control	08-8280-1106	02 Mar-21	03 Mar-21	96h	Teck Coal Ltd	
10Cu Control	01-9333-5370	02 Mar-21	03 Mar-21	96h		
15Cu Control	19-6548-0518	02 Mar-21	03 Mar-21	96h		
20Cu Control	00-8675-6744	02 Mar-21	03 Mar-21	96h		
FR_UFR1 + 20Cu	20-4721-8257	02 Mar-21	03 Mar-21	96h (4.6 °C)		
GH_ER2 +15Cu	01-1137-9253	02 Mar-21	03 Mar-21	96h (4.2 °C)		
CM_MC1 + 15Cu	01-3772-5048	02 Mar-21	03 Mar-21	96h (1 °C)		
LC_SLC + 15Cu	01-2380-6574	02 Mar-21	03 Mar-21	96h (3.1 °C)		
FR_FRABCH + 20C	08-4134-0746	02 Mar-21	03 Mar-21	96h (3.8 °C)		
FR_FRCP1 + 20Cu	11-2694-6466	02 Mar-21	03 Mar-21	96h (3 °C)		
GH_FR1 + 20Cu	20-1635-3152	02 Mar-21	03 Mar-21	96h (2.4 °C)		
GH_ERC + 10Cu	05-1950-5597	02 Mar-21	03 Mar-21	96h (4.1 °C)		
CM_MC2 + 20Cu	14-4685-1067	02 Mar-21	03 Mar-21	96h (0.3 °C)		
RG_MIDAG + 15Cu	21-3889-1829	02 Mar-21	03 Mar-21	96h (0.6 °C)		
EV_MC2 + 20Cu	05-6103-5191	02 Mar-21	03 Mar-21	96h (4.4 °C)		
EV_HC1 + 20Cu	12-5501-3302	02 Mar-21	03 Mar-21	96h (3.4 °C)		
LC_DCDS + 20Cu	04-1088-5978	02 Mar-21	03 Mar-21	96h (0.6 °C)		
LC_LC3 + 20Cu	14-7773-4190	02 Mar-21	03 Mar-21	96h (2.3 °C)		
LC_LC5 + 20Cu	01-7235-6798	02 Mar-21	03 Mar-21	96h (0.6 °C)		
LC_LCDSSLCC20C	06-4197-2641	02 Mar-21	03 Mar-21	96h (2.4 °C)		
FR_FR4 + 20Cu	10-9481-5020	02 Mar-21	03 Mar-21	96h (5.4 °C)		
FR_FR2 + 20Cu	00-3159-8672	02 Mar-21	03 Mar-21	96h (4.4 °C)		
FR_MULTIPLATE2	02-2179-0364	02 Mar-21	03 Mar-21	96h (2.9 °C)		
FR_FRRD + 20Cu	19-5167-8345	02 Mar-21	03 Mar-21	96h (6.2 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
Lab Control	Ambient Sample	Teck Coal Ltd	Lab Control	
10Cu Control	Ambient Sample	Teck Coal Ltd	10Cu Control	
15Cu Control	Ambient Sample	Teck Coal Ltd	15Cu Control	
20Cu Control	Ambient Sample	Teck Coal Ltd	20Cu Control	
FR_UFR1 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_UFR1_MON_2021-03-0	
GH_ER2 +15Cu	Ambient Sample	Teck Coal Ltd	GH_ER2_WS_2021-03-02_	
CM_MC1 + 15Cu	Ambient Sample	Teck Coal Ltd	CM_MC1_WS_2021-03-02	
LC_SLC + 15Cu	Ambient Sample	Teck Coal Ltd	LC_SLC_WS_2021-03-02_	
FR_FRABCH + 20C	Ambient Sample	Teck Coal Ltd	FR_FRABCH_MON_2021-	
FR_FRCP1 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FRCP1_MON_2021-03	
GH_FR1 + 20Cu	Ambient Sample	Teck Coal Ltd	GH_FR1_WS_2021-03-02_	
GH_ERC + 10Cu	Ambient Sample	Teck Coal Ltd	GH_ERC_WS_2021-03-02	
CM_MC2 + 20Cu	Ambient Sample	Teck Coal Ltd	CM_MC2_WS_2021-03-02	
RG_MIDAG + 15Cu	Ambient Sample	Teck Coal Ltd	RG_MIDAG_WS_2021-03-	
EV_MC2 + 20Cu	Ambient Sample	Teck Coal Ltd	EV_MC2_WS_2021_Q1_W	
EV_HC1 + 20Cu	Ambient Sample	Teck Coal Ltd	EV_HC1_WS_2021_Q1_W	
LC_DCDS + 20Cu	Ambient Sample	Teck Coal Ltd	LC_DCDS_WS_2021-03-02	
LC_LC3 + 20Cu	Ambient Sample	Teck Coal Ltd	LC_LC3_WS_2021-03-02_	
LC_LC5 + 20Cu	Ambient Sample	Teck Coal Ltd	LC_LC5_WS_2021-03-02_	
LC_LCDSSLCC20C	Ambient Sample	Teck Coal Ltd	LC_LCDSSLCC_WS_2021-	
FR_FR4 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FR4_WS_2021-03-02_	
FR_FR2 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FR2_WS_2021-03-02_	

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Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 08-9041-7720 **Endpoint:** Mean Dry Biomass-mg **CETIS Version:** CETISv1.9.4
Analyzed: 01 Jun-21 8:36 **Analysis:** Nonparametric-Control vs Treatments **Status Level:** 1

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_MULTIPLATE2	Ambient Sample	Teck Coal Ltd	FR_MULTIPLATE_WS_202	
FR_FRRD + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FRRD_WS_2021-03-02	

Nemenyi-Damico-Wolfe Test

Sample I	vs	Sample II	Test Stat	Critical	Ties	P-Type	P-Value	Decision(α:5%)
Site Control		Lab Control	-187	211.4	2	CDF	1.0000	Non-Significant Effect
		10Cu Control	-154	211.4	2	CDF	1.0000	Non-Significant Effect
		15Cu Control	-221	211.4	2	CDF	1.0000	Non-Significant Effect
		20Cu Control	-213	211.4	2	CDF	1.0000	Non-Significant Effect
		FR_UFR1 + 20Cu	-154	211.4	2	CDF	1.0000	Non-Significant Effect
		GH_ER2 +15Cu	49	211.4	2	CDF	0.8248	Non-Significant Effect
		LC_SLC + 15Cu	-85	211.4	2	CDF	0.9991	Non-Significant Effect
		FR_FRABCH + 20C	-95	211.4	2	CDF	0.9995	Non-Significant Effect
		FR_FRCP1 + 20Cu	7	211.4	2	CDF	0.9471	Non-Significant Effect
		GH_FR1 + 20Cu	-183.5	211.4	2	CDF	1.0000	Non-Significant Effect
		GH_ERC + 10Cu	-192	211.4	2	CDF	1.0000	Non-Significant Effect
		CM_MC2 + 20Cu	-106	211.4	2	CDF	0.9997	Non-Significant Effect
		RG_MIDAG + 15Cu	-49.5	211.4	2	CDF	0.9945	Non-Significant Effect
		EV_MC2 + 20Cu	-80	211.4	2	CDF	0.9988	Non-Significant Effect
		EV_HC1 + 20Cu	-170.5	211.4	2	CDF	1.0000	Non-Significant Effect
		LC_DCDS + 20Cu	-140	211.4	2	CDF	1.0000	Non-Significant Effect
		LC_LC3 + 20Cu	-119	211.4	2	CDF	0.9999	Non-Significant Effect
		LC_LC5 + 20Cu	-153	211.4	2	CDF	1.0000	Non-Significant Effect
		LC_LCDSSLCC20Cu	-123	211.4	2	CDF	0.9999	Non-Significant Effect
		FR_FR4 + 20Cu	-71.5	211.4	2	CDF	0.9982	Non-Significant Effect
		FR_FR2 + 20Cu	53	211.4	2	CDF	0.8076	Non-Significant Effect
		FR_MULTIPLATE20	-196	211.4	2	CDF	1.0000	Non-Significant Effect
		FR_FRRD + 20Cu	-200	211.4	2	CDF	1.0000	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	2.393	3.37	1.0000	No Outliers Detected
Treatment Effect	Fligner-Wolfe Omnibus Test	4346		0.9856	Non-Significant Overall Effect
Treatment Effect	Kruskal-Wallis Omnibus Test	48.55	35.17	0.0014	Significant Overall Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	9.6416	0.4192	23	4.746	1.9E-07	Significant Effect
Error	6.35993	0.0883324	72			
Total	16.0015		95			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Variances	Bartlett Equality of Variance Test	15.29	35.17	0.8840	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9376	0.9737	1.9E-04	Non-Normal Distribution

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 08-9041-7720 **Endpoint:** Mean Dry Biomass-mg **CETIS Version:** CETISv1.9.4
Analyzed: 01 Jun-21 8:36 **Analysis:** Nonparametric-Control vs Treatments **Status Level:** 1

Mean Dry Biomass-mg Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
Lab Control		4	2.276	1.813	2.739	2.216	1.989	2.681	0.1455	12.79%	0.00%
10Cu Control		4	2.164	1.858	2.471	2.08	2.048	2.45	0.09618	8.89%	4.89%
15Cu Control		4	2.423	1.816	3.031	2.311	2.096	2.975	0.191	15.76%	-6.49%
20Cu Control		4	2.343	1.952	2.734	2.305	2.085	2.677	0.1229	10.49%	-2.94%
FR_UFR1 + 20Cu		4	2.254	1.609	2.9	2.06	2.035	2.862	0.2028	18.00%	0.94%
GH_ER2 +15Cu		4	1.181	0.4596	1.902	1.135	0.6767	1.777	0.2266	38.38%	48.12%
CM_MC1 + 15Cu	XC	4	1.604	1.076	2.132	1.478	1.367	2.092	0.166	20.69%	29.52%
LC_SLC + 15Cu		4	2.008	1.849	2.167	2.005	1.908	2.114	0.04997	4.98%	11.75%
FR_FRABCH + 20C		4	2.097	1.427	2.766	1.929	1.814	2.716	0.2103	20.06%	7.86%
FR_FRCP1 + 20Cu		4	1.699	1.29	2.108	1.729	1.358	1.98	0.1285	15.13%	25.34%
GH_FR1 + 20Cu		4	2.278	1.812	2.745	2.307	1.917	2.584	0.1465	12.86%	-0.12%
GH_ERC + 10Cu		4	2.248	1.979	2.517	2.217	2.095	2.463	0.08461	7.53%	1.22%
CM_MC2 + 20Cu		4	2.049	1.554	2.544	2.058	1.671	2.409	0.1556	15.19%	9.96%
RG_MIDAG + 15Cu		4	1.9	1.521	2.278	1.856	1.677	2.209	0.1189	12.52%	16.52%
EV_MC2 + 20Cu		4	2	1.594	2.406	1.937	1.765	2.361	0.1276	12.76%	12.10%
EV_HC1 + 20Cu		4	2.2	1.928	2.471	2.171	2.024	2.433	0.0853	7.75%	3.33%
LC_DCDS + 20Cu		4	2.111	1.845	2.377	2.162	1.875	2.245	0.08356	7.92%	7.22%
LC_LC3 + 20Cu		4	2.076	1.846	2.306	2.072	1.927	2.233	0.0723	6.96%	8.76%
LC_LC5 + 20Cu		4	2.19	1.749	2.631	2.166	1.906	2.523	0.1385	12.65%	3.75%
LC_LCDSSLCC20C		4	2.097	1.762	2.432	2.051	1.923	2.363	0.1054	10.05%	7.85%
FR_FR4 + 20Cu		4	2.013	1.388	2.639	1.85	1.754	2.599	0.1965	19.52%	11.53%
FR_FR2 + 20Cu		4	1.239	0.6549	1.824	1.13	0.96	1.738	0.1837	29.64%	45.54%
FR_MULTIPLATE2		4	2.352	1.754	2.949	2.25	2.019	2.888	0.1877	15.96%	-3.35%
FR_FRRD + 20Cu		4	2.338	1.844	2.832	2.304	2.016	2.729	0.1553	13.28%	-2.75%

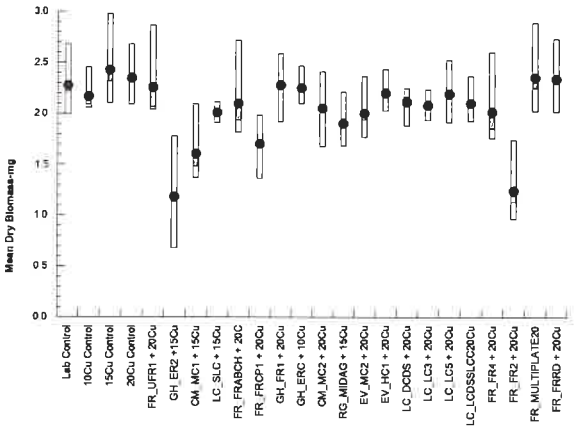
Mean Dry Biomass-mg Detail

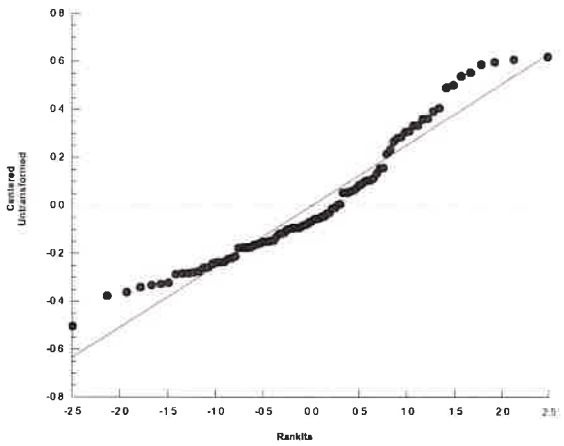
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Lab Control		2.222	1.989	2.211	2.681
10Cu Control		2.109	2.051	2.048	2.45
15Cu Control		2.293	2.096	2.329	2.975
20Cu Control		2.297	2.085	2.313	2.677
FR_UFR1 + 20Cu		2.078	2.035	2.042	2.862
GH_ER2 +15Cu		1.17	1.777	0.6767	1.099
CM_MC1 + 15Cu	XC	1.429	2.092	1.367	1.527
LC_SLC + 15Cu		2.071	1.939	1.908	2.114
FR_FRABCH + 20C		1.855	1.814	2.003	2.716
FR_FRCP1 + 20Cu		1.705	1.358	1.98	1.753
GH_FR1 + 20Cu		2.433	2.181	1.917	2.584
GH_ERC + 10Cu		2.095	2.463	2.131	2.302
CM_MC2 + 20Cu		1.963	1.671	2.153	2.409
RG_MIDAG + 15Cu		1.677	1.754	2.209	1.959
EV_MC2 + 20Cu		1.967	1.907	1.765	2.361
EV_HC1 + 20Cu		2.155	2.024	2.188	2.433
LC_DCDS + 20Cu		2.245	1.875	2.113	2.212
LC_LC3 + 20Cu		2.233	1.927	1.983	2.161
LC_LC5 + 20Cu		1.906	2.029	2.304	2.523
LC_LCDSSLCC20C		1.923	1.933	2.169	2.363
FR_FR4 + 20Cu		1.754	1.838	1.863	2.599
FR_FR2 + 20Cu		0.9653	0.96	1.738	1.294
FR_MULTIPLATE2		2.295	2.019	2.205	2.888
FR_FRRD + 20Cu		2.016	2.181	2.427	2.729

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID:	08-9041-7720	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.9.4
Analyzed:	01 Jun-21 8:36	**Analysis:**	Nonparametric-Control vs Treatments	**Status Level:**	1

Graphics





CETIS Analytical Report

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID:	03-9850-0329	**Endpoint:**	Hatch Rate	**CETIS Version:**	CETISv1.9.4
Analyzed:	22 May-21 11:25	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1
Batch ID:	16-2689-7673	**Test Type:**	32 Day Fathead Minnow Test	**Analyst:**	Kayla Knol
Start Date:	06 Mar-21	**Protocol:**	ASTM E1241-05 (2013)	**Diluent:**	Dechlorinated Tap Water
Ending Date:	07 Apr-21	**Species:**	Pimephales promelas	**Brine:**	
Test Length:	32d 0h	**Taxon:**	Actinopterygii	**Source:**	Aquatox, AR **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
Lab Control	08-8280-1106	02 Mar-21	03 Mar-21	96h	Teck Coal Ltd	
10Cu Control	01-9333-5370	02 Mar-21	03 Mar-21	96h		
15Cu Control	19-6548-0518	02 Mar-21	03 Mar-21	96h		
20Cu Control	00-8675-6744	02 Mar-21	03 Mar-21	96h		
FR_UFR1 + 20Cu	20-4721-8257	02 Mar-21	03 Mar-21	96h (4.6 °C)		
GH_ER2 +15Cu	01-1137-9253	02 Mar-21	03 Mar-21	96h (4.2 °C)		
CM_MC1 + 15Cu	01-3772-5048	02 Mar-21	03 Mar-21	96h (1 °C)		
LC_SLC + 15Cu	01-2380-6574	02 Mar-21	03 Mar-21	96h (3.1 °C)		
FR_FRABCH + 20C	08-4134-0746	02 Mar-21	03 Mar-21	96h (3.8 °C)		
FR_FRCP1 + 20Cu	11-2694-6466	02 Mar-21	03 Mar-21	96h (3 °C)		
GH_FR1 + 20Cu	20-1635-3152	02 Mar-21	03 Mar-21	96h (2.4 °C)		
GH_ERC + 10Cu	05-1950-5597	02 Mar-21	03 Mar-21	96h (4.1 °C)		
CM_MC2 + 20Cu	14-4685-1067	02 Mar-21	03 Mar-21	96h (0.3 °C)		
RG_MIDAG + 15Cu	21-3889-1829	02 Mar-21	03 Mar-21	96h (0.6 °C)		
EV_MC2 + 20Cu	05-6103-5191	02 Mar-21	03 Mar-21	96h (4.4 °C)		
EV_HC1 + 20Cu	12-5501-3302	02 Mar-21	03 Mar-21	96h (3.4 °C)		
LC_DCDS + 20Cu	04-1088-5978	02 Mar-21	03 Mar-21	96h (0.6 °C)		
LC_LC3 + 20Cu	14-7773-4190	02 Mar-21	03 Mar-21	96h (2.3 °C)		
LC_LC5 + 20Cu	01-7235-6798	02 Mar-21	03 Mar-21	96h (0.6 °C)		
LC_LCDSSLCC20C	06-4197-2641	02 Mar-21	03 Mar-21	96h (2.4 °C)		
FR_FR4 + 20Cu	10-9481-5020	02 Mar-21	03 Mar-21	96h (5.4 °C)		
FR_FR2 + 20Cu	00-3159-8672	02 Mar-21	03 Mar-21	96h (4.4 °C)		
FR_MULTIPLATE2	02-2179-0364	02 Mar-21	03 Mar-21	96h (2.9 °C)		
FR_FRRD + 20Cu	19-5167-8345	02 Mar-21	03 Mar-21	96h (6.2 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
Lab Control	Ambient Sample	Teck Coal Ltd	Lab Control	
10Cu Control	Ambient Sample	Teck Coal Ltd	10Cu Control	
15Cu Control	Ambient Sample	Teck Coal Ltd	15Cu Control	
20Cu Control	Ambient Sample	Teck Coal Ltd	20Cu Control	
FR_UFR1 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_UFR1_MON_2021-03-0	
GH_ER2 +15Cu	Ambient Sample	Teck Coal Ltd	GH_ER2_WS_2021-03-02_	
CM_MC1 + 15Cu	Ambient Sample	Teck Coal Ltd	CM_MC1_WS_2021-03-02	
LC_SLC + 15Cu	Ambient Sample	Teck Coal Ltd	LC_SLC_WS_2021-03-02_	
FR_FRABCH + 20C	Ambient Sample	Teck Coal Ltd	FR_FRABCH_MON_2021-	
FR_FRCP1 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FRCP1_MON_2021-03	
GH_FR1 + 20Cu	Ambient Sample	Teck Coal Ltd	GH_FR1_WS_2021-03-02_	
GH_ERC + 10Cu	Ambient Sample	Teck Coal Ltd	GH_ERC_WS_2021-03-02	
CM_MC2 + 20Cu	Ambient Sample	Teck Coal Ltd	CM_MC2_WS_2021-03-02	
RG_MIDAG + 15Cu	Ambient Sample	Teck Coal Ltd	RG_MIDAG_WS_2021-03-	
EV_MC2 + 20Cu	Ambient Sample	Teck Coal Ltd	EV_MC2_WS_2021_Q1_W	
EV_HC1 + 20Cu	Ambient Sample	Teck Coal Ltd	EV_HC1_WS_2021_Q1_W	
LC_DCDS + 20Cu	Ambient Sample	Teck Coal Ltd	LC_DCDS_WS_2021-03-02	
LC_LC3 + 20Cu	Ambient Sample	Teck Coal Ltd	LC_LC3_WS_2021-03-02_	
LC_LC5 + 20Cu	Ambient Sample	Teck Coal Ltd	LC_LC5_WS_2021-03-02_	
LC_LCDSSLCC20C	Ambient Sample	Teck Coal Ltd	LC_LCDSSLCC_WS_2021-	
FR_FR4 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FR4_WS_2021-03-02_	
FR_FR2 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FR2_WS_2021-03-02_	

Analyst: KK QA: MG

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Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 03-9850-0329 **Endpoint:** Hatch Rate **CETIS Version:** CETISv1.9.4
Analyzed: 22 May-21 11:25 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_MULTIPLATE2	Ambient Sample	Teck Coal Ltd	FR_MULTIPLATE_WS_202	
FR_FRRD + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FRRD_WS_2021-03-02	

Fisher Exact/Bonferroni Adj Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
Site Control		Lab Control	1.0000	Exact	1.0000	Non-Significant Effect
		10Cu Control	0.7521	Exact	1.0000	Non-Significant Effect
		15Cu Control	0.7521	Exact	1.0000	Non-Significant Effect
		20Cu Control	0.3093	Exact	1.0000	Non-Significant Effect
		FR_UFR1 + 20Cu	0.3093	Exact	1.0000	Non-Significant Effect
		GH_ER2 +15Cu	0.7521	Exact	1.0000	Non-Significant Effect
		LC_SLC + 15Cu	0.7521	Exact	1.0000	Non-Significant Effect
		FR_FRABCH + 20C	0.7521	Exact	1.0000	Non-Significant Effect
		FR_FRCP1 + 20Cu	0.7521	Exact	1.0000	Non-Significant Effect
		GH_FR1 + 20Cu	0.1034	Exact	1.0000	Non-Significant Effect
		GH_ERC + 10Cu	0.7521	Exact	1.0000	Non-Significant Effect
		CM_MC2 + 20Cu	0.7521	Exact	1.0000	Non-Significant Effect
		RG_MIDAG + 15Cu	0.7521	Exact	1.0000	Non-Significant Effect
		EV_MC2 + 20Cu	0.1822	Exact	1.0000	Non-Significant Effect
		EV_HC1 + 20Cu	0.5000	Exact	1.0000	Non-Significant Effect
		LC_DCDS + 20Cu	0.0083	Exact	0.1907	Non-Significant Effect
		LC_LC3 + 20Cu	1.0000	Exact	1.0000	Non-Significant Effect
		LC_LC5 + 20Cu	0.7521	Exact	1.0000	Non-Significant Effect
		LC_LCDSSLCC20Cu	1.0000	Exact	1.0000	Non-Significant Effect
		FR_FR4 + 20Cu	0.7521	Exact	1.0000	Non-Significant Effect
		FR_FR2 + 20Cu	0.7521	Exact	1.0000	Non-Significant Effect
		FR_MULTIPLATE20	0.7521	Exact	1.0000	Non-Significant Effect
		FR_FRRD + 20Cu	0.1822	Exact	1.0000	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	3.165	3.37	0.1123	No Outliers Detected

JUN 10 2021

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 03-9850-0329 **Endpoint:** Hatch Rate **CETIS Version:** CETISv1.9.4
Analyzed: 22 May-21 11:25 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Data Summary

Sample	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
Lab Control		60	0	60	1	0	-1.7%
10Cu Control		59	1	60	0.9833	0.01667	0.0%
15Cu Control		59	1	60	0.9833	0.01667	0.0%
20Cu Control		57	3	60	0.95	0.05	3.39%
FR_UFR1 + 20Cu		57	3	60	0.95	0.05	3.39%
GH_ER2 +15Cu		59	1	60	0.9833	0.01667	0.0%
CM_MC1 + 15Cu	XC	59	1	60	0.9833	0.01667	0.0%
LC_SLC + 15Cu		59	1	60	0.9833	0.01667	0.0%
FR_FRABCH + 20C		59	1	60	0.9833	0.01667	0.0%
FR_FRCP1 + 20Cu		59	1	60	0.9833	0.01667	0.0%
GH_FR1 + 20Cu		55	5	60	0.9167	0.08333	6.78%
GH_ERC + 10Cu		59	1	60	0.9833	0.01667	0.0%
CM_MC2 + 20Cu		59	1	60	0.9833	0.01667	0.0%
RG_MIDAG + 15Cu		59	1	60	0.9833	0.01667	0.0%
EV_MC2 + 20Cu		56	4	60	0.9333	0.06667	5.09%
EV_HC1 + 20Cu		58	2	60	0.9667	0.03333	1.7%
LC_DCDS + 20Cu		51	9	60	0.85	0.15	13.56%
LC_LC3 + 20Cu		60	0	60	1	0	-1.7%
LC_LC5 + 20Cu		59	1	60	0.9833	0.01667	0.0%
LC_LCDSSLCC20C		60	0	60	1	0	-1.7%
FR_FR4 + 20Cu		59	1	60	0.9833	0.01667	0.0%
FR_FR2 + 20Cu		59	1	60	0.9833	0.01667	0.0%
FR_MULTIPLATE20		59	1	60	0.9833	0.01667	0.0%
FR_FRRD + 20Cu		56	4	60	0.9333	0.06667	5.09%

Hatch Rate Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Lab Control		1.0000	1.0000	1.0000	1.0000
10Cu Control		0.9333	1.0000	1.0000	1.0000
15Cu Control		1.0000	1.0000	1.0000	0.9333
20Cu Control		0.9333	0.8667	1.0000	1.0000
FR_UFR1 + 20Cu		0.8667	1.0000	1.0000	0.9333
GH_ER2 +15Cu		1.0000	1.0000	1.0000	0.9333
CM_MC1 + 15Cu	XC	1.0000	1.0000	0.9333	1.0000
LC_SLC + 15Cu		0.9333	1.0000	1.0000	1.0000
FR_FRABCH + 20C		1.0000	1.0000	0.9333	1.0000
FR_FRCP1 + 20Cu		0.9333	1.0000	1.0000	1.0000
GH_FR1 + 20Cu		0.9333	0.8000	1.0000	0.9333
GH_ERC + 10Cu		1.0000	1.0000	0.9333	1.0000
CM_MC2 + 20Cu		1.0000	1.0000	1.0000	0.9333
RG_MIDAG + 15Cu		1.0000	0.9333	1.0000	1.0000
EV_MC2 + 20Cu		0.9333	0.8000	1.0000	1.0000
EV_HC1 + 20Cu		1.0000	0.9333	1.0000	0.9333
LC_DCDS + 20Cu		0.8000	0.9333	1.0000	0.6667
LC_LC3 + 20Cu		1.0000	1.0000	1.0000	1.0000
LC_LC5 + 20Cu		1.0000	1.0000	1.0000	0.9333
LC_LCDSSLCC20C		1.0000	1.0000	1.0000	1.0000
FR_FR4 + 20Cu		1.0000	1.0000	1.0000	0.9333
FR_FR2 + 20Cu		1.0000	1.0000	0.9333	1.0000
FR_MULTIPLATE2		0.9333	1.0000	1.0000	1.0000
FR_FRRD + 20Cu		0.9333	0.9333	1.0000	0.8667

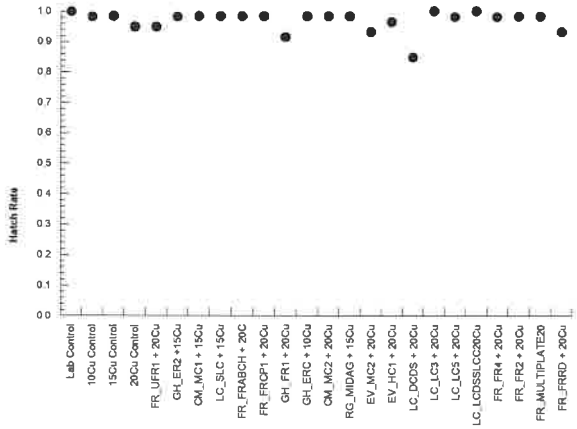
Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 03-9850-0329 **Endpoint:** Hatch Rate **CETIS Version:** CETISv1.9.4
Analyzed: 22 May-21 11:25 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Hatch Rate Binomials

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Lab Control		15/15	15/15	15/15	15/15
10Cu Control		14/15	15/15	15/15	15/15
15Cu Control		15/15	15/15	15/15	14/15
20Cu Control		14/15	13/15	15/15	15/15
FR_UFR1 + 20Cu		13/15	15/15	15/15	14/15
GH_ER2 +15Cu		15/15	15/15	15/15	14/15
CM_MC1 + 15Cu	XC	15/15	15/15	14/15	15/15
LC_SLC + 15Cu		14/15	15/15	15/15	15/15
FR_FRABCH + 20C		15/15	15/15	14/15	15/15
FR_FRCP1 + 20Cu		14/15	15/15	15/15	15/15
GH_FR1 + 20Cu		14/15	12/15	15/15	14/15
GH_ERC + 10Cu		15/15	15/15	14/15	15/15
CM_MC2 + 20Cu		15/15	15/15	15/15	14/15
RG_MIDAG + 15Cu		15/15	14/15	15/15	15/15
EV_MC2 + 20Cu		14/15	12/15	15/15	15/15
EV_HC1 + 20Cu		15/15	14/15	15/15	14/15
LC_DCDS + 20Cu		12/15	14/15	15/15	10/15
LC_LC3 + 20Cu		15/15	15/15	15/15	15/15
LC_LC5 + 20Cu		15/15	15/15	15/15	14/15
LC_LCDSSLCC20C		15/15	15/15	15/15	15/15
FR_FR4 + 20Cu		15/15	15/15	15/15	14/15
FR_FR2 + 20Cu		15/15	15/15	14/15	15/15
FR_MULTIPLATE2		14/15	15/15	15/15	15/15
FR_FRRD + 20Cu		14/15	14/15	15/15	13/15

Graphics



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Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID:	02-7704-7679	**Endpoint:**	Length	**CETIS Version:**	CETISv1.9.4
Analyzed:	22 May-21 11:29	**Analysis:**	Parametric-Control vs Treatments	**Status Level:**	1
Batch ID:	16-2689-7673	**Test Type:**	32 Day Fathead Minnow Test	**Analyst:**	Kayla Knol
Start Date:	06 Mar-21	**Protocol:**	ASTM E1241-05 (2013)	**Diluent:**	Dechlorinated Tap Water
Ending Date:	07 Apr-21	**Species:**	Pimephales promelas	**Brine:**	
Test Length:	32d 0h	**Taxon:**	Actinopterygii	**Source:**	Aquatox, AR **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
Lab Control	08-8280-1106	02 Mar-21	03 Mar-21	96h	Teck Coal Ltd	
10Cu Control	01-9333-5370	02 Mar-21	03 Mar-21	96h		
15Cu Control	19-6548-0518	02 Mar-21	03 Mar-21	96h		
20Cu Control	00-8675-6744	02 Mar-21	03 Mar-21	96h		
FR_UFR1 + 20Cu	20-4721-8257	02 Mar-21	03 Mar-21	96h (4.6 °C)		
GH_ER2 +15Cu	01-1137-9253	02 Mar-21	03 Mar-21	96h (4.2 °C)		
CM_MC1 + 15Cu	01-3772-5048	02 Mar-21	03 Mar-21	96h (1 °C)		
LC_SLC + 15Cu	01-2380-6574	02 Mar-21	03 Mar-21	96h (3.1 °C)		
FR_FRABCH + 20C	08-4134-0746	02 Mar-21	03 Mar-21	96h (3.8 °C)		
FR_FRCP1 + 20Cu	11-2694-6466	02 Mar-21	03 Mar-21	96h (3 °C)		
GH_FR1 + 20Cu	20-1635-3152	02 Mar-21	03 Mar-21	96h (2.4 °C)		
GH_ERC + 10Cu	05-1950-5597	02 Mar-21	03 Mar-21	96h (4.1 °C)		
CM_MC2 + 20Cu	14-4685-1067	02 Mar-21	03 Mar-21	96h (0.3 °C)		
RG_MIDAG + 15Cu	21-3889-1829	02 Mar-21	03 Mar-21	96h (0.6 °C)		
EV_MC2 + 20Cu	05-6103-5191	02 Mar-21	03 Mar-21	96h (4.4 °C)		
EV_HC1 + 20Cu	12-5501-3302	02 Mar-21	03 Mar-21	96h (3.4 °C)		
LC_DCDS + 20Cu	04-1088-5978	02 Mar-21	03 Mar-21	96h (0.6 °C)		
LC_LC3 + 20Cu	14-7773-4190	02 Mar-21	03 Mar-21	96h (2.3 °C)		
LC_LC5 + 20Cu	01-7235-6798	02 Mar-21	03 Mar-21	96h (0.6 °C)		
LC_LCDSSLCC20C	06-4197-2641	02 Mar-21	03 Mar-21	96h (2.4 °C)		
FR_FR4 + 20Cu	10-9481-5020	02 Mar-21	03 Mar-21	96h (5.4 °C)		
FR_FR2 + 20Cu	00-3159-8672	02 Mar-21	03 Mar-21	96h (4.4 °C)		
FR_MULTIPLATE2	02-2179-0364	02 Mar-21	03 Mar-21	96h (2.9 °C)		
FR_FRRD + 20Cu	19-5167-8345	02 Mar-21	03 Mar-21	96h (6.2 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
Lab Control	Ambient Sample	Teck Coal Ltd	Lab Control	
10Cu Control	Ambient Sample	Teck Coal Ltd	10Cu Control	
15Cu Control	Ambient Sample	Teck Coal Ltd	15Cu Control	
20Cu Control	Ambient Sample	Teck Coal Ltd	20Cu Control	
FR_UFR1 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_UFR1_MON_2021-03-0	
GH_ER2 +15Cu	Ambient Sample	Teck Coal Ltd	GH_ER2_WS_2021-03-02_	
CM_MC1 + 15Cu	Ambient Sample	Teck Coal Ltd	CM_MC1_WS_2021-03-02	
LC_SLC + 15Cu	Ambient Sample	Teck Coal Ltd	LC_SLC_WS_2021-03-02_	
FR_FRABCH + 20C	Ambient Sample	Teck Coal Ltd	FR_FRABCH_MON_2021-	
FR_FRCP1 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FRCP1_MON_2021-03	
GH_FR1 + 20Cu	Ambient Sample	Teck Coal Ltd	GH_FR1_WS_2021-03-02_	
GH_ERC + 10Cu	Ambient Sample	Teck Coal Ltd	GH_ERC_WS_2021-03-02	
CM_MC2 + 20Cu	Ambient Sample	Teck Coal Ltd	CM_MC2_WS_2021-03-02	
RG_MIDAG + 15Cu	Ambient Sample	Teck Coal Ltd	RG_MIDAG_WS_2021-03-	
EV_MC2 + 20Cu	Ambient Sample	Teck Coal Ltd	EV_MC2_WS_2021_Q1_W	
EV_HC1 + 20Cu	Ambient Sample	Teck Coal Ltd	EV_HC1_WS_2021_Q1_W	
LC_DCDS + 20Cu	Ambient Sample	Teck Coal Ltd	LC_DCDS_WS_2021-03-02	
LC_LC3 + 20Cu	Ambient Sample	Teck Coal Ltd	LC_LC3_WS_2021-03-02_	
LC_LC5 + 20Cu	Ambient Sample	Teck Coal Ltd	LC_LC5_WS_2021-03-02_	
LC_LCDSSLCC20C	Ambient Sample	Teck Coal Ltd	LC_LCDSSLCC_WS_2021-	
FR_FR4 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FR4_WS_2021-03-02_	
FR_FR2 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FR2_WS_2021-03-02_	

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 02-7704-7679 **Endpoint:** Length **CETIS Version:** CETISv1.9.4
Analyzed: 22 May-21 11:29 **Analysis:** Parametric-Control vs Treatments **Status Level:** 1

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_MULTIPLATE2	Ambient Sample	Teck Coal Ltd	FR_MULTIPLATE_WS_202	
FR_FRRD + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FRRD_WS_2021-03-02	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	Lab Control passed length	12.35%
		10Cu Control passed length	12.35%
		15Cu Control passed length	12.35%
		20Cu Control passed length	12.35%
		FR_UFR1 + 20Cu passed length	12.35%
		GH_ER2 +15Cu passed length	12.35%
		LC_SLC + 15Cu passed length	12.35%
		FR_FRABCH + 20C passed length	12.35%
		FR_FRCP1 + 20Cu passed length	12.35%
		GH_FR1 + 20Cu passed length	12.35%
		GH_ERC + 10Cu passed length	12.35%
		CM_MC2 + 20Cu passed length	12.35%
		RG_MIDAG + 15Cu passed length	12.35%
		EV_MC2 + 20Cu passed length	12.35%
		EV_HC1 + 20Cu passed length	12.35%
		LC_DCDS + 20Cu passed length	12.35%
		LC_LC3 + 20Cu passed length	12.35%
		LC_LC5 + 20Cu passed length	12.35%
		LC_LCDSSLCC20Cu passed length	12.35%
		FR_FR4 + 20Cu passed length	12.35%
		FR_FR2 + 20Cu passed length	12.35%
		FR_MULTIPLATE20 passed length	12.35%
		FR_FRRD + 20Cu passed length	12.35%

Dunnett Multiple Comparison Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Site Control		Lab Control	0.1574	2.744	1.349	6	CDF	0.9369	Non-Significant Effect
		10Cu Control	0.5271	2.744	1.349	6	CDF	0.8544	Non-Significant Effect
		15Cu Control	-0.3177	2.744	1.349	6	CDF	0.9838	Non-Significant Effect
		20Cu Control	-0.5143	2.744	1.349	6	CDF	0.9916	Non-Significant Effect
		FR_UFR1 + 20Cu	1.044	2.744	1.349	6	CDF	0.6551	Non-Significant Effect
		GH_ER2 +15Cu	0.164	2.744	1.349	6	CDF	0.9359	Non-Significant Effect
		LC_SLC + 15Cu	-1.078	2.744	1.349	6	CDF	0.9990	Non-Significant Effect
		FR_FRABCH + 20C	0.8599	2.744	1.349	6	CDF	0.7362	Non-Significant Effect
		FR_FRCP1 + 20Cu	-0.5125	2.744	1.349	6	CDF	0.9915	Non-Significant Effect
		GH_FR1 + 20Cu	0.6098	2.744	1.349	6	CDF	0.8289	Non-Significant Effect
		GH_ERC + 10Cu	0.888	2.744	1.349	6	CDF	0.7244	Non-Significant Effect
		CM_MC2 + 20Cu	1.618	2.744	1.349	6	CDF	0.3760	Non-Significant Effect
		RG_MIDAG + 15Cu	0.3177	2.744	1.349	6	CDF	0.9072	Non-Significant Effect
		EV_MC2 + 20Cu	0.3762	2.744	1.349	6	CDF	0.8941	Non-Significant Effect
		EV_HC1 + 20Cu	0.7205	2.744	1.349	6	CDF	0.7907	Non-Significant Effect
		LC_DCDS + 20Cu	-0.4894	2.744	1.349	6	CDF	0.9908	Non-Significant Effect
		LC_LC3 + 20Cu	0.3998	2.744	1.349	6	CDF	0.8885	Non-Significant Effect
		LC_LC5 + 20Cu	-0.262	2.744	1.349	6	CDF	0.9807	Non-Significant Effect
		LC_LCDSSLCC20Cu	0.483	2.744	1.349	6	CDF	0.8670	Non-Significant Effect
		FR_FR4 + 20Cu	-0.392	2.744	1.349	6	CDF	0.9873	Non-Significant Effect
		FR_FR2 + 20Cu	0.9774	2.744	1.349	6	CDF	0.6855	Non-Significant Effect
		FR_MULTIPLATE20	0.07563	2.744	1.349	6	CDF	0.9489	Non-Significant Effect
		FR_FRRD + 20Cu	0.233	2.744	1.349	6	CDF	0.9240	Non-Significant Effect

Auxiliary Tests

JUN 10 2021

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 02-7704-7679 **Endpoint:** Length **CETIS Version:** CETISv1.9.4
Analyzed: 22 May-21 11:29 **Analysis:** Parametric-Control vs Treatments **Status Level:** 1

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	3.392	3.37	0.0458	Outlier Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	8.62615	0.37505	23	0.7753	0.7491	Non-Significant Effect
Error	34.8279	0.483721	72			
Total	43.4541		95			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Variances	Bartlett Equality of Variance Test	31.32	35.17	0.1151	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9841	0.9737	0.3005	Normal Distribution

Length Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
Lab Control		4	10.85	10.2	11.5	10.74	10.5	11.42	0.2039	3.76%	0.00%
10Cu Control		4	10.67	10.19	11.15	10.69	10.29	11	0.1513	2.84%	1.68%
15Cu Control		4	11.08	9.919	12.25	11	10.33	12	0.3658	6.60%	-2.15%
20Cu Control		4	11.18	10.17	12.19	10.96	10.69	12.11	0.3171	5.67%	-3.04%
FR_UFR1 + 20Cu		4	10.41	9.005	11.82	10.04	9.857	11.73	0.4425	8.50%	4.02%
GH_ER2 +15Cu		4	10.85	10.27	11.43	10.8	10.5	11.29	0.182	3.36%	0.03%
CM_MC1 + 15Cu	XC	4	10.93	9.723	12.13	10.83	10.17	11.88	0.3782	6.92%	-0.71%
LC_SLC + 15Cu		4	11.46	10.55	12.37	11.45	10.93	12	0.2857	4.99%	-5.60%
FR_FRABCH + 20C		4	10.5	9.776	11.23	10.47	10	11.08	0.2288	4.36%	3.18%
FR_FRCP1 + 20Cu		4	11.18	10.1	12.26	11.13	10.45	12	0.3392	6.07%	-3.04%
GH_FR1 + 20Cu		4	10.63	9.531	11.72	10.72	9.846	11.23	0.3445	6.48%	2.05%
GH_ERC + 10Cu		4	10.49	10.24	10.74	10.48	10.31	10.69	0.0791	1.51%	3.31%
CM_MC2 + 20Cu		4	10.13	8.98	11.28	10.01	9.429	11.08	0.3617	7.14%	6.62%
RG_MIDAG + 15Cu		4	10.77	10.19	11.35	10.72	10.4	11.25	0.1826	3.39%	0.73%
EV_MC2 + 20Cu		4	10.74	9.791	11.69	10.76	10.08	11.36	0.2987	5.56%	0.99%
EV_HC1 + 20Cu		4	10.57	10.15	10.99	10.54	10.31	10.9	0.1325	2.51%	2.55%
LC_DCDS + 20Cu		4	11.17	9.661	12.67	11.06	10.18	12.38	0.4734	8.48%	-2.93%
LC_LC3 + 20Cu		4	10.73	9.975	11.49	10.77	10.13	11.25	0.2375	4.43%	1.10%
LC_LC5 + 20Cu		4	11.06	9.583	12.53	10.93	10.07	12.3	0.4627	8.37%	-1.90%
LC_LCDSSLCC20C		4	10.69	10.4	10.98	10.66	10.5	10.93	0.09091	1.70%	1.48%
FR_FR4 + 20Cu		4	11.12	10.17	12.07	11.06	10.45	11.9	0.298	5.36%	-2.49%
FR_FR2 + 20Cu		4	10.45	7.854	13.04	10.14	9	12.5	0.8146	15.60%	3.72%
FR_MULTIPLATE2		4	10.89	9.947	11.83	10.89	10.23	11.55	0.2964	5.44%	-0.37%
FR_FRRD + 20Cu		4	10.81	9.242	12.38	10.83	9.917	11.67	0.4934	9.13%	0.34%

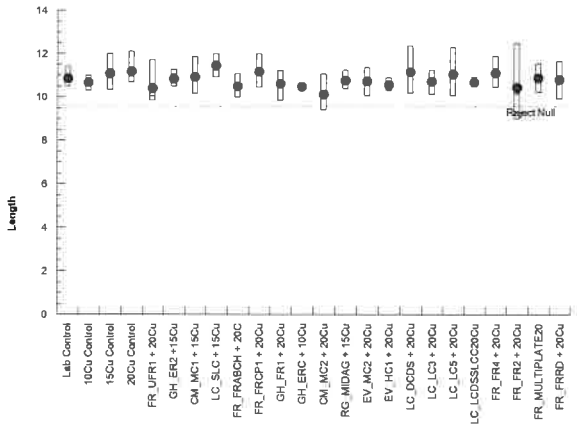
Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

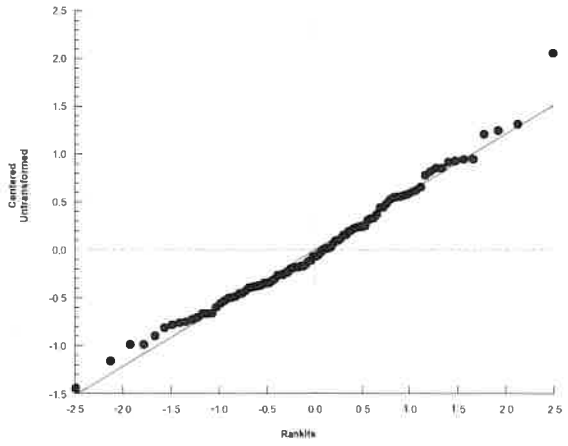
Analysis ID: 02-7704-7679 **Endpoint:** Length **CETIS Version:** CETISv1.9.4
Analyzed: 22 May-21 11:29 **Analysis:** Parametric-Control vs Treatments **Status Level:** 1

Length Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Lab Control		10.5	10.62	11.42	10.87
10Cu Control		10.79	11	10.29	10.6
15Cu Control		10.69	10.33	12	11.31
20Cu Control		10.92	10.69	12.11	11
FR_UFR1 + 20Cu		9.917	9.857	10.15	11.73
GH_ER2 +15Cu		10.5	11.29	11	10.6
CM_MC1 + 15Cu	XC	10.5	11.88	10.17	11.17
LC_SLC + 15Cu		12	11.9	10.93	11
FR_FRABCH + 20C		10.33	10	10.6	11.08
FR_FRCP1 + 20Cu		12	10.83	10.45	11.43
GH_FR1 + 20Cu		11.18	10.25	9.846	11.23
GH_ERC + 10Cu		10.5	10.31	10.69	10.46
CM_MC2 + 20Cu		9.429	9.733	10.29	11.08
RG_MIDAG + 15Cu		10.4	10.6	10.83	11.25
EV_MC2 + 20Cu		10.08	11.11	10.42	11.36
EV_HC1 + 20Cu		10.67	10.42	10.31	10.9
LC_DCDS + 20Cu		12.38	10.18	10.71	11.4
LC_LC3 + 20Cu		10.92	10.13	10.62	11.25
LC_LC5 + 20Cu		10.07	10.86	11	12.3
LC_LCDSSLCC20C		10.71	10.5	10.62	10.93
FR_FR4 + 20Cu		11	10.45	11.12	11.9
FR_FR2 + 20Cu		9.286	9	11	12.5
FR_MULTIPLATE2		11.2	10.58	10.23	11.55
FR_FRRD + 20Cu		9.917	10	11.67	11.67

Graphics





Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID:	20-9153-0192	**Endpoint:**	Proportion Normal	**CETIS Version:**	CETISv1.9.4
Analyzed:	01 Jun-21 8:35	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1
Batch ID:	16-2689-7673	**Test Type:**	32 Day Fathead Minnow Test	**Analyst:**	Kayla Knol
Start Date:	06 Mar-21	**Protocol:**	ASTM E1241-05 (2013)	**Diluent:**	Dechlorinated Tap Water
Ending Date:	07 Apr-21	**Species:**	Pimephales promelas	**Brine:**	
Test Length:	32d 0h	**Taxon:**	Actinopterygii	**Source:**	Aquatox, AR **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
Lab Control	08-8280-1106	02 Mar-21	03 Mar-21	96h	Teck Coal Ltd	
10Cu Control	01-9333-5370	02 Mar-21	03 Mar-21	96h		
15Cu Control	19-6548-0518	02 Mar-21	03 Mar-21	96h		
20Cu Control	00-8675-6744	02 Mar-21	03 Mar-21	96h		
FR_UFR1 + 20Cu	20-4721-8257	02 Mar-21	03 Mar-21	96h (4.6 °C)		
GH_ER2 +15Cu	01-1137-9253	02 Mar-21	03 Mar-21	96h (4.2 °C)		
CM_MC1 + 15Cu	01-3772-5048	02 Mar-21	03 Mar-21	96h (1 °C)		
LC_SLC + 15Cu	01-2380-6574	02 Mar-21	03 Mar-21	96h (3.1 °C)		
FR_FRABCH + 20C	08-4134-0746	02 Mar-21	03 Mar-21	96h (3.8 °C)		
FR_FRCP1 + 20Cu	11-2694-6466	02 Mar-21	03 Mar-21	96h (3 °C)		
GH_FR1 + 20Cu	20-1635-3152	02 Mar-21	03 Mar-21	96h (2.4 °C)		
GH_ERC + 10Cu	05-1950-5597	02 Mar-21	03 Mar-21	96h (4.1 °C)		
CM_MC2 + 20Cu	14-4685-1067	02 Mar-21	03 Mar-21	96h (0.3 °C)		
RG_MIDAG + 15Cu	21-3889-1829	02 Mar-21	03 Mar-21	96h (0.6 °C)		
EV_MC2 + 20Cu	05-6103-5191	02 Mar-21	03 Mar-21	96h (4.4 °C)		
EV_HC1 + 20Cu	12-5501-3302	02 Mar-21	03 Mar-21	96h (3.4 °C)		
LC_DCDS + 20Cu	04-1088-5978	02 Mar-21	03 Mar-21	96h (0.6 °C)		
LC_LC3 + 20Cu	14-7773-4190	02 Mar-21	03 Mar-21	96h (2.3 °C)		
LC_LC5 + 20Cu	01-7235-6798	02 Mar-21	03 Mar-21	96h (0.6 °C)		
LC_LCDSSLCC20C	06-4197-2641	02 Mar-21	03 Mar-21	96h (2.4 °C)		
FR_FR4 + 20Cu	10-9481-5020	02 Mar-21	03 Mar-21	96h (5.4 °C)		
FR_FR2 + 20Cu	00-3159-8672	02 Mar-21	03 Mar-21	96h (4.4 °C)		
FR_MULTIPLATE2	02-2179-0364	02 Mar-21	03 Mar-21	96h (2.9 °C)		
FR_FRRD + 20Cu	19-5167-8345	02 Mar-21	03 Mar-21	96h (6.2 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
Lab Control	Ambient Sample	Teck Coal Ltd	Lab Control	
10Cu Control	Ambient Sample	Teck Coal Ltd	10Cu Control	
15Cu Control	Ambient Sample	Teck Coal Ltd	15Cu Control	
20Cu Control	Ambient Sample	Teck Coal Ltd	20Cu Control	
FR_UFR1 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_UFR1_MON_2021-03-0	
GH_ER2 +15Cu	Ambient Sample	Teck Coal Ltd	GH_ER2_WS_2021-03-02_	
CM_MC1 + 15Cu	Ambient Sample	Teck Coal Ltd	CM_MC1_WS_2021-03-02	
LC_SLC + 15Cu	Ambient Sample	Teck Coal Ltd	LC_SLC_WS_2021-03-02_	
FR_FRABCH + 20C	Ambient Sample	Teck Coal Ltd	FR_FRABCH_MON_2021-	
FR_FRCP1 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FRCP1_MON_2021-03	
GH_FR1 + 20Cu	Ambient Sample	Teck Coal Ltd	GH_FR1_WS_2021-03-02_	
GH_ERC + 10Cu	Ambient Sample	Teck Coal Ltd	GH_ERC_WS_2021-03-02	
CM_MC2 + 20Cu	Ambient Sample	Teck Coal Ltd	CM_MC2_WS_2021-03-02	
RG_MIDAG + 15Cu	Ambient Sample	Teck Coal Ltd	RG_MIDAG_WS_2021-03-	
EV_MC2 + 20Cu	Ambient Sample	Teck Coal Ltd	EV_MC2_WS_2021_Q1_W	
EV_HC1 + 20Cu	Ambient Sample	Teck Coal Ltd	EV_HC1_WS_2021_Q1_W	
LC_DCDS + 20Cu	Ambient Sample	Teck Coal Ltd	LC_DCDS_WS_2021-03-02	
LC_LC3 + 20Cu	Ambient Sample	Teck Coal Ltd	LC_LC3_WS_2021-03-02_	
LC_LC5 + 20Cu	Ambient Sample	Teck Coal Ltd	LC_LC5_WS_2021-03-02_	
LC_LCDSSLCC20C	Ambient Sample	Teck Coal Ltd	LC_LCDSSLCC_WS_2021-	
FR_FR4 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FR4_WS_2021-03-02_	
FR_FR2 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FR2_WS_2021-03-02_	

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID:	20-9153-0192	**Endpoint:**	Proportion Normal	**CETIS Version:**	CETISv1.9.4
Analyzed:	01 Jun-21 8:35	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_MULTIPLATE2	Ambient Sample	Teck Coal Ltd	FR_MULTIPLATE_WS_202	
FR_FRRD + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FRRD_WS_2021-03-02	

Fisher Exact/Bonferroni Adj Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
Site Control		Lab Control	1.0000	Exact	1.0000	Non-Significant Effect
		10Cu Control	1.0000	Exact	1.0000	Non-Significant Effect
		15Cu Control	1.0000	Exact	1.0000	Non-Significant Effect
		20Cu Control	0.9995	Exact	1.0000	Non-Significant Effect
		FR_UFR1 + 20Cu	1.0000	Exact	1.0000	Non-Significant Effect
		GH_ER2 +15Cu	0.4802	Exact	1.0000	Non-Significant Effect
		LC_SLC + 15Cu	1.0000	Exact	1.0000	Non-Significant Effect
		FR_FRABCH + 20C	0.9965	Exact	1.0000	Non-Significant Effect
		FR_FRCP1 + 20Cu	0.9955	Exact	1.0000	Non-Significant Effect
		GH_FR1 + 20Cu	0.9904	Exact	1.0000	Non-Significant Effect
		GH_ERC + 10Cu	0.8475	Exact	1.0000	Non-Significant Effect
		CM_MC2 + 20Cu	0.9984	Exact	1.0000	Non-Significant Effect
		RG_MIDAG + 15Cu	0.9954	Exact	1.0000	Non-Significant Effect
		EV_MC2 + 20Cu	0.9993	Exact	1.0000	Non-Significant Effect
		EV_HC1 + 20Cu	0.9994	Exact	1.0000	Non-Significant Effect
		LC_DCDS + 20Cu	0.9949	Exact	1.0000	Non-Significant Effect
		LC_LC3 + 20Cu	0.9980	Exact	1.0000	Non-Significant Effect
		LC_LC5 + 20Cu	1.0000	Exact	1.0000	Non-Significant Effect
		LC_LCDSSLCC20Cu	0.9997	Exact	1.0000	Non-Significant Effect
		FR_FR4 + 20Cu	1.0000	Exact	1.0000	Non-Significant Effect
		FR_FR2 + 20Cu	0.9712	Exact	1.0000	Non-Significant Effect
		FR_MULTIPLATE20	1.0000	Exact	1.0000	Non-Significant Effect
		FR_FRRD + 20Cu	0.9944	Exact	1.0000	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	4.105	3.37	0.0017	Outlier Detected

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 20-9153-0192 **Endpoint:** Proportion Normal **CETIS Version:** CETISv1.9.4
Analyzed: 01 Jun-21 8:35 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Data Summary

Sample	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
Lab Control		54	0	54	1	0	-27.27%
10Cu Control		56	0	56	1	0	-27.27%
15Cu Control		50	0	50	1	0	-27.27%
20Cu Control		47	1	48	0.9792	0.02083	-24.62%
FR_UFR1 + 20Cu		50	0	50	1	0	-27.27%
GH_ER2 +15Cu		14	5	19	0.7368	0.2632	6.22%
CM_MC1 + 15Cu	XC	22	6	28	0.7857	0.2143	0.0%
LC_SLC + 15Cu		47	0	47	1	0	-27.27%
FR_FRABCH + 20C		45	2	47	0.9574	0.04255	-21.86%
FR_FRCP1 + 20Cu		28	1	29	0.9655	0.03448	-22.88%
GH_FR1 + 20Cu		46	3	49	0.9388	0.06122	-19.48%
GH_ERC + 10Cu		45	8	53	0.8491	0.1509	-8.06%
CM_MC2 + 20Cu		54	2	56	0.9643	0.03571	-22.73%
RG_MIDAG + 15Cu		42	2	44	0.9545	0.04545	-21.49%
EV_MC2 + 20Cu		45	1	46	0.9783	0.02174	-24.51%
EV_HC1 + 20Cu		46	1	47	0.9787	0.02128	-24.56%
LC_DCDS + 20Cu		41	2	43	0.9535	0.04651	-21.35%
LC_LC3 + 20Cu		51	2	53	0.9623	0.03774	-22.47%
LC_LC5 + 20Cu		52	0	52	1	0	-27.27%
LC_LCDSSLCC20C		52	1	53	0.9811	0.01887	-24.87%
FR_FR4 + 20Cu		38	0	38	1	0	-27.27%
FR_FR2 + 20Cu		25	2	27	0.9259	0.07407	-17.85%
FR_MULTIPLATE20		46	0	46	1	0	-27.27%
FR_FRRD + 20Cu		40	2	42	0.9524	0.04762	-21.21%

Proportion Normal Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Lab Control		1.0000	1.0000	1.0000	1.0000
10Cu Control		1.0000	1.0000	1.0000	1.0000
15Cu Control		1.0000	1.0000	1.0000	1.0000
20Cu Control		0.9167	1.0000	1.0000	1.0000
FR_UFR1 + 20Cu		1.0000	1.0000	1.0000	1.0000
GH_ER2 +15Cu		0.7500	0.8571	1.0000	0.4000
CM_MC1 + 15Cu	XC	0.6250	0.8750	0.6667	1.0000
LC_SLC + 15Cu		1.0000	1.0000	1.0000	1.0000
FR_FRABCH + 20C		1.0000	1.0000	0.8000	1.0000
FR_FRCP1 + 20Cu		1.0000	0.8333	1.0000	1.0000
GH_FR1 + 20Cu		1.0000	1.0000	0.9231	0.8462
GH_ERC + 10Cu		0.7857	0.7692	0.9231	0.9231
CM_MC2 + 20Cu		1.0000	0.9333	0.9286	1.0000
RG_MIDAG + 15Cu		0.9000	1.0000	1.0000	0.9167
EV_MC2 + 20Cu		0.9231	1.0000	1.0000	1.0000
EV_HC1 + 20Cu		0.9167	1.0000	1.0000	1.0000
LC_DCDS + 20Cu		1.0000	0.9091	0.9286	1.0000
LC_LC3 + 20Cu		1.0000	0.9333	1.0000	0.9167
LC_LC5 + 20Cu		1.0000	1.0000	1.0000	1.0000
LC_LCDSSLCC20C		1.0000	0.9167	1.0000	1.0000
FR_FR4 + 20Cu		1.0000	1.0000	1.0000	1.0000
FR_FR2 + 20Cu		0.8571	0.8571	1.0000	1.0000
FR_MULTIPLATE2		1.0000	1.0000	1.0000	1.0000
FR_FRRD + 20Cu		0.9167	0.9167	1.0000	1.0000

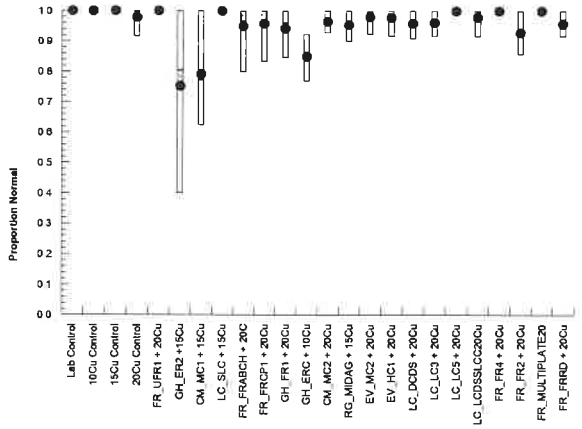
Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 20-9153-0192 **Endpoint:** Proportion Normal **CETIS Version:** CETISv1.9.4
Analyzed: 01 Jun-21 8:35 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Proportion Normal Binomials

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Lab Control		14/14	13/13	12/12	15/15
10Cu Control		14/14	13/13	14/14	15/15
15Cu Control		13/13	15/15	9/9	13/13
20Cu Control		11/12	13/13	9/9	14/14
FR_UFR1 + 20Cu		12/12	14/14	13/13	11/11
GH_ER2 +15Cu		3/4	6/7	3/3	2/5
CM_MC1 + 15Cu	XC	5/8	7/8	4/6	6/6
LC_SLC + 15Cu		9/9	10/10	14/14	14/14
FR_FRABCH + 20C		12/12	13/13	8/10	12/12
FR_FRCP1 + 20Cu		5/5	5/6	11/11	7/7
GH_FR1 + 20Cu		11/11	12/12	12/13	11/13
GH_ERC + 10Cu		11/14	10/13	12/13	12/13
CM_MC2 + 20Cu		14/14	14/15	13/14	13/13
RG_MIDAG + 15Cu		9/10	10/10	12/12	11/12
EV_MC2 + 20Cu		12/13	9/9	12/12	11/11
EV_HC1 + 20Cu		11/12	12/12	13/13	10/10
LC_DCDS + 20Cu		8/8	10/11	13/14	10/10
LC_LC3 + 20Cu		13/13	14/15	13/13	11/12
LC_LC5 + 20Cu		15/15	14/14	13/13	10/10
LC_LCDSSLCC20C		14/14	11/12	13/13	14/14
FR_FR4 + 20Cu		9/9	11/11	8/8	10/10
FR_FR2 + 20Cu		6/7	6/7	9/9	4/4
FR_MULTIPLATE2		10/10	12/12	13/13	11/11
FR_FRRD + 20Cu		11/12	11/12	9/9	9/9

Graphics



JUN 10 2021

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID:	12-1420-8751	**Endpoint:**	Post Hatch Survival	**CETIS Version:**	CETISv1.9.4
Analyzed:	22 May-21 11:26	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1
Batch ID:	16-2689-7673	**Test Type:**	32 Day Fathead Minnow Test	**Analyst:**	Kayla Knol
Start Date:	06 Mar-21	**Protocol:**	ASTM E1241-05 (2013)	**Diluent:**	Dechlorinated Tap Water
Ending Date:	07 Apr-21	**Species:**	Pimephales promelas	**Brine:**	
Test Length:	32d 0h	**Taxon:**	Actinopterygii	**Source:**	Aquatox, AR **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
Lab Control	08-8280-1106	02 Mar-21	03 Mar-21	96h	Teck Coal Ltd	
10Cu Control	01-9333-5370	02 Mar-21	03 Mar-21	96h		
15Cu Control	19-6548-0518	02 Mar-21	03 Mar-21	96h		
20Cu Control	00-8675-6744	02 Mar-21	03 Mar-21	96h		
FR_UFR1 + 20Cu	20-4721-8257	02 Mar-21	03 Mar-21	96h (4.6 °C)		
GH_ER2 +15Cu	01-1137-9253	02 Mar-21	03 Mar-21	96h (4.2 °C)		
CM_MC1 + 15Cu	01-3772-5048	02 Mar-21	03 Mar-21	96h (1 °C)		
LC_SLC + 15Cu	01-2380-6574	02 Mar-21	03 Mar-21	96h (3.1 °C)		
FR_FRABCH + 20C	08-4134-0746	02 Mar-21	03 Mar-21	96h (3.8 °C)		
FR_FRCP1 + 20Cu	11-2694-6466	02 Mar-21	03 Mar-21	96h (3 °C)		
GH_FR1 + 20Cu	20-1635-3152	02 Mar-21	03 Mar-21	96h (2.4 °C)		
GH_ERC + 10Cu	05-1950-5597	02 Mar-21	03 Mar-21	96h (4.1 °C)		
CM_MC2 + 20Cu	14-4685-1067	02 Mar-21	03 Mar-21	96h (0.3 °C)		
RG_MIDAG + 15Cu	21-3889-1829	02 Mar-21	03 Mar-21	96h (0.6 °C)		
EV_MC2 + 20Cu	05-6103-5191	02 Mar-21	03 Mar-21	96h (4.4 °C)		
EV_HC1 + 20Cu	12-5501-3302	02 Mar-21	03 Mar-21	96h (3.4 °C)		
LC_DCDS + 20Cu	04-1088-5978	02 Mar-21	03 Mar-21	96h (0.6 °C)		
LC_LC3 + 20Cu	14-7773-4190	02 Mar-21	03 Mar-21	96h (2.3 °C)		
LC_LC5 + 20Cu	01-7235-6798	02 Mar-21	03 Mar-21	96h (0.6 °C)		
LC_LCDSSLCC20C	06-4197-2641	02 Mar-21	03 Mar-21	96h (2.4 °C)		
FR_FR4 + 20Cu	10-9481-5020	02 Mar-21	03 Mar-21	96h (5.4 °C)		
FR_FR2 + 20Cu	00-3159-8672	02 Mar-21	03 Mar-21	96h (4.4 °C)		
FR_MULTIPLATE2	02-2179-0364	02 Mar-21	03 Mar-21	96h (2.9 °C)		
FR_FRRD + 20Cu	19-5167-8345	02 Mar-21	03 Mar-21	96h (6.2 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
Lab Control	Ambient Sample	Teck Coal Ltd	Lab Control	
10Cu Control	Ambient Sample	Teck Coal Ltd	10Cu Control	
15Cu Control	Ambient Sample	Teck Coal Ltd	15Cu Control	
20Cu Control	Ambient Sample	Teck Coal Ltd	20Cu Control	
FR_UFR1 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_UFR1_MON_2021-03-0	
GH_ER2 +15Cu	Ambient Sample	Teck Coal Ltd	GH_ER2_WS_2021-03-02_	
CM_MC1 + 15Cu	Ambient Sample	Teck Coal Ltd	CM_MC1_WS_2021-03-02	
LC_SLC + 15Cu	Ambient Sample	Teck Coal Ltd	LC_SLC_WS_2021-03-02_	
FR_FRABCH + 20C	Ambient Sample	Teck Coal Ltd	FR_FRABCH_MON_2021-	
FR_FRCP1 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FRCP1_MON_2021-03	
GH_FR1 + 20Cu	Ambient Sample	Teck Coal Ltd	GH_FR1_WS_2021-03-02_	
GH_ERC + 10Cu	Ambient Sample	Teck Coal Ltd	GH_ERC_WS_2021-03-02	
CM_MC2 + 20Cu	Ambient Sample	Teck Coal Ltd	CM_MC2_WS_2021-03-02	
RG_MIDAG + 15Cu	Ambient Sample	Teck Coal Ltd	RG_MIDAG_WS_2021-03-	
EV_MC2 + 20Cu	Ambient Sample	Teck Coal Ltd	EV_MC2_WS_2021_Q1_W	
EV_HC1 + 20Cu	Ambient Sample	Teck Coal Ltd	EV_HC1_WS_2021_Q1_W	
LC_DCDS + 20Cu	Ambient Sample	Teck Coal Ltd	LC_DCDS_WS_2021-03-02	
LC_LC3 + 20Cu	Ambient Sample	Teck Coal Ltd	LC_LC3_WS_2021-03-02_	
LC_LC5 + 20Cu	Ambient Sample	Teck Coal Ltd	LC_LC5_WS_2021-03-02_	
LC_LCDSSLCC20C	Ambient Sample	Teck Coal Ltd	LC_LCDSSLCC_WS_2021-	
FR_FR4 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FR4_WS_2021-03-02_	
FR_FR2 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FR2_WS_2021-03-02_	

JUN 10 2021

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 12-1420-8751 **Endpoint:** Post Hatch Survival **CETIS Version:** CETISv1.9.4
Analyzed: 22 May-21 11:26 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_MULTIPLATE2	Ambient Sample	Teck Coal Ltd	FR_MULTIPLATE_WS_202	
FR_FRRD + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FRRD_WS_2021-03-02	

Fisher Exact/Bonferroni Adj Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
Site Control		Lab Control	1.0000	Exact	1.0000	Non-Significant Effect
		10Cu Control	1.0000	Exact	1.0000	Non-Significant Effect
		15Cu Control	1.0000	Exact	1.0000	Non-Significant Effect
		20Cu Control	1.0000	Exact	1.0000	Non-Significant Effect
		FR_UFR1 + 20Cu	1.0000	Exact	1.0000	Non-Significant Effect
		GH_ER2 +15Cu	0.0660	Exact	1.0000	Non-Significant Effect
		LC_SLC + 15Cu	0.9999	Exact	1.0000	Non-Significant Effect
		FR_FRABCH + 20C	0.9999	Exact	1.0000	Non-Significant Effect
		FR_FRCP1 + 20Cu	0.6436	Exact	1.0000	Non-Significant Effect
		GH_FR1 + 20Cu	1.0000	Exact	1.0000	Non-Significant Effect
		GH_ERC + 10Cu	1.0000	Exact	1.0000	Non-Significant Effect
		CM_MC2 + 20Cu	1.0000	Exact	1.0000	Non-Significant Effect
		RG_MIDAG + 15Cu	0.9994	Exact	1.0000	Non-Significant Effect
		EV_MC2 + 20Cu	1.0000	Exact	1.0000	Non-Significant Effect
		EV_HC1 + 20Cu	1.0000	Exact	1.0000	Non-Significant Effect
		LC_DCDS + 20Cu	1.0000	Exact	1.0000	Non-Significant Effect
		LC_LC3 + 20Cu	1.0000	Exact	1.0000	Non-Significant Effect
		LC_LC5 + 20Cu	1.0000	Exact	1.0000	Non-Significant Effect
		LC_LCDSSLCC20Cu	1.0000	Exact	1.0000	Non-Significant Effect
		FR_FR4 + 20Cu	0.9795	Exact	1.0000	Non-Significant Effect
		FR_FR2 + 20Cu	0.5000	Exact	1.0000	Non-Significant Effect
		FR_MULTIPLATE20	0.9999	Exact	1.0000	Non-Significant Effect
		FR_FRRD + 20Cu	0.9994	Exact	1.0000	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	2.592	3.37	0.8135	No Outliers Detected

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 12-1420-8751 **Endpoint:** Post Hatch Survival **CETIS Version:** CETISv1.9.4
Analyzed: 22 May-21 11:26 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Data Summary

Sample	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
Lab Control		54	6	60	0.9	0.1	-89.64%
10Cu Control		56	3	59	0.9492	0.05085	-100.0%
15Cu Control		50	9	59	0.8475	0.1525	-78.57%
20Cu Control		48	9	57	0.8421	0.1579	-77.44%
FR_UFR1 + 20Cu		50	7	57	0.8772	0.1228	-84.84%
GH_ER2 +15Cu		19	40	59	0.322	0.678	32.14%
CM_MC1 + 15Cu	XC	28	31	59	0.4746	0.5254	0.0%
LC_SLC + 15Cu		47	12	59	0.7966	0.2034	-67.86%
FR_FRABCH + 20C		47	12	59	0.7966	0.2034	-67.86%
FR_FRCP1 + 20Cu		29	30	59	0.4915	0.5085	-3.57%
GH_FR1 + 20Cu		49	6	55	0.8909	0.1091	-87.73%
GH_ERC + 10Cu		53	6	59	0.8983	0.1017	-89.29%
CM_MC2 + 20Cu		56	3	59	0.9492	0.05085	-100.0%
RG_MIDAG + 15Cu		44	15	59	0.7458	0.2542	-57.14%
EV_MC2 + 20Cu		46	10	56	0.8214	0.1786	-73.09%
EV_HC1 + 20Cu		47	11	58	0.8103	0.1897	-70.75%
LC_DCDS + 20Cu		43	8	51	0.8431	0.1569	-77.66%
LC_LC3 + 20Cu		53	7	60	0.8833	0.1167	-86.13%
LC_LC5 + 20Cu		52	7	59	0.8814	0.1186	-85.71%
LC_LCDSSLCC20C		53	7	60	0.8833	0.1167	-86.13%
FR_FR4 + 20Cu		38	21	59	0.6441	0.3559	-35.71%
FR_FR2 + 20Cu		27	32	59	0.4576	0.5424	3.57%
FR_MULTIPLATE20		46	13	59	0.7797	0.2203	-64.29%
FR_FRRD + 20Cu		42	14	56	0.75	0.25	-58.04%

Post Hatch Survival Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Lab Control		0.9333	0.8667	0.8000	1.0000
10Cu Control		1.0000	0.8667	0.9333	1.0000
15Cu Control		0.8667	1.0000	0.6000	0.9286
20Cu Control		0.8571	1.0000	0.6000	0.9333
FR_UFR1 + 20Cu		0.9231	0.9333	0.8667	0.7857
GH_ER2 +15Cu		0.2667	0.4667	0.2000	0.3571
CM_MC1 + 15Cu	XC	0.5333	0.5333	0.4286	0.4000
LC_SLC + 15Cu		0.6429	0.6667	0.9333	0.9333
FR_FRABCH + 20C		0.8000	0.8667	0.7143	0.8000
FR_FRCP1 + 20Cu		0.3571	0.4000	0.7333	0.4667
GH_FR1 + 20Cu		0.7857	1.0000	0.8667	0.9286
GH_ERC + 10Cu		0.9333	0.8667	0.9286	0.8667
CM_MC2 + 20Cu		0.9333	1.0000	0.9333	0.9286
RG_MIDAG + 15Cu		0.6667	0.7143	0.8000	0.8000
EV_MC2 + 20Cu		0.9286	0.7500	0.8000	0.8000
EV_HC1 + 20Cu		0.8000	0.8571	0.8667	0.7143
LC_DCDS + 20Cu		0.6667	0.7857	0.9333	1.0000
LC_LC3 + 20Cu		0.8667	1.0000	0.8667	0.8000
LC_LC5 + 20Cu		1.0000	0.9333	0.8667	0.7143
LC_LCDSSLCC20C		0.9333	0.8000	0.8667	0.9333
FR_FR4 + 20Cu		0.6000	0.7333	0.5333	0.7143
FR_FR2 + 20Cu		0.4667	0.4667	0.6429	0.2667
FR_MULTIPLATE2		0.7143	0.8000	0.8667	0.7333
FR_FRRD + 20Cu		0.8571	0.8571	0.6000	0.6923

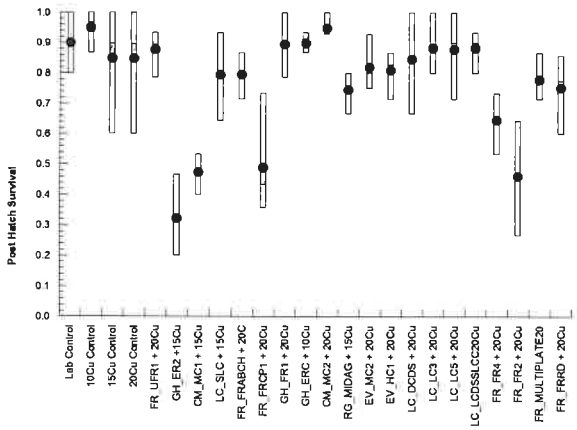
Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 12-1420-8751 **Endpoint:** Post Hatch Survival **CETIS Version:** CETISv1.9.4
Analyzed: 22 May-21 11:26 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Post Hatch Survival Binomials

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Lab Control		14/15	13/15	12/15	15/15
10Cu Control		14/14	13/15	14/15	15/15
15Cu Control		13/15	15/15	9/15	13/14
20Cu Control		12/14	13/13	9/15	14/15
FR_UFR1 + 20Cu		12/13	14/15	13/15	11/14
GH_ER2 +15Cu		4/15	7/15	3/15	5/14
CM_MC1 + 15Cu	XC	8/15	8/15	6/14	6/15
LC_SLC + 15Cu		9/14	10/15	14/15	14/15
FR_FRABCH + 20C		12/15	13/15	10/14	12/15
FR_FRCP1 + 20Cu		5/14	6/15	11/15	7/15
GH_FR1 + 20Cu		11/14	12/12	13/15	13/14
GH_ERC + 10Cu		14/15	13/15	13/14	13/15
CM_MC2 + 20Cu		14/15	15/15	14/15	13/14
RG_MIDAG + 15Cu		10/15	10/14	12/15	12/15
EV_MC2 + 20Cu		13/14	9/12	12/15	12/15
EV_HC1 + 20Cu		12/15	12/14	13/15	10/14
LC_DCDS + 20Cu		8/12	11/14	14/15	10/10
LC_LC3 + 20Cu		13/15	15/15	13/15	12/15
LC_LC5 + 20Cu		15/15	14/15	13/15	10/14
LC_LCDSSLCC20C		14/15	12/15	13/15	14/15
FR_FR4 + 20Cu		9/15	11/15	8/15	10/14
FR_FR2 + 20Cu		7/15	7/15	9/14	4/15
FR_MULTIPLATE2		10/14	12/15	13/15	11/15
FR_FRRD + 20Cu		12/14	12/14	9/15	9/13

Graphics



JUN 10 2021

CETIS Analytical Report

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID:	09-3091-1419	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.9.4
Analyzed:	01 Jun-21 8:38	**Analysis:**	Nonparametric-Control vs Treatments	**Status Level:**	1
Batch ID:	16-2689-7673	**Test Type:**	32 Day Fathead Minnow Test	**Analyst:**	Kayla Knol
Start Date:	06 Mar-21	**Protocol:**	ASTM E1241-05 (2013)	**Diluent:**	Dechlorinated Tap Water
Ending Date:	07 Apr-21	**Species:**	Pimephales promelas	**Brine:**	
Test Length:	32d 0h	**Taxon:**	Actinopterygii	**Source:**	Aquatox, AR **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
Lab Control	08-8280-1106	02 Mar-21	03 Mar-21	96h	Teck Coal Ltd	
10Cu Control	01-9333-5370	02 Mar-21	03 Mar-21	96h		
15Cu Control	19-6548-0518	02 Mar-21	03 Mar-21	96h		
20Cu Control	00-8675-6744	02 Mar-21	03 Mar-21	96h		
FR_UFR1 + 20Cu	20-4721-8257	02 Mar-21	03 Mar-21	96h (4.6 °C)		
GH_ER2 +15Cu	01-1137-9253	02 Mar-21	03 Mar-21	96h (4.2 °C)		
CM_MC1 + 15Cu	01-3772-5048	02 Mar-21	03 Mar-21	96h (1 °C)		
LC_SLC + 15Cu	01-2380-6574	02 Mar-21	03 Mar-21	96h (3.1 °C)		
FR_FRABCH + 20C	08-4134-0746	02 Mar-21	03 Mar-21	96h (3.8 °C)		
FR_FRCP1 + 20Cu	11-2694-6466	02 Mar-21	03 Mar-21	96h (3 °C)		
GH_FR1 + 20Cu	20-1635-3152	02 Mar-21	03 Mar-21	96h (2.4 °C)		
GH_ERC + 10Cu	05-1950-5597	02 Mar-21	03 Mar-21	96h (4.1 °C)		
CM_MC2 + 20Cu	14-4685-1067	02 Mar-21	03 Mar-21	96h (0.3 °C)		
RG_MIDAG + 15Cu	21-3889-1829	02 Mar-21	03 Mar-21	96h (0.6 °C)		
EV_MC2 + 20Cu	05-6103-5191	02 Mar-21	03 Mar-21	96h (4.4 °C)		
EV_HC1 + 20Cu	12-5501-3302	02 Mar-21	03 Mar-21	96h (3.4 °C)		
LC_DCDS + 20Cu	04-1088-5978	02 Mar-21	03 Mar-21	96h (0.6 °C)		
LC_LC3 + 20Cu	14-7773-4190	02 Mar-21	03 Mar-21	96h (2.3 °C)		
LC_LC5 + 20Cu	01-7235-6798	02 Mar-21	03 Mar-21	96h (0.6 °C)		
LC_LCDSSLCC20C	06-4197-2641	02 Mar-21	03 Mar-21	96h (2.4 °C)		
FR_FR4 + 20Cu	10-9481-5020	02 Mar-21	03 Mar-21	96h (5.4 °C)		
FR_FR2 + 20Cu	00-3159-8672	02 Mar-21	03 Mar-21	96h (4.4 °C)		
FR_MULTIPLATE2	02-2179-0364	02 Mar-21	03 Mar-21	96h (2.9 °C)		
FR_FRRD + 20Cu	19-5167-8345	02 Mar-21	03 Mar-21	96h (6.2 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
Lab Control	Ambient Sample	Teck Coal Ltd	Lab Control	
10Cu Control	Ambient Sample	Teck Coal Ltd	10Cu Control	
15Cu Control	Ambient Sample	Teck Coal Ltd	15Cu Control	
20Cu Control	Ambient Sample	Teck Coal Ltd	20Cu Control	
FR_UFR1 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_UFR1_MON_2021-03-0	
GH_ER2 +15Cu	Ambient Sample	Teck Coal Ltd	GH_ER2_WS_2021-03-02_	
CM_MC1 + 15Cu	Ambient Sample	Teck Coal Ltd	CM_MC1_WS_2021-03-02	
LC_SLC + 15Cu	Ambient Sample	Teck Coal Ltd	LC_SLC_WS_2021-03-02_	
FR_FRABCH + 20C	Ambient Sample	Teck Coal Ltd	FR_FRABCH_MON_2021-	
FR_FRCP1 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FRCP1_MON_2021-03	
GH_FR1 + 20Cu	Ambient Sample	Teck Coal Ltd	GH_FR1_WS_2021-03-02_	
GH_ERC + 10Cu	Ambient Sample	Teck Coal Ltd	GH_ERC_WS_2021-03-02	
CM_MC2 + 20Cu	Ambient Sample	Teck Coal Ltd	CM_MC2_WS_2021-03-02	
RG_MIDAG + 15Cu	Ambient Sample	Teck Coal Ltd	RG_MIDAG_WS_2021-03-	
EV_MC2 + 20Cu	Ambient Sample	Teck Coal Ltd	EV_MC2_WS_2021_Q1_W	
EV_HC1 + 20Cu	Ambient Sample	Teck Coal Ltd	EV_HC1_WS_2021_Q1_W	
LC_DCDS + 20Cu	Ambient Sample	Teck Coal Ltd	LC_DCDS_WS_2021-03-02	
LC_LC3 + 20Cu	Ambient Sample	Teck Coal Ltd	LC_LC3_WS_2021-03-02_	
LC_LC5 + 20Cu	Ambient Sample	Teck Coal Ltd	LC_LC5_WS_2021-03-02_	
LC_LCDSSLCC20C	Ambient Sample	Teck Coal Ltd	LC_LCDSSLCC_WS_2021-	
FR_FR4 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FR4_WS_2021-03-02_	
FR_FR2 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FR2_WS_2021-03-02_	

Analyst: KLC QA: MG JUN 10 2021

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 09-3091-1419 **Endpoint:** Mean Dry Biomass-mg **CETIS Version:** CETISv1.9.4
Analyzed: 01 Jun-21 8:38 **Analysis:** Nonparametric-Control vs Treatments **Status Level:** 1

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_MULTIPLATE2	Ambient Sample	Teck Coal Ltd	FR_MULTIPLATE_WS_202	
FR_FRRD + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FRRD_WS_2021-03-02	

Nemenyi-Damico-Wolfe Test

Sample I	vs	Sample II	Test Stat	Critical	Ties	P-Type	P-Value	Decision(α:5%)
Site Control		Lab Control	-102	211.4	2	CDF	0.9997	Non-Significant Effect
		10Cu Control	-69	211.4	2	CDF	0.9979	Non-Significant Effect
		15Cu Control	-136	211.4	2	CDF	1.0000	Non-Significant Effect
		20Cu Control	-128	211.4	2	CDF	0.9999	Non-Significant Effect
		FR_UFR1 + 20Cu	-69	211.4	2	CDF	0.9979	Non-Significant Effect
		GH_ER2 +15Cu	134	211.4	2	CDF	0.3333	Non-Significant Effect
		CM_MC1 + 15Cu	85	211.4	2	CDF	0.6378	Non-Significant Effect
		FR_FRABCH + 20C	-10	211.4	2	CDF	0.9710	Non-Significant Effect
		FR_FRCP1 + 20Cu	92	211.4	2	CDF	0.5948	Non-Significant Effect
		GH_FR1 + 20Cu	-98.5	211.4	2	CDF	0.9996	Non-Significant Effect
		GH_ERC + 10Cu	-107	211.4	2	CDF	0.9998	Non-Significant Effect
		CM_MC2 + 20Cu	-21	211.4	2	CDF	0.9810	Non-Significant Effect
		RG_MIDAG + 15Cu	35.5	211.4	2	CDF	0.8755	Non-Significant Effect
		EV_MC2 + 20Cu	5	211.4	2	CDF	0.9505	Non-Significant Effect
		EV_HC1 + 20Cu	-85.5	211.4	2	CDF	0.9991	Non-Significant Effect
		LC_DCDS + 20Cu	-55	211.4	2	CDF	0.9958	Non-Significant Effect
		LC_LC3 + 20Cu	-34	211.4	2	CDF	0.9890	Non-Significant Effect
		LC_LC5 + 20Cu	-68	211.4	2	CDF	0.9978	Non-Significant Effect
		LC_LCDSSLCC20Cu	-38	211.4	2	CDF	0.9907	Non-Significant Effect
		FR_FR4 + 20Cu	13.5	211.4	2	CDF	0.9346	Non-Significant Effect
		FR_FR2 + 20Cu	138	211.4	2	CDF	0.3105	Non-Significant Effect
		FR_MULTIPLATE20	-111	211.4	2	CDF	0.9998	Non-Significant Effect
		FR_FRRD + 20Cu	-115	211.4	2	CDF	0.9999	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	2.393	3.37	1.0000	No Outliers Detected
Treatment Effect	Fligner-Wolfe Omnibus Test	4431		0.7115	Non-Significant Overall Effect
Treatment Effect	Kruskal-Wallis Omnibus Test	48.55	35.17	0.0014	Significant Overall Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	9.6416	0.4192	23	4.746	1.9E-07	Significant Effect
Error	6.35993	0.0883324	72			
Total	16.0015		95			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Variances	Bartlett Equality of Variance Test	15.29	35.17	0.8840	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9376	0.9737	1.9E-04	Non-Normal Distribution

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 09-3091-1419 **Endpoint:** Mean Dry Biomass-mg **CETIS Version:** CETISv1.9.4
Analyzed: 01 Jun-21 8:38 **Analysis:** Nonparametric-Control vs Treatments **Status Level:** 1

Mean Dry Biomass-mg Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
Lab Control		4	2.276	1.813	2.739	2.216	1.989	2.681	0.1455	12.79%	0.00%
10Cu Control		4	2.164	1.858	2.471	2.08	2.048	2.45	0.09618	8.89%	4.89%
15Cu Control		4	2.423	1.816	3.031	2.311	2.096	2.975	0.191	15.76%	-6.49%
20Cu Control		4	2.343	1.952	2.734	2.305	2.085	2.677	0.1229	10.49%	-2.94%
FR_UFR1 + 20Cu		4	2.254	1.609	2.9	2.06	2.035	2.862	0.2028	18.00%	0.94%
GH_ER2 +15Cu		4	1.181	0.4596	1.902	1.135	0.6767	1.777	0.2266	38.38%	48.12%
CM_MC1 + 15Cu		4	1.604	1.076	2.132	1.478	1.367	2.092	0.166	20.69%	29.52%
LC_SLC + 15Cu	XC	4	2.008	1.849	2.167	2.005	1.908	2.114	0.04997	4.98%	11.75%
FR_FRABCH + 20C		4	2.097	1.427	2.766	1.929	1.814	2.716	0.2103	20.06%	7.86%
FR_FRCP1 + 20Cu		4	1.699	1.29	2.108	1.729	1.358	1.98	0.1285	15.13%	25.34%
GH_FR1 + 20Cu		4	2.278	1.812	2.745	2.307	1.917	2.584	0.1465	12.86%	-0.12%
GH_ERC + 10Cu		4	2.248	1.979	2.517	2.217	2.095	2.463	0.08461	7.53%	1.22%
CM_MC2 + 20Cu		4	2.049	1.554	2.544	2.058	1.671	2.409	0.1556	15.19%	9.96%
RG_MIDAG + 15Cu		4	1.9	1.521	2.278	1.856	1.677	2.209	0.1189	12.52%	16.52%
EV_MC2 + 20Cu		4	2	1.594	2.406	1.937	1.765	2.361	0.1276	12.76%	12.10%
EV_HC1 + 20Cu		4	2.2	1.928	2.471	2.171	2.024	2.433	0.0853	7.75%	3.33%
LC_DCDS + 20Cu		4	2.111	1.845	2.377	2.162	1.875	2.245	0.08356	7.92%	7.22%
LC_LC3 + 20Cu		4	2.076	1.846	2.306	2.072	1.927	2.233	0.0723	6.96%	8.76%
LC_LC5 + 20Cu		4	2.19	1.749	2.631	2.166	1.906	2.523	0.1385	12.65%	3.75%
LC_LCDSSLCC20C		4	2.097	1.762	2.432	2.051	1.923	2.363	0.1054	10.05%	7.85%
FR_FR4 + 20Cu		4	2.013	1.388	2.639	1.85	1.754	2.599	0.1965	19.52%	11.53%
FR_FR2 + 20Cu		4	1.239	0.6549	1.824	1.13	0.96	1.738	0.1837	29.64%	45.54%
FR_MULTIPLATE2		4	2.352	1.754	2.949	2.25	2.019	2.888	0.1877	15.96%	-3.35%
FR_FRRD + 20Cu		4	2.338	1.844	2.832	2.304	2.016	2.729	0.1553	13.28%	-2.75%

Mean Dry Biomass-mg Detail

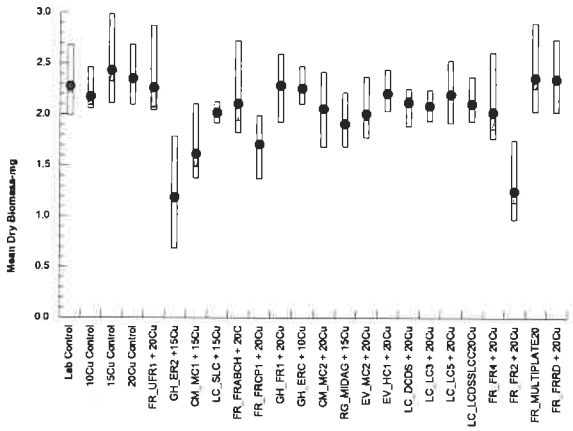
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Lab Control		2.222	1.989	2.211	2.681
10Cu Control		2.109	2.051	2.048	2.45
15Cu Control		2.293	2.096	2.329	2.975
20Cu Control		2.297	2.085	2.313	2.677
FR_UFR1 + 20Cu		2.078	2.035	2.042	2.862
GH_ER2 +15Cu		1.17	1.777	0.6767	1.099
CM_MC1 + 15Cu		1.429	2.092	1.367	1.527
LC_SLC + 15Cu	XC	2.071	1.939	1.908	2.114
FR_FRABCH + 20C		1.855	1.814	2.003	2.716
FR_FRCP1 + 20Cu		1.705	1.358	1.98	1.753
GH_FR1 + 20Cu		2.433	2.181	1.917	2.584
GH_ERC + 10Cu		2.095	2.463	2.131	2.302
CM_MC2 + 20Cu		1.963	1.671	2.153	2.409
RG_MIDAG + 15Cu		1.677	1.754	2.209	1.959
EV_MC2 + 20Cu		1.967	1.907	1.765	2.361
EV_HC1 + 20Cu		2.155	2.024	2.188	2.433
LC_DCDS + 20Cu		2.245	1.875	2.113	2.212
LC_LC3 + 20Cu		2.233	1.927	1.983	2.161
LC_LC5 + 20Cu		1.906	2.029	2.304	2.523
LC_LCDSSLCC20C		1.923	1.933	2.169	2.363
FR_FR4 + 20Cu		1.754	1.838	1.863	2.599
FR_FR2 + 20Cu		0.9653	0.96	1.738	1.294
FR_MULTIPLATE2		2.295	2.019	2.205	2.888
FR_FRRD + 20Cu		2.016	2.181	2.427	2.729

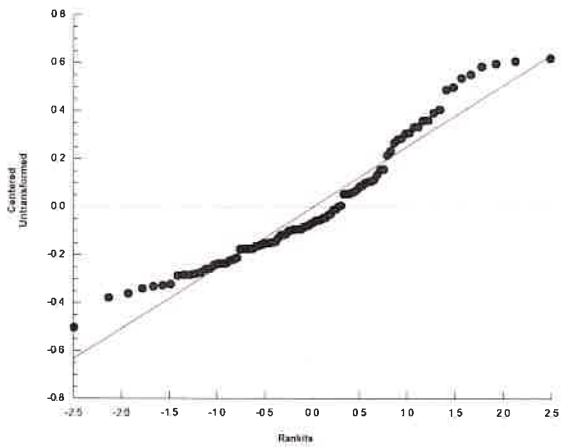
JUN 10 2021

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID:	09-3091-1419	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.9.4
Analyzed:	01 Jun-21 8:38	**Analysis:**	Nonparametric-Control vs Treatments	**Status Level:**	1

Graphics





JUN 10 2021

CETIS Analytical Report

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID:	16-8608-7207	**Endpoint:**	Hatch Rate	**CETIS Version:**	CETISv1.9.4
Analyzed:	22 May-21 11:31	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1
Batch ID:	16-2689-7673	**Test Type:**	32 Day Fathead Minnow Test	**Analyst:**	Kayla Knol
Start Date:	06 Mar-21	**Protocol:**	ASTM E1241-05 (2013)	**Diluent:**	Dechlorinated Tap Water
Ending Date:	07 Apr-21	**Species:**	Pimephales promelas	**Brine:**	
Test Length:	32d 0h	**Taxon:**	Actinopterygii	**Source:**	Aquatox, AR **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
Lab Control	08-8280-1106	02 Mar-21	03 Mar-21	96h	Teck Coal Ltd	
10Cu Control	01-9333-5370	02 Mar-21	03 Mar-21	96h		
15Cu Control	19-6548-0518	02 Mar-21	03 Mar-21	96h		
20Cu Control	00-8675-6744	02 Mar-21	03 Mar-21	96h		
FR_UFR1 + 20Cu	20-4721-8257	02 Mar-21	03 Mar-21	96h (4.6 °C)		
GH_ER2 +15Cu	01-1137-9253	02 Mar-21	03 Mar-21	96h (4.2 °C)		
CM_MC1 + 15Cu	01-3772-5048	02 Mar-21	03 Mar-21	96h (1 °C)		
LC_SLC + 15Cu	01-2380-6574	02 Mar-21	03 Mar-21	96h (3.1 °C)		
FR_FRABCH + 20C	08-4134-0746	02 Mar-21	03 Mar-21	96h (3.8 °C)		
FR_FRCP1 + 20Cu	11-2694-6466	02 Mar-21	03 Mar-21	96h (3 °C)		
GH_FR1 + 20Cu	20-1635-3152	02 Mar-21	03 Mar-21	96h (2.4 °C)		
GH_ERC + 10Cu	05-1950-5597	02 Mar-21	03 Mar-21	96h (4.1 °C)		
CM_MC2 + 20Cu	14-4685-1067	02 Mar-21	03 Mar-21	96h (0.3 °C)		
RG_MIDAG + 15Cu	21-3889-1829	02 Mar-21	03 Mar-21	96h (0.6 °C)		
EV_MC2 + 20Cu	05-6103-5191	02 Mar-21	03 Mar-21	96h (4.4 °C)		
EV_HC1 + 20Cu	12-5501-3302	02 Mar-21	03 Mar-21	96h (3.4 °C)		
LC_DCDS + 20Cu	04-1088-5978	02 Mar-21	03 Mar-21	96h (0.6 °C)		
LC_LC3 + 20Cu	14-7773-4190	02 Mar-21	03 Mar-21	96h (2.3 °C)		
LC_LC5 + 20Cu	01-7235-6798	02 Mar-21	03 Mar-21	96h (0.6 °C)		
LC_LCDSSLCC20C	06-4197-2641	02 Mar-21	03 Mar-21	96h (2.4 °C)		
FR_FR4 + 20Cu	10-9481-5020	02 Mar-21	03 Mar-21	96h (5.4 °C)		
FR_FR2 + 20Cu	00-3159-8672	02 Mar-21	03 Mar-21	96h (4.4 °C)		
FR_MULTIPLATE2	02-2179-0364	02 Mar-21	03 Mar-21	96h (2.9 °C)		
FR_FRRD + 20Cu	19-5167-8345	02 Mar-21	03 Mar-21	96h (6.2 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
Lab Control	Ambient Sample	Teck Coal Ltd	Lab Control	
10Cu Control	Ambient Sample	Teck Coal Ltd	10Cu Control	
15Cu Control	Ambient Sample	Teck Coal Ltd	15Cu Control	
20Cu Control	Ambient Sample	Teck Coal Ltd	20Cu Control	
FR_UFR1 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_UFR1_MON_2021-03-0	
GH_ER2 +15Cu	Ambient Sample	Teck Coal Ltd	GH_ER2_WS_2021-03-02_	
CM_MC1 + 15Cu	Ambient Sample	Teck Coal Ltd	CM_MC1_WS_2021-03-02	
LC_SLC + 15Cu	Ambient Sample	Teck Coal Ltd	LC_SLC_WS_2021-03-02_	
FR_FRABCH + 20C	Ambient Sample	Teck Coal Ltd	FR_FRABCH_MON_2021-	
FR_FRCP1 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FRCP1_MON_2021-03	
GH_FR1 + 20Cu	Ambient Sample	Teck Coal Ltd	GH_FR1_WS_2021-03-02_	
GH_ERC + 10Cu	Ambient Sample	Teck Coal Ltd	GH_ERC_WS_2021-03-02	
CM_MC2 + 20Cu	Ambient Sample	Teck Coal Ltd	CM_MC2_WS_2021-03-02	
RG_MIDAG + 15Cu	Ambient Sample	Teck Coal Ltd	RG_MIDAG_WS_2021-03-	
EV_MC2 + 20Cu	Ambient Sample	Teck Coal Ltd	EV_MC2_WS_2021_Q1_W	
EV_HC1 + 20Cu	Ambient Sample	Teck Coal Ltd	EV_HC1_WS_2021_Q1_W	
LC_DCDS + 20Cu	Ambient Sample	Teck Coal Ltd	LC_DCDS_WS_2021-03-02	
LC_LC3 + 20Cu	Ambient Sample	Teck Coal Ltd	LC_LC3_WS_2021-03-02_	
LC_LC5 + 20Cu	Ambient Sample	Teck Coal Ltd	LC_LC5_WS_2021-03-02_	
LC_LCDSSLCC20C	Ambient Sample	Teck Coal Ltd	LC_LCDSSLCC_WS_2021-	
FR_FR4 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FR4_WS_2021-03-02_	
FR_FR2 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FR2_WS_2021-03-02_	

Analyst: KK QA: MG

JUN 10 2021

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID:	16-8608-7207	**Endpoint:**	Hatch Rate	**CETIS Version:**	CETISv1.9.4
Analyzed:	22 May-21 11:31	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_MULTIPLATE2	Ambient Sample	Teck Coal Ltd	FR_MULTIPLATE_WS_202	
FR_FRRD + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FRRD_WS_2021-03-02	

Fisher Exact/Bonferroni Adj Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
Site Control		Lab Control	1.0000	Exact	1.0000	Non-Significant Effect
		10Cu Control	0.7521	Exact	1.0000	Non-Significant Effect
		15Cu Control	0.7521	Exact	1.0000	Non-Significant Effect
		20Cu Control	0.3093	Exact	1.0000	Non-Significant Effect
		FR_UFR1 + 20Cu	0.3093	Exact	1.0000	Non-Significant Effect
		GH_ER2 +15Cu	0.7521	Exact	1.0000	Non-Significant Effect
		CM_MC1 + 15Cu	0.7521	Exact	1.0000	Non-Significant Effect
		FR_FRABCH + 20C	0.7521	Exact	1.0000	Non-Significant Effect
		FR_FRCP1 + 20Cu	0.7521	Exact	1.0000	Non-Significant Effect
		GH_FR1 + 20Cu	0.1034	Exact	1.0000	Non-Significant Effect
		GH_ERC + 10Cu	0.7521	Exact	1.0000	Non-Significant Effect
		CM_MC2 + 20Cu	0.7521	Exact	1.0000	Non-Significant Effect
		RG_MIDAG + 15Cu	0.7521	Exact	1.0000	Non-Significant Effect
		EV_MC2 + 20Cu	0.1822	Exact	1.0000	Non-Significant Effect
		EV_HC1 + 20Cu	0.5000	Exact	1.0000	Non-Significant Effect
		LC_DCDS + 20Cu	0.0083	Exact	0.1907	Non-Significant Effect
		LC_LC3 + 20Cu	1.0000	Exact	1.0000	Non-Significant Effect
		LC_LC5 + 20Cu	0.7521	Exact	1.0000	Non-Significant Effect
		LC_LCDSSLCC20Cu	1.0000	Exact	1.0000	Non-Significant Effect
		FR_FR4 + 20Cu	0.7521	Exact	1.0000	Non-Significant Effect
		FR_FR2 + 20Cu	0.7521	Exact	1.0000	Non-Significant Effect
		FR_MULTIPLATE20	0.7521	Exact	1.0000	Non-Significant Effect
		FR_FRRD + 20Cu	0.1822	Exact	1.0000	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	3.165	3.37	0.1123	No Outliers Detected

JUN 10 2021

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 16-8608-7207 **Endpoint:** Hatch Rate **CETIS Version:** CETISv1.9.4
Analyzed: 22 May-21 11:31 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Data Summary

Sample	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
Lab Control		60	0	60	1	0	-1.7%
10Cu Control		59	1	60	0.9833	0.01667	0.0%
15Cu Control		59	1	60	0.9833	0.01667	0.0%
20Cu Control		57	3	60	0.95	0.05	3.39%
FR_UFR1 + 20Cu		57	3	60	0.95	0.05	3.39%
GH_ER2 +15Cu		59	1	60	0.9833	0.01667	0.0%
CM_MC1 + 15Cu		59	1	60	0.9833	0.01667	0.0%
LC_SLC + 15Cu	XC	59	1	60	0.9833	0.01667	0.0%
FR_FRABCH + 20C		59	1	60	0.9833	0.01667	0.0%
FR_FRCP1 + 20Cu		59	1	60	0.9833	0.01667	0.0%
GH_FR1 + 20Cu		55	5	60	0.9167	0.08333	6.78%
GH_ERC + 10Cu		59	1	60	0.9833	0.01667	0.0%
CM_MC2 + 20Cu		59	1	60	0.9833	0.01667	0.0%
RG_MIDAG + 15Cu		59	1	60	0.9833	0.01667	0.0%
EV_MC2 + 20Cu		56	4	60	0.9333	0.06667	5.09%
EV_HC1 + 20Cu		58	2	60	0.9667	0.03333	1.7%
LC_DCDS + 20Cu		51	9	60	0.85	0.15	13.56%
LC_LC3 + 20Cu		60	0	60	1	0	-1.7%
LC_LC5 + 20Cu		59	1	60	0.9833	0.01667	0.0%
LC_LCDSSLCC20C		60	0	60	1	0	-1.7%
FR_FR4 + 20Cu		59	1	60	0.9833	0.01667	0.0%
FR_FR2 + 20Cu		59	1	60	0.9833	0.01667	0.0%
FR_MULTIPLATE20		59	1	60	0.9833	0.01667	0.0%
FR_FRRD + 20Cu		56	4	60	0.9333	0.06667	5.09%

Hatch Rate Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Lab Control		1.0000	1.0000	1.0000	1.0000
10Cu Control		0.9333	1.0000	1.0000	1.0000
15Cu Control		1.0000	1.0000	1.0000	0.9333
20Cu Control		0.9333	0.8667	1.0000	1.0000
FR_UFR1 + 20Cu		0.8667	1.0000	1.0000	0.9333
GH_ER2 +15Cu		1.0000	1.0000	1.0000	0.9333
CM_MC1 + 15Cu		1.0000	1.0000	0.9333	1.0000
LC_SLC + 15Cu	XC	0.9333	1.0000	1.0000	1.0000
FR_FRABCH + 20C		1.0000	1.0000	0.9333	1.0000
FR_FRCP1 + 20Cu		0.9333	1.0000	1.0000	1.0000
GH_FR1 + 20Cu		0.9333	0.8000	1.0000	0.9333
GH_ERC + 10Cu		1.0000	1.0000	0.9333	1.0000
CM_MC2 + 20Cu		1.0000	1.0000	1.0000	0.9333
RG_MIDAG + 15Cu		1.0000	0.9333	1.0000	1.0000
EV_MC2 + 20Cu		0.9333	0.8000	1.0000	1.0000
EV_HC1 + 20Cu		1.0000	0.9333	1.0000	0.9333
LC_DCDS + 20Cu		0.8000	0.9333	1.0000	0.6667
LC_LC3 + 20Cu		1.0000	1.0000	1.0000	1.0000
LC_LC5 + 20Cu		1.0000	1.0000	1.0000	0.9333
LC_LCDSSLCC20C		1.0000	1.0000	1.0000	1.0000
FR_FR4 + 20Cu		1.0000	1.0000	1.0000	0.9333
FR_FR2 + 20Cu		1.0000	1.0000	0.9333	1.0000
FR_MULTIPLATE2		0.9333	1.0000	1.0000	1.0000
FR_FRRD + 20Cu		0.9333	0.9333	1.0000	0.8667

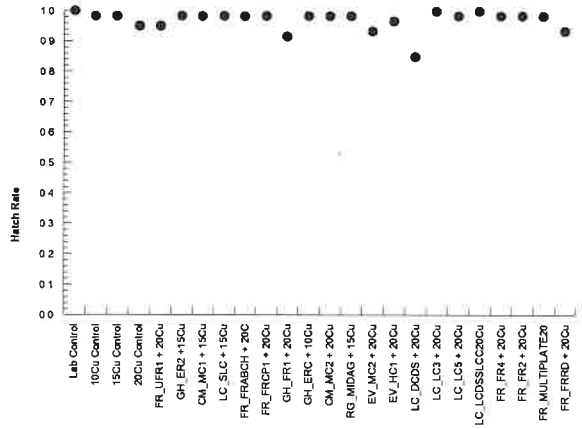
Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 16-8608-7207 **Endpoint:** Hatch Rate **CETIS Version:** CETISv1.9.4
Analyzed: 22 May-21 11:31 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Hatch Rate Binomials

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Lab Control		15/15	15/15	15/15	15/15
10Cu Control		14/15	15/15	15/15	15/15
15Cu Control		15/15	15/15	15/15	14/15
20Cu Control		14/15	13/15	15/15	15/15
FR_UFR1 + 20Cu		13/15	15/15	15/15	14/15
GH_ER2 +15Cu		15/15	15/15	15/15	14/15
CM_MC1 + 15Cu		15/15	15/15	14/15	15/15
LC_SLC + 15Cu	XC	14/15	15/15	15/15	15/15
FR_FRABCH + 20C		15/15	15/15	14/15	15/15
FR_FRCP1 + 20Cu		14/15	15/15	15/15	15/15
GH_FR1 + 20Cu		14/15	12/15	15/15	14/15
GH_ERC + 10Cu		15/15	15/15	14/15	15/15
CM_MC2 + 20Cu		15/15	15/15	15/15	14/15
RG_MIDAG + 15Cu		15/15	14/15	15/15	15/15
EV_MC2 + 20Cu		14/15	12/15	15/15	15/15
EV_HC1 + 20Cu		15/15	14/15	15/15	14/15
LC_DCDS + 20Cu		12/15	14/15	15/15	10/15
LC_LC3 + 20Cu		15/15	15/15	15/15	15/15
LC_LC5 + 20Cu		15/15	15/15	15/15	14/15
LC_LCDSSLCC20C		15/15	15/15	15/15	15/15
FR_FR4 + 20Cu		15/15	15/15	15/15	14/15
FR_FR2 + 20Cu		15/15	15/15	14/15	15/15
FR_MULTIPLATE2		14/15	15/15	15/15	15/15
FR_FRRD + 20Cu		14/15	14/15	15/15	13/15

Graphics



CETIS Analytical Report

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID:	05-0281-7980	**Endpoint:**	Length	**CETIS Version:**	CETISv1.9.4
Analyzed:	22 May-21 11:34	**Analysis:**	Parametric-Control vs Treatments	**Status Level:**	1
Batch ID:	16-2689-7673	**Test Type:**	32 Day Fathead Minnow Test	**Analyst:**	Kayla Knol
Start Date:	06 Mar-21	**Protocol:**	ASTM E1241-05 (2013)	**Diluent:**	Dechlorinated Tap Water
Ending Date:	07 Apr-21	**Species:**	Pimephales promelas	**Brine:**	
Test Length:	32d 0h	**Taxon:**	Actinopterygii	**Source:**	Aquatox, AR **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
Lab Control	08-8280-1106	02 Mar-21	03 Mar-21	96h	Teck Coal Ltd	
10Cu Control	01-9333-5370	02 Mar-21	03 Mar-21	96h		
15Cu Control	19-6548-0518	02 Mar-21	03 Mar-21	96h		
20Cu Control	00-8675-6744	02 Mar-21	03 Mar-21	96h		
FR_UFR1 + 20Cu	20-4721-8257	02 Mar-21	03 Mar-21	96h (4.6 °C)		
GH_ER2 +15Cu	01-1137-9253	02 Mar-21	03 Mar-21	96h (4.2 °C)		
CM_MC1 + 15Cu	01-3772-5048	02 Mar-21	03 Mar-21	96h (1 °C)		
LC_SLC + 15Cu	01-2380-6574	02 Mar-21	03 Mar-21	96h (3.1 °C)		
FR_FRABCH + 20C	08-4134-0746	02 Mar-21	03 Mar-21	96h (3.8 °C)		
FR_FRCP1 + 20Cu	11-2694-6466	02 Mar-21	03 Mar-21	96h (3 °C)		
GH_FR1 + 20Cu	20-1635-3152	02 Mar-21	03 Mar-21	96h (2.4 °C)		
GH_ERC + 10Cu	05-1950-5597	02 Mar-21	03 Mar-21	96h (4.1 °C)		
CM_MC2 + 20Cu	14-4685-1067	02 Mar-21	03 Mar-21	96h (0.3 °C)		
RG_MIDAG + 15Cu	21-3889-1829	02 Mar-21	03 Mar-21	96h (0.6 °C)		
EV_MC2 + 20Cu	05-6103-5191	02 Mar-21	03 Mar-21	96h (4.4 °C)		
EV_HC1 + 20Cu	12-5501-3302	02 Mar-21	03 Mar-21	96h (3.4 °C)		
LC_DCDS + 20Cu	04-1088-5978	02 Mar-21	03 Mar-21	96h (0.6 °C)		
LC_LC3 + 20Cu	14-7773-4190	02 Mar-21	03 Mar-21	96h (2.3 °C)		
LC_LC5 + 20Cu	01-7235-6798	02 Mar-21	03 Mar-21	96h (0.6 °C)		
LC_LCDSSLCC20C	06-4197-2641	02 Mar-21	03 Mar-21	96h (2.4 °C)		
FR_FR4 + 20Cu	10-9481-5020	02 Mar-21	03 Mar-21	96h (5.4 °C)		
FR_FR2 + 20Cu	00-3159-8672	02 Mar-21	03 Mar-21	96h (4.4 °C)		
FR_MULTIPLATE2	02-2179-0364	02 Mar-21	03 Mar-21	96h (2.9 °C)		
FR_FRRD + 20Cu	19-5167-8345	02 Mar-21	03 Mar-21	96h (6.2 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
Lab Control	Ambient Sample	Teck Coal Ltd	Lab Control	
10Cu Control	Ambient Sample	Teck Coal Ltd	10Cu Control	
15Cu Control	Ambient Sample	Teck Coal Ltd	15Cu Control	
20Cu Control	Ambient Sample	Teck Coal Ltd	20Cu Control	
FR_UFR1 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_UFR1_MON_2021-03-0	
GH_ER2 +15Cu	Ambient Sample	Teck Coal Ltd	GH_ER2_WS_2021-03-02_	
CM_MC1 + 15Cu	Ambient Sample	Teck Coal Ltd	CM_MC1_WS_2021-03-02	
LC_SLC + 15Cu	Ambient Sample	Teck Coal Ltd	LC_SLC_WS_2021-03-02_	
FR_FRABCH + 20C	Ambient Sample	Teck Coal Ltd	FR_FRABCH_MON_2021-	
FR_FRCP1 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FRCP1_MON_2021-03	
GH_FR1 + 20Cu	Ambient Sample	Teck Coal Ltd	GH_FR1_WS_2021-03-02_	
GH_ERC + 10Cu	Ambient Sample	Teck Coal Ltd	GH_ERC_WS_2021-03-02	
CM_MC2 + 20Cu	Ambient Sample	Teck Coal Ltd	CM_MC2_WS_2021-03-02	
RG_MIDAG + 15Cu	Ambient Sample	Teck Coal Ltd	RG_MIDAG_WS_2021-03-	
EV_MC2 + 20Cu	Ambient Sample	Teck Coal Ltd	EV_MC2_WS_2021_Q1_W	
EV_HC1 + 20Cu	Ambient Sample	Teck Coal Ltd	EV_HC1_WS_2021_Q1_W	
LC_DCDS + 20Cu	Ambient Sample	Teck Coal Ltd	LC_DCDS_WS_2021-03-02	
LC_LC3 + 20Cu	Ambient Sample	Teck Coal Ltd	LC_LC3_WS_2021-03-02_	
LC_LC5 + 20Cu	Ambient Sample	Teck Coal Ltd	LC_LC5_WS_2021-03-02_	
LC_LCDSSLCC20C	Ambient Sample	Teck Coal Ltd	LC_LCDSSLCC_WS_2021-	
FR_FR4 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FR4_WS_2021-03-02_	
FR_FR2 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FR2_WS_2021-03-02_	

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Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 05-0281-7980 **Endpoint:** Length **CETIS Version:** CETISv1.9.4
Analyzed: 22 May-21 11:34 **Analysis:** Parametric-Control vs Treatments **Status Level:** 1

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_MULTIPLATE2	Ambient Sample	Teck Coal Ltd	FR_MULTIPLATE_WS_202	
FR_FRRD + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FRRD_WS_2021-03-02	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	Lab Control passed length	11.78%
		10Cu Control passed length	11.78%
		15Cu Control passed length	11.78%
		20Cu Control passed length	11.78%
		FR_UFR1 + 20Cu passed length	11.78%
		GH_ER2 +15Cu passed length	11.78%
		CM_MC1 + 15Cu passed length	11.78%
		FR_FRABCH + 20C passed length	11.78%
		FR_FRCP1 + 20Cu passed length	11.78%
		GH_FR1 + 20Cu passed length	11.78%
		GH_ERC + 10Cu passed length	11.78%
		CM_MC2 + 20Cu passed length	11.78%
		RG_MIDAG + 15Cu passed length	11.78%
		EV_MC2 + 20Cu passed length	11.78%
		EV_HC1 + 20Cu passed length	11.78%
		LC_DCDS + 20Cu passed length	11.78%
		LC_LC3 + 20Cu passed length	11.78%
		LC_LC5 + 20Cu passed length	11.78%
		LC_LCDSSLCC20Cu passed length	11.78%
		FR_FR4 + 20Cu passed length	11.78%
		FR_FR2 + 20Cu passed length	11.78%
		FR_MULTIPLATE20 passed length	11.78%
		FR_FRRD + 20Cu passed length	11.78%

Dunnett Multiple Comparison Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Site Control		Lab Control	1.235	2.744	1.349	6	CDF	0.5631	Non-Significant Effect
		10Cu Control	1.605	2.744	1.349	6	CDF	0.3823	Non-Significant Effect
		15Cu Control	0.7601	2.744	1.349	6	CDF	0.7759	Non-Significant Effect
		20Cu Control	0.5635	2.744	1.349	6	CDF	0.8435	Non-Significant Effect
		FR_UFR1 + 20Cu	2.122	2.744	1.349	6	CDF	0.1779	Non-Significant Effect
		GH_ER2 +15Cu	1.242	2.744	1.349	6	CDF	0.5598	Non-Significant Effect
		CM_MC1 + 15Cu	1.078	2.744	1.349	6	CDF	0.6392	Non-Significant Effect
		FR_FRABCH + 20C	1.938	2.744	1.349	6	CDF	0.2408	Non-Significant Effect
		FR_FRCP1 + 20Cu	0.5653	2.744	1.349	6	CDF	0.8430	Non-Significant Effect
		GH_FR1 + 20Cu	1.688	2.744	1.349	6	CDF	0.3443	Non-Significant Effect
		GH_ERC + 10Cu	1.966	2.744	1.349	6	CDF	0.2304	Non-Significant Effect
		CM_MC2 + 20Cu	2.696	2.744	1.349	6	CDF	0.0558	Non-Significant Effect
		RG_MIDAG + 15Cu	1.396	2.744	1.349	6	CDF	0.4837	Non-Significant Effect
		EV_MC2 + 20Cu	1.454	2.744	1.349	6	CDF	0.4549	Non-Significant Effect
		EV_HC1 + 20Cu	1.798	2.744	1.349	6	CDF	0.2962	Non-Significant Effect
		LC_DCDS + 20Cu	0.5884	2.744	1.349	6	CDF	0.8358	Non-Significant Effect
		LC_LC3 + 20Cu	1.478	2.744	1.349	6	CDF	0.4433	Non-Significant Effect
		LC_LC5 + 20Cu	0.8158	2.744	1.349	6	CDF	0.7542	Non-Significant Effect
		LC_LCDSSLCC20Cu	1.561	2.744	1.349	6	CDF	0.4032	Non-Significant Effect
		FR_FR4 + 20Cu	0.6858	2.744	1.349	6	CDF	0.8032	Non-Significant Effect
		FR_FR2 + 20Cu	2.055	2.744	1.349	6	CDF	0.1992	Non-Significant Effect
		FR_MULTIPLATE20	1.153	2.744	1.349	6	CDF	0.6031	Non-Significant Effect
		FR_FRRD + 20Cu	1.311	2.744	1.349	6	CDF	0.5257	Non-Significant Effect

Auxiliary Tests

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Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 05-0281-7980 **Endpoint:** Length **CETIS Version:** CETISv1.9.4
Analyzed: 22 May-21 11:34 **Analysis:** Parametric-Control vs Treatments **Status Level:** 1

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	3.392	3.37	0.0458	Outlier Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	8.62615	0.37505	23	0.7753	0.7491	Non-Significant Effect
Error	34.8279	0.483721	72			
Total	43.4541		95			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Variances	Bartlett Equality of Variance Test	31.32	35.17	0.1151	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9841	0.9737	0.3005	Normal Distribution

Length Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
Lab Control		4	10.85	10.2	11.5	10.74	10.5	11.42	0.2039	3.76%	0.00%
10Cu Control		4	10.67	10.19	11.15	10.69	10.29	11	0.1513	2.84%	1.68%
15Cu Control		4	11.08	9.919	12.25	11	10.33	12	0.3658	6.60%	-2.15%
20Cu Control		4	11.18	10.17	12.19	10.96	10.69	12.11	0.3171	5.67%	-3.04%
FR_UFR1 + 20Cu		4	10.41	9.005	11.82	10.04	9.857	11.73	0.4425	8.50%	4.02%
GH_ER2 +15Cu		4	10.85	10.27	11.43	10.8	10.5	11.29	0.182	3.36%	0.03%
CM_MC1 + 15Cu		4	10.93	9.723	12.13	10.83	10.17	11.88	0.3782	6.92%	-0.71%
LC_SLC + 15Cu	XC	4	11.46	10.55	12.37	11.45	10.93	12	0.2857	4.99%	-5.60%
FR_FRABCH + 20C		4	10.5	9.776	11.23	10.47	10	11.08	0.2288	4.36%	3.18%
FR_FRCP1 + 20Cu		4	11.18	10.1	12.26	11.13	10.45	12	0.3392	6.07%	-3.04%
GH_FR1 + 20Cu		4	10.63	9.531	11.72	10.72	9.846	11.23	0.3445	6.48%	2.05%
GH_ERC + 10Cu		4	10.49	10.24	10.74	10.48	10.31	10.69	0.0791	1.51%	3.31%
CM_MC2 + 20Cu		4	10.13	8.98	11.28	10.01	9.429	11.08	0.3617	7.14%	6.62%
RG_MIDAG + 15Cu		4	10.77	10.19	11.35	10.72	10.4	11.25	0.1826	3.39%	0.73%
EV_MC2 + 20Cu		4	10.74	9.791	11.69	10.76	10.08	11.36	0.2987	5.56%	0.99%
EV_HC1 + 20Cu		4	10.57	10.15	10.99	10.54	10.31	10.9	0.1325	2.51%	2.55%
LC_DCDS + 20Cu		4	11.17	9.661	12.67	11.06	10.18	12.38	0.4734	8.48%	-2.93%
LC_LC3 + 20Cu		4	10.73	9.975	11.49	10.77	10.13	11.25	0.2375	4.43%	1.10%
LC_LC5 + 20Cu		4	11.06	9.583	12.53	10.93	10.07	12.3	0.4627	8.37%	-1.90%
LC_LCDSSLCC20C		4	10.69	10.4	10.98	10.66	10.5	10.93	0.09091	1.70%	1.48%
FR_FR4 + 20Cu		4	11.12	10.17	12.07	11.06	10.45	11.9	0.298	5.36%	-2.49%
FR_FR2 + 20Cu		4	10.45	7.854	13.04	10.14	9	12.5	0.8146	15.60%	3.72%
FR_MULTIPLATE2		4	10.89	9.947	11.83	10.89	10.23	11.55	0.2964	5.44%	-0.37%
FR_FRRD + 20Cu		4	10.81	9.242	12.38	10.83	9.917	11.67	0.4934	9.13%	0.34%

Analyst: KK QA: MG
JUN 10 2021

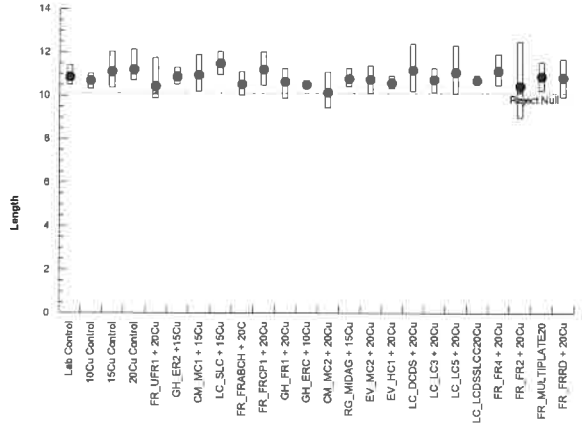
Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

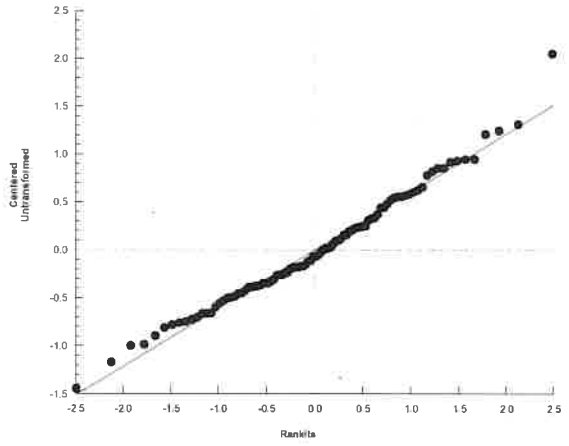
Analysis ID: 05-0281-7980 **Endpoint:** Length **CETIS Version:** CETISv1.9.4
Analyzed: 22 May-21 11:34 **Analysis:** Parametric-Control vs Treatments **Status Level:** 1

Length Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Lab Control		10.5	10.62	11.42	10.87
10Cu Control		10.79	11	10.29	10.6
15Cu Control		10.69	10.33	12	11.31
20Cu Control		10.92	10.69	12.11	11
FR_UFR1 + 20Cu		9.917	9.857	10.15	11.73
GH_ER2 +15Cu		10.5	11.29	11	10.6
CM_MC1 + 15Cu		10.5	11.88	10.17	11.17
LC_SLC + 15Cu	XC	12	11.9	10.93	11
FR_FRABCH + 20C		10.33	10	10.6	11.08
FR_FRCP1 + 20Cu		12	10.83	10.45	11.43
GH_FR1 + 20Cu		11.18	10.25	9.846	11.23
GH_ERC + 10Cu		10.5	10.31	10.69	10.46
CM_MC2 + 20Cu		9.429	9.733	10.29	11.08
RG_MIDAG + 15Cu		10.4	10.6	10.83	11.25
EV_MC2 + 20Cu		10.08	11.11	10.42	11.36
EV_HC1 + 20Cu		10.67	10.42	10.31	10.9
LC_DCDS + 20Cu		12.38	10.18	10.71	11.4
LC_LC3 + 20Cu		10.92	10.13	10.62	11.25
LC_LC5 + 20Cu		10.07	10.86	11	12.3
LC_LCDSSLCC20C		10.71	10.5	10.62	10.93
FR_FR4 + 20Cu		11	10.45	11.12	11.9
FR_FR2 + 20Cu		9.286	9	11	12.5
FR_MULTIPLATE2		11.2	10.58	10.23	11.55
FR_FRRD + 20Cu		9.917	10	11.67	11.67

Graphics





CETIS Analytical Report

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID:	16-6640-3269	**Endpoint:**	Proportion Normal	**CETIS Version:**	CETISv1.9.4
Analyzed:	01 Jun-21 8:38	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1
Batch ID:	16-2689-7673	**Test Type:**	32 Day Fathead Minnow Test	**Analyst:**	Kayla Knol
Start Date:	06 Mar-21	**Protocol:**	ASTM E1241-05 (2013)	**Diluent:**	Dechlorinated Tap Water
Ending Date:	07 Apr-21	**Species:**	Pimephales promelas	**Brine:**	
Test Length:	32d 0h	**Taxon:**	Actinopterygii	**Source:**	Aquatox, AR **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
Lab Control	08-8280-1106	02 Mar-21	03 Mar-21	96h	Teck Coal Ltd	
10Cu Control	01-9333-5370	02 Mar-21	03 Mar-21	96h		
15Cu Control	19-6548-0518	02 Mar-21	03 Mar-21	96h		
20Cu Control	00-8675-6744	02 Mar-21	03 Mar-21	96h		
FR_UFR1 + 20Cu	20-4721-8257	02 Mar-21	03 Mar-21	96h (4.6 °C)		
GH_ER2 +15Cu	01-1137-9253	02 Mar-21	03 Mar-21	96h (4.2 °C)		
CM_MC1 + 15Cu	01-3772-5048	02 Mar-21	03 Mar-21	96h (1 °C)		
LC_SLC + 15Cu	01-2380-6574	02 Mar-21	03 Mar-21	96h (3.1 °C)		
FR_FRABCH + 20C	08-4134-0746	02 Mar-21	03 Mar-21	96h (3.8 °C)		
FR_FRCP1 + 20Cu	11-2694-6466	02 Mar-21	03 Mar-21	96h (3 °C)		
GH_FR1 + 20Cu	20-1635-3152	02 Mar-21	03 Mar-21	96h (2.4 °C)		
GH_ERC + 10Cu	05-1950-5597	02 Mar-21	03 Mar-21	96h (4.1 °C)		
CM_MC2 + 20Cu	14-4685-1067	02 Mar-21	03 Mar-21	96h (0.3 °C)		
RG_MIDAG + 15Cu	21-3889-1829	02 Mar-21	03 Mar-21	96h (0.6 °C)		
EV_MC2 + 20Cu	05-6103-5191	02 Mar-21	03 Mar-21	96h (4.4 °C)		
EV_HC1 + 20Cu	12-5501-3302	02 Mar-21	03 Mar-21	96h (3.4 °C)		
LC_DCDS + 20Cu	04-1088-5978	02 Mar-21	03 Mar-21	96h (0.6 °C)		
LC_LC3 + 20Cu	14-7773-4190	02 Mar-21	03 Mar-21	96h (2.3 °C)		
LC_LC5 + 20Cu	01-7235-6798	02 Mar-21	03 Mar-21	96h (0.6 °C)		
LC_LCDSSLCC20C	06-4197-2641	02 Mar-21	03 Mar-21	96h (2.4 °C)		
FR_FR4 + 20Cu	10-9481-5020	02 Mar-21	03 Mar-21	96h (5.4 °C)		
FR_FR2 + 20Cu	00-3159-8672	02 Mar-21	03 Mar-21	96h (4.4 °C)		
FR_MULTIPLATE2	02-2179-0364	02 Mar-21	03 Mar-21	96h (2.9 °C)		
FR_FRRD + 20Cu	19-5167-8345	02 Mar-21	03 Mar-21	96h (6.2 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
Lab Control	Ambient Sample	Teck Coal Ltd	Lab Control	
10Cu Control	Ambient Sample	Teck Coal Ltd	10Cu Control	
15Cu Control	Ambient Sample	Teck Coal Ltd	15Cu Control	
20Cu Control	Ambient Sample	Teck Coal Ltd	20Cu Control	
FR_UFR1 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_UFR1_MON_2021-03-0	
GH_ER2 +15Cu	Ambient Sample	Teck Coal Ltd	GH_ER2_WS_2021-03-02_	
CM_MC1 + 15Cu	Ambient Sample	Teck Coal Ltd	CM_MC1_WS_2021-03-02	
LC_SLC + 15Cu	Ambient Sample	Teck Coal Ltd	LC_SLC_WS_2021-03-02_	
FR_FRABCH + 20C	Ambient Sample	Teck Coal Ltd	FR_FRABCH_MON_2021-	
FR_FRCP1 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FRCP1_MON_2021-03	
GH_FR1 + 20Cu	Ambient Sample	Teck Coal Ltd	GH_FR1_WS_2021-03-02_	
GH_ERC + 10Cu	Ambient Sample	Teck Coal Ltd	GH_ERC_WS_2021-03-02	
CM_MC2 + 20Cu	Ambient Sample	Teck Coal Ltd	CM_MC2_WS_2021-03-02	
RG_MIDAG + 15Cu	Ambient Sample	Teck Coal Ltd	RG_MIDAG_WS_2021-03-	
EV_MC2 + 20Cu	Ambient Sample	Teck Coal Ltd	EV_MC2_WS_2021_Q1_W	
EV_HC1 + 20Cu	Ambient Sample	Teck Coal Ltd	EV_HC1_WS_2021_Q1_W	
LC_DCDS + 20Cu	Ambient Sample	Teck Coal Ltd	LC_DCDS_WS_2021-03-02	
LC_LC3 + 20Cu	Ambient Sample	Teck Coal Ltd	LC_LC3_WS_2021-03-02_	
LC_LC5 + 20Cu	Ambient Sample	Teck Coal Ltd	LC_LC5_WS_2021-03-02_	
LC_LCDSSLCC20C	Ambient Sample	Teck Coal Ltd	LC_LCDSSLCC_WS_2021-	
FR_FR4 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FR4_WS_2021-03-02_	
FR_FR2 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FR2_WS_2021-03-02_	

Analyst: KJC QA: MG

JUN 10 2021

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 16-6640-3269 **Endpoint:** Proportion Normal **CETIS Version:** CETISv1.9.4
Analyzed: 01 Jun-21 8:38 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_MULTIPLATE2	Ambient Sample	Teck Coal Ltd	FR_MULTIPLATE_WS_202	
FR_FRRD + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FRRD_WS_2021-03-02	

Fisher Exact/Bonferroni Adj Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
Site Control		Lab Control	1.0000	Exact	1.0000	Non-Significant Effect
		10Cu Control	1.0000	Exact	1.0000	Non-Significant Effect
		15Cu Control	1.0000	Exact	1.0000	Non-Significant Effect
		20Cu Control	0.5053	Exact	1.0000	Non-Significant Effect
		FR_UFR1 + 20Cu	1.0000	Exact	1.0000	Non-Significant Effect
		GH_ER2 +15Cu*	0.0013	Exact	0.0299	Significant Effect
		CM_MC1 + 15Cu*	0.0019	Exact	0.0430	Significant Effect
		FR_FRABCH + 20C	0.2473	Exact	1.0000	Non-Significant Effect
		FR_FRCP1 + 20Cu	0.3816	Exact	1.0000	Non-Significant Effect
		GH_FR1 + 20Cu	0.1289	Exact	1.0000	Non-Significant Effect
		GH_ERC + 10Cu	0.0048	Exact	0.1095	Non-Significant Effect
		CM_MC2 + 20Cu	0.2932	Exact	1.0000	Non-Significant Effect
		RG_MIDAG + 15Cu	0.2310	Exact	1.0000	Non-Significant Effect
		EV_MC2 + 20Cu	0.4946	Exact	1.0000	Non-Significant Effect
		EV_HC1 + 20Cu	0.5000	Exact	1.0000	Non-Significant Effect
		LC_DCDS + 20Cu	0.2255	Exact	1.0000	Non-Significant Effect
		LC_LC3 + 20Cu	0.2784	Exact	1.0000	Non-Significant Effect
		LC_LC5 + 20Cu	1.0000	Exact	1.0000	Non-Significant Effect
		LC_LCDSSLCC20Cu	0.5300	Exact	1.0000	Non-Significant Effect
		FR_FR4 + 20Cu	1.0000	Exact	1.0000	Non-Significant Effect
		FR_FR2 + 20Cu	0.1300	Exact	1.0000	Non-Significant Effect
		FR_MULTIPLATE20	1.0000	Exact	1.0000	Non-Significant Effect
		FR_FRRD + 20Cu	0.2199	Exact	1.0000	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	4.105	3.37	0.0017	Outlier Detected

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 16-6640-3269 **Endpoint:** Proportion Normal **CETIS Version:** CETISv1.9.4
Analyzed: 01 Jun-21 8:38 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Data Summary

Sample	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
Lab Control		54	0	54	1	0	0.0%
10Cu Control		56	0	56	1	0	0.0%
15Cu Control		50	0	50	1	0	0.0%
20Cu Control		47	1	48	0.9792	0.02083	2.08%
FR_UFR1 + 20Cu		50	0	50	1	0	0.0%
GH_ER2 +15Cu		14	5	19	0.7368	0.2632	26.32%
CM_MC1 + 15Cu		22	6	28	0.7857	0.2143	21.43%
LC_SLC + 15Cu	XC	47	0	47	1	0	0.0%
FR_FRABCH + 20C		45	2	47	0.9574	0.04255	4.26%
FR_FRCP1 + 20Cu		28	1	29	0.9655	0.03448	3.45%
GH_FR1 + 20Cu		46	3	49	0.9388	0.06122	6.12%
GH_ERC + 10Cu		45	8	53	0.8491	0.1509	15.09%
CM_MC2 + 20Cu		54	2	56	0.9643	0.03571	3.57%
RG_MIDAG + 15Cu		42	2	44	0.9545	0.04545	4.55%
EV_MC2 + 20Cu		45	1	46	0.9783	0.02174	2.17%
EV_HC1 + 20Cu		46	1	47	0.9787	0.02128	2.13%
LC_DCDS + 20Cu		41	2	43	0.9535	0.04651	4.65%
LC_LC3 + 20Cu		51	2	53	0.9623	0.03774	3.77%
LC_LC5 + 20Cu		52	0	52	1	0	0.0%
LC_LCDSSLCC20C		52	1	53	0.9811	0.01887	1.89%
FR_FR4 + 20Cu		38	0	38	1	0	0.0%
FR_FR2 + 20Cu		25	2	27	0.9259	0.07407	7.41%
FR_MULTIPLATE20		46	0	46	1	0	0.0%
FR_FRRD + 20Cu		40	2	42	0.9524	0.04762	4.76%

Proportion Normal Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Lab Control		1.0000	1.0000	1.0000	1.0000
10Cu Control		1.0000	1.0000	1.0000	1.0000
15Cu Control		1.0000	1.0000	1.0000	1.0000
20Cu Control		0.9167	1.0000	1.0000	1.0000
FR_UFR1 + 20Cu		1.0000	1.0000	1.0000	1.0000
GH_ER2 +15Cu		0.7500	0.8571	1.0000	0.4000
CM_MC1 + 15Cu		0.6250	0.8750	0.6667	1.0000
LC_SLC + 15Cu	XC	1.0000	1.0000	1.0000	1.0000
FR_FRABCH + 20C		1.0000	1.0000	0.8000	1.0000
FR_FRCP1 + 20Cu		1.0000	0.8333	1.0000	1.0000
GH_FR1 + 20Cu		1.0000	1.0000	0.9231	0.8462
GH_ERC + 10Cu		0.7857	0.7692	0.9231	0.9231
CM_MC2 + 20Cu		1.0000	0.9333	0.9286	1.0000
RG_MIDAG + 15Cu		0.9000	1.0000	1.0000	0.9167
EV_MC2 + 20Cu		0.9231	1.0000	1.0000	1.0000
EV_HC1 + 20Cu		0.9167	1.0000	1.0000	1.0000
LC_DCDS + 20Cu		1.0000	0.9091	0.9286	1.0000
LC_LC3 + 20Cu		1.0000	0.9333	1.0000	0.9167
LC_LC5 + 20Cu		1.0000	1.0000	1.0000	1.0000
LC_LCDSSLCC20C		1.0000	0.9167	1.0000	1.0000
FR_FR4 + 20Cu		1.0000	1.0000	1.0000	1.0000
FR_FR2 + 20Cu		0.8571	0.8571	1.0000	1.0000
FR_MULTIPLATE2		1.0000	1.0000	1.0000	1.0000
FR_FRRD + 20Cu		0.9167	0.9167	1.0000	1.0000

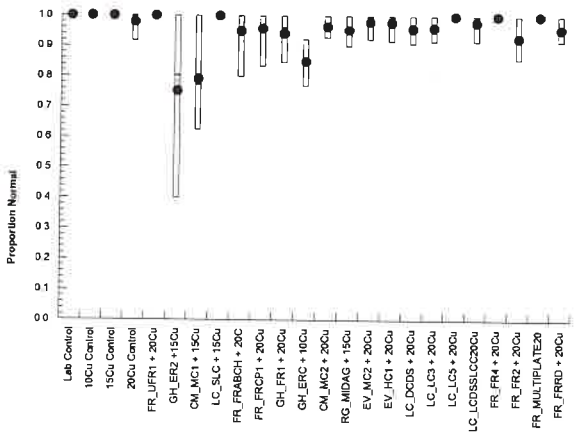
Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 16-6640-3269 **Endpoint:** Proportion Normal **CETIS Version:** CETISv1.9.4
Analyzed: 01 Jun-21 8:38 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Proportion Normal Binomials

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Lab Control		14/14	13/13	12/12	15/15
10Cu Control		14/14	13/13	14/14	15/15
15Cu Control		13/13	15/15	9/9	13/13
20Cu Control		11/12	13/13	9/9	14/14
FR_UFR1 + 20Cu		12/12	14/14	13/13	11/11
GH_ER2 +15Cu		3/4	6/7	3/3	2/5
CM_MC1 + 15Cu		5/8	7/8	4/6	6/6
LC_SLC + 15Cu	XC	9/9	10/10	14/14	14/14
FR_FRABCH + 20C		12/12	13/13	8/10	12/12
FR_FRCP1 + 20Cu		5/5	5/6	11/11	7/7
GH_FR1 + 20Cu		11/11	12/12	12/13	11/13
GH_ERC + 10Cu		11/14	10/13	12/13	12/13
CM_MC2 + 20Cu		14/14	14/15	13/14	13/13
RG_MIDAG + 15Cu		9/10	10/10	12/12	11/12
EV_MC2 + 20Cu		12/13	9/9	12/12	11/11
EV_HC1 + 20Cu		11/12	12/12	13/13	10/10
LC_DCDS + 20Cu		8/8	10/11	13/14	10/10
LC_LC3 + 20Cu		13/13	14/15	13/13	11/12
LC_LC5 + 20Cu		15/15	14/14	13/13	10/10
LC_LCDSSLCC20C		14/14	11/12	13/13	14/14
FR_FR4 + 20Cu		9/9	11/11	8/8	10/10
FR_FR2 + 20Cu		6/7	6/7	9/9	4/4
FR_MULTIPLATE2		10/10	12/12	13/13	11/11
FR_FRRD + 20Cu		11/12	11/12	9/9	9/9

Graphics



Analyst: KE QA: MG

JUN 10 2021

CETIS Analytical Report

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID:	21-4567-4526	**Endpoint:**	Post Hatch Survival	**CETIS Version:**	CETISv1.9.4
Analyzed:	22 May-21 11:32	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1
Batch ID:	16-2689-7673	**Test Type:**	32 Day Fathead Minnow Test	**Analyst:**	Kayla Knol
Start Date:	06 Mar-21	**Protocol:**	ASTM E1241-05 (2013)	**Diluent:**	Dechlorinated Tap Water
Ending Date:	07 Apr-21	**Species:**	Pimephales promelas	**Brine:**	
Test Length:	32d 0h	**Taxon:**	Actinopterygii	**Source:**	Aquatox, AR **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
Lab Control	08-8280-1106	02 Mar-21	03 Mar-21	96h	Teck Coal Ltd	
10Cu Control	01-9333-5370	02 Mar-21	03 Mar-21	96h		
15Cu Control	19-6548-0518	02 Mar-21	03 Mar-21	96h		
20Cu Control	00-8675-6744	02 Mar-21	03 Mar-21	96h		
FR_UFR1 + 20Cu	20-4721-8257	02 Mar-21	03 Mar-21	96h (4.6 °C)		
GH_ER2 +15Cu	01-1137-9253	02 Mar-21	03 Mar-21	96h (4.2 °C)		
CM_MC1 + 15Cu	01-3772-5048	02 Mar-21	03 Mar-21	96h (1 °C)		
LC_SLC + 15Cu	01-2380-6574	02 Mar-21	03 Mar-21	96h (3.1 °C)		
FR_FRABCH + 20C	08-4134-0746	02 Mar-21	03 Mar-21	96h (3.8 °C)		
FR_FRCP1 + 20Cu	11-2694-6466	02 Mar-21	03 Mar-21	96h (3 °C)		
GH_FR1 + 20Cu	20-1635-3152	02 Mar-21	03 Mar-21	96h (2.4 °C)		
GH_ERC + 10Cu	05-1950-5597	02 Mar-21	03 Mar-21	96h (4.1 °C)		
CM_MC2 + 20Cu	14-4685-1067	02 Mar-21	03 Mar-21	96h (0.3 °C)		
RG_MIDAG + 15Cu	21-3889-1829	02 Mar-21	03 Mar-21	96h (0.6 °C)		
EV_MC2 + 20Cu	05-6103-5191	02 Mar-21	03 Mar-21	96h (4.4 °C)		
EV_HC1 + 20Cu	12-5501-3302	02 Mar-21	03 Mar-21	96h (3.4 °C)		
LC_DCDS + 20Cu	04-1088-5978	02 Mar-21	03 Mar-21	96h (0.6 °C)		
LC_LC3 + 20Cu	14-7773-4190	02 Mar-21	03 Mar-21	96h (2.3 °C)		
LC_LC5 + 20Cu	01-7235-6798	02 Mar-21	03 Mar-21	96h (0.6 °C)		
LC_LCDSSLCC20C	06-4197-2641	02 Mar-21	03 Mar-21	96h (2.4 °C)		
FR_FR4 + 20Cu	10-9481-5020	02 Mar-21	03 Mar-21	96h (5.4 °C)		
FR_FR2 + 20Cu	00-3159-8672	02 Mar-21	03 Mar-21	96h (4.4 °C)		
FR_MULTIPLATE2	02-2179-0364	02 Mar-21	03 Mar-21	96h (2.9 °C)		
FR_FRRD + 20Cu	19-5167-8345	02 Mar-21	03 Mar-21	96h (6.2 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
Lab Control	Ambient Sample	Teck Coal Ltd	Lab Control	
10Cu Control	Ambient Sample	Teck Coal Ltd	10Cu Control	
15Cu Control	Ambient Sample	Teck Coal Ltd	15Cu Control	
20Cu Control	Ambient Sample	Teck Coal Ltd	20Cu Control	
FR_UFR1 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_UFR1_MON_2021-03-0	
GH_ER2 +15Cu	Ambient Sample	Teck Coal Ltd	GH_ER2_WS_2021-03-02_	
CM_MC1 + 15Cu	Ambient Sample	Teck Coal Ltd	CM_MC1_WS_2021-03-02	
LC_SLC + 15Cu	Ambient Sample	Teck Coal Ltd	LC_SLC_WS_2021-03-02_	
FR_FRABCH + 20C	Ambient Sample	Teck Coal Ltd	FR_FRABCH_MON_2021-	
FR_FRCP1 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FRCP1_MON_2021-03	
GH_FR1 + 20Cu	Ambient Sample	Teck Coal Ltd	GH_FR1_WS_2021-03-02_	
GH_ERC + 10Cu	Ambient Sample	Teck Coal Ltd	GH_ERC_WS_2021-03-02	
CM_MC2 + 20Cu	Ambient Sample	Teck Coal Ltd	CM_MC2_WS_2021-03-02	
RG_MIDAG + 15Cu	Ambient Sample	Teck Coal Ltd	RG_MIDAG_WS_2021-03-	
EV_MC2 + 20Cu	Ambient Sample	Teck Coal Ltd	EV_MC2_WS_2021_Q1_W	
EV_HC1 + 20Cu	Ambient Sample	Teck Coal Ltd	EV_HC1_WS_2021_Q1_W	
LC_DCDS + 20Cu	Ambient Sample	Teck Coal Ltd	LC_DCDS_WS_2021-03-02	
LC_LC3 + 20Cu	Ambient Sample	Teck Coal Ltd	LC_LC3_WS_2021-03-02_	
LC_LC5 + 20Cu	Ambient Sample	Teck Coal Ltd	LC_LC5_WS_2021-03-02_	
LC_LCDSSLCC20C	Ambient Sample	Teck Coal Ltd	LC_LCDSSLCC_WS_2021-	
FR_FR4 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FR4_WS_2021-03-02_	
FR_FR2 + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FR2_WS_2021-03-02_	

Analyst: KLe QA: MG

JUN 10 2021

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 21-4567-4526 **Endpoint:** Post Hatch Survival **CETIS Version:** CETISv1.9.4
Analyzed: 22 May-21 11:32 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_MULTIPLATE2	Ambient Sample	Teck Coal Ltd	FR_MULTIPLATE_WS_202	
FR_FRRD + 20Cu	Ambient Sample	Teck Coal Ltd	FR_FRRD_WS_2021-03-02	

Fisher Exact/Bonferroni Adj Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
Site Control		Lab Control	0.9673	Exact	1.0000	Non-Significant Effect
		10Cu Control	0.9979	Exact	1.0000	Non-Significant Effect
		15Cu Control	0.8321	Exact	1.0000	Non-Significant Effect
		20Cu Control	0.8096	Exact	1.0000	Non-Significant Effect
		FR_UFR1 + 20Cu	0.9234	Exact	1.0000	Non-Significant Effect
		GH_ER2 +15Cu*	0.0000	Exact	3.8E-06	Significant Effect
		CM_MC1 + 15Cu*	0.0003	Exact	0.0058	Significant Effect
		FR_FRABCH + 20C	0.5902	Exact	1.0000	Non-Significant Effect
		FR_FRCP1 + 20Cu*	0.0005	Exact	0.0111	Significant Effect
		GH_FR1 + 20Cu	0.9505	Exact	1.0000	Non-Significant Effect
		GH_ERC + 10Cu	0.9645	Exact	1.0000	Non-Significant Effect
		CM_MC2 + 20Cu	0.9979	Exact	1.0000	Non-Significant Effect
		RG_MIDAG + 15Cu	0.3309	Exact	1.0000	Non-Significant Effect
		EV_MC2 + 20Cu	0.7168	Exact	1.0000	Non-Significant Effect
		EV_HC1 + 20Cu	0.6621	Exact	1.0000	Non-Significant Effect
		LC_DCDS + 20Cu	0.8098	Exact	1.0000	Non-Significant Effect
		LC_LC3 + 20Cu	0.9391	Exact	1.0000	Non-Significant Effect
		LC_LC5 + 20Cu	0.9343	Exact	1.0000	Non-Significant Effect
		LC_LCDSSLCC20Cu	0.9391	Exact	1.0000	Non-Significant Effect
		FR_FR4 + 20Cu	0.0500	Exact	1.0000	Non-Significant Effect
		FR_FR2 + 20Cu*	0.0001	Exact	0.0029	Significant Effect
		FR_MULTIPLATE20	0.5000	Exact	1.0000	Non-Significant Effect
		FR_FRRD + 20Cu	0.3540	Exact	1.0000	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	2.592	3.37	0.8135	No Outliers Detected

JUN 10 2021

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 21-4567-4526 **Endpoint:** Post Hatch Survival **CETIS Version:** CETISv1.9.4
Analyzed: 22 May-21 11:32 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Data Summary

Sample	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
Lab Control		54	6	60	0.9	0.1	-12.98%
10Cu Control		56	3	59	0.9492	0.05085	-19.15%
15Cu Control		50	9	59	0.8475	0.1525	-6.38%
20Cu Control		48	9	57	0.8421	0.1579	-5.71%
FR_UFR1 + 20Cu		50	7	57	0.8772	0.1228	-10.12%
GH_ER2 +15Cu		19	40	59	0.322	0.678	59.57%
CM_MC1 + 15Cu		28	31	59	0.4746	0.5254	40.43%
LC_SLC + 15Cu	XC	47	12	59	0.7966	0.2034	0.0%
FR_FRABCH + 20C		47	12	59	0.7966	0.2034	0.0%
FR_FRCP1 + 20Cu		29	30	59	0.4915	0.5085	38.3%
GH_FR1 + 20Cu		49	6	55	0.8909	0.1091	-11.84%
GH_ERC + 10Cu		53	6	59	0.8983	0.1017	-12.77%
CM_MC2 + 20Cu		56	3	59	0.9492	0.05085	-19.15%
RG_MIDAG + 15Cu		44	15	59	0.7458	0.2542	6.38%
EV_MC2 + 20Cu		46	10	56	0.8214	0.1786	-3.12%
EV_HC1 + 20Cu		47	11	58	0.8103	0.1897	-1.72%
LC_DCDS + 20Cu		43	8	51	0.8431	0.1569	-5.84%
LC_LC3 + 20Cu		53	7	60	0.8833	0.1167	-10.89%
LC_LC5 + 20Cu		52	7	59	0.8814	0.1186	-10.64%
LC_LCDSSLCC20C		53	7	60	0.8833	0.1167	-10.89%
FR_FR4 + 20Cu		38	21	59	0.6441	0.3559	19.15%
FR_FR2 + 20Cu		27	32	59	0.4576	0.5424	42.55%
FR_MULTIPLATE20		46	13	59	0.7797	0.2203	2.13%
FR_FRRD + 20Cu		42	14	56	0.75	0.25	5.85%

Post Hatch Survival Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Lab Control		0.9333	0.8667	0.8000	1.0000
10Cu Control		1.0000	0.8667	0.9333	1.0000
15Cu Control		0.8667	1.0000	0.6000	0.9286
20Cu Control		0.8571	1.0000	0.6000	0.9333
FR_UFR1 + 20Cu		0.9231	0.9333	0.8667	0.7857
GH_ER2 +15Cu		0.2667	0.4667	0.2000	0.3571
CM_MC1 + 15Cu		0.5333	0.5333	0.4286	0.4000
LC_SLC + 15Cu	XC	0.6429	0.6667	0.9333	0.9333
FR_FRABCH + 20C		0.8000	0.8667	0.7143	0.8000
FR_FRCP1 + 20Cu		0.3571	0.4000	0.7333	0.4667
GH_FR1 + 20Cu		0.7857	1.0000	0.8667	0.9286
GH_ERC + 10Cu		0.9333	0.8667	0.9286	0.8667
CM_MC2 + 20Cu		0.9333	1.0000	0.9333	0.9286
RG_MIDAG + 15Cu		0.6667	0.7143	0.8000	0.8000
EV_MC2 + 20Cu		0.9286	0.7500	0.8000	0.8000
EV_HC1 + 20Cu		0.8000	0.8571	0.8667	0.7143
LC_DCDS + 20Cu		0.6667	0.7857	0.9333	1.0000
LC_LC3 + 20Cu		0.8667	1.0000	0.8667	0.8000
LC_LC5 + 20Cu		1.0000	0.9333	0.8667	0.7143
LC_LCDSSLCC20C		0.9333	0.8000	0.8667	0.9333
FR_FR4 + 20Cu		0.6000	0.7333	0.5333	0.7143
FR_FR2 + 20Cu		0.4667	0.4667	0.6429	0.2667
FR_MULTIPLATE2		0.7143	0.8000	0.8667	0.7333
FR_FRRD + 20Cu		0.8571	0.8571	0.6000	0.6923

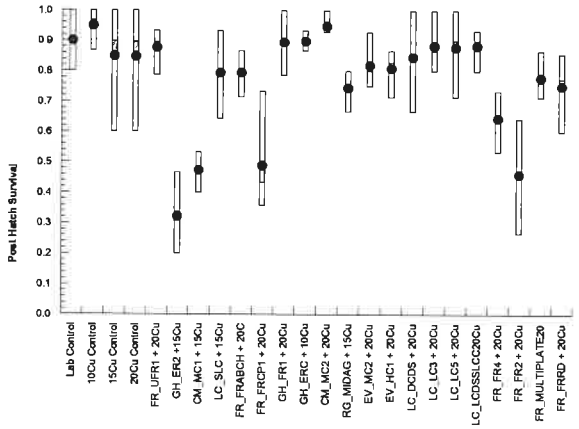
Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 21-4567-4526 **Endpoint:** Post Hatch Survival **CETIS Version:** CETISv1.9.4
Analyzed: 22 May-21 11:32 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Post Hatch Survival Binomials

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Lab Control		14/15	13/15	12/15	15/15
10Cu Control		14/14	13/15	14/15	15/15
15Cu Control		13/15	15/15	9/15	13/14
20Cu Control		12/14	13/13	9/15	14/15
FR_UFR1 + 20Cu		12/13	14/15	13/15	11/14
GH_ER2 +15Cu		4/15	7/15	3/15	5/14
CM_MC1 + 15Cu		8/15	8/15	6/14	6/15
LC_SLC + 15Cu	XC	9/14	10/15	14/15	14/15
FR_FRABCH + 20C		12/15	13/15	10/14	12/15
FR_FRCP1 + 20Cu		5/14	6/15	11/15	7/15
GH_FR1 + 20Cu		11/14	12/12	13/15	13/14
GH_ERC + 10Cu		14/15	13/15	13/14	13/15
CM_MC2 + 20Cu		14/15	15/15	14/15	13/14
RG_MIDAG + 15Cu		10/15	10/14	12/15	12/15
EV_MC2 + 20Cu		13/14	9/12	12/15	12/15
EV_HC1 + 20Cu		12/15	12/14	13/15	10/14
LC_DCDS + 20Cu		8/12	11/14	14/15	10/10
LC_LC3 + 20Cu		13/15	15/15	13/15	12/15
LC_LC5 + 20Cu		15/15	14/15	13/15	10/14
LC_LCDSSLCC20C		14/15	12/15	13/15	14/15
FR_FR4 + 20Cu		9/15	11/15	8/15	10/14
FR_FR2 + 20Cu		7/15	7/15	9/14	4/15
FR_MULTIPLATE2		10/14	12/15	13/15	11/15
FR_FRRD + 20Cu		12/14	12/14	9/15	9/13

Graphics



Analyst: CL QA: MG JUN 10 2021

APPENDIX D – Chain-of-Custody Forms

Teck

COC ID: 2/23/2021 | TURNAROUND TIME: | RUSH:

PROJECT/CLIENT INFO				LABORATORY				OTHER INFO			
Facility Name / Job#	Fording River Operation			Lab Name	Nautilus Environmental - BC			Report Format / Distribution		Excel	PDF	EDD
Project Manager	Scott Roughead			Lab Contact				Email 1:	david.burroughs@teck.com	X	X	X
Email	scott.roughead@teck.com			Email	BCinfo@nautilusenvironmental.ca			Email 2:	britt.anderson@teck.com	X	X	X
Address				Address	8664 Commerce Court			Email 3:	scott.roughead@teck.com	X	X	X
								Email 4:	teckcoal@equisonline.com			X
City	Elkford	Province	BC	City	Burnaby	Province	BC	Email 5:				
Postal Code		Country	Canada	Postal Code	V5A 4N7	Country	Canada	Email 6:	jared.cayenne@teck.com	X	X	X
Phone Number	1-250-433-6976			Phone Number	604-420-8773			VPO00741382				

SAMPLE DETAILS / ANALYSIS REQUESTED (Filtered - F: Field, L: Lab, FL: Field & Lab, N: None)

Sample ID	Sample Location (sys_loc_code)	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	Filt.	PRESERV.	ANALYSIS: 210269 7-d C.dubia P/F	ANALYSIS: 210290 7-d C.dubia P/F (EDTA)	ANALYSIS: 210288 72-hr P. subcapitata P/F								
								NO	NO	NO										
								NO	NO	NO										
FR_FRCP1_MON_2021-02-01_N	FR_FRCP1	WS	NO	2/23/2021		G	1			X	X	X								5.8
FR_FRABCH_MON_2021-02-01_NP	FR_FRABCH	WS	NO	2/23/2021		G	1			X		X								5.7
FR_UFR1_MON_2021-02-01_N	FR_UFR1	WS	NO	2/23/2021	9:40	G	1			X		X								9.4

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
	Britt Anderson	February 23, 2021	Tyme Hamilton	Feb 11/21 @ 16:44
			Nautilus - Burnaby	QI

SERVICE REQUEST (rush - subject to availability)

Regular (default)	X
Priority (2-3 business days) - 50% surcharge	
Emergency (1 Business Day) - 100% surcharge	
For Emergency <1 Day, ASAP or Weekend - Contact ALS	

Sampler's Name	Britt Anderson	Mobile #	250-425-5335
Sampler's Signature		Date/Time	February 23, 2021

Teck

COC ID: 2021-02-23 | TURNAROUND TIME: | RUSH:

PROJECT/CLIENT INFO				LABORATORY				OTHER INFO				
Facility Name / Job#	Fording River Operation			Lab Name	Nautilus Environmental - BC			Report Format / Distribution		Excel	PDF	EDD
Project Manager	Scott Roughead			Lab Contact				Email 1:	david.burroughs@teck.com	X	X	X
Email	scott.roughead@teck.com			Email	BCinfo@nautilusenvironmental.ca			Email 2:	britt.anderson@teck.com	X	X	X
Address				Address	8664 Commerce Court			Email 3:	scott.roughead@teck.com	X	X	X
								Email 4:	teckcoal@equisonline.com			X
City	Elkford	Province	BC	City	Burnaby	Province	BC	Email 5:	carlie.meyer@teck.com	X	X	X
Postal Code		Country	Canada	Postal Code	V5A 4N7	Country	Canada	Email 6:	cait.good@teck.com	X	X	X
Phone Number	1-250-433-6976			Phone Number	604-420-8773							

SAMPLE DETAILS / ANALYSIS REQUESTED (Filtered: F: Field, L: Lab, FL: Field & Lab, N: None)

Sample ID	Sample Location (sys loc code)	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	FIELD	PRESERV.	ANALYSIS: 210289 7-d C.dubia P/F	7-d C.dubia P/F (EDTA)	72-hr P. subcapitata P/F	30-d embryo EA P/F	28-d Hyalella P/F	28-d Hyalella P/F (EDTA)					
FR_FR4_WS_2021-02-23_N	FR_FR4	WS	NO	2021-02-23	11:54	G	1			X										1.8
FR_FRRD_WS_2021-02-23_N	FR_FRRD	WS	NO	2021-02-23	13:03	G	1			X										4.5
FR_FR2_WS_2021-02-23_N	FR_FR2	WS	NO	2021-02-23	10:14	G	1			X										4.8
FR_MULTIPLATE_WS_2021-02-23_NP	FR_MULTIPLATE	WS	NO	2021-02-23	9:14	G	1			X										1.3

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
			Tyrone Hamilton	Feb. 24/21 @ 11:44
			Nautilus - Burnaby	QI

SERVICE REQUEST (rush - subject to availability)					
Regular (default)	X	Sampler's Name	Haley Pocaluyko	Mobile #	604 362 6626
Priority (2-3 business days) - 50% surcharge		Sampler's Signature	Haley Pocaluyko	Date/Time	2021/02/23
Emergency (1 Business Day) - 100% surcharge					
For Emergency <1 Day, ASAP or Weekend - Contact ALS					

Teck

COC ID: 20210223 Chronic Tox Burn | **TURNAROUND TIME:** | **RUSH:**

PROJECT/CLIENT INFO				LABORATORY				OTHER INFO				
Facility Name / Job#	Line Creek Operation			Lab Name	Nautilus Environmental			Report Format / Distribution		Excel	PDF	EDD
Project Manager	Chris Blurton			Lab Contact	Armando Tang			Email 1:	chris.blurton@teck.com	x	x	
Email	chris.blurton@teck.com			Email	armando@nautilusenvironmental.com			Email 2:	teckcoal@equisonline.com			x
Address	Box 2003			Address	8664 Commerce Crt			Email 3:	drake.tymstra@teck.com	x	x	
	15km North Hwy 43							Email 4:	shanise.fossen@teck.com	x	x	
								Email 5:				
City	Sparwood	Province	BC	City	Burnaby	Province	BC	PO number	VPO00741384			
Postal Code	V0B 2G0	Country	Canada	Postal Code	V5A 4N7	Country	Canada					
Phone Number	250-425-6111			Phone Number	604-420-8773							

SAMPLE DETAILS								ANALYSIS REQUESTED											Filtered - F: Field, L: Lab, FL: Field & Lab, N: None
								Filt.	N	N	N								
								PRESERV.	N	N	N								
Sample ID	Sample Location	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	ANALYSIS	7-d C.dubia P/F	72-hr P. subcapitata P/F	30-d fathead minnow P/F 210287								
LC_DCDS_WS_2021-02-23_N	LC_DCDS	WS	No	23-Feb-21	11:15	G	1				X								8.1
LC_LC3_WS_2021-02-22_N	LC_LC3	WS	No	23-Feb-21	11:00	G	1				X								2.9
LC_SLC_WS_2021-02-22_N	LC_SLC	WS	No	23-Feb-21	11:45	G	1				X								0.9
LC_LC5_WS_2021-02-22_N	LC_LC5	WS	No	23-Feb-21	13:45	G	1				X								1.8
LC_LCDSSLCC_WS_2021-02-22_N	LC_LCDSSLCC	WS	No	23-Feb-21	13:00	G	1				X								0.9

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
Please provide prelimnary update as results are available	S.Fossen	2/23/2021	Tyrone Hamilton	Feb. 24/21 @ 11:44
			Nautilus - Burnaby	Q1

NB OF BOTTLES RETURNED/DESCRIPTION	
Regular (default)	X
Priority (2-3 business days) - 50% surcharge	
Emergency (1 Business Day) - 100% surcharge	
For Emergency <1 Day, ASAP or Weekend - Contact ALS	

Sampler's Name	S.Fossen	Mobile #	O: 250-425-3196 / C: 780-223-8222
Sampler's Signature	S Fossen	Date/Time	February 23, 2021

Teck

COC ID: 20210223 Chronic Tox Calg | **TURNAROUND TIME:** | **RUSH:**

PROJECT/CLIENT INFO				LABORATORY				OTHER INFO			
Facility Name / Job#	Line Creek Operation			Lab Name	Nautilus Environmental			Report Format / Distribution		Excel	PDF	EDD
Project Manager	Chris Blurton			Lab Contact	Jeslin Wijaya			Email 1:	chris.blurton@teck.com	x	x	
Email	chris.blurton@teck.com			Email	jeslin@nautilusenvironmental.ca			Email 2:	teckcoal@equisonline.com			x
Address	Box 2003			Address	6125 12 St NE			Email 3:	drake.tymstra@teck.com	x	x	
	15km North Hwy 43							Email 4:	shanise.fossen@teck.com	x	x	
								Email 5:				
City	Sparwood	Province	BC	City	Calgary	Province	AB	PO number	VPO00741384			
Postal Code	V0B 2G0	Country	Canada	Postal Code	T2H 2K1	Country	Canada					
Phone Number	250-425-6111			Phone Number	403-253-7121							

SAMPLE DETAILS | **ANALYSIS REQUESTED** | Filtered - F: Field, L: Lab, FL: Field & Lab, N: None

Sample ID	Sample Location	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	FIL	PRESERV.	ANALYSIS 210289 7-d C.dubia P/F	210288 72-hr P. subcapitata P/F	30-d fathead minnow P/F	
									N	N	N		
									N	N	N		
LC_DCDS_WS_2021-02-23_N	LC_DCDS	WS	No	23-Feb-21	11:15	G	3			X	X		8.1
LC_LC3_WS_2021-02-22_N	LC_LC3	WS	No	23-Feb-21	11:00	G	3			X	X		2.9
LC_SLC_WS_2021-02-22_N	LC_SLC	WS	No	23-Feb-21	11:45	G	3			X	X		0.9
LC_LC5_WS_2021-02-22_N	LC_LC5	WS	No	23-Feb-21	13:45	G	3			X	X		1.8
LC_LCDSSLCC_WS_2021-02-22_N	LC_LCDSSLCC	WS	No	23-Feb-21	13:00	G	3			X	X		0.9

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
Please provide prelimnary update as results are available	S.Fossen	2/23/2021	Tyrone Hamilton	Feb. 24/21 @ 11:44
			Nautilus - Bemby	Q1

NB OF BOTTLES RETURNED/DESCRIPTION	
Regular (default)	X
Priority (2-3 business days) - 50% surcharge	
Emergency (1 Business Day) - 100% surcharge	
For Emergency <1 Day, ASAP or Weekend - Contact ALS	

Sampler's Name	S.Fossen	Mobile #	O: 250-425-3196 / C: 780-223-8222
Sampler's Signature	S Fossen	Date/Time	February 23, 2021

Teck

COC ID: **2021-02-23-Chronic-Tox** | Phone Number | RUSH: NO

PROJECT/CLIENT INFO				LABORATORY				OTHER INFO			
Facility Name / Job#	Greenhills Operation			Lab Name	Nautilus Environmental			Report Format / Distribution		Excel	PDF	EDD
Project Manager	Jeremy Enns			Lab Contact	Armondo Tang			Email 1:	Leigh.Stickney@teck.com	X	X	X
Email	jeremy.enns@teck.com			Email	armando@nautilusenvironmental.ca			Email 2:	Heather.stevenson@teck.com	X	X	X
Address	P.O. BOX 5000			Address	8664 Commerce Court			Email 3:	teckcoal@equisonline.com			X
City	Elkford	Province	BC	City	Burnaby	Province	BC	Email 4:	jaydon.francis@teck.com	X	X	X
Postal Code	V0B1H0	Country	Canada	Postal Code	V5A4N7	Country	Can	Email 5:	ashlee.fudge@teck.com	X	X	X
Phone Number	250-865-3048			Phone Number	604-420-8773			Email 6:	DL-Equis-GHO-Field@teck.com	X	X	X
								Email 7:	jeremy.enns@teck.com	X	X	X
								PO number	740426			

Sample ID		Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	FIL.	PRESERV.	ANALYSIS 7-d C.dubia P/F	72-hr P. subcapitata P/F	30-d fathead minnow P/F								°C
										210289	210288	210287								
GH_FR1_WS_2021-02-23_N	GH_FR1	WS	N	2/23/2021	10:20	G	1			X	X	X								-0.7
GH_ERC_WS_2021-02-23_N	GH_ERC	WS	N	2/23/2021	1535	G	1			X	X	X								8.4
GH_ER2_WS_2021-02-23_N	GH_ER2	WS	N	2/23/2021	14:00	G	1			X	X	X								7.8

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
			Tyme Hamilton	Feb. 24/21 @ 11:44
			Nautilus - Burnaby	Q1

SERVICE REQUEST (rush - subject to availability)	
Regular (default)	X
Priority (2-3 business days) - 50% surcharge	
Emergency (1 Business Day) - 100% surcharge	
For Emergency <1 Day, ASAP or Weekend - Contact ALS	

Sampler's Name	HS/AF	Mobile #	
Sampler's Signature		Date/Time	FEB 23 2021

Teck

COC ID:	Q1_CHRONIC_02232021_Burn	TURNAROUND TIME:	Regular	RUSH:	No

PROJECT/CLIENT INFO				LABORATORY				OTHER INFO				
Facility Name / Job#	Coal Mountain Operations			Lab Name	Nautilus Environmental			Report Format / Distribution		Excel	PDF	EDD
Project Manager	Jay Jones			Lab Contact	Armando Tang			Email 1:	Jay.Jones@teck.com	X	X	X
Email	Jay.Jones@teck.com			Email	armando@nautilusenvironmental.ca			Email 2:	teckcoal@equisonline.com			X
								Email 3:	Victoria.Sharpe@teck.com	X	X	X
								Email 4	Don.Sacino@teck.com	X	X	X
Address	PO Box 3000			Address	8664 commerce Court			Email 5:	Shelby.Holden@teck.com	X	X	X
City	Sparwood	Province	BC	City	Burnaby	Province	BC	PO number				
Postal Code	V0B 2G0	Country	Canada	Postal Code	V5A 4N7	Country	Canada					
Phone Number	1-250-425-7321			Phone Number	604-420-8773							

SAMPLE DETAILS								ANALYSIS REQUESTED											Filtered - F: Field, L: Lab, FL: Field & Lab, N: None
								Filt.											
								PRESERV.											
								ANALYSIS	210289 7-d C.dubia P/F	7-d C.dubia P/F (EDTA) 210290	210288 72-hr P. subcapitata P/F	30-d embryo EA P/F	30-d embryo EA P/F (20 ug/L Cu)	28-d Hyalella P/F	28-d Hyalella P/F (EDTA)				9C
Sample ID	Sample Location	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.												
CM_MC2_AHC_2021-02-23_N	CM_MC2	WS	No	2/23/2021	10:25	G	1		X	X	X								0.3
CM_MC1_WS_2021-02-23_N	CM_MC1	WS	No	2/23/2021	11:25	G	1		X		X								1
RG_MIDAG_WS_2021-02-23_N	RG_MIDAG	WS	No	2/23/2021	9:33	G	1		X	X									

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
			Tyrone Hamilton	Feb. 24 @ 11:44
			Nautilus - Burnby	Q1

NB OF BOTTLES RETURNED/DESCRIPTION	
Regular (default)	X
Priority (2-3 business days) - 50% surcharge	
Emergency (1 Business Day) - 100% surcharge	
For Emergency <1 Day, ASAP or Weekend - Contact ALS	

Sampler's Name	SH/JD	Mobile #	250 425 7522
Sampler's Signature		Date/Time	February 23, 2021

Teck

COC ID:	20210223CRN1B	TURNAROUND TIME:		RUSH:	

PROJECT/CLIENT INFO				LABORATORY				OTHER INFO				
Facility Name / Job#	Elkview Operations			Lab Name	Nautilus Environmental			Report Format / Distribution		Excel	PDF	EDD
Job Description	Q1 Chronic Sampling			Lab Contact	Jeslin Wijaya			Email 1:	kennedy.allen@teck.com	X	X	X
Project Manager	Annie Larrivee			Email	[illegible]			Email 2:	teckcoal@equisonline.com			X
Email	Annie.Larrivee@teck.com			Address	8664 Commerce Court			Email 3:	Kimberley.Hackett@teck.com	X	X	X
Address	RR#1 HWY# 3				Imperial Square Lake City			Email 4:	Annie.Larrivee@teck.com	X	X	X
								Email 5:	Teck.Lab.Results@sharepoint.teck.com	X	X	X
City	Sparwood	Province	BC	City	Burnaby	Province	BC	PO number	VPO00678876			
Postal Code	V1C 4C3	Country	Canada	Postal Code	V5A 4N7	Country	Canada					
Phone Number	1-250-425-8137			Phone Number	604-420-8773							

SAMPLE DETAILS								ANALYSIS REQUESTED											Filtered - F: Field, L: Lab, FL: Field & Lab, N: None
								FILTERED	No	No	No	No							
								PRESERVED	No	No	No	No							
Sample ID	Sample Location	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	ANALYSIS	7-d C.dubia P/F	72-hr P. subcapitata P/F	30-d embryo EA P/F	28-d H. azteca P/F							
EV_HC1_WS_2020_Q1_WK1_N	EV_HC1	WS	N	2/23/2021	11:10	G	1				3								0.0
EV_MC2_WS_2020_Q1_WK1_N	EV_MC2	WS	N	2/23/2021	12:40	G	1				3								0.0
											210291	210292							
					Total		2												

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
Toxicity 96-Hr/48-HR = 96 Hr Rainbow Trout pass/fail & 48 Hr Daphnia pass/fail (Daphinia testing to occur at 20 degrees)	Dominique Nicholas	23-Feb-21	Tyrone Hamilton Nautilus - Burnby	Feb. 24/21 @ 9:44 Q1

NB OF BOTTLES RETURNED/DESCRIPTION					
Regular (default)	X	Sampler's Name	D. Nicholas	Mobile #	1-250-425-1101
Priority (2-3 business days) - 50% surcharge		Sampler's Signature		Date/Time	February 23, 2021
Emergency (1 Business Day) - 100% surcharge					
For Emergency <1 Day, ASAP or Weekend - Contact ALS					

Teck

COC ID: 3/2/2021 | **TURNAROUND TIME:** | **RUSH:**

PROJECT/CLIENT INFO

Facility Name / Job#	Fording River Operation		
Project Manager	Scott Roughead		
Email	Scott.Roughead@teck.com		
Address	PO Box 100		
City	Elkford	Province	BC
Postal Code	V0B 1H0	Country	Canada
Phone Number	1-250-865-5195		

LABORATORY

Lab Name	HydroQual Laboratories Ltd.		
Lab Contact			
Email	ABinfo@nautilusenvironmental.ca		
Address	#4, 6125 12 Street SE		
City	Calgary	Province	AB
Postal Code	?T2H 2K1	Country	Canada
Phone Number	403-253-7121		

OTHER INFO

Report Format / Distribution		Excel	PDF	EDD
Email 1:	david.burroughs@teck.com	X	X	X
Email 2:	britt.anderson@teck.com	X	X	X
Email 3:	scott.roughead@teck.com	X	X	X
Email 4:	teckcoal@equisonline.com			X
Email 5:	jared.cayenne@teck.com	X	X	X
Email 6:				

PO: VPO00741382

SAMPLE DETAILS

2021/03/03
11:30
Bear Paw
SC/AE
9x20L carboys/S
NOS/NOI
Good Condition
Week 1

ANALYSIS REQUESTED

Filtered - F: Field, L: Lab, FL: Field & Lab, N: None

Sample ID	Sample Location (sys_loc_code)	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	Filt.	PRESERV.	ANALYSIS: 30-d fathead minnow P/F	
								N	NONE		
FR_FRCP1_MON_2021-03-01_N 2021-0970	FR_FRCP1	WS	NO	3/2/2021	10:15	G	3			X	3.0°C
FR_FRABCH_MON_2021-03-01_NP 2021-0972	FR_FRABCH	WS	NO	3/2/2021	11:45	G	3			X	3.8°C
FR_UFR1_MON_2021-03-01_N ~~2021-0972~~ 2021-0971	FR_UFR1	WS	NO	3/2/2021	11:30	G	3			X	4.6°C

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
	Britt Anderson	March 2, 2021		

SERVICE REQUEST (rush - subject to availability)

Regular (default)	X
Priority (2-3 business days) - 50% surcharge	
Emergency (1 Business Day) - 100% surcharge	
For Emergency <1 Day, ASAP or Weekend - Contact ALS	

Sampler's Name	Britt Anderson	Mobile #	250-425-5335
Sampler's Signature		Date/Time	March 2, 2021

Teck

COC ID: 2021-03-02 | TURNAROUND TIME: | RUSH:

PROJECT/CLIENT INFO			
Facility Name / Job#	Fording River Operation		
Project Manager	Scott Roughead		
Email	Scott.Roughead@teck.com		
Address	PO Box 100		
City	Elkford	Province	BC
Postal Code	V0B 1H0	Country	Canada
Phone Number	1-250-865-5195		

LABORATORY			
Lab Name	Nautilus Environmental Labs Calgary		
Lab Contact			
Email	ABinfo@nautilusenvironmental.ca		
Address	#4, 6125 12 Street SE		
City	Calgary	Province	AB
Postal Code	T2H 2K1	Country	Canada
Phone Number	403-253-7121		

OTHER INFO				
Report Format / Distribution		Excel	PDF	EDD
Email 1:	david.burroughs@teck.com	X	X	X
Email 2:	britt.anderson@teck.com	X	X	X
Email 3:	scott.roughead@teck.com	X	X	X
Email 4:	teckcoal@equisonline.com			X
Email 5:	carlie.meyer@teck.com	X	X	X
Email 6:	cait.good@teck.com	X	X	X

SAMPLE DETAILS

2021/03/03
11:30
Bear Paw
SC/AE
12x 20L carboys
N&S/N&I
Good Condition
Week 1

ANALYSIS REQUESTED — Filtered - F; Field, L: Lab, FL: Field & Lab, N: None

Sample ID	Sample Location (sys loc code)	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	Filt.	PRESERV.	ANALYSIS: 30-d fathead minnow P/F	
								N	NONE		
FR_FR4_WS_2021-02-23_N (03-02) 2021-0973	FR_FR4	WS	NO	2021/03/02	11:25	G	3			3	5.4°C
FR_FRRD_WS_2021-02-23_N (03-02) 2021-0972	FR_FRRD	WS	NO	2021/03/02	13:00	G	3			3	6.2°C
FR_FR2_WS_2021-02-23_N (03-02) 2021-0974	FR_FR2	WS	NO	2021/03/02	10:14	G	3			3	4.4°C
FR_MULTIPLATE_WS_2021-02-23_NP (03-02) 2021-0975	FR_MULTIPLATE	WS	NO	2021/03/02	8:44	G	3			3	2.9°C

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME

SERVICE REQUEST (rush - subject to availability)

Regular (default)	X
Priority (2-3 business days) - 50% surcharge	
Emergency (1 Business Day) - 100% surcharge	
For Emergency <1 Day, ASAP or Weekend - Contact ALS	

Sampler's Name	Haley Pocaluyko / Niko Wicharuk	Mobile #	306-690-8885
Sampler's Signature	Haley Pocaluyko	Date/Time	March 2, 2021

Teck

COC ID:	2021-03-02-Chronic-Tox	Phone Number		RUSH:	NO

PROJECT/CLIENT INFO				LABORATORY				OTHER INFO			
Facility Name / Job#	Greenhills Operation			Lab Name	Hydroqual Laboratories Ltd			Report Format / Distribution		Excel	PDF	EDD
Project Manager	Jeremy Enns			Lab Contact	Jacklyn Pool			Email 1:	Leigh.Stickney@teck.com	X	X	X
Email	jeremy.enns@teck.com			Email				Email 2:	Heather.stevenson@teck.com	X	X	X
Address	P.O. BOX 5000			Address	#4, 6125 - 12th Street S.E.			Email 3:	teckcoal@equisonline.com			X
City	Elkford	Province	BC	City	Calgary	Province	AB	Email 4:	jaydon.francis@teck.com	X	X	X
Postal Code	V0B1H0	Country	Canada	Postal Code	T2H 2K1	Country	Can	Email 5:	ashlee.fudge@teck.com	X	X	X
Phone Number	250-865-3048			Phone Number	403-253-7121			Email 6:	DL-Equis-GHO-Field@teck.com	X	X	X
								Email 7:	jeremy.enns@teck.com	X	X	X
								PO number	740426			

2021/03/03
11:30
Bear Paw
JC/AE
9x20L carboys
NoS/NoT
GH_ER2 carboys missing,
three carboys marked GH_ER1
delivered
Week1

Sample ID		Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	Fil.	PRESERV.	ANALYSIS: 30-d fathead minnow P/F	
GH_FR1_WS_2021-03-02_N	2021-0977 GH_FR1	WS	N	3/2/2021	10:00	G	3			X	2.4°C
GH_ERC_WS_2021-03-02_N	2021-0978 GH_ERC	WS	N	3/2/2021	13:10	G	3			X	4.1°C
GH_ER2_WS_2021-03-02_N	2021-0979 GH_ER2	WS	N	3/2/2021	11:45	G	3			X	4.2°C

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME

SERVICE REQUEST (rush - subject to availability)					
Regular (default)	X	Sampler's Name	AF/HS	Mobile #	
Priority (2-3 business days) - 50% surcharge					
Emergency (1 Business Day) - 100% surcharge		Sampler's Signature		Date/Time	MAR 02 2021
For Emergency <1 Day, ASAP or Weekend - Contact ALS					

Teck

COC ID:	20210302CRN2C	TURNAROUND TIME:		RUSH:	

PROJECT/CLIENT INFO				LABORATORY				OTHER INFO				
Facility Name / Job#	Elkview Operations			Lab Name	Nautilus Environmental			Report Format / Distribution		Excel	PDF	EDD
Job Description	Q1 Chronic Sampling			Lab Contact	Jacklyn Poole			Email 1:	kennedy.allen@teck.com	X	X	X
Project Manager	Annie Larrivee			Email	Jacklyn@nautilusenvironmental.ca			Email 2:	teckcoal@equisonline.com			X
Email	Annie.Larrivee@teck.com			Address	6125 12st SE			Email 3:	Kimberley.Hackett@teck.com	X	X	X
Address	RR#1 HWY# 3							Email 4:	Annie.Larrivee@teck.com	X	X	X
								Email 5:	Teck.Lab.Results@sharepoint.teck.com	X	X	X
City	Sparwood	Province	BC	City	Calgary	Province	AB	PO number	VPO00678876			
Postal Code	V1C 4C3	Country	Canada	Postal Code	T2H 2K1	Country	Canada					
Phone Number	1-250-425-8137			Phone Number	403-253-7121							

SAMPLE DETAILS

2021/03/03 Week 1
11:30
Bear Paw
JC/AE
6x20L carboys
N66/N6J
Good Condition 2021-0980

ANALYSIS REQUESTED

Filtered - F: Field, L: Lab, FL: Field & Lab, N: None

Sample ID	Sample Location	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	ANALYSIS	7-d C.dubia P/F	72-hr P. subcapitata P/F	30-d fathead minnow P/F						
FILTERED									No	No	No	No					
PRESERVED									No	No	No	No					
EV_HC1_WS_2021_Q1_WK2_N	EV_HC1	WS	N	3/2/2021	11:20	G	3				3		3.4°C				
EV_MC2_WS_2021_Q1_WK2_N	EV_MC2	WS	N	3/2/2021	9:00	G	3				3		4.4°C				
2021-0981																	
					Total		6										

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
Toxicity 96-Hr/48-HR = 96 Hr Rainbow Trout pass/fail & 48 Hr Daphnia pass/fail (Daphinia testing to occur at 20 degrees)	Chris Emslie	2-Mar-21		

NB OF BOTTLES RETURNED/DESCRIPTION					
Regular (default)	X	Sampler's Name	Chris Emslie/Justin Kamata	Mobile #	1-250-425-1101
Priority (2-3 business days) - 50% surcharge		Sampler's Signature		Date/Time	March 2, 2021
Emergency (1 Business Day) - 100% surcharge					
For Emergency <1 Day, ASAP or Weekend - Contact ALS					

Teck

COC ID:	Q1_CHRONIC_03022021_CAL	TURNAROUND TIME:	Regular	RUSH:	NO

PROJECT/CLIENT INFO				LABORATORY				OTHER INFO				
Facility Name / Job#	Coal Mountain Operations			Lab Name	Hydroqual Laboratories			Report Format / Distribution		Excel	PDF	EDD
Project Manager	Jay Jones			Lab Contact	Claudio Quinteros			Email 1:	Victoria.Sharpe@teck.com	X	X	X
Email	Jay.Jones@teck.com				Jessica Wang			Email 2:	teckcoal@equisonline.com			X
				Email	claudio@nautilusenvironmental.ca			Email 3:	Jay.jones@teck.com	X	X	X
					jessica@nautilusenvironmental.ca			Email 4	Don.Sacino@teck.com	X	X	X
Address	PO Box 3000			Address	#4, 6125-12th Street S.E.							
City	Sparwood	Province	BC	City	Calgary	Province	AB	PO number				
Postal Code	V0B 2G0	Country	Canada	Postal Code	T2H 2K1	Country	Canada					
Phone Number	1-250-425-7321			Phone Number	403-253-7121							

SAMPLE DETAILS

2021/03/03
11:30
Bear Pond
JC/AE
9x20L carboys
NGS/NOT
Good Condition
Week 1

ANALYSIS REQUESTED

Filtered - F: Field, L: Lab, FL: Field & Lab, N: None

Sample ID (JC)	Sample Location	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	Filt.	PRESERV.	ANALYSIS: 30-d fathead minnow P/F			
CM_MC2_WS_2021-03-02_N 2021-0981 2	CM_MC2	WS	No	3/2/2021	9:42	G	3			X		0.3°C	
CM_MC1_WS_2021-03-02_N 2021-0983	CM_MC1	WS	No	3/2/2021	10:30	G	3			X		1.0°C	
RG_MIDAG_WS_2021-03-02_N 2021-0984	RG_MIDAG	WS	NO	3/2/2021	8:54	G	3			X		0.6°C	

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME

NB OF BOTTLES RETURNED/DESCRIPTION

Regular (default)	X
Priority (2-3 business days) - 50% surcharge	
Emergency (1 Business Day) - 100% surcharge	
For Emergency <1 Day, ASAP or Weekend - Contact ALS	

Sampler's Name	SH/JD	Mobile #	250 425 7522
Sampler's Signature		Date/Time	March 2, 2021

Teck

COC ID:	20210302 Chronic Tox Calg	TURNAROUND TIME:		RUSH:	

PROJECT/CLIENT INFO				LABORATORY				OTHER INFO				
Facility Name / Job#	Line Creek Operation			Lab Name	Nautilus Environmental			Report Format / Distribution		Excel	PDF	EDD
Project Manager	Chris Blurton			Lab Contact	Jeslin Wijaya			Email 1:	chris.blurton@teck.com	x	x	
Email	chris.blurton@teck.com			Email	jeslin@nautilusenvironmental.ca			Email 2:	teckcoal@equisonline.com			x
Address	Box 2003			Address	6125 12 St NE			Email 3:	drake.tymstra@teck.com	x	x	
	15km North Hwy 43							Email 4:	shanise.fossen@teck.com	x	x	
								Email 5:				
City	Sparwood	Province	BC	City	Calgary	Province	AB	PO number	VPO00741384			
Postal Code	V0B 2G0	Country	Canada	Postal Code	T2H 2K1	Country	Canada					
Phone Number	250-425-6111			Phone Number	403-253-7121							

2021/03/03
11:30
Bear Pan
JC/AE
15x20L carboys
N6S/N0I
Good Condition
Week 1

SAMPLE DETAILS								ANALYSIS REQUESTED														Filtered - F: Field, L: Lab, FL: Field & Lab, N: None
								Filt.	N	N	N											
								PRESERV.	N	N	N											
Sample ID	Sample Location	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	ANALYSIS	7-d C.dubia P/F	72-hr P. subcapitata P/F	30-d fathead minnow P/F											
LC_DCDS_WS_2021-03-02_N 2021-0988	LC_DCDS	WS	No	02-Mar-21	11:00	G	3				X	0.2°C										
LC_LC3_WS_2021-03-02_N 2021-0988	LC_LC3	WS	No	02-Mar-21	11:30	G	3				X	2.3°C										
LC_SLC_WS_2021-03-02_N 2021-0987	LC_SLC	WS	No	02-Mar-21	11:15	G	3				X	3.1°C										
LC_LC5_WS_2021-03-02_N 2021-0989	LC_LC5	WS	No	02-Mar-21	13:30	G	3				X	0.6°C										
LC_LCDSSLCC_WS_2021-03-02_N	LC_LCDSSLCC	WS	No	02-Mar-21	12:15	G	3				X	2.9°C										
2021-0985																						

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
Please provide prelimnary update as results are available	S.Fossen	2021/03/02		

NB OF BOTTLES RETURNED/DESCRIPTION	
Regular (default)	X
Priority (2-3 business days) - 50% surcharge	
Emergency (1 Business Day) - 100% surcharge	
For Emergency <1 Day, ASAP or Weekend - Contact ALS	

Sampler's Name	S.Fossen	Mobile #	O: 250-425-3196 / C: 780-223-8222
Sampler's Signature	S Fossen	Date/Time	March 2, 2021

Teck

COC ID:	3/9/2021	TURNAROUND TIME:		RUSH:	

PROJECT/CLIENT INFO				LABORATORY				OTHER INFO			
Facility Name / Job#	Fording River Operation			Lab Name	HydroQual Laboratories Ltd.			Report Format / Distribution		Excel	PDF	EDD
Project Manager	Scott Roughead			Lab Contact				Email 1:	david.burroughs@teck.com	X	X	X
Email	Scott.Roughead@teck.com			Email	ABinfo@nautilusenvironmental.ca			Email 2:	britt.anderson@teck.com	X	X	X
Address	PO Box 100			Address	#4, 6125 12 Street SE			Email 3:	scott.roughead@teck.com	X	X	X
								Email 4:	teckcoal@equisonline.com			X
City	Elkford	Province	BC	City	Calgary	Province	AB	Email 5:	jared.cayenne@teck.com	X	X	X
Postal Code	V0B 1H0	Country	Canada	Postal Code	?T2H 2K1	Country	Canada	Email 6:				
Phone Number	1-250-865-5195			Phone Number	403-253-7121			PO:	VPO00741382			

SAMPLE DETAILS / **ANALYSIS REQUESTED** (Filtered - F: Field, L: Lab, FL: Field & Lab, N: None)

2021/03/10
12:00
Beau Pan
JC
6x20L carboys
NOS/NGI
Good Condition
Week 2

Sample ID	Sample Location (sys_loc_code)	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	Filt.	PRESERV.	ANALYSIS: 30-d fathead minnow P/F	
								N	NONE		
FR_FRCP1_WS-TOX_2021-03-09_N 2021-0970	FR_FRCP1	WS	NO	3/9/2021	9:55	G	2			X	3.1°C
FR_FRABCH_WS-TOX_2021-03-09_NP 2021-0972	FR_FRABCH	WS	NO	3/9/2021	11:50	G	2			X	4.1°C
FR_UFR1_WS-TOX_2021-03-09_N 2021-0971	FR_UFR1	WS	NO	3/9/2021	11:12	G	2			X	1.8°C

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
	Britt Anderson	3/9/2021		

SERVICE REQUEST (rush - subject to availability)					
Regular (default)	X	Sampler's Name	Britt Anderson	Mobile #	250-425-5335
Priority (2-3 business days) - 50% surcharge					
Emergency (1 Business Day) - 100% surcharge		Sampler's Signature		Date/Time	3/9/2021
For Emergency <1 Day, ASAP or Weekend - Contact ALS					

Teck

COC ID:	2021-03-09	TURNAROUND TIME:		RUSH:	

PROJECT/CLIENT INFO

Facility Name / Job#	Fording River Operation		
Project Manager	Scott Roughead		
Email	Scott.Roughead@teck.com		
Address	PO Box 100		
City	Elkford	Province	BC
Postal Code	V0B 1H0	Country	Canada
Phone Number	1-250-865-5195		

LABORATORY

Lab Name	HydroQual Laboratories Ltd.		
Lab Contact			
Email	ABinfo@nautilusenvironmental.ca		
Address	#4, 6125 12 Street SE		
City	Calgary	Province	AB
Postal Code	?T2H 2K1	Country	Canada
Phone Number	403-253-7121		

OTHER INFO

Report Format / Distribution		Excel	PDF	EDD
Email 1:	david.burroughs@teck.com	X	X	X
Email 2:	britt.anderson@teck.com	X	X	X
Email 3:	scott.roughead@teck.com	X	X	X
Email 4:	teckcoal@equisonline.com			X
Email 5:	carlie.meyer@teck.com	X	X	X
Email 6:	cait.good@teck.com	X	X	X

SAMPLE DETAILS

2021/03/10
12:00
Bear Paw
JC
8x20L carboys
NoS/NGL
Good Condition
Week 2

ANALYSIS REQUESTED — Filtered - F: Field, L: Lab, FL: Field & Lab, N: None

Sample ID	Sample Location (sys loc code)	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	30-d fathead minnow P/F (Filt.: N; Preserv.: NONE)	(Filt.: N; Preserv.: NONE)	(Filt.: N; Preserv.: NONE)	(Filt.: N; Preserv.: NONE)
FR_FR4_WS_2021-03-09_N 2021-0973	FR_FR4	WS	NO	09-Mar-21	11:54	G	2	X	3.2°C		
FR_FRRD_WS_2021-03-09_N 2021-0976	FR_FRRD	WS	NO	09-Mar-21	1:02	G	2	X	6.4°C		
FR_FR2_WS_2021-03-09_N 2021-0974	FR_FR2	WS	NO	09-Mar-21	10:25	G	2	X	4.3°C		
FR_MULTIPLATE_WS_2021-03-09_NP 2021-0975	FR_MULTIPLATE	WS	NO	09-Mar-21	9:10	G	2	X	1.8°C		

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS

RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME

SERVICE REQUEST (rush - subject to availability)

Regular (default)	X
Priority (2-3 business days) - 50% surcharge	
Emergency (1 Business Day) - 100% surcharge	
For Emergency <1 Day, ASAP or Weekend - Contact ALS	

Sampler's Name	Haley Pocaluyko	Mobile #	604 362 6626
Sampler's Signature	Haley Pocaluyko	Date/Time	March 9, 2021

Teck

COC ID: 2020-03-09-Chronic-tox | **TURNAROUND TIME:** | **RUSH:** NO

PROJECT/CLIENT INFO				LABORATORY				OTHER INFO			
Facility Name / Job#	Greenhills Operation			Lab Name	Hydroqual Laboratories Ltd			Report Format / Distribution	Excel	PDF	EDD
Project Manager	Jeremy Enns			Lab Contact	Jacklyn Pool			Email 1: Leigh.Stickney@teck.com	X	X	X
Email	jeremy.enns@teck.com			Email				Email 2: Heather.stevenson@teck.com	X	X	X
Address	P.O. BOX 5000			Address	#4, 6125 - 12th Street S.E.			Email 3: teckcoal@equisonline.com			X
								Email 4: jaydon.francis@teck.com	X	X	X
City	Elkford	Province	BC	City	Calgary	Province	AB	Email 5: ashlee.fudge@teck.com	X	X	X
Postal Code	V0B1H0	Country	Canada	Postal Code	T2H 2K1	Country	Can	Email 6: DL-Equis-GHO-Field@teck.com	X	X	X
Phone Number	250-865-3048			Phone Number	403-253-7121			Email 7: jeremy.enns@teck.com	X	X	X
								PO number 740426			

2021/03/10
12:00
Bear Paw
JC
6x20L carboys
NOS/NOT
Good Condition
Week 2

Sample ID			Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	Filt.	PRESERV.	ANALYSIS: 30-d fathead minnow P/F											
GH_FR1_WS_2021-03-09_N	2021-0977	GH_FR1	WS	N	3/9/2021		G	2			X	1.9°C										
GH_ER2_WS_2021-03-09_N	2021-0979	GH_ER2	WS	N	3/9/2021		G	2			X	3.2°C										
GH_ERC_WS_2021-03-09_N	2021-0978	GH_ERC	WS	N	3/9/2021		G	2			X	3.1°C										

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME

SERVICE REQUEST (rush - subject to availability)					
Regular (default)	X	Sampler's Name	JF/JM	Mobile #	
Priority (2-3 business days) - 50% surcharge					
Emergency (1 Business Day) - 100% surcharge		Sampler's Signature		Date/Time	MAR 09 2021
For Emergency <1 Day, ASAP or Weekend - Contact ALS					

Teck

COC ID: 20210309CRN3C

TURNAROUND TIME:

RUSH:

PROJECT/CLIENT INFO

Facility Name / Job#	Elkview Operations
Job Description	Q1 Chronic Sampling
Project Manager	Annie Larrivee
Email	Annie.Larrivee@teck.com
Address	RR#1 HWY# 3
City	Sparwood
Province	BC
Postal Code	V1C 4C3
Country	Canada
Phone Number	1-250-425-8137

LABORATORY

Lab Name	Nautilus Environmental
Lab Contact	Jacklyn Poole
Email	Jacklyn@nautilusenvironmental.ca
Address	6125 12st SE
City	Calgary
Province	AB
Postal Code	T2H 2K1
Country	Canada
Phone Number	403-253-7121

OTHER INFO

Report Format / Distribution		Excel	PDF	EDD
Email 1:	kennedy.allen@teck.com	x	x	x
Email 2:	teckcoal@equisonline.com			x
Email 3:	Michael.Moore@teck.com	x	x	x
Email 4:	Annie.Larrivee@teck.com	x	x	x
Email 5:	Teck.Lab.Results@sharepoint.teck.com	x	x	x
PO number	VPO00678876			

SAMPLE DETAILS

2021/03/10 Week 2
12:00
Bear Paw
SC
4x20L carboys
N6S/N6L
Good Cond 2021-0980

ANALYSIS REQUESTED

Filtered - F: Field, L: Lab, FL: Field & Lab, N: None

Sample ID	Sample Location	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	ANALYSIS	7-d C.dubia P/F	72-hr P. subcapitata P/F	30-d fathead minnow P/F
								FILTERED	No	No	No	No
								PRESERVED	No	No	No	No
EV_HC1_WS_2021_Q1_WK3_N	EV_HC1	WS	N	3/9/2021	11:25	G	2		1.9°C		3
EV_MC2_WS_2021_Q1_WK3_N	EV_MC2	WS	N	3/9/2021	12:35	G	2		1.4°C		3
2021-0981											
					Total		4				

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS

Toxicity 96-Hr/48-HR = 96 Hr Rainbow Trout pass/fail & 48 Hr Daphnia pass/fail
(Daphinia testing to occur at 20 degrees)

RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
Chris Emslie	9-Mar-21		

NB OF BOTTLES RETURNED/DESCRIPTION

Regular (default)	X
Priority (2-3 business days) - 50% surcharge	
Emergency (1 Business Day) - 100% surcharge	
For Emergency <1 Day, ASAP or Weekend - Contact ALS	

Sampler's Name	Dominique Nicholas/Justin Kamata	Mobile #	1-250-425-1101
Sampler's Signature		Date/Time	March 9, 2021

Teck

COC ID:	Q1_CHRONIC_03092021_CAL	TURNAROUND TIME:	Regular	RUSH:	NO

PROJECT/CLIENT INFO				LABORATORY				OTHER INFO				
Facility Name / Job#	Coal Mountain Operations			Lab Name	Hydroqual Laboratories			Report Format / Distribution		Excel	PDF	EDD
Project Manager	Jay Jones			Lab Contact	Jacklyn			Email 1:	Victoria.Sharpe@teck.com	X	X	X
Email	Jay.Jones@teck.com				Tamara			Email 2:	teckcoal@equisonline.com			X
				Email	jacklyn@nautilusenvironmental.ca			Email 3:	Jay.jones@teck.com	X	X	X
					tamara@nautilusenvironmental.ca			Email 4	Don.Sacino@teck.com	X	X	X
Address	PO Box 3000			Address	#4, 6125-12th Street S.E.			Email 5:	Shelby.Holden@teck.com	X	X	X
City	Sparwood	Province	BC	City	Calgary	Province	AB	PO number				
Postal Code	V0B 2G0	Country	Canada	Postal Code	T2H 2K1	Country	Canada					
Phone Number	1-250-425-7321			Phone Number	403-253-7121							

SAMPLE DETAILS / **ANALYSIS REQUESTED** (Filtered - F: Field, L: Lab, FL: Field & Lab, N: None)

2021/03/10
12:00
Bear Paw
JC
6x20L carboys
NoS/NoL
Good Condition
Week 2

Sample ID	Sample Location	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	Filt.	PRESERV.	ANALYSIS: 30-d fathead minnow P/F		
CM_MC2_AHC_2021-03-09_N 2021-0982	CM_MC2	WS	No	3/9/2021	10:57	G	2			X	0.5°C	
CM_MC1_WS_2021-03-09_N 2021-0983	CM_MC1	WS	No	3/9/2021	11:31	G	2			X	1.2°C	
RG_MIDAG_WS_2021-03-09_N 2021-0984	RG_MIDAG	WS	NO	3/9/2021	10:22	G	2			X	0.7°C	

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME

NB OF BOTTLES RETURNED/DESCRIPTION					
Regular (default)	X	Sampler's Name	SH/JD	Mobile #	250 425 7522
Priority (2-3 business days) - 50% surcharge		Sampler's Signature	SHOff	Date/Time	March 9, 2021
Emergency (1 Business Day) - 100% surcharge					
For Emergency <1 Day, ASAP or Weekend - Contact ALS					

Teck

COC ID: 20210309 Chronic Tox Calg | **TURNAROUND TIME:** | **RUSH:**

PROJECT/CLIENT INFO				LABORATORY				OTHER INFO				
Facility Name / Job#	Line Creek Operation			Lab Name	Nautilus Environmental			Report Format / Distribution		Excel	PDF	EDD
Project Manager	Chris Blurton			Lab Contact	Jeslin Wijaya			Email 1:	chris.blurton@teck.com	x	x	
Email	chris.blurton@teck.com			Email	jeslin@nautilusenvironmental.ca			Email 2:	teckcoal@equisonline.com			x
Address	Box 2003			Address	6125 12 St NE			Email 3:	drake.tymstra@teck.com	x	x	
	15km North Hwy 43							Email 4:	shanise.fossen@teck.com	x	x	
								Email 5:				
City	Sparwood	Province	BC	City	Calgary	Province	AB	PO number	VPO00741384			
Postal Code	V0B 2G0	Country	Canada	Postal Code	T2H 2K1	Country	Canada					
Phone Number	250-425-6111			Phone Number	403-253-7121							

SAMPLE DETAILS | **ANALYSIS REQUESTED** (Filtered - F: Field, L: Lab, FL: Field & Lab, N: None)

2021/03/10
12:00
Bear Paw
JC
10x20L carboys
NoS/NoI
Good Condition
Veelt 2

Sample ID	Sample Location	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	Filt.	PRESERV.	ANALYSIS: 7-d C.dubia P/F	72-hr P. subcapitata P/F	30-d fathead minnow P/F
								N	N	N	N	N
LC_DCDS_WS_2021-03-09_N 2021-0988	LC_DCDS	WS	No	09-Mar-21	11:10	G	2			2.4°C		X
LC_LC3_WS_2021-03-09_N 2021-0986	LC_LC3	WS	No	09-Mar-21	11:50	G	2			0.3°C		X
LC_SLC_WS_2021-03-09_N 2021-0987	LC_SLC	WS	No	09-Mar-21	14:00	G	2			0.4°C		X
LC_LC5_WS_2021-03-09_N 2021-0989	LC_LC5	WS	No	09-Mar-21	12:50	G	2			2.3°C		X
LC_LCDSSLCC_WS_2021-03-09_N 2021-0985	LC_LCDSSLCC	WS	No	09-Mar-21	12:15	G	2			2.9°C		X

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
Please provide prelimnary update as results are available	S.Fossen	2021/03/09		

NB OF BOTTLES RETURNED/DESCRIPTION

Regular (default)	X
Priority (2-3 business days) - 50% surcharge	
Emergency (1 Business Day) - 100% surcharge	
For Emergency <1 Day, ASAP or Weekend - Contact ALS	

Sampler's Name	S.Fossen	Mobile #	O: 250-425-3196 / C: 780-223-8222
Sampler's Signature	S Fossen	Date/Time	March 9, 2021

Teck

COC ID:	3/16/2021	TURNAROUND TIME:		RUSH:	

PROJECT/CLIENT INFO				LABORATORY				OTHER INFO				
Facility Name / Job#	Fording River Operation			Lab Name	HydroQual Laboratories Ltd.			Report Format / Distribution		Excel	PDF	EDD
Project Manager	Scott Roughead			Lab Contact				Email 1:	david.burroughs@teck.com	X	X	X
Email	Scott.Roughead@teck.com			Email	ABinfo@nautilusenvironmental.ca			Email 2:	britt.anderson@teck.com	X	X	X
Address	PO Box 100			Address	#4, 6125 12 Street SE			Email 3:	scott.roughead@teck.com	X	X	X
								Email 4:	teckcoal@equisonline.com			X
City	Elkford	Province	BC	City	Calgary	Province	AB	Email 5:	jared.cayenne@teck.com	X	X	X
Postal Code	V0B 1H0	Country	Canada	Postal Code	?T2H 2K1	Country	Canada	Email 6:				
Phone Number	1-250-865-5195			Phone Number	403-253-7121			PO:	VPO00741382			

SAMPLE DETAILS

2021/03/17
12:30
Bear Paw
JC
6x20L carboys
NoS/NoB
Good Condition
Week 3

ANALYSIS REQUESTED — Filtered - F: Field, L: Lab, FL: Field & Lab, N: None

Sample ID	Sample Location (sys_loc_code)	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	30-d fathead minnow P/F	
								Filt.	N
								PRESERV.	NONE
FR_FRABCH_WS-TOX_2021-03-16_NP 2021-0922	FR_FRABCH	WS	NO	3/16/2021	11:10	G	2	X	6.8°C
FR_FRCP1_WS-TOX_2021-03-16_N 2021-0970	FR_FRCP1	WS	NO	3/16/2021	09:50	G	2	X	4.6°C
FR_UFR1_WS-TOX_2021-03-16_N 2021-0971	FR_UFR1	WS	NO	3/16/2021	10:00	G	2	X	3.4°C

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
	Britt Anderson	3/16/2021		

SERVICE REQUEST (rush - subject to availability)					
Regular (default)	X	Sampler's Name	Britt Anderson	Mobile #	250-425-5335
Priority (2-3 business days) - 50% surcharge					
Emergency (1 Business Day) - 100% surcharge		Sampler's Signature	[signature]	Date/Time	3/16/2021
For Emergency <1 Day, ASAP or Weekend - Contact ALS					

Teck

COC ID: 2021-03-16 | TURNAROUND TIME: | RUSH:

PROJECT/CLIENT INFO				LABORATORY				OTHER INFO			
Facility Name / Job#	Fording River Operation			Lab Name	HydroQual Laboratories Ltd.			Report Format / Distribution		Excel	PDF	EDD
Project Manager	Scott Roughead			Lab Contact				Email 1:	david.burroughs@teck.com	X	X	X
Email	Scott.Roughead@teck.com			Email	ABinfo@nautilusenvironmental.ca			Email 2:	britt.anderson@teck.com	X	X	X
Address	PO Box 100			Address	#4, 6125 12 Street SE			Email 3:	scott.roughead@teck.com	X	X	X
								Email 4:	teckcoal@equisonline.com			X
City	Elkford	Province	BC	City	Calgary	Province	AB	Email 5:	carlie.meyer@teck.com	X	X	X
Postal Code	V0B 1H0	Country	Canada	Postal Code	?T2H 2K1	Country	Canada	Email 6:	cait.good@teck.com	X	X	X
Phone Number	1-250-865-5195			Phone Number	403-253-7121							

SAMPLE DETAILS

2021/03/17
12:30
Bear Paw
JC
6x20L carboys
NOS/NOI
Good Condition
Week 3

ANALYSIS REQUESTED — Filtered - F: Field, L: Lab, FL: Field & Lab, N: None

Sample ID	Sample Location (sys loc code)	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	FIL	PRESERV.	ANALYSIS: 30-d fathead minnow P/F	
								N	NONE		
FR_FR4_WS_2021-03-16_N 2021-0973	FR_FR4	WS	NO	16-Mar-21	11:52	G	2			X	4.4°C
FR_FRRD_WS_2021-03-16_N 2021-0976	FR_FRRD	WS	NO	16-Mar-21	12:47	G	2			X	4.6°C
FR_FR2_WS_2021-03-16_N 2021-0974	FR_FR2	WS	NO	16-Mar-21	10:39	G	2			X	7.1°C
FR_MULTIPLATE_WS_2021-03-16_NP	FR_MULTIPLATE	WS	NO	16-Mar-21	9:25	G	2			X	4.3°C
2021-0975											

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME

SERVICE REQUEST (rush - subject to availability)

Regular (default)	X
Priority (2-3 business days) - 50% surcharge	
Emergency (1 Business Day) - 100% surcharge	
For Emergency <1 Day, ASAP or Weekend - Contact ALS	

Sampler's Name	Haley Pocaluyko	Mobile #	604 362 6626
Sampler's Signature	Haley Pocaluyko	Date/Time	March 16th, 2021

Teck

COC ID:	2020-03-16-Chronic-tox	TURNAROUND TIME:		RUSH:	NO

PROJECT/CLIENT INFO

Facility Name / Job#	Greenhills Operation		
Project Manager	Jeremy Enns		
Email	jeremy.enns@teck.com		
Address	P.O. BOX 5000		
City	Elkford	Province	BC
Postal Code	V0B1H0	Country	Canada
Phone Number	250-865-3048		

LABORATORY

Lab Name	Hydroqual Laboratories Ltd		
Lab Contact	Jacklyn Pool		
Email			
Address	#4, 6125 - 12th Street S.E.		
City	Calgary	Province	AB
Postal Code	T2H 2K1	Country	Can
Phone Number	403-253-7121		

OTHER INFO

Report Format / Distribution		Excel	PDF	EDD
Email 1:	Leigh.Stickney@teck.com	X	X	X
Email 2:	Heather.stevenson@teck.com	X	X	X
Email 3:	teckcoal@equisonline.com			X
Email 4:	jennifer.manojlovic@teck.com	X	X	X
Email 5:	ashlee.fudge@teck.com	X	X	X
Email 6:	DL-Equis-GHO-Field@teck.com	X	X	X
Email 7:	jeremy.enns@teck.com	X	X	X
PO number	740426			

2021/03/17
12:30
Bear Paw
DC
6x20L carboys
NoS/NoI
Good Condition
Week 3

Sample ID			Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	Filt.	PRES'RV.	ANALYSIS: 30-d fathead minnow P/F	
GH_ER2_WS_2021-03-15_N	2021-0979	GH_ER2	WS	N	3/16/2021	10:10	G	2			X	3.8°C
GH_ERC_WS_2021-03-15_N	2021-0978	GH_ERC	WS	N	3/16/2021	11:05	G	2			X	5.4°C
GH_FR1_WS_2021-03-15_N	2021-0977	GH_FR1	WS	N	3/16/2021	11:50	G	2			X	6.9°C

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME

SERVICE REQUEST (rush - subject to availability)

Regular (default)	X
Priority (2-3 business days) - 50% surcharge	
Emergency (1 Business Day) - 100% surcharge	
For Emergency <1 Day, ASAP or Weekend - Contact ALS	

Sampler's Name	JF/AF	Mobile #	
Sampler's Signature		Date/Time	MAR 16 2021

Teck

COC ID: 20210316CRN4C | TURNAROUND TIME: | RUSH:

PROJECT/CLIENT INFO

Facility Name / Job#	Elkview Operations		
Job Description	Q1 Chronic Sampling		
Project Manager	Annie Larrivee		
Email	Annie.Larrivee@teck.com		
Address	RR#1 HWY# 3		
City	Sparwood	Province	BC
Postal Code	V1C 4C3	Country	Canada
Phone Number	1-250-425-8137		

LABORATORY

Lab Name	Nautilus Environmental		
Lab Contact	Jacklyn Poole		
Email	Jacklyn@nautilusenvironmental.ca		
Address	6125 12st SE		
City	Calgary	Province	AB
Postal Code	T2H 2K1	Country	Canada
Phone Number	403-253-7121		

OTHER INFO

Report Format / Distribution		Excel	PDF	EDD
Email 1:	kennedy.allen@teck.com	x	x	x
Email 2:	teckcoal@equisonline.com			x
Email 3:	Micheal.Moore@teck.com	x	x	x
Email 4:	Annie.Larrivee@teck.com	x	x	x
Email 5:	Teck.Lab.Results@sharepoint.teck.com	x	x	x
PO number	VPO00678876			

SAMPLE DETAILS

2021/03/17 Week 3
12:30
Bear Paw
3C
4x20L carboys
NoS/NoT
Good Condition 2021-0980

ANALYSIS REQUESTED

Filtered - F: Field, L: Lab, FL: Field & Lab, N: None

Sample ID	Sample Location	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	FILTERED	PRESERVED	ANALYSIS: 7-d C.dubia P/F	72-hr P. subcapitata P/F	30-d fathead minnow P/F		
								No	No	No	No	No	No	
EV_HC1_WS_2021_Q1_WK4_N	EV_HC1	WS	N	3/16/2021	10:15	G	2					3	2.0°C	
EV_MC2_WS_2021_Q1_WK4_N	EV_MC2	WS	N	3/16/2021	12:45	G	2					3	0.9°C	
2021-0981														
					Total		4							

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS

Toxicity 96-Hr/48-HR = 96 Hr Rainbow Trout pass/fail & 48 Hr Daphnia pass/fail
(Daphinia testing to occur at 20 degrees)

RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
Dominique Nicholas	16-Mar-21		

NB OF BOTTLES RETURNED/DESCRIPTION

Regular (default)	X
Priority (2-3 business days) - 50% surcharge	
Emergency (1 Business Day) - 100% surcharge	
For Emergency <1 Day, ASAP or Weekend - Contact ALS	

Sampler's Name	D.Nicholas/Bolu.O	Mobile #	1-250-425-1101
Sampler's Signature		Date/Time	March 16, 2021

Teck

COC ID:	Q1_CHRONIC_03162021_CAL	TURNAROUND TIME:	Regular	RUSH:	NO

PROJECT/CLIENT INFO

Facility Name / Job#	Coal Mountain Operations		
Project Manager	Jay Jones		
Email	Jay.Jones@teck.com		
Address	PO Box 3000		
City	Sparwood	Province	BC
Postal Code	V0B 2G0	Country	Canada
Phone Number	1-250-425-7321		

LABORATORY

Lab Name	Hydroqual Laboratories		
Lab Contact	Jacklyn Poole		
	Tamara Pomeroy		
Email	jacklyn@nautilusenvironmental.ca		
	tamara@nautilusenvironmental.ca		
Address	#4, 6125-12th Street S.E.		
City	Calgary	Province	AB
Postal Code	T2H 2K1	Country	Canada
Phone Number	403-253-7121		

OTHER INFO

Report Format / Distribution		Excel	PDF	EDD
Email 1:	Victoria.Sharpe@teck.com	X	X	X
Email 2:	teckcoal@equisonline.com			X
Email 3:	Jay.jones@teck.com	X	X	X
Email 4	Don.Sacino@teck.com	X	X	X
Email 5:	Shelby.Holden@teck.com	X	X	X
PO number				

SAMPLE DETAILS

2021/03/17
12:30
Bear Paw
JC
6x20L carboys
NoS/NoT
Good Condition
Week 3

ANALYSIS REQUESTED

Filtered - F: Field, L: Lab, FL: Field & Lab, N: None

Sample ID		Sample Location	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	Filt.	PRESERV.	ANALYSIS: 30-d fathead minnow P/F	
CM_MC2_WS_2021-03-16_N	2021-0982	CM_MC2	WS	No	3/16/2021	10:06	G	2			X	3.0°C
CM_MC1_WS_2021-03-16_N	2021-0983	CM_MC1	WS	No	3/16/2021	10:56	G	2			X	2.9°C
RG_MIDAG_WS_2021-03-16_N	2021-0984	RG_MIDAG	WS	No	3/16/2021	9:20	G	2			X	2.0°C

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME

NB OF BOTTLES RETURNED/DESCRIPTION

Regular (default)	X
Priority (2-3 business days) - 50% surcharge	
Emergency (1 Business Day) - 100% surcharge	
For Emergency <1 Day, ASAP or Weekend - Contact ALS	

Sampler's Name	SH/JD	Mobile #	250 425 7522
Sampler's Signature	SHolden	Date/Time	March 16, 2021

Teck

COC ID:	20210316 Chronic Tox Calg	TURNAROUND TIME:		RUSH:	

PROJECT/CLIENT INFO				LABORATORY				OTHER INFO				
Facility Name / Job#	Line Creek Operation			Lab Name	Nautilus Environmental			Report Format / Distribution		Excel	PDF	EDD
Project Manager	Tom Jeffery			Lab Contact	Jeslin Wijaya			Email 1:	tom.jeffery@teck.com	x	x	
Email	tom.jeffery@teck.com			Email	jeslin@nautilusenvironmental.ca			Email 2:	teckcoal@equisonline.com			x
Address	Box 2003			Address	6125 12 St NE			Email 3:	drake.tymstra@teck.com	x	x	
	15km North Hwy 43							Email 4:	shanise.fossen@teck.com	x	x	
								Email 5:				
City	Sparwood	Province	BC	City	Calgary	Province	AB	PO number	VPO00741384			
Postal Code	V0B 2G0	Country	Canada	Postal Code	T2H 2K1	Country	Canada					
Phone Number	250-425-6111			Phone Number	403-253-7121							

2021/03/17
12:30
Bear Pan
SC
10x20L carboys
N6S/N6E
Good Condition
Week 3

SAMPLE DETAILS								ANALYSIS REQUESTED														Filtered - F: Field, L: Lab, FL: Field & Lab, N: None
								Filt.	N	N	N											
								PRESERV.	N	N	N											
Sample ID	Sample Location	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	ANALYSIS	7-d C.dubia P/F	72-hr P. subcapitata P/F	30-d fathead minnow P/F											
LC_DCDS_WS_2021-03-16_N 2021-0986	LC_DCDS	WS	No	16-Mar-21	12:05	G	2				X	2.1°C										
LC_LC3_WS_2021-03-16_N 2021-0986	LC_LC3	WS	No	16-Mar-21	11:20	G	2				X	2.2°C										
LC_SLC_WS_2021-03-16_N 2021-0987	LC_SLC	WS	No	16-Mar-21	10:20	G	2				X	-0.2°C										
LC_LC5_WS_2021-03-16_N 2021-0989	LC_LC5	WS	No	16-Mar-21	12:30	G	2				X	-0.8°C										
LC_LCDSSLCC_WS_2021-03-16_N 2021-0985	LC_LCDSSLCC	WS	No	16-Mar-21	11:40	G	2				X	0.1°C										

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
Please provide prelimnary update as results are available	S.Fossen	2021/03/16		

NB OF BOTTLES RETURNED/DESCRIPTION	
Regular (default)	X
Priority (2-3 business days) - 50% surcharge	
Emergency (1 Business Day) - 100% surcharge	
For Emergency <1 Day, ASAP or Weekend - Contact ALS	

Sampler's Name	S.Fossen	Mobile #	O: 250-425-3196 / C: 780-223-8222
Sampler's Signature	S Fossen	Date/Time	March 16, 2021

Teck

COC ID: 3/23/2021 | TURNAROUND TIME: | RUSH:

PROJECT/CLIENT INFO

Facility Name / Job#	Fording River Operation		
Project Manager	Scott Roughead		
Email	Scott.Roughead@teck.com		
Address	PO Box 100		
City	Elkford	Province	BC
Postal Code	V0B 1H0	Country	Canada
Phone Number	1-250-865-5195		

LABORATORY

Lab Name	HydroQual Laboratories Ltd.		
Lab Contact			
Email	ABinfo@nautilusenvironmental.ca		
Address	#4, 6125 12 Street SE		
City	Calgary	Province	AB
Postal Code	?T2H 2K1	Country	Canada
Phone Number	403-253-7121		

OTHER INFO

Report Format / Distribution		Excel	PDF	EDD
Email 1:	david.burroughs@teck.com	X	X	X
Email 2:	britt.anderson@teck.com	X	X	X
Email 3:	scott.roughead@teck.com	X	X	X
Email 4:	teckcoal@equisonline.com			X
Email 5:	jared.cayenne@teck.com	X	X	X
Email 6:				

PO: VPO00741382

SAMPLE DETAILS

2021/03/24
12:00
Bear Paw
SC/AE/KL
9x20L carboys
N6S/NoI
Good Condition
Week 4

ANALYSIS REQUESTED

Filtered - F: Field, L: Lab, FL: Field & Lab, N: None

Sample ID	Sample Location (sys_loc_code)	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	Filt.	PRESERV.	ANALYSIS: 30-d fathead minnow P/F	
								N	NONE		
FR_FRABCH_WEK_2021-03-23_NP 2021-0972	FR_FRABCH	WS	NO	3/23/2021	11:10	G	3			X	0.6°C
FR_FRCP1_WEK_2021-03-23_N 2021-0970	FR_FRCP1	WS	NO	3/23/2021	09:50	G	3			X	-0.7°C
FR_UFR1_WEK_2021-03-23_N 2021-0971	FR_UFR1	WS	NO	3/23/2021	11:00	G	3			X	-0.6°C

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
	Britt Anderson	3/23/2021		

SERVICE REQUEST (rush - subject to availability)

Regular (default)	X
Priority (2-3 business days) - 50% surcharge	
Emergency (1 Business Day) - 100% surcharge	
For Emergency <1 Day, ASAP or Weekend - Contact ALS	

Sampler's Name	Britt Anderson	Mobile #	250-425-5335
Sampler's Signature		Date/Time	3/23/2021

Teck

COC ID:	2021/03/23	TURNAROUND TIME:		RUSH:	

PROJECT/CLIENT INFO

Facility Name / Job#	Fording River Operation		
Project Manager	Scott Roughead		
Email	Scott.Roughead@teck.com		
Address	PO Box 100		
City	Elkford	Province	BC
Postal Code	V0B 1H0	Country	Canada
Phone Number	1-250-865-5195		

LABORATORY

Lab Name	HydroQual Laboratories Ltd.		
Lab Contact			
Email	ABinfo@nautilusenvironmental.ca		
Address	#4, 6125 12 Street SE		
City	Calgary	Province	AB
Postal Code	?T2H 2K1	Country	Canada
Phone Number	403-253-7121		

OTHER INFO

Report Format / Distribution		Excel	PDF	EDD
Email 1:	david.burroughs@teck.com	X	X	X
Email 2:	britt.anderson@teck.com	X	X	X
Email 3:	scott.roughead@teck.com	X	X	X
Email 4:	teckcoal@equisonline.com			X
Email 5:	carlie.meyer@teck.com	X	X	X
Email 6:	cait.good@teck.com	X	X	X

SAMPLE DETAILS

2021/03/24
12:00
Bear Paw
JC/AE/KL
12x 20L carboys
NOS/NOI
Good Condition
Week 4

ANALYSIS REQUESTED

Filtered - F: Field, L: Lab, FL: Field & Lab, N: None

Sample ID	Sample Location (sys_loc_code)	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	Filt.	PRESERV.	ANALYSIS: 30-d fathead minnow P/F	
								N	NONE		
FR_FR4_WS_2021-03-23_N 2021-0973	FR_FR4	WS	NO	23-Mar-21	11:29	G	3			X	0.5°C
FR_FRRD_WS_2021-03-23_N 2021-0976	FR_FRRD	WS	NO	23-Mar-21	12:27	G	3			X	2.2°C
FR_FR2_WS_2021-03-23_N 2021-0974	FR_FR2	WS	NO	23-Mar-21	10:47	G	3			X	1.6°C
FR_MULTIPLATE_WS_2021-03-23_NP	FR_MULTIPLATE	WS	NO	23-Mar-21	09:11	G	3			X	1.6°C
2021-0975											

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME

SERVICE REQUEST (rush - subject to availability)

Regular (default)	X
Priority (2-3 business days) - 50% surcharge	
Emergency (1 Business Day) - 100% surcharge	
For Emergency <1 Day, ASAP or Weekend - Contact ALS	

Sampler's Name	Haley Pocaluyko/Niko Wicharuk	Mobile #	604 362 6626
Sampler's Signature		Date/Time	March 23, 2021

Teck

COC ID: 2020-03-23-Chronic-tox

TURNAROUND TIME:

RUSH: NO

PROJECT/CLIENT INFO

Facility Name / Job#	Greenhills Operation
Project Manager	Jeremy Enns
Email	jeremy.enns@teck.com
Address	P.O. BOX 5000
City	Elkford
Province	BC
Postal Code	V0B1H0
Country	Canada
Phone Number	250-865-3048

LABORATORY

Lab Name	Hydroqual Laboratories Ltd
Lab Contact	Jacklyn Pool
Email	
Address	#4, 6125 - 12th Street S.E.
City	Calgary
Province	AB
Postal Code	T2H 2K1
Country	Can
Phone Number	403-253-7121

OTHER INFO

Report Format / Distribution		Excel	PDF	EDD
Email 1:	Leigh.Stickney@teck.com	x	x	x
Email 2:	Heather.stevenson@teck.com	x	x	x
Email 3:	teckcoal@equisonline.com			x
Email 4:	jennifer.manojlovic@teck.com	x	x	x
Email 5:	ashlee.fudge@teck.com	x	x	x
Email 6:	DL-Equis-GHO-Field@teck.com	x	x	x
Email 7:	jeremy.enns@teck.com	x	x	x
PO number	740426			

2021/03/24
12:00
Bear Paw
JC/AE/KL
9x 20L carboys
NoS/NoI
Good Condition
Week 4

Sample ID		Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	Filt.	PRESERV.	ANALYSIS: 30-d fathead minnow P/F	
GH_ER2_WS_2021-03-22_N	2021-0479 GH_ER2	WS	N	3/23/2021	11:40	G	3			X	4.8°C
GH_ERC_WS_2021-03-22_N	2021-0478 GH_ERC	WS	N	3/23/2021	13:10	G	3			X	5.9°C
GH_FR1_WS_2021-03-22_N	2021-0477 GH_FR1	WS	N	3/23/2021	9:15	G	3			X	7.3°C

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME

SERVICE REQUEST (rush - subject to availability)

Regular (default)	X
Priority (2-3 business days) - 50% surcharge	
Emergency (1 Business Day) - 100% surcharge	
For Emergency <1 Day, ASAP or Weekend - Contact ALS	

Sampler's Name	AF/SS/EO	Mobile #	
Sampler's Signature		Date/Time	MAR 23 2021

Teck

COC ID: 20210323CRN5C | TURNAROUND TIME: | RUSH:

PROJECT/CLIENT INFO				LABORATORY				OTHER INFO			
Facility Name / Job#	Elkview Operations			Lab Name	Nautilus Environmental			Report Format / Distribution		Excel	PDF	EDD
Job Description	Q4 Chronic Sampling			Lab Contact	Jacklyn Poole			Email 1:	kennedy.allen@teck.com	X	X	X
Project Manager	Annie Larrivee			Email	Jacklyn@nautilusenvironmental.ca			Email 2:	teckcoal@equisonline.com			X
Email	Annie.Larrivee@teck.com			Address	6125 12st SE			Email 3:	Micheal.Moore@teck.com	X	X	X
Address	RR#1 HWY# 3							Email 4:	Annie.Larrivee@teck.com	X	X	X
								Email 5:	Teck.Lab.Results@sharepoint.teck.com	X	X	X
City	Sparwood	Province	BC	City	Calgary	Province	AB	PO number	VPO00678876			
Postal Code	V1C 4C3	Country	Canada	Postal Code	T2H 2K1	Country	Canada					
Phone Number	1-250-425-8137			Phone Number	403-253-7121							

SAMPLE DETAILS | **ANALYSIS REQUESTED** (Filtered - F: Field, L: Lab, FL: Field & Lab, N: None)

Sample ID	Sample Location	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	ANALYSIS	7-d C dubia P/F	72-hr P. subcapitata P/F	30-d fathead minnow P/F							
FILTERED									No	No	No	No						
PRESERVED									No	No	No	No						
2021-0980																		
EV_HC1_WS_2021_Q1_WK5_N	EV_HC1	WS	N	2021/03/16	14:23	G	3		1		3		3.5°C					
EV_MC2_WS_2021_Q1_WK5_N	EV_MC2	WS	N	2021/03/16	10:20	G	3		1		3		4.1°C					
2021-0981																		
2021/03/24																		
12:00																		
Bear Row																		
JC/AE/KL																		
6x 20L carboys																		
NOS/NOS																		
Good Condition																		
Week 4																		
					Total		6											

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
Toxicity 96-Hr/48-HR = 96 Hr Rainbow Trout pass/fail & 48 Hr Daphnia pass/fail (Daphinia testing to occur at 20 degrees)	Dominique Nicholas	23-Mar-21		

NB OF BOTTLES RETURNED/DESCRIPTION					
Regular (default)	X	Sampler's Name	D.Nicholas	Mobile #	1-250-425-1101
Priority (2-3 business days) - 50% surcharge		Sampler's Signature		Date/Time	March 23, 2021
Emergency (1 Business Day) - 100% surcharge					
For Emergency <1 Day, ASAP or Weekend - Contact ALS					

Teck

Page 1 of 1

COC ID:	Q1_CHRONIC_03232021_CAL	TURNAROUND TIME:	Regular	RUSH:	NO

PROJECT/CLIENT INFO				LABORATORY				OTHER INFO				
Facility Name / Job#	Coal Mountain Mine			Lab Name	Hydroqual Laboratories			Report Format / Distribution		Excel	PDF	EDD
Project Manager	Victoria Sharpe			Lab Contact	Jacklyn Poole			Email 1:	Victoria.Sharpe@teck.com	X	X	X
Email	Victoria.Sharpe@teck.com				Tamara Pomeroy			Email 2:	teckcoal@equisonline.com			X
				Email	jacklyn@nautilusenvironmental.ca			Email 3:	Jay.jones@teck.com	X	X	X
					tamara@nautilusenvironmental.ca			Email 4	Don.Sacino@teck.com	X	X	X
Address	PO Box 3000			Address	#4, 6125-12th Street S.E.			Email 5:	Shelby.Holden@teck.com	X	X	X
City	Sparwood	Province	BC	City	Calgary	Province	AB	PO number				
Postal Code	V0B 2G0	Country	Canada	Postal Code	T2H 2K1	Country	Canada					
Phone Number	1-250-425-7522			Phone Number	403-253-7121							

SAMPLE DETAILS

2021/03/24
12:00
Bear Paw
JC/AE/KL
9x 20L carboys
NoS/NoT
Good Condition
Week 4

ANALYSIS REQUESTED

Filtered - F: Field, L: Lab, FL: Field & Lab, N: None

Sample ID	Sample Location	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	FIL.	PRESERV.	ANALYSIS: 30-d fathead minnow P/F										
CM_MC2_WS_2021-03-23_N 2021-0982	CM_MC2	WS	No	2021/03/23	09:20	G	3			X			2.0°C							
CM_MC1_WS_2021-03-23_N 2021-0983	CM_MC1	WS	No	2021/03/23	11:20	G	3			X			3.2°C							
RG_MIDAG_WS_2021-03-23_N 2021-0984	RG_MIDAG	WS	NO	2021/03/23	09:45	G	3			X			2.1°C							

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME

NB OF BOTTLES RETURNED/DESCRIPTION	
Regular (default)	X
Priority (2-3 business days) - 50% surcharge	
Emergency (1 Business Day) - 100% surcharge	
For Emergency <1 Day, ASAP or Weekend - Contact ALS	

Sampler's Name	SH/JD	Mobile #	250 425 7522
Sampler's Signature		Date/Time	March 23, 2021

Teck

COC ID:	20210323 Chronic Tox Calg	TURNAROUND TIME:		RUSH:	

PROJECT/CLIENT INFO

Facility Name / Job#	Line Creek Operation		
Project Manager	Tom Jeffery		
Email	tom.jeffery@teck.com		
Address	Box 2003		
	15km North Hwy 43		
City	Sparwood	Province	BC
Postal Code	V0B 2G0	Country	Canada
Phone Number	250-425-6111		

LABORATORY

Lab Name	Nautilus Environmental		
Lab Contact	Jeslin Wijaya		
Email	jeslin@nautilusenvironmental.ca		
Address	6125 12 St NE		
City	Calgary	Province	AB
Postal Code	T2H 2K1	Country	Canada
Phone Number	403-253-7121		

OTHER INFO

Report Format / Distribution		Excel	PDF	EDD
Email 1:	tom.jeffery@teck.com	x	x	
Email 2:	teckcoal@equisonline.com			x
Email 3:	drake.tymstra@teck.com	x	x	
Email 4:	shanise.fossen@teck.com	x	x	
Email 5:				
PO number	VPO00741384			

SAMPLE DETAILS

2021/03/24
12:00
Bear Paw
JC/AE/ML
16x20L carboys
NOS/NOI
Good Condition
Week 4

ANALYSIS REQUESTED — Filtered - F: Field, L: Lab, FL: Field & Lab, N: None

Sample ID	Sample Location	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	Filt.	PRESERV.	ANALYSIS: 7-d C.dubia P/F	ANALYSIS: 72-hr P. subcapitata P/F	ANALYSIS: 30-d fathead minnow P/F	
								N	N	N	N	N	
LC_DCDS_WS_2021-03-23_N 2021-0988	LC_DCDS	WS	No	23-Mar-21	12:55	G	3			X		X	2.4°C
LC_LC3_WS_2021-03-23_N 2021-0986	LC_LC3	WS	No	23-Mar-21	10:00	G	3			X		X	3.4°C
LC_SLC_WS_2021-03-23_N 2021-0987	LC_SLC	WS	No	23-Mar-21	09:30	G	3			X		X	3.3°C
LC_LC5_WS_2021-03-23_N 2021-0989	LC_LC5	WS	No	23-Mar-21	11:40	G	3			X		X	4.4°C
LC_LCDSSLCC_WS_2021-03-23_N 2021-0985	LC_LCDSSLCC	WS	No	23-Mar-21	10:55	G	3			X		X	5.1°C

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
Please provide prelimnary update as results are available	S.Fossen	2021/03/23		

NB OF BOTTLES RETURNED/DESCRIPTION

Regular (default)	X
Priority (2-3 business days) - 50% surcharge	
Emergency (1 Business Day) - 100% surcharge	
For Emergency <1 Day, ASAP or Weekend - Contact ALS	

Sampler's Name	S.Fossen	Mobile #	O: 250-425-3196 / C: 780-223-8222
Sampler's Signature	S Fossen	Date/Time	March 23, 2021

Teck

COC ID:	3/30/2021	TURNAROUND TIME:		RUSH:	

PROJECT/CLIENT INFO				LABORATORY				OTHER INFO				
Facility Name / Job#	Fording River Operation			Lab Name	HydroQual Laboratories Ltd.			Report Format / Distribution		Excel	PDF	EDD
Project Manager	Scott Roughead			Lab Contact				Email 1:	david.burroughs@teck.com	X	X	X
Email	Scott.Roughead@teck.com			Email	ABinfo@nautilusenvironmental.ca			Email 2:	britt.anderson@teck.com	X	X	X
Address	PO Box 100			Address	#4, 6125 12 Street SE			Email 3:	scott.roughead@teck.com	X	X	X
								Email 4:	teckcoal@equisonline.com			X
City	Elkford	Province	BC	City	Calgary	Province	AB	Email 5:	jared.cayenne@teck.com	X	X	X
Postal Code	V0B 1H0	Country	Canada	Postal Code	?T2H 2K1	Country	Canada	Email 6:				
Phone Number	1-250-865-5195			Phone Number	403-253-7121			PO:	VPO00741382			

SAMPLE DETAILS

2021/03/31
12:30
Bear Paw
JC
6x20L carboys
NoS/NoT
Good Condition
Week 5

ANALYSIS REQUESTED

Filtered - F: Field, L: Lab, FL: Field & Lab, N: None

Sample ID	Sample Location (sys_loc_code)	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	Filt. N	PRESERV. NONE	ANALYSIS 30-d fathead minnow P/F	
FR_FRABCH_WEK_2021-03-29_NP 2021-0972	FR_FRABCH	WS	NO	3/30/2021	10:40	G	2			X	6.0°C
FR_FRCP1_WEK_2021-03-29_N 2021-0970	FR_FRCP1	WS	NO	3/30/2021	09:05	G	2			X	6.1°C
FR_UFR1_WEK_2021-03-29_N 2021-0971	FR_UFR1	WS	NO	3/30/2021	11:55	G	2			X	4.0°C

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
	Britt Anderson	3/30/2021		

SERVICE REQUEST (rush - subject to availability)	
Regular (default)	X
Priority (2-3 business days) - 50% surcharge	
Emergency (1 Business Day) - 100% surcharge	
For Emergency <1 Day, ASAP or Weekend - Contact ALS	

Sampler's Name	Britt Anderson	Mobile #	250-425-5335
Sampler's Signature		Date/Time	3/30/2021

Teck

COC ID: 2021-03-30 | TURNAROUND TIME: | RUSH:

PROJECT/CLIENT INFO

Facility Name / Job #	Fording River Operation		
Project Manager	Scott Roughead		
Email	Scott.Roughead@teck.com		
Address	PO Box 100		
City	Elkford	Province	BC
Postal Code	V0B 1H0	Country	Canada
Phone Number	1-250-865-5195		

LABORATORY

Lab Name	HydroQual Laboratories Ltd.		
Lab Contact			
Email	ABinfo@nautilusenvironmental.ca		
Address	#4, 6125 12 Street SE		
City	Calgary	Province	AB
Postal Code	T2H 2K1	Country	Canada
Phone Number	403-253-7121		

OTHER INFO

Report Format / Distribution		Excel	PDF	EDD
Email 1:	david.burroughs@teck.com	x	x	x
Email 2:	britt.anderson@teck.com	x	x	x
Email 3:	scott.roughead@teck.com	x	x	x
Email 4:	teckcoal@equisonline.com			x
Email 5:	carlie.meyer@teck.com	x	x	x
Email 6:	cait.good@teck.com	x	x	x

SAMPLE DETAILS

2021/03/31
12:30
Bear Paw
SC
8x20L carboys
NoS/NoL
Good Condition
Week 5

Sample ID	Sample Location (sys_loc_code)	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	ANALYSIS: 30-d fathead minnow P/F	PRESERV.	Filt.
									NONE	N
FR_FR4_WS_2021-03-30_N 2021-0973	FR_FR4	WS	NO	30-Mar-21	11:32	G	2	X 4.4°C		
FR_FRRD_WS_2021-03-30_N 2021-0976	FR_FRRD	WS	NO	30-Mar-21	12:30	G	2	X 4.6°C		
FR_FR2_WS_2021-03-30_N 2021-0974	FR_FR2	WS	NO	30-Mar-21	10:44	G	2	X 4.1°C		
FR_MULTIPLATE_WS_2021-03-30_NP	FR_MULTIPLATE	WS	NO	30-Mar-21	9:12	G	2	X 3.1°C		
2021-0975										

Filtered - F: Field, L: Lab, FL: Field & Lab, N: No

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME

SERVICE REQUEST (rush - subject to availability)

Regular (default)	X
Priority (2-3 business days) - 50% surcha	
Emergency (1 Business Day) - 100% surch	
For Emergency <1 Day, ASAP or Weekend - Contact	

Sampler's Name	Haley Pocaluyko/Niko Wicharuk	Mobile #	604 362 6626
Sampler's Signature	Haley Pocaluyko	Date/Time	March 30, 2021

Teck

COC ID:	2020-03-30-Chronic-tox	TURNAROUND TIME:		RUSH:	NO

PROJECT/CLIENT INFO			
Facility Name / Job#	Greenhills Operation		
Project Manager	Jeremy Enns		
Email	jeremy.enns@teck.com		
Address	P.O. BOX 5000		
City	Elkford	Province	BC
Postal Code	V0B1H0	Country	Canada
Phone Number	250-865-3048		

LABORATORY			
Lab Name	Hydroqual Laboratories Ltd		
Lab Contact	Jacklyn Pool		
Email			
Address	#4, 6125 - 12th Street S.E.		
City	Calgary	Province	AB
Postal Code	T2H 2K1	Country	Can
Phone Number	403-253-7121		

OTHER INFO				
Report Format / Distribution		Excel	PDF	EDD
Email 1:	Leigh.Stickney@teck.com	X	X	X
Email 2:	Heather.stevenson@teck.com	X	X	X
Email 3:	teckcoal@equisonline.com			X
Email 4:	jennifer.manojlovic@teck.com	X	X	X
Email 5:	ashlee.fudge@teck.com	X	X	X
Email 6:	DL-Equis-GHO-Field@teck.com	X	X	X
Email 7:	jeremy.enns@teck.com	X	X	X
Email 8:	Sylvie.Simkova@teck.com	X	X	X
PO number	740426			

2021/03/31
12:30
Bear Paw
JC
6x20L carboys
N6S/N6I
Good Condition
Week 5

Sample ID		Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	ANALYSIS: 30-d fathead minnow P/F	FIL.	PRESERV.	
GH_ER2_WS_2021-03-29_N	2021-0979	GH_ER2	WS	N	2021/03/30	10:40	G	2	X		3.7°C
GH_ERC_WS_2021-03-29_N	2021-0976	GH_ERC	WS	N	2021/03/30	11:40	G	2	X		3.4°C
GH_FR1_WS_2021-03-29_N	2021-0977	GH_FR1	WS	N	2021/03/30	13:45	G	2	X		2.8°C

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME

SERVICE REQUEST (rush - subject to availability)	
Regular (default)	X
Priority (2-3 business days) - 50% surcharge	
Emergency (1 Business Day) - 100% surcharge	
For Emergency <1 Day, ASAP or Weekend - Contact ALS	

Sampler's Name	AF/SS/EO	Mobile #	
Sampler's Signature		Date/Time	MAR 30 2021

Teck

COC ID: 20210323CRN6C | **TURNAROUND TIME:** | **RUSH:**

PROJECT/CLIENT INFO

Facility Name / Job#	Elkview Operations		
Job Description	Q4 Chronic Sampling		
Project Manager	Kennedy Allen		
Email	Kennedy.Allen@teck,com		
Address	RR#1 HWY# 3		
City	Sparwood	Province	BC
Postal Code	V1C 4C3	Country	Canada
Phone Number	1-250-425-8137		

LABORATORY

Lab Name	Nautilus Environmental		
Lab Contact	Jacklyn Poole		
Email	Jacklyn@nautilusenvironmental.ca		
Address	6125 12st SE		
City	Calgary	Province	AB
Postal Code	T2H 2K1	Country	Canada
Phone Number	403-253-7121		

OTHER INFO

Report Format / Distribution		Excel	PDF	EDD
Email 1:	kennedy.allen@teck.com	X	X	X
Email 2:	teckcoal@equisonline.com			X
Email 3:	Micheal.Moore@teck.com	X	X	X
Email 4:	Teck.Lab.Results@sharepoint.teck.com	X	X	X
Email 5:				
PO number	VPO00678876			

SAMPLE DETAILS

2021/03/31 12:30 Bear Pow 3C 4x20L carboys NoS/NoB — Good Condition Week 5 — 2021-0980

ANALYSIS REQUESTED

Filtered - F: Field, L: Lab, FL: Field & Lab, N: None

Sample ID	Sample Location	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	ANALYSIS	7-d C.dubia P/F	72-hr P. subcapitata P/F	30-d fathead minnow P/F					
FILTERED									No	No	No	No				
PRESERVED									No	No	No	No				
EV_HC1_WS_2021_Q1_WK6_N	EV_HC1	WS	N	2021/03/29	11:00	G	2		1		3		3.9°C			
EV_MC2_WS_2021_Q1_WK6_N	EV_MC2	WS	N	2021/03/29	13:33	G	2		1		3		2.3°C			
2021-0981																
					Total		4									

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS

Toxicity 96-Hr/48-HR = 96 Hr Rainbow Trout pass/fail & 48 Hr Daphnia pass/fail
(Daphinia testing to occur at 20 degrees)

RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
D.Nicholas/B.Blenkin	30-Mar-21		

NB OF BOTTLES RETURNED/DESCRIPTION

Regular (default)	X
Priority (2-3 business days) - 50% surcharge	
Emergency (1 Business Day) - 100% surcharge	
For Emergency <1 Day, ASAP or Weekend - Contact ALS	

Sampler's Name	D.Nicholas/B.Blenkin	Mobile #	1-250-425-1101
Sampler's Signature		Date/Time	March 30, 2021

Teck

COC ID:	Q1_CHRONIC_03302021_CAL	TURNAROUND TIME:	Regular	RUSH:	NO

PROJECT/CLIENT INFO				LABORATORY				OTHER INFO				
Facility Name / Job#	Coal Mountain Operations			Lab Name	Hydroqual Laboratories			Report Format / Distribution		Excel	PDF	EDD
Project Manager	Jay Jones			Lab Contact	Jacklyn Poole			Email 1:	Victoria.Sharpe@teck.com	X	X	X
Email	Jay.Jones@teck.com				Tamara Pomeroy			Email 2:	teckcoal@equisonline.com			X
				Email	jacklyn@nautilusenvironmental.ca			Email 3:	Jay.jones@teck.com	X	X	X
					tamara@nautilusenvironmental.ca			Email 4	Don.Sacino@teck.com	X	X	X
Address	PO Box 3000			Address	#4, 6125-12th Street S.E.			Email 5:	Shelby.Holden@teck.com	X	X	X
City	Sparwood	Province	BC	City	Calgary	Province	AB	PO number				
Postal Code	V0B 2G0	Country	Canada	Postal Code	T2H 2K1	Country	Canada					
Phone Number	1-250-425-7321			Phone Number	403-253-7121							

SAMPLE DETAILS

2021/03/31
12:30
Bear Paw
JC
6x20L carboys
NoS/NoL
Good Condition
Week 5

ANALYSIS REQUESTED — Filtered - F: Field, L: Lab, FL: Field & Lab, N: None

Sample ID	Sample Location	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	Filt.	PRESERV.	ANALYSIS: 30-d fathead minnow P/F	
CM_MC2_WS_2021-03-30_N 2021-0982	CM_MC2	WS	No	2021/03/30	10:10	G	2			X	4.8°C
CM_MC1_WS_2021-03-30_N 2021-0983	CM_MC1	WS	No	2021/03/30	11:10	G	2			X	4.5°C
RG_MIDAG_WS_2021-03-30_N 2021-0984	RG_MIDAG	WS	NO	2021/03/30	09:37	G	2			X	3.2°C

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME

NB OF BOTTLES RETURNED/DESCRIPTION	
Regular (default)	X
Priority (2-3 business days) - 50% surcharge	
Emergency (1 Business Day) - 100% surcharge	
For Emergency <1 Day, ASAP or Weekend - Contact ALS	

Sampler's Name	SH/JD	Mobile #	250 425 7522
Sampler's Signature		Date/Time	March 30, 2021

Teck

COC ID:	20210330 Chronic Tox Calg	TURNAROUND TIME:		RUSH:	

PROJECT/CLIENT INFO

Facility Name / Job#	Line Creek Operation		
Project Manager	Tom Jeffery		
Email	tom.jeffery@teck.com		
Address	Box 2003		
	15km North Hwy 43		
City	Sparwood	Province	BC
Postal Code	V0B 2G0	Country	Canada
Phone Number	250-425-6111		

LABORATORY

Lab Name	Nautilus Environmental		
Lab Contact	Jeslin Wijaya		
Email	jeslin@nautilusenvironmental.ca		
Address	6125 12 St NE		
City	Calgary	Province	AB
Postal Code	T2H 2K1	Country	Canada
Phone Number	403-253-7121		

OTHER INFO

Report Format / Distribution		Excel	PDF	EDD
Email 1:	tom.jeffery@teck.com	x	x	
Email 2:	teckcoal@equisonline.com			x
Email 3:	drake.tymstra@teck.com	x	x	
Email 4:	shanise.fossen@teck.com	x	x	
Email 5:				
PO number	VPO00741384			

SAMPLE DETAILS

2021/03/31
12:30
Bear Paw
DC
10x20L carboys
N6S/N6I
Good Condition
Week 5

ANALYSIS REQUESTED

Filtered - F: Field, L: Lab, FL: Field & Lab, N: None

Sample ID	Sample Location	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	Filt.	PRESERV.	ANALYSIS: 7-d C.dubia P/F	ANALYSIS: 72-hr P. subcapitata P/F	ANALYSIS: 30-d fathead minnow P/F	
								N	N			N	
								N	N			N	
LC_DCDS_WS_2021-03-30_N 2021-0988	LC_DCDS	WS	No	30-Mar-21	12:35	G	2					X	5.8°C
LC_LC3_WS_2021-03-30_N 2021-0986	LC_LC3	WS	No	30-Mar-21	11:20	G	2					X	5.9°C
LC_SLC_WS_2021-03-30_N 2021-0987	LC_SLC	WS	No	30-Mar-21	10:30	G	2					X	5.1°C
LC_LC5_WS_2021-03-30_N 2021-0989	LC_LC5	WS	No	30-Mar-21	12:50	G	2					X	4.1°C
LC_LCDSSLCC_WS_2021-03-30_N 2021-0985	LC_LCDSSLCC	WS	No	30-Mar-21	11:50	G	2					X	4.2°C

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS

Please provide prelimnary update as results are available

RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
S.Fossen	2021/03/30		

NB OF BOTTLES RETURNED/DESCRIPTION

Regular (default)	X
Priority (2-3 business days) - 50% surcharge	
Emergency (1 Business Day) - 100% surcharge	
For Emergency <1 Day, ASAP or Weekend - Contact ALS	

Sampler's Name	S.Fossen	Mobile #	O: 250-425-3196 / C: 780-223-8222
Sampler's Signature	S Fossen	Date/Time	March 30, 2021

Teck

COC ID:	Q1_CHRONIC_04132021_CAL	TURNAROUND TIME:	Regular	RUSH:	NO

PROJECT/CLIENT INFO				LABORATORY				OTHER INFO				
Facility Name / Job#	Coal Mountain Operations			Lab Name	Hydroqual Laboratories			Report Format / Distribution		Excel	PDF	EDD
Project Manager	Jay Jones			Lab Contact	Jacklyn Poole			Email 1:	Victoria.Sharpe@teck.com	X	X	X
Email	Jay.Jones@teck.com				Tamara Pomeroy			Email 2:	teckcoal@equisonline.com			X
				Email	jacklyn@nautilusenvironmental.ca			Email 3:	Jay.jones@teck.com	X	X	X
					tamara@nautilusenvironmental.ca			Email 4	Don.Sacino@teck.com	X	X	X
Address	PO Box 3000			Address	#4, 6125-12th Street S.E.			Email 5:	Shelby.Holden@teck.com	X	X	X
City	Sparwood	Province	BC	City	Calgary	Province	AB	PO number				
Postal Code	V0B 2G0	Country	Canada	Postal Code	T2H 2K1	Country	Canada					
Phone Number	1-250-425-7321			Phone Number	403-253-7121							

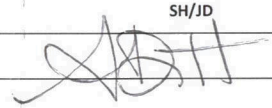
SAMPLE DETAILS — **ANALYSIS REQUESTED** — Filtered - F: Field, L: Lab, FL: Field & Lab, N: None

2021/04/14
12:30
Bear Paw
JC
3x 20L carboys
NoS/NaI
Good Conditions
CRD Samples

Sample ID	Sample Location	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	Filt.	PRESERV.	ANALYSIS: 30-d fathead minnow P/F	
CM_MC2_WS_2021-04-13_N 2021-0982	CM_MC2	WS	No	4/13/2021	10:45	G	1			X	5.9°C
CM_MC1_WS_2021-04-13_N 2021-0983	CM_MC1	WS	No	4/13/2021	9:30	G	1			X	6.9°C
RG_MIDAG_WS_2021-04-13_N 2021-0984	RG_MIDAG	WS	No	4/13/2021	10:18	G	1			X	7.1°C

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME

NB OF BOTTLES RETURNED/DESCRIPTION	
Regular (default)	X
Priority (2-3 business days) - 50% surcharge	
Emergency (1 Business Day) - 100% surcharge	
For Emergency <1 Day, ASAP or Weekend - Contact ALS	

Sampler's Name	SH/JD	Mobile #	250 425 7522
Sampler's Signature		Date/Time	April 13, 2021

ALS Environmental

www.alsglobal.com

Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 668 9878

Affix ALS barcode label here (lab use only)

COC Number: 17 - 757279

Page 1 of 1

Report To	Contact and company name below will appear on the final report
Company:	Teck Coal - EVO
Contact:	Kennedy Allen
Phone:	250 425 8707
Company address below will appear on the final report	
Street:	RR1
City/Province:	Sparwood BC
Postal Code:	V0B 2G1

Report Format / Distribution	
Select Report Format:	PDF [X] EXCEL [X] EDD (DIGITAL)
Quality Control (QC) Report with Report	[ ] YES [ ] NO
[ ] Compare Results to Criteria on Report - provide details below if box checked	
Select Distribution:	[ ] EMAIL [ ] MAIL [ ] FAX
Email 1 or Fax	See Electronic COC
Email 2	
Email 3	

Invoice To		
	Same as Report To	[X] YES [ ] NO
	Copy of Invoice with Report	[ ] YES [ ] NO
Company:		
Contact:		

Invoice Distribution	
Select Invoice Distribution:	[ ] EMAIL [ ] MAIL [ ] FAX
Email 1 or Fax	
Email 2	

Project Information	
ALS Account # / Quote #:	
Job #:	See Electronic COC
PO / AFE:	
LSD:	

Oil and Gas Required Fields (client use)	
AFE/Cost Center:	PO#
Major/Minor Code:	Routing Code:
Requisitioner:	
Location:	

ALS Lab Work Order # (lab use only):

ALS Contact:

Sampler:

Select Service Level Below - Contact your AM to confirm all E&P TATs (surcharges may apply)

Regular [R] [X] Standard TAT if received by 3 pm - business days - no surcharges apply

PRIORITY (Business Days): 4 day [P4-20%] [ ] | 3 day [P3-25%] [ ] | 2 day [P2-50%] [ ]

EMERGENCY: 1 Business day [E - 100%] | Same Day, Weekend or Statutory holiday [E2 -200% (Laboratory opening fees may apply)]

Date and Time Required for all E&P TATs: dd-mmm-yy hh:mm

For tests that can not be performed according to the service level selected, you will be contacted.

Analysis Request

Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	NUMBER OF CONTAINERS: See electronic COC	SAMPLES ON HOLD
	EV_HC1_WS_2021-04-14_N 2021-0980	04/14/21	10:30	3.6°C	1	1
	EV_MC2_WS_2021-04-14_N 2021-0981	04/14/21	09:50	2.6°C	1	1
	2021/04/14					
	15:40					
	Manitoulin					
	BC					
	2x20L coolers					
	NoS/NaT					
	Good Condition					

Drinking Water (DW) Samples[1] (client use)

Are samples taken from a Regulated DW System? [ ] YES [ ] NO

Are samples for human consumption/ use? [ ] YES [ ] NO

Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only)

SAMPLE CONDITION AS RECEIVED (lab use only)

Frozen [ ] | SIF Observations Yes [ ] No | Ice Packs [ ] Ice Cubes [ ] | Custody seal intact Yes [ ] No | Cooling Initiated [ ]

INITIAL COOLER TEMPERATURES °C				FINAL COOLER TEMPERATURES °C		

SHIPMENT RELEASE (client use)		
Released by:	Date:	Time:

INITIAL SHIPMENT RECEPTION (lab use only)		
Received by:	Date:	Time:

FINAL SHIPMENT RECEPTION (lab use only)		
Received by:	Date:	Time:

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

1. If any water samples are taken from a **Regulated Drinking Water (DW) System**, please submit using an **Authorized DW COC form**.

White Paper Co. 604 951-3900

Teck

COC ID:	4/13/2021	TURNAROUND TIME:		RUSH:	

PROJECT/CLIENT INFO				LABORATORY				OTHER INFO				
Facility Name / Job#	Fording River Operation			Lab Name	HydroQual Laboratories Ltd.			Report Format / Distribution		Excel	PDF	EDD
Project Manager	Scott Roughead			Lab Contact				Email 1:	david.burroughs@teck.com	X	X	X
Email	Scott.Roughead@teck.com			Email	ABinfo@nautilusenvironmental.ca			Email 2:	britt.anderson@teck.com	X	X	X
Address	PO Box 100			Address	#4, 6125 12 Street SE			Email 3:	scott.roughead@teck.com	X	X	X
								Email 4:	teckcoal@equisonline.com			X
City	Elkford	Province	BC	City	Calgary	Province	AB	Email 5:	ty.stone@teck.com	X	X	X
Postal Code	V0B 1H0	Country	Canada	Postal Code	?T2H 2K1	Country	Canada	Email 6:				
Phone Number	1-250-865-5195			Phone Number	403-253-7121			PO:	VPO00741382			

SAMPLE DETAILS

2021/04/14
12:30
Bear Pow
5C
3x20L carboys
NOS/NOI
Good Condition
CDD Samples

ANALYSIS REQUESTED — Filtered - F: Field, L: Lab, FL: Field & Lab, N: None

Sample ID	Sample Location (sys_loc_code)	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	Filt.	N											
								PRESERV.	NONE											
								ANALYSIS	c. dubia											
FR_FRCP1_WEK_2021-04-12_N 2021-0970	FR_FRCP1	WS	NO	4/13/2021	09:20	G	1		X	4.2°C										
FR_UFR1_WEK_2021-04-12_N 2021-0971	FR_UFR1	WS	NO	4/13/2021	09:30	G	1		X	3.6°C										
FR_FRABCH_WEK_2021-04-12_NP 2021-0972	FR_FRABCH	WS	NO	4/13/2021	10:00	G	1		X	6.C°										

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
	Britt Anderson	April 13, 2021		

SERVICE REQUEST (rush - subject to availability)					
Regular (default)	X	Sampler's Name	Britt Anderson	Mobile #	250-425-5335
Priority (2-3 business days) - 50% surcharge					
Emergency (1 Business Day) - 100% surcharge		Sampler's Signature	[signature]	Date/Time	April 13, 2021
For Emergency <1 Day, ASAP or Weekend - Contact ALS					

Teck

COC ID:	2021-04-13	TURNAROUND TIME:		RUSH:	

PROJECT/CLIENT INFO				LABORATORY				OTHER INFO				
Facility Name / Job#	Fording River Operation			Lab Name	Nautilus Environmental Labs Calgary			Report Format / Distribution		Excel	PDF	EDD
Project Manager	Scott Roughead			Lab Contact				Email 1:	david.burroughs@teck.com	X	X	X
Email	Scott.Roughead@teck.com			Email	ABinfo@nautilusenvironmental.ca			Email 2:	britt.anderson@teck.com	X	X	X
Address	PO Box 100			Address	#4, 6125 12 Street SE			Email 3:	scott.roughead@teck.com	X	X	X
								Email 4:	teckcoal@equisonline.com			X
City	Elkford	Province	BC	City	Calgary	Province	AB	Email 5:	carlie.meyer@teck.com	X	X	X
Postal Code	V0B 1H0	Country	Canada	Postal Code	T2H 2K1	Country	Canada	Email 6:	cait.good@teck.com	X	X	X
Phone Number	1-250-865-5195			Phone Number	403-253-7121							

SAMPLE DETAILS

2021/04/14
12:30
Bear Paw
JC
4x20L carboys
NoS/NoI
Good Condition
CRA Samples

ANALYSIS REQUESTED — Filtered - F: Field, L: Lab, FL: Field & Lab, N: None

Sample ID	Sample Location (sys_loc_code)	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	Filt.	PRESERV.	ANALYSIS: 30-d fathead minnow P/F	
								N	NONE		
FR_FR4_WS_2021-04-13_N 2021-0973	FR_FR4	WS	NO	13-Apr-21	10:20	G	3			X	4.3°C
FR_FRRD_WS_2021-04-13_N 2021-0974	FR_FRRD	WS	NO	13-Apr-21	9:00	G	3			X	4.4°C
FR_FR2_WS_2021-04-13_N 2021-0974	FR_FR2	WS	NO	13-Apr-21	11:15	G	3			X	6.4°C
FR_MULTIPLATE_WS_2021-04-13_NP	FR_MULTIPLATE	WS	NO	13-Apr-21	13:15	G	3			X	6.3°C
2021-0975											

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME

SERVICE REQUEST (rush - subject to availability)

Regular (default)	X
Priority (2-3 business days) - 50% surcharge	
Emergency (1 Business Day) - 100% surcharge	
For Emergency <1 Day, ASAP or Weekend - Contact ALS	

Sampler's Name	Tyler Fortin	Mobile #	250-464-5914
Sampler's Signature		Date/Time	April 13, 2021

Teck

COC ID:	2021-04-12-Chronic-tox	TURNAROUND TIME:		RUSH:	NO

PROJECT/CLIENT INFO				LABORATORY				OTHER INFO			
Facility Name / Job#	Greenhills Operation			Lab Name	Hydroqual Laboratories Ltd			Report Format / Distribution		Excel	PDF	EDD
Project Manager	Jeremy Enns			Lab Contact	Jacklyn Pool			Email 1:	DL-Equis-GHO-Field@teck.com	X	X	X
Email	jeremy.enns@teck.com			Email				Email 2:	teckcoal@equisonline.com			X
Address	P.O. BOX 5000			Address	#4, 6125 - 12th Street S.E.			Email 3:	teckcoal@equisonline.com			
City	Elkford	Province	BC	City	Calgary	Province	AB					
Postal Code	V0B1H0	Country	Canada	Postal Code	T2H 2K1	Country	Can					
Phone Number	250-865-3048			Phone Number	403-253-7121							
								PO number	740426			

2021/04/14
12:30
Bear Paw
DC
3x20L carboys
NaS/NoI
Good Condition
COC samples

Sample ID		Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	Filt.	PRESERV.	ANALYSIS c. dubia		
GH_ER2_WS_2021-04-12_N	2021-0979 GH_ER2	WS	N	4/13/2021	1:30	G	1			X	4.9°C	
GH_ERC_WS_2021-04-12_N	2021-0978 GH_ERC	WS	N	4/13/2021	11:20	G	1			X	5.9°C	
GH_FR1_WS_2021-04-12_N	2021-0977 GH_FR1	WS	N	4/13/2021	12:45	G	1			X	4.6°C	

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME

SERVICE REQUEST (rush - subject to availability)					
Regular (default)	X	Sampler's Name	AF/RG	Mobile #	
Priority (2-3 business days) - 50% surcharge					
Emergency (1 Business Day) - 100% surcharge		Sampler's Signature		Date/Time	APR 13 2021
For Emergency <1 Day, ASAP or Weekend - Contact ALS					

Teck

COC ID: 20210413 Chronic Tox Calg

TURNAROUND TIME:

RUSH:

PROJECT/CLIENT INFO

Facility Name / Job#	Line Creek Operation
Project Manager	Tom Jeffery
Email	tom.jeffery@teck.com
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	15km North Hwy 43
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Province	BC
Postal Code	V0B 2G0
Country	Canada
Phone Number	250-425-6111

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Province	AB
Postal Code	T2H 2K1
Country	Canada
Phone Number	403-253-7121

OTHER INFO

Report Format / Distribution		Excel	PDF	EDD
Email 1:	tom.jeffery@teck.com	x	x	
Email 2:	teckcoal@equisonline.com			x
Email 3:	drake.tymstra@teck.com	x	x	
Email 4:	shanise.fossen@teck.com	x	x	
Email 5:				
PO number	VPO00741384			

SAMPLE DETAILS

2021/04/14
12:30
Bear Paw
JC
5x20L carboys
NoS/NoE
Good Condition
COC Samples

ANALYSIS REQUESTED

Filtered - F: Field, L: Lab, FL: Field & Lab, N: None

Sample ID	Sample Location	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	Filt.	PRESERV.	ANALYSIS: 7-d C.dubia P/F	ANALYSIS: 72-hr P. subcapitata P/F	ANALYSIS: 30-d fathead minnow P/F
								N	N	N	N	N
LC_DCDS_WS_2021-04-13_N 2021-0988	LC_DCDS	WS	No	13-Apr-21	12:15	G	1			X		3.6°C
LC_LC3_WS_2021-04-13_N 2021-0986	LC_LC3	WS	No	13-Apr-21	13:30	G	1			X		4.2°C
LC_SLC_WS_2021-04-13_N 2021-0987	LC_SLC	WS	No	13-Apr-21	11:55	G	1			X		6.4°C
LC_LC5_WS_2021-04-13_N 2021-0989	LC_LC5	WS	No	13-Apr-21	13:00	G	1			X		3.2°C
LC_LCDSSLCC_WS_2021-04-13_N 2021-0985	LC_LCDSSLCC	WS	No	13-Apr-21	12:30	G	1			X		4.2°C

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
Please provide prelimnary update as results are available	S.Fossen	2021/04/13		

NB OF BOTTLES RETURNED/DESCRIPTION

Regular (default)	X
Priority (2-3 business days) - 50% surcharge	
Emergency (1 Business Day) - 100% surcharge	
For Emergency <1 Day, ASAP or Weekend - Contact ALS	

Sampler's Name	S.Fossen	Mobile #	O: 250-425-3196 / C: 780-223-8222
Sampler's Signature	S Fossen	Date/Time	April 13, 2021

END OF REPORT

Toxicity testing on Elk Valley samples with *Ceriodaphnia dubia*, *Pseudokirchneriella subcapitata*, *Hyalella azteca*, and *Oncorhynchus mykiss*

Second Quarter 2021

Final Report

October 22, 2021

Submitted to: **Teck Coal Ltd.**
Sparwood, BC

8664 Commerce Court, Burnaby, BC V5A 4N7

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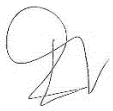
SIGNATURE PAGE



Report By:
Émilie Viczko, M.Sc.
Project Biologist

Reviewed By:
Melanie Gallant, Ph.D.
Environmental Toxicologist

This report has been prepared by Nautilus Environmental Company Inc. based on data and/or samples provided by our client and the results of this study are for their sole benefit. Any reliance on the data by a third party is at the sole and exclusive risk of that party. The results presented here relate only to the samples tested.

1.0 INTRODUCTION

Nautilus Environmental conducted toxicity tests for Teck Coal Ltd. (Teck) on samples collected from various locations in the Elk Valley as part of a quarterly toxicity testing program required under the BC Ministry of Environment and Climate Change Strategy permit number 107517.

Stations sampled in the second quarter of 2021 are shown in Figure 1; stations shown as green symbols align with the integrated chronic toxicity testing program, which was designed to eliminate redundancy between Permit 107517 Section 9.8 (ii) and Permit 106970 toxicity testing programs. The integrated program was approved by the BC Ministry of Environment and Climate Change Strategy on March 4, 2019 (BC ENV 2019). Species requiring quarterly testing include a cladoceran (*Ceriodaphnia dubia*) and a unicellular green alga (*Pseudokirchneriella subcapitata*). On a semi-annual basis, tests using rainbow trout (*Oncorhynchus mykiss*; Q2 and Q4), an amphipod (*Hyalella azteca*; Q2 and Q4), and fathead minnows (*Pimephales promelas*; Q1 and Q3) are also required. Figure 1 stations shown as orange symbols align with the upper Fording River chronic toxicity testing program, which is a supplemental study for 2021 to satisfy Section 4D3.6 of Permit 107517. The upper Fording River program includes the same test species and testing frequency as the regional program, except that green alga is not tested.

Water samples used for testing were transported in 20-L plastic containers in coolers containing ice packs. Samples were received at temperatures ranging from 0.0 to 20.6°C and were stored in the dark at 4 ± 2°C prior to testing. Table 1 summarizes the toxicity tests that were conducted on each sample as well as weekly sample collection dates for the duration of the *H. azteca* and *O. mykiss* tests. All toxicity tests were conducted at the Nautilus Environmental laboratory in Burnaby, BC.

This report presents the results of the toxicity tests. Copies of laboratory data sheets and printouts of statistical analyses are provided in Appendices A through D. The chain-of-custody forms are provided in Appendix E. Results of analytical chemistry that was performed on the samples tested in this program are uploaded by Teck to the Environmental Management System database. Analytical chemistry samples were collected by Teck personnel at the same time the samples were collected for toxicity testing.

Figure 1. Chronic toxicity monitoring locations.

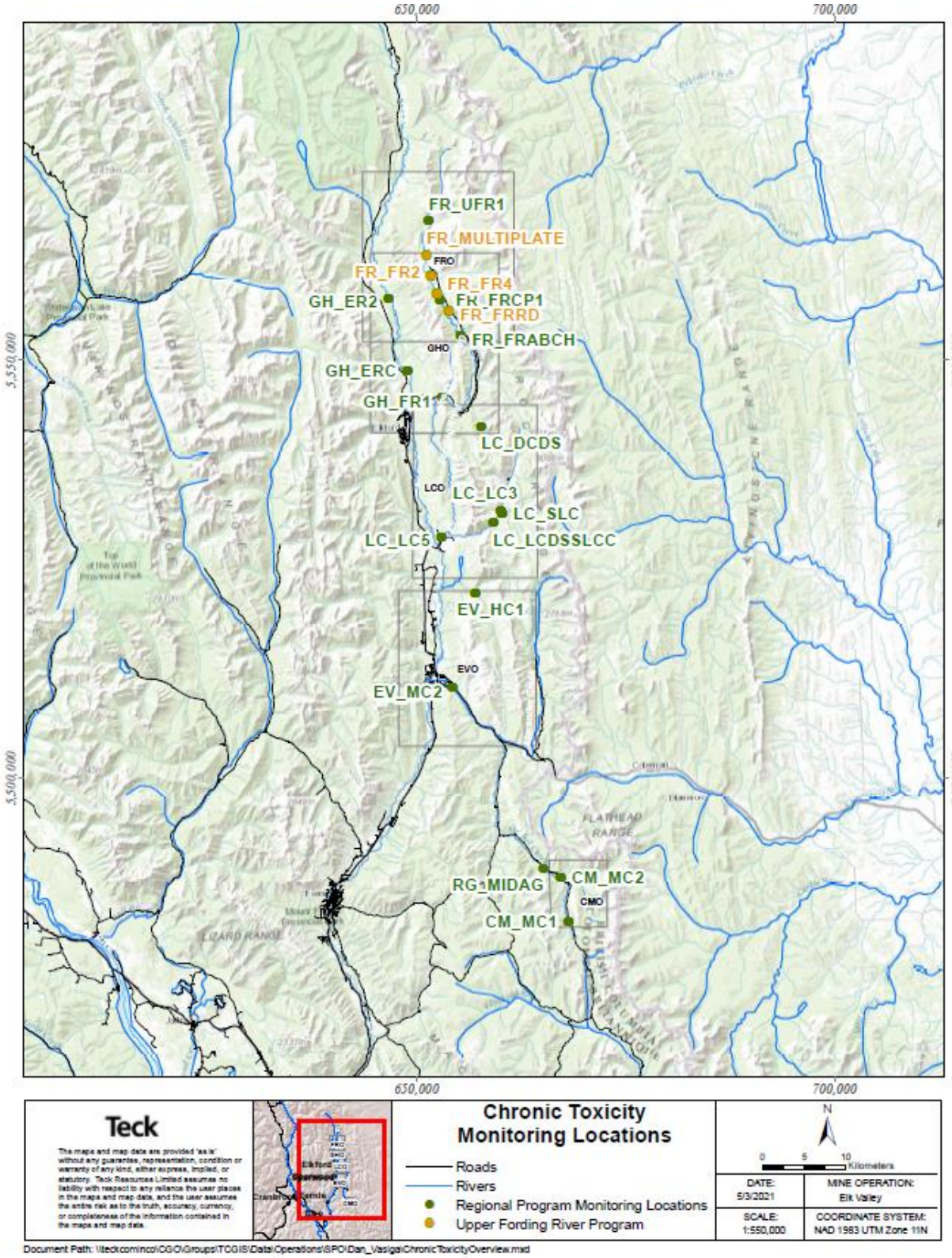


Table 1. Summary of toxicity testing program.

Sample ID	EMS Location ID	Species Tested	Sample Collection Dates[†]
FR_UFR1 [*]	E300071	*C. dubia*, *P. subcapitata*, *O. mykiss and H. azteca*	May 18, 25, June 1, 8, 15, 29, and July 6, 13, 20; 2021
GH_ER2 [*]	E300090	*C. dubia*, *P. subcapitata*, and *O. mykiss*	May 18, 25, and June 1, 8, 15; 2021
CM_MC1 [*]	E258937	*C. dubia*, *P. subcapitata*, and *O. mykiss*	May 18, 25, and June 1, 8, 15; 2021
LC_SLC [*]	E282149	*C. dubia*, *P. subcapitata*, and *O. mykiss*	May 18, 25, and June 1, 8, 15; 2021
FR_FRABCH	E223753	*C. dubia*, *P. subcapitata*, and *O. mykiss*	May 18, 25, and June 1, 8, 15; 2021
FR_FRCP1	E299272	*C. dubia*, *P. subcapitata*, and *O. mykiss*	May 18, 25, and June 1, 8, 15; 2021
GH_FR1	E200028	*C. dubia*, *P. subcapitata*, and *O. mykiss*	May 18, 25, and June 1, 8, 15; 2021
GH_ERC	E258175	*C. dubia*, *P. subcapitata*, and *O. mykiss*	May 18, 25, and June 1, 8, 15; 2021
CM_MC2	E300091	*C. dubia*, *P. subcapitata*, and *O. mykiss*	May 18, 25, and June 1, 8, 15; 2021
RG_MIDAG	-	*C. dubia*, and *H. azteca*	May 18, 25, and June 1, 8, 15; 2021
EV_MC2	E102682	*C. dubia*, *P. subcapitata*, and *O. mykiss*	May 18, 25, and June 1, 8, 15; 2021
EV_HC1	E299270	*C. dubia*, *P. subcapitata*, and *O. mykiss*	May 18, 25, and June 1, 8, 15; 2021
LC_DCDS	E291569	*C. dubia*, *P. subcapitata*, and *O. mykiss*	May 18, 25, and June 1, 8, 15; 2021
LC_LC3	E297110	*C. dubia*, *P. subcapitata*, and *O. mykiss*	May 18, 25, and June 1, 8, 15; 2021
LC_LC5	0200389	*C. dubia*, *P. subcapitata*, and *O. mykiss*	May 18, 25, and June 1, 8, 15; 2021
LC_LCDSSLCC	E282149	*C. dubia*, *P. subcapitata*, and *O. mykiss*	May 18, 25, and June 1, 8, 15; 2021
FR_FR4[#]	0200311	*C. dubia*, *O. mykiss and H. azteca*	May 18, 25, June 1, 8, 15, 29, and July 6, 13, 20; 2021
FR_FRRD[#]	E300097	*C. dubia*, *O. mykiss and H. azteca*	May 18, 25, June 1, 8, 15, 29, and July 6, 13, 20; 2021
FR_FR2[#]	200201	*C. dubia*, *O. mykiss and H. azteca*	May 18, 25, June 1, 8, 15, 29, and July 6, 13, 20; 2021
FR_MULTIPLATE[#]	--	*C. dubia*, *O. mykiss and H. azteca*	May 18, 25, June 1, 8, 15, 29, and July 6, 13, 20; 2021

***** Site water controls

[#] upper Fording River samples from the supplemental study for 2021.

[†] June 29th to July 20th, 2021 sample collections were for the *H. azteca* re-test.

2.0 METHODS

Methods for the toxicity tests using *C. dubia*, *P. subcapitata*, *H. azteca,* and *O. mykiss* are summarized in Tables 2-5. Laboratory control water was prepared using deionized water with 20% Perrier for *C. dubia*; deionized water with supplemented nutrients for *P. subcapitata*; reconstituted water prepared by addition of reagent grade salts to dechlorinated Metro Vancouver municipal tap water for *H. azteca* according to a recipe provided in Environment Canada (2013); and dechlorinated Metro Vancouver municipal tap water for *O. mykiss*.

For *C. dubia*, the test protocol specifies that test duration must be 7 ± 1 day, with the test terminated on the day that at least 60% of control organisms have produced three broods. To provide additional information on reproduction patterns in the samples, and as requested by Teck, the tests were extended to 8 days, regardless of when 60% of controls had produced three broods. However, the results reported below were calculated based on the specifications of the test method, which in this case was based on the reproduction that had been observed up to Day 6 of exposure. The additional information on reproduction up to Day 8 of exposure is available in Appendix A.

For the *H. azteca* tests, all site waters were supplemented with 25 mg/L chloride and 0.02 mg/L bromide using NaCl and NaBr, respectively, in accordance with recommendations by the *Hyalella* Advisory Group (chaired by Chris Ingersoll, USGS; Norberg-King et al., 2014). Insufficient concentrations of these halides are known to impair growth of this species. The laboratory control water contained approximately 75 mg/L chloride and 0.8 mg/L bromide.

As requested by Teck, site waters used in tests with *O. mykiss* were amended with 20 µg/L copper to reduce the potentially confounding effects of microbial growth (Nautilus 2020).

Rainbow trout embryo-alevin tests were performed using a blocked design (i.e., eggs from one fish were used for replicate A of each test concentration, eggs from a second fish for replicate B, etc.). The blocked design approach was a planned deviation from the Environment Canada test method, which indicates that the eggs should be pooled prior to testing. However, this modification is considered appropriate because it reduces the risk of non-viable eggs from a single fish affecting the results of the entire test.

Statistical analyses were performed using CETIS (Tidepool Scientific Software, 2013), and involved comparison of results to both the laboratory and site water controls.

Table 2. Test conditions: *Ceriodaphnia dubia* survival and reproduction test.

Test species	*Ceriodaphnia dubia*
Organism source	In-house culture
Organism age	<24-hour old neonates, produced within a 12-hour window
Test type	Static-renewal
Test duration	8 days[1]
Test vessel	20-mL glass test tube
Test volume	15 mL
Test solution depth	10 cm
Test concentrations	100% (undiluted) sample, plus laboratory control
Test replicates	10 per treatment
Number of organisms	1 per replicate
Control water	20% Perrier water and 80% deionized water + 5 µg/L Se and 2 µg/L vitamin B12
Test solution renewal	Daily (100% renewal)
Test temperature	25 ± 1°C
Feeding	Daily with *Pseudokirchneriella subcapitata* and TCC[2] (3:1 ratio)
Light intensity	100 to 600 lux at water surface
Photoperiod	16 hours light / 8 hours dark
Aeration	None
Test measurements	Temperature, dissolved oxygen, pH and conductivity measured daily; hardness and alkalinity of undiluted sample measured at test initiation; survival and reproduction checked daily
Test protocol	Environment Canada (2007a), EPS 1/RM/21
Statistical software	CETIS Version 1.9.4
Test endpoints	Survival and reproduction
Test acceptability criteria for controls	≥80% survival; ≥15 young per surviving control producing three broods; ≥60% of controls producing three or more broods; no ephippia present
Reference toxicant	Sodium chloride (NaCl)

[1] Test duration was extended to 8 days to provide additional information on patterns of reproduction. Summarized data and calculated means are based on results from Day 6, according to the standard test procedure; however, all of the data through 8 days are provided in Appendix A.

[2] TCC = Trout chow + cerophyl

Table 3. Test conditions: *Pseudokirchneriella subcapitata* growth inhibition test.

Test species	*Pseudokirchneriella subcapitata*, strain CPCC# 37
Organism source	In-house axenic culture, obtained from Canadian Phycological Culture Center, and originally isolated from Nivelta River, Norway.
Organism age	3-to 7-day old culture in logarithmic growth phase
Test type	Static
Test duration	72 hours
Test vessel	Microplate
Test volume	220 µL
Test concentrations	Full strength sample diluted to 95.2% (v/v) by addition of nutrients, plus laboratory control
Test replicates	4 per treatment; 8 for laboratory control and site control
Number of organisms	10,000 cells/mL
Control water	Deionized water supplemented with nutrients
Test solution renewal	None
Test temperature	24 ± 2°C
Feeding	None
Light intensity	3600 to 4400 lux
Photoperiod	24 hours light
Aeration	None
Test measurements	Test area temperature measured daily; temperature and pH measured at test initiation; pH of two control wells measured at test termination
Test protocol	Environment Canada (2007b), EPS 1/RM/25
Statistical software	CETIS Version 1.9.4
Test endpoints	Algal cell growth inhibition
Test acceptability criteria for controls	>16-fold increase in number of algal cells; CV ≤20%; no trend when analyzed using Mann-Kendall test
Reference toxicant	Zinc (added as $ZnSO_4$)

Table 4. Test conditions: *Hyalella azteca* survival and growth test.

Test species	*Hyalella azteca*
Organism source	Aquatic Biosystems, CO
Organism age	7- to 8-days old
Test type	Static-renewal
Test duration	28 days
Test vessel	375-mL glass container
Test volume	300 mL
Test concentrations	100% (undiluted) samples amended with 25 mg/L Cl and 0.02 mg/L Br, plus laboratory control
Test replicates	5 per treatment
Number of organisms	10 per replicate
Control water	Reconstituted water containing ~75 mg/L Cl and 0.8 mg/L Br (Environment Canada 2013). Samples were supplemented with 25 mg/L Cl and 0.02 mg/L Br.
Test solution renewal	Twice daily (~80% renewal)
Test temperature	23 ± 1°C
Feeding	1 mL of YCT daily to each container. Tetramin daily, with amounts increasing weekly; Week 1: 0.25 mg, Week 2: 0.5 mg, Week 3: 1 mg, Week 4: 1.5 mg in each test container.
Light intensity	500 to 1000 lux at water surface
Photoperiod	16 hours light / 8 hours dark
Aeration	None
Test measurements	Temperature, dissolved oxygen, pH and conductivity measured daily; hardness and alkalinity measured upon arrival; hardness and alkalinity measured at test termination; total ammonia measured at test initiation and termination
Test protocol	Modified from US EPA (2000), as described in Norberg-King et al. (2014)
Statistical software	CETIS Version 1.9.4
Test endpoints	Survival and dry weight
Test acceptability criteria for controls	Mean control survival of ≥80%, dry weight ≥0.10 mg
Reference toxicant	Sodium chloride (NaCl)

Table 5. Test conditions: *Oncorhynchus mykiss* embryo-alevin development test.

Test species	*Oncorhynchus mykiss*
Organism source	Ted's Trout, BC
Gamete quality	Small amount of water added to milt on a dry glass slide; verification of vigorous sperm motility using a compound microscope (100 X magnification)
Organism age	<30 minutes post fertilization, <24-hour old gametes
Test type	Static-renewal
Test duration	Test terminated 7 days after ≥50% of controls hatch
Test vessel	4-L plastic containers
Test volume	2 L
Test solution depth	17 cm
Test concentrations	100% (undiluted sample) amended with 20 µg/L Cu, plus laboratory control
Test replicates	6 per treatment
Number of organisms	30 per replicate
Control water	Dechlorinated Metro Vancouver municipal tap water
Test solution renewal	Daily (80% renewal)
Test temperature	14 ± 1°C
Feeding	None
Light intensity	Dark
Photoperiod	24 hours dark; low intensity light used during solution renewals
Aeration	Continuous gentle aeration
Test measurements	Temperature, dissolved oxygen, pH and conductivity measured daily; hardness and alkalinity of undiluted sample measured upon arrival; survival checked daily
Test protocol	Environment Canada (1998), EPS 1/RM/28
Statistical software	CETIS Version 1.9.4
Test endpoint	Survival, viability (which assesses incidence of deformities), length, wet weight
Test acceptability criteria for controls	≥65% normally developed hatched fish
Reference toxicant	Sodium dodecyl sulphate (SDS)

3.0 RESULTS

3.1 *Ceriodaphnia dubia*

Results of the toxicity tests using *C. dubia* are provided in Table 6. Survival and reproduction in the site controls (FR_UFR1, GH_ER2, CM_MC1 and LC_SLC) performed similarly to the laboratory control, indicating that there were no adverse effects associated with the upstream stations.

There were no adverse effects on survival in any of the samples tested; survival ranged between 90 and 100%. Additionally, there were no adverse effects on reproduction in any of the samples tested.

3.2 *Pseudokirchneriella subcapitata*

Results of the toxicity tests using *P. subcapitata* are provided in Table 7. The cell yield in site controls FR_UFR1, GH_ER2, CM_MC1 and LC_SLC was 2.0- to 2.4-fold greater than the laboratory control. This finding is not unusual. The higher ionic strength associated with the site water controls would be expected to stimulate cell growth of this species relative to the very low ionic strength associated with the laboratory control water.

Significantly lower cell yield relative to one or more controls was observed in GH_FR1, EV_HC1, LC_LC3, LC_LC5, and LC_LCDSSLC. Percent stimulation of growth, compared to laboratory control, ranged from 47.7 – 135.6% across samples.

3.3 *Hyalella azteca*

Results of the *H. azteca* toxicity tests are provided in Table 8. Tests were originally initiated with samples from all stations and were successfully terminated. However, a technical laboratory error rendered the organisms collected at termination unusable and final dry weight measurements could not be collected. Survival results from the original test of all stations will be provided in a separate memo. The results included here are derived from a subset of the samples originally intended for testing. Testing for stations associated with the UFR program were re-initiated right away (including the upstream reference station on the Fording), which is why they are shown in this quarterly report. Re-testing for stations associated with the regional program occurred in the third quarter and will therefore be reported in the next quarterly report.

The survival and dry weight of the site control did not differ from those of the laboratory control. Additionally, there were no adverse effects on survival or dry weight in any of the samples tested.

3.4 *Oncorhynchus mykiss*

Results of the toxicity tests using *O. mykiss* are provided in Table 9. The site water controls FR_UFR1, CM_MC1, GH_ER2 and LC_SLC performed similarly to the laboratory control for all endpoints (survival, viability, length, and wet weight), indicating that there were no adverse effects associated with the upstream site waters. Adverse effects on survival were observed in the copper control relative to the laboratory control. The viability, length, and wet weight of the copper control, however, were not affected.

Adverse effects on survival were observed in GH_FR1 and LC_LC5 when compared to one or more controls. Viability of the eggs were also significantly decreased in GH_FR1, LC_LC5 and FR_MULTIPLATE when compared to one or more controls. Survival ranged from 75.6 – 95.4% and embryo viability ranged from 71.1 – 94.3%. No adverse effects on growth endpoints (length and wet weight) were observed in any of the samples tested.

There were no observations of unusual behavior in fish exposed to any of the samples. A new protocol for microbial growth observations was implemented wherein daily observations of the number of fish with microbial growth were divided by whether the affected fish was alive or dead. This quarter, all observations of microbial growth were associated with dead fish. Microbial growth was observed following hatch in one or more replicates of all controls and samples, except the laboratory control. Observations of microbial growth were made as early as day 6 of exposure (FR_FRRD); however, the majority of observations were made when eggs were hatching (on days 26 through 29 of exposure), and this is not an uncommon occurrence in this toxicity test because of the organic material associated with the egg that is released into the test containers during hatch. The sample with the most fish observed to have microbial growth was GH_FR1.

Table 6. Results: *Ceriodaphnia dubia* survival and reproduction test.

Sample ID	Survival (%)	Reproduction (Mean ± SD)
Laboratory Control	100	22.4 ± 2.1
FR_UFR1 (Site Control)	100	23.4 ± 2.4
GH_ER2 (Site Control)	90	24.5 ± 5.5
CM_MC1 (Site Control)	90	23.8 ± 4.3
LC_SLC (Site Control)	100	23.6 ± 3.9
FR_FRABCH	100	23.1 ± 4.4
FR_FRCP1	100	23.5 ± 3.9
GH_FR1	100	22.0 ± 3.1
GH_ERC	100	23.4 ± 7.3
CM_MC2	100	21.3 ± 3.1
RG_MIDAG	100	23.3 ± 4.0
EV_MC2	100	19.2 ± 7.1
EV_HC1	100	21.0 ± 2.2
LC_DCDS	100	21.4 ± 6.0
LC_LC3	100	22.2 ± 4.5
LC_LC5	90	18.1 ± 8.9
LC_LCDSSLCC	90	19.5 ± 6.4
FR_FR4	100	24.7 ± 4.9
FR_FR2	100	24.5 ± 3.6
FR_MULTIPLATE	100	23.5 ± 5.4
FR_FRRD	100	22.3 ± 3.9

SD = Standard Deviation
* Result was significantly lower than the laboratory control
# Result was significantly lower than the FR_UFR1 site control
† Result was significantly lower than the GH_ER2 site control
‡ Result was significantly lower than the CM_MC1 site control
§ Result was significantly lower than the LC_SLC site control

Table 7. Results: *Pseudokirchneriella subcapitata* growth inhibition test.

Sample ID	Cell Yield (x 10^4 cells/mL) (Mean ± SD)	Stimulation relative to laboratory control (%)
Laboratory Control	32.0 ± 2.9	-
FR_UFR1 (Site Control)	62.8 ± 7.8 ‡	96.1
GH_ER2 (Site Control)	64.9 ± 5.5 ‡	102.7
CM_MC1 (Site Control)	75.4 ± 4.3	135.6
LC_SLC (Site Control)	63.1 ± 4.5 ‡	97.3
FR_FRABCH	67.5 ± 6.6	110.9
FR_FRCP1	68.8 ± 10.5	114.8
GH_FR1	61.5 ± 3.4 ‡	92.2
GH_ERC	66.2 ± 6.2	107.0
CM_MC2	66.2 ± 6.8	107.0
EV_MC2	70.0 ± 6.1	118.8
EV_HC1	60.2 ± 3.2 ‡	88.3
LC_DCDS	69.0 ± 9.8	115.6
LC_LC3	47.2 ± 2.4 # † ‡ §	47.7
LC_LC5	54.5 ± 5.7 † ‡	70.3
LC_LCDSSLCC	55.0 ± 2.2 † ‡	71.9

SD = Standard Deviation
* Result was significantly lower than the laboratory control
# Result was significantly lower than the FR_UFR1 site control
† Result was significantly lower than the GH_ER2 site control
‡ Result was significantly lower than the CM_MC1 site control
§ Result was significantly lower than the LC_SLC site control

Table 8. Results: *Hyalella azteca* survival and growth test.

Sample ID	(Mean ± SD)	
	Survival (%)	Dry weight (mg)
Laboratory Control	96.0 ± 5.5	0.31 ± 0.12
FR_UFR1 (Site Control)	92.0 ± 8.4	0.37 ± 0.09
FR_FR4	98.0 ± 4.5	0.48 ± 0.09
FR_FRRD	92.0 ± 8.4	0.38 ± 0.10
FR_FR2	98.0 ± 4.5	0.48 ± 0.11
FR_MULTIPLATE	94.0 ± 8.9	0.25 ± 0.09

SD = Standard Deviation

Table 9. Results: *Oncorhynchus mykiss* embryo-alevin development test.

Sample ID	(Mean ± SD)			
	Survival (%)	Viability (%)	Length (mm)	Wet Weight (mg)
Laboratory Control	92.3 ± 10.7	85.7 ± 8.4	19.9 ± 0.5	82.5 ± 12.0
Control + 20 µg/L Cu [M]	75.6 ± 11.7 *	71.1 ± 11.7	20.2 ± 0.2	85.8 ± 12.2
FR_UFR1 (Site Control) [M]	95.4 ± 5.3	94.3 ± 4.0	20.8 ± 0.2	87.5 ± 11.6
GH_ER2 (Site Control) [M]	92.0 ± 5.3	83.0 ± 3.5	20.4 ± 0.6	97.8 ± 14.4
CM_MC1 (Site Control) [M]	92.3 ± 6.9	89.0 ± 5.1	20.7 ± 0.2	92.2 ± 10.3
LC_SLC (Site Control) [M]	87.8 ±10.2	85.6 ± 10.2	20.2 ± 0.5	95.2 ± 8.3
FR_FRABCH [M]	89.0 ± 4.7	84.6 ± 7.9	20.6 ± 0.4	99.5 ± 12.7
FR_FRCP1 [M]	91.1 ± 1.9	88.9 ± 3.8	20.3 ± 0.4	96.9 ± 9.4
GH_FR1[M]	81.8 ± 14.0 #	79.6 ± 14.9 #	20.6 ± 0.2	98.6 ± 10.3
GH_ERC [M]	90.0 ± 8.8	88.9 ± 8.4	20.9 ± 0.0	105.4 ± 11.2
CM_MC2 [M]	89.9 ± 6.7	89.9 ± 6.7	20.8 ± 0.5	100.5 ± 18.4
EV_MC2[M]	92.5 ± 8.1	83.8 ± 11.6	20.8 ± 0.5	100.7 ± 13.0
EV_HC1 [M]	93.1 ± 12.0	89.7 ± 9.2	20.5 ± 0.6	99.6 ± 10.6
LC_DCDS [M]	94.4 ± 3.8	93.3 ± 5.8	21.3 ± 0.5	108.6 ± 13.2
LC_LC3 [M]	90.1 ± 3.0	86.8 ± 5.5	21.0 ± 0.2	100.6 ± 17.1
LC_LC5 [M]	77.4 ± 9.4 #	77.4 ± 9.4 #	21.1 ± 0.2	104.2 ± 20.4
LC_LCDSSLCC [M]	92.3 ± 2.0	91.2 ± 2.0	21.1 ± 0.1	111.5 ± 13.0
FR_FR4 [M]	85.4 ± 5.0	81.0 ± 4.8	20.7 ± 0.1	97.5 ± 9.7
FR_FRRD [M]	84.6 ± 13.5	81.3 ± 15.0	20.6 ± 0.3	94.7 ± 13.9
FR_FR2 [M]	87.7 ± 6.8	87.7 ± 6.8	20.8 ± 0.5	97.4 ± 14.8
FR_MULTIPLATE [M]	83.4 ± 9.5	78.9 ± 13.0 #	20.7 ± 0.6	106.6 ± 11.8

Note: Site waters were amended with 20 µg/L Cu
SD = Standard Deviation; M = microbial growth
[C] Result was significantly lower than the copper control (control + 20 µg/L Cu)
* Result was significantly lower than the laboratory control
# Result was significantly lower than the FR_UFR1 site control
† Result was significantly lower than the GH_ER2 site control
‡ Result was significantly lower than the CM_MC1 site control
§ Result was significantly lower than the LC_SLC site control

4.0 QA/QC

The health histories of the test organisms used in the exposures were acceptable and met the requirements of the test protocols. All tests met control acceptability criteria. Water quality parameters remained within the ranges specified in the protocols throughout the tests and uncertainty associated with these tests is best described by the standard deviations around the means.

There were no deviations from test methodologies with the exception of planned modifications to the *C. dubia, H. azteca* and *O. mykiss* methods described in Section 2.0. In the *O. mykiss* test, eggs in one of the four replicates were considered non-viable, producing poor results (near complete mortality across all treatments within the first two weeks of exposure). Since the blocked design of the test isolated eggs from individual females into individual replicates across the test, the effect of this non-viable batch of eggs was removed by excluding this replicate from statistical analyses, thereby leaving three replicates with viable eggs for analysis.

Results of the reference toxicant tests conducted during the testing program are summarized in Table 10. Results for these tests fell within the acceptable range for organism performance of two standard deviations around the mean, based on historical results obtained by the laboratory. Thus, the sensitivity of the organisms used in these tests was appropriate. The reference toxicant tests were performed under the same conditions as those used for the samples.

Table 10. Reference toxicant test results.

Test species	Endpoint	Historical mean (2 SD Range)	CV (%)	Test date
C. dubia	Survival (LC50): 2.1 g/L NaCl	2.0 (1.8 – 2.2)	5	May 21, 2021
	Reproduction (IC50): 1.9 g/L NaCl	1.9 (1.5 – 2.3)	11	
P. subcapitata	Growth (IC50): 32.7 µg/L Zn	31.7 (26.0 – 38.5)	10	May 6, 2021
H. azteca	Survival (LC50): 6.9 g/L NaCl	6.1 (3.8-9.8)	24	July 1, 2021
O. mykiss	Viability (EC50): 5.3 mg/L SDS	4.8 (2.2 – 10.4)	41	May 19, 2021

SD = Standard Deviation, CV = Coefficient of Variation, LC = Lethal Concentration, IC = Inhibition Concentration, EC = Effective Concentration

5.0 REFERENCES

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APPENDIX A – *Ceriodaphnia dubia* toxicity test data

Ceriodaphnia dubia Summary Sheet

Client: TECK
Work Order No.: 210962

Start Date/Time: May. 19/21 @ 1400h
Set up by: JZL/GJU

Sample Information:

Sample ID: Various - see below
Sample Date: May. 18/21
Date Received: May. 19/21
Sample Volume: Various

Test Validity Criteria:

1) Mean survival of first generation controls is ≥80 %
2) At least 60% of controls have produced three broods within 8 days
3) An average of ≥15 live young produced per surviving female in the control solutions during the first three broods.
4) Invalid if ephippia observed in any control solution at any time.

WQ Ranges:

T (°C) = 25 ± 1; DO (mg/L) = 3.3 to 8.4 ; pH = 6.0 to 8.5

Test Organism Information:

Broodstock No.: BBO50621A+B ; BBO511218, BB 051321
Age of young (Day 0): <24-h (within 12-h)
Avg No. young in first 3 broods of previous 7 d: 23
Mortality (%) in previous 7 d: 5 %
Individual female # used ≥8 young on test day: ± 4, 6, 9, 12, 37, 38 ; # 71-74, 76, 79, 80 ; 1-10, 12-15, 17-20

NaCl Reference Toxicant Results:

Reference Toxicant ID: Cd284
Stock Solution ID: 21NaCl
Date Initiated: ~~Jun~~ May. 21/21

7-d LC50 (95% CL): 2.1 (2.0-2.2) g/L NaCL
7-d IC50 (95% CL): 1.9 (1.8-2.0) g/L NaCL

7-d LC50 Reference Toxicant Mean and Historical Range: 2.0 (1.8-2.2) g/L NaCL CV (%): 5
7-d IC50 Reference Toxicant Mean and Historical Range: 1.9 (1.5-2.3) g/L NaCL CV (%): 11

Test Results:

	Survival (%)	Reproduction (Mean ± SD)
Negative Control	100	22.4 ± 2.1
FR_UFRI	100	23.4 ± 2.4
GH_ER2	90	24.5 ± 5.5
CM_MCI	90	~~38~~ 23.8 ± 4.3
LC_SLC	100	23.6 ± 3.9
FR_FRABCH	100	23.1 ± 4.4
FR_FRCPI	100	23.5 ± 3.9
GH_FRI	100	22.0 ± 3.1
GH_ERC	100	23.4 ± 7.3

Reviewed by: [signature]
Date reviewed: June 22, 2021

Ceriodaphnia dubia Summary Sheet

Client: TECK
Work Order No.: 210962

Start Date/Time: May. 19/21 @ 1400h
Set up by: JZL/GJU

Test Validity Criteria:
1) Mean survival of first generation controls is ≥80 %
2) At least 60% of controls have produced three broods within 8 days
3) An average of ≥15 live young produced per surviving female in the control solutions during the first three broods.
4) Invalid if ephippia observed in any control solution at any time.

WQ Ranges:
T (°C) = 25 ± 1; DO (mg/L) = 3.3 to 8.4 ; pH = 6.0 to 8.5

Sample Information:

Sample ID: Various - see below
Sample Date: May. 18/21
Date Received: May. 19/21
Sample Volume: Various

Test Organism Information:

Broodstock No.: BB050621A+B ; BB051121B ; BB 051321
Age of young (Day 0): <24-h (within 12-h)
Avg No. young in first 3 broods of previous 7 d: 23
Mortality (%) in previous 7 d: 5 %
Individual female # used ≥8 young on test day: # 4, 6, 9, 12, 37, 38 ; # 71-74, 76, 79, 80 ; 1-10, 12-15, 17-20

NaCl Reference Toxicant Results:

Reference Toxicant ID: Cd 284
Stock Solution ID: 21 NaCl
Date Initiated: May. 21/21

7-d LC50 (95% CL): 2.1 (2.0 - 2.2) g/L NaCL
7-d IC50 (95% CL): 1.9 (1.8 - 2.0) g/L NaCL

7-d LC50 Reference Toxicant Mean and Historical Range: 2.0 (1.8 - 2.2) g/L NaCL CV (%): 5
7-d IC50 Reference Toxicant Mean and Historical Range: 1.9 (1.5 - 2.3) g/L NaCL CV (%): 11

Test Results:

	Survival (%)	Reproduction (Mean ± SD)
Negative Control	100	22.4 ± 2.1
CM_MC2	100	21.3 ± 3.1
EV_MC2	100	19.2 ± 7.1
EV_HCl	100	21.0 ± 2.2
LC_DCDS	100	21.4 ± 6.0
LC_LC3	100	22.2 ± 4.5
LC_LC5	90	18.1 ± 8.9
LC_LCDSSLCC	90	19.5 ± 6.4
RG_MIDAG	100	23.3 ± 4.0

Reviewed by: _____ Date reviewed: June 22, 2021

Ceriodaphnia dubia Summary Sheet

Client: TECK
Work Order No.: 210962

Start Date/Time: May. 19/21 @ 1400h
Set up by: JZL/GJU

Sample Information:

Sample ID: Various - see below
Sample Date: May. 18/21
Date Received: May. 19/21
Sample Volume: Various

Test Validity Criteria:

1) Mean survival of first generation controls is ≥80 %
2) At least 60% of controls have produced three broods within 8 days
3) An average of ≥15 live young produced per surviving female in the control solutions during the first three broods.
4) Invalid if ephippia observed in any control solution at any time.

WQ Ranges:

T (°C) = 25 ± 1; DO (mg/L) = 3.3 to 8.4 ; pH = 6.0 to 8.5

Test Organism Information:

Broodstock No.: BB050621A+B*; BB051121B*; BB 051321
Age of young (Day 0): <24-h (within 12-h)
Avg No. young in first 3 broods of previous 7 d: 23
Mortality (%) in previous 7 d: 5 %
Individual female # used ≥8 young on test day: *4, 6, 9, 12, 37, 38*; # 71-74, 76, 79, 80*; 1-10, 12-15, 17-20

NaCl Reference Toxicant Results:

Reference Toxicant ID: CD284
Stock Solution ID: 21 NaCl
Date Initiated: May. 21/21

7-d LC50 (95% CL): 2.1 (2.2 - 2.2) g/L NaCL
7-d IC50 (95% CL): 1.9 (1.8 - 2.0) g/L NaCL

7-d LC50 Reference Toxicant Mean and Historical Range: 2.0 (1.8-2.2) g/L NaCL CV (%): 5
7-d IC50 Reference Toxicant Mean and Historical Range: 1.9 (1.5-2.3) g/L NaCL CV (%): 11

Test Results:

	Survival (%)	Reproduction (Mean ± SD)
Negative Control	100	22.4 ± 2.1
FR_FR4	100	24.7 ± 4.9
FR_FR2	100	24.5 ± 3.6
FR_FR8 MULTIPLATE	100	23.5 ± 5.4
FR_FRRD	100	22.3 ± 3.9
		±
		±
		±
		±

Reviewed by: _____ Date reviewed: June 22, 2021

Chronic Freshwater Toxicity Test
Initial and Final Water Quality Measurements

Client: Teck
Sample ID: various
Work Order #: 210962

Start Date & Time: May 19/21 @ 1400h
Stop Date & Time: May 27/21 @ 1500h
CER #: 4
Test Species: *Ceriodaphnia dubia*

Control	Days																
Concentration	0	1		2		3		4		5		6		7		8	
	init.	old	new	old	new	old	new	old	new	old	new	old	new	old final	new	final	
Temperature (°C)	25.0	25.0	25.0	24.0	25.0	24.5	25.0	25.0	25.0	25.5	25.0	24.0	25.0	24.0	25.0	26.0	
DO (mg/L)	8.1	7.3	8.1	7.3	8.1	7.3	8.1	7.0	8.0	7.3	8.1	[illegible]	8.2	7.0	8.1	6.2	
pH	8.0	7.8	8.0	7.8	8.0	7.8	8.1	8.0	8.0	7.8	8.1	7.7	8.0	7.7	8.1	7.6	
Cond. (µS/cm)	212	213		211		213		211		212		213		213	213	218	
Initials	GM	JZL		SAK		SAK		MM		JZL		SAK		JZL	JZL	JZL	

① 6.9

① FR_UFR1	Days																
Concentration	0	1		2		3		4		5		6		7		8	
	init.	old	new	old	new	old	new	old	new	old	new	old	new	old final	new	final	
Temperature (°C)	24.5	25.0	24.5	24.0	24.0	24.5	24.0	25.0	24.0	25.5	25.0	25.0	25.0	24.0	25.0	25.5	
DO (mg/L)	7.9	7.2	8.0	7.3	7.9	7.3	8.1	7.3	8.2	7.3	7.9	[illegible]	7.9	7.2	8.1	6.6	
pH	7.9	7.8	7.9	7.9	8.0	7.8	8.0	7.9	8.0	7.7	7.8	7.7	7.9	7.6	7.7	7.6	
Cond. (µS/cm)	208	213		212		207		202		212		213		215	212	212	
Initials	GM	JZL		SAK		SAK		MM		JZL		SAK		JZL	JZL	JZL	

② 6.9

② GH_ER2	Days																
Concentration	0	1		2		3		4		5		6		7		8	
	init.	old	new	old	new	old	new	old	new	old	new	old	new	old final	new	final	
Temperature (°C)	25.0	25.0	24.5	24.5	24.0	24.5	24.0	25.0	24.0	25.5	25.0	25.0	25.0	24.0	25.0	25.5	
DO (mg/L)	7.9	7.2	8.1	7.3	7.9	7.3	8.0	6.9	8.1	7.3	8.1	[illegible]	7.9	7.2	8.1	6.7	
pH	8.0	7.9	7.9	8.0	8.1	8.0	8.0	8.0	8.0	7.9	7.9	7.8	8.0	7.7	7.8	7.8	
Cond. (µS/cm)	271	280		275		266		262		277		278		276	279	276	
Initials	GM	JZL		SAK		SAK		MM		JZL		SAK		JZL	JZL	JZL	

③ 6.9

③ CM_MCI	Days																
Concentration	0	1		2		3		4		5		6		7		8	
	init.	old	new	old	new	old	new	old	new	old	new	old	new	old final	new	final	
Temperature (°C)	25.0	25.0	24.5	24.5	24.0	24.5	24.0	25.0	24.0	25.5	24.5	25.0	25.0	24.0	25.0	25.5	
DO (mg/L)	7.7	7.2	7.9	7.3	7.9	7.3	8.0	7.1	8.1	7.4	8.1	6.9	7.9	7.3	8.1	6.8	
pH	7.9	7.8	7.8	7.9	7.9	7.9	7.9	7.9	7.9	7.9	7.8	7.7	7.8	7.7	7.7	7.7	
Cond. (µS/cm)	174	177		176		173		172		177		177		182	176	180	
Initials	GM	JZL		SAK		SAK		MM		JZL		SAK		JZL	JZL	JZL	

Thermometer: CER #4 DO meter/probe: 1 / 1 pH meter/probe: 1 / 1 Conductivity meter/probe: 1 / 1

	Control	FR-UFR1	GH-ER2	CM-MCI
Hardness*	100	108	144	94
Alkalinity*	87	108	146	90

* mg/L as CaCO3

Analysts: SAK, JZL, RES, YYL

Reviewed by: [signature]

Date reviewed: June 22, 2021

Sample Description: various - see 4th coc

Comments: Broodboard Used: BB050621A+B (#4,6,9,12,37,38); BB051121B (#71-74,76,79,80); BB051321 (#1-10,12-15,17-20)

Chronic Freshwater Toxicity Test
Initial and Final Water Quality Measurements

Client: Teck
Sample ID: Various
Work Order #: 210962

Start Date & Time: May 19/21 @ 1400h
Stop Date & Time: May 27/21 @ 1500h
CER #: 4
Test Species: *Ceriodaphnia dubia*

④ Concentration LC_SLC

	Days																
	0	1		2		3		4		5		6		7		8	
	init.	old	new	old	new	old	new	old	new	old	new	old	new	old final	new	final	
Temperature (°C)	25.0	25.5	24.5	24.5	24.0	24.5	24.0	25.0	24.0	25.5	25.0	25.0	25.0	24.0	25.0	25.0	
DO (mg/L)	7.9	7.1	7.8	7.3	8.0	7.1	8.0	7.3	8.0	7.0	8.0	6.9	7.8	7.2	8.1	6.9	
pH	8.0	7.8	7.9	7.9	8.0	7.8	8.0	7.7	8.0	7.8	7.8	7.7	7.9	7.6	7.7	7.7	
Cond. (µS/cm)	218	224		221		218		216		222		222		223	220	223	
Initials	GSM	JZL		SAK		SAK		[illegible]		JZL		SAK		JZL	JZL	JZL	

⑤ Concentration FR_FRABCH

	Days																
	0	1		2		3		4		5		6		7		8	
	init.	old	new	old	new	old	new	old	new	old	new	old	new	old final	new	final	
Temperature (°C)	26.0	24.5	24.0	25.0	24.0	24.5	24.0	25.0	24.0	25.5	24.5	25.0	25.0	24.0	24.0	25.0	
DO (mg/L)	7.9	7.2	7.9	7.3	8.0	7.2	8.0	7.3	8.1	7.1	8.1	6.8	7.8	6.8	8.2	6.9	
pH	8.0	7.9	7.9	8.0	8.0	7.9	8.0	8.0	8.0	7.9	7.8	7.8	7.9	7.6	7.8	7.7	
Cond. (µS/cm)	580	594		591		590		585		589		593		571	592	574	
Initials	GSM	JZL		SAK		SAK		[illegible]		JZL		SAK		JZL	JZL	JZL	

⑥ Concentration FR_FRCPi

	Days																
	0	1		2		3		4		5		6		7		8	
	init.	old	new	old	new	old	new	old	new	old	new	old	new	old final	new	final	
Temperature (°C)	26.0	25.5	24.5	25.0	24.0	24.5	24.0	25.0	24.0	25.0	24.5	25.0	25.0	24.0	24.0	25.5	
DO (mg/L)	7.9	7.2	7.9	7.3	8.0	7.2	8.0	7.0	7.9	7.2	8.2	6.8	7.7	6.9	8.1	6.7	
pH	8.0	8.0	7.9	8.0	8.0	8.0	8.0	8.1	8.0	7.9	7.9	7.8	7.9	7.7	7.8	7.8	
Cond. (µS/cm)	491	503		497		495		498		500		500		492	498	490	
Initials	GSM	JZL		SAK		SAK		[illegible]		JZL		SAK		JZL	JZL	JZL	

⑦ Concentration GH_FRI

	Days																
	0	1		2		3		4		5		6		7		8	
	init.	old	new	old	new	old	new	old	new	old	new	old	new	old final	new	final	
Temperature (°C)	26.0	25.5	24.5	25.0	24.0	24.5	24.0	25.0	24.0	25.0	25.0	25.0	25.0	24.0	24.0	25.0	
DO (mg/L)	7.8	7.2	8.0	7.3	8.0	7.2	8.1	6.9	8.1	7.3	8.0	6.8	7.7	6.9	8.2	6.9	
pH	8.0	8.0	8.0	8.0	8.0	8.0	8.1	8.0	8.0	7.9	8.0	7.8	8.0	7.7	7.9	7.8	
Cond. (µS/cm)	498	509		506		499		503		508		506		496	506	494	
Initials	GSM	JZL		SAK		SAK		[illegible]		JZL		SAK		JZL	JZL	JZL	

Thermometer: CER #4 DO meter/probe: 1 / 1 pH meter/probe: 1 / 1 Conductivity meter/probe: 1 / 1

	Control	LC-SLC	FR_FRABCH	FR_FRCPi
Hardness*	100	112	320	290
Alkalinity*	87	116	154	146

* mg/L as CaCO3

Analysts: SAK, JZL, RES, YYL
Reviewed by: [signature]
Date reviewed: June 22, 2021

Sample Description: refer to COC

Comments: Broodboard Used: See P. 1

Chronic Freshwater Toxicity Test
Initial and Final Water Quality Measurements

Client: Teck
Sample ID: Various
Work Order #: 210962

Start Date & Time: May 19/21 @ 1400h
Stop Date & Time: May 27/21 @ 1500h
CER #: 4
Test Species: *Ceriodaphnia dubia*

③ Concentration GH-ERC	Days																
	0	1		2		3		4		5		6		7		8	
	init.	old	new	old	new	old	new	old	new	old	new	old	new	old final	new	final
Temperature (°C)	25.5	25.5	24.5	24.0	24.0	24.5	24.0	25.0	24.0	25.0	25.0	~~25.0~~	25.0	24.0	25.0	25.5
DO (mg/L)	7.8	7.1	8.1	7.2	8.1	7.3	8.0	7.0	8.0	7.2	8.1	6.8	7.8	6.8	7.9	6.9
pH	8.0	8.0	8.0	8.0	8.1	8.0	8.1	8.1	8.1	8.0	8.0	~~7.9~~	8.0	7.8	7.9	7.9
Cond. (µS/cm)	297	301		301		293		292		300		301		303	300	298
Initials	GM	JZL		SAK		SAK		MW		JZL		~~SAK~~		JZL	JZL	JZL

⑨ Concentration CM-MC2	Days																
	0	1		2		3		4		5		6		7		8	
	init.	old	new	old	new	old	new	old	new	old	new	old	new	old final	new	final
Temperature (°C)	25.0	25.0	24.5	24.0	24.0	24.0	24.0	25.0	24.0	25.0	24.5	24.0	25.0	24.0	25.0	25.5
DO (mg/L)	7.8	7.2	8.0	7.2	8.0	7.4	8.1	7.0	8.2	7.2	8.2	6.8	7.8	6.8	7.9	6.9
pH	7.9	8.0	8.0	7.9	8.0	7.9	8.1	8.0	8.0	8.0	7.9	7.9	8.0	7.8	7.9	7.9
Cond. (µS/cm)	504	517		515		510		507		512		513		500	514	506
Initials	GM	JZL		SAK		SAK		MW		JZL		SAK		JZL	JZL	JZL

⑩ Concentration EV-MC2	Days																
	0	1		2		3		4		5		6		7		8	
	init.	old	new	old	new	old	new	old	new	old	new	old	new	old final	new	final
Temperature (°C)	24.5	25.0	24.5	24.0	24.0	24.0	24.0	25.0	24.0	25.0	25.0	24.0	25.0	24.0	25.0	25.5
DO (mg/L)	7.9	7.2	8.1	7.2	8.0	7.4	8.0	6.9	8.0	7.2	8.1	6.8	7.8	6.9	8.0	6.9
pH	7.8	8.0	7.8	7.8	7.8	7.8	7.9	7.8	7.9	7.9	7.8	7.7	7.8	7.7	7.8	7.7
Cond. (µS/cm)	220	225		223		219		219		225		227		232	226	233
Initials	GM	JZL		SAK		SAK		MW		JZL		SAK		JZL	JZL	JZL

⑪ Concentration EV-HCl	Days																
	0	1		2		3		4		5		6		7		8	
	init.	old	new	old	new	old	new	old	new	old	new	old	new	old final	new	final
Temperature (°C)	24.0	25.0	24.0	24.0	24.0	24.0	24.0	25.0	24.0	25.0	24.5	24.0	25.0	24.0	25.0	25.5
DO (mg/L)	7.8	7.3	8.0	7.2	7.9	7.9	7.8	7.1	8.0	7.4	8.0	6.8	7.8	7.0	7.9	6.9
pH	8.1	8.0	8.1	8.0	8.1	7.9	8.1	8.1	8.1	7.9	8.0	7.9	8.0	7.7	7.9	7.8
Cond. (µS/cm)	400	410		409		405		402		408		410		402	410	403
Initials	GM	JZL		SAK		SAK		MW		JZL		SAK		JZL	JZL	JZL

Thermometer: CER #4 DO meter/probe: 1 / 1 pH meter/probe: 1 / 1 Conductivity meter/probe: 1 / 1

	Control	GH_FR1	GH-ERC	CM_MC2
Hardness*	100	250	160	240
Alkalinity*	87	152	150	142

* mg/L as CaCO3

Analysts: SAK, JZL, RZS, MYL

Reviewed by:

Date reviewed: June 22, 2021

Sample Description: Refer to COC

Comments: Broodboard Used: See P.1

Chronic Freshwater Toxicity Test
Initial and Final Water Quality Measurements

Client: Teck
Sample ID: Various
Work Order #: 210962

Start Date & Time: May 19 / 21 @ 1400h
Stop Date & Time: May 27 / 21 @ 1500h
CER #: 4
Test Species: *Ceriodaphnia dubia*

(12) Concentration LC-DCDS

	Days																
	0	1		2		3		4		5		6		7		8	
	init.	old	new	old	new	old	new	old	new	old	new	old	new	old final	new	final	
Temperature (°C)	24.5	25.0	24.5	24.0	24.0	24.0	24.0	25.0	24.0	25.5	24.5	24.0	25.0	24.0	25.0	25.5	
DO (mg/L)	7.9	6.8	8.0	7.2	7.9	7.4	8.0	6.9	8.1	7.1	8.0	6.8	7.8	6.8	8.0	7.1	
pH	7.9	7.9	7.9	7.9	8.0	8.0	7.9	7.9	8.0	7.8	7.9	7.7	7.9	7.6	7.8	7.7	
Cond. (µS/cm)	458	470		471		461		458		468		470		458	469	460	
Initials	GBM	JZL		SAK		SAK		MM		JZL		SAK		JZL	JZL	JZL	

(13) Concentration LC-LC3

	Days																
	0	1		2		3		4		5		6		7		8	
	init.	old	new	old	new	old	new	old	new	old	new	old	new	old final	new	final	
Temperature (°C)	24.5	25.0	24.5	24.0	24.0	24.0	24.0	25.0	24.0	25.5	24.5	24.0	25.0	24.0	25.0	25.5	
DO (mg/L)	7.8	6.9	8.0	7.2	8.0	7.4	8.0	7.1	8.0	7.2	8.1	6.8	7.9	6.9	8.0	6.8	
pH	7.9	8.0	8.0	8.1	8.0	8.1	8.0	8.0	8.0	7.9	8.0	8.0	8.0	7.8	7.9	7.9	
Cond. (µS/cm)	724	746		742		739		731		740		736		715	734	721	
Initials	GBM	JZL		SAK		SAK		MM		JZL		SAK		JZL	JZL	JZL	

(14) Concentration LC-LC5

	Days																
	0	1		2		3		4		5		6		7		8	
	init.	old	new	old	new	old	new	old	new	old	new	old	new	old final	new	final	
Temperature (°C)	24.5	25.5	24.5	24.0	24.0	24.0	24.0	25.0	24.0	25.0	24.5	24.0	25.0	24.0	25.0	26.0	
DO (mg/L)	7.8	6.9	8.0	7.3	8.0	7.5	8.0	7.1	7.9	7.2	7.9	6.9	7.9	6.9	8.1	6.9	
pH	8.0	8.0	8.0	8.0	8.1	8.0	8.1	8.1	8.1	8.0	8.0	7.9	8.0	7.8	7.9	7.9	
Cond. (µS/cm)	499	513		515		506		509		511		514		508	512	506	
Initials	GBM	JZL		SAK		SAK		MM		JZL		SAK		JZL	JZL	JZL	

(15) Concentration LC-LCDSSLCC

	Days																
	0	1		2		3		4		5		6		7		8	
	init.	old	new	old	new	old	new	old	new	old	new	old	new	old final	new	final	
Temperature (°C)	24.5	25.5	24.5	24.0	24.0	24.0	24.0	25.0	24.0	25.5	24.5	24.0	25.0	24.0	25.0	25.5	
DO (mg/L)	7.8	7.3	8.1	7.3	8.0	7.4	8.0	7.3	8.0	7.3	8.1	6.9	8.0	6.9	8.1	6.7	
pH	8.0	8.0	8.0	8.0	8.1	8.0	8.1	8.0	8.1	8.0	8.0	7.9	8.0	7.8	7.9	7.9	
Cond. (µS/cm)	471	481		478		470		~~476~~ 474		478		481		473	480	476	
Initials	GBM	JZL		SAK		SAK		MM		JZL		SAK		JZL	JZL	JZL	

Thermometer: CER #4 DO meter/probe: 1 / 1 pH meter/probe: 1 / 1 Conductivity meter/probe: 1 / 1

	Control	EV_MC2	EV-HC1	LC-DCDS
Hardness*	100	114	210	250
Alkalinity*	87	96	166	118

* mg/L as CaCO3

Analysts: SAK, JZL, RZS
Reviewed by: [signature]
Date reviewed: June 22, 2021

Sample Description: refer to COC

Comments: Broodboard Used: see P.1

Chronic Freshwater Toxicity Test
Initial and Final Water Quality Measurements

Client: Teck
Sample ID: various
Work Order #: 210962

Start Date & Time: May 19/21 @ 1400h
Stop Date & Time: May 27/21 @ 1500h
CER #: 4
Test Species: *Ceriodaphnia dubia*

(16) Concentration RG_MIDAG

	Days																
	0	1		2		3		4		5		6		7		8	
	init.	old	new	old	new	old	new	old	new	old	new	old	new	old final	new	final	
Temperature (°C)	24.0	25.5	24.5	24.0	24.0	24.0	24.0	25.0	24.0	25.5	24.5	24.0	25.0	24.0	25.0	25.5	
DO (mg/L)	7.9	7.1	8.0	7.3	8.1	7.4	8.0	7.2	8.2	7.0	8.1	7.0	7.9	6.9	8.0	6.8	
pH	7.9	8.0	8.0	7.9	8.0	8.0	8.0	7.9	8.1	7.9	7.9	7.8	8.0	7.7	7.9	7.8	
Cond. (µS/cm)	325	330		328		321		323		326		329		328	328	327	
Initials	GM	JZL		SAK		SAK		NW		JZL		SAK		JZL	JZL	JZL	

(17) Concentration FR_FR4

	Days																
	0	1		2		3		4		5		6		7		8	
	init.	old	new	old	new	old	new	old	new	old	new	old	new	old final	new	final	
Temperature (°C)	24.0	25.0	24.5	24.0	24.0	24.0	24.0	25.0	24.0	25.5	24.5	24.0	25.0	24.5	25.0	25.5	
DO (mg/L)	7.9	7.2	8.0	7.3	7.9	7.1	8.1	7.3	7.9	7.2	8.1	6.8	7.9	6.9	8.1	6.7	
pH	8.0	8.0	7.9	7.9	8.0	7.9	8.0	8.0	8.0	7.9	7.9	7.8	7.9	7.7	7.9	7.7	
Cond. (µS/cm)	446	442		437		SAK ~~429~~ 435		434		437		440		432	439	433	
Initials	GM	JZL		SAK		SAK		NW		JZL		SAK		JZL	JZL	JZL	

(18) Concentration FR_FR2

	Days																
	0	1		2		3		4		5		6		7		8	
	init.	old	new	old	new	old	new	old	new	old	new	old	new	old final	new	final	
Temperature (°C)	25.0	25.0	24.5	24.0	24.0	24.0	24.0	25.0	24.0	25.5	24.5	24.0	25.0	24.5	25.0	25.5	
DO (mg/L)	7.9	7.2	7.8	7.3	7.9	7.0	8.0	7.1	8.1	7.2	8.1	7.0	7.8	6.9	7.8	6.8	
pH	7.9	8.0	8.0	7.9	8.0	7.9	8.0	7.9	8.1	7.8	8.0	7.8	8.0	7.7	7.8	7.7	
Cond. (µS/cm)	399	405		402		397		395		403		403		398	404	398	
Initials	GM	JZL		SAK		SAK		SAK NW		JZL		SAK		JZL	JZL	JZL	

(19) Concentration FR_MULTIPLATE

	Days																
	0	1		2		3		4		5		6		7		8	
	init.	old	new	old	new	old	new	old	new	old	new	old	new	old final	new	final	
Temperature (°C)	25.5	25.0	24.5	24.0	24.0	24.0	24.0	25.0	24.0	25.5	24.5	24.0	25.0	24.5	25.0	25.5	
DO (mg/L)	7.8	7.2	7.9	7.4	7.9	7.1	8.0	7.2	8.0	7.1	8.1	6.8	7.8	6.9	8.2	6.8	
pH	8.0	7.9	7.9	7.9	8.0	7.9	8.0	7.8	8.1	7.8	8.0	7.8	8.0	7.7	7.9	7.7	
Cond. (µS/cm)	385	390		386		382		376		387		388		383	386	~~388~~ 383	
Initials	GM	JZL		SAK		SAK		NW		JZL		SAK		JZL	JZL	JZL	

Thermometer: CER #4 DO meter/probe: 1 / 1 pH meter/probe: 1 / 1 Conductivity meter/probe: 1 / 1

	~~SAK Control~~ LC-LC3	LC-LC5	LC-LCDSSLCC	RG_MIDAG
Hardness*	400	280	270	160
Alkalinity*	180	158	146	122

* mg/L as CaCO3

Analysts: SAK, JZL, RZS

Reviewed by:

Date reviewed: June 22, 2021

Sample Description: refer to COC

Comments: Broodboard Used: See P.1

Chronic Freshwater Toxicity Test
Initial and Final Water Quality Measurements

Client: Teck
Sample ID: various
Work Order #: 210962

Start Date & Time: May 19/21 @ 1400h
Stop Date & Time: May 27/21 @ 1500h
CER #: 4
Test Species: *Ceriodaphnia dubia*

(20) Concentration FR_FRRD	Days 0 init.	1 old	1 new	2 old	2 new	3 old	3 new	4 old	4 new	5 old	5 new	6 old	6 new	7 old final	8 new	8 final
Temperature (°C)	25.0	25.0	24.0	24.0	24.0	24.0	24.0	25.0	24.0	25.0	24.0	24.0	25.0	24.5	25.0	25.5
DO (mg/L)	7.8	7.2	7.9	7.3	7.9	7.2	8.0	7.1	8.1	7.1	8.1	6.9	7.8	6.8	7.8	6.8
pH	7.9	8.0	7.9	8.0	8.1	8.0	8.0	8.1	8.1	7.8	8.0	7.8	8.0	7.7	7.9	7.7
Cond. (µS/cm)	643	650		646		644		647		651		651		633	649	631
Initials	GBu	JEL		SAK		SAK		HW		JEL		SAK		JEL	JEL	JEL

Concentration	Days 0 init.	1 old	1 new	2 old	2 new	3 old	3 new	4 old	4 new	5 old	5 new	6 old	6 new	7 old final	8 new	8 final
Temperature (°C)																
DO (mg/L)																
pH																
Cond. (µS/cm)																
Initials																

Concentration	Days 0 init.	1 old	1 new	2 old	2 new	3 old	3 new	4 old	4 new	5 old	5 new	6 old	6 new	7 old final	8 new	8 final
Temperature (°C)																
DO (mg/L)																
pH																
Cond. (µS/cm)																
Initials																

Concentration	Days 0 init.	1 old	1 new	2 old	2 new	3 old	3 new	4 old	4 new	5 old	5 new	6 old	6 new	7 old final	8 new	8 final
Temperature (°C)																
DO (mg/L)																
pH																
Cond. (µS/cm)																
Initials																

Thermometer: CER #4 DO meter/probe: 1 / 1 pH meter/probe: 1 / 1 Conductivity meter/probe: 1 / 1

	~~SW Control~~	ER_FRRD	FR_FR2	FR_MULTIPLATE (FR_FR4)
Hardness*	250	380	220	200
Alkalinity*	136	166	132	126

* mg/L as CaCO3

Analysts: SAK, JEL, RZS
Reviewed by:
Date reviewed: June 22, 2021

Sample Description: refer to COC

Comments: Broodboard Used: See P.1

Chronic Freshwater Toxicity Test
Initial and Final Water Quality Measurements

Client: Teck
Sample ID: Various
Work Order #: 210959

Start Date & Time: May 19 / 21 @ 1400h
Stop Date & Time: May 27 / 21 @ 1600h
CER #: 4
Test Species: *Ceriodaphnia dubia*

(21) Concentration EDTA Control	Days															
	0	1		2		3		4		5		6		7		8
	init.	old	new	old	new	old	new	old	new	old	new	old	new	old final	new	final
Temperature (°C)	24.0	25.0	25.0	24.0	25.0	25.0	25.0	25.0	25.5	25.5	25.0	24.5	25.0	24.5	25.0	25.5
DO (mg/L)	7.9	7.5	7.7	7.3	7.4	7.1	7.6	7.0	7.6	7.1	7.6	6.7	7.4	6.7	7.3	6.2
pH	7.9	7.9	7.9	7.8	7.9	7.8	8.0	7.8	7.9	7.8	8.1	7.6	8.0	7.7	8.0	7.7
Cond. (µS/cm)	211	212		213		215		215		213		215		220	215	220
Initials	GM	JEL		SAK		SAK		MM		JEL		SAK		JEL	JEL	JEL

(22) Concentration FR_FRCP1 + EDTA	Days															
	0	1		2		3		4		5		6		7		8
	init.	old	new	old	new	old	new	old	new	old	new	old	new	old final	new	final
Temperature (°C)	24.0	25.0	24.5	24.0	25.0	25.0	25.0	25.0	25.5	25.5	25.0	24.5	25.0	24.5	25.0	25.5
DO (mg/L)	7.8	7.1	7.7	7.3	7.5	6.5	7.6	6.9	7.4	7.0	7.7	6.89	7.4	6.9	7.4	6.3
pH	7.9	7.9	7.9	7.8	8.1	7.8	8.1	7.8	7.9	7.8	8.1	7.8	8.0	7.6	8.0	7.7
Cond. (µS/cm)	497	502		506		509		511		499		513		503	514	502
Initials	GM	JEL		SAK		SAK		MM		JEL		SAK		JEL	JEL	JEL

(23) Concentration CM_MC2 + EDTA	Days															
	0	1		2		3		4		5		6		7		8
	init.	old	new	old	new	old	new	old	new	old	new	old	new	old final	new	final
Temperature (°C)	24.0	25.0	25.0	24.0	25.0	25.0	25.0	25.0	25.5	25.5	25.0	25.0	25.0	24.5	25.0	25.5
DO (mg/L)	7.8	7.2	7.9	7.3	7.3	6.7	7.1	7.0	7.2	7.0	7.6	6.8	7.3	6.8	7.4	6.5
pH	8.0	7.9	7.9	7.8	8.1	7.9	8.0	7.9	7.9	7.8	8.0	7.8	8.1	7.7	8.1	7.8
Cond. (µS/cm)	510	518		520		522		525		528		533		522	533	523
Initials	GM	JEL		SAK		SAK		MM		JEL		SAK		JEL	JEL	JEL

(24) Concentration RG_MIDAG + EDTA	Days															
	0	1		2		3		4		5		6		7		8
	init.	old	new	old	new	old	new	old	new	old	new	old	new	old final	new	final
Temperature (°C)	24.0	25.0	25.0	24.0	25.0	25.0	25.0	25.0	25.5	25.5	24.5	25.0	25.0	24.5	25.0	25.0
DO (mg/L)	7.7	7.2	7.9	7.1	7.3	6.3	6.7	7.0	7.2	7.0	7.5	6.8	7.2	6.8	7.4	6.4
pH	7.9	7.9	8.0	7.8	8.0	7.8	8.0	7.8	8.0	7.8	8.0	7.8	8.0	7.7	8.0	7.8
Cond. (µS/cm)	323	329		335		337		338		341		349		350	350	356
Initials	GM	JEL		SAK		SAK		MM		JEL		SAK		JEL	JEL	JEL

Thermometer: CER #4 DO meter/probe: 1 / 1 pH meter/probe: 1 / 1 Conductivity meter/probe: 1 / 1

	Control			
Hardness*				
Alkalinity*				

* mg/L as CaCO3

Analysts: SAK, JEL, RZS
Reviewed by:
Date reviewed: June 22, 2021

Sample Description: refers to COC

Comments: Broodboard Used: See P.1

Chronic Freshwater Toxicity Test
C. dubia Reproduction Data

Client: Teck
Sample ID: Various
Work Order: 210962

Start Date & Time: May 19/21 @ 1400h
Stop Date & Time: May 27/21 @ 1500h
Set up by: JEL/GJU

%(v/v)

Days	Concentration: Control										
	A	B	C	D	E	F	G	H	I	J	Init
1	/	/	/	/	/	/	/	/	/	/	JEL
2	/	/	/	/	/	/	/	/	/	/	SAK
3	3	3	3	4	3	3	3	2	3	4	SAK
4	/	5	7	7	6	/	6	7	/	6	WW
5	7	/	12	/	14	10	12	13	7	/	JEL
6	12	11	/	12	/	14	/	/	11	14	SAK
7	14	17	15	15	14	13	14	16	14	14	JEL
8	8	16	15	14	15	16	17	17	17	16	JEL
Total	22	19	22	23	23	27	21	22	21	24	JEL

Days	Concentration: ① FR-VFR1										
	A	B	C	D	E	F	G	H	I	J	Init
1	/	/	/	/	/	/	/	/	/	/	JEL
2	/	/	/	/	/	/	/	/	/	/	SAK
3	3	/	3	4	4	4	/	/	4	3	SAK
4	8	7	6	7	7	6	3	6	7	7	WW
5	10	13	/	/	/	/	12	10	11	14	JEL
6	/	/	15	11	15	16	7	11	/	/	SAK
7	17	18	17	16	17	15	17	18	14	16	JEL
8	18	18	15	16	17	15	16	16	19	19	JEL
Total	21	~~38~~ 20	24	22	26	26	22	27	22	24	JEL

Days	Concentration: ② GH-ER2										
	A	B	C	D	E	F	G	H	I	J	Init
1	/	/	/	/	/	/	/	/	/	/	JEL
2	/	/	/	/	/	/	/	/	/	/	SAK
3	2	2	/	/	/	/	/	/	/	/	SAK
4	5	7	6	5	4	4	3	4	2	5	WW
5	12	/	13	8	8	12	9	10	10X	9	JEL
6	/	16	12	12	11	14	15	13	↓	12	SAK
7	/	15	13	14	7	14	15	15	↓	11	JEL
8	18	10	/	13	5	15	/	/	↓	5	JEL
Total	19	25	31	25	23	30	27	~~25~~ 27	12X	26	JEL

Days	Concentration: ③ CM-MC1										
	A	B	C	D	E	F	G	H	I	J	Init
1	/	/	/	/	/	/	/	/	/	/	JEL
2	/	/	/	/	/	/	/	/	/	/	SAK
3	2	3	/	2	3	4	3	4	/	4	SAK
4	6	6	5	7	7	6	8	/	5	6	WW
5	14	13	10	/	9	/	13	11	12	12	JEL
6	/	/	8	16X	3	9	/	17	13	/	SAK
7	14	17	13	↓	16	15	14	15	14	17	JEL
8	19	23	16	↓	21	15	19	14	/	15	JEL
Total	22	22	23	25X	19	19	24	32	30	22	JEL

Days	Concentration: ④ LC-SLC										
	A	B	C	D	E	F	G	H	I	J	Init
1	/	/	/	/	/	/	/	/	/	/	JEL
2	/	/	/	/	/	/	/	/	/	/	SAK
3	4	/	2	3	3	/	4	2	3	/	SAK
4	7	6	8	6	5	4	/	6	/	3	WW
5	/	13	/	/	/	8	6	13	6	8	JEL
6	9	15	14	15	14	10	12	/	15	12	SAK
7	7	16	14	17	16	12	17	17	15	15	JEL
8	11	/	3	8	14	16	12	20	9	12	JEL
Total	20	34	24	24	22	22	22	21	24	23	JEL

Days	Concentration: ⑤ FR-FRABCH										
	A	B	C	D	E	F	G	H	I	J	Init
1	/	/	/	/	/	/	/	/	/	/	JEL
2	/	/	/	/	/	/	/	/	/	/	SAK
3	2	3	3	/	3	3	3	/	2	2	SAK
4	6	7	/	4	6	/	5	4	5	/	WW
5	11	12	11	11	10	12	/	10	12	10	JEL
6	/	/	9	16	/	14	11	12	8	12	SAK
7	14	13	10	16	10	13	16	10	12	12	JEL
8	17	15	3	/	18	11	15	/	/	10	JEL
Total	19	22	23	31	19	29	19	26	19	24	JEL

Days	Concentration: ⑥ FR-FRCP1										
	A	B	C	D	E	F	G	H	I	J	Init
1	/	/	/	/	/	/	/	/	/	/	JEL
2	/	/	/	/	/	/	/	/	/	/	SAK
3	3	/	4	/	2	4	3	3	/	3	SAK
4	4	3	7	6	7	/	7	/	4	4	WW
5	/	12	/	14	/	9	/	8	8	/	JEL
6	13	10	11	13	14	10	13	13	12	11	SAK
7	12	2	16	14	14	12	13	13	14	16	JEL
8	8	10	9	/	10	/	12	/	/	11	JEL
Total	20	25	22	33	23	23	23	24	24	18	JEL

Days	Concentration: ⑦ GH-FR1										
	A	B	C	D	E	F	G	H	I	J	Init
1	/	/	/	/	/	/	/	/	/	/	JEL
2	/	/	/	/	/	/	/	/	/	/	SAK
3	2	3	2	/	4	2	4	3	2	2	SAK
4	4	5	6	5	6	6	5	7	7	6	WW
5	/	/	/	11	/	11	/	/	14	/	JEL
6	10	12	14	11	15	/	14	12	/	15	SAK
7	13	17	16	12	16	12	15	17	16	15	JEL
8	8	9	11	/	12	19	8	9	15	13	JEL
Total	16	20	22	27	25	19	23	22	23	23	JEL

Days	Concentration: ⑧ GH-ERC										
	A	B	C	D	E	F	G	H	I	J	Init
1	/	/	/	/	/	/	/	/	/	/	JEL
2	/	/	/	/	/	/	/	/	/	/	SAK
3	/	/	2	/	/	/	/	/	2	/	SAK
4	4	~~3~~ 3	2	5	4	6	4	2	/	4	WW
5	12	/	10	6	14	11	9	11	9	6	JEL
6	11	10	10	6	18	12	10	16	14	11	SAK
7	14	14	14	/	/	12	12	13	14	11	JEL
8	/	/	13	13	13	13	12	10	13	/	JEL
Total	27	~~28~~ 13	14	17	36	29	23	29	25	21	JEL

Notes: X = mortality.

Comments: 1. Total # Young only based on the first 3 Broods. Fourth and subsequent broods not included in total count.

2. Ephippia present in Controls (Y), (N)?

Reviewed by: [signature]

Date reviewed: June 22, 2021

Chronic Freshwater Toxicity Test
C. dubia Reproduction Data

Client: Teck
Sample ID: various
Work Order: 210962

Start Date & Time: May 19/21 @ 1400h
Stop Date & Time: May 21/21 @ 1500h
Set up by: JEL / GJU

(9) CM_MC2

Days	A	B	C	D	E	F	G	H	I	J	Init
1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	JEL
2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	SAM
3	3	3	3	3	4	3	✓	2	3	3	SAM
4	5	7	8	6	✓	7	4	7	✓	6	MW
5	✓	11	14	✓	9	✓	10	✓	8	✓	JEL
6	12	✓	✓	7	8	12	12	8	11	14	SAM
7	17	12	14	✓	14	16	✓	16	16	16	JEL
8	10	13	15	✓	✓	10	12	12	7	13	JEL
Total	20	21	25	16	21	22	26	17	22	23	GJU

(10) EV_MC2

Days	A	B	C	D	E	F	G	H	I	J	Init
1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	JEL
2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	SAM
3	3	3	✓	2	3	✓	✓	✓	✓	✓	SAM
4	5	6	4	4	5	4	✓	3	✓	4	MW
5	✓	✓	10	✓	10	✓	6	8	4	10	JEL
6	✓	17	14	14	8	3	14	13	13	10	SAM
7	✓	17	15	14	✓	✓	14	6	✓	✓	JEL
8	6	14	10	13	10	12	15	✓	16	14	JEL
Total	8	26	28	20	18	7	20	17	24	24	GJU

(11) EV_HCl

Days	A	B	C	D	E	F	G	H	I	J	Init
1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	JEL
2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	SAM
3	3	2	✓	3	4	4	✓	2	3	2	SAM
4	8	8	10	7	7	6	7	6	7	5	MW
5	✓	✓	✓	✓	10	10	✓	14	✓	11	JEL
6	13	13	13	12	9	6	12	4	8	7	SAM
7	15	10	10	10	15	✓	9	✓	12	11	JEL
8	12	11	10	17	2	15	13	15	10	4	JEL
Total	24	23	23	22	21	20	19	22	18	18	GJU

(12) LC_DCDS

Days	A	B	C	D	E	F	G	H	I	J	Init
1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	JEL
2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	SAM
3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	SAM
4	✓	6	7	5	6	✓	4	6	4	7	MW
5	8	✓	12	✓	✓	10	9	✓	11	✓	JEL
6	9	12	16	15	16	8	15	13	✓	15	SAM
7	12	17	9	14	13	13	9	12	14	18	JEL
8	9	16	✓	10	14	✓	✓	14	14	6	JEL
Total	17	19	35	20	22	18	28	19	15	22	GJU

(13) LC_LC3

Days	A	B	C	D	E	F	G	H	I	J	Init
1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	JEL
2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	SAM
3	3	✓	✓	✓	✓	✓	3	✓	3	✓	SAM
4	8	6	6	3	6	4	7	4	3	3	MW
5	✓	10	✓	7	9	11	✓	9	7	7	JEL
6	12	12	14	12	11	12	12	10	9	8	SAM
7	15	9	15	14	✓	14	14	16	13	14	JEL
8	7	✓	12	✓	15	✓	12	✓	8	✓	JEL
Total	23	28	20	22	26	27	22	23	13	18	GJU

(14) LC_LCS

Days	A	B	C	D	E	F	G	H	I	J	Init
1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	JEL
2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	SAM
3	3	✓	✓	2	✓	4	✓	✓	2	2	SAM
4	5	4	6	7	X	✓	2	2	5	3	MW
5	✓	9	11	✓	|	8	7	8	✓	✓	JEL
6	9	13	15	12	|	12	✓	9	8	14	SAM
7	17	✓	13	19	|	10	15	17	18	19	JEL
8	10	16	✓	13	|	✓	4	✓	16	15	JEL
Total	17	26	32	21	0	23	9	19	15	19	GJU

(15) LC_LCPSSLCC

Days	A	B	C	D	E	F	G	H	I	J	Init
1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	JEL
2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	SAM
3	4	3	✓	3	4	3	2x	✓	4	4	SAM
4	5	4	4	5	4	6	|	5	7	7	MW
5	✓	✓	6	✓	✓	✓	|	8	✓	✓	JEL
6	12	14	8	12	13	15	|	11	10	12	SAM
7	19	17	19	14	18	18	|	16	19	15	JEL
8	14	14	14	10	14	12	↓	✓	14	13	JEL
Total	21	21	18	20	21	24	2	24	21	23	GJU

(16) RG_MIDAG

Days	A	B	C	D	E	F	G	H	I	J	Init
1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	JEL
2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	SAM
3	5	✓	3	✓	3	✓	✓	✓	✓	2	SAM
4	7	3	7	✓	6	6	4	3	2	3	MW
5	✓	12	✓	11	12	13	6	11	10	✓	JEL
6	11	11	15	12	12	12	9	13	10	12	SAM
7	16	✓	16	✓	5	✓	✓	✓	✓	14	JEL
8	12	15	7	19	✓	14	12	15	14	15	JEL
Total	23	26	25	23	21	31	19	26	22	17	GJU

(17) FR_FR4

Days	A	B	C	D	E	F	G	H	I	J	Init
1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	JEL
2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	SAM
3	4	4	✓	✓	✓	3	2	3	4	4	SAM
4	7	5	6	6	2	✓	4	✓	✓	6	MW
5	✓	✓	12	12	5	10	✓	11	10	10	JEL
6	11	15	13	13	12	13	12	15	13	✓	SAM
7	18	17	✓	✓	✓	13	15	13	16	16	JEL
8	12	11	15	16	16	✓	9	✓	✓	15	JEL
Total	22	24	31	31	19	26	18	29	27	20	GJU

Notes: X = mortality.

Comments: 1. Total # Young only based on the first 3 Broods. Fourth and subsequent broods not included in total count.

2. Ephippia present in Controls (Y), (N)?

Reviewed by:

Date reviewed: June 22, 2021

Chronic Freshwater Toxicity Test
C. dubia Reproduction Data

Client: Teck
Sample ID: Various
Work Order: ~~210165~~ 210162

Start Date & Time: May. 19/21 @ 1400h
Stop Date & Time: May. 27/21 @ 1500h
Set up by: JZL / GJU

Concentration: (18) FR_FR2

Days	A	B	C	D	E	F	G	H	I	J	Init
1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	JZL
2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	SAH
3	2	2	3	4	✓	3	4	4	✓	3	SAH
4	7	6	5	✓	3	✓	7	6	3	6	HW
5	15	✓	✓	12	9	11	✓	✓	12	✓	RZS
6	✓	14	15	17	9	12	14	13	12	12	SAH
7	14	16	15	12	16	17	19	16	✓	19	JZL
8	15	9	✓	✓	✓	✓	✓	12	10	8	SAH
Total	24	22	23	33	21	26	25	23	27	31	GJU

Concentration: (19) FR_MULTIPLATE

Days	A	B	C	D	E	F	G	H	I	J	Init
1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	JZL
2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	SAH
3	✓	✓	3	4	4	2	✓	4	✓	2	SAH
4	7	✓	6	5	3	7	5	6	4	✓	HW
5	14	5	✓	✓	✓	✓	13	13	11	11	RZJ
6	11	9	14	12	13	12	12	11	13	12	SAH
7	4	12	14	14	14	4	✓	17	14	16	JZL
8	10	✓	10	✓	8	✓	14	9	✓	✓	SAH
Total	32	~~35~~ 14	23	21	20	21	30	~~33~~ 21	28	25	GJU

Concentration: (20) FR_FRRD

Days	A	B	C	D	E	F	G	H	I	J	Init
1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	JZL
2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	SAH
3	✓	2	2	3	4	3	2	3	4	3	SAH
4	✓	4	6	✓	4	4	5	✓	7	✓	HW
5	10	✓	✓	9	✓	✓	✓	10	✓	8	RZJ
6	9	14	11	13	13	14	10	15	15	16	SAH
7	15	18	✓	16	17	18	15	18	16	16	JZL
8	✓	8	3	✓	9	7	11	✓	9	✓	SAH
Total	~~19~~	20	19	25	21	21	17	28	26	27	GJU

Concentration:

Days	A	B	C	D	E	F	G	H	I	J	Init
1											
2											
3											
4											
5											
6											
7											
8											
Total											

Concentration:

Days	A	B	C	D	E	F	G	H	I	J	Init
1											
2											
3											
4											
5											
6											
7											
8											
Total											

Concentration:

Days	A	B	C	D	E	F	G	H	I	J	Init
1											
2											
3											
4											
5											
6											
7											
8											
Total											

Notes: X = mortality.

Comments: 1. Total # Young only based on the first 3 Broods. Fourth and subsequent broods not included in total count.

2. Ephippia present in Controls (Y), (N) ?

Reviewed by:

Date reviewed: June 22, 2021

Chronic Freshwater Toxicity Test
C. dubia Reproduction Data

Client: Teck (EDTA)
Sample ID: Various
Work Order: 210959

Start Date & Time: May 19/21 @ 1400h
Stop Date & Time: May 27/21 @ 1600h
Set up by: JZL/GJU

Days	Concentration: (21) EDTA Control										
	A	B	C	D	E	F	G	H	I	J	Init
1	/	/	/	/	/	/	/	/	/	/	JZL
2	/	/	/	/	/	/	/	/	/	/	SAH
3	/	/	2	2	3	2	2	4	3	4	SAH
4	5	2	4	/	7	8	7	5	6	7	UW
5	9	8	2	/	/	/	/	/	/	/	RZS
6	13	10	10	12	12	13	10	13	12	15	SAH
7	12	16	/	14	13	17	18	16	12	17	JZL
8	/	/	/	12	10	12	12	13	12	14	SAH
Total	27	20	8	~~26~~ 14	22	23	19	22	21	26	GM

Days	Concentration: (22) FR-FRCP1 + EDTA										
	A	B	C	D	E	F	G	H	I	J	Init
1	/	/	/	/	/	/	/	/	/	/	JZL
2	/	/	/	/	/	/	/	/	/	/	SAH
3	4	2	/	4	/	/	4	/	3	4	SAH
4	7	5	3	6	5	4	8	6	5	7	UW
5	/	/	8	/	12	11	/	11	/	/	RZS
6	12	12	11	13	13	12	14	14	14	10	SAH
7	15	18	16	18	/	/	19	/	14	17	JZL
8	13	14	/	13	13	16	8	16	12	13	SAH
Total	23	19	22	23	30	27	26	31	22	21	GM

Days	Concentration: (23) CM_MCZ + EDTA										
	A	B	C	D	E	F	G	H	I	J	Init
1	/	/	/	/	/	/	/	/	/	/	JZL
2	/	/	/	/	/	/	/	/	/	/	SAH
3	3	3	2×	2	3	2	3	2	/	3	SAH
4	3	/	|	2	5	4	7	5	3	/	UW
5	10	9	|	8	/	/	/	/	/	8	RZS
6	17	12×	|	11	14	16	16	15	9	14	SAH
7	17	↓	↓	16	18	22	20	19	16	19	JZL
8	14	↓	↓	12	10	15	13	11	12	/	SAH
Total	16	24	2	12	22	17	26	22	~~28~~ 12	~~25~~ 12	GM

Days	Concentration: (24) RG-MIDAG + EDTA										
	A	B	C	D	E	F	G	H	I	J	Init
1	/	/	/	/	/	/	/	/	/	/	JZL
2	/	/	/	/	/	/	/	/	/	/	SAH
3	3	/	3	2	2	2	2	2	2.	2	SAH
4	/	4	6	3	7	3	4	5	6	6	UW
5	9	8	/	8	/	/	/	/	/	/	RZS
6	12	13	16	11	12	12	12	9	18	16	SAH
7	14	16	19	17	20	19	17	21	17	21	JZL
8	11	/	12	9	14	10	9	12	12	10	SAH
Total	24	25	25	13	21	17	18	16	26	24	GM

Days	Concentration:										
	A	B	C	D	E	F	G	H	I	J	Init
1											
2											
3											
4											
5											
6											
7											
8											
Total											

Days	Concentration:										
	A	B	C	D	E	F	G	H	I	J	Init
1											
2											
3											
4											
5											
6											
7											
8											
Total											

Notes: X = mortality.

Comments: 1. Total # Young only based on the first 3 Broods. Fourth and subsequent broods not included in total count.

2. Ephippia present in Controls (Y), (N)?

Reviewed by: [signature]

Date reviewed: June 22, 2021

Ceriodaphnia 7-d Survival and Reproduction Test

Nautilus Environmental

Batch ID:	19-5534-0118	**Test Type:**	Reproduction-Survival (7d)	**Analyst:**	Sierra Klueppel
Start Date:	19 May-21 14:00	**Protocol:**	EC/EPS 1/RM/21	**Diluent:**	20% Perrier Water
Ending Date:	27 May-21 15:00	**Species:**	Ceriodaphnia dubia	**Brine:**	
Test Length:	8d 1h	**Taxon:**	Branchiopoda	**Source:**	In-House Culture **Age:** <24

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
Lab Control	18-4614-6401	19 May-21	19 May-21 06:00	14h	Teck Coal	
FR_UFR1	12-4424-2146	18 May-21	19 May-21 11:20	38h (2.3 °C)		
GH_ER2	02-4275-7088	18 May-21 09:55	19 May-21 11:20	28h (0.4 °C)		
CM_MC1	01-4263-6393	18 May-21 11:08	19 May-21 11:20	27h (1.1 °C)		
LC_SLC	12-1662-7355	18 May-21 09:45	19 May-21 11:20	28h (4.1 °C)		
FR_FRABCH	05-6713-4959	18 May-21	19 May-21 11:20	38h (1.9 °C)		
FR_FRCP1	19-8027-7867	18 May-21	19 May-21 11:20	38h (1.2 °C)		
GH_FR1	15-9886-5398	18 May-21 12:30	19 May-21 11:20	26h (0.1 °C)		
GH_ERC	21-0704-4941	18 May-21 11:20	19 May-21 11:20	27h (0.6 °C)		
CM_MC2	17-6814-6287	18 May-21 09:50	19 May-21 11:20	28h (1.1 °C)		
EV_MC2	15-5628-9197	18 May-21 13:00	19 May-21 11:20	25h (3.6 °C)		
EV_HC1	05-8730-9056	18 May-21 11:20	19 May-21 11:20	27h (4.8 °C)		
LC_DCDS	20-0340-1068	18 May-21 11:00	19 May-21 11:20	27h (4.6 °C)		
LC_LC3	18-4816-9590	18 May-21 10:15	19 May-21 11:20	28h (4.7 °C)		
LC_LC5	03-8768-2280	18 May-21 09:50	19 May-21 11:20	28h (5.2 °C)		
LC_LCDSSLCC	02-2977-6783	18 May-21 11:00	19 May-21 11:20	27h (4.3 °C)		
RG_MIDAG	19-6180-4600	18 May-21 09:15	19 May-21 11:20	29h (0.1 °C)		
FR_FR4	17-1641-7069	18 May-21 09:29	19 May-21 11:20	29h (4.6 °C)		
FR_FR2	11-2149-8709	18 May-21 10:28	19 May-21 11:20	28h (4.6 °C)		
FR_MULTIPLATE	16-7235-2081	18 May-21 11:21	19 May-21 11:20	27h (3.4 °C)		
FR_FRRD	06-3190-8505	18 May-21 08:22	19 May-21 11:20	30h (3.4 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
Lab Control	Water Sample	Teck Coal	Lab Control	
FR_UFR1	Water Sample	Teck Coal	FR_UFR1_WEK_2021-05-1	
GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-05-18_	
CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-05-18	
LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-05-18_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_WEK_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_WEK_2021-05	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-05-18_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-05-18	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-05-18	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2020_Q2_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2020_Q2_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-05-18	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-05-18_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-05-18_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	
RG_MIDAG	Water Sample	Teck Coal	RG_MIDAG_WS_2021-05-	
FR_FR4	Water Sample	Teck Coal	FR_FR4_WS_2021-05-18_	
FR_FR2	Water Sample	Teck Coal	FR_FR2_WS_2021-05-18_	
FR_MULTIPLATE	Water Sample	Teck Coal	FR_MULTIPLATE_WS_202	
FR_FRRD	Water Sample	Teck Coal	FR_FRRD_WS_2021-05-18	

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Lab Control passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed 6d survival rate	1

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	RG_MIDAG passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Lab Control passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	RG_MIDAG passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	RG_MIDAG passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed 6d survival rate	1

SIngle Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Lab Control passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	RG_MIDAG passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Lab Control passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Lab Control passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	RG_MIDAG passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Lab Control passed 6d survival rate	1

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	RG_MIDAG passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Lab Control passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	RG_MIDAG passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Lab Control passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed 6d survival rate	1

SIngle Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	RG_MIDAG passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	RG_MIDAG passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Lab Control passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	RG_MIDAG passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Lab Control passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed 6d survival rate	1

SIngle Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	RG_MIDAG passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Lab Control passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Lab Control passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	RG_MIDAG passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	RG_MIDAG passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Lab Control passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed 6d survival rate	1

Ceriodaphnia 7-d Survival and Reproduction Test **Nautilus Environmental**

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	RG_MIDAG passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Lab Control passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	RG_MIDAG passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Lab Control passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	RG_MIDAG passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed 6d survival rate	1

SIngle Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Lab Control passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Lab Control passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	RG_MIDAG passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	RG_MIDAG passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Lab Control passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed 6d survival rate	1

SIngle Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Lab Control passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	RG_MIDAG passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Lab Control passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	RG_MIDAG passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed 6d survival rate	1
11-1473-2466	6d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed 6d survival rate	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9969	GH_FR1 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9969	CM_MC2 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9969	Lab Control passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9969	LC_LC3 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9969	GH_ER2 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9969	LC_LC5 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9969	FR_FRABCH passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9969	FR_UFR1 passed reproduction	1

Ceriodaphnia 7-d Survival and Reproduction Test **Nautilus Environmental**

SIngle Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9969	CM_MC1 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9969	GH_ERC passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9969	LC_LCDSSLCC passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9969	FR_FR2 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9969	FR_FRCP1 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9969	RG_MIDAG passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9969	LC_SLC passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9969	FR_FRRD passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9969	FR_FR4 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9969	FR_MULTIPLATE passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9969	EV_HC1 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9969	EV_MC2 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9969	LC_DCDS passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	1.0000	FR_FRRD passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	1.0000	LC_LC5 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	1.0000	FR_MULTIPLATE passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	1.0000	CM_MC1 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	1.0000	EV_MC2 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	1.0000	GH_ERC passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	1.0000	LC_LCDSSLCC passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	1.0000	GH_ER2 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	1.0000	FR_FR2 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	1.0000	FR_FRCP1 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	1.0000	GH_FR1 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	1.0000	RG_MIDAG passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	1.0000	LC_DCDS passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	1.0000	LC_SLC passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	1.0000	Lab Control passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	1.0000	CM_MC2 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	1.0000	FR_FRABCH passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	1.0000	FR_UFR1 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	1.0000	EV_HC1 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	1.0000	LC_LC3 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	1.0000	FR_FR4 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9945	FR_FR2 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9945	GH_FR1 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9945	CM_MC1 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9945	FR_FR4 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9945	FR_FRRD passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9945	LC_LCDSSLCC passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9945	EV_HC1 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9945	RG_MIDAG passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9945	LC_SLC passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9945	FR_FRCP1 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9945	CM_MC2 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9945	FR_FRABCH passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9945	GH_ERC passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9945	FR_UFR1 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9945	LC_LC5 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9945	FR_MULTIPLATE passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9945	GH_ER2 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9945	EV_MC2 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9945	LC_LC3 passed reproduction	1

Ceriodaphnia 7-d Survival and Reproduction Test — Nautilus Environmental

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9945	LC_DCDS passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9945	Lab Control passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9945	GH_FR1 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9945	LC_LC3 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9945	EV_HC1 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9945	FR_MULTIPLATE passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9945	Lab Control passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9945	FR_FRCP1 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9945	FR_FRABCH passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9945	FR_FR4 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9945	LC_DCDS passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9945	FR_UFR1 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9945	CM_MC2 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9945	LC_SLC passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9945	CM_MC1 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9945	LC_LC5 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9945	FR_FRRD passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9945	EV_MC2 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9945	LC_LCDSSLCC passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9945	GH_ER2 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9945	GH_ERC passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9945	FR_FR2 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9945	RG_MIDAG passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9612	GH_FR1 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9612	EV_MC2 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9612	LC_DCDS passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9612	FR_FRABCH passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9612	GH_ERC passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9612	Lab Control passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9612	LC_LC5 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9612	FR_FRRD passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9612	LC_LCDSSLCC passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9612	LC_LC3 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9612	FR_FRCP1 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9612	RG_MIDAG passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9612	GH_ER2 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9612	FR_FR4 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9612	LC_SLC passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9612	CM_MC1 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9612	FR_MULTIPLATE passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9612	CM_MC2 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9612	FR_UFR1 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9612	EV_HC1 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9612	FR_FR2 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9981	EV_MC2 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9981	FR_FRCP1 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9981	FR_MULTIPLATE passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9981	LC_LC5 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9981	GH_FR1 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9981	LC_LCDSSLCC passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9981	GH_ERC passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9981	FR_FR2 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9981	CM_MC1 passed reproduction	1

Ceriodaphnia 7-d Survival and Reproduction Test **Nautilus Environmental**

SIngle Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9981	LC_LC3 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9981	GH_ER2 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9981	Lab Control passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9981	FR_FR4 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9981	LC_SLC passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9981	RG_MIDAG passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9981	CM_MC2 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9981	FR_UFR1 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9981	FR_FRABCH passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9981	LC_DCDS passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9981	FR_FRRD passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9981	EV_HC1 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9524	LC_DCDS passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9524	Lab Control passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9524	FR_FR2 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9524	GH_FR1 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9524	EV_MC2 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9524	LC_LC5 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9524	LC_LC3 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9524	GH_ER2 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9524	FR_MULTIPLATE passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9524	GH_ERC passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9524	CM_MC2 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9524	FR_UFR1 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9524	LC_SLC passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9524	RG_MIDAG passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9524	CM_MC1 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9524	EV_HC1 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9524	FR_FRABCH passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9524	LC_LCDSSLCC passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9524	FR_FR4 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9524	FR_FRCP1 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9524	FR_FRRD passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9918	FR_FRRD passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9918	FR_FR4 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9918	FR_FR2 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9918	GH_ERC passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9918	LC_LC3 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9918	LC_LCDSSLCC passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9918	EV_HC1 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9918	FR_FRABCH passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9918	LC_SLC passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9918	FR_UFR1 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9918	Lab Control passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9918	RG_MIDAG passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9918	FR_MULTIPLATE passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9918	CM_MC1 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9918	CM_MC2 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9918	GH_ER2 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9918	LC_LC5 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9918	GH_FR1 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9918	EV_MC2 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9918	LC_DCDS passed reproduction	1

Ceriodaphnia 7-d Survival and Reproduction Test **Nautilus Environmental**

SIngle Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9918	FR_FRCP1 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.7285	CM_MC1 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.7285	FR_UFR1 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.7285	FR_FRABCH passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.7285	LC_LC3 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.7285	FR_MULTIPLATE passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.7285	EV_MC2 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.7285	Lab Control passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.7285	LC_DCDS passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.7285	LC_SLC passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.7285	FR_FR4 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.7285	GH_FR1 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.7285	FR_FRRD passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.7285	FR_FRCP1 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.7285	LC_LCDSSLCC passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.7285	FR_FR2 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.7285	GH_ERC passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.7285	GH_ER2 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.7285	RG_MIDAG passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.7285	LC_LC5 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.7285	CM_MC2 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.7285	EV_HC1 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.6959	EV_HC1 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.6959	CM_MC2 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.6959	FR_FRRD passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.6959	FR_FR2 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.6959	RG_MIDAG passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.6959	LC_SLC passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.6959	EV_MC2 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.6959	LC_LCDSSLCC passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.6959	FR_FR4 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.6959	FR_FRCP1 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.6959	CM_MC1 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.6959	GH_FR1 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.6959	Lab Control passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.6959	GH_ERC passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.6959	FR_UFR1 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.6959	LC_DCDS passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.6959	LC_LC5 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.6959	FR_MULTIPLATE passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.6959	GH_ER2 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.6959	FR_FRABCH passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.6959	LC_LC3 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.5896	LC_LC5 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.5896	FR_FRRD passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.5896	LC_LC3 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.5896	LC_DCDS passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.5896	LC_LCDSSLCC passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.5896	FR_FR2 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.5896	FR_MULTIPLATE passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.5896	RG_MIDAG passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.5896	CM_MC2 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.5896	FR_FR4 passed reproduction	1

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Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.5896	CM_MC1 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.5896	FR_FRCP1 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.5896	GH_FR1 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.5896	EV_HC1 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.5896	GH_ERC passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.5896	LC_SLC passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.5896	EV_MC2 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.5896	FR_UFR1 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.5896	FR_FRABCH passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.5896	GH_ER2 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.5896	Lab Control passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.4205	FR_FR4 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.4205	LC_SLC passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.4205	Lab Control passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.4205	FR_UFR1 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.4205	LC_DCDS passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.4205	FR_MULTIPLATE passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.4205	LC_LC3 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.4205	FR_FR2 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.4205	GH_ERC passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.4205	GH_ER2 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.4205	EV_HC1 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.4205	FR_FRCP1 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.4205	LC_LCDSSLCC passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.4205	RG_MIDAG passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.4205	LC_LC5 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.4205	CM_MC2 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.4205	FR_FRABCH passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.4205	FR_FRRD passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.4205	CM_MC1 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.4205	GH_FR1 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.4205	EV_MC2 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9720	FR_FRCP1 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9720	GH_ERC passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9720	LC_LCDSSLCC passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9720	FR_FR4 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9720	FR_FRABCH passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9720	LC_LC5 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9720	RG_MIDAG passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9720	LC_SLC passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9720	GH_FR1 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9720	CM_MC1 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9720	LC_LC3 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9720	EV_HC1 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9720	FR_MULTIPLATE passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9720	Lab Control passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9720	FR_FRRD passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9720	FR_UFR1 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9720	EV_MC2 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9720	CM_MC2 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9720	FR_FR2 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9720	GH_ER2 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9720	LC_DCDS passed reproduction	1

Ceriodaphnia 7-d Survival and Reproduction Test **Nautilus Environmental**

SIngle Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.3661	EV_MC2 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.3661	LC_LCDSSLCC passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.3661	GH_FR1 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.3661	LC_LC5 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.3661	FR_FRRD passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.3661	FR_FRCP1 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.3661	EV_HC1 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.3661	FR_MULTIPLATE passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.3661	CM_MC2 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.3661	GH_ERC passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.3661	CM_MC1 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.3661	GH_ER2 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.3661	FR_FR4 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.3661	FR_FR2 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.3661	FR_UFR1 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.3661	LC_LC3 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.3661	FR_FRABCH passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.3661	Lab Control passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.3661	LC_SLC passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.3661	RG_MIDAG passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.3661	LC_DCDS passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.5145	EV_HC1 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.5145	CM_MC1 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.5145	LC_SLC passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.5145	FR_MULTIPLATE passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.5145	FR_UFR1 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.5145	FR_FR2 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.5145	FR_FRABCH passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.5145	LC_LCDSSLCC passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.5145	RG_MIDAG passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.5145	FR_FR4 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.5145	GH_ER2 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.5145	CM_MC2 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.5145	LC_DCDS passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.5145	GH_ERC passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.5145	LC_LC5 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.5145	FR_FRCP1 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.5145	LC_LC3 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.5145	Lab Control passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.5145	EV_MC2 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.5145	GH_FR1 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.5145	FR_FRRD passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9928	CM_MC1 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9928	EV_MC2 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9928	GH_FR1 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9928	FR_MULTIPLATE passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9928	LC_DCDS passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9928	LC_SLC passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9928	EV_HC1 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9928	LC_LC3 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9928	GH_ER2 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9928	FR_FR4 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9928	GH_ERC passed reproduction	1

Ceriodaphnia 7-d Survival and Reproduction Test **Nautilus Environmental**

SIngle Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9928	FR_FRRD passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9928	FR_UFR1 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9928	RG_MIDAG passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9928	FR_FRABCH passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9928	LC_LC5 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9928	FR_FRCP1 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9928	Lab Control passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9928	CM_MC2 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9928	FR_FR2 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9928	LC_LCDSSLCC passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9983	FR_MULTIPLATE passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9983	CM_MC1 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9983	CM_MC2 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9983	LC_LCDSSLCC passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9983	FR_FRRD passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9983	FR_FRABCH passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9983	FR_FR4 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9983	LC_LC3 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9983	GH_ER2 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9983	EV_HC1 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9983	GH_ERC passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9983	GH_FR1 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9983	Lab Control passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9983	RG_MIDAG passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9983	LC_LC5 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9983	FR_UFR1 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9983	FR_FRCP1 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9983	FR_FR2 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9983	EV_MC2 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9983	LC_SLC passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9983	LC_DCDS passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9997	GH_ER2 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9997	GH_ERC passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9997	LC_DCDS passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9997	FR_FR2 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9997	EV_HC1 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9997	Lab Control passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9997	LC_LC3 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9997	FR_FRABCH passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9997	CM_MC2 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9997	LC_LCDSSLCC passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9997	LC_LC5 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9997	EV_MC2 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9997	LC_SLC passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9997	RG_MIDAG passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9997	FR_FRRD passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9997	CM_MC1 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9997	FR_UFR1 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9997	GH_FR1 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9997	FR_FR4 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9997	FR_MULTIPLATE passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9997	FR_FRCP1 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9750	EV_HC1 passed reproduction	1

SIngle Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9750	Lab Control passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9750	FR_MULTIPLATE passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9750	EV_MC2 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9750	FR_FRRD passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9750	CM_MC2 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9750	GH_ER2 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9750	LC_LC3 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9750	RG_MIDAG passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9750	FR_UFR1 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9750	GH_FR1 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9750	FR_FR4 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9750	LC_SLC passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9750	CM_MC1 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9750	LC_LCDSSLCC passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9750	LC_DCDS passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9750	FR_FR2 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9750	LC_LC5 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9750	GH_ERC passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9750	FR_FRABCH passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.9750	FR_FRCP1 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.8509	EV_MC2 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.8509	LC_SLC passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.8509	RG_MIDAG passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.8509	FR_FRCP1 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.8509	CM_MC2 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.8509	Lab Control passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.8509	LC_LC5 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.8509	LC_LC3 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.8509	GH_ER2 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.8509	EV_HC1 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.8509	FR_MULTIPLATE passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.8509	GH_FR1 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.8509	FR_FR4 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.8509	FR_FRABCH passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.8509	LC_LCDSSLCC passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.8509	FR_FRRD passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.8509	LC_DCDS passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.8509	FR_FR2 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.8509	GH_ERC passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.8509	FR_UFR1 passed reproduction	1
15-7777-1624	Reproduction	Steel Many-One Rank Sum Test	0.8509	CM_MC1 passed reproduction	1

Ceriodaphnia 7-d Survival and Reproduction Test **Nautilus Environmental**

6d Survival Rate Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
Lab Control	N	10	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
FR_UFR1		10	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
GH_ER2		10	0.9000	0.6738	1.0000	0.0000	1.0000	0.1000	0.3162	35.14%	10.00%
CM_MC1		10	0.9000	0.6738	1.0000	0.0000	1.0000	0.1000	0.3162	35.14%	10.00%
LC_SLC		10	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
FR_FRABCH		10	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
FR_FRCP1		10	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
GH_FR1		10	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
GH_ERC		10	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
CM_MC2		10	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
EV_MC2		10	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
EV_HC1		10	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
LC_DCDS		10	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
LC_LC3		10	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
LC_LC5		10	0.9000	0.6738	1.0000	0.0000	1.0000	0.1000	0.3162	35.14%	10.00%
LC_LCDSSLCC		10	0.9000	0.6738	1.0000	0.0000	1.0000	0.1000	0.3162	35.14%	10.00%
RG_MIDAG		10	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
FR_FR4		10	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
FR_FR2		10	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
FR_MULTIPLATE		10	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
FR_FRRD		10	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%

Reproduction Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
Lab Control	N	10	22.4	20.88	23.92	19	27	0.67	2.119	9.46%	0.00%
FR_UFR1		10	23.4	21.71	25.09	20	27	0.7483	2.366	10.11%	-4.46%
GH_ER2		10	24.5	20.53	28.47	12	31	1.753	5.543	22.62%	-9.38%
CM_MC1		10	23.8	20.75	26.85	19	32	1.348	4.264	17.91%	-6.25%
LC_SLC		10	23.6	20.82	26.38	20	34	1.231	3.893	16.50%	-5.36%
FR_FRABCH		10	23.1	19.95	26.25	19	31	1.394	4.408	19.08%	-3.13%
FR_FRCP1		10	23.5	20.69	26.31	18	33	1.241	3.923	16.69%	-4.91%
GH_FR1		10	22	19.79	24.21	16	27	0.9775	3.091	14.05%	1.79%
GH_ERC		10	23.4	18.17	28.63	13	36	2.31	7.306	31.22%	-4.46%
CM_MC2		10	21.3	19.06	23.54	16	26	0.9894	3.129	14.69%	4.91%
EV_MC2		10	19.2	14.13	24.27	7	28	2.24	7.084	36.89%	14.29%
EV_HC1		10	21	19.45	22.55	18	24	0.6831	2.16	10.29%	6.25%
LC_DCDS		10	21.4	17.13	25.67	15	35	1.887	5.967	27.88%	4.46%
LC_LC3		10	22.2	19	25.4	13	28	1.413	4.467	20.12%	0.89%
LC_LC5		10	18.1	11.74	24.46	0	32	2.81	8.888	49.10%	19.20%
LC_LCDSSLCC		10	19.5	14.91	24.09	2	24	2.029	6.416	32.90%	12.95%
RG_MIDAG		10	23.3	20.46	26.14	17	31	1.257	3.974	17.05%	-4.02%
FR_FR4		10	24.7	21.23	28.17	18	31	1.535	4.855	19.65%	-10.27%
FR_FR2		10	24.5	21.93	27.07	21	33	1.138	3.598	14.69%	-9.38%
FR_MULTIPLATE		10	23.5	19.67	27.33	14	32	1.695	5.359	22.81%	-4.91%
FR_FRRD		10	22.3	19.54	25.06	17	28	1.221	3.86	17.31%	0.45%

Ceriodaphnia 7-d Survival and Reproduction Test Nautilus Environmental

6d Survival Rate Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
Lab Control	N	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
FR_UFR1		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
GH_ER2		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	1.0000
CM_MC1		1.0000	1.0000	1.0000	0.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
LC_SLC		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
FR_FRABCH		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
FR_FRCP1		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
GH_FR1		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
GH_ERC		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
CM_MC2		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
EV_MC2		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
EV_HC1		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
LC_DCDS		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
LC_LC3		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
LC_LC5		1.0000	1.0000	1.0000	1.0000	0.0000	1.0000	1.0000	1.0000	1.0000	1.0000
LC_LCDSSLCC		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	1.0000	1.0000	1.0000
RG_MIDAG		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
FR_FR4		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
FR_FR2		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
FR_MULTIPLATE		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
FR_FRRD		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

Reproduction Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
Lab Control	N	22	19	22	23	23	27	21	22	21	24
FR_UFR1		21	20	24	22	26	26	22	27	22	24
GH_ER2		19	25	31	25	23	30	27	27	12	26
CM_MC1		22	22	23	25	19	19	24	32	30	22
LC_SLC		20	34	24	24	22	22	22	21	24	23
FR_FRABCH		19	22	23	31	19	29	19	26	19	24
FR_FRCP1		20	25	22	33	23	23	23	24	24	18
GH_FR1		16	20	22	27	25	19	23	22	23	23
GH_ERC		27	13	14	17	36	29	23	29	25	21
CM_MC2		20	21	25	16	21	22	26	17	22	23
EV_MC2		8	26	28	20	18	7	20	24	17	24
EV_HC1		24	23	23	22	21	20	19	22	18	18
LC_DCDS		17	18	35	20	22	18	28	19	15	22
LC_LC3		23	28	20	22	26	27	22	23	13	18
LC_LC5		17	26	32	21	0	23	9	19	15	19
LC_LCDSSLCC		21	21	18	20	21	24	2	24	21	23
RG_MIDAG		23	26	25	23	21	31	19	26	22	17
FR_FR4		22	24	31	31	19	26	18	29	27	20
FR_FR2		24	22	23	33	21	26	25	23	27	21
FR_MULTIPLATE		32	14	23	21	20	21	30	21	28	25
FR_FRRD		19	20	19	25	21	21	17	28	26	27

Ceriodaphnia 7-d Survival and Reproduction Test

Nautilus Environmental

Analysis ID:	11-1473-2466	**Endpoint:**	6d Survival Rate	**CETIS Version:**	CETISv1.9.4
Analyzed:	11 Jun-21 14:23	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1
Batch ID:	19-5534-0118	**Test Type:**	Reproduction-Survival (7d)	**Analyst:**	Sierra Klueppel
Start Date:	19 May-21 14:00	**Protocol:**	EC/EPS 1/RM/21	**Diluent:**	20% Perrier Water
Ending Date:	27 May-21 15:00	**Species:**	Ceriodaphnia dubia	**Brine:**	
Test Length:	8d 1h	**Taxon:**	Branchiopoda	**Source:**	In-House Culture **Age:** <24

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
Lab Control	18-4614-6401	19 May-21	19 May-21 06:00	14h	Teck Coal	
FR_UFR1	12-4424-2146	18 May-21	19 May-21 11:20	38h (2.3 °C)		
GH_ER2	02-4275-7088	18 May-21 09:55	19 May-21 11:20	28h (0.4 °C)		
CM_MC1	01-4263-6393	18 May-21 11:08	19 May-21 11:20	27h (1.1 °C)		
LC_SLC	12-1662-7355	18 May-21 09:45	19 May-21 11:20	28h (4.1 °C)		
FR_FRABCH	05-6713-4959	18 May-21	19 May-21 11:20	38h (1.9 °C)		
FR_FRCP1	19-8027-7867	18 May-21	19 May-21 11:20	38h (1.2 °C)		
GH_FR1	15-9886-5398	18 May-21 12:30	19 May-21 11:20	26h (0.1 °C)		
GH_ERC	21-0704-4941	18 May-21 11:20	19 May-21 11:20	27h (0.6 °C)		
CM_MC2	17-6814-6287	18 May-21 09:50	19 May-21 11:20	28h (1.1 °C)		
EV_MC2	15-5628-9197	18 May-21 13:00	19 May-21 11:20	25h (3.6 °C)		
EV_HC1	05-8730-9056	18 May-21 11:20	19 May-21 11:20	27h (4.8 °C)		
LC_DCDS	20-0340-1068	18 May-21 11:00	19 May-21 11:20	27h (4.6 °C)		
LC_LC3	18-4816-9590	18 May-21 10:15	19 May-21 11:20	28h (4.7 °C)		
LC_LC5	03-8768-2280	18 May-21 09:50	19 May-21 11:20	28h (5.2 °C)		
LC_LCDSSLCC	02-2977-6783	18 May-21 11:00	19 May-21 11:20	27h (4.3 °C)		
RG_MIDAG	19-6180-4600	18 May-21 09:15	19 May-21 11:20	29h (0.1 °C)		
FR_FR4	17-1641-7069	18 May-21 09:29	19 May-21 11:20	29h (4.6 °C)		
FR_FR2	11-2149-8709	18 May-21 10:28	19 May-21 11:20	28h (4.6 °C)		
FR_MULTIPLATE	16-7235-2081	18 May-21 11:21	19 May-21 11:20	27h (3.4 °C)		
FR_FRRD	06-3190-8505	18 May-21 08:22	19 May-21 11:20	30h (3.4 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
Lab Control	Water Sample	Teck Coal	Lab Control	
FR_UFR1	Water Sample	Teck Coal	FR_UFR1_WEK_2021-05-1	
GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-05-18_	
CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-05-18	
LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-05-18_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_WEK_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_WEK_2021-05	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-05-18_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-05-18	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-05-18	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2020_Q2_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2020_Q2_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-05-18	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-05-18_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-05-18_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	
RG_MIDAG	Water Sample	Teck Coal	RG_MIDAG_WS_2021-05-	
FR_FR4	Water Sample	Teck Coal	FR_FR4_WS_2021-05-18_	
FR_FR2	Water Sample	Teck Coal	FR_FR2_WS_2021-05-18_	
FR_MULTIPLATE	Water Sample	Teck Coal	FR_MULTIPLATE_WS_202	
FR_FRRD	Water Sample	Teck Coal	FR_FRRD_WS_2021-05-18	

Fisher Exact/Bonferroni-Holm Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
Negative Control		FR_UFR1	1.0000	Exact	1.0000	Non-Significant Effect
		GH_ER2	0.5000	Exact	1.0000	Non-Significant Effect

Ceriodaphnia 7-d Survival and Reproduction Test — **Nautilus Environmental**

Analysis ID: 11-1473-2466 **Endpoint:** 6d Survival Rate **CETIS Version:** CETISv1.9.4
Analyzed: 11 Jun-21 14:23 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Fisher Exact/Bonferroni-Holm Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
		CM_MC1	0.5000	Exact	1.0000	Non-Significant Effect
		LC_SLC	1.0000	Exact	1.0000	Non-Significant Effect
		FR_FRABCH	1.0000	Exact	1.0000	Non-Significant Effect
		FR_FRCP1	1.0000	Exact	1.0000	Non-Significant Effect
		GH_FR1	1.0000	Exact	1.0000	Non-Significant Effect
		GH_ERC	1.0000	Exact	1.0000	Non-Significant Effect
		CM_MC2	1.0000	Exact	1.0000	Non-Significant Effect
		EV_MC2	1.0000	Exact	1.0000	Non-Significant Effect
		EV_HC1	1.0000	Exact	1.0000	Non-Significant Effect
		LC_DCDS	1.0000	Exact	1.0000	Non-Significant Effect
		LC_LC3	1.0000	Exact	1.0000	Non-Significant Effect
		LC_LC5	0.5000	Exact	1.0000	Non-Significant Effect
		LC_LCDSSLCC	0.5000	Exact	1.0000	Non-Significant Effect
		RG_MIDAG	1.0000	Exact	1.0000	Non-Significant Effect
		FR_FR4	1.0000	Exact	1.0000	Non-Significant Effect
		FR_FR2	1.0000	Exact	1.0000	Non-Significant Effect
		FR_MULTIPLATE	1.0000	Exact	1.0000	Non-Significant Effect
		FR_FRRD	1.0000	Exact	1.0000	Non-Significant Effect

Data Summary

Sample	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
Lab Control	N	10	0	10	1	0	-11.11%
FR_UFR1		10	0	10	1	0	-11.11%
GH_ER2		9	1	10	0.9	0.1	0.0%
CM_MC1		9	1	10	0.9	0.1	0.0%
LC_SLC		10	0	10	1	0	-11.11%
FR_FRABCH		10	0	10	1	0	-11.11%
FR_FRCP1		10	0	10	1	0	-11.11%
GH_FR1		10	0	10	1	0	-11.11%
GH_ERC		10	0	10	1	0	-11.11%
CM_MC2		10	0	10	1	0	-11.11%
EV_MC2		10	0	10	1	0	-11.11%
EV_HC1		10	0	10	1	0	-11.11%
LC_DCDS		10	0	10	1	0	-11.11%
LC_LC3		10	0	10	1	0	-11.11%
LC_LC5		9	1	10	0.9	0.1	0.0%
LC_LCDSSLCC		9	1	10	0.9	0.1	0.0%
RG_MIDAG		10	0	10	1	0	-11.11%
FR_FR4		10	0	10	1	0	-11.11%
FR_FR2		10	0	10	1	0	-11.11%
FR_MULTIPLATE		10	0	10	1	0	-11.11%
FR_FRRD		10	0	10	1	0	-11.11%

Ceriodaphnia 7-d Survival and Reproduction Test — **Nautilus Environmental**

Analysis ID: 11-1473-2466 **Endpoint:** 6d Survival Rate **CETIS Version:** CETISv1.9.4
Analyzed: 11 Jun-21 14:23 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

6d Survival Rate Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
Lab Control	N	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
FR_UFR1		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
GH_ER2		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	1.0000
CM_MC1		1.0000	1.0000	1.0000	0.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
LC_SLC		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
FR_FRABCH		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
FR_FRCP1		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
GH_FR1		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
GH_ERC		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
CM_MC2		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
EV_MC2		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
EV_HC1		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
LC_DCDS		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
LC_LC3		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
LC_LC5		1.0000	1.0000	1.0000	1.0000	0.0000	1.0000	1.0000	1.0000	1.0000	1.0000
LC_LCDSSLCC		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	1.0000	1.0000	1.0000
RG_MIDAG		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
FR_FR4		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
FR_FR2		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
FR_MULTIPLATE		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
FR_FRRD		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

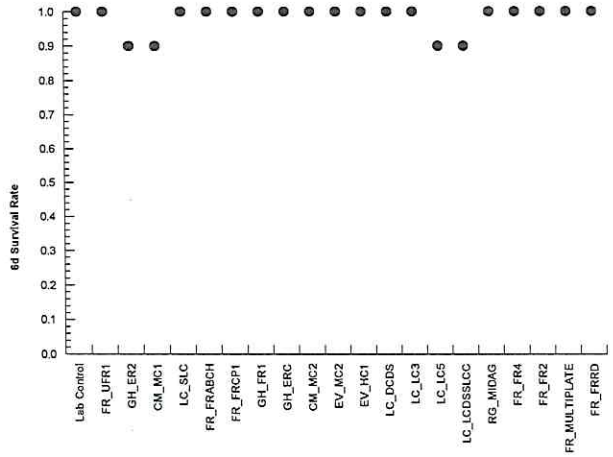
6d Survival Rate Binomials

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
Lab Control	N	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
FR_UFR1		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
GH_ER2		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	0/1	1/1
CM_MC1		1/1	1/1	1/1	0/1	1/1	1/1	1/1	1/1	1/1	1/1
LC_SLC		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
FR_FRABCH		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
FR_FRCP1		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
GH_FR1		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
GH_ERC		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
CM_MC2		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
EV_MC2		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
EV_HC1		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
LC_DCDS		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
LC_LC3		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
LC_LC5		1/1	1/1	1/1	1/1	0/1	1/1	1/1	1/1	1/1	1/1
LC_LCDSSLCC		1/1	1/1	1/1	1/1	1/1	1/1	0/1	1/1	1/1	1/1
RG_MIDAG		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
FR_FR4		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
FR_FR2		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
FR_MULTIPLATE		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
FR_FRRD		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1

Ceriodaphnia 7-d Survival and Reproduction Test — **Nautilus Environmental**

Analysis ID:	11-1473-2466	**Endpoint:**	6d Survival Rate	**CETIS Version:**	CETISv1.9.4
Analyzed:	11 Jun-21 14:23	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1

Graphics



Analyst: SRH QA: June 22/21

Ceriodaphnia 7-d Survival and Reproduction Test

Nautilus Environmental

Analysis ID:	03-6234-7957	**Endpoint:**	6d Survival Rate	**CETIS Version:**	CETISv1.9.4
Analyzed:	11 Jun-21 14:28	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1
Batch ID:	19-5534-0118	**Test Type:**	Reproduction-Survival (7d)	**Analyst:**	Sierra Klueppel
Start Date:	19 May-21 14:00	**Protocol:**	EC/EPS 1/RM/21	**Diluent:**	20% Perrier Water
Ending Date:	27 May-21 15:00	**Species:**	Ceriodaphnia dubia	**Brine:**	
Test Length:	8d 1h	**Taxon:**	Branchiopoda	**Source:**	In-House Culture **Age:** <24

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
FR_UFR1	12-4424-2146	18 May-21	19 May-21 11:20	38h (2.3 °C)	Teck Coal	
GH_ER2	02-4275-7088	18 May-21 09:55	19 May-21 11:20	28h (0.4 °C)		
CM_MC1	01-4263-6393	18 May-21 11:08	19 May-21 11:20	27h (1.1 °C)		
LC_SLC	12-1662-7355	18 May-21 09:45	19 May-21 11:20	28h (4.1 °C)		
FR_FRABCH	05-6713-4959	18 May-21	19 May-21 11:20	38h (1.9 °C)		
FR_FRCP1	19-8027-7867	18 May-21	19 May-21 11:20	38h (1.2 °C)		
GH_FR1	15-9886-5398	18 May-21 12:30	19 May-21 11:20	26h (0.1 °C)		
GH_ERC	21-0704-4941	18 May-21 11:20	19 May-21 11:20	27h (0.6 °C)		
CM_MC2	17-6814-6287	18 May-21 09:50	19 May-21 11:20	28h (1.1 °C)		
EV_MC2	15-5628-9197	18 May-21 13:00	19 May-21 11:20	25h (3.6 °C)		
EV_HC1	05-8730-9056	18 May-21 11:20	19 May-21 11:20	27h (4.8 °C)		
LC_DCDS	20-0340-1068	18 May-21 11:00	19 May-21 11:20	27h (4.6 °C)		
LC_LC3	18-4816-9590	18 May-21 10:15	19 May-21 11:20	28h (4.7 °C)		
LC_LC5	03-8768-2280	18 May-21 09:50	19 May-21 11:20	28h (5.2 °C)		
LC_LCDSSLCC	02-2977-6783	18 May-21 11:00	19 May-21 11:20	27h (4.3 °C)		
RG_MIDAG	19-6180-4600	18 May-21 09:15	19 May-21 11:20	29h (0.1 °C)		
FR_FR4	17-1641-7069	18 May-21 09:29	19 May-21 11:20	29h (4.6 °C)		
FR_FR2	11-2149-8709	18 May-21 10:28	19 May-21 11:20	28h (4.6 °C)		
FR_MULTIPLATE	16-7235-2081	18 May-21 11:21	19 May-21 11:20	27h (3.4 °C)		
FR_FRRD	06-3190-8505	18 May-21 08:22	19 May-21 11:20	30h (3.4 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_UFR1	Water Sample	Teck Coal	FR_UFR1_WEK_2021-05-1	
GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-05-18_	
CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-05-18	
LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-05-18_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_WEK_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_WEK_2021-05	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-05-18_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-05-18	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-05-18	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2020_Q2_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2020_Q2_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-05-18	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-05-18_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-05-18_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	
RG_MIDAG	Water Sample	Teck Coal	RG_MIDAG_WS_2021-05-	
FR_FR4	Water Sample	Teck Coal	FR_FR4_WS_2021-05-18_	
FR_FR2	Water Sample	Teck Coal	FR_FR2_WS_2021-05-18_	
FR_MULTIPLATE	Water Sample	Teck Coal	FR_MULTIPLATE_WS_202	
FR_FRRD	Water Sample	Teck Coal	FR_FRRD_WS_2021-05-18	

Fisher Exact/Bonferroni-Holm Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
Site Control		GH_ER2	0.5000	Exact	1.0000	Non-Significant Effect
		CM_MC1	0.5000	Exact	1.0000	Non-Significant Effect
		LC_SLC	1.0000	Exact	1.0000	Non-Significant Effect
		FR_FRABCH	1.0000	Exact	1.0000	Non-Significant Effect

Ceriodaphnia 7-d Survival and Reproduction Test — **Nautilus Environmental**

Analysis ID: 03-6234-7957 **Endpoint:** 6d Survival Rate **CETIS Version:** CETISv1.9.4
Analyzed: 11 Jun-21 14:28 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Fisher Exact/Bonferroni-Holm Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
		FR_FRCP1	1.0000	Exact	1.0000	Non-Significant Effect
		GH_FR1	1.0000	Exact	1.0000	Non-Significant Effect
		GH_ERC	1.0000	Exact	1.0000	Non-Significant Effect
		CM_MC2	1.0000	Exact	1.0000	Non-Significant Effect
		EV_MC2	1.0000	Exact	1.0000	Non-Significant Effect
		EV_HC1	1.0000	Exact	1.0000	Non-Significant Effect
		LC_DCDS	1.0000	Exact	1.0000	Non-Significant Effect
		LC_LC3	1.0000	Exact	1.0000	Non-Significant Effect
		LC_LC5	0.5000	Exact	1.0000	Non-Significant Effect
		LC_LCDSSLCC	0.5000	Exact	1.0000	Non-Significant Effect
		RG_MIDAG	1.0000	Exact	1.0000	Non-Significant Effect
		FR_FR4	1.0000	Exact	1.0000	Non-Significant Effect
		FR_FR2	1.0000	Exact	1.0000	Non-Significant Effect
		FR_MULTIPLATE	1.0000	Exact	1.0000	Non-Significant Effect
		FR_FRRD	1.0000	Exact	1.0000	Non-Significant Effect

Data Summary

Sample	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
FR_UFR1	XC	10	0	10	1	0	-11.11%
GH_ER2		9	1	10	0.9	0.1	0.0%
CM_MC1		9	1	10	0.9	0.1	0.0%
LC_SLC		10	0	10	1	0	-11.11%
FR_FRABCH		10	0	10	1	0	-11.11%
FR_FRCP1		10	0	10	1	0	-11.11%
GH_FR1		10	0	10	1	0	-11.11%
GH_ERC		10	0	10	1	0	-11.11%
CM_MC2		10	0	10	1	0	-11.11%
EV_MC2		10	0	10	1	0	-11.11%
EV_HC1		10	0	10	1	0	-11.11%
LC_DCDS		10	0	10	1	0	-11.11%
LC_LC3		10	0	10	1	0	-11.11%
LC_LC5		9	1	10	0.9	0.1	0.0%
LC_LCDSSLCC		9	1	10	0.9	0.1	0.0%
RG_MIDAG		10	0	10	1	0	-11.11%
FR_FR4		10	0	10	1	0	-11.11%
FR_FR2		10	0	10	1	0	-11.11%
FR_MULTIPLATE		10	0	10	1	0	-11.11%
FR_FRRD		10	0	10	1	0	-11.11%

Ceriodaphnia 7-d Survival and Reproduction Test — **Nautilus Environmental**

Analysis ID: 03-6234-7957 **Endpoint:** 6d Survival Rate **CETIS Version:** CETISv1.9.4
Analyzed: 11 Jun-21 14:28 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

6d Survival Rate Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
FR_UFR1	XC	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
GH_ER2		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	1.0000
CM_MC1		1.0000	1.0000	1.0000	0.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
LC_SLC		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
FR_FRABCH		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
FR_FRCP1		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
GH_FR1		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
GH_ERC		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
CM_MC2		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
EV_MC2		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
EV_HC1		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
LC_DCDS		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
LC_LC3		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
LC_LC5		1.0000	1.0000	1.0000	1.0000	0.0000	1.0000	1.0000	1.0000	1.0000	1.0000
LC_LCDSSLCC		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	1.0000	1.0000	1.0000
RG_MIDAG		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
FR_FR4		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
FR_FR2		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
FR_MULTIPLATE		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
FR_FRRD		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

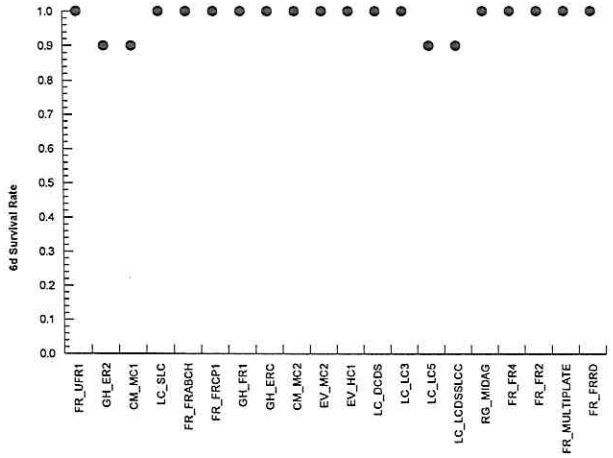
6d Survival Rate Binomials

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
GH_ER2		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	0/1	1/1
CM_MC1		1/1	1/1	1/1	0/1	1/1	1/1	1/1	1/1	1/1	1/1
LC_SLC		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
FR_FRABCH		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
FR_FRCP1		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
GH_FR1		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
GH_ERC		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
CM_MC2		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
EV_MC2		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
EV_HC1		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
LC_DCDS		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
LC_LC3		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
LC_LC5		1/1	1/1	1/1	1/1	0/1	1/1	1/1	1/1	1/1	1/1
LC_LCDSSLCC		1/1	1/1	1/1	1/1	1/1	1/1	0/1	1/1	1/1	1/1
RG_MIDAG		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
FR_FR4		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
FR_FR2		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
FR_MULTIPLATE		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
FR_FRRD		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1

Ceriodaphnia 7-d Survival and Reproduction Test — **Nautilus Environmental**

Analysis ID:	03-6234-7957	**Endpoint:**	6d Survival Rate	**CETIS Version:**	CETISv1.9.4
Analyzed:	11 Jun-21 14:28	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1

Graphics



Ceriodaphnia 7-d Survival and Reproduction Test

Nautilus Environmental

Analysis ID:	15-9718-2024	**Endpoint:**	6d Survival Rate	**CETIS Version:**	CETISv1.9.4
Analyzed:	11 Jun-21 14:29	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1
Batch ID:	19-5534-0118	**Test Type:**	Reproduction-Survival (7d)	**Analyst:**	Sierra Klueppel
Start Date:	19 May-21 14:00	**Protocol:**	EC/EPS 1/RM/21	**Diluent:**	20% Perrier Water
Ending Date:	27 May-21 15:00	**Species:**	Ceriodaphnia dubia	**Brine:**	
Test Length:	8d 1h	**Taxon:**	Branchiopoda	**Source:**	In-House Culture **Age:** <24

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
FR_UFR1	12-4424-2146	18 May-21	19 May-21 11:20	38h (2.3 °C)	Teck Coal	
GH_ER2	02-4275-7088	18 May-21 09:55	19 May-21 11:20	28h (0.4 °C)		
CM_MC1	01-4263-6393	18 May-21 11:08	19 May-21 11:20	27h (1.1 °C)		
LC_SLC	12-1662-7355	18 May-21 09:45	19 May-21 11:20	28h (4.1 °C)		
FR_FRABCH	05-6713-4959	18 May-21	19 May-21 11:20	38h (1.9 °C)		
FR_FRCP1	19-8027-7867	18 May-21	19 May-21 11:20	38h (1.2 °C)		
GH_FR1	15-9886-5398	18 May-21 12:30	19 May-21 11:20	26h (0.1 °C)		
GH_ERC	21-0704-4941	18 May-21 11:20	19 May-21 11:20	27h (0.6 °C)		
CM_MC2	17-6814-6287	18 May-21 09:50	19 May-21 11:20	28h (1.1 °C)		
EV_MC2	15-5628-9197	18 May-21 13:00	19 May-21 11:20	25h (3.6 °C)		
EV_HC1	05-8730-9056	18 May-21 11:20	19 May-21 11:20	27h (4.8 °C)		
LC_DCDS	20-0340-1068	18 May-21 11:00	19 May-21 11:20	27h (4.6 °C)		
LC_LC3	18-4816-9590	18 May-21 10:15	19 May-21 11:20	28h (4.7 °C)		
LC_LC5	03-8768-2280	18 May-21 09:50	19 May-21 11:20	28h (5.2 °C)		
LC_LCDSSLCC	02-2977-6783	18 May-21 11:00	19 May-21 11:20	27h (4.3 °C)		
RG_MIDAG	19-6180-4600	18 May-21 09:15	19 May-21 11:20	29h (0.1 °C)		
FR_FR4	17-1641-7069	18 May-21 09:29	19 May-21 11:20	29h (4.6 °C)		
FR_FR2	11-2149-8709	18 May-21 10:28	19 May-21 11:20	28h (4.6 °C)		
FR_MULTIPLATE	16-7235-2081	18 May-21 11:21	19 May-21 11:20	27h (3.4 °C)		
FR_FRRD	06-3190-8505	18 May-21 08:22	19 May-21 11:20	30h (3.4 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_UFR1	Water Sample	Teck Coal	FR_UFR1_WEK_2021-05-1	
GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-05-18_	
CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-05-18	
LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-05-18_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_WEK_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_WEK_2021-05	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-05-18_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-05-18	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-05-18	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2020_Q2_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2020_Q2_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-05-18	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-05-18_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-05-18_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	
RG_MIDAG	Water Sample	Teck Coal	RG_MIDAG_WS_2021-05-	
FR_FR4	Water Sample	Teck Coal	FR_FR4_WS_2021-05-18_	
FR_FR2	Water Sample	Teck Coal	FR_FR2_WS_2021-05-18_	
FR_MULTIPLATE	Water Sample	Teck Coal	FR_MULTIPLATE_WS_202	
FR_FRRD	Water Sample	Teck Coal	FR_FRRD_WS_2021-05-18	

Fisher Exact/Bonferroni-Holm Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
Site Control		FR_UFR1	1.0000	Exact	1.0000	Non-Significant Effect
		CM_MC1	0.7632	Exact	1.0000	Non-Significant Effect
		LC_SLC	1.0000	Exact	1.0000	Non-Significant Effect
		FR_FRABCH	1.0000	Exact	1.0000	Non-Significant Effect

Ceriodaphnia 7-d Survival and Reproduction Test **Nautilus Environmental**

Analysis ID: 15-9718-2024 **Endpoint:** 6d Survival Rate **CETIS Version:** CETISv1.9.4
Analyzed: 11 Jun-21 14:29 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Fisher Exact/Bonferroni-Holm Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
		FR_FRCP1	1.0000	Exact	1.0000	Non-Significant Effect
		GH_FR1	1.0000	Exact	1.0000	Non-Significant Effect
		GH_ERC	1.0000	Exact	1.0000	Non-Significant Effect
		CM_MC2	1.0000	Exact	1.0000	Non-Significant Effect
		EV_MC2	1.0000	Exact	1.0000	Non-Significant Effect
		EV_HC1	1.0000	Exact	1.0000	Non-Significant Effect
		LC_DCDS	1.0000	Exact	1.0000	Non-Significant Effect
		LC_LC3	1.0000	Exact	1.0000	Non-Significant Effect
		LC_LC5	0.7632	Exact	1.0000	Non-Significant Effect
		LC_LCDSSLCC	0.7632	Exact	1.0000	Non-Significant Effect
		RG_MIDAG	1.0000	Exact	1.0000	Non-Significant Effect
		FR_FR4	1.0000	Exact	1.0000	Non-Significant Effect
		FR_FR2	1.0000	Exact	1.0000	Non-Significant Effect
		FR_MULTIPLATE	1.0000	Exact	1.0000	Non-Significant Effect
		FR_FRRD	1.0000	Exact	1.0000	Non-Significant Effect

Data Summary

Sample	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
FR_UFR1		10	0	10	1	0	-11.11%
GH_ER2	XC	9	1	10	0.9	0.1	0.0%
CM_MC1		9	1	10	0.9	0.1	0.0%
LC_SLC		10	0	10	1	0	-11.11%
FR_FRABCH		10	0	10	1	0	-11.11%
FR_FRCP1		10	0	10	1	0	-11.11%
GH_FR1		10	0	10	1	0	-11.11%
GH_ERC		10	0	10	1	0	-11.11%
CM_MC2		10	0	10	1	0	-11.11%
EV_MC2		10	0	10	1	0	-11.11%
EV_HC1		10	0	10	1	0	-11.11%
LC_DCDS		10	0	10	1	0	-11.11%
LC_LC3		10	0	10	1	0	-11.11%
LC_LC5		9	1	10	0.9	0.1	0.0%
LC_LCDSSLCC		9	1	10	0.9	0.1	0.0%
RG_MIDAG		10	0	10	1	0	-11.11%
FR_FR4		10	0	10	1	0	-11.11%
FR_FR2		10	0	10	1	0	-11.11%
FR_MULTIPLATE		10	0	10	1	0	-11.11%
FR_FRRD		10	0	10	1	0	-11.11%

Ceriodaphnia 7-d Survival and Reproduction Test — **Nautilus Environmental**

Analysis ID: 15-9718-2024 **Endpoint:** 6d Survival Rate **CETIS Version:** CETISv1.9.4
Analyzed: 11 Jun-21 14:29 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

6d Survival Rate Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
FR_UFR1		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
GH_ER2	XC	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	1.0000
CM_MC1		1.0000	1.0000	1.0000	0.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
LC_SLC		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
FR_FRABCH		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
FR_FRCP1		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
GH_FR1		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
GH_ERC		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
CM_MC2		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
EV_MC2		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
EV_HC1		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
LC_DCDS		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
LC_LC3		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
LC_LC5		1.0000	1.0000	1.0000	1.0000	0.0000	1.0000	1.0000	1.0000	1.0000	1.0000
LC_LCDSSLCC		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	1.0000	1.0000	1.0000
RG_MIDAG		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
FR_FR4		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
FR_FR2		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
FR_MULTIPLATE		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
FR_FRRD		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

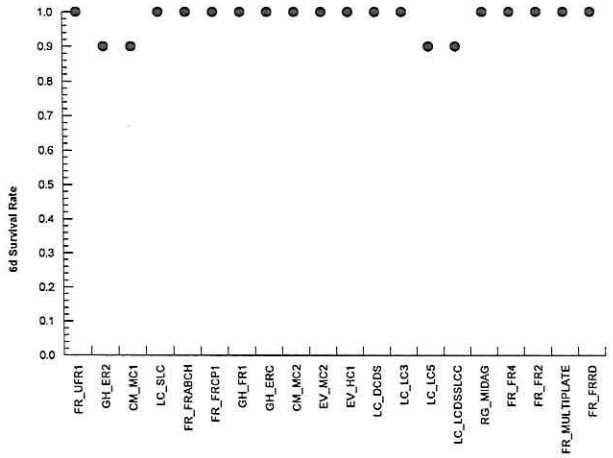
6d Survival Rate Binomials

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
FR_UFR1		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
CM_MC1		1/1	1/1	1/1	0/1	1/1	1/1	1/1	1/1	1/1	1/1
LC_SLC		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
FR_FRABCH		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
FR_FRCP1		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
GH_FR1		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
GH_ERC		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
CM_MC2		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
EV_MC2		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
EV_HC1		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
LC_DCDS		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
LC_LC3		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
LC_LC5		1/1	1/1	1/1	1/1	0/1	1/1	1/1	1/1	1/1	1/1
LC_LCDSSLCC		1/1	1/1	1/1	1/1	1/1	1/1	0/1	1/1	1/1	1/1
RG_MIDAG		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
FR_FR4		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
FR_FR2		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
FR_MULTIPLATE		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
FR_FRRD		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1

Ceriodaphnia 7-d Survival and Reproduction Test **Nautilus Environmental**

Analysis ID:	15-9718-2024	**Endpoint:**	6d Survival Rate	**CETIS Version:**	CETISv1.9.4
Analyzed:	11 Jun-21 14:29	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1

Graphics



 Analyst: SAM QA: June 22/21

Ceriodaphnia 7-d Survival and Reproduction Test

Nautilus Environmental

Analysis ID:	19-6324-9902	**Endpoint:**	6d Survival Rate	**CETIS Version:**	CETISv1.9.4
Analyzed:	11 Jun-21 14:31	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1
Batch ID:	19-5534-0118	**Test Type:**	Reproduction-Survival (7d)	**Analyst:**	Sierra Klueppel
Start Date:	19 May-21 14:00	**Protocol:**	EC/EPS 1/RM/21	**Diluent:**	20% Perrier Water
Ending Date:	27 May-21 15:00	**Species:**	Ceriodaphnia dubia	**Brine:**	
Test Length:	8d 1h	**Taxon:**	Branchiopoda	**Source:**	In-House Culture **Age:** <24

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
FR_UFR1	12-4424-2146	18 May-21	19 May-21 11:20	38h (2.3 °C)	Teck Coal	
GH_ER2	02-4275-7088	18 May-21 09:55	19 May-21 11:20	28h (0.4 °C)		
CM_MC1	01-4263-6393	18 May-21 11:08	19 May-21 11:20	27h (1.1 °C)		
LC_SLC	12-1662-7355	18 May-21 09:45	19 May-21 11:20	28h (4.1 °C)		
FR_FRABCH	05-6713-4959	18 May-21	19 May-21 11:20	38h (1.9 °C)		
FR_FRCP1	19-8027-7867	18 May-21	19 May-21 11:20	38h (1.2 °C)		
GH_FR1	15-9886-5398	18 May-21 12:30	19 May-21 11:20	26h (0.1 °C)		
GH_ERC	21-0704-4941	18 May-21 11:20	19 May-21 11:20	27h (0.6 °C)		
CM_MC2	17-6814-6287	18 May-21 09:50	19 May-21 11:20	28h (1.1 °C)		
EV_MC2	15-5628-9197	18 May-21 13:00	19 May-21 11:20	25h (3.6 °C)		
EV_HC1	05-8730-9056	18 May-21 11:20	19 May-21 11:20	27h (4.8 °C)		
LC_DCDS	20-0340-1068	18 May-21 11:00	19 May-21 11:20	27h (4.6 °C)		
LC_LC3	18-4816-9590	18 May-21 10:15	19 May-21 11:20	28h (4.7 °C)		
LC_LC5	03-8768-2280	18 May-21 09:50	19 May-21 11:20	28h (5.2 °C)		
LC_LCDSSLCC	02-2977-6783	18 May-21 11:00	19 May-21 11:20	27h (4.3 °C)		
RG_MIDAG	19-6180-4600	18 May-21 09:15	19 May-21 11:20	29h (0.1 °C)		
FR_FR4	17-1641-7069	18 May-21 09:29	19 May-21 11:20	29h (4.6 °C)		
FR_FR2	11-2149-8709	18 May-21 10:28	19 May-21 11:20	28h (4.6 °C)		
FR_MULTIPLATE	16-7235-2081	18 May-21 11:21	19 May-21 11:20	27h (3.4 °C)		
FR_FRRD	06-3190-8505	18 May-21 08:22	19 May-21 11:20	30h (3.4 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_UFR1	Water Sample	Teck Coal	FR_UFR1_WEK_2021-05-1	
GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-05-18_	
CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-05-18	
LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-05-18_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_WEK_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_WEK_2021-05	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-05-18_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-05-18	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-05-18	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2020_Q2_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2020_Q2_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-05-18	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-05-18_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-05-18_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	
RG_MIDAG	Water Sample	Teck Coal	RG_MIDAG_WS_2021-05-	
FR_FR4	Water Sample	Teck Coal	FR_FR4_WS_2021-05-18_	
FR_FR2	Water Sample	Teck Coal	FR_FR2_WS_2021-05-18_	
FR_MULTIPLATE	Water Sample	Teck Coal	FR_MULTIPLATE_WS_202	
FR_FRRD	Water Sample	Teck Coal	FR_FRRD_WS_2021-05-18	

Fisher Exact/Bonferroni-Holm Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
Site Control		FR_UFR1	1.0000	Exact	1.0000	Non-Significant Effect
		GH_ER2	0.7632	Exact	1.0000	Non-Significant Effect
		LC_SLC	1.0000	Exact	1.0000	Non-Significant Effect
		FR_FRABCH	1.0000	Exact	1.0000	Non-Significant Effect

Ceriodaphnia 7-d Survival and Reproduction Test — **Nautilus Environmental**

Analysis ID: 19-6324-9902 **Endpoint:** 6d Survival Rate **CETIS Version:** CETISv1.9.4
Analyzed: 11 Jun-21 14:31 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Fisher Exact/Bonferroni-Holm Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
		FR_FRCP1	1.0000	Exact	1.0000	Non-Significant Effect
		GH_FR1	1.0000	Exact	1.0000	Non-Significant Effect
		GH_ERC	1.0000	Exact	1.0000	Non-Significant Effect
		CM_MC2	1.0000	Exact	1.0000	Non-Significant Effect
		EV_MC2	1.0000	Exact	1.0000	Non-Significant Effect
		EV_HC1	1.0000	Exact	1.0000	Non-Significant Effect
		LC_DCDS	1.0000	Exact	1.0000	Non-Significant Effect
		LC_LC3	1.0000	Exact	1.0000	Non-Significant Effect
		LC_LC5	0.7632	Exact	1.0000	Non-Significant Effect
		LC_LCDSSLCC	0.7632	Exact	1.0000	Non-Significant Effect
		RG_MIDAG	1.0000	Exact	1.0000	Non-Significant Effect
		FR_FR4	1.0000	Exact	1.0000	Non-Significant Effect
		FR_FR2	1.0000	Exact	1.0000	Non-Significant Effect
		FR_MULTIPLATE	1.0000	Exact	1.0000	Non-Significant Effect
		FR_FRRD	1.0000	Exact	1.0000	Non-Significant Effect

Data Summary

Sample	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
FR_UFR1		10	0	10	1	0	-11.11%
GH_ER2		9	1	10	0.9	0.1	0.0%
CM_MC1	XC	9	1	10	0.9	0.1	0.0%
LC_SLC		10	0	10	1	0	-11.11%
FR_FRABCH		10	0	10	1	0	-11.11%
FR_FRCP1		10	0	10	1	0	-11.11%
GH_FR1		10	0	10	1	0	-11.11%
GH_ERC		10	0	10	1	0	-11.11%
CM_MC2		10	0	10	1	0	-11.11%
EV_MC2		10	0	10	1	0	-11.11%
EV_HC1		10	0	10	1	0	-11.11%
LC_DCDS		10	0	10	1	0	-11.11%
LC_LC3		10	0	10	1	0	-11.11%
LC_LC5		9	1	10	0.9	0.1	0.0%
LC_LCDSSLCC		9	1	10	0.9	0.1	0.0%
RG_MIDAG		10	0	10	1	0	-11.11%
FR_FR4		10	0	10	1	0	-11.11%
FR_FR2		10	0	10	1	0	-11.11%
FR_MULTIPLATE		10	0	10	1	0	-11.11%
FR_FRRD		10	0	10	1	0	-11.11%

Ceriodaphnia 7-d Survival and Reproduction Test — **Nautilus Environmental**

Analysis ID: 19-6324-9902 **Endpoint:** 6d Survival Rate **CETIS Version:** CETISv1.9.4
Analyzed: 11 Jun-21 14:31 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

6d Survival Rate Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
FR_UFR1		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
GH_ER2		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	1.0000
CM_MC1	XC	1.0000	1.0000	1.0000	0.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
LC_SLC		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
FR_FRABCH		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
FR_FRCP1		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
GH_FR1		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
GH_ERC		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
CM_MC2		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
EV_MC2		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
EV_HC1		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
LC_DCDS		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
LC_LC3		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
LC_LC5		1.0000	1.0000	1.0000	1.0000	0.0000	1.0000	1.0000	1.0000	1.0000	1.0000
LC_LCDSSLCC		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	1.0000	1.0000	1.0000
RG_MIDAG		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
FR_FR4		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
FR_FR2		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
FR_MULTIPLATE		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
FR_FRRD		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

6d Survival Rate Binomials

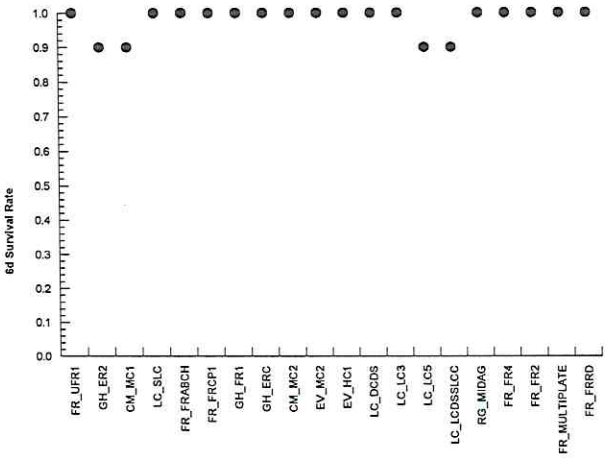
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
FR_UFR1		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
GH_ER2		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	0/1	1/1
LC_SLC		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
FR_FRABCH		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
FR_FRCP1		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
GH_FR1		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
GH_ERC		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
CM_MC2		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
EV_MC2		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
EV_HC1		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
LC_DCDS		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
LC_LC3		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
LC_LC5		1/1	1/1	1/1	1/1	0/1	1/1	1/1	1/1	1/1	1/1
LC_LCDSSLCC		1/1	1/1	1/1	1/1	1/1	1/1	0/1	1/1	1/1	1/1
RG_MIDAG		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
FR_FR4		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
FR_FR2		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
FR_MULTIPLATE		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
FR_FRRD		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1

Ceriodaphnia 7-d Survival and Reproduction Test

Nautilus Environmental

Analysis ID:	19-6324-9902	**Endpoint:**	6d Survival Rate	**CETIS Version:**	CETISv1.9.4
Analyzed:	11 Jun-21 14:31	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1

Graphics



Ceriodaphnia 7-d Survival and Reproduction Test

Nautilus Environmental

Analysis ID:	06-0975-2399	**Endpoint:**	6d Survival Rate	**CETIS Version:**	CETISv1.9.4
Analyzed:	11 Jun-21 14:32	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1
Batch ID:	19-5534-0118	**Test Type:**	Reproduction-Survival (7d)	**Analyst:**	Sierra Klueppel
Start Date:	19 May-21 14:00	**Protocol:**	EC/EPS 1/RM/21	**Diluent:**	20% Perrier Water
Ending Date:	27 May-21 15:00	**Species:**	Ceriodaphnia dubia	**Brine:**	
Test Length:	8d 1h	**Taxon:**	Branchiopoda	**Source:**	In-House Culture **Age:** <24

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
FR_UFR1	12-4424-2146	18 May-21	19 May-21 11:20	38h (2.3 °C)	Teck Coal	
GH_ER2	02-4275-7088	18 May-21 09:55	19 May-21 11:20	28h (0.4 °C)		
CM_MC1	01-4263-6393	18 May-21 11:08	19 May-21 11:20	27h (1.1 °C)		
LC_SLC	12-1662-7355	18 May-21 09:45	19 May-21 11:20	28h (4.1 °C)		
FR_FRABCH	05-6713-4959	18 May-21	19 May-21 11:20	38h (1.9 °C)		
FR_FRCP1	19-8027-7867	18 May-21	19 May-21 11:20	38h (1.2 °C)		
GH_FR1	15-9886-5398	18 May-21 12:30	19 May-21 11:20	26h (0.1 °C)		
GH_ERC	21-0704-4941	18 May-21 11:20	19 May-21 11:20	27h (0.6 °C)		
CM_MC2	17-6814-6287	18 May-21 09:50	19 May-21 11:20	28h (1.1 °C)		
EV_MC2	15-5628-9197	18 May-21 13:00	19 May-21 11:20	25h (3.6 °C)		
EV_HC1	05-8730-9056	18 May-21 11:20	19 May-21 11:20	27h (4.8 °C)		
LC_DCDS	20-0340-1068	18 May-21 11:00	19 May-21 11:20	27h (4.6 °C)		
LC_LC3	18-4816-9590	18 May-21 10:15	19 May-21 11:20	28h (4.7 °C)		
LC_LC5	03-8768-2280	18 May-21 09:50	19 May-21 11:20	28h (5.2 °C)		
LC_LCDSSLCC	02-2977-6783	18 May-21 11:00	19 May-21 11:20	27h (4.3 °C)		
RG_MIDAG	19-6180-4600	18 May-21 09:15	19 May-21 11:20	29h (0.1 °C)		
FR_FR4	17-1641-7069	18 May-21 09:29	19 May-21 11:20	29h (4.6 °C)		
FR_FR2	11-2149-8709	18 May-21 10:28	19 May-21 11:20	28h (4.6 °C)		
FR_MULTIPLATE	16-7235-2081	18 May-21 11:21	19 May-21 11:20	27h (3.4 °C)		
FR_FRRD	06-3190-8505	18 May-21 08:22	19 May-21 11:20	30h (3.4 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_UFR1	Water Sample	Teck Coal	FR_UFR1_WEK_2021-05-1	
GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-05-18_	
CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-05-18	
LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-05-18_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_WEK_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_WEK_2021-05	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-05-18_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-05-18	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-05-18	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2020_Q2_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2020_Q2_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-05-18	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-05-18_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-05-18_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	
RG_MIDAG	Water Sample	Teck Coal	RG_MIDAG_WS_2021-05-	
FR_FR4	Water Sample	Teck Coal	FR_FR4_WS_2021-05-18_	
FR_FR2	Water Sample	Teck Coal	FR_FR2_WS_2021-05-18_	
FR_MULTIPLATE	Water Sample	Teck Coal	FR_MULTIPLATE_WS_202	
FR_FRRD	Water Sample	Teck Coal	FR_FRRD_WS_2021-05-18	

Fisher Exact/Bonferroni-Holm Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
Site Control		FR_UFR1	1.0000	Exact	1.0000	Non-Significant Effect
		GH_ER2	0.5000	Exact	1.0000	Non-Significant Effect
		CM_MC1	0.5000	Exact	1.0000	Non-Significant Effect
		FR_FRABCH	1.0000	Exact	1.0000	Non-Significant Effect

Ceriodaphnia 7-d Survival and Reproduction Test — **Nautilus Environmental**

Analysis ID: 06-0975-2399 **Endpoint:** 6d Survival Rate **CETIS Version:** CETISv1.9.4
Analyzed: 11 Jun-21 14:32 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Fisher Exact/Bonferroni-Holm Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
		FR_FRCP1	1.0000	Exact	1.0000	Non-Significant Effect
		GH_FR1	1.0000	Exact	1.0000	Non-Significant Effect
		GH_ERC	1.0000	Exact	1.0000	Non-Significant Effect
		CM_MC2	1.0000	Exact	1.0000	Non-Significant Effect
		EV_MC2	1.0000	Exact	1.0000	Non-Significant Effect
		EV_HC1	1.0000	Exact	1.0000	Non-Significant Effect
		LC_DCDS	1.0000	Exact	1.0000	Non-Significant Effect
		LC_LC3	1.0000	Exact	1.0000	Non-Significant Effect
		LC_LC5	0.5000	Exact	1.0000	Non-Significant Effect
		LC_LCDSSLCC	0.5000	Exact	1.0000	Non-Significant Effect
		RG_MIDAG	1.0000	Exact	1.0000	Non-Significant Effect
		FR_FR4	1.0000	Exact	1.0000	Non-Significant Effect
		FR_FR2	1.0000	Exact	1.0000	Non-Significant Effect
		FR_MULTIPLATE	1.0000	Exact	1.0000	Non-Significant Effect
		FR_FRRD	1.0000	Exact	1.0000	Non-Significant Effect

Data Summary

Sample	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
FR_UFR1		10	0	10	1	0	-11.11%
GH_ER2		9	1	10	0.9	0.1	0.0%
CM_MC1		9	1	10	0.9	0.1	0.0%
LC_SLC	XC	10	0	10	1	0	-11.11%
FR_FRABCH		10	0	10	1	0	-11.11%
FR_FRCP1		10	0	10	1	0	-11.11%
GH_FR1		10	0	10	1	0	-11.11%
GH_ERC		10	0	10	1	0	-11.11%
CM_MC2		10	0	10	1	0	-11.11%
EV_MC2		10	0	10	1	0	-11.11%
EV_HC1		10	0	10	1	0	-11.11%
LC_DCDS		10	0	10	1	0	-11.11%
LC_LC3		10	0	10	1	0	-11.11%
LC_LC5		9	1	10	0.9	0.1	0.0%
LC_LCDSSLCC		9	1	10	0.9	0.1	0.0%
RG_MIDAG		10	0	10	1	0	-11.11%
FR_FR4		10	0	10	1	0	-11.11%
FR_FR2		10	0	10	1	0	-11.11%
FR_MULTIPLATE		10	0	10	1	0	-11.11%
FR_FRRD		10	0	10	1	0	-11.11%

Ceriodaphnia 7-d Survival and Reproduction Test — Nautilus Environmental

Analysis ID: 06-0975-2399 Endpoint: 6d Survival Rate CETIS Version: CETISv1.9.4
Analyzed: 11 Jun-21 14:32 Analysis: STP 2xK Contingency Tables Status Level: 1

6d Survival Rate Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
FR_UFR1		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
GH_ER2		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	1.0000
CM_MC1		1.0000	1.0000	1.0000	0.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
LC_SLC	XC	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
FR_FRABCH		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
FR_FRCP1		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
GH_FR1		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
GH_ERC		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
CM_MC2		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
EV_MC2		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
EV_HC1		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
LC_DCDS		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
LC_LC3		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
LC_LC5		1.0000	1.0000	1.0000	1.0000	0.0000	1.0000	1.0000	1.0000	1.0000	1.0000
LC_LCDSSLCC		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	1.0000	1.0000	1.0000
RG_MIDAG		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
FR_FR4		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
FR_FR2		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
FR_MULTIPLATE		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
FR_FRRD		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

6d Survival Rate Binomials

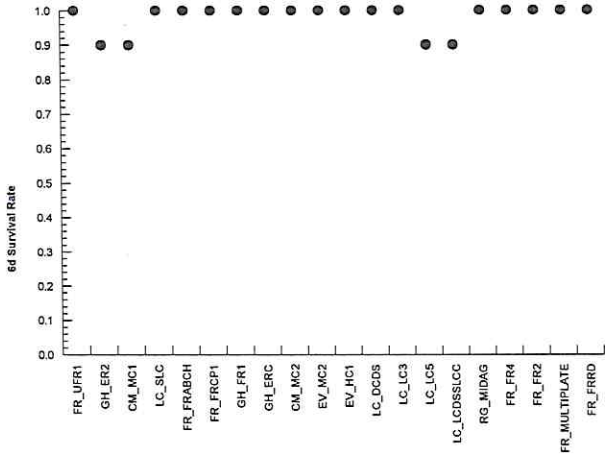
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
FR_UFR1		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
GH_ER2		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	0/1	1/1
CM_MC1		1/1	1/1	1/1	0/1	1/1	1/1	1/1	1/1	1/1	1/1
FR_FRABCH		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
FR_FRCP1		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
GH_FR1		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
GH_ERC		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
CM_MC2		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
EV_MC2		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
EV_HC1		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
LC_DCDS		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
LC_LC3		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
LC_LC5		1/1	1/1	1/1	1/1	0/1	1/1	1/1	1/1	1/1	1/1
LC_LCDSSLCC		1/1	1/1	1/1	1/1	1/1	1/1	0/1	1/1	1/1	1/1
RG_MIDAG		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
FR_FR4		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
FR_FR2		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
FR_MULTIPLATE		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
FR_FRRD		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1

Analyst: SM QA: 6/11/21

Ceriodaphnia 7-d Survival and Reproduction Test — **Nautilus Environmental**

Analysis ID:	06-0975-2399	**Endpoint:**	6d Survival Rate	**CETIS Version:**	CETISv1.9.4
Analyzed:	11 Jun-21 14:32	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1

Graphics



 Analyst: SAH QA: June 22/21

Ceriodaphnia 7-d Survival and Reproduction Test

Nautilus Environmental

Analysis ID:	15-7777-1624	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.9.4
Analyzed:	11 Jun-21 14:24	**Analysis:**	Nonparametric-Control vs Treatments	**Status Level:**	1
Batch ID:	19-5534-0118	**Test Type:**	Reproduction-Survival (7d)	**Analyst:**	Sierra Klueppel
Start Date:	19 May-21 14:00	**Protocol:**	EC/EPS 1/RM/21	**Diluent:**	20% Perrier Water
Ending Date:	27 May-21 15:00	**Species:**	Ceriodaphnia dubia	**Brine:**	
Test Length:	8d 1h	**Taxon:**	Branchiopoda	**Source:**	In-House Culture **Age:** <24

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
Lab Control	18-4614-6401	19 May-21	19 May-21 06:00	14h	Teck Coal	
FR_UFR1	12-4424-2146	18 May-21	19 May-21 11:20	38h (2.3 °C)		
GH_ER2	02-4275-7088	18 May-21 09:55	19 May-21 11:20	28h (0.4 °C)		
CM_MC1	01-4263-6393	18 May-21 11:08	19 May-21 11:20	27h (1.1 °C)		
LC_SLC	12-1662-7355	18 May-21 09:45	19 May-21 11:20	28h (4.1 °C)		
FR_FRABCH	05-6713-4959	18 May-21	19 May-21 11:20	38h (1.9 °C)		
FR_FRCP1	19-8027-7867	18 May-21	19 May-21 11:20	38h (1.2 °C)		
GH_FR1	15-9886-5398	18 May-21 12:30	19 May-21 11:20	26h (0.1 °C)		
GH_ERC	21-0704-4941	18 May-21 11:20	19 May-21 11:20	27h (0.6 °C)		
CM_MC2	17-6814-6287	18 May-21 09:50	19 May-21 11:20	28h (1.1 °C)		
EV_MC2	15-5628-9197	18 May-21 13:00	19 May-21 11:20	25h (3.6 °C)		
EV_HC1	05-8730-9056	18 May-21 11:20	19 May-21 11:20	27h (4.8 °C)		
LC_DCDS	20-0340-1068	18 May-21 11:00	19 May-21 11:20	27h (4.6 °C)		
LC_LC3	18-4816-9590	18 May-21 10:15	19 May-21 11:20	28h (4.7 °C)		
LC_LC5	03-8768-2280	18 May-21 09:50	19 May-21 11:20	28h (5.2 °C)		
LC_LCDSSLCC	02-2977-6783	18 May-21 11:00	19 May-21 11:20	27h (4.3 °C)		
RG_MIDAG	19-6180-4600	18 May-21 09:15	19 May-21 11:20	29h (0.1 °C)		
FR_FR4	17-1641-7069	18 May-21 09:29	19 May-21 11:20	29h (4.6 °C)		
FR_FR2	11-2149-8709	18 May-21 10:28	19 May-21 11:20	28h (4.6 °C)		
FR_MULTIPLATE	16-7235-2081	18 May-21 11:21	19 May-21 11:20	27h (3.4 °C)		
FR_FRRD	06-3190-8505	18 May-21 08:22	19 May-21 11:20	30h (3.4 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
Lab Control	Water Sample	Teck Coal	Lab Control	
FR_UFR1	Water Sample	Teck Coal	FR_UFR1_WEK_2021-05-1	
GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-05-18_	
CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-05-18	
LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-05-18_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_WEK_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_WEK_2021-05	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-05-18_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-05-18	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-05-18	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2020_Q2_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2020_Q2_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-05-18	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-05-18_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-05-18_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	
RG_MIDAG	Water Sample	Teck Coal	RG_MIDAG_WS_2021-05-	
FR_FR4	Water Sample	Teck Coal	FR_FR4_WS_2021-05-18_	
FR_FR2	Water Sample	Teck Coal	FR_FR2_WS_2021-05-18_	
FR_MULTIPLATE	Water Sample	Teck Coal	FR_MULTIPLATE_WS_202	
FR_FRRD	Water Sample	Teck Coal	FR_FRRD_WS_2021-05-18	

Ceriodaphnia 7-d Survival and Reproduction Test — **Nautilus Environmental**

Analysis ID: 15-7777-1624 **Endpoint:** Reproduction **CETIS Version:** CETISv1.9.4
Analyzed: 11 Jun-21 14:24 **Analysis:** Nonparametric-Control vs Treatments **Status Level:** 1

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	FR_UFR1 passed reproduction	26.20%
		GH_ER2 passed reproduction	26.20%
		CM_MC1 passed reproduction	26.20%
		LC_SLC passed reproduction	26.20%
		FR_FRABCH passed reproduction	26.20%
		FR_FRCP1 passed reproduction	26.20%
		GH_FR1 passed reproduction	26.20%
		GH_ERC passed reproduction	26.20%
		CM_MC2 passed reproduction	26.20%
		EV_MC2 passed reproduction	26.20%
		EV_HC1 passed reproduction	26.20%
		LC_DCDS passed reproduction	26.20%
		LC_LC3 passed reproduction	26.20%
		LC_LC5 passed reproduction	26.20%
		LC_LCDSSLCC passed reproduction	26.20%
		RG_MIDAG passed reproduction	26.20%
		FR_FR4 passed reproduction	26.20%
		FR_FR2 passed reproduction	26.20%
		FR_MULTIPLATE passed reproduction	26.20%
		FR_FRRD passed reproduction	26.20%

Steel Many-One Rank Sum Test

Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)
Negative Control		FR_UFR1	116	70	4	18	CDF	0.9969	Non-Significant Effect
		GH_ER2	128.5	70	3	18	CDF	1.0000	Non-Significant Effect
		CM_MC1	114	70	4	18	CDF	0.9945	Non-Significant Effect
		LC_SLC	114	70	4	18	CDF	0.9945	Non-Significant Effect
		FR_FRABCH	106	70	4	18	CDF	0.9612	Non-Significant Effect
		FR_FRCP1	117.5	70	3	18	CDF	0.9981	Non-Significant Effect
		GH_FR1	105	70	4	18	CDF	0.9524	Non-Significant Effect
		GH_ERC	112.5	70	3	18	CDF	0.9918	Non-Significant Effect
		CM_MC2	94	70	3	18	CDF	0.7285	Non-Significant Effect
		EV_MC2	93	70	1	18	CDF	0.6959	Non-Significant Effect
		EV_HC1	90	70	5	18	CDF	0.5896	Non-Significant Effect
		LC_DCDS	85.5	70	2	18	CDF	0.4205	Non-Significant Effect
		LC_LC3	107.5	70	3	18	CDF	0.9720	Non-Significant Effect
		LC_LC5	84	70	3	18	CDF	0.3661	Non-Significant Effect
		LC_LCDSSLCC	88	70	3	18	CDF	0.5145	Non-Significant Effect
		RG_MIDAG	113	70	4	18	CDF	0.9928	Non-Significant Effect
		FR_FR4	118	70	4	18	CDF	0.9983	Non-Significant Effect
		FR_FR2	123.5	70	5	18	CDF	0.9997	Non-Significant Effect
		FR_MULTIPLATE	108	70	2	18	CDF	0.9750	Non-Significant Effect
		FR_FRRD	98.5	70	3	18	CDF	0.8509	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	3.869	3.62	0.0173	Outlier Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	647.457	32.3729	20	1.338	0.1596	Non-Significant Effect
Error	4573.5	24.1984	189			
Total	5220.96		209			

Distributional Tests

Ceriodaphnia 7-d Survival and Reproduction Test — **Nautilus Environmental**

Analysis ID: 15-7777-1624 **Endpoint:** Reproduction **CETIS Version:** CETISv1.9.4
Analyzed: 11 Jun-21 14:24 **Analysis:** Nonparametric-Control vs Treatments **Status Level:** 1

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance Test	50.08	37.57	2.2E-04	Unequal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9657	0.9824	5.6E-05	Non-Normal Distribution

Reproduction Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
Lab Control	N	10	22.4	20.88	23.92	22	19	27	0.67	9.46%	0.00%
FR_UFR1		10	23.4	21.71	25.09	23	20	27	0.7483	10.11%	-4.46%
GH_ER2		10	24.5	20.53	28.47	25.5	12	31	1.753	22.62%	-9.38%
CM_MC1		10	23.8	20.75	26.85	22.5	19	32	1.348	17.91%	-6.25%
LC_SLC		10	23.6	20.82	26.38	22.5	20	34	1.231	16.50%	-5.36%
FR_FRABCH		10	23.1	19.95	26.25	22.5	19	31	1.394	19.08%	-3.13%
FR_FRCP1		10	23.5	20.69	26.31	23	18	33	1.241	16.69%	-4.91%
GH_FR1		10	22	19.79	24.21	22.5	16	27	0.9775	14.05%	1.79%
GH_ERC		10	23.4	18.17	28.63	24	13	36	2.31	31.22%	-4.46%
CM_MC2		10	21.3	19.06	23.54	21.5	16	26	0.9894	14.69%	4.91%
EV_MC2		10	19.2	14.13	24.27	20	7	28	2.24	36.89%	14.29%
EV_HC1		10	21	19.45	22.55	21.5	18	24	0.6831	10.29%	6.25%
LC_DCDS		10	21.4	17.13	25.67	19.5	15	35	1.887	27.88%	4.46%
LC_LC3		10	22.2	19	25.4	22.5	13	28	1.413	20.12%	0.89%
LC_LC5		10	18.1	11.74	24.46	19	0	32	2.81	49.10%	19.20%
LC_LCDSSLCC		10	19.5	14.91	24.09	21	2	24	2.029	32.90%	12.95%
RG_MIDAG		10	23.3	20.46	26.14	23	17	31	1.257	17.05%	-4.02%
FR_FR4		10	24.7	21.23	28.17	25	18	31	1.535	19.65%	-10.27%
FR_FR2		10	24.5	21.93	27.07	23.5	21	33	1.138	14.69%	-9.38%
FR_MULTIPLATE		10	23.5	19.67	27.33	22	14	32	1.695	22.81%	-4.91%
FR_FRRD		10	22.3	19.54	25.06	21	17	28	1.221	17.31%	0.45%

Reproduction Detail

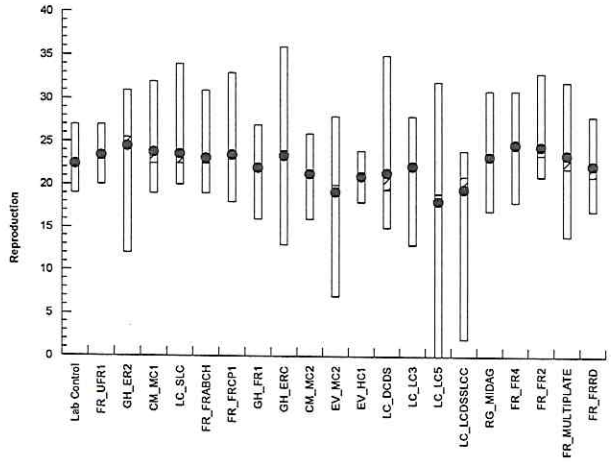
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
Lab Control	N	22	19	22	23	23	27	21	22	21	24
FR_UFR1		21	20	24	22	26	26	22	27	22	24
GH_ER2		19	25	31	25	23	30	27	27	12	26
CM_MC1		22	22	23	25	19	19	24	32	30	22
LC_SLC		20	34	24	24	22	22	22	21	24	23
FR_FRABCH		19	22	23	31	19	29	19	26	19	24
FR_FRCP1		20	25	22	33	23	23	23	24	24	18
GH_FR1		16	20	22	27	25	19	23	22	23	23
GH_ERC		27	13	14	17	36	29	23	29	25	21
CM_MC2		20	21	25	16	21	22	26	17	22	23
EV_MC2		8	26	28	20	18	7	20	24	17	24
EV_HC1		24	23	23	22	21	20	19	22	18	18
LC_DCDS		17	18	35	20	22	18	28	19	15	22
LC_LC3		23	28	20	22	26	27	22	23	13	18
LC_LC5		17	26	32	21	0	23	9	19	15	19
LC_LCDSSLCC		21	21	18	20	21	24	2	24	21	23
RG_MIDAG		23	26	25	23	21	31	19	26	22	17
FR_FR4		22	24	31	31	19	26	18	29	27	20
FR_FR2		24	22	23	33	21	26	25	23	27	21
FR_MULTIPLATE		32	14	23	21	20	21	30	21	28	25
FR_FRRD		19	20	19	25	21	21	17	28	26	27

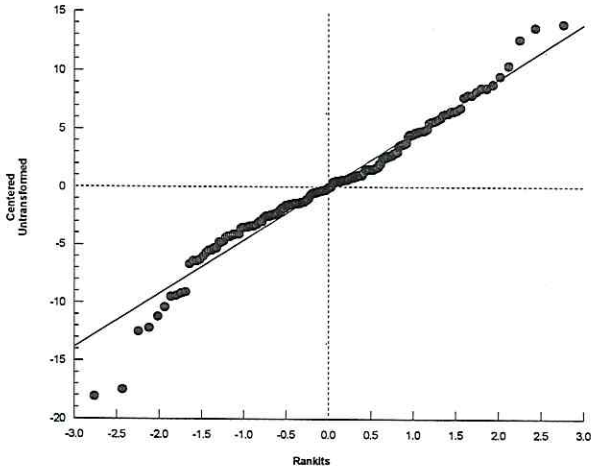
Ceriodaphnia 7-d Survival and Reproduction Test

Nautilus Environmental

Analysis ID:	15-7777-1624	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.9.4
Analyzed:	11 Jun-21 14:24	**Analysis:**	Nonparametric-Control vs Treatments	**Status Level:**	1

Graphics





Analyst: SKM QA: June 22/21

Ceriodaphnia 7-d Survival and Reproduction Test

Nautilus Environmental

Analysis ID:	09-5956-5924	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.9.4
Analyzed:	11 Jun-21 14:28	**Analysis:**	Nonparametric-Control vs Treatments	**Status Level:**	1
Batch ID:	19-5534-0118	**Test Type:**	Reproduction-Survival (7d)	**Analyst:**	Sierra Klueppel
Start Date:	19 May-21 14:00	**Protocol:**	EC/EPS 1/RM/21	**Diluent:**	20% Perrier Water
Ending Date:	27 May-21 15:00	**Species:**	Ceriodaphnia dubia	**Brine:**	
Test Length:	8d 1h	**Taxon:**	Branchiopoda	**Source:**	In-House Culture **Age:** <24

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
FR_UFR1	12-4424-2146	18 May-21	19 May-21 11:20	38h (2.3 °C)	Teck Coal	
GH_ER2	02-4275-7088	18 May-21 09:55	19 May-21 11:20	28h (0.4 °C)		
CM_MC1	01-4263-6393	18 May-21 11:08	19 May-21 11:20	27h (1.1 °C)		
LC_SLC	12-1662-7355	18 May-21 09:45	19 May-21 11:20	28h (4.1 °C)		
FR_FRABCH	05-6713-4959	18 May-21	19 May-21 11:20	38h (1.9 °C)		
FR_FRCP1	19-8027-7867	18 May-21	19 May-21 11:20	38h (1.2 °C)		
GH_FR1	15-9886-5398	18 May-21 12:30	19 May-21 11:20	26h (0.1 °C)		
GH_ERC	21-0704-4941	18 May-21 11:20	19 May-21 11:20	27h (0.6 °C)		
CM_MC2	17-6814-6287	18 May-21 09:50	19 May-21 11:20	28h (1.1 °C)		
EV_MC2	15-5628-9197	18 May-21 13:00	19 May-21 11:20	25h (3.6 °C)		
EV_HC1	05-8730-9056	18 May-21 11:20	19 May-21 11:20	27h (4.8 °C)		
LC_DCDS	20-0340-1068	18 May-21 11:00	19 May-21 11:20	27h (4.6 °C)		
LC_LC3	18-4816-9590	18 May-21 10:15	19 May-21 11:20	28h (4.7 °C)		
LC_LC5	03-8768-2280	18 May-21 09:50	19 May-21 11:20	28h (5.2 °C)		
LC_LCDSSLCC	02-2977-6783	18 May-21 11:00	19 May-21 11:20	27h (4.3 °C)		
RG_MIDAG	19-6180-4600	18 May-21 09:15	19 May-21 11:20	29h (0.1 °C)		
FR_FR4	17-1641-7069	18 May-21 09:29	19 May-21 11:20	29h (4.6 °C)		
FR_FR2	11-2149-8709	18 May-21 10:28	19 May-21 11:20	28h (4.6 °C)		
FR_MULTIPLATE	16-7235-2081	18 May-21 11:21	19 May-21 11:20	27h (3.4 °C)		
FR_FRRD	06-3190-8505	18 May-21 08:22	19 May-21 11:20	30h (3.4 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_UFR1	Water Sample	Teck Coal	FR_UFR1_WEK_2021-05-1	
GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-05-18_	
CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-05-18	
LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-05-18_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_WEK_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_WEK_2021-05	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-05-18_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-05-18	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-05-18	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2020_Q2_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2020_Q2_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-05-18	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-05-18_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-05-18_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	
RG_MIDAG	Water Sample	Teck Coal	RG_MIDAG_WS_2021-05-	
FR_FR4	Water Sample	Teck Coal	FR_FR4_WS_2021-05-18_	
FR_FR2	Water Sample	Teck Coal	FR_FR2_WS_2021-05-18_	
FR_MULTIPLATE	Water Sample	Teck Coal	FR_MULTIPLATE_WS_202	
FR_FRRD	Water Sample	Teck Coal	FR_FRRD_WS_2021-05-18	

Ceriodaphnia 7-d Survival and Reproduction Test

Nautilus Environmental

Analysis ID: 09-5956-5924 Endpoint: Reproduction CETIS Version: CETISv1.9.4
Analyzed: 11 Jun-21 14:28 Analysis: Nonparametric-Control vs Treatments Status Level: 1

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	GH_ER2 passed reproduction	25.46%
		CM_MC1 passed reproduction	25.46%
		LC_SLC passed reproduction	25.46%
		FR_FRABCH passed reproduction	25.46%
		FR_FRCP1 passed reproduction	25.46%
		GH_FR1 passed reproduction	25.46%
		GH_ERC passed reproduction	25.46%
		CM_MC2 passed reproduction	25.46%
		EV_MC2 passed reproduction	25.46%
		EV_HC1 passed reproduction	25.46%
		LC_DCDS passed reproduction	25.46%
		LC_LC3 passed reproduction	25.46%
		LC_LC5 passed reproduction	25.46%
		LC_LCDSSLCC passed reproduction	25.46%
		RG_MIDAG passed reproduction	25.46%
		FR_FR4 passed reproduction	25.46%
		FR_FR2 passed reproduction	25.46%
		FR_MULTIPLATE passed reproduction	25.46%
		FR_FRRD passed reproduction	25.46%

Steel Many-One Rank Sum Test

Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)
Site Control		GH_ER2	121	70	2	18	CDF	0.9993	Non-Significant Effect
FR_UFRJ		CM_MC1	103.5	70	2	18	CDF	0.9332	Non-Significant Effect
		LC_SLC	100.5	70	4	18	CDF	0.8869	Non-Significant Effect
		FR_FRABCH	97.5	70	3	18	CDF	0.8217	Non-Significant Effect
		FR_FRCP1	103	70	3	18	CDF	0.9267	Non-Significant Effect
		GH_FR1	94	70	3	18	CDF	0.7213	Non-Significant Effect
		GH_ERC	108	70	2	18	CDF	0.9735	Non-Significant Effect
		CM_MC2	85.5	70	4	18	CDF	0.4127	Non-Significant Effect
		EV_MC2	86	70	3	18	CDF	0.4312	Non-Significant Effect
		EV_HC1	80	70	4	18	CDF	0.2305	Non-Significant Effect
		LC_DCDS	82.5	70	2	18	CDF	0.3075	Non-Significant Effect
		LC_LC3	100	70	4	18	CDF	0.8774	Non-Significant Effect
		LC_LC5	79.5	70	2	18	CDF	0.2165	Non-Significant Effect
		LC_LCDSSLCC	78.5	70	3	18	CDF	0.1902	Non-Significant Effect
		RG_MIDAG	103	70	3	18	CDF	0.9267	Non-Significant Effect
		FR_FR4	112.5	70	5	18	CDF	0.9912	Non-Significant Effect
		FR_FR2	112	70	5	18	CDF	0.9900	Non-Significant Effect
		FR_MULTIPLATE	102	70	2	18	CDF	0.9123	Non-Significant Effect
		FR_FRRD	93	70	4	18	CDF	0.6884	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	3.792	3.606	0.0228	Outlier Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	647.455	34.0766	19	1.353	0.1559	Non-Significant Effect
Error	4533.1	25.1839	180			
Total	5180.56		199			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance Test	42.39	36.19	0.0016	Unequal Variances

Ceriodaphnia 7-d Survival and Reproduction Test

Nautilus Environmental

Analysis ID: 09-5956-5924 Endpoint: Reproduction CETIS Version: CETISv1.9.4
Analyzed: 11 Jun-21 14:28 Analysis: Nonparametric-Control vs Treatments Status Level: 1

Distribution					
	Shapiro-Wilk W Normality Test	0.9688	0.9816	2.0E-04	Non-Normal Distribution

Reproduction Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
FR_UFR1	XC	10	23.4	21.71	25.09	23	20	27	0.7483	10.11%	0.00%
GH_ER2		10	24.5	20.53	28.47	25.5	12	31	1.753	22.62%	-4.70%
CM_MC1		10	23.8	20.75	26.85	22.5	19	32	1.348	17.91%	-1.71%
LC_SLC		10	23.6	20.82	26.38	22.5	20	34	1.231	16.50%	-0.85%
FR_FRABCH		10	23.1	19.95	26.25	22.5	19	31	1.394	19.08%	1.28%
FR_FRCP1		10	23.5	20.69	26.31	23	18	33	1.241	16.69%	-0.43%
GH_FR1		10	22	19.79	24.21	22.5	16	27	0.9775	14.05%	5.98%
GH_ERC		10	23.4	18.17	28.63	24	13	36	2.31	31.22%	0.00%
CM_MC2		10	21.3	19.06	23.54	21.5	16	26	0.9894	14.69%	8.97%
EV_MC2		10	19.2	14.13	24.27	20	7	28	2.24	36.89%	17.95%
EV_HC1		10	21	19.45	22.55	21.5	18	24	0.6831	10.29%	10.26%
LC_DCDS		10	21.4	17.13	25.67	19.5	15	35	1.887	27.88%	8.55%
LC_LC3		10	22.2	19	25.4	22.5	13	28	1.413	20.12%	5.13%
LC_LC5		10	18.1	11.74	24.46	19	0	32	2.81	49.10%	22.65%
LC_LCDSSLCC		10	19.5	14.91	24.09	21	2	24	2.029	32.90%	16.67%
RG_MIDAG		10	23.3	20.46	26.14	23	17	31	1.257	17.05%	0.43%
FR_FR4		10	24.7	21.23	28.17	25	18	31	1.535	19.65%	-5.56%
FR_FR2		10	24.5	21.93	27.07	23.5	21	33	1.138	14.69%	-4.70%
FR_MULTIPLATE		10	23.5	19.67	27.33	22	14	32	1.695	22.81%	-0.43%
FR_FRRD		10	22.3	19.54	25.06	21	17	28	1.221	17.31%	4.70%

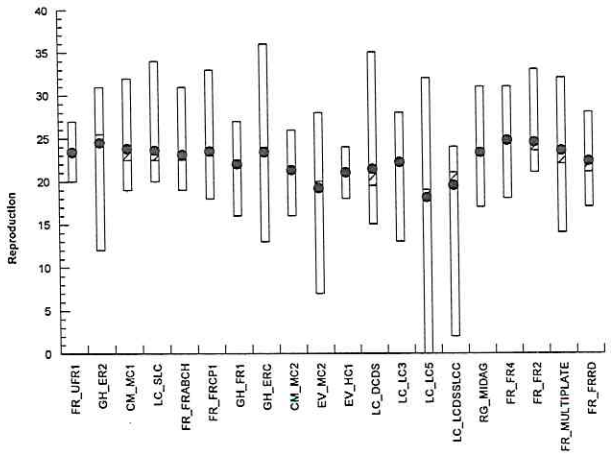
Reproduction Detail

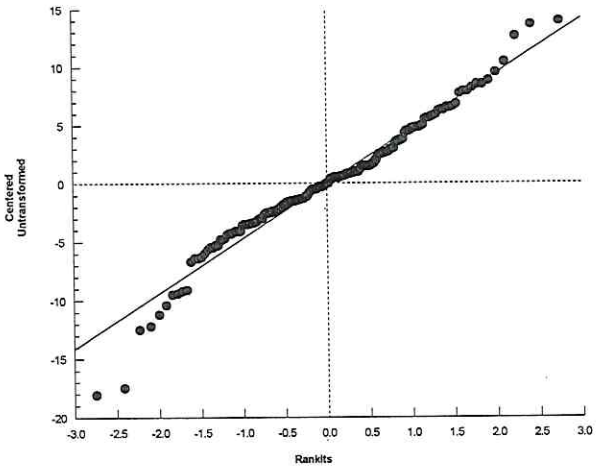
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
FR_UFR1	XC	21	20	24	22	26	26	22	27	22	24
GH_ER2		19	25	31	25	23	30	27	27	12	26
CM_MC1		22	22	23	25	19	19	24	32	30	22
LC_SLC		20	34	24	24	22	22	22	21	24	23
FR_FRABCH		19	22	23	31	19	29	19	26	19	24
FR_FRCP1		20	25	22	33	23	23	23	24	24	18
GH_FR1		16	20	22	27	25	19	23	22	23	23
GH_ERC		27	13	14	17	36	29	23	29	25	21
CM_MC2		20	21	25	16	21	22	26	17	22	23
EV_MC2		8	26	28	20	18	7	20	24	17	24
EV_HC1		24	23	23	22	21	20	19	22	18	18
LC_DCDS		17	18	35	20	22	18	28	19	15	22
LC_LC3		23	28	20	22	26	27	22	23	13	18
LC_LC5		17	26	32	21	0	23	9	19	15	19
LC_LCDSSLCC		21	21	18	20	21	24	2	24	21	23
RG_MIDAG		23	26	25	23	21	31	19	26	22	17
FR_FR4		22	24	31	31	19	26	18	29	27	20
FR_FR2		24	22	23	33	21	26	25	23	27	21
FR_MULTIPLATE		32	14	23	21	20	21	30	21	28	25
FR_FRRD		19	20	19	25	21	21	17	28	26	27

Ceriodaphnia 7-d Survival and Reproduction Test — **Nautilus Environmental**

Analysis ID:	09-5956-5924	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.9.4
Analyzed:	11 Jun-21 14:28	**Analysis:**	Nonparametric-Control vs Treatments	**Status Level:**	1

Graphics





Ceriodaphnia 7-d Survival and Reproduction Test

Nautilus Environmental

Analysis ID:	09-1118-3203	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.9.4
Analyzed:	11 Jun-21 14:29	**Analysis:**	Nonparametric-Control vs Treatments	**Status Level:**	1
Batch ID:	19-5534-0118	**Test Type:**	Reproduction-Survival (7d)	**Analyst:**	Sierra Klueppel
Start Date:	19 May-21 14:00	**Protocol:**	EC/EPS 1/RM/21	**Diluent:**	20% Perrier Water
Ending Date:	27 May-21 15:00	**Species:**	Ceriodaphnia dubia	**Brine:**	
Test Length:	8d 1h	**Taxon:**	Branchiopoda	**Source:**	In-House Culture **Age:** <24

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
FR_UFR1	12-4424-2146	18 May-21	19 May-21 11:20	38h (2.3 °C)	Teck Coal	
GH_ER2	02-4275-7088	18 May-21 09:55	19 May-21 11:20	28h (0.4 °C)		
CM_MC1	01-4263-6393	18 May-21 11:08	19 May-21 11:20	27h (1.1 °C)		
LC_SLC	12-1662-7355	18 May-21 09:45	19 May-21 11:20	28h (4.1 °C)		
FR_FRABCH	05-6713-4959	18 May-21	19 May-21 11:20	38h (1.9 °C)		
FR_FRCP1	19-8027-7867	18 May-21	19 May-21 11:20	38h (1.2 °C)		
GH_FR1	15-9886-5398	18 May-21 12:30	19 May-21 11:20	26h (0.1 °C)		
GH_ERC	21-0704-4941	18 May-21 11:20	19 May-21 11:20	27h (0.6 °C)		
CM_MC2	17-6814-6287	18 May-21 09:50	19 May-21 11:20	28h (1.1 °C)		
EV_MC2	15-5628-9197	18 May-21 13:00	19 May-21 11:20	25h (3.6 °C)		
EV_HC1	05-8730-9056	18 May-21 11:20	19 May-21 11:20	27h (4.8 °C)		
LC_DCDS	20-0340-1068	18 May-21 11:00	19 May-21 11:20	27h (4.6 °C)		
LC_LC3	18-4816-9590	18 May-21 10:15	19 May-21 11:20	28h (4.7 °C)		
LC_LC5	03-8768-2280	18 May-21 09:50	19 May-21 11:20	28h (5.2 °C)		
LC_LCDSSLCC	02-2977-6783	18 May-21 11:00	19 May-21 11:20	27h (4.3 °C)		
RG_MIDAG	19-6180-4600	18 May-21 09:15	19 May-21 11:20	29h (0.1 °C)		
FR_FR4	17-1641-7069	18 May-21 09:29	19 May-21 11:20	29h (4.6 °C)		
FR_FR2	11-2149-8709	18 May-21 10:28	19 May-21 11:20	28h (4.6 °C)		
FR_MULTIPLATE	16-7235-2081	18 May-21 11:21	19 May-21 11:20	27h (3.4 °C)		
FR_FRRD	06-3190-8505	18 May-21 08:22	19 May-21 11:20	30h (3.4 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_UFR1	Water Sample	Teck Coal	FR_UFR1_WEK_2021-05-1	
GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-05-18_	
CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-05-18	
LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-05-18_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_WEK_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_WEK_2021-05	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-05-18_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-05-18	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-05-18	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2020_Q2_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2020_Q2_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-05-18	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-05-18_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-05-18_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	
RG_MIDAG	Water Sample	Teck Coal	RG_MIDAG_WS_2021-05-	
FR_FR4	Water Sample	Teck Coal	FR_FR4_WS_2021-05-18_	
FR_FR2	Water Sample	Teck Coal	FR_FR2_WS_2021-05-18_	
FR_MULTIPLATE	Water Sample	Teck Coal	FR_MULTIPLATE_WS_202	
FR_FRRD	Water Sample	Teck Coal	FR_FRRD_WS_2021-05-18	

Analyst: SAM QA: [illegible] 22/6/21

Ceriodaphnia 7-d Survival and Reproduction Test — **Nautilus Environmental**

Analysis ID: 09-1118-3203 **Endpoint:** Reproduction **CETIS Version:** CETISv1.9.4
Analyzed: 11 Jun-21 14:29 **Analysis:** Nonparametric-Control vs Treatments **Status Level:** 1

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	FR_UFR1 passed reproduction	24.31%
		CM_MC1 passed reproduction	24.31%
		LC_SLC passed reproduction	24.31%
		FR_FRABCH passed reproduction	24.31%
		FR_FRCP1 passed reproduction	24.31%
		GH_FR1 passed reproduction	24.31%
		GH_ERC passed reproduction	24.31%
		CM_MC2 passed reproduction	24.31%
		EV_MC2 passed reproduction	24.31%
		EV_HC1 passed reproduction	24.31%
		LC_DCDS passed reproduction	24.31%
		LC_LC3 passed reproduction	24.31%
		LC_LC5 passed reproduction	24.31%
		LC_LCDSSLCC passed reproduction	24.31%
		RG_MIDAG passed reproduction	24.31%
		FR_FR4 passed reproduction	24.31%
		FR_FR2 passed reproduction	24.31%
		FR_MULTIPLATE passed reproduction	24.31%
		FR_FRRD passed reproduction	24.31%

Steel Many-One Rank Sum Test

Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)
Site Control		FR_UFR1	89	70	2	18	CDF	0.5440	Non-Significant Effect
GH-ER2		CM_MC1	92	70	4	18	CDF	0.6539	Non-Significant Effect
		LC_SLC	86.5	70	1	18	CDF	0.4498	Non-Significant Effect
		FR_FRABCH	91.5	70	4	18	CDF	0.6362	Non-Significant Effect
		FR_FRCP1	87.5	70	2	18	CDF	0.4874	Non-Significant Effect
		GH_FR1	82	70	4	18	CDF	0.2912	Non-Significant Effect
		GH_ERC	99.5	70	3	18	CDF	0.8674	Non-Significant Effect
		CM_MC2	79	70	3	18	CDF	0.2031	Non-Significant Effect
		EV_MC2	80.5	70	1	18	CDF	0.2449	Non-Significant Effect
		EV_HC1	74.5	70	2	18	CDF	0.1059	Non-Significant Effect
		LC_DCDS	84.5	70	1	18	CDF	0.3764	Non-Significant Effect
		LC_LC3	88.5	70	3	18	CDF	0.5252	Non-Significant Effect
		LC_LC5	80	70	3	18	CDF	0.2305	Non-Significant Effect
		LC_LCDSSLCC	74.5	70	1	18	CDF	0.1059	Non-Significant Effect
		RG_MIDAG	91	70	5	18	CDF	0.6181	Non-Significant Effect
		FR_FR4	104	70	4	18	CDF	0.9392	Non-Significant Effect
		FR_FR2	95.5	70	4	18	CDF	0.7674	Non-Significant Effect
		FR_MULTIPLATE	97	70	3	18	CDF	0.8089	Non-Significant Effect
		FR_FRRD	89.5	70	4	18	CDF	0.5628	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	3.792	3.606	0.0228	Outlier Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	647.455	34.0766	19	1.353	0.1559	Non-Significant Effect
Error	4533.1	25.1839	180			
Total	5180.56		199			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance Test	42.39	36.19	0.0016	Unequal Variances

Ceriodaphnia 7-d Survival and Reproduction Test — **Nautilus Environmental**

Analysis ID: 09-1118-3203 **Endpoint:** Reproduction **CETIS Version:** CETISv1.9.4
Analyzed: 11 Jun-21 14:29 **Analysis:** Nonparametric-Control vs Treatments **Status Level:** 1

Distribution					
Shapiro-Wilk W Normality Test	0.9688	0.9816	2.0E-04	Non-Normal Distribution	

Reproduction Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
FR_UFR1		10	23.4	21.71	25.09	23	20	27	0.7483	10.11%	0.00%
GH_ER2	XC	10	24.5	20.53	28.47	25.5	12	31	1.753	22.62%	-4.70%
CM_MC1		10	23.8	20.75	26.85	22.5	19	32	1.348	17.91%	-1.71%
LC_SLC		10	23.6	20.82	26.38	22.5	20	34	1.231	16.50%	-0.85%
FR_FRABCH		10	23.1	19.95	26.25	22.5	19	31	1.394	19.08%	1.28%
FR_FRCP1		10	23.5	20.69	26.31	23	18	33	1.241	16.69%	-0.43%
GH_FR1		10	22	19.79	24.21	22.5	16	27	0.9775	14.05%	5.98%
GH_ERC		10	23.4	18.17	28.63	24	13	36	2.31	31.22%	0.00%
CM_MC2		10	21.3	19.06	23.54	21.5	16	26	0.9894	14.69%	8.97%
EV_MC2		10	19.2	14.13	24.27	20	7	28	2.24	36.89%	17.95%
EV_HC1		10	21	19.45	22.55	21.5	18	24	0.6831	10.29%	10.26%
LC_DCDS		10	21.4	17.13	25.67	19.5	15	35	1.887	27.88%	8.55%
LC_LC3		10	22.2	19	25.4	22.5	13	28	1.413	20.12%	5.13%
LC_LC5		10	18.1	11.74	24.46	19	0	32	2.81	49.10%	22.65%
LC_LCDSSLCC		10	19.5	14.91	24.09	21	2	24	2.029	32.90%	16.67%
RG_MIDAG		10	23.3	20.46	26.14	23	17	31	1.257	17.05%	0.43%
FR_FR4		10	24.7	21.23	28.17	25	18	31	1.535	19.65%	-5.56%
FR_FR2		10	24.5	21.93	27.07	23.5	21	33	1.138	14.69%	-4.70%
FR_MULTIPLATE		10	23.5	19.67	27.33	22	14	32	1.695	22.81%	-0.43%
FR_FRRD		10	22.3	19.54	25.06	21	17	28	1.221	17.31%	4.70%

Reproduction Detail

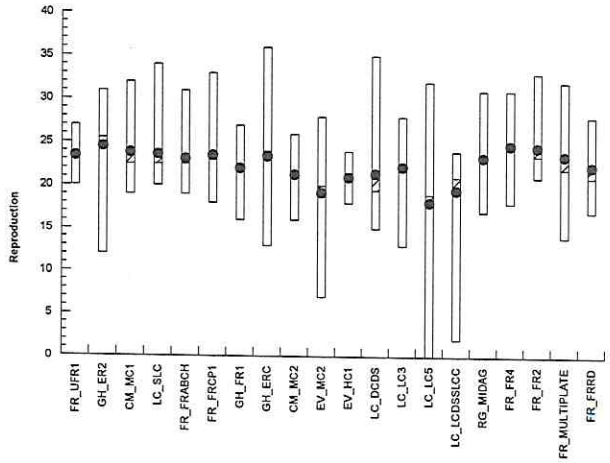
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
FR_UFR1		21	20	24	22	26	26	22	27	22	24
GH_ER2	XC	19	25	31	25	23	30	27	27	12	26
CM_MC1		22	22	23	25	19	19	24	32	30	22
LC_SLC		20	34	24	24	22	22	22	21	24	23
FR_FRABCH		19	22	23	31	19	29	19	26	19	24
FR_FRCP1		20	25	22	33	23	23	23	24	24	18
GH_FR1		16	20	22	27	25	19	23	22	23	23
GH_ERC		27	13	14	17	36	29	23	29	25	21
CM_MC2		20	21	25	16	21	22	26	17	22	23
EV_MC2		8	26	28	20	18	7	20	24	17	24
EV_HC1		24	23	23	22	21	20	19	22	18	18
LC_DCDS		17	18	35	20	22	18	28	19	15	22
LC_LC3		23	28	20	22	26	27	22	23	13	18
LC_LC5		17	26	32	21	0	23	9	19	15	19
LC_LCDSSLCC		21	21	18	20	21	24	2	24	21	23
RG_MIDAG		23	26	25	23	21	31	19	26	22	17
FR_FR4		22	24	31	31	19	26	18	29	27	20
FR_FR2		24	22	23	33	21	26	25	23	27	21
FR_MULTIPLATE		32	14	23	21	20	21	30	21	28	25
FR_FRRD		19	20	19	25	21	21	17	28	26	27

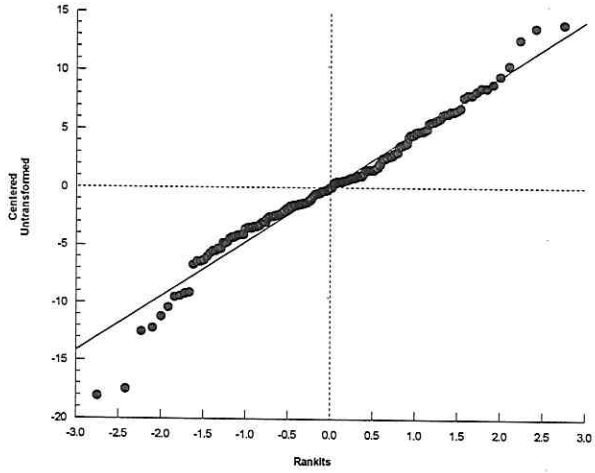
Ceriodaphnia 7-d Survival and Reproduction Test

Nautilus Environmental

Analysis ID: 09-1118-3203 **Endpoint:** Reproduction **CETIS Version:** CETISv1.9.4
Analyzed: 11 Jun-21 14:29 **Analysis:** Nonparametric-Control vs Treatments **Status Level:** 1

Graphics





Analyst: SNH QA: June 22/21

Ceriodaphnia 7-d Survival and Reproduction Test — **Nautilus Environmental**

Analysis ID:	07-7088-5807	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.9.4
Analyzed:	11 Jun-21 14:31	**Analysis:**	Nonparametric-Control vs Treatments	**Status Level:**	1
Batch ID:	19-5534-0118	**Test Type:**	Reproduction-Survival (7d)	**Analyst:**	Sierra Klueppel
Start Date:	19 May-21 14:00	**Protocol:**	EC/EPS 1/RM/21	**Diluent:**	20% Perrier Water
Ending Date:	27 May-21 15:00	**Species:**	Ceriodaphnia dubia	**Brine:**	
Test Length:	8d 1h	**Taxon:**	Branchiopoda	**Source:**	In-House Culture **Age:** <24

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
FR_UFR1	12-4424-2146	18 May-21	19 May-21 11:20	38h (2.3 °C)	Teck Coal	
GH_ER2	02-4275-7088	18 May-21 09:55	19 May-21 11:20	28h (0.4 °C)		
CM_MC1	01-4263-6393	18 May-21 11:08	19 May-21 11:20	27h (1.1 °C)		
LC_SLC	12-1662-7355	18 May-21 09:45	19 May-21 11:20	28h (4.1 °C)		
FR_FRABCH	05-6713-4959	18 May-21	19 May-21 11:20	38h (1.9 °C)		
FR_FRCP1	19-8027-7867	18 May-21	19 May-21 11:20	38h (1.2 °C)		
GH_FR1	15-9886-5398	18 May-21 12:30	19 May-21 11:20	26h (0.1 °C)		
GH_ERC	21-0704-4941	18 May-21 11:20	19 May-21 11:20	27h (0.6 °C)		
CM_MC2	17-6814-6287	18 May-21 09:50	19 May-21 11:20	28h (1.1 °C)		
EV_MC2	15-5628-9197	18 May-21 13:00	19 May-21 11:20	25h (3.6 °C)		
EV_HC1	05-8730-9056	18 May-21 11:20	19 May-21 11:20	27h (4.8 °C)		
LC_DCDS	20-0340-1068	18 May-21 11:00	19 May-21 11:20	27h (4.6 °C)		
LC_LC3	18-4816-9590	18 May-21 10:15	19 May-21 11:20	28h (4.7 °C)		
LC_LC5	03-8768-2280	18 May-21 09:50	19 May-21 11:20	28h (5.2 °C)		
LC_LCDSSLCC	02-2977-6783	18 May-21 11:00	19 May-21 11:20	27h (4.3 °C)		
RG_MIDAG	19-6180-4600	18 May-21 09:15	19 May-21 11:20	29h (0.1 °C)		
FR_FR4	17-1641-7069	18 May-21 09:29	19 May-21 11:20	29h (4.6 °C)		
FR_FR2	11-2149-8709	18 May-21 10:28	19 May-21 11:20	28h (4.6 °C)		
FR_MULTIPLATE	16-7235-2081	18 May-21 11:21	19 May-21 11:20	27h (3.4 °C)		
FR_FRRD	06-3190-8505	18 May-21 08:22	19 May-21 11:20	30h (3.4 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_UFR1	Water Sample	Teck Coal	FR_UFR1_WEK_2021-05-1	
GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-05-18_	
CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-05-18	
LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-05-18_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_WEK_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_WEK_2021-05	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-05-18_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-05-18	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-05-18	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2020_Q2_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2020_Q2_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-05-18	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-05-18_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-05-18_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	
RG_MIDAG	Water Sample	Teck Coal	RG_MIDAG_WS_2021-05-	
FR_FR4	Water Sample	Teck Coal	FR_FR4_WS_2021-05-18_	
FR_FR2	Water Sample	Teck Coal	FR_FR2_WS_2021-05-18_	
FR_MULTIPLATE	Water Sample	Teck Coal	FR_MULTIPLATE_WS_202	
FR_FRRD	Water Sample	Teck Coal	FR_FRRD_WS_2021-05-18	

Ceriodaphnia 7-d Survival and Reproduction Test — **Nautilus Environmental**

Analysis ID: 07-7088-5807 **Endpoint:** Reproduction **CETIS Version:** CETISv1.9.4
Analyzed: 11 Jun-21 14:31 **Analysis:** Nonparametric-Control vs Treatments **Status Level:** 1

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	FR_UFR1 passed reproduction	25.03%
		GH_ER2 passed reproduction	25.03%
		LC_SLC passed reproduction	25.03%
		FR_FRABCH passed reproduction	25.03%
		FR_FRCP1 passed reproduction	25.03%
		GH_FR1 passed reproduction	25.03%
		GH_ERC passed reproduction	25.03%
		CM_MC2 passed reproduction	25.03%
		EV_MC2 passed reproduction	25.03%
		EV_HC1 passed reproduction	25.03%
		LC_DCDS passed reproduction	25.03%
		LC_LC3 passed reproduction	25.03%
		LC_LC5 passed reproduction	25.03%
		LC_LCDSSLCC passed reproduction	25.03%
		RG_MIDAG passed reproduction	25.03%
		FR_FR4 passed reproduction	25.03%
		FR_FR2 passed reproduction	25.03%
		FR_MULTIPLATE passed reproduction	25.03%
		FR_FRRD passed reproduction	25.03%

Steel Many-One Rank Sum Test

Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)
Site Control		FR_UFR1	106.5	70	2	18	CDF	0.9633	Non-Significant Effect
CM_MC1		GH_ER2	118	70	4	18	CDF	0.9982	Non-Significant Effect
		LC_SLC	104.5	70	3	18	CDF	0.9448	Non-Significant Effect
		FR_FRABCH	99.5	70	4	18	CDF	0.8674	Non-Significant Effect
		FR_FRCP1	107.5	70	4	18	CDF	0.9704	Non-Significant Effect
		GH_FR1	97	70	4	18	CDF	0.8089	Non-Significant Effect
		GH_ERC	104	70	2	18	CDF	0.9392	Non-Significant Effect
		CM_MC2	89	70	3	18	CDF	0.5440	Non-Significant Effect
		EV_MC2	88	70	1	18	CDF	0.5063	Non-Significant Effect
		EV_HC1	84.5	70	4	18	CDF	0.3764	Non-Significant Effect
		LC_DCDS	83	70	2	18	CDF	0.3242	Non-Significant Effect
		LC_LC3	99	70	2	18	CDF	0.8568	Non-Significant Effect
		LC_LC5	82	70	3	18	CDF	0.2912	Non-Significant Effect
		LC_LCDSSLCC	83.5	70	2	18	CDF	0.3412	Non-Significant Effect
		RG_MIDAG	105	70	4	18	CDF	0.9500	Non-Significant Effect
		FR_FR4	110	70	3	18	CDF	0.9834	Non-Significant Effect
		FR_FR2	113.5	70	4	18	CDF	0.9933	Non-Significant Effect
		FR_MULTIPLATE	102	70	4	18	CDF	0.9123	Non-Significant Effect
		FR_FRRD	94.5	70	2	18	CDF	0.7371	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	3.792	3.606	0.0228	Outlier Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	647.455	34.0766	19	1.353	0.1559	Non-Significant Effect
Error	4533.1	25.1839	180			
Total	5180.56		199			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance Test	42.39	36.19	0.0016	Unequal Variances

Ceriodaphnia 7-d Survival and Reproduction Test **Nautilus Environmental**

Analysis ID: 07-7088-5807 **Endpoint:** Reproduction **CETIS Version:** CETISv1.9.4
Analyzed: 11 Jun-21 14:31 **Analysis:** Nonparametric-Control vs Treatments **Status Level:** 1

Distribution	Shapiro-Wilk W Normality Test	0.9688	0.9816	2.0E-04	Non-Normal Distribution

Reproduction Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
FR_UFR1		10	23.4	21.71	25.09	23	20	27	0.7483	10.11%	0.00%
GH_ER2		10	24.5	20.53	28.47	25.5	12	31	1.753	22.62%	-4.70%
CM_MC1	XC	10	23.8	20.75	26.85	22.5	19	32	1.348	17.91%	-1.71%
LC_SLC		10	23.6	20.82	26.38	22.5	20	34	1.231	16.50%	-0.85%
FR_FRABCH		10	23.1	19.95	26.25	22.5	19	31	1.394	19.08%	1.28%
FR_FRCP1		10	23.5	20.69	26.31	23	18	33	1.241	16.69%	-0.43%
GH_FR1		10	22	19.79	24.21	22.5	16	27	0.9775	14.05%	5.98%
GH_ERC		10	23.4	18.17	28.63	24	13	36	2.31	31.22%	0.00%
CM_MC2		10	21.3	19.06	23.54	21.5	16	26	0.9894	14.69%	8.97%
EV_MC2		10	19.2	14.13	24.27	20	7	28	2.24	36.89%	17.95%
EV_HC1		10	21	19.45	22.55	21.5	18	24	0.6831	10.29%	10.26%
LC_DCDS		10	21.4	17.13	25.67	19.5	15	35	1.887	27.88%	8.55%
LC_LC3		10	22.2	19	25.4	22.5	13	28	1.413	20.12%	5.13%
LC_LC5		10	18.1	11.74	24.46	19	0	32	2.81	49.10%	22.65%
LC_LCDSSLCC		10	19.5	14.91	24.09	21	2	24	2.029	32.90%	16.67%
RG_MIDAG		10	23.3	20.46	26.14	23	17	31	1.257	17.05%	0.43%
FR_FR4		10	24.7	21.23	28.17	25	18	31	1.535	19.65%	-5.56%
FR_FR2		10	24.5	21.93	27.07	23.5	21	33	1.138	14.69%	-4.70%
FR_MULTIPLATE		10	23.5	19.67	27.33	22	14	32	1.695	22.81%	-0.43%
FR_FRRD		10	22.3	19.54	25.06	21	17	28	1.221	17.31%	4.70%

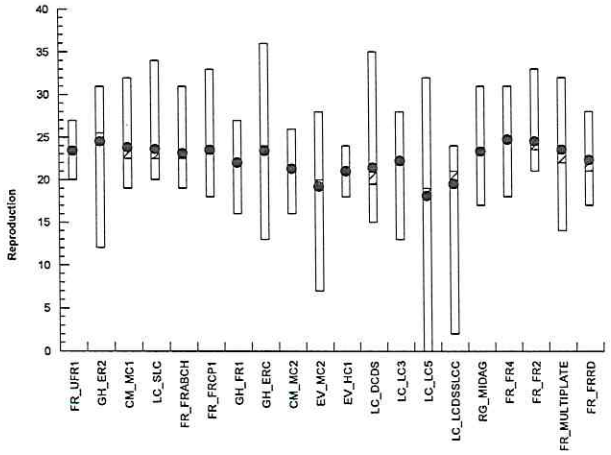
Reproduction Detail

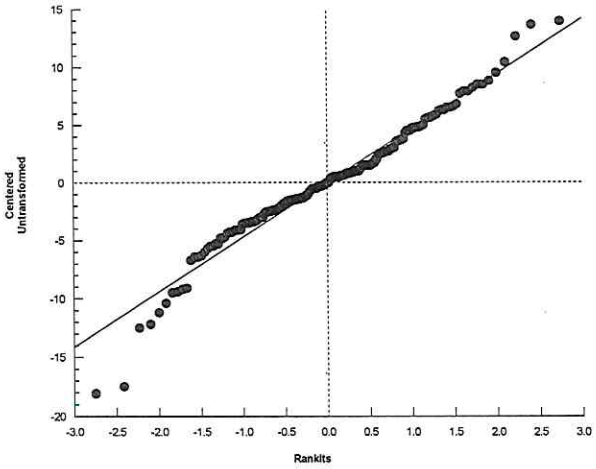
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
FR_UFR1		21	20	24	22	26	26	22	27	22	24
GH_ER2		19	25	31	25	23	30	27	27	12	26
CM_MC1	XC	22	22	23	25	19	19	24	32	30	22
LC_SLC		20	34	24	24	22	22	22	21	24	23
FR_FRABCH		19	22	23	31	19	29	19	26	19	24
FR_FRCP1		20	25	22	33	23	23	23	24	24	18
GH_FR1		16	20	22	27	25	19	23	22	23	23
GH_ERC		27	13	14	17	36	29	23	29	25	21
CM_MC2		20	21	25	16	21	22	26	17	22	23
EV_MC2		8	26	28	20	18	7	20	24	17	24
EV_HC1		24	23	23	22	21	20	19	22	18	18
LC_DCDS		17	18	35	20	22	18	28	19	15	22
LC_LC3		23	28	20	22	26	27	22	23	13	18
LC_LC5		17	26	32	21	0	23	9	19	15	19
LC_LCDSSLCC		21	21	18	20	21	24	2	24	21	23
RG_MIDAG		23	26	25	23	21	31	19	26	22	17
FR_FR4		22	24	31	31	19	26	18	29	27	20
FR_FR2		24	22	23	33	21	26	25	23	27	21
FR_MULTIPLATE		32	14	23	21	20	21	30	21	28	25
FR_FRRD		19	20	19	25	21	21	17	28	26	27

Ceriodaphnia 7-d Survival and Reproduction Test — **Nautilus Environmental**

Analysis ID:	07-7088-5807	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.9.4
Analyzed:	11 Jun-21 14:31	**Analysis:**	Nonparametric-Control vs Treatments	**Status Level:**	1

Graphics





 Analyst: SAM QA: 22/21

Ceriodaphnia 7-d Survival and Reproduction Test — **Nautilus Environmental**

Analysis ID:	12-3106-0201	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.9.4
Analyzed:	11 Jun-21 14:32	**Analysis:**	Nonparametric-Control vs Treatments	**Status Level:**	1
Batch ID:	19-5534-0118	**Test Type:**	Reproduction-Survival (7d)	**Analyst:**	Sierra Klueppel
Start Date:	19 May-21 14:00	**Protocol:**	EC/EPS 1/RM/21	**Diluent:**	20% Perrier Water
Ending Date:	27 May-21 15:00	**Species:**	Ceriodaphnia dubia	**Brine:**	
Test Length:	8d 1h	**Taxon:**	Branchiopoda	**Source:**	In-House Culture **Age:** <24

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
FR_UFR1	12-4424-2146	18 May-21	19 May-21 11:20	38h (2.3 °C)	Teck Coal	
GH_ER2	02-4275-7088	18 May-21 09:55	19 May-21 11:20	28h (0.4 °C)		
CM_MC1	01-4263-6393	18 May-21 11:08	19 May-21 11:20	27h (1.1 °C)		
LC_SLC	12-1662-7355	18 May-21 09:45	19 May-21 11:20	28h (4.1 °C)		
FR_FRABCH	05-6713-4959	18 May-21	19 May-21 11:20	38h (1.9 °C)		
FR_FRCP1	19-8027-7867	18 May-21	19 May-21 11:20	38h (1.2 °C)		
GH_FR1	15-9886-5398	18 May-21 12:30	19 May-21 11:20	26h (0.1 °C)		
GH_ERC	21-0704-4941	18 May-21 11:20	19 May-21 11:20	27h (0.6 °C)		
CM_MC2	17-6814-6287	18 May-21 09:50	19 May-21 11:20	28h (1.1 °C)		
EV_MC2	15-5628-9197	18 May-21 13:00	19 May-21 11:20	25h (3.6 °C)		
EV_HC1	05-8730-9056	18 May-21 11:20	19 May-21 11:20	27h (4.8 °C)		
LC_DCDS	20-0340-1068	18 May-21 11:00	19 May-21 11:20	27h (4.6 °C)		
LC_LC3	18-4816-9590	18 May-21 10:15	19 May-21 11:20	28h (4.7 °C)		
LC_LC5	03-8768-2280	18 May-21 09:50	19 May-21 11:20	28h (5.2 °C)		
LC_LCDSSLCC	02-2977-6783	18 May-21 11:00	19 May-21 11:20	27h (4.3 °C)		
RG_MIDAG	19-6180-4600	18 May-21 09:15	19 May-21 11:20	29h (0.1 °C)		
FR_FR4	17-1641-7069	18 May-21 09:29	19 May-21 11:20	29h (4.6 °C)		
FR_FR2	11-2149-8709	18 May-21 10:28	19 May-21 11:20	28h (4.6 °C)		
FR_MULTIPLATE	16-7235-2081	18 May-21 11:21	19 May-21 11:20	27h (3.4 °C)		
FR_FRRD	06-3190-8505	18 May-21 08:22	19 May-21 11:20	30h (3.4 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_UFR1	Water Sample	Teck Coal	FR_UFR1_WEK_2021-05-1	
GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-05-18_	
CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-05-18	
LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-05-18_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_WEK_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_WEK_2021-05	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-05-18_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-05-18	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-05-18	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2020_Q2_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2020_Q2_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-05-18	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-05-18_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-05-18_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	
RG_MIDAG	Water Sample	Teck Coal	RG_MIDAG_WS_2021-05-	
FR_FR4	Water Sample	Teck Coal	FR_FR4_WS_2021-05-18_	
FR_FR2	Water Sample	Teck Coal	FR_FR2_WS_2021-05-18_	
FR_MULTIPLATE	Water Sample	Teck Coal	FR_MULTIPLATE_WS_202	
FR_FRRD	Water Sample	Teck Coal	FR_FRRD_WS_2021-05-18	

Analyst: SKM QA: June 22/21

Ceriodaphnia 7-d Survival and Reproduction Test — **Nautilus Environmental**

Analysis ID: 12-3106-0201 **Endpoint:** Reproduction **CETIS Version:** CETISv1.9.4
Analyzed: 11 Jun-21 14:32 **Analysis:** Nonparametric-Control vs Treatments **Status Level:** 1

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	FR_UFR1 passed reproduction	25.24%
		GH_ER2 passed reproduction	25.24%
		CM_MC1 passed reproduction	25.24%
		FR_FRABCH passed reproduction	25.24%
		FR_FRCP1 passed reproduction	25.24%
		GH_FR1 passed reproduction	25.24%
		GH_ERC passed reproduction	25.24%
		CM_MC2 passed reproduction	25.24%
		EV_MC2 passed reproduction	25.24%
		EV_HC1 passed reproduction	25.24%
		LC_DCDS passed reproduction	25.24%
		LC_LC3 passed reproduction	25.24%
		LC_LC5 passed reproduction	25.24%
		LC_LCDSSLCC passed reproduction	25.24%
		RG_MIDAG passed reproduction	25.24%
		FR_FR4 passed reproduction	25.24%
		FR_FR2 passed reproduction	25.24%
		FR_MULTIPLATE passed reproduction	25.24%
		FR_FRRD passed reproduction	25.24%

Steel Many-One Rank Sum Test

Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)
Site Control		FR_UFR1	109.5	70	4	18	CDF	0.9813	Non-Significant Effect
LC-SLC		GH_ER2	123.5	70	1	18	CDF	0.9997	Non-Significant Effect
		CM_MC1	105.5	70	3	18	CDF	0.9548	Non-Significant Effect
		FR_FRABCH	98.5	70	3	18	CDF	0.8456	Non-Significant Effect
		FR_FRCP1	108.5	70	4	18	CDF	0.9764	Non-Significant Effect
		GH_FR1	97	70	3	18	CDF	0.8089	Non-Significant Effect
		GH_ERC	108	70	2	18	CDF	0.9735	Non-Significant Effect
		CM_MC2	89	70	4	18	CDF	0.5440	Non-Significant Effect
		EV_MC2	89	70	2	18	CDF	0.5440	Non-Significant Effect
		EV_HC1	82.5	70	5	18	CDF	0.3075	Non-Significant Effect
		LC_DCDS	81.5	70	2	18	CDF	0.2753	Non-Significant Effect
		LC_LC3	100.5	70	3	18	CDF	0.8869	Non-Significant Effect
		LC_LC5	80	70	2	18	CDF	0.2305	Non-Significant Effect
		LC_LCDSSLCC	82	70	4	18	CDF	0.2912	Non-Significant Effect
		RG_MIDAG	107	70	3	18	CDF	0.9670	Non-Significant Effect
		FR_FR4	111.5	70	3	18	CDF	0.9886	Non-Significant Effect
		FR_FR2	116	70	4	18	CDF	0.9967	Non-Significant Effect
		FR_MULTIPLATE	101.5	70	3	18	CDF	0.9043	Non-Significant Effect
		FR_FRRD	94.5	70	2	18	CDF	0.7371	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	3.792	3.606	0.0228	Outlier Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	647.455	34.0766	19	1.353	0.1559	Non-Significant Effect
Error	4533.1	25.1839	180			
Total	5180.56		199			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance Test	42.39	36.19	0.0016	Unequal Variances

Ceriodaphnia 7-d Survival and Reproduction Test

Nautilus Environmental

Analysis ID: 12-3106-0201 **Endpoint:** Reproduction **CETIS Version:** CETISv1.9.4
Analyzed: 11 Jun-21 14:32 **Analysis:** Nonparametric-Control vs Treatments **Status Level:** 1

Distribution	Shapiro-Wilk W Normality Test	0.9688	0.9816	2.0E-04	Non-Normal Distribution

Reproduction Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
FR_UFR1		10	23.4	21.71	25.09	23	20	27	0.7483	10.11%	0.00%
GH_ER2		10	24.5	20.53	28.47	25.5	12	31	1.753	22.62%	-4.70%
CM_MC1		10	23.8	20.75	26.85	22.5	19	32	1.348	17.91%	-1.71%
LC_SLC	XC	10	23.6	20.82	26.38	22.5	20	34	1.231	16.50%	-0.85%
FR_FRABCH		10	23.1	19.95	26.25	22.5	19	31	1.394	19.08%	1.28%
FR_FRCP1		10	23.5	20.69	26.31	23	18	33	1.241	16.69%	-0.43%
GH_FR1		10	22	19.79	24.21	22.5	16	27	0.9775	14.05%	5.98%
GH_ERC		10	23.4	18.17	28.63	24	13	36	2.31	31.22%	0.00%
CM_MC2		10	21.3	19.06	23.54	21.5	16	26	0.9894	14.69%	8.97%
EV_MC2		10	19.2	14.13	24.27	20	7	28	2.24	36.89%	17.95%
EV_HC1		10	21	19.45	22.55	21.5	18	24	0.6831	10.29%	10.26%
LC_DCDS		10	21.4	17.13	25.67	19.5	15	35	1.887	27.88%	8.55%
LC_LC3		10	22.2	19	25.4	22.5	13	28	1.413	20.12%	5.13%
LC_LC5		10	18.1	11.74	24.46	19	0	32	2.81	49.10%	22.65%
LC_LCDSSLCC		10	19.5	14.91	24.09	21	2	24	2.029	32.90%	16.67%
RG_MIDAG		10	23.3	20.46	26.14	23	17	31	1.257	17.05%	0.43%
FR_FR4		10	24.7	21.23	28.17	25	18	31	1.535	19.65%	-5.56%
FR_FR2		10	24.5	21.93	27.07	23.5	21	33	1.138	14.69%	-4.70%
FR_MULTIPLATE		10	23.5	19.67	27.33	22	14	32	1.695	22.81%	-0.43%
FR_FRRD		10	22.3	19.54	25.06	21	17	28	1.221	17.31%	4.70%

Reproduction Detail

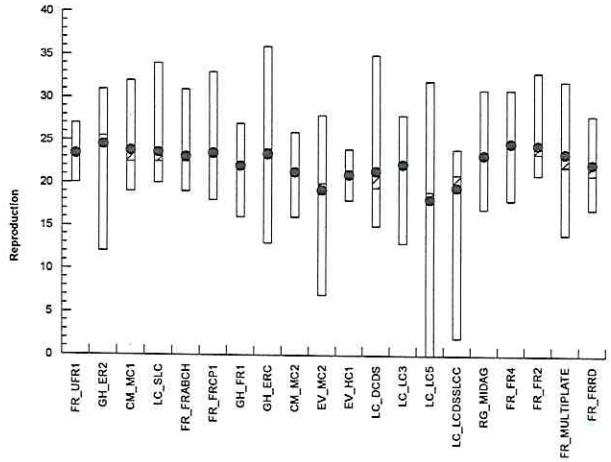
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
FR_UFR1		21	20	24	22	26	26	22	27	22	24
GH_ER2		19	25	31	25	23	30	27	27	12	26
CM_MC1		22	22	23	25	19	19	24	32	30	22
LC_SLC	XC	20	34	24	24	22	22	22	21	24	23
FR_FRABCH		19	22	23	31	19	29	19	26	19	24
FR_FRCP1		20	25	22	33	23	23	23	24	24	18
GH_FR1		16	20	22	27	25	19	23	22	23	23
GH_ERC		27	13	14	17	36	29	23	29	25	21
CM_MC2		20	21	25	16	21	22	26	17	22	23
EV_MC2		8	26	28	20	18	7	20	24	17	24
EV_HC1		24	23	23	22	21	20	19	22	18	18
LC_DCDS		17	18	35	20	22	18	28	19	15	22
LC_LC3		23	28	20	22	26	27	22	23	13	18
LC_LC5		17	26	32	21	0	23	9	19	15	19
LC_LCDSSLCC		21	21	18	20	21	24	2	24	21	23
RG_MIDAG		23	26	25	23	21	31	19	26	22	17
FR_FR4		22	24	31	31	19	26	18	29	27	20
FR_FR2		24	22	23	33	21	26	25	23	27	21
FR_MULTIPLATE		32	14	23	21	20	21	30	21	28	25
FR_FRRD		19	20	19	25	21	21	17	28	26	27

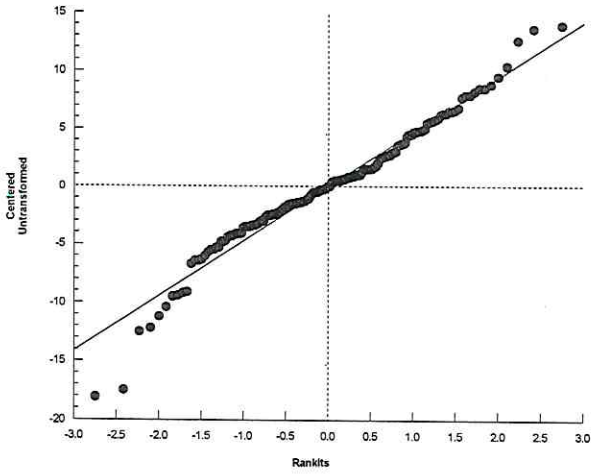
Ceriodaphnia 7-d Survival and Reproduction Test

Nautilus Environmental

Analysis ID:	12-3106-0201	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.9.4
Analyzed:	11 Jun-21 14:32	**Analysis:**	Nonparametric-Control vs Treatments	**Status Level:**	1

Graphics





Analyst: GAH QA: June 22/21

Ceriodaphnia 7-d Survival and Reproduction Test

Nautilus Environmental

Analysis ID:	07-6229-4923	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.9.4
Analyzed:	11 Jun-21 14:32	**Analysis:**	Nonparametric-Control vs Treatments	**Status Level:**	1
Batch ID:	19-5534-0118	**Test Type:**	Reproduction-Survival (7d)	**Analyst:**	Sierra Klueppel
Start Date:	19 May-21 14:00	**Protocol:**	EC/EPS 1/RM/21	**Diluent:**	20% Perrier Water
Ending Date:	27 May-21 15:00	**Species:**	Ceriodaphnia dubia	**Brine:**	
Test Length:	8d 1h	**Taxon:**	Branchiopoda	**Source:**	In-House Culture **Age:** <24

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
FR_UFR1	12-4424-2146	18 May-21	19 May-21 11:20	38h (2.3 °C)	Teck Coal	
GH_ER2	02-4275-7088	18 May-21 09:55	19 May-21 11:20	28h (0.4 °C)		
CM_MC1	01-4263-6393	18 May-21 11:08	19 May-21 11:20	27h (1.1 °C)		
LC_SLC	12-1662-7355	18 May-21 09:45	19 May-21 11:20	28h (4.1 °C)		
FR_FRABCH	05-6713-4959	18 May-21	19 May-21 11:20	38h (1.9 °C)		
FR_FRCP1	19-8027-7867	18 May-21	19 May-21 11:20	38h (1.2 °C)		
GH_FR1	15-9886-5398	18 May-21 12:30	19 May-21 11:20	26h (0.1 °C)		
GH_ERC	21-0704-4941	18 May-21 11:20	19 May-21 11:20	27h (0.6 °C)		
CM_MC2	17-6814-6287	18 May-21 09:50	19 May-21 11:20	28h (1.1 °C)		
EV_MC2	15-5628-9197	18 May-21 13:00	19 May-21 11:20	25h (3.6 °C)		
EV_HC1	05-8730-9056	18 May-21 11:20	19 May-21 11:20	27h (4.8 °C)		
LC_DCDS	20-0340-1068	18 May-21 11:00	19 May-21 11:20	27h (4.6 °C)		
LC_LC3	18-4816-9590	18 May-21 10:15	19 May-21 11:20	28h (4.7 °C)		
LC_LC5	03-8768-2280	18 May-21 09:50	19 May-21 11:20	28h (5.2 °C)		
LC_LCDSSLCC	02-2977-6783	18 May-21 11:00	19 May-21 11:20	27h (4.3 °C)		
RG_MIDAG	19-6180-4600	18 May-21 09:15	19 May-21 11:20	29h (0.1 °C)		
FR_FR4	17-1641-7069	18 May-21 09:29	19 May-21 11:20	29h (4.6 °C)		
FR_FR2	11-2149-8709	18 May-21 10:28	19 May-21 11:20	28h (4.6 °C)		
FR_MULTIPLATE	16-7235-2081	18 May-21 11:21	19 May-21 11:20	27h (3.4 °C)		
FR_FRRD	06-3190-8505	18 May-21 08:22	19 May-21 11:20	30h (3.4 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_UFR1	Water Sample	Teck Coal	FR_UFR1_WEK_2021-05-1	
GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-05-18_	
CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-05-18	
LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-05-18_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_WEK_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_WEK_2021-05	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-05-18_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-05-18	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-05-18	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2020_Q2_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2020_Q2_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-05-18	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-05-18_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-05-18_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	
RG_MIDAG	Water Sample	Teck Coal	RG_MIDAG_WS_2021-05-	
FR_FR4	Water Sample	Teck Coal	FR_FR4_WS_2021-05-18_	
FR_FR2	Water Sample	Teck Coal	FR_FR2_WS_2021-05-18_	
FR_MULTIPLATE	Water Sample	Teck Coal	FR_MULTIPLATE_WS_202	
FR_FRRD	Water Sample	Teck Coal	FR_FRRD_WS_2021-05-18	

APPENDIX B – *Pseudokirchneriella subcapitata* toxicity test data

Pseudokirchneriella subcapitata Summary Sheet

Client: TECK
Work Order No.: 210961

Start Date: May. 20/21
Set up by: SAK

Sample Information:

Sample ID: Various - see below
Sample Date: May. 18/21
Date Received: May. 19/21
Sample Volume: various

Test Organism Information:

Culture Date: May. 14/21
Age of culture (Day 0): 6d

Zinc Reference Toxicant Results:

Reference Toxicant ID: SC214
Stock Solution ID: 21Zn01
Date Initiated: May. 6/21
72-h IC50 (95% CL): 32.7 (31.2 - 33.9) ~~35.0 (32.5 - 36.7)~~ mg/L Zn

72-h IC50 Reference Toxicant Mean and Range: 31.7 (26.0 - 38.5) mg/L ^{Zn} CV (%): 10

Test Results:

All samples are significantly greater than the lab control.
Results that are significantly lower than*:
a = FR_UFR1
b = GH_ER2
c = CM_MC1
d = LC_SLC

	Cell Yield (Mean± SD)
Negative Control	32.0 ± 2.9
FR_UFR1	62.8 ± 7.8 [c]
GH_ER2	64.9 ± 5.5 [c]
CM_MC1	75.4 ± 4.3 [GH_ER2]
LC_SLC	63.1 ± 4.5 [c]
FR_FRABCH	67.5 ± 6.6
FR_FRCP1	68.8 ± 10.5
GH_ERC	66.2 ~~61.5~~ [CM] ± ~~3.4~~ [CM] 6.2
CM_MC2	66.2 ± ~~6.2~~ [CM] 6.8

Reviewed by: [signature]
Date reviewed: June 15, 2021

Pseudokirchneriella subcapitata Summary Sheet

Client: TECK
Work Order No.: 210961

Start Date: May. 20/21
Set up by: SAK

Sample Information:

Sample ID: Various - see below
Sample Date: May. 18/21
Date Received: May. 19/21
Sample Volume: Various

Test Organism Information:

Culture Date: May. 14/21
Age of culture (Day 0): 6d

Zinc Reference Toxicant Results:

Reference Toxicant ID: SC214
Stock Solution ID: 21ZnO1
Date Initiated: May. 6/21
72-h IC50 (95% CL): 32.7 (31.2 - 33.9) ~~35.0 (32.5 - 36.7)~~ mg/L Zn

72-h IC50 Reference Toxicant Mean and Range: 31.7 (26.0 - 38.5) mg/L Zn CV (%): 10

Test Results:

	Cell Yield (Mean± SD)
Negative Control	32.0 ± 2.9
EV-MC2	70.0 ± 6.1
EV-HCl	60.2 ± 3.2 [c]
LC-DLDS	69.0 ± 9.8
LC-LC3	47.2 ± 2.4 [a, b, c, d]
LC-LC5	54.5 ± 5.7 [b, c]
LC-LCDSSLCC	55.0 ± 2.2 [c, b]
GH-FR1	61.5 ± 3.4 [c]
	±

All samples are significantly greater than the lab control.
Results ~~that~~ that are significantly lower than "c"
a = FR-UFR1
b = GH-ER2
c = CM-MC1
d = LC-SLC

Reviewed by: [signature]

Date reviewed: June 15, 2021

72-h Algal Growth Inhibition Toxicity Test
Water Quality Measurements

Client : TECK **Setup by:** SAK

Sample ID: Various **Test Date/Time:** May. 20/21 @ 1630h

Work Order No.: 210961 **CER #:** 4

Test Species: *Pseudokirchneriella subcapitata*

Culture Date: May. 14/21 **Age of Culture:** 6d **Culture Health:** Good

Culture Count: 1 140 2 145 **Average:** 142.5 **Culture Cell Density (c1):** 142.5×10^4 cells/mL

v1 = 220,000 cells/ml x 50 ml / (c1) 142.5×10^4 cells/ml = 7.7mL

Time Zero Counts: 1 22 2 22 **Average:** 22

No. of Cells/mL: 22×10^4 cells/mL **Initial Density:** # cells/mL ÷ 220 µL x 10 µL = 10000 cells/mL

Concentration %(v/v)	Water Quality		Incubator Temperature (°C)				Microplates rotated 2X per day?			
	pH	Temp (°C)								
	0 h	0 h	0 h	24 h	48 h	72 h	0 h	24 h	48 h	72 h
Control	6.9	23.0	24.0	25.0	25.0	24.0	✓	✓	✓	✓
FR_UFR1	8.0	22.0	↓	↓	↓	↓	↓	↓	↓	↓
GH-ER2	8.0	↓	↓	↓	↓	↓	↓	↓	↓	↓
CM_MC1	7.8	↓	↓	↓	↓	↓	↓	↓	↓	↓
LC_SLC	8.0	↓	↓	↓	↓	↓	↓	↓	↓	↓
FR_FRABCH	8.0	↓	↓	↓	↓	↓	↓	↓	↓	↓
FR-FRCP1	8.0	↓	↓	↓	↓	↓	↓	↓	↓	↓
GH-FR1	8.0	↓	↓	↓	↓	↓	↓	↓	↓	↓
GH-ERC	8.1	↓	↓	↓	↓	↓	↓	↓	↓	↓
CM-MC2	8.0	↓	↓	↓	↓	↓	↓	↓	↓	↓
Initials	SAK	SAK	SAK	SAK	SAK	RZS	SAK	SAK	SAK	RZS

Initial control pH: Well 1: 6.9 Well 2: 6.9

Final control pH: Well 1: 7.0 Well 2: 7.0

Light intensity (lux): 4380 **Date measured:** May. 20/21

Thermometer: 1 **Light meter:** 1 **pH meter/probe:** 1 / 1

Sample Description: refer to COC

Comments:

Reviewed: [signature] **Date reviewed:** June 15, 2021

72-h Algal Growth Inhibition Toxicity Test
Water Quality Measurements

Client : TECK | Setup by: SAM

Sample ID: various | Test Date/Time: May. 20/21 @1630h

Work Order No.: 210961 | CER #: 4

Test Species: *Pseudokirchneriella subcapitata*

Culture Date: ~~May~~ 14/21 | Age of Culture: 6d | Culture Health: Good

Culture Count: 1 140 2 145 | Average: 142.5 | Culture Cell Density (c1): 142.5×10^4 cells/mL

v1 = 220,000 cells/ml x 50 ml / (c1) 142.5×10^4 cells/ml = 7.7 mL

Time Zero Counts: 1 22 2 22 | Average: 22

No. of Cells/mL: 22×10^4 cells/mL | Initial Density: # cells/mL ÷ 220 µL x 10 µL = 10000 cells/mL

Concentration %(v/v)	Water Quality		Incubator Temperature (°C)				Microplates rotated 2X per day?			
	pH	Temp (°C)								
	0 h	0 h	0 h	24 h	48 h	72 h	0 h	24 h	48 h	72 h
Control	6.9	23.0	24.0	25.0	25.0	24.0	✓	✓	✓	✓
EV_MC2	7.9	22.0	↓	↓	↓		↓	↓	↓	↓
EV-HCl	8.1	↓	↓	↓	↓	↓	↓	↓	↓	↓
LC-DCDS	8.0	↓	↓	↓	↓	↓	↓	↓	↓	↓
LC-LC3	8.0	↓	↓	↓	↓	↓	↓	↓	↓	↓
LC-LC5	8.1	↓	↓	↓	↓	↓	↓	↓	↓	↓
LC-LCDSSLCC	8.1	↓	↓	↓	↓	↓	↓	↓	↓	↓
Initials	SAM	SAM	SAM	SAM	SAM	RZS	SAM	SAM	SAM	RZS

Initial control pH: Well 1: ~~SA~~ 6.9 | Well 2: ~~SA~~ SM 6.9

Final control pH: Well 1: 7.0 | Well 2: 7.0

Light intensity (lux): 4380 | Date measured: May. 20/21

Thermometer: 1 | Light meter: 1 | pH meter/probe: 5/5

Sample Description: refer to COC

Comments:

Reviewed: [signature] | Date reviewed: June 15, 2021

Pseudokirchneriella subcapitata Toxicity Test Data Sheet
72-h Algal Cell Counts

Client: TECC
Work Order #: 210961
Sample ID: Vanos
%(v/v)

Start Date/Time: May. 20/21 @1630h
Termination Date: May. 23/21 @ 1630h
Test set up by: SAH

Concentration	Rep	Count 1	Count 2	Count 3	Count 4	Comments	Initials
Control	A	32					SAH
	B	33					
	C	31					
	D	35					
	E	33					
	F	30					
	G	31					
	H	31					
FR-UFR1	A	58					
	B	65					
	C	64					
	D	61					
	SAH A E	76					
	B F	74					
	C G	54					
	D H	58					
GH-ER2	A	62					
	B	58					
	C	69					
	D	66					
	SAH A E	61					
	B F	72					
	C G	65					
	D H	74					
CM-MCI	A	76					
	B	78					
	C	75					
	D	82					
	SAH A E	78					
	B F	68					
	C G	74					
	D H	80					
	A						
	B						
	C						
	D						

Comments:

Reviewed by: [signature]

Date Reviewed: June 15, 2021

Pseudokirchneriella subcapitata Toxicity Test Data Sheet
72-h Algal Cell Counts

Client: TECK
Start Date/Time: May-20/21 @ 1630h
Work Order #: 210961
Termination Date: May. 23/21 @ 1630h
Sample ID: Various
Test set up by: SAH
%(v/v)

Concentration	Rep	Count 1	Count 2	Count 3	Count 4	Comments	Initials
~~Control~~ LC_SLC	A	65					SAH
	B	64					
	C	62					
	D	67					
	E	58					
	F	63					
	G	61					
	H	73					
FR_FRABCH	A	63					
	B	67					
	C	78					
	D	66					
FR_FRCPI	A	62					
	B	60					
	C	75					
	D	82					
GH_FRI	A	66					
	B	62					
	C	64					
	D	58					
GH_ERC	A	61					
	B	71					
	C	63					
	D	74					
CM_MC2	A	61					
	B	63					
	C	69					
	D	76					
EV_MC2	A	62					
	B	74					
	C	75					
	D	73					
EV_HCI	A	60					
	B	59					
	C	66					
	D	60					

Comments:

Reviewed by: [signature] Date Reviewed: June 15, 2021

Pseudokirchneriella subcapitata Toxicity Test Data Sheet
72-h Algal Cell Counts

Client: TECK
Work Order #: 210961
Sample ID: various
%(v/v)

Start Date/Time: May. 20/21 @1630h
Termination Date: May. 23/21 @1630h
Test set up by: SAH

Concentration	Rep	Count 1	Count 2	Count 3	Count 4	Comments	Initials
Control	A						
	B						
	C						
	D						
	E						
	F						
	G						
	H						
~~LC-LCD~~ SH LC-DCDS	A	62					SAH
	B	62					
	C	74					
	D	82					
LC-LC3	A	45					
	B	48					
	C	50					
	D	50					
LC-LC5	A	55					
	B	49					
	C	55					
	D	63					
LC-LCDSSLCC	A	54					
	B	56					
	C	55					
	D	59					
	A						
	B						
	C						
	D						
	A						
	B						
	C						
	D						
	A						
	B						
	C						
	D						

Comments:

Reviewed by: [signature] Date Reviewed: June 15, 2021

Pseudokirchneriella subcapitata Algal Counts

Client: Teck
WO#: 210961
Sample ID: Various

Start Date/Time: May.20/20@1630h
Termination Date/Time: May.23/20@1630h

Initial Cell Density: 10000 cell/mL

									220000
									0.22
									0.01
Concentration %(v/v)	Rep	Count 1 (x 10^4)	Count 2 (x 10^4)	Count 3 (x 10^4)	Count 4 (x 10^4)	Mean (x 10^4)	Cell Yield (x 10^4) cell/mL		10000
Control	A	32				32	31.0	mean	32.0
	B	33				33	32.0	SD	2.878492
	C	31				31	30.0	CV	8.995286
	D	35				35	34.0		
	E	33				33	32.0		
	F	30				30	29.0		
	G	39				39	38.0		
	H	31				31	30.0		
FR_UFR1	A	58				58	57.0		
	B	65				65	64.0		
	C	64				64	63.0		
	D	61				61	60.0		
	E	76				76	75.0		
	F	74				74	73.0		
	G	54				54	53.0		
	H	58				58	57.0		
GH_ER2	A	62				62	61.0		
	B	58				58	57.0		
	C	69				69	68.0		
	D	66				66	65.0		
	E	61				61	60.0		
	F	72				72	71.0		
	G	65				65	64.0		
	H	74				74	73.0		
CM_MC1	A	76				76	75.0		
	B	78				78	77.0		
	C	75				75	74.0		
	D	82				82	81.0		
	E	78				78	77.0		
	F	68				68	67.0		
	G	74				74	73.0		
	H	80				80	79.0		
						#DIV/0!	#DIV/0!		
						#DIV/0!	#DIV/0!		
						#DIV/0!	#DIV/0!		
						#DIV/0!	#DIV/0!		

Reviewed by: _____

Date reviewed: June 15 2021

Pseudokirchneriella subcapitata Algal Counts

Client: Teck
WO#: 210961
Sample ID: Various

Start Date/Time: May.20/20@1630h
Termination Date/Time: May.23/20@1630h

Initial Cell Density: 10000 cell/mL

									220000
									0.22
									0.01
Concentration %(v/v)	Rep	Count 1 (x 10^4)	Count 2 (x 10^4)	Count 3 (x 10^4)	Count 4 (x 10^4)	Mean (x 10^4)	Cell Yield (x 10^4) cell/mL		10000
LC_SLC	A	65				65	64.0	mean	63.1
	B	64				64	63.0	SD	4.48609
	C	62				62	61.0	CV	7.106677
	D	67				67	66.0		
	E	58				58	57.0		
	F	63				63	62.0		
	G	61				61	60.0		
	H	73				73	72.0		
FR_FRABCH	A	63				63	62.0		
	B	67				67	66.0		
	C	78				78	77.0		
	D	66				66	65.0		
FR_FRCP1	A	62				62	61.0		
	B	60				60	59.0		
	C	75				75	74.0		
	D	82				82	81.0		
GH_FR1	A	66				66	65.0		
	B	62				62	61.0		
	C	64				64	63.0		
	D	58				58	57.0		
GH_ERC	A	61				61	60.0		
	B	71				71	70.0		
	C	63				63	62.0		
	D	74				74	73.0		
CM_MC2	A	61				61	60.0		
	B	63				63	62.0		
	C	69				69	68.0		
	D	76				76	75.0		
EV_MC2	A	62				62	61.0		
	B	74				74	73.0		
	C	75				75	74.0		
	D	73				73	72.0		
EV_HC1	A	60				60	59.0		
	B	59				59	58.0		
	C	66				66	65.0		
	D	60				60	59.0		

Reviewed by: _____

Date reviewed: June 15, 2021

Pseudokirchneriella subcapitata Algal Counts

Client: Teck
WO#: 210961
Sample ID: Various

Start Date/Time: May.20/20@1630h
Termination Date/Time: May.23/20@1630h

Initial Cell Density: 10000 cell/mL

220000
0.22
0.01
10000

Concentration %(v/v)	Rep	Count 1 (x 10^4)	Count 2 (x 10^4)	Count 3 (x 10^4)	Count 4 (x 10^4)	Mean (x 10^4)	Cell Yield (x 10^4) cell/mL		
	A					#DIV/0!	#DIV/0!	mean	#DIV/0!
	B					#DIV/0!	#DIV/0!	SD	#DIV/0!
	C					#DIV/0!	#DIV/0!	CV	#DIV/0!
	D					#DIV/0!	#DIV/0!		
	E					#DIV/0!	#DIV/0!		
	F					#DIV/0!	#DIV/0!		
	G					#DIV/0!	#DIV/0!		
	H					#DIV/0!	#DIV/0!		
LC_DCDS	A	62				62	61.0		
	B	62				62	61.0		
	C	74				74	73.0		
	D	82				82	81.0		
LC_LC3	A	45				45	44.0		
	B	48				48	47.0		
	C	50				50	49.0		
	D	50				50	49.0		
LC_LC5	A	55				55	54.0		
	B	49				49	48.0		
	C	55				55	54.0		
	D	63				63	62.0		
LC_LCDSSLCC	A	54				54	53.0		
	B	56				56	55.0		
	C	55				55	54.0		
	D	59				59	58.0		
	A					#DIV/0!	#DIV/0!		
	B					#DIV/0!	#DIV/0!		
	C					#DIV/0!	#DIV/0!		
	D					#DIV/0!	#DIV/0!		
	A					#DIV/0!	#DIV/0!		
	B					#DIV/0!	#DIV/0!		
	C					#DIV/0!	#DIV/0!		
	D					#DIV/0!	#DIV/0!		
	A					#DIV/0!	#DIV/0!		
	B					#DIV/0!	#DIV/0!		
	C					#DIV/0!	#DIV/0!		
	D					#DIV/0!	#DIV/0!		

Reviewed by: _____

Date reviewed: June 15, 2021

EC Alga Growth Inhibition Test — **Nautilus Environmental**

Batch ID:	17-9854-5282	**Test Type:**	Cell Growth	**Analyst:**	Sierra Klueppel
Start Date:	20 May-21 16:30	**Protocol:**	EC/EPS 1/RM/25	**Diluent:**	Deionized Water + nutrients
Ending Date:	23 May-21 16:30	**Species:**	Pseudokirchneriella subcapitata	**Brine:**	
Test Length:	72h	**Taxon:**	Chlorophyta	**Source:**	In-House Culture **Age:** 6d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
Lab Control	16-0549-5947	20 May-21	20 May-21 06:00	16h	Teck Coal	
FR_UFR1	12-4424-2146	18 May-21	19 May-21 11:20	64h (2.3 °C)		
GH_ER2	02-4275-7088	18 May-21 09:55	19 May-21 11:20	55h (0.4 °C)		
CM_MC1	01-4263-6393	18 May-21 11:08	19 May-21 11:20	53h (1.1 °C)		
LC_SLC	12-1662-7355	18 May-21 09:45	19 May-21 11:20	55h (4.1 °C)		
FR_FRABCH	05-6713-4959	18 May-21	19 May-21 11:20	64h (1.9 °C)		
FR_FRCP1	19-8027-7867	18 May-21	19 May-21 11:20	64h (1.2 °C)		
GH_FR1	15-9886-5398	18 May-21 12:30	19 May-21 11:20	52h (0.1 °C)		
GH_ERC	21-0704-4941	18 May-21 11:20	19 May-21 11:20	53h (0.6 °C)		
CM_MC2	17-6814-6287	18 May-21 09:50	19 May-21 11:20	55h (1.1 °C)		
EV_MC2	15-5628-9197	18 May-21 13:00	19 May-21 11:20	52h (3.6 °C)		
EV_HC1	05-8730-9056	18 May-21 11:20	19 May-21 11:20	53h (4.8 °C)		
LC_DCDS	20-0340-1068	18 May-21 11:00	19 May-21 11:20	53h (4.6 °C)		
LC_LC3	18-4816-9590	18 May-21 10:15	19 May-21 11:20	54h (4.7 °C)		
LC_LC5	03-8768-2280	18 May-21 09:50	19 May-21 11:20	55h (5.2 °C)		
LC_LCDSSLCC	02-2977-6783	18 May-21 11:00	19 May-21 11:20	53h (4.3 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
Lab Control	Water Sample	Teck Coal	Lab Control	
FR_UFR1	Water Sample	Teck Coal	FR_UFR1_WEK_2021-05-1	
GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-05-18_	
CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-05-18	
LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-05-18_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_WEK_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_WEK_2021-05	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-05-18_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-05-18	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-05-18	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2020_Q2_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2020_Q2_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-05-18	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-05-18_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-05-18_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	

SIngle Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	LC_LC3 passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	FR_UFR1 passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	GH_ER2 passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	GH_ERC passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	LC_LC5 passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	LC_SLC passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	LC_DCDS passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	EV_HC1 passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	CM_MC1 passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	EV_MC2 passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	CM_MC2 passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	LC_LCDSSLCC passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	GH_FR1 passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	Lab Control passed cell yield	1

EC Alga Growth Inhibition Test **Nautilus Environmental**

SIngle Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	FR_FRABCH passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	FR_FRCP1 passed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	GH_FR1 failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	LC_DCDS failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	EV_HC1 failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	EV_MC2 failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	CM_MC2 failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	LC_LCDSSLCC failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	Lab Control failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	FR_FRABCH failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	LC_SLC failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	CM_MC1 failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	GH_ERC failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	LC_LC3 failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	FR_UFR1 failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	GH_ER2 failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	FR_FRCP1 failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	LC_LC5 failed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	LC_LC3 passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	FR_UFR1 passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	GH_ER2 passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	FR_FRCP1 passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	LC_LC5 passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	LC_DCDS passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	EV_HC1 passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	CM_MC1 passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	EV_MC2 passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	CM_MC2 passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	Lab Control passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	LC_LCDSSLCC passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	LC_SLC passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	FR_FRABCH passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	GH_FR1 passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	GH_ERC passed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	GH_ERC failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	FR_UFR1 failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	GH_ER2 failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	CM_MC1 failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	LC_SLC failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	FR_FRCP1 failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	Lab Control failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	EV_HC1 failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	GH_FR1 failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	LC_LCDSSLCC failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	CM_MC2 failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	FR_FRABCH failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	LC_LC5 failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	LC_LC3 failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	LC_DCDS failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	EV_MC2 failed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	FR_FRABCH passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	CM_MC2 passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	CM_MC1 passed cell yield	1

Analyst: BAH QA: June 15/21

EC Alga Growth Inhibition Test **Nautilus Environmental**

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	FR_UFR1 passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	GH_FR1 passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	EV_MC2 passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	Lab Control passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	FR_FRCP1 passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	LC_DCDS passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	LC_LCDSSLCC passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	GH_ERC passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	LC_LC5 passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	GH_ER2 passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	LC_SLC passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	LC_LC3 passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	EV_HC1 passed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	FR_FRABCH failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	LC_LC3 failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	LC_LC5 failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	GH_FR1 failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	CM_MC1 failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	LC_DCDS failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	GH_ER2 failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	FR_UFR1 failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	LC_SLC failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	EV_MC2 failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	FR_FRCP1 failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	GH_ERC failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	EV_HC1 failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	LC_LCDSSLCC failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	Lab Control failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	CM_MC2 failed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	LC_DCDS passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	EV_HC1 passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	LC_LC3 passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	FR_FRCP1 passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	CM_MC1 passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	LC_LC5 passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	GH_ER2 passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	GH_ERC passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	GH_FR1 passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	LC_SLC passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	EV_MC2 passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	CM_MC2 passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	FR_FRABCH passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	LC_LCDSSLCC passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	Lab Control passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	FR_UFR1 passed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	FR_FRABCH failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	GH_ERC failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	GH_FR1 failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	FR_UFR1 failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	LC_SLC failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	CM_MC1 failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	GH_ER2 failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	EV_HC1 failed cell yield	1

EC Alga Growth Inhibition Test **Nautilus Environmental**

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	CM_MC2 failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	LC_LCDSSLCC failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	EV_MC2 failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	Lab Control failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	FR_FRCP1 failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	LC_LC5 failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	LC_LC3 failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	LC_DCDS failed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	LC_SLC passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	FR_FRABCH passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	Lab Control passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	GH_FR1 passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	LC_LCDSSLCC passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	CM_MC1 passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	EV_MC2 passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	GH_ER2 passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	EV_HC1 passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	LC_DCDS passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	LC_LC3 passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	GH_ERC passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	LC_LC5 passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	FR_FRCP1 passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	CM_MC2 passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	FR_UFR1 passed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	LC_DCDS failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	GH_ERC failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	FR_FRABCH failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	FR_UFR1 failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	FR_FRCP1 failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	LC_LC3 failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	LC_SLC failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	LC_LCDSSLCC failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	EV_HC1 failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	EV_MC2 failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	GH_ER2 failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	LC_LC5 failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	GH_FR1 failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	CM_MC2 failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	Lab Control failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	CM_MC1 failed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	LC_LC5 passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	FR_FRABCH passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	Lab Control passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	CM_MC2 passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	FR_UFR1 passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	LC_DCDS passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	EV_MC2 passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	CM_MC1 passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	EV_HC1 passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	GH_ERC passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	GH_FR1 passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	LC_LCDSSLCC passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	GH_ER2 passed cell yield	1

EC Alga Growth Inhibition Test **Nautilus Environmental**

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	FR_FRCP1 passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	LC_SLC passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	LC_LC3 passed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	LC_DCDS failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	FR_UFR1 failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	GH_ERC failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	LC_LC3 failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	GH_FR1 failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	LC_LC5 failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	GH_ER2 failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	EV_HC1 failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	LC_LCDSSLCC failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	CM_MC1 failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	CM_MC2 failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	FR_FRCP1 failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	LC_SLC failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	Lab Control failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	EV_MC2 failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	FR_FRABCH failed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	EV_HC1 passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	LC_LC5 passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	LC_DCDS passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	LC_LCDSSLCC passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	LC_SLC passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	LC_LC3 passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	Lab Control passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	CM_MC1 passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	GH_FR1 passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	CM_MC2 passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	FR_FRCP1 passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	FR_FRABCH passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	FR_UFR1 passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	GH_ERC passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	EV_MC2 passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	GH_ER2 passed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	LC_LCDSSLCC failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	LC_LC3 failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	CM_MC1 failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	LC_LC5 failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	GH_ERC failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	FR_UFR1 failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	Lab Control failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	LC_SLC failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	GH_ER2 failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	FR_FRABCH failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	LC_DCDS failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	EV_HC1 failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	GH_FR1 failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	CM_MC2 failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	EV_MC2 failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	FR_FRCP1 failed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	CM_MC2 passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	GH_ERC passed cell yield	1

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Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	EV_MC2 passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	GH_ER2 passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	GH_FR1 passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	LC_LC5 passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	LC_DCDS passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	LC_SLC passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	CM_MC1 passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	EV_HC1 passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	LC_LC3 passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	LC_LCDSSLCC passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	FR_FRCP1 passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	FR_UFR1 passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	Lab Control passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	FR_FRABCH passed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	EV_HC1 failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	EV_MC2 failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	GH_FR1 failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	LC_DCDS failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	FR_FRABCH failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	FR_UFR1 failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	GH_ER2 failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	LC_LCDSSLCC failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	LC_LC3 failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	FR_FRCP1 failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	GH_ERC failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	Lab Control failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	LC_SLC failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	LC_LC5 failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	CM_MC1 failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	CM_MC2 failed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	Lab Control passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	EV_HC1 passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	GH_ER2 passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	LC_LCDSSLCC passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	FR_FRCP1 passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	LC_LC3 passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	LC_SLC passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	CM_MC2 passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	LC_LC5 passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	EV_MC2 passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	CM_MC1 passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	GH_FR1 passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	LC_DCDS passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	FR_UFR1 passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	GH_ERC passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	FR_FRABCH passed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	EV_MC2 failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	LC_LC3 failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	CM_MC1 failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	FR_UFR1 failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	GH_FR1 failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	FR_FRCP1 failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	CM_MC2 failed cell yield	1

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Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	GH_ERC failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	Lab Control failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	GH_ER2 failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	FR_FRABCH failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	EV_HC1 failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	LC_LCDSSLCC failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	LC_DCDS failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	LC_SLC failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	LC_LC5 failed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	EV_MC2 passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	FR_FRABCH passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	EV_HC1 passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	LC_LCDSSLCC passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	CM_MC2 passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	GH_ERC passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	LC_SLC passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	FR_UFR1 passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	LC_DCDS passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	FR_FRCP1 passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	GH_ER2 passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	CM_MC1 passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	GH_FR1 passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	Lab Control passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	LC_LC5 passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	LC_LC3 passed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	Lab Control failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	CM_MC2 failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	LC_LC5 failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	FR_FRCP1 failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	EV_HC1 failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	LC_SLC failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	EV_MC2 failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	CM_MC1 failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	GH_ERC failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	GH_FR1 failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	FR_FRABCH failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	FR_UFR1 failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	LC_DCDS failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	LC_LC3 failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	GH_ER2 failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	LC_LCDSSLCC failed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	Lab Control passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	GH_ERC passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	LC_SLC passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	CM_MC1 passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	CM_MC2 passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	FR_FRCP1 passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	FR_UFR1 passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	GH_ER2 passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	GH_FR1 passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	LC_LCDSSLCC passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	EV_HC1 passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	LC_LC5 passed cell yield	1

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Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	FR_FRABCH passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	LC_LC3 passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	LC_DCDS passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	EV_MC2 passed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	LC_LC3 failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	FR_FRCP1 failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	CM_MC2 failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	EV_MC2 failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	LC_DCDS failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	GH_ERC failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	CM_MC1 failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	LC_LC5 failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	LC_LCDSSLCC failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	GH_ER2 failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	LC_SLC failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	FR_UFR1 failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	GH_FR1 failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	EV_HC1 failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	Lab Control failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	FR_FRABCH failed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	FR_FRCP1 passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	LC_DCDS passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	LC_LC5 passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	CM_MC1 passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	LC_LC3 passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	GH_FR1 passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	CM_MC2 passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	FR_FRABCH passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	GH_ERC passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	EV_HC1 passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	EV_MC2 passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	LC_LCDSSLCC passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	Lab Control passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	LC_SLC passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	FR_UFR1 passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	GH_ER2 passed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	LC_LC3 failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	CM_MC1 failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	LC_LC5 failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	GH_ER2 failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	LC_SLC failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	Lab Control failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	LC_LCDSSLCC failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	GH_FR1 failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	FR_FRABCH failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	FR_UFR1 failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	EV_HC1 failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	FR_FRCP1 failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	GH_ERC failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	LC_DCDS failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	EV_MC2 failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	6.2E-07	CM_MC2 failed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	LC_LC5 passed cell yield	1

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Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	GH_ER2 passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	LC_SLC passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	EV_HC1 passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	LC_LCDSSLCC passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	Lab Control passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	FR_UFR1 passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	EV_MC2 passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	LC_DCDS passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	GH_FR1 passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	CM_MC1 passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	LC_LC3 passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	GH_ERC passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	FR_FRCP1 passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	CM_MC2 passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	FR_FRABCH passed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	3.9E-04	LC_SLC failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	3.9E-04	Lab Control failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	3.9E-04	LC_DCDS failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	3.9E-04	LC_LC3 failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	3.9E-04	FR_FRABCH failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	3.9E-04	EV_MC2 failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	3.9E-04	CM_MC1 failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	3.9E-04	CM_MC2 failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	3.9E-04	GH_ER2 failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	3.9E-04	FR_FRCP1 failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	3.9E-04	LC_LC5 failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	3.9E-04	FR_UFR1 failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	3.9E-04	EV_HC1 failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	3.9E-04	GH_ERC failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	3.9E-04	GH_FR1 failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	3.9E-04	LC_LCDSSLCC failed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	GH_ER2 passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	CM_MC1 passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	FR_UFR1 passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	GH_ERC passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	LC_LCDSSLCC passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	LC_LC3 passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	LC_LC5 passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	EV_MC2 passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	CM_MC2 passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	LC_DCDS passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	FR_FRCP1 passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	EV_HC1 passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	GH_FR1 passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	Lab Control passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	FR_FRABCH passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	LC_SLC passed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	7.7E-07	GH_ERC failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	7.7E-07	CM_MC1 failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	7.7E-07	FR_FRABCH failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	7.7E-07	FR_UFR1 failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	7.7E-07	Lab Control failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	7.7E-07	GH_FR1 failed cell yield	1

EC Alga Growth Inhibition Test **Nautilus Environmental**

SIngle Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	7.7E-07	LC_SLC failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	7.7E-07	LC_LCDSSLCC failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	7.7E-07	CM_MC2 failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	7.7E-07	GH_ER2 failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	7.7E-07	EV_MC2 failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	7.7E-07	EV_HC1 failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	7.7E-07	LC_DCDS failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	7.7E-07	LC_LC3 failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	7.7E-07	LC_LC5 failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	7.7E-07	FR_FRCP1 failed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	FR_FRCP1 passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	GH_ERC passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	GH_ER2 passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	LC_SLC passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	FR_FRABCH passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	Lab Control passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	GH_FR1 passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	LC_LCDSSLCC passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	CM_MC2 passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	EV_MC2 passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	FR_UFR1 passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	EV_HC1 passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	LC_DCDS passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	CM_MC1 passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	LC_LC3 passed cell yield	1
05-3247-9633	Cell Yield	Dunnett Multiple Comparison Test	1.0000	LC_LC5 passed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	7.0E-07	EV_MC2 failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	7.0E-07	LC_LC5 failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	7.0E-07	GH_ER2 failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	7.0E-07	LC_LC3 failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	7.0E-07	GH_ERC failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	7.0E-07	LC_DCDS failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	7.0E-07	CM_MC1 failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	7.0E-07	LC_LCDSSLCC failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	7.0E-07	FR_FRCP1 failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	7.0E-07	Lab Control failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	7.0E-07	LC_SLC failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	7.0E-07	CM_MC2 failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	7.0E-07	FR_UFR1 failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	7.0E-07	FR_FRABCH failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	7.0E-07	GH_FR1 failed cell yield	1
19-4248-9899	Cell Yield	Dunnett Multiple Comparison Test	7.0E-07	EV_HC1 failed cell yield	1

EC Alga Growth Inhibition Test **Nautilus Environmental**

Cell Yield Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
Lab Control	N	8	32	29.59	34.41	29	38	1.018	2.878	9.00%	0.00%
FR_UFR1		8	62.75	56.23	69.27	53	75	2.756	7.797	12.42%	-96.09%
GH_ER2		8	64.88	60.24	69.51	57	73	1.959	5.54	8.54%	-102.73%
CM_MC1		8	75.38	71.8	78.95	67	81	1.511	4.274	5.67%	-135.55%
LC_SLC		8	63.12	59.37	66.88	57	72	1.586	4.486	7.11%	-97.27%
FR_FRABCH		4	67.5	57.07	77.93	62	77	3.279	6.557	9.71%	-110.94%
FR_FRCP1		4	68.75	51.99	85.51	59	81	5.266	10.53	15.32%	-114.84%
GH_FR1		4	61.5	56.06	66.94	57	65	1.708	3.416	5.55%	-92.19%
GH_ERC		4	66.25	56.32	76.18	60	73	3.119	6.238	9.42%	-107.03%
CM_MC2		4	66.25	55.51	76.99	60	75	3.376	6.752	10.19%	-107.03%
EV_MC2		4	70	60.36	79.64	61	74	3.028	6.055	8.65%	-118.75%
EV_HC1		4	60.25	55.16	65.34	58	65	1.601	3.202	5.31%	-88.28%
LC_DCDS		4	69	53.41	84.59	61	81	4.899	9.798	14.20%	-115.63%
LC_LC3		4	47.25	43.49	51.01	44	49	1.181	2.363	5.00%	-47.66%
LC_LC5		4	54.5	45.36	63.64	48	62	2.872	5.745	10.54%	-70.31%
LC_LCDSSLCC		4	55	51.56	58.44	53	58	1.08	2.16	3.93%	-71.88%

Cell Yield Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
Lab Control	N	31	32	30	34	32	29	38	30
FR_UFR1		57	64	63	60	75	73	53	57
GH_ER2		61	57	68	65	60	71	64	73
CM_MC1		75	77	74	81	77	67	73	79
LC_SLC		64	63	61	66	57	62	60	72
FR_FRABCH		62	66	77	65				
FR_FRCP1		61	59	74	81				
GH_FR1		65	61	63	57				
GH_ERC		60	70	62	73				
CM_MC2		60	62	68	75				
EV_MC2		61	73	74	72				
EV_HC1		59	58	65	59				
LC_DCDS		61	61	73	81				
LC_LC3		44	47	49	49				
LC_LC5		54	48	54	62				
LC_LCDSSLCC		53	55	54	58				

Analyst: SAM QA: June 15/21

EC Alga Growth Inhibition Test — **Nautilus Environmental**

Analysis ID:	05-3247-9633	**Endpoint:**	Cell Yield	**CETIS Version:**	CETISv1.9.4
Analyzed:	10 Jun-21 12:45	**Analysis:**	Parametric-Control vs Treatments	**Status Level:**	1
Batch ID:	17-9854-5282	**Test Type:**	Cell Growth	**Analyst:**	Sierra Klueppel
Start Date:	20 May-21 16:30	**Protocol:**	EC/EPS 1/RM/25	**Diluent:**	Deionized Water + nutrients
Ending Date:	23 May-21 16:30	**Species:**	Pseudokirchneriella subcapitata	**Brine:**	
Test Length:	72h	**Taxon:**	Chlorophyta	**Source:**	In-House Culture **Age:** 6d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
Lab Control	16-0549-5947	20 May-21	20 May-21 06:00	16h	Teck Coal	
FR_UFR1	12-4424-2146	18 May-21	19 May-21 11:20	64h (2.3 °C)		
GH_ER2	02-4275-7088	18 May-21 09:55	19 May-21 11:20	55h (0.4 °C)		
CM_MC1	01-4263-6393	18 May-21 11:08	19 May-21 11:20	53h (1.1 °C)		
LC_SLC	12-1662-7355	18 May-21 09:45	19 May-21 11:20	55h (4.1 °C)		
FR_FRABCH	05-6713-4959	18 May-21	19 May-21 11:20	64h (1.9 °C)		
FR_FRCP1	19-8027-7867	18 May-21	19 May-21 11:20	64h (1.2 °C)		
GH_FR1	15-9886-5398	18 May-21 12:30	19 May-21 11:20	52h (0.1 °C)		
GH_ERC	21-0704-4941	18 May-21 11:20	19 May-21 11:20	53h (0.6 °C)		
CM_MC2	17-6814-6287	18 May-21 09:50	19 May-21 11:20	55h (1.1 °C)		
EV_MC2	15-5628-9197	18 May-21 13:00	19 May-21 11:20	52h (3.6 °C)		
EV_HC1	05-8730-9056	18 May-21 11:20	19 May-21 11:20	53h (4.8 °C)		
LC_DCDS	20-0340-1068	18 May-21 11:00	19 May-21 11:20	53h (4.6 °C)		
LC_LC3	18-4816-9590	18 May-21 10:15	19 May-21 11:20	54h (4.7 °C)		
LC_LC5	03-8768-2280	18 May-21 09:50	19 May-21 11:20	55h (5.2 °C)		
LC_LCDSSLCC	02-2977-6783	18 May-21 11:00	19 May-21 11:20	53h (4.3 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
Lab Control	Water Sample	Teck Coal	Lab Control	
FR_UFR1	Water Sample	Teck Coal	FR_UFR1_WEK_2021-05-1	
GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-05-18_	
CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-05-18	
LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-05-18_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_WEK_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_WEK_2021-05	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-05-18_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-05-18	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-05-18	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2020_Q2_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2020_Q2_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-05-18	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-05-18_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-05-18_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	

Analyst: SRK QA: June 15/21

EC Alga Growth Inhibition Test — **Nautilus Environmental**

Analysis ID: 05-3247-9633 **Endpoint:** Cell Yield **CETIS Version:** CETISv1.9.4
Analyzed: 10 Jun-21 12:45 **Analysis:** Parametric-Control vs Treatments **Status Level:** 1

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	FR_UFR1 passed cell yield	29.76%
		GH_ER2 passed cell yield	29.76%
		CM_MC1 passed cell yield	29.76%
		LC_SLC passed cell yield	29.76%
		FR_FRABCH passed cell yield	29.76%
		FR_FRCP1 passed cell yield	29.76%
		GH_FR1 passed cell yield	29.76%
		GH_ERC passed cell yield	29.76%
		CM_MC2 passed cell yield	29.76%
		EV_MC2 passed cell yield	29.76%
		EV_HC1 passed cell yield	29.76%
		LC_DCDS passed cell yield	29.76%
		LC_LC3 passed cell yield	29.76%
		LC_LC5 passed cell yield	29.76%
		LC_LCDSSLCC passed cell yield	29.76%

Dunnett Multiple Comparison Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Negative Control		FR_UFR1	-10.63	2.688	7.776	14	CDF	1.0000	Non-Significant Effect
		GH_ER2	-11.37	2.688	7.776	14	CDF	1.0000	Non-Significant Effect
		CM_MC1	-15	2.688	7.776	14	CDF	1.0000	Non-Significant Effect
		LC_SLC	-10.76	2.688	7.776	14	CDF	1.0000	Non-Significant Effect
		FR_FRABCH	-10.02	2.688	9.524	10	CDF	1.0000	Non-Significant Effect
		FR_FRCP1	-10.37	2.688	9.524	10	CDF	1.0000	Non-Significant Effect
		GH_FR1	-8.327	2.688	9.524	10	CDF	1.0000	Non-Significant Effect
		GH_ERC	-9.668	2.688	9.524	10	CDF	1.0000	Non-Significant Effect
		CM_MC2	-9.668	2.688	9.524	10	CDF	1.0000	Non-Significant Effect
		EV_MC2	-10.73	2.688	9.524	10	CDF	1.0000	Non-Significant Effect
		EV_HC1	-7.974	2.688	9.524	10	CDF	1.0000	Non-Significant Effect
		LC_DCDS	-10.44	2.688	9.524	10	CDF	1.0000	Non-Significant Effect
		LC_LC3	-4.305	2.688	9.524	10	CDF	1.0000	Non-Significant Effect
		LC_LC5	-6.351	2.688	9.524	10	CDF	1.0000	Non-Significant Effect
		LC_LCDSSLCC	-6.492	2.688	9.524	10	CDF	1.0000	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	2.339	3.323	1.0000	No Outliers Detected
Control Trend	Mann-Kendall Trend Test	2.339		0.9061	Non-Significant Trend in Controls

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	10843.7	722.913	15	21.6	<1.0E-37	Significant Effect
Error	2275.88	33.4688	68			
Total	13119.6		83			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance Test	20.85	30.58	0.1416	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9786	0.9596	0.1756	Normal Distribution

EC Alga Growth Inhibition Test — **Nautilus Environmental**

Analysis ID: 05-3247-9633 **Endpoint:** Cell Yield **CETIS Version:** CETISv1.9.4
Analyzed: 10 Jun-21 12:45 **Analysis:** Parametric-Control vs Treatments **Status Level:** 1

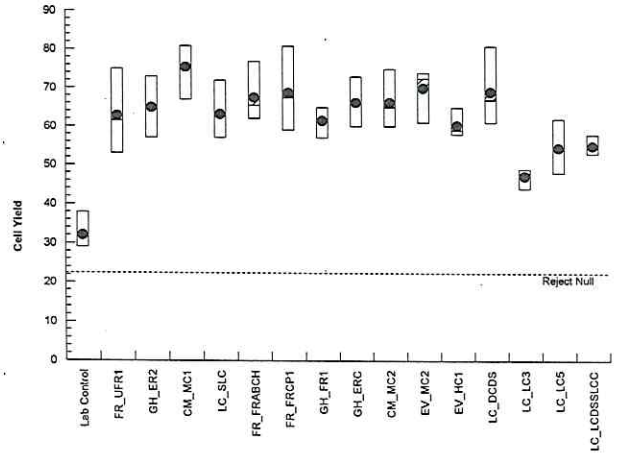
Cell Yield Summary

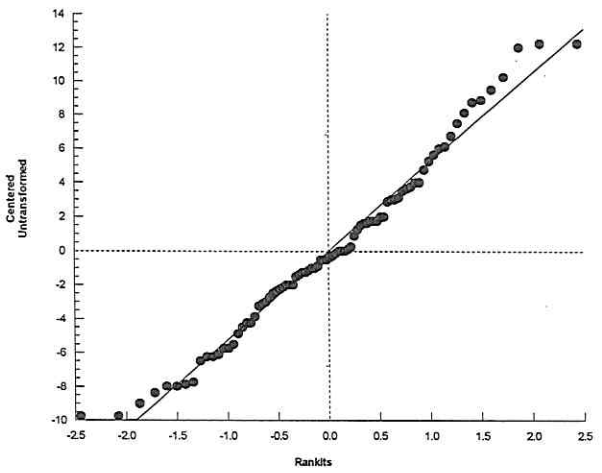
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
Lab Control	N	8	32	29.59	34.41	31.5	29	38	1.018	9.00%	0.00%
FR_UFR1		8	62.75	56.23	69.27	61.5	53	75	2.756	12.42%	-96.09%
GH_ER2		8	64.88	60.24	69.51	64.5	57	73	1.959	8.54%	-102.73%
CM_MC1		8	75.38	71.8	78.95	76	67	81	1.511	5.67%	-135.55%
LC_SLC		8	63.12	59.37	66.88	62.5	57	72	1.586	7.11%	-97.27%
FR_FRABCH		4	67.5	57.07	77.93	65.5	62	77	3.279	9.71%	-110.94%
FR_FRCP1		4	68.75	51.99	85.51	67.5	59	81	5.266	15.32%	-114.84%
GH_FR1		4	61.5	56.06	66.94	62	57	65	1.708	5.55%	-92.19%
GH_ERC		4	66.25	56.32	76.18	66	60	73	3.119	9.42%	-107.03%
CM_MC2		4	66.25	55.51	76.99	65	60	75	3.376	10.19%	-107.03%
EV_MC2		4	70	60.36	79.64	72.5	61	74	3.028	8.65%	-118.75%
EV_HC1		4	60.25	55.16	65.34	59	58	65	1.601	5.31%	-88.28%
LC_DCDS		4	69	53.41	84.59	67	61	81	4.899	14.20%	-115.63%
LC_LC3		4	47.25	43.49	51.01	48	44	49	1.181	5.00%	-47.66%
LC_LC5		4	54.5	45.36	63.64	54	48	62	2.872	10.54%	-70.31%
LC_LCDSSLCC		4	55	51.56	58.44	54.5	53	58	1.08	3.93%	-71.88%

Cell Yield Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
Lab Control	N	31	32	30	34	32	29	38	30
FR_UFR1		57	64	63	60	75	73	53	57
GH_ER2		61	57	68	65	60	71	64	73
CM_MC1		75	77	74	81	77	67	73	79
LC_SLC		64	63	61	66	57	62	60	72
FR_FRABCH		62	66	77	65				
FR_FRCP1		61	59	74	81				
GH_FR1		65	61	63	57				
GH_ERC		60	70	62	73				
CM_MC2		60	62	68	75				
EV_MC2		61	73	74	72				
EV_HC1		59	58	65	59				
LC_DCDS		61	61	73	81				
LC_LC3		44	47	49	49				
LC_LC5		54	48	54	62				
LC_LCDSSLCC		53	55	54	58				

Graphics





EC Alga Growth Inhibition Test

Nautilus Environmental

Analysis ID:	19-4248-9899	**Endpoint:**	Cell Yield	**CETIS Version:**	CETISv1.9.4
Analyzed:	10 Jun-21 12:45	**Analysis:**	Parametric-Control vs Treatments	**Status Level:**	1
Batch ID:	17-9854-5282	**Test Type:**	Cell Growth	**Analyst:**	Sierra Klueppel
Start Date:	20 May-21 16:30	**Protocol:**	EC/EPS 1/RM/25	**Diluent:**	Deionized Water + nutrients
Ending Date:	23 May-21 16:30	**Species:**	Pseudokirchneriella subcapitata	**Brine:**	
Test Length:	72h	**Taxon:**	Chlorophyta	**Source:**	In-House Culture **Age:** 6d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
Lab Control	16-0549-5947	20 May-21	20 May-21 06:00	16h	Teck Coal	
FR_UFR1	12-4424-2146	18 May-21	19 May-21 11:20	64h (2.3 °C)		
GH_ER2	02-4275-7088	18 May-21 09:55	19 May-21 11:20	55h (0.4 °C)		
CM_MC1	01-4263-6393	18 May-21 11:08	19 May-21 11:20	53h (1.1 °C)		
LC_SLC	12-1662-7355	18 May-21 09:45	19 May-21 11:20	55h (4.1 °C)		
FR_FRABCH	05-6713-4959	18 May-21	19 May-21 11:20	64h (1.9 °C)		
FR_FRCP1	19-8027-7867	18 May-21	19 May-21 11:20	64h (1.2 °C)		
GH_FR1	15-9886-5398	18 May-21 12:30	19 May-21 11:20	52h (0.1 °C)		
GH_ERC	21-0704-4941	18 May-21 11:20	19 May-21 11:20	53h (0.6 °C)		
CM_MC2	17-6814-6287	18 May-21 09:50	19 May-21 11:20	55h (1.1 °C)		
EV_MC2	15-5628-9197	18 May-21 13:00	19 May-21 11:20	52h (3.6 °C)		
EV_HC1	05-8730-9056	18 May-21 11:20	19 May-21 11:20	53h (4.8 °C)		
LC_DCDS	20-0340-1068	18 May-21 11:00	19 May-21 11:20	53h (4.6 °C)		
LC_LC3	18-4816-9590	18 May-21 10:15	19 May-21 11:20	54h (4.7 °C)		
LC_LC5	03-8768-2280	18 May-21 09:50	19 May-21 11:20	55h (5.2 °C)		
LC_LCDSSLCC	02-2977-6783	18 May-21 11:00	19 May-21 11:20	53h (4.3 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
Lab Control	Water Sample	Teck Coal	Lab Control	
FR_UFR1	Water Sample	Teck Coal	FR_UFR1_WEK_2021-05-1	
GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-05-18_	
CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-05-18	
LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-05-18_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_WEK_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_WEK_2021-05	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-05-18_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-05-18	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-05-18	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2020_Q2_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2020_Q2_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-05-18	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-05-18_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-05-18_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	

Analyst: SAN QA: June 15/21

EC Alga Growth Inhibition Test — **Nautilus Environmental**

Analysis ID: 19-4248-9899 **Endpoint:** Cell Yield **CETIS Version:** CETISv1.9.4
Analyzed: 10 Jun-21 12:45 **Analysis:** Parametric-Control vs Treatments **Status Level:** 1

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C < T	FR_UFR1 failed cell yield	29.76%
		GH_ER2 failed cell yield	29.76%
		CM_MC1 failed cell yield	29.76%
		LC_SLC failed cell yield	29.76%
		FR_FRABCH failed cell yield	29.76%
		FR_FRCP1 failed cell yield	29.76%
		GH_FR1 failed cell yield	29.76%
		GH_ERC failed cell yield	29.76%
		CM_MC2 failed cell yield	29.76%
		EV_MC2 failed cell yield	29.76%
		EV_HC1 failed cell yield	29.76%
		LC_DCDS failed cell yield	29.76%
		LC_LC3 failed cell yield	29.76%
		LC_LC5 failed cell yield	29.76%
		LC_LCDSSLCC failed cell yield	29.76%

Dunnett Multiple Comparison Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Negative Control		FR_UFR1*	10.63	2.688	7.776	14	CDF	6.2E-07	Significant Effect
		GH_ER2*	11.37	2.688	7.776	14	CDF	6.2E-07	Significant Effect
		CM_MC1*	15	2.688	7.776	14	CDF	6.2E-07	Significant Effect
		LC_SLC*	10.76	2.688	7.776	14	CDF	6.2E-07	Significant Effect
		FR_FRABCH*	10.02	2.688	9.524	10	CDF	6.2E-07	Significant Effect
		FR_FRCP1*	10.37	2.688	9.524	10	CDF	6.2E-07	Significant Effect
		GH_FR1*	8.327	2.688	9.524	10	CDF	6.2E-07	Significant Effect
		GH_ERC*	9.668	2.688	9.524	10	CDF	6.2E-07	Significant Effect
		CM_MC2*	9.668	2.688	9.524	10	CDF	6.2E-07	Significant Effect
		EV_MC2*	10.73	2.688	9.524	10	CDF	6.2E-07	Significant Effect
		EV_HC1*	7.974	2.688	9.524	10	CDF	6.2E-07	Significant Effect
		LC_DCDS*	10.44	2.688	9.524	10	CDF	6.2E-07	Significant Effect
		LC_LC3*	4.305	2.688	9.524	10	CDF	3.9E-04	Significant Effect
		LC_LC5*	6.351	2.688	9.524	10	CDF	7.7E-07	Significant Effect
		LC_LCDSSLCC*	6.492	2.688	9.524	10	CDF	7.0E-07	Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	2.339	3.323	1.0000	No Outliers Detected
Control Trend	Mann-Kendall Trend Test	2.339		0.9061	Non-Significant Trend in Controls

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	10843.7	722.913	15	21.6	<1.0E-37	Significant Effect
Error	2275.88	33.4688	68			
Total	13119.6		83			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance Test	20.85	30.58	0.1416	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9786	0.9596	0.1756	Normal Distribution

EC Alga Growth Inhibition Test — **Nautilus Environmental**

Analysis ID: 19-4248-9899 **Endpoint:** Cell Yield **CETIS Version:** CETISv1.9.4
Analyzed: 10 Jun-21 12:45 **Analysis:** Parametric-Control vs Treatments **Status Level:** 1

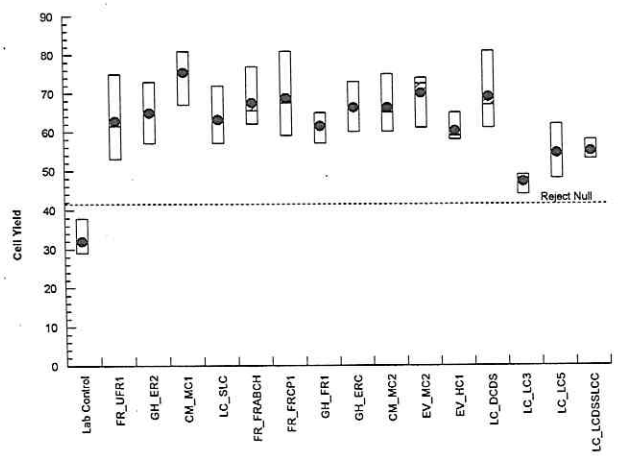
Cell Yield Summary

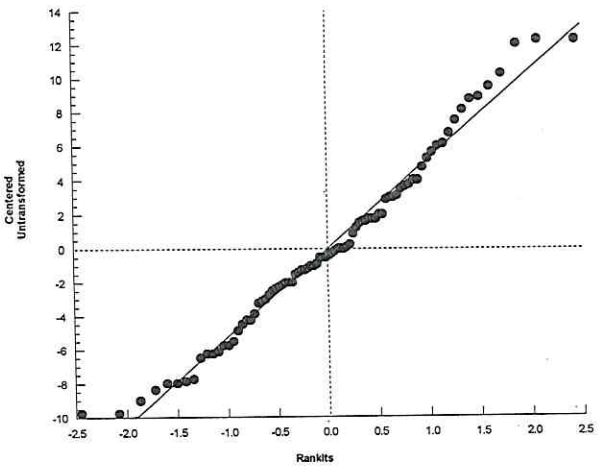
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
Lab Control	N	8	32	29.59	34.41	31.5	29	38	1.018	9.00%	0.00%
FR_UFR1		8	62.75	56.23	69.27	61.5	53	75	2.756	12.42%	-96.09%
GH_ER2		8	64.88	60.24	69.51	64.5	57	73	1.959	8.54%	-102.73%
CM_MC1		8	75.38	71.8	78.95	76	67	81	1.511	5.67%	-135.55%
LC_SLC		8	63.12	59.37	66.88	62.5	57	72	1.586	7.11%	-97.27%
FR_FRABCH		4	67.5	57.07	77.93	65.5	62	77	3.279	9.71%	-110.94%
FR_FRCP1		4	68.75	51.99	85.51	67.5	59	81	5.266	15.32%	-114.84%
GH_FR1		4	61.5	56.06	66.94	62	57	65	1.708	5.55%	-92.19%
GH_ERC		4	66.25	56.32	76.18	66	60	73	3.119	9.42%	-107.03%
CM_MC2		4	66.25	55.51	76.99	65	60	75	3.376	10.19%	-107.03%
EV_MC2		4	70	60.36	79.64	72.5	61	74	3.028	8.65%	-118.75%
EV_HC1		4	60.25	55.16	65.34	59	58	65	1.601	5.31%	-88.28%
LC_DCDS		4	69	53.41	84.59	67	61	81	4.899	14.20%	-115.63%
LC_LC3		4	47.25	43.49	51.01	48	44	49	1.181	5.00%	-47.66%
LC_LC5		4	54.5	45.36	63.64	54	48	62	2.872	10.54%	-70.31%
LC_LCDSSLCC		4	55	51.56	58.44	54.5	53	58	1.08	3.93%	-71.88%

Cell Yield Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
Lab Control	N	31	32	30	34	32	29	38	30
FR_UFR1		57	64	63	60	75	73	53	57
GH_ER2		61	57	68	65	60	71	64	73
CM_MC1		75	77	74	81	77	67	73	79
LC_SLC		64	63	61	66	57	62	60	72
FR_FRABCH		62	66	77	65				
FR_FRCP1		61	59	74	81				
GH_FR1		65	61	63	57				
GH_ERC		60	70	62	73				
CM_MC2		60	62	68	75				
EV_MC2		61	73	74	72				
EV_HC1		59	58	65	59				
LC_DCDS		61	61	73	81				
LC_LC3		44	47	49	49				
LC_LC5		54	48	54	62				
LC_LCDSSLCC		53	55	54	58				

Graphics





EC Alga Growth Inhibition Test — **Nautilus Environmental**

Analysis ID:	15-8907-6907	**Endpoint:**	Cell Yield	**CETIS Version:**	CETISv1.9.4
Analyzed:	10 Jun-21 12:47	**Analysis:**	Parametric-Control vs Treatments	**Status Level:**	1
Batch ID:	17-9854-5282	**Test Type:**	Cell Growth	**Analyst:**	Sierra Klueppel
Start Date:	20 May-21 16:30	**Protocol:**	EC/EPS 1/RM/25	**Diluent:**	Deionized Water + nutrients
Ending Date:	23 May-21 16:30	**Species:**	Pseudokirchneriella subcapitata	**Brine:**	
Test Length:	72h	**Taxon:**	Chlorophyta	**Source:**	In-House Culture **Age:** 6d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
FR_UFR1	12-4424-2146	18 May-21	19 May-21 11:20	64h (2.3 °C)	Teck Coal	
GH_ER2	02-4275-7088	18 May-21 09:55	19 May-21 11:20	55h (0.4 °C)		
CM_MC1	01-4263-6393	18 May-21 11:08	19 May-21 11:20	53h (1.1 °C)		
LC_SLC	12-1662-7355	18 May-21 09:45	19 May-21 11:20	55h (4.1 °C)		
FR_FRABCH	05-6713-4959	18 May-21	19 May-21 11:20	64h (1.9 °C)		
FR_FRCP1	19-8027-7867	18 May-21	19 May-21 11:20	64h (1.2 °C)		
GH_FR1	15-9886-5398	18 May-21 12:30	19 May-21 11:20	52h (0.1 °C)		
GH_ERC	21-0704-4941	18 May-21 11:20	19 May-21 11:20	53h (0.6 °C)		
CM_MC2	17-6814-6287	18 May-21 09:50	19 May-21 11:20	55h (1.1 °C)		
EV_MC2	15-5628-9197	18 May-21 13:00	19 May-21 11:20	52h (3.6 °C)		
EV_HC1	05-8730-9056	18 May-21 11:20	19 May-21 11:20	53h (4.8 °C)		
LC_DCDS	20-0340-1068	18 May-21 11:00	19 May-21 11:20	53h (4.6 °C)		
LC_LC3	18-4816-9590	18 May-21 10:15	19 May-21 11:20	54h (4.7 °C)		
LC_LC5	03-8768-2280	18 May-21 09:50	19 May-21 11:20	55h (5.2 °C)		
LC_LCDSSLCC	02-2977-6783	18 May-21 11:00	19 May-21 11:20	53h (4.3 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_UFR1	Water Sample	Teck Coal	FR_UFR1_WEK_2021-05-1	
GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-05-18_	
CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-05-18	
LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-05-18_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_WEK_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_WEK_2021-05	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-05-18_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-05-18	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-05-18	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2020_Q2_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2020_Q2_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-05-18	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-05-18_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-05-18_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	

EC Alga Growth Inhibition Test — **Nautilus Environmental**

Analysis ID: 15-8907-6907 **Endpoint:** Cell Yield **CETIS Version:** CETISv1.9.4
Analyzed: 10 Jun-21 12:47 **Analysis:** Parametric-Control vs Treatments **Status Level:** 1

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	CM_MC1 passed cell yield	15.75%
		LC_SLC passed cell yield	15.75%
		FR_FRABCH passed cell yield	15.75%
		FR_FRCP1 passed cell yield	15.75%
		GH_FR1 passed cell yield	15.75%
		GH_ERC passed cell yield	15.75%
		CM_MC2 passed cell yield	15.75%
		EV_MC2 passed cell yield	15.75%
		EV_HC1 passed cell yield	15.75%
		LC_DCDS passed cell yield	15.75%
		LC_LC3 failed cell yield	15.75%
		LC_LC5 passed cell yield	15.75%
		LC_LCDSSLCC passed cell yield	15.75%
		GH_ER2 passed cell yield	15.75%

Dunnett Multiple Comparison Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Site Control		GH_ER2	-0.7048	2.677	8.072	14	CDF	0.9978	Non-Significant Effect
FR-UFR1		CM_MC1	-4.188	2.677	8.072	14	CDF	1.0000	Non-Significant Effect
		LC_SLC	-0.1244	2.677	8.072	14	CDF	0.9790	Non-Significant Effect
		FR_FRABCH	-1.286	2.677	9.886	10	CDF	0.9999	Non-Significant Effect
		FR_FRCP1	-1.625	2.677	9.886	10	CDF	1.0000	Non-Significant Effect
		GH_FR1	0.3385	2.677	9.886	10	CDF	0.9168	Non-Significant Effect
		GH_ERC	-0.9479	2.677	9.886	10	CDF	0.9993	Non-Significant Effect
		CM_MC2	-0.9479	2.677	9.886	10	CDF	0.9993	Non-Significant Effect
		EV_MC2	-1.963	2.677	9.886	10	CDF	1.0000	Non-Significant Effect
		EV_HC1	0.6771	2.677	9.886	10	CDF	0.8195	Non-Significant Effect
		LC_DCDS	-1.693	2.677	9.886	10	CDF	1.0000	Non-Significant Effect
		LC_LC3*	4.198	2.677	9.886	10	CDF	5.9E-04	Significant Effect
		LC_LC5	2.234	2.677	9.886	10	CDF	0.1313	Non-Significant Effect
		LC_LCDSSLCC	2.099	2.677	9.886	10	CDF	0.1698	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	2.253	3.288	1.0000	No Outliers Detected
Control Trend	Mann-Kendall Trend Test	2.253		0.7195	Non-Significant Trend in Controls

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	3370.81	240.772	14	6.622	<1.0E-37	Significant Effect
Error	2217.88	36.3586	61			
Total	5588.68		75			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance Test	16.5	29.14	0.2840	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9774	0.9559	0.1919	Normal Distribution

EC Alga Growth Inhibition Test — **Nautilus Environmental**

Analysis ID: 15-8907-6907 **Endpoint:** Cell Yield **CETIS Version:** CETISv1.9.4
Analyzed: 10 Jun-21 12:47 **Analysis:** Parametric-Control vs Treatments **Status Level:** 1

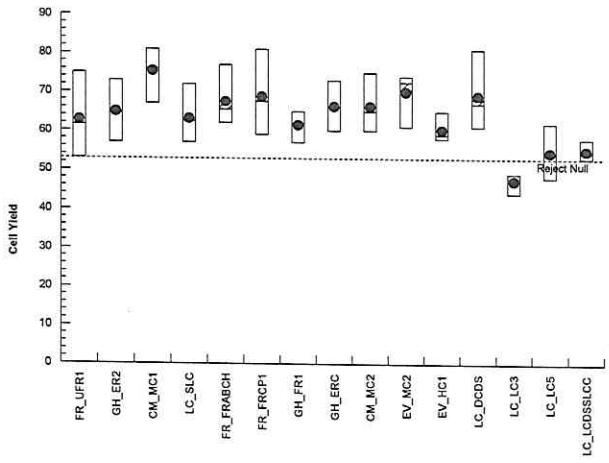
Cell Yield Summary

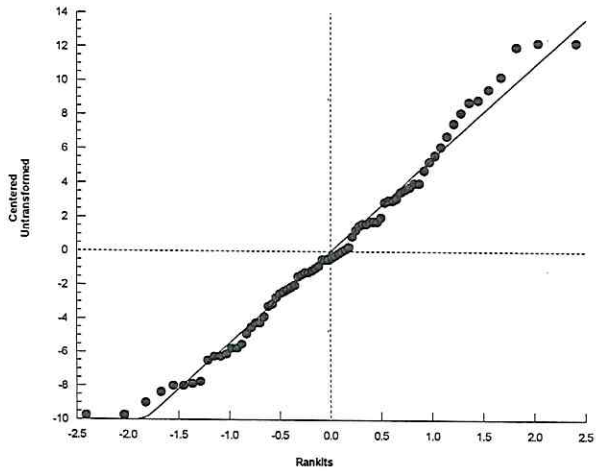
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
FR_UFR1	XC	8	62.75	56.23	69.27	61.5	53	75	2.756	12.42%	0.00%
GH_ER2		8	64.88	60.24	69.51	64.5	57	73	1.959	8.54%	-3.39%
CM_MC1		8	75.38	71.8	78.95	76	67	81	1.511	5.67%	-20.12%
LC_SLC		8	63.12	59.37	66.88	62.5	57	72	1.586	7.11%	-0.60%
FR_FRABCH		4	67.5	57.07	77.93	65.5	62	77	3.279	9.71%	-7.57%
FR_FRCP1		4	68.75	51.99	85.51	67.5	59	81	5.266	15.32%	-9.56%
GH_FR1		4	61.5	56.06	66.94	62	57	65	1.708	5.55%	1.99%
GH_ERC		4	66.25	56.32	76.18	66	60	73	3.119	9.42%	-5.58%
CM_MC2		4	66.25	55.51	76.99	65	60	75	3.376	10.19%	-5.58%
EV_MC2		4	70	60.36	79.64	72.5	61	74	3.028	8.65%	-11.55%
EV_HC1		4	60.25	55.16	65.34	59	58	65	1.601	5.31%	3.98%
LC_DCDS		4	69	53.41	84.59	67	61	81	4.899	14.20%	-9.96%
LC_LC3		4	47.25	43.49	51.01	48	44	49	1.181	5.00%	24.70%
LC_LC5		4	54.5	45.36	63.64	54	48	62	2.872	10.54%	13.15%
LC_LCDSSLCC		4	55	51.56	58.44	54.5	53	58	1.08	3.93%	12.35%

Cell Yield Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
FR_UFR1	XC	57	64	63	60	75	73	53	57
GH_ER2		61	57	68	65	60	71	64	73
CM_MC1		75	77	74	81	77	67	73	79
LC_SLC		64	63	61	66	57	62	60	72
FR_FRABCH		62	66	77	65				
FR_FRCP1		61	59	74	81				
GH_FR1		65	61	63	57				
GH_ERC		60	70	62	73				
CM_MC2		60	62	68	75				
EV_MC2		61	73	74	72				
EV_HC1		59	58	65	59				
LC_DCDS		61	61	73	81				
LC_LC3		44	47	49	49				
LC_LC5		54	48	54	62				
LC_LCDSSLCC		53	55	54	58				

Graphics





EC Alga Growth Inhibition Test — **Nautilus Environmental**

Analysis ID:	07-5766-1425	**Endpoint:**	Cell Yield	**CETIS Version:**	CETISv1.9.4
Analyzed:	10 Jun-21 12:48	**Analysis:**	Parametric-Control vs Treatments	**Status Level:**	1
Batch ID:	17-9854-5282	**Test Type:**	Cell Growth	**Analyst:**	Sierra Klueppel
Start Date:	20 May-21 16:30	**Protocol:**	EC/EPS 1/RM/25	**Diluent:**	Deionized Water + nutrients
Ending Date:	23 May-21 16:30	**Species:**	Pseudokirchneriella subcapitata	**Brine:**	
Test Length:	72h	**Taxon:**	Chlorophyta	**Source:**	In-House Culture **Age:** 6d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
FR_UFR1	12-4424-2146	18 May-21	19 May-21 11:20	64h (2.3 °C)	Teck Coal	
GH_ER2	02-4275-7088	18 May-21 09:55	19 May-21 11:20	55h (0.4 °C)		
CM_MC1	01-4263-6393	18 May-21 11:08	19 May-21 11:20	53h (1.1 °C)		
LC_SLC	12-1662-7355	18 May-21 09:45	19 May-21 11:20	55h (4.1 °C)		
FR_FRABCH	05-6713-4959	18 May-21	19 May-21 11:20	64h (1.9 °C)		
FR_FRCP1	19-8027-7867	18 May-21	19 May-21 11:20	64h (1.2 °C)		
GH_FR1	15-9886-5398	18 May-21 12:30	19 May-21 11:20	52h (0.1 °C)		
GH_ERC	21-0704-4941	18 May-21 11:20	19 May-21 11:20	53h (0.6 °C)		
CM_MC2	17-6814-6287	18 May-21 09:50	19 May-21 11:20	55h (1.1 °C)		
EV_MC2	15-5628-9197	18 May-21 13:00	19 May-21 11:20	52h (3.6 °C)		
EV_HC1	05-8730-9056	18 May-21 11:20	19 May-21 11:20	53h (4.8 °C)		
LC_DCDS	20-0340-1068	18 May-21 11:00	19 May-21 11:20	53h (4.6 °C)		
LC_LC3	18-4816-9590	18 May-21 10:15	19 May-21 11:20	54h (4.7 °C)		
LC_LC5	03-8768-2280	18 May-21 09:50	19 May-21 11:20	55h (5.2 °C)		
LC_LCDSSLCC	02-2977-6783	18 May-21 11:00	19 May-21 11:20	53h (4.3 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_UFR1	Water Sample	Teck Coal	FR_UFR1_WEK_2021-05-1	
GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-05-18_	
CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-05-18	
LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-05-18_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_WEK_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_WEK_2021-05	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-05-18_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-05-18	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-05-18	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2020_Q2_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2020_Q2_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-05-18	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-05-18_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-05-18_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	

EC Alga Growth Inhibition Test **Nautilus Environmental**

Analysis ID: 07-5766-1425 **Endpoint:** Cell Yield **CETIS Version:** CETISv1.9.4
Analyzed: 10 Jun-21 12:48 **Analysis:** Parametric-Control vs Treatments **Status Level:** 1

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C < T	GH_ER2 passed cell yield	15.75%
		CM_MC1 failed cell yield	15.75%
		LC_SLC passed cell yield	15.75%
		FR_FRABCH passed cell yield	15.75%
		FR_FRCP1 passed cell yield	15.75%
		GH_FR1 passed cell yield	15.75%
		GH_ERC passed cell yield	15.75%
		CM_MC2 passed cell yield	15.75%
		EV_MC2 passed cell yield	15.75%
		EV_HC1 passed cell yield	15.75%
		LC_DCDS passed cell yield	15.75%
		LC_LC3 passed cell yield	15.75%
		LC_LC5 passed cell yield	15.75%
		LC_LCDSSLCC passed cell yield	15.75%

Dunnett Multiple Comparison Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Site Control		GH_ER2	0.7048	2.677	8.072	14	CDF	0.8092	Non-Significant Effect
FR_UFR1		CM_MC1*	4.188	2.677	8.072	14	CDF	6.1E-04	Significant Effect
		LC_SLC	0.1244	2.677	8.072	14	CDF	0.9539	Non-Significant Effect
		FR_FRABCH	1.286	2.677	9.886	10	CDF	0.5346	Non-Significant Effect
		FR_FRCP1	1.625	2.677	9.886	10	CDF	0.3606	Non-Significant Effect
		GH_FR1	-0.3385	2.677	9.886	10	CDF	0.9902	Non-Significant Effect
		GH_ERC	0.9479	2.677	9.886	10	CDF	0.7062	Non-Significant Effect
		CM_MC2	0.9479	2.677	9.886	10	CDF	0.7062	Non-Significant Effect
		EV_MC2	1.963	2.677	9.886	10	CDF	0.2157	Non-Significant Effect
		EV_HC1	-0.6771	2.677	9.886	10	CDF	0.9975	Non-Significant Effect
		LC_DCDS	1.693	2.677	9.886	10	CDF	0.3285	Non-Significant Effect
		LC_LC3	-4.198	2.677	9.886	10	CDF	1.0000	Non-Significant Effect
		LC_LC5	-2.234	2.677	9.886	10	CDF	1.0000	Non-Significant Effect
		LC_LCDSSLCC	-2.099	2.677	9.886	10	CDF	1.0000	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	2.253	3.288	1.0000	No Outliers Detected
Control Trend	Mann-Kendall Trend Test	2.253		0.7195	Non-Significant Trend in Controls

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	3370.81	240.772	14	6.622	<1.0E-37	Significant Effect
Error	2217.88	36.3586	61			
Total	5588.68		75			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance Test	16.5	29.14	0.2840	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9774	0.9559	0.1919	Normal Distribution

EC Alga Growth Inhibition Test — **Nautilus Environmental**

Analysis ID: 07-5766-1425 **Endpoint:** Cell Yield **CETIS Version:** CETISv1.9.4
Analyzed: 10 Jun-21 12:48 **Analysis:** Parametric-Control vs Treatments **Status Level:** 1

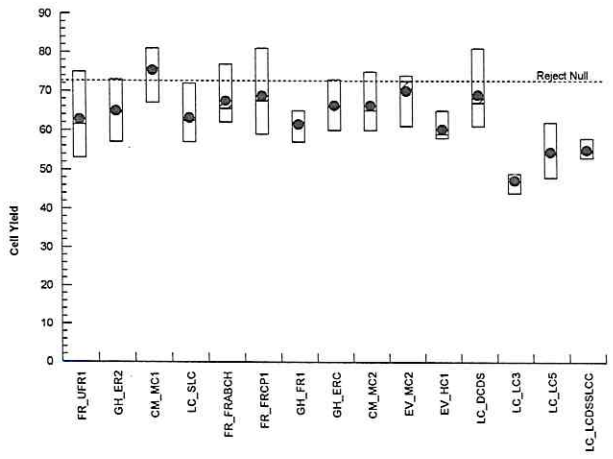
Cell Yield Summary

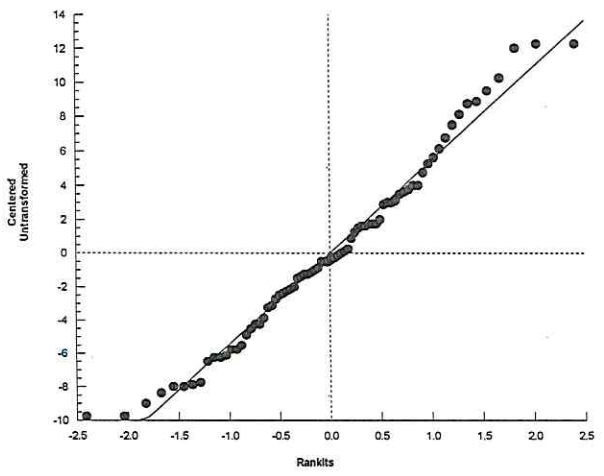
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
FR_UFR1	XC	8	62.75	56.23	69.27	61.5	53	75	2.756	12.42%	0.00%
GH_ER2		8	64.88	60.24	69.51	64.5	57	73	1.959	8.54%	-3.39%
CM_MC1		8	75.38	71.8	78.95	76	67	81	1.511	5.67%	-20.12%
LC_SLC		8	63.12	59.37	66.88	62.5	57	72	1.586	7.11%	-0.60%
FR_FRABCH		4	67.5	57.07	77.93	65.5	62	77	3.279	9.71%	-7.57%
FR_FRCP1		4	68.75	51.99	85.51	67.5	59	81	5.266	15.32%	-9.56%
GH_FR1		4	61.5	56.06	66.94	62	57	65	1.708	5.55%	1.99%
GH_ERC		4	66.25	56.32	76.18	66	60	73	3.119	9.42%	-5.58%
CM_MC2		4	66.25	55.51	76.99	65	60	75	3.376	10.19%	-5.58%
EV_MC2		4	70	60.36	79.64	72.5	61	74	3.028	8.65%	-11.55%
EV_HC1		4	60.25	55.16	65.34	59	58	65	1.601	5.31%	3.98%
LC_DCDS		4	69	53.41	84.59	67	61	81	4.899	14.20%	-9.96%
LC_LC3		4	47.25	43.49	51.01	48	44	49	1.181	5.00%	24.70%
LC_LC5		4	54.5	45.36	63.64	54	48	62	2.872	10.54%	13.15%
LC_LCDSSLCC		4	55	51.56	58.44	54.5	53	58	1.08	3.93%	12.35%

Cell Yield Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
FR_UFR1	XC	57	64	63	60	75	73	53	57
GH_ER2		61	57	68	65	60	71	64	73
CM_MC1		75	77	74	81	77	67	73	79
LC_SLC		64	63	61	66	57	62	60	72
FR_FRABCH		62	66	77	65				
FR_FRCP1		61	59	74	81				
GH_FR1		65	61	63	57				
GH_ERC		60	70	62	73				
CM_MC2		60	62	68	75				
EV_MC2		61	73	74	72				
EV_HC1		59	58	65	59				
LC_DCDS		61	61	73	81				
LC_LC3		44	47	49	49				
LC_LC5		54	48	54	62				
LC_LCDSSLCC		53	55	54	58				

Graphics





EC Alga Growth Inhibition Test — **Nautilus Environmental**

Analysis ID:	10-1317-1912	**Endpoint:**	Cell Yield	**CETIS Version:**	CETISv1.9.4
Analyzed:	10 Jun-21 12:48	**Analysis:**	Parametric-Control vs Treatments	**Status Level:**	1
Batch ID:	17-9854-5282	**Test Type:**	Cell Growth	**Analyst:**	Sierra Klueppel
Start Date:	20 May-21 16:30	**Protocol:**	EC/EPS 1/RM/25	**Diluent:**	Deionized Water + nutrients
Ending Date:	23 May-21 16:30	**Species:**	Pseudokirchneriella subcapitata	**Brine:**	
Test Length:	72h	**Taxon:**	Chlorophyta	**Source:**	In-House Culture **Age:** 6d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
FR_UFR1	12-4424-2146	18 May-21	19 May-21 11:20	64h (2.3 °C)	Teck Coal	
GH_ER2	02-4275-7088	18 May-21 09:55	19 May-21 11:20	55h (0.4 °C)		
CM_MC1	01-4263-6393	18 May-21 11:08	19 May-21 11:20	53h (1.1 °C)		
LC_SLC	12-1662-7355	18 May-21 09:45	19 May-21 11:20	55h (4.1 °C)		
FR_FRABCH	05-6713-4959	18 May-21	19 May-21 11:20	64h (1.9 °C)		
FR_FRCP1	19-8027-7867	18 May-21	19 May-21 11:20	64h (1.2 °C)		
GH_FR1	15-9886-5398	18 May-21 12:30	19 May-21 11:20	52h (0.1 °C)		
GH_ERC	21-0704-4941	18 May-21 11:20	19 May-21 11:20	53h (0.6 °C)		
CM_MC2	17-6814-6287	18 May-21 09:50	19 May-21 11:20	55h (1.1 °C)		
EV_MC2	15-5628-9197	18 May-21 13:00	19 May-21 11:20	52h (3.6 °C)		
EV_HC1	05-8730-9056	18 May-21 11:20	19 May-21 11:20	53h (4.8 °C)		
LC_DCDS	20-0340-1068	18 May-21 11:00	19 May-21 11:20	53h (4.6 °C)		
LC_LC3	18-4816-9590	18 May-21 10:15	19 May-21 11:20	54h (4.7 °C)		
LC_LC5	03-8768-2280	18 May-21 09:50	19 May-21 11:20	55h (5.2 °C)		
LC_LCDSSLCC	02-2977-6783	18 May-21 11:00	19 May-21 11:20	53h (4.3 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_UFR1	Water Sample	Teck Coal	FR_UFR1_WEK_2021-05-1	
GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-05-18_	
CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-05-18	
LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-05-18_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_WEK_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_WEK_2021-05	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-05-18_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-05-18	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-05-18	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2020_Q2_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2020_Q2_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-05-18	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-05-18_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-05-18_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	

EC Alga Growth Inhibition Test

Nautilus Environmental

Analysis ID:	15-2046-0632	**Endpoint:**	Cell Yield	**CETIS Version:**	CETISv1.9.4
Analyzed:	18 Jun-21 16:44	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	17-9854-5282	**Test Type:**	Cell Growth	**Analyst:**	Sierra Klueppel
Start Date:	20 May-21 16:30	**Protocol:**	EC/EPS 1/RM/25	**Diluent:**	Deionized Water + nutrients
Ending Date:	23 May-21 16:30	**Species:**	Pseudokirchneriella subcapitata	**Brine:**	
Test Length:	72h	**Taxon:**	Chlorophyta	**Source:**	In-House Culture **Age:** 6d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
FR_UFR1	12-4424-2146	18 May-21	19 May-21 11:20	64h (2.3 °C)	Teck Coal	
GH_ER2	02-4275-7088	18 May-21 09:55	19 May-21 11:20	55h (0.4 °C)		
CM_MC1	01-4263-6393	18 May-21 11:08	19 May-21 11:20	53h (1.1 °C)		
LC_SLC	12-1662-7355	18 May-21 09:45	19 May-21 11:20	55h (4.1 °C)		
FR_FRABCH	05-6713-4959	18 May-21	19 May-21 11:20	64h (1.9 °C)		
FR_FRCP1	19-8027-7867	18 May-21	19 May-21 11:20	64h (1.2 °C)		
GH_FR1	15-9886-5398	18 May-21 12:30	19 May-21 11:20	52h (0.1 °C)		
GH_ERC	21-0704-4941	18 May-21 11:20	19 May-21 11:20	53h (0.6 °C)		
CM_MC2	17-6814-6287	18 May-21 09:50	19 May-21 11:20	55h (1.1 °C)		
EV_MC2	15-5628-9197	18 May-21 13:00	19 May-21 11:20	52h (3.6 °C)		
EV_HC1	05-8730-9056	18 May-21 11:20	19 May-21 11:20	53h (4.8 °C)		
LC_DCDS	20-0340-1068	18 May-21 11:00	19 May-21 11:20	53h (4.6 °C)		
LC_LC3	18-4816-9590	18 May-21 10:15	19 May-21 11:20	54h (4.7 °C)		
LC_LC5	03-8768-2280	18 May-21 09:50	19 May-21 11:20	55h (5.2 °C)		
LC_LCDSSLCC	02-2977-6783	18 May-21 11:00	19 May-21 11:20	53h (4.3 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_UFR1	Water Sample	Teck Coal	FR_UFR1_WEK_2021-05-1	
GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-05-18_	
CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-05-18	
LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-05-18_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_WEK_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_WEK_2021-05	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-05-18_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-05-18	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-05-18	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2020_Q2_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2020_Q2_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-05-18	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-05-18_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-05-18_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	

EC Alga Growth Inhibition Test **Nautilus Environmental**

Analysis ID: 15-2046-0632 **Endpoint:** Cell Yield **CETIS Version:** CETISv1.9.4
Analyzed: 18 Jun-21 16:44 **Analysis:** Parametric-Two Sample **Status Level:** 1

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	LC_SLC passed cell yield	8.18%
		FR_FRABCH passed cell yield	8.18%
		FR_FRCP1 passed cell yield	8.18%
		GH_FR1 passed cell yield	8.18%
		GH_ERC passed cell yield	8.18%
		CM_MC2 passed cell yield	8.18%
		EV_MC2 passed cell yield	8.18%
		EV_HC1 passed cell yield	8.18%
		LC_DCDS passed cell yield	8.18%
		LC_LC3 failed cell yield	8.18%
		LC_LC5 failed cell yield	8.18%
		LC_LCDSSLCC failed cell yield	8.18%
		FR_UFR1 passed cell yield	8.18%
		CM_MC1 passed cell yield	8.18%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Site Control		FR_UFR1	0.6284	1.761	5.956	14	CDF	0.2699	Non-Significant Effect
		CM_MC1	-4.244	1.761	4.357	14	CDF	0.9996	Non-Significant Effect
GH_ERC		LC_SLC	0.6943	1.761	4.439	14	CDF	0.2494	Non-Significant Effect
		FR_FRABCH	-0.731	1.812	6.509	10	CDF	0.7592	Non-Significant Effect
		FR_FRCP1	-0.8551	1.812	8.213	10	CDF	0.7937	Non-Significant Effect
		GH_FR1	1.103	1.812	5.548	10	CDF	0.1480	Non-Significant Effect
		GH_ERC	-0.3899	1.812	6.392	10	CDF	0.6476	Non-Significant Effect
		CM_MC2	-0.3787	1.812	6.581	10	CDF	0.6436	Non-Significant Effect
		EV_MC2	-1.468	1.812	6.326	10	CDF	0.9136	Non-Significant Effect
		EV_HC1	1.524	1.812	5.501	10	CDF	0.0793	Non-Significant Effect
		LC_DCDS	-0.9499	1.812	7.871	10	CDF	0.8177	Non-Significant Effect
		LC_LC3*	5.98	1.812	5.342	10	CDF	6.8E-05	Significant Effect
		LC_LC5*	3.024	1.812	6.218	10	CDF	0.0064	Significant Effect
		LC_LCDSSLCC*	3.371	1.812	5.31	10	CDF	0.0036	Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	2.253	3.288	1.0000	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	3370.81	240.772	14	6.622	<1.0E-37	Significant Effect
Error	2217.88	36.3586	61			
Total	5588.68		75			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance Test	16.5	29.14	0.2840	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9774	0.9559	0.1919	Normal Distribution

EC Alga Growth Inhibition Test — **Nautilus Environmental**

Analysis ID: 15-2046-0632 **Endpoint:** Cell Yield **CETIS Version:** CETISv1.9.4
Analyzed: 18 Jun-21 16:44 **Analysis:** Parametric-Two Sample **Status Level:** 1

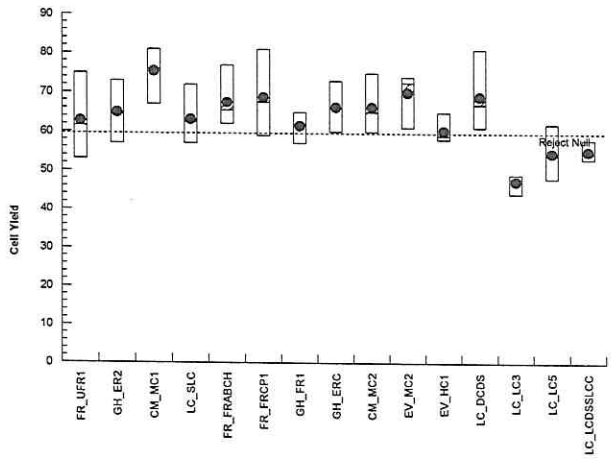
Cell Yield Summary

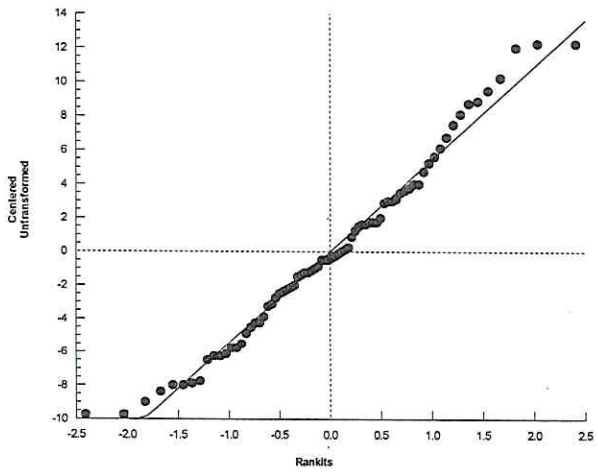
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
FR_UFR1		8	62.75	56.23	69.27	61.5	53	75	2.756	12.42%	0.00%
GH_ER2	XC	8	64.88	60.24	69.51	64.5	57	73	1.959	8.54%	-3.39%
CM_MC1		8	75.38	71.8	78.95	76	67	81	1.511	5.67%	-20.12%
LC_SLC		8	63.12	59.37	66.88	62.5	57	72	1.586	7.11%	-0.60%
FR_FRABCH		4	67.5	57.07	77.93	65.5	62	77	3.279	9.71%	-7.57%
FR_FRCP1		4	68.75	51.99	85.51	67.5	59	81	5.266	15.32%	-9.56%
GH_FR1		4	61.5	56.06	66.94	62	57	65	1.708	5.55%	1.99%
GH_ERC		4	66.25	56.32	76.18	66	60	73	3.119	9.42%	-5.58%
CM_MC2		4	66.25	55.51	76.99	65	60	75	3.376	10.19%	-5.58%
EV_MC2		4	70	60.36	79.64	72.5	61	74	3.028	8.65%	-11.55%
EV_HC1		4	60.25	55.16	65.34	59	58	65	1.601	5.31%	3.98%
LC_DCDS		4	69	53.41	84.59	67	61	81	4.899	14.20%	-9.96%
LC_LC3		4	47.25	43.49	51.01	48	44	49	1.181	5.00%	24.70%
LC_LC5		4	54.5	45.36	63.64	54	48	62	2.872	10.54%	13.15%
LC_LCDSSLCC		4	55	51.56	58.44	54.5	53	58	1.08	3.93%	12.35%

Cell Yield Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
FR_UFR1		57	64	63	60	75	73	53	57
GH_ER2	XC	61	57	68	65	60	71	64	73
CM_MC1		75	77	74	81	77	67	73	79
LC_SLC		64	63	61	66	57	62	60	72
FR_FRABCH		62	66	77	65				
FR_FRCP1		61	59	74	81				
GH_FR1		65	61	63	57				
GH_ERC		60	70	62	73				
CM_MC2		60	62	68	75				
EV_MC2		61	73	74	72				
EV_HC1		59	58	65	59				
LC_DCDS		61	61	73	81				
LC_LC3		44	47	49	49				
LC_LC5		54	48	54	62				
LC_LCDSSLCC		53	55	54	58				

Graphics





EC Alga Growth Inhibition Test — **Nautilus Environmental**

Analysis ID:	08-7163-0967	**Endpoint:**	Cell Yield	**CETIS Version:**	CETISv1.9.4
Analyzed:	10 Jun-21 12:49	**Analysis:**	Parametric-Control vs Treatments	**Status Level:**	1
Batch ID:	17-9854-5282	**Test Type:**	Cell Growth	**Analyst:**	Sierra Klueppel
Start Date:	20 May-21 16:30	**Protocol:**	EC/EPS 1/RM/25	**Diluent:**	Deionized Water + nutrients
Ending Date:	23 May-21 16:30	**Species:**	Pseudokirchneriella subcapitata	**Brine:**	
Test Length:	72h	**Taxon:**	Chlorophyta	**Source:**	In-House Culture **Age:** 6d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
FR_UFR1	12-4424-2146	18 May-21	19 May-21 11:20	64h (2.3 °C)	Teck Coal	
GH_ER2	02-4275-7088	18 May-21 09:55	19 May-21 11:20	55h (0.4 °C)		
CM_MC1	01-4263-6393	18 May-21 11:08	19 May-21 11:20	53h (1.1 °C)		
LC_SLC	12-1662-7355	18 May-21 09:45	19 May-21 11:20	55h (4.1 °C)		
FR_FRABCH	05-6713-4959	18 May-21	19 May-21 11:20	64h (1.9 °C)		
FR_FRCP1	19-8027-7867	18 May-21	19 May-21 11:20	64h (1.2 °C)		
GH_FR1	15-9886-5398	18 May-21 12:30	19 May-21 11:20	52h (0.1 °C)		
GH_ERC	21-0704-4941	18 May-21 11:20	19 May-21 11:20	53h (0.6 °C)		
CM_MC2	17-6814-6287	18 May-21 09:50	19 May-21 11:20	55h (1.1 °C)		
EV_MC2	15-5628-9197	18 May-21 13:00	19 May-21 11:20	52h (3.6 °C)		
EV_HC1	05-8730-9056	18 May-21 11:20	19 May-21 11:20	53h (4.8 °C)		
LC_DCDS	20-0340-1068	18 May-21 11:00	19 May-21 11:20	53h (4.6 °C)		
LC_LC3	18-4816-9590	18 May-21 10:15	19 May-21 11:20	54h (4.7 °C)		
LC_LC5	03-8768-2280	18 May-21 09:50	19 May-21 11:20	55h (5.2 °C)		
LC_LCDSSLCC	02-2977-6783	18 May-21 11:00	19 May-21 11:20	53h (4.3 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_UFR1	Water Sample	Teck Coal	FR_UFR1_WEK_2021-05-1	
GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-05-18_	
CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-05-18	
LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-05-18_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_WEK_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_WEK_2021-05	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-05-18_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-05-18	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-05-18	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2020_Q2_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2020_Q2_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-05-18	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-05-18_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-05-18_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	

Analyst: SKK QA: June 15/21

EC Alga Growth Inhibition Test — **Nautilus Environmental**

Analysis ID: 08-7163-0967 **Endpoint:** Cell Yield **CETIS Version:** CETISv1.9.4
Analyzed: 10 Jun-21 12:49 **Analysis:** Parametric-Control vs Treatments **Status Level:** 1

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C < T	FR_UFR1 passed cell yield	15.24%
		CM_MC1 failed cell yield	15.24%
		LC_SLC passed cell yield	15.24%
		FR_FRABCH passed cell yield	15.24%
		FR_FRCP1 passed cell yield	15.24%
		GH_FR1 passed cell yield	15.24%
		GH_ERC passed cell yield	15.24%
		CM_MC2 passed cell yield	15.24%
		EV_MC2 passed cell yield	15.24%
		EV_HC1 passed cell yield	15.24%
		LC_DCDS passed cell yield	15.24%
		LC_LC3 passed cell yield	15.24%
		LC_LC5 passed cell yield	15.24%
		LC_LCDSSLCC passed cell yield	15.24%

Dunnett Multiple Comparison Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Site Control		FR_UFR1	-0.7048	2.677	8.072	14	CDF	0.9978	Non-Significant Effect
GH-ER2		CM_MC1*	3.483	2.677	8.072	14	CDF	0.0057	Significant Effect
		LC_SLC	-0.5804	2.677	8.072	14	CDF	0.9962	Non-Significant Effect
		FR_FRABCH	0.7109	2.677	9.886	10	CDF	0.8070	Non-Significant Effect
		FR_FRCP1	1.049	2.677	9.886	10	CDF	0.6571	Non-Significant Effect
		GH_FR1	-0.914	2.677	9.886	10	CDF	0.9991	Non-Significant Effect
		GH_ERC	0.3724	2.677	9.886	10	CDF	0.9093	Non-Significant Effect
		CM_MC2	0.3724	2.677	9.886	10	CDF	0.9093	Non-Significant Effect
		EV_MC2	1.388	2.677	9.886	10	CDF	0.4810	Non-Significant Effect
		EV_HC1	-1.253	2.677	9.886	10	CDF	0.9998	Non-Significant Effect
		LC_DCDS	1.117	2.677	9.886	10	CDF	0.6229	Non-Significant Effect
		LC_LC3	-4.773	2.677	9.886	10	CDF	1.0000	Non-Significant Effect
		LC_LC5	-2.81	2.677	9.886	10	CDF	1.0000	Non-Significant Effect
		LC_LCDSSLCC	-2.674	2.677	9.886	10	CDF	1.0000	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	2.253	3.288	1.0000	No Outliers Detected
Control Trend	Mann-Kendall Trend Test	2.253		0.1788	Non-Significant Trend in Controls

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	3370.81	240.772	14	6.622	<1.0E-37	Significant Effect
Error	2217.88	36.3586	61			
Total	5588.68		75			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance Test	16.5	29.14	0.2840	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9774	0.9559	0.1919	Normal Distribution

EC Alga Growth Inhibition Test — **Nautilus Environmental**

Analysis ID: 08-7163-0967 **Endpoint:** Cell Yield **CETIS Version:** CETISv1.9.4
Analyzed: 10 Jun-21 12:49 **Analysis:** Parametric-Control vs Treatments **Status Level:** 1

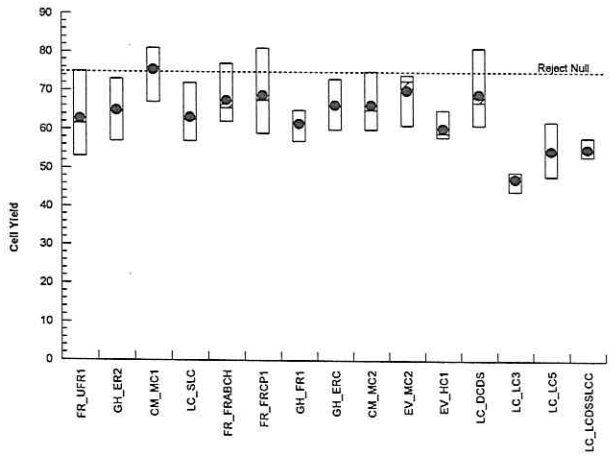
Cell Yield Summary

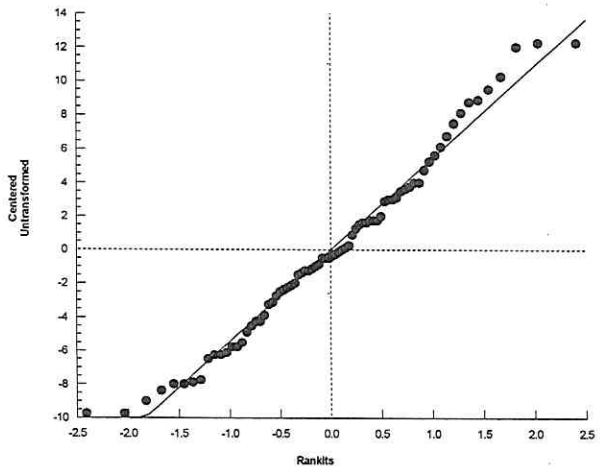
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
FR_UFR1		8	62.75	56.23	69.27	61.5	53	75	2.756	12.42%	0.00%
GH_ER2	XC	8	64.88	60.24	69.51	64.5	57	73	1.959	8.54%	-3.39%
CM_MC1		8	75.38	71.8	78.95	76	67	81	1.511	5.67%	-20.12%
LC_SLC		8	63.12	59.37	66.88	62.5	57	72	1.586	7.11%	-0.60%
FR_FRABCH		4	67.5	57.07	77.93	65.5	62	77	3.279	9.71%	-7.57%
FR_FRCP1		4	68.75	51.99	85.51	67.5	59	81	5.266	15.32%	-9.56%
GH_FR1		4	61.5	56.06	66.94	62	57	65	1.708	5.55%	1.99%
GH_ERC		4	66.25	56.32	76.18	66	60	73	3.119	9.42%	-5.58%
CM_MC2		4	66.25	55.51	76.99	65	60	75	3.376	10.19%	-5.58%
EV_MC2		4	70	60.36	79.64	72.5	61	74	3.028	8.65%	-11.55%
EV_HC1		4	60.25	55.16	65.34	59	58	65	1.601	5.31%	3.98%
LC_DCDS		4	69	53.41	84.59	67	61	81	4.899	14.20%	-9.96%
LC_LC3		4	47.25	43.49	51.01	48	44	49	1.181	5.00%	24.70%
LC_LC5		4	54.5	45.36	63.64	54	48	62	2.872	10.54%	13.15%
LC_LCDSSLCC		4	55	51.56	58.44	54.5	53	58	1.08	3.93%	12.35%

Cell Yield Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
FR_UFR1		57	64	63	60	75	73	53	57
GH_ER2	XC	61	57	68	65	60	71	64	73
CM_MC1		75	77	74	81	77	67	73	79
LC_SLC		64	63	61	66	57	62	60	72
FR_FRABCH		62	66	77	65				
FR_FRCP1		61	59	74	81				
GH_FR1		65	61	63	57				
GH_ERC		60	70	62	73				
CM_MC2		60	62	68	75				
EV_MC2		61	73	74	72				
EV_HC1		59	58	65	59				
LC_DCDS		61	61	73	81				
LC_LC3		44	47	49	49				
LC_LC5		54	48	54	62				
LC_LCDSSLCC		53	55	54	58				

Graphics





EC Alga Growth Inhibition Test — **Nautilus Environmental**

Analysis ID:	14-1488-9697	**Endpoint:**	Cell Yield	**CETIS Version:**	CETISv1.9.4
Analyzed:	10 Jun-21 12:49	**Analysis:**	Parametric-Control vs Treatments	**Status Level:**	1
Batch ID:	17-9854-5282	**Test Type:**	Cell Growth	**Analyst:**	Sierra Klueppel
Start Date:	20 May-21 16:30	**Protocol:**	EC/EPS 1/RM/25	**Diluent:**	Deionized Water + nutrients
Ending Date:	23 May-21 16:30	**Species:**	Pseudokirchneriella subcapitata	**Brine:**	
Test Length:	72h	**Taxon:**	Chlorophyta	**Source:**	In-House Culture **Age:** 6d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
FR_UFR1	12-4424-2146	18 May-21	19 May-21 11:20	64h (2.3 °C)	Teck Coal	
GH_ER2	02-4275-7088	18 May-21 09:55	19 May-21 11:20	55h (0.4 °C)		
CM_MC1	01-4263-6393	18 May-21 11:08	19 May-21 11:20	53h (1.1 °C)		
LC_SLC	12-1662-7355	18 May-21 09:45	19 May-21 11:20	55h (4.1 °C)		
FR_FRABCH	05-6713-4959	18 May-21	19 May-21 11:20	64h (1.9 °C)		
FR_FRCP1	19-8027-7867	18 May-21	19 May-21 11:20	64h (1.2 °C)		
GH_FR1	15-9886-5398	18 May-21 12:30	19 May-21 11:20	52h (0.1 °C)		
GH_ERC	21-0704-4941	18 May-21 11:20	19 May-21 11:20	53h (0.6 °C)		
CM_MC2	17-6814-6287	18 May-21 09:50	19 May-21 11:20	55h (1.1 °C)		
EV_MC2	15-5628-9197	18 May-21 13:00	19 May-21 11:20	52h (3.6 °C)		
EV_HC1	05-8730-9056	18 May-21 11:20	19 May-21 11:20	53h (4.8 °C)		
LC_DCDS	20-0340-1068	18 May-21 11:00	19 May-21 11:20	53h (4.6 °C)		
LC_LC3	18-4816-9590	18 May-21 10:15	19 May-21 11:20	54h (4.7 °C)		
LC_LC5	03-8768-2280	18 May-21 09:50	19 May-21 11:20	55h (5.2 °C)		
LC_LCDSSLCC	02-2977-6783	18 May-21 11:00	19 May-21 11:20	53h (4.3 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_UFR1	Water Sample	Teck Coal	FR_UFR1_WEK_2021-05-1	
GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-05-18_	
CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-05-18	
LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-05-18_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_WEK_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_WEK_2021-05	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-05-18_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-05-18	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-05-18	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2020_Q2_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2020_Q2_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-05-18	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-05-18_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-05-18_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	

Analyst: SRM QA: June 15/21

EC Alga Growth Inhibition Test — **Nautilus Environmental**

Analysis ID: 14-1488-9697 **Endpoint:** Cell Yield **CETIS Version:** CETISv1.9.4
Analyzed: 10 Jun-21 12:49 **Analysis:** Parametric-Control vs Treatments **Status Level:** 1

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	FR_UFR1 failed cell yield	13.12%
		GH_ER2 failed cell yield	13.12%
		LC_SLC failed cell yield	13.12%
		FR_FRABCH passed cell yield	13.12%
		FR_FRCP1 passed cell yield	13.12%
		GH_FR1 failed cell yield	13.12%
		GH_ERC passed cell yield	13.12%
		CM_MC2 passed cell yield	13.12%
		EV_MC2 passed cell yield	13.12%
		EV_HC1 failed cell yield	13.12%
		LC_DCDS passed cell yield	13.12%
		LC_LC3 failed cell yield	13.12%
		LC_LC5 failed cell yield	13.12%
		LC_LCDSSLCC failed cell yield	13.12%

Dunnett Multiple Comparison Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Site Control		FR_UFR1*	4.188	2.677	8.072	14	CDF	6.1E-04	Significant Effect
CM_MC1		GH_ER2*	3.483	2.677	8.072	14	CDF	0.0057	Significant Effect
		LC_SLC*	4.063	2.677	8.072	14	CDF	9.2E-04	Significant Effect
		FR_FRABCH	2.133	2.677	9.886	10	CDF	0.1595	Non-Significant Effect
		FR_FRCP1	1.794	2.677	9.886	10	CDF	0.2831	Non-Significant Effect
		GH_FR1*	3.758	2.677	9.886	10	CDF	0.0025	Significant Effect
		GH_ERC	2.471	2.677	9.886	10	CDF	0.0801	Non-Significant Effect
		CM_MC2	2.471	2.677	9.886	10	CDF	0.0801	Non-Significant Effect
		EV_MC2	1.456	2.677	9.886	10	CDF	0.4457	Non-Significant Effect
		EV_HC1*	4.096	2.677	9.886	10	CDF	8.3E-04	Significant Effect
		LC_DCDS	1.726	2.677	9.886	10	CDF	0.3130	Non-Significant Effect
		LC_LC3*	7.617	2.677	9.886	10	CDF	1.9E-07	Significant Effect
		LC_LC5*	5.653	2.677	9.886	10	CDF	3.2E-06	Significant Effect
		LC_LCDSSLCC*	5.518	2.677	9.886	10	CDF	5.3E-06	Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	2.253	3.288	1.0000	No Outliers Detected
Control Trend	Mann-Kendall Trend Test	2.253		0.9049	Non-Significant Trend in Controls

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	3370.81	240.772	14	6.622	<1.0E-37	Significant Effect
Error	2217.88	36.3586	61			
Total	5588.68		75			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance Test	16.5	29.14	0.2840	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9774	0.9559	0.1919	Normal Distribution

EC Alga Growth Inhibition Test — **Nautilus Environmental**

Analysis ID: 14-1488-9697 **Endpoint:** Cell Yield **CETIS Version:** CETISv1.9.4
Analyzed: 10 Jun-21 12:49 **Analysis:** Parametric-Control vs Treatments **Status Level:** 1

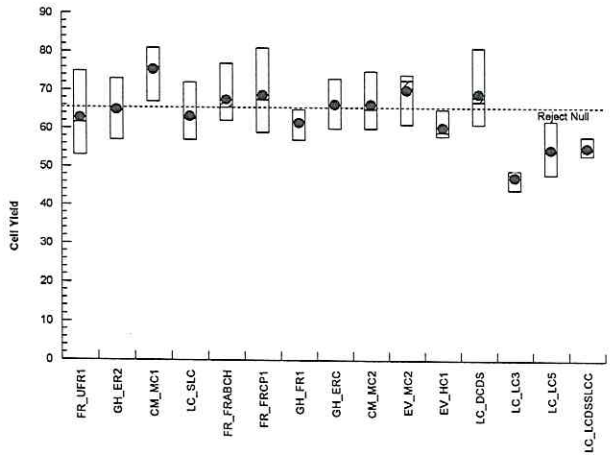
Cell Yield Summary

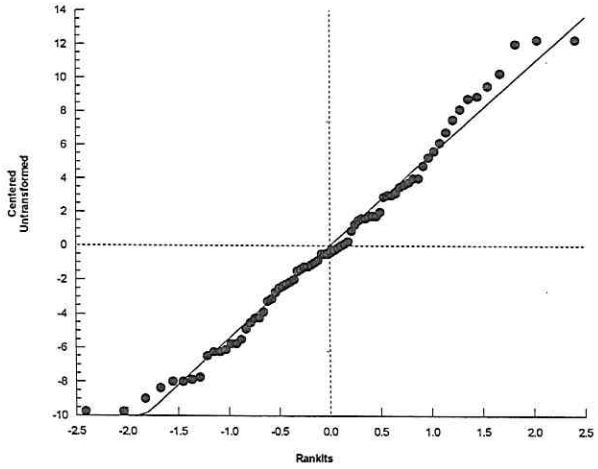
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
FR_UFR1		8	62.75	56.23	69.27	61.5	53	75	2.756	12.42%	0.00%
GH_ER2		8	64.88	60.24	69.51	64.5	57	73	1.959	8.54%	-3.39%
CM_MC1	XC	8	75.38	71.8	78.95	76	67	81	1.511	5.67%	-20.12%
LC_SLC		8	63.12	59.37	66.88	62.5	57	72	1.586	7.11%	-0.60%
FR_FRABCH		4	67.5	57.07	77.93	65.5	62	77	3.279	9.71%	-7.57%
FR_FRCP1		4	68.75	51.99	85.51	67.5	59	81	5.266	15.32%	-9.56%
GH_FR1		4	61.5	56.06	66.94	62	57	65	1.708	5.55%	1.99%
GH_ERC		4	66.25	56.32	76.18	66	60	73	3.119	9.42%	-5.58%
CM_MC2		4	66.25	55.51	76.99	65	60	75	3.376	10.19%	-5.58%
EV_MC2		4	70	60.36	79.64	72.5	61	74	3.028	8.65%	-11.55%
EV_HC1		4	60.25	55.16	65.34	59	58	65	1.601	5.31%	3.98%
LC_DCDS		4	69	53.41	84.59	67	61	81	4.899	14.20%	-9.96%
LC_LC3		4	47.25	43.49	51.01	48	44	49	1.181	5.00%	24.70%
LC_LC5		4	54.5	45.36	63.64	54	48	62	2.872	10.54%	13.15%
LC_LCDSSLCC		4	55	51.56	58.44	54.5	53	58	1.08	3.93%	12.35%

Cell Yield Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
FR_UFR1		57	64	63	60	75	73	53	57
GH_ER2		61	57	68	65	60	71	64	73
CM_MC1	XC	75	77	74	81	77	67	73	79
LC_SLC		64	63	61	66	57	62	60	72
FR_FRABCH		62	66	77	65				
FR_FRCP1		61	59	74	81				
GH_FR1		65	61	63	57				
GH_ERC		60	70	62	73				
CM_MC2		60	62	68	75				
EV_MC2		61	73	74	72				
EV_HC1		59	58	65	59				
LC_DCDS		61	61	73	81				
LC_LC3		44	47	49	49				
LC_LC5		54	48	54	62				
LC_LCDSSLCC		53	55	54	58				

Graphics





 Analyst: SKM QA: June 15/21

EC Alga Growth Inhibition Test

Nautilus Environmental

Analysis ID:	02-6675-0421	**Endpoint:**	Cell Yield	**CETIS Version:**	CETISv1.9.4
Analyzed:	10 Jun-21 12:49	**Analysis:**	Parametric-Control vs Treatments	**Status Level:**	1
Batch ID:	17-9854-5282	**Test Type:**	Cell Growth	**Analyst:**	Sierra Klueppel
Start Date:	20 May-21 16:30	**Protocol:**	EC/EPS 1/RM/25	**Diluent:**	Deionized Water + nutrients
Ending Date:	23 May-21 16:30	**Species:**	Pseudokirchneriella subcapitata	**Brine:**	
Test Length:	72h	**Taxon:**	Chlorophyta	**Source:**	In-House Culture **Age:** 6d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
FR_UFR1	12-4424-2146	18 May-21	19 May-21 11:20	64h (2.3 °C)	Teck Coal	
GH_ER2	02-4275-7088	18 May-21 09:55	19 May-21 11:20	55h (0.4 °C)		
CM_MC1	01-4263-6393	18 May-21 11:08	19 May-21 11:20	53h (1.1 °C)		
LC_SLC	12-1662-7355	18 May-21 09:45	19 May-21 11:20	55h (4.1 °C)		
FR_FRABCH	05-6713-4959	18 May-21	19 May-21 11:20	64h (1.9 °C)		
FR_FRCP1	19-8027-7867	18 May-21	19 May-21 11:20	64h (1.2 °C)		
GH_FR1	15-9886-5398	18 May-21 12:30	19 May-21 11:20	52h (0.1 °C)		
GH_ERC	21-0704-4941	18 May-21 11:20	19 May-21 11:20	53h (0.6 °C)		
CM_MC2	17-6814-6287	18 May-21 09:50	19 May-21 11:20	55h (1.1 °C)		
EV_MC2	15-5628-9197	18 May-21 13:00	19 May-21 11:20	52h (3.6 °C)		
EV_HC1	05-8730-9056	18 May-21 11:20	19 May-21 11:20	53h (4.8 °C)		
LC_DCDS	20-0340-1068	18 May-21 11:00	19 May-21 11:20	53h (4.6 °C)		
LC_LC3	18-4816-9590	18 May-21 10:15	19 May-21 11:20	54h (4.7 °C)		
LC_LC5	03-8768-2280	18 May-21 09:50	19 May-21 11:20	55h (5.2 °C)		
LC_LCDSSLCC	02-2977-6783	18 May-21 11:00	19 May-21 11:20	53h (4.3 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_UFR1	Water Sample	Teck Coal	FR_UFR1_WEK_2021-05-1	
GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-05-18_	
CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-05-18	
LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-05-18_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_WEK_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_WEK_2021-05	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-05-18_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-05-18	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-05-18	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2020_Q2_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2020_Q2_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-05-18	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-05-18_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-05-18_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	

EC Alga Growth Inhibition Test — **Nautilus Environmental**

Analysis ID: 02-6675-0421 **Endpoint:** Cell Yield **CETIS Version:** CETISv1.9.4
Analyzed: 10 Jun-21 12:49 **Analysis:** Parametric-Control vs Treatments **Status Level:** 1

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C < T	FR_UFR1 passed cell yield	13.12%
		GH_ER2 passed cell yield	13.12%
		LC_SLC passed cell yield	13.12%
		FR_FRABCH passed cell yield	13.12%
		FR_FRCP1 passed cell yield	13.12%
		GH_FR1 passed cell yield	13.12%
		GH_ERC passed cell yield	13.12%
		CM_MC2 passed cell yield	13.12%
		EV_MC2 passed cell yield	13.12%
		EV_HC1 passed cell yield	13.12%
		LC_DCDS passed cell yield	13.12%
		LC_LC3 passed cell yield	13.12%
		LC_LC5 passed cell yield	13.12%
		LC_LCDSSLCC passed cell yield	13.12%

Dunnett Multiple Comparison Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Site Control		FR_UFR1	-4.188	2.677	8.072	14	CDF	1.0000	Non-Significant Effect
CM-MC1		GH_ER2	-3.483	2.677	8.072	14	CDF	1.0000	Non-Significant Effect
		LC_SLC	-4.063	2.677	8.072	14	CDF	1.0000	Non-Significant Effect
		FR_FRABCH	-2.133	2.677	9.886	10	CDF	1.0000	Non-Significant Effect
		FR_FRCP1	-1.794	2.677	9.886	10	CDF	1.0000	Non-Significant Effect
		GH_FR1	-3.758	2.677	9.886	10	CDF	1.0000	Non-Significant Effect
		GH_ERC	-2.471	2.677	9.886	10	CDF	1.0000	Non-Significant Effect
		CM_MC2	-2.471	2.677	9.886	10	CDF	1.0000	Non-Significant Effect
		EV_MC2	-1.456	2.677	9.886	10	CDF	1.0000	Non-Significant Effect
		EV_HC1	-4.096	2.677	9.886	10	CDF	1.0000	Non-Significant Effect
		LC_DCDS	-1.726	2.677	9.886	10	CDF	1.0000	Non-Significant Effect
		LC_LC3	-7.617	2.677	9.886	10	CDF	1.0000	Non-Significant Effect
		LC_LC5	-5.653	2.677	9.886	10	CDF	1.0000	Non-Significant Effect
		LC_LCDSSLCC	-5.518	2.677	9.886	10	CDF	1.0000	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	2.253	3.288	1.0000	No Outliers Detected
Control Trend	Mann-Kendall Trend Test	2.253		0.9049	Non-Significant Trend in Controls

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	3370.81	240.772	14	6.622	<1.0E-37	Significant Effect
Error	2217.88	36.3586	61			
Total	5588.68		75			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance Test	16.5	29.14	0.2840	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9774	0.9559	0.1919	Normal Distribution

EC Alga Growth Inhibition Test — **Nautilus Environmental**

Analysis ID: 02-6675-0421 **Endpoint:** Cell Yield **CETIS Version:** CETISv1.9.4
Analyzed: 10 Jun-21 12:49 **Analysis:** Parametric-Control vs Treatments **Status Level:** 1

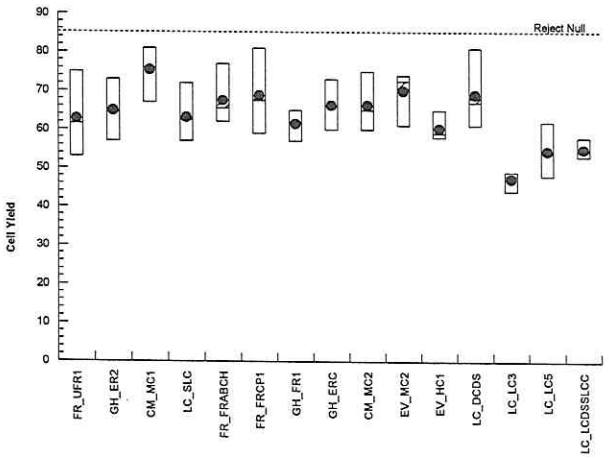
Cell Yield Summary

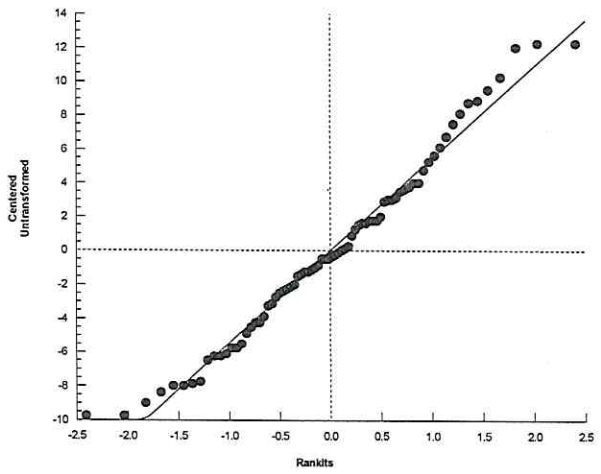
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
FR_UFR1		8	62.75	56.23	69.27	61.5	53	75	2.756	12.42%	0.00%
GH_ER2		8	64.88	60.24	69.51	64.5	57	73	1.959	8.54%	-3.39%
CM_MC1	XC	8	75.38	71.8	78.95	76	67	81	1.511	5.67%	-20.12%
LC_SLC		8	63.12	59.37	66.88	62.5	57	72	1.586	7.11%	-0.60%
FR_FRABCH		4	67.5	57.07	77.93	65.5	62	77	3.279	9.71%	-7.57%
FR_FRCP1		4	68.75	51.99	85.51	67.5	59	81	5.266	15.32%	-9.56%
GH_FR1		4	61.5	56.06	66.94	62	57	65	1.708	5.55%	1.99%
GH_ERC		4	66.25	56.32	76.18	66	60	73	3.119	9.42%	-5.58%
CM_MC2		4	66.25	55.51	76.99	65	60	75	3.376	10.19%	-5.58%
EV_MC2		4	70	60.36	79.64	72.5	61	74	3.028	8.65%	-11.55%
EV_HC1		4	60.25	55.16	65.34	59	58	65	1.601	5.31%	3.98%
LC_DCDS		4	69	53.41	84.59	67	61	81	4.899	14.20%	-9.96%
LC_LC3		4	47.25	43.49	51.01	48	44	49	1.181	5.00%	24.70%
LC_LC5		4	54.5	45.36	63.64	54	48	62	2.872	10.54%	13.15%
LC_LCDSSLCC		4	55	51.56	58.44	54.5	53	58	1.08	3.93%	12.35%

Cell Yield Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
FR_UFR1		57	64	63	60	75	73	53	57
GH_ER2		61	57	68	65	60	71	64	73
CM_MC1	XC	75	77	74	81	77	67	73	79
LC_SLC		64	63	61	66	57	62	60	72
FR_FRABCH		62	66	77	65				
FR_FRCP1		61	59	74	81				
GH_FR1		65	61	63	57				
GH_ERC		60	70	62	73				
CM_MC2		60	62	68	75				
EV_MC2		61	73	74	72				
EV_HC1		59	58	65	59				
LC_DCDS		61	61	73	81				
LC_LC3		44	47	49	49				
LC_LC5		54	48	54	62				
LC_LCDSSLCC		53	55	54	58				

Graphics





EC Alga Growth Inhibition Test

Nautilus Environmental

Analysis ID:	21-1072-1299	**Endpoint:**	Cell Yield	**CETIS Version:**	CETISv1.9.4
Analyzed:	11 Jun-21 12:26	**Analysis:**	Parametric-Control vs Treatments	**Status Level:**	1
Batch ID:	17-9854-5282	**Test Type:**	Cell Growth	**Analyst:**	Sierra Klueppel
Start Date:	20 May-21 16:30	**Protocol:**	EC/EPS 1/RM/25	**Diluent:**	Deionized Water + nutrients
Ending Date:	23 May-21 16:30	**Species:**	Pseudokirchneriella subcapitata	**Brine:**	
Test Length:	72h	**Taxon:**	Chlorophyta	**Source:**	In-House Culture **Age:** 6d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
FR_UFR1	12-4424-2146	18 May-21	19 May-21 11:20	64h (2.3 °C)	Teck Coal	
GH_ER2	02-4275-7088	18 May-21 09:55	19 May-21 11:20	55h (0.4 °C)		
CM_MC1	01-4263-6393	18 May-21 11:08	19 May-21 11:20	53h (1.1 °C)		
LC_SLC	12-1662-7355	18 May-21 09:45	19 May-21 11:20	55h (4.1 °C)		
FR_FRABCH	05-6713-4959	18 May-21	19 May-21 11:20	64h (1.9 °C)		
FR_FRCP1	19-8027-7867	18 May-21	19 May-21 11:20	64h (1.2 °C)		
GH_FR1	15-9886-5398	18 May-21 12:30	19 May-21 11:20	52h (0.1 °C)		
GH_ERC	21-0704-4941	18 May-21 11:20	19 May-21 11:20	53h (0.6 °C)		
CM_MC2	17-6814-6287	18 May-21 09:50	19 May-21 11:20	55h (1.1 °C)		
EV_MC2	15-5628-9197	18 May-21 13:00	19 May-21 11:20	52h (3.6 °C)		
EV_HC1	05-8730-9056	18 May-21 11:20	19 May-21 11:20	53h (4.8 °C)		
LC_DCDS	20-0340-1068	18 May-21 11:00	19 May-21 11:20	53h (4.6 °C)		
LC_LC3	18-4816-9590	18 May-21 10:15	19 May-21 11:20	54h (4.7 °C)		
LC_LC5	03-8768-2280	18 May-21 09:50	19 May-21 11:20	55h (5.2 °C)		
LC_LCDSSLCC	02-2977-6783	18 May-21 11:00	19 May-21 11:20	53h (4.3 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_UFR1	Water Sample	Teck Coal	FR_UFR1_WEK_2021-05-1	
GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-05-18_	
CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-05-18	
LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-05-18_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_WEK_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_WEK_2021-05	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-05-18_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-05-18	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-05-18	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2020_Q2_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2020_Q2_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-05-18	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-05-18_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-05-18_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	

Analyst: SR QA: June 15/21

EC Alga Growth Inhibition Test **Nautilus Environmental**

Analysis ID: 21-1072-1299 **Endpoint:** Cell Yield **CETIS Version:** CETISv1.9.4
Analyzed: 11 Jun-21 12:26 **Analysis:** Parametric-Control vs Treatments **Status Level:** 1

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	FR_UFR1 passed cell yield	15.66%
		GH_ER2 passed cell yield	15.66%
		CM_MC1 passed cell yield	15.66%
		FR_FRABCH passed cell yield	15.66%
		FR_FRCP1 passed cell yield	15.66%
		GH_FR1 passed cell yield	15.66%
		GH_ERC passed cell yield	15.66%
		CM_MC2 passed cell yield	15.66%
		EV_MC2 passed cell yield	15.66%
		EV_HC1 passed cell yield	15.66%
		LC_DCDS passed cell yield	15.66%
		LC_LC3 failed cell yield	15.66%
		LC_LC5 passed cell yield	15.66%
		LC_LCDSSLCC passed cell yield	15.66%

Dunnett Multiple Comparison Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Site Control		FR_UFR1	0.1244	2.677	8.072	14	CDF	0.9539	Non-Significant Effect
LC_SLC		GH_ER2	-0.5804	2.677	8.072	14	CDF	0.9962	Non-Significant Effect
		CM_MC1	-4.063	2.677	8.072	14	CDF	1.0000	Non-Significant Effect
		FR_FRABCH	-1.185	2.677	9.886	10	CDF	0.9998	Non-Significant Effect
		FR_FRCP1	-1.523	2.677	9.886	10	CDF	1.0000	Non-Significant Effect
		GH_FR1	0.4401	2.677	9.886	10	CDF	0.8929	Non-Significant Effect
		GH_ERC	-0.8463	2.677	9.886	10	CDF	0.9988	Non-Significant Effect
		CM_MC2	-0.8463	2.677	9.886	10	CDF	0.9988	Non-Significant Effect
		EV_MC2	-1.862	2.677	9.886	10	CDF	1.0000	Non-Significant Effect
		EV_HC1	0.7786	2.677	9.886	10	CDF	0.7804	Non-Significant Effect
		LC_DCDS	-1.591	2.677	9.886	10	CDF	1.0000	Non-Significant Effect
		LC_LC3*	4.299	2.677	9.886	10	CDF	4.2E-04	Significant Effect
		LC_LC5	2.336	2.677	9.886	10	CDF	0.1069	Non-Significant Effect
		LC_LCDSSLCC	2.2	2.677	9.886	10	CDF	0.1402	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	2.253	3.288	1.0000	No Outliers Detected
Control Trend	Mann-Kendall Trend Test	2.253		0.9049	Non-Significant Trend in Controls

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	3370.81	240.772	14	6.622	<1.0E-37	Significant Effect
Error	2217.88	36.3586	61			
Total	5588.68		75			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance Test	16.5	29.14	0.2840	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9774	0.9559	0.1919	Normal Distribution

EC Alga Growth Inhibition Test — **Nautilus Environmental**

Analysis ID: 21-1072-1299 **Endpoint:** Cell Yield **CETIS Version:** CETISv1.9.4
Analyzed: 11 Jun-21 12:26 **Analysis:** Parametric-Control vs Treatments **Status Level:** 1

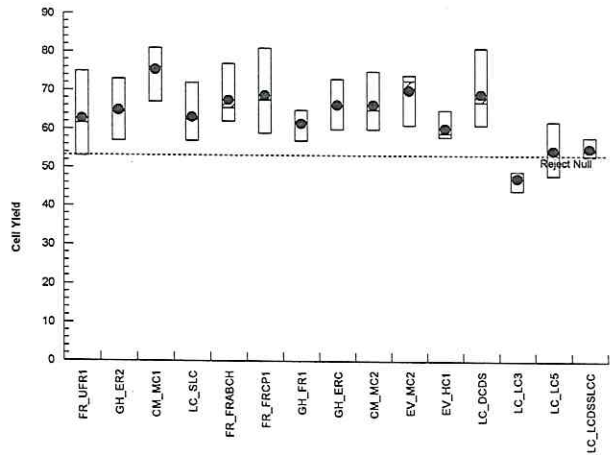
Cell Yield Summary

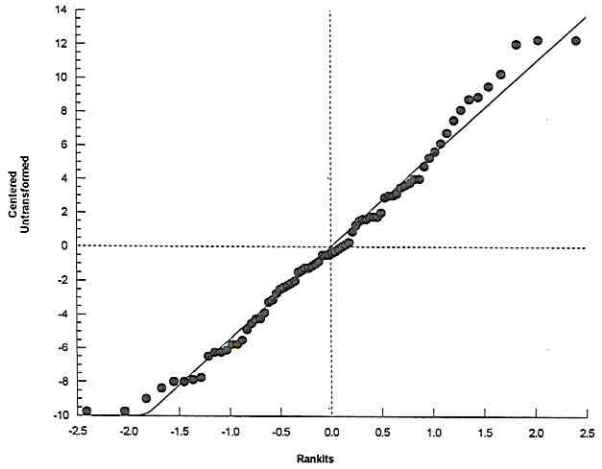
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
FR_UFR1		8	62.75	56.23	69.27	61.5	53	75	2.756	12.42%	0.00%
GH_ER2		8	64.88	60.24	69.51	64.5	57	73	1.959	8.54%	-3.39%
CM_MC1		8	75.38	71.8	78.95	76	67	81	1.511	5.67%	-20.12%
LC_SLC	XC	8	63.12	59.37	66.88	62.5	57	72	1.586	7.11%	-0.60%
FR_FRABCH		4	67.5	57.07	77.93	65.5	62	77	3.279	9.71%	-7.57%
FR_FRCP1		4	68.75	51.99	85.51	67.5	59	81	5.266	15.32%	-9.56%
GH_FR1		4	61.5	56.06	66.94	62	57	65	1.708	5.55%	1.99%
GH_ERC		4	66.25	56.32	76.18	66	60	73	3.119	9.42%	-5.58%
CM_MC2		4	66.25	55.51	76.99	65	60	75	3.376	10.19%	-5.58%
EV_MC2		4	70	60.36	79.64	72.5	61	74	3.028	8.65%	-11.55%
EV_HC1		4	60.25	55.16	65.34	59	58	65	1.601	5.31%	3.98%
LC_DCDS		4	69	53.41	84.59	67	61	81	4.899	14.20%	-9.96%
LC_LC3		4	47.25	43.49	51.01	48	44	49	1.181	5.00%	24.70%
LC_LC5		4	54.5	45.36	63.64	54	48	62	2.872	10.54%	13.15%
LC_LCDSSLCC		4	55	51.56	58.44	54.5	53	58	1.08	3.93%	12.35%

Cell Yield Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
FR_UFR1		57	64	63	60	75	73	53	57
GH_ER2		61	57	68	65	60	71	64	73
CM_MC1		75	77	74	81	77	67	73	79
LC_SLC	XC	64	63	61	66	57	62	60	72
FR_FRABCH		62	66	77	65				
FR_FRCP1		61	59	74	81				
GH_FR1		65	61	63	57				
GH_ERC		60	70	62	73				
CM_MC2		60	62	68	75				
EV_MC2		61	73	74	72				
EV_HC1		59	58	65	59				
LC_DCDS		61	61	73	81				
LC_LC3		44	47	49	49				
LC_LC5		54	48	54	62				
LC_LCDSSLCC		53	55	54	58				

Graphics





EC Alga Growth Inhibition Test **Nautilus Environmental**

Analysis ID:	15-7070-8394	**Endpoint:**	Cell Yield	**CETIS Version:**	CETISv1.9.4
Analyzed:	11 Jun-21 12:26	**Analysis:**	Parametric-Control vs Treatments	**Status Level:**	1
Batch ID:	17-9854-5282	**Test Type:**	Cell Growth	**Analyst:**	Sierra Klueppel
Start Date:	20 May-21 16:30	**Protocol:**	EC/EPS 1/RM/25	**Diluent:**	Deionized Water + nutrients
Ending Date:	23 May-21 16:30	**Species:**	Pseudokirchneriella subcapitata	**Brine:**	
Test Length:	72h	**Taxon:**	Chlorophyta	**Source:**	In-House Culture **Age:** 6d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
FR_UFR1	12-4424-2146	18 May-21	19 May-21 11:20	64h (2.3 °C)	Teck Coal	
GH_ER2	02-4275-7088	18 May-21 09:55	19 May-21 11:20	55h (0.4 °C)		
CM_MC1	01-4263-6393	18 May-21 11:08	19 May-21 11:20	53h (1.1 °C)		
LC_SLC	12-1662-7355	18 May-21 09:45	19 May-21 11:20	55h (4.1 °C)		
FR_FRABCH	05-6713-4959	18 May-21	19 May-21 11:20	64h (1.9 °C)		
FR_FRCP1	19-8027-7867	18 May-21	19 May-21 11:20	64h (1.2 °C)		
GH_FR1	15-9886-5398	18 May-21 12:30	19 May-21 11:20	52h (0.1 °C)		
GH_ERC	21-0704-4941	18 May-21 11:20	19 May-21 11:20	53h (0.6 °C)		
CM_MC2	17-6814-6287	18 May-21 09:50	19 May-21 11:20	55h (1.1 °C)		
EV_MC2	15-5628-9197	18 May-21 13:00	19 May-21 11:20	52h (3.6 °C)		
EV_HC1	05-8730-9056	18 May-21 11:20	19 May-21 11:20	53h (4.8 °C)		
LC_DCDS	20-0340-1068	18 May-21 11:00	19 May-21 11:20	53h (4.6 °C)		
LC_LC3	18-4816-9590	18 May-21 10:15	19 May-21 11:20	54h (4.7 °C)		
LC_LC5	03-8768-2280	18 May-21 09:50	19 May-21 11:20	55h (5.2 °C)		
LC_LCDSSLCC	02-2977-6783	18 May-21 11:00	19 May-21 11:20	53h (4.3 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_UFR1	Water Sample	Teck Coal	FR_UFR1_WEK_2021-05-1	
GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-05-18_	
CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-05-18	
LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-05-18_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_WEK_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_WEK_2021-05	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-05-18_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-05-18	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-05-18	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2020_Q2_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2020_Q2_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-05-18	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-05-18_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-05-18_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	

Analyst: SKK QA: June 15/21

EC Alga Growth Inhibition Test — **Nautilus Environmental**

Analysis ID: 15-7070-8394 **Endpoint:** Cell Yield **CETIS Version:** CETISv1.9.4
Analyzed: 11 Jun-21 12:26 **Analysis:** Parametric-Control vs Treatments **Status Level:** 1

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C < T	FR_UFR1 passed cell yield	15.66%
		GH_ER2 passed cell yield	15.66%
		CM_MC1 failed cell yield	15.66%
		FR_FRABCH passed cell yield	15.66%
		FR_FRCP1 passed cell yield	15.66%
		GH_FR1 passed cell yield	15.66%
		GH_ERC passed cell yield	15.66%
		CM_MC2 passed cell yield	15.66%
		EV_MC2 passed cell yield	15.66%
		EV_HC1 passed cell yield	15.66%
		LC_DCDS passed cell yield	15.66%
		LC_LC3 passed cell yield	15.66%
		LC_LC5 passed cell yield	15.66%
		LC_LCDSSLCC passed cell yield	15.66%

Dunnett Multiple Comparison Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Site Control		FR_UFR1	-0.1244	2.677	8.072	14	CDF	0.9790	Non-Significant Effect
		GH_ER2	0.5804	2.677	8.072	14	CDF	0.8525	Non-Significant Effect
LC_SLC		CM_MC1*	4.063	2.677	8.072	14	CDF	9.2E-04	Significant Effect
		FR_FRABCH	1.185	2.677	9.886	10	CDF	0.5880	Non-Significant Effect
		FR_FRCP1	1.523	2.677	9.886	10	CDF	0.4110	Non-Significant Effect
		GH_FR1	-0.4401	2.677	9.886	10	CDF	0.9934	Non-Significant Effect
		GH_ERC	0.8463	2.677	9.886	10	CDF	0.7520	Non-Significant Effect
		CM_MC2	0.8463	2.677	9.886	10	CDF	0.7520	Non-Significant Effect
		EV_MC2	1.862	2.677	9.886	10	CDF	0.2548	Non-Significant Effect
		EV_HC1	-0.7786	2.677	9.886	10	CDF	0.9984	Non-Significant Effect
		LC_DCDS	1.591	2.677	9.886	10	CDF	0.3771	Non-Significant Effect
		LC_LC3	-4.299	2.677	9.886	10	CDF	1.0000	Non-Significant Effect
		LC_LC5	-2.336	2.677	9.886	10	CDF	1.0000	Non-Significant Effect
		LC_LCDSSLCC	-2.2	2.677	9.886	10	CDF	1.0000	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	2.253	3.288	1.0000	No Outliers Detected
Control Trend	Mann-Kendall Trend Test	2.253		0.9049	Non-Significant Trend in Controls

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	3370.81	240.772	14	6.622	<1.0E-37	Significant Effect
Error	2217.88	36.3586	61			
Total	5588.68		75			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance Test	16.5	29.14	0.2840	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9774	0.9559	0.1919	Normal Distribution

EC Alga Growth Inhibition Test — **Nautilus Environmental**

Analysis ID: 15-7070-8394 **Endpoint:** Cell Yield **CETIS Version:** CETISv1.9.4
Analyzed: 11 Jun-21 12:26 **Analysis:** Parametric-Control vs Treatments **Status Level:** 1

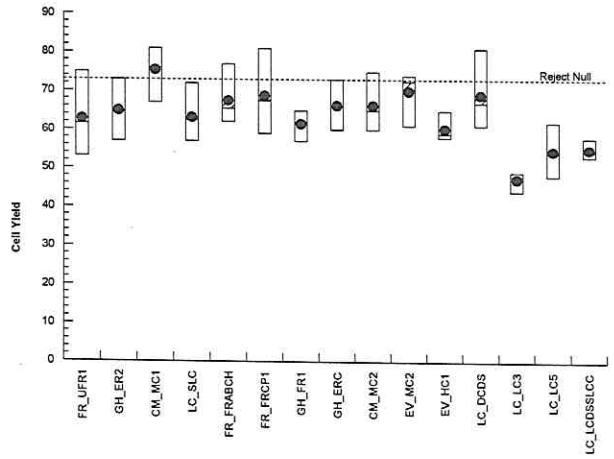
Cell Yield Summary

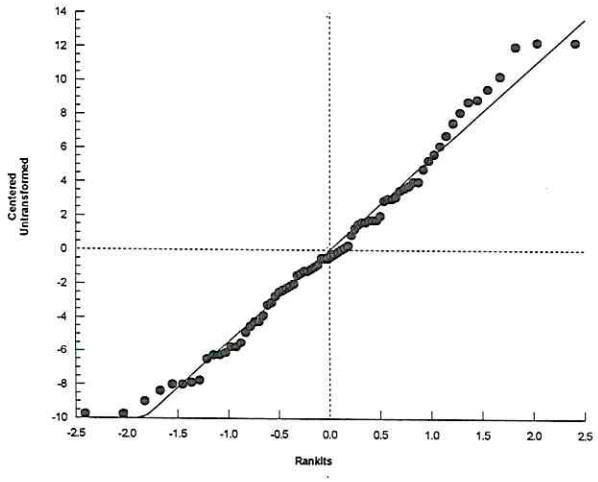
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
FR_UFR1		8	62.75	56.23	69.27	61.5	53	75	2.756	12.42%	0.00%
GH_ER2		8	64.88	60.24	69.51	64.5	57	73	1.959	8.54%	-3.39%
CM_MC1		8	75.38	71.8	78.95	76	67	81	1.511	5.67%	-20.12%
LC_SLC	XC	8	63.12	59.37	66.88	62.5	57	72	1.586	7.11%	-0.60%
FR_FRABCH		4	67.5	57.07	77.93	65.5	62	77	3.279	9.71%	-7.57%
FR_FRCP1		4	68.75	51.99	85.51	67.5	59	81	5.266	15.32%	-9.56%
GH_FR1		4	61.5	56.06	66.94	62	57	65	1.708	5.55%	1.99%
GH_ERC		4	66.25	56.32	76.18	66	60	73	3.119	9.42%	-5.58%
CM_MC2		4	66.25	55.51	76.99	65	60	75	3.376	10.19%	-5.58%
EV_MC2		4	70	60.36	79.64	72.5	61	74	3.028	8.65%	-11.55%
EV_HC1		4	60.25	55.16	65.34	59	58	65	1.601	5.31%	3.98%
LC_DCDS		4	69	53.41	84.59	67	61	81	4.899	14.20%	-9.96%
LC_LC3		4	47.25	43.49	51.01	48	44	49	1.181	5.00%	24.70%
LC_LC5		4	54.5	45.36	63.64	54	48	62	2.872	10.54%	13.15%
LC_LCDSSLCC		4	55	51.56	58.44	54.5	53	58	1.08	3.93%	12.35%

Cell Yield Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
FR_UFR1		57	64	63	60	75	73	53	57
GH_ER2		61	57	68	65	60	71	64	73
CM_MC1		75	77	74	81	77	67	73	79
LC_SLC	XC	64	63	61	66	57	62	60	72
FR_FRABCH		62	66	77	65				
FR_FRCP1		61	59	74	81				
GH_FR1		65	61	63	57				
GH_ERC		60	70	62	73				
CM_MC2		60	62	68	75				
EV_MC2		61	73	74	72				
EV_HC1		59	58	65	59				
LC_DCDS		61	61	73	81				
LC_LC3		44	47	49	49				
LC_LC5		54	48	54	62				
LC_LCDSSLCC		53	55	54	58				

Graphics





APPENDIX C – *Hyalella azteca* toxicity test data

Hyalella azteca Sediment Test Summary Sheet

Client: Teck Coal
Work Order No.: 211262

Start Date: July 1, 2021
Set up by: KJL/RZS

Sample Information:

Sample ID: Various
Sample Date: June 29, 2021, July 6, July 13, July 20
Date Received: June 30, 2021, July 8, July 14, July 21
Sample Volume: 20L

Test Organism Information:

Species: *Hyalella azteca*
Supplier: Aquatic Biosystems, CO
Date received: June 30, 2021
Age or size (Day 0): 7-8 d

NaCl Reference Toxicant Results:

Reference Toxicant ID: HA200
Stock Solution ID: n/a
Date Initiated: July 1, 2021

96-h LC50 (95% CL): 6.9 (5.6-8.4) g/L NaCl

96-h LC50 Reference Toxicant Mean and Range: 6.1 (3.8-9.8) CV (%): 24

Test Results:

Sample ID	Survival ± SD (%)	Average Dry Wt. ± SD (mg)
Lab Control	96.0 ± 5.5	0.31 ± 0.12
FR-UFR1	92.0 ± 8.4	0.37 ± 0.09
FR-FR4	98.0 ± 4.5	0.48 ± 0.09
FR-FRRD	92.0 ± 8.4	0.38 ± 0.10
FR-FR2	98.0 ± 4.5	0.48 ± 0.11
FR-MULTIPLATE	94.0 ± 8.9	0.25 ± 0.09
	±	±
	±	±

Reviewed by: [signature]
Date reviewed: Sep. 22/21

Chronic *H. azteca* Water-Only Toxicity Test Data Sheet
Water Quality

Client: Teck
Work Order No.: 211262
Sample ID: Various - see below

Start Date: July 1, 2021
Termination Date: July 29, 2021
CER #: 6
Test Organism: *Hyalella azteca*

Temperature (°C)

Sample ID/Conc.	Day													
	0	1		2		3		4		5		6		7
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Lab Control	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0
FR-UFR1	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0
FR-FR4	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0
FR-FRRD	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0
FR-FR2	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0
FR-MULTIPLATE	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0
Technician Initials	KJL	JRL	JRL	JRL	JRL	RZJ	RZJ	RZJ	RZJ	RZJ	RZJ	RZJ	RZJ	JRL

Thermometer: 6

Conductivity (µS)

Sample ID/Conc.	Day													
	0	1		2		3		4		5		6		7
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Lab Control	423	441	426	428	425	429	424	427	424	429	426	430	424	431
FR-UFR1	332	345	334	339	335	339	336	340	332	339	333	339	334	338
FR-FR4	601	618	614	619	616	616	615	617	613	616	614	618	614	621
FR-FRRD	879	880	881	876	882	873	878	876	879	889	881	885	879	878
FR-FR2	526	538	528	527	531	530	530	530	528	533	529	535	530	535
FR-MULTIPLATE	490	507	493	496	494	493	495	498	491	496	492	496	492	497
Technician Initials	KJL	JRL	JRL	JRL	JRL	RZJ	RZJ	RZJ	RZJ	RZJ	RZJ	RZJ	RZJ	JRL

Conductivity meter: 313

Comments:

Reviewed by: JRL Date Reviewed: Sep. 13/21

Chronic *H. azteca* Water-Only Toxicity Test Data Sheet
Water Quality

Client: Teck
Work Order No.: 411262
Sample ID: Various - see below

Start Date: July 1, 2021
Termination Date: July 29, 2021
Test Organism: *Hyalella azteca*

Dissolved Oxygen (mg/L)

Sample ID/Conc.	Day													
	0	1		2		3		4		5		6		7
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Lab Control	8.2	6.8	8.2	6.8	8.1	7.0	8.4	6.6	8.3	6.5	8.3	6.6	8.4	6.1
FR-UFR1	7.8	6.7	8.0	6.6	8.1	6.5	8.1	6.2	8.6	6.6	8.4	6.3	8.2	5.0
FR-FR4	8.1	6.8	7.9	6.4	8.0	6.3	8.1	6.4	8.6	6.6	8.4	6.3	8.2	5.0
FR-FRRD	8.2	6.8	8.0	6.2	8.0	6.2	8.2	6.3	8.6	6.5	8.3	6.2	8.3	5.1
FR-FR2	8.2	6.7	8.0	6.2	8.1	6.2	8.2	6.5	8.6	6.6	8.4	6.2	8.3	5.0
FR-MULTIPLATE	8.3	6.9	8.0	6.4	8.0	6.3	8.1	6.4	8.6	6.5	8.4	6.4	8.3	5.2
Technician Initials	KJL	JZL	JZL	JZL	JZL	RZS	RZS	RZS	RZS	RZS	RZS	RZS	RZS	JZL

DO meter: 3/3

pH

Sample ID/Conc.	Day													
	0	1		2		3		4		5		6		7
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Lab Control	7.8	7.5	7.8	7.4	7.7	7.3	7.7	7.3	7.8	7.2	7.8	7.1	7.8	7.2
FR-UFR1	7.8	7.8	7.9	7.6	7.8	7.6	7.8	7.6	7.8	7.6	7.8	7.5	7.9	7.4
FR-FR4	7.9	7.9	8.0	7.8	8.0	7.9	8.0	7.8	8.0	7.8	8.0	7.7	8.0	7.7
FR-FRRD	7.8	8.0	8.0	7.9	8.0	8.0	8.1	8.0	8.0	7.9	8.0	7.9	8.1	7.9
FR-FR2	7.9	7.9	8.0	7.7	8.0	7.8	8.0	7.8	8.0	7.8	8.0	7.7	8.0	7.7
FR-MULTIPLATE	7.8	7.8	7.9	7.7	7.9	7.7	7.9	7.7	7.9	7.6	7.9	7.6	7.9	7.6
Technician Initials	KJL	JZL	JZL	JZL	JZL	RZS	RZS	RZS	RZS	RZS	RZS	RZS	RZS	JZL

pH meter: 3/3

Light meter: 1.7

Light intensity (Lux): 420 - 950

Comments:

Reviewed by: JCh

Date Reviewed: Sep-13/21

Chronic *H. azteca* Water-Only Toxicity Test Data Sheet
Water Quality

Client: Teck
Work Order No.: 211262
Sample ID: Various - See below

Start Date: July 1, 2021
Termination Date: July 29, 2021
CER #: 6
Test Organism: *Hyalella azteca*

Temperature (°C)

Sample ID/Conc.	Day													
	7	8		9		10		11		12		13		14
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Lab Control	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0
FR_UFR1	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.5	22.0	22.0	22.0	22.0	22.0
FR_FR4	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.5	22.0	22.0	22.0	22.0	22.0
FR_FRRD	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.5	22.0	22.0	22.0	22.0	22.0
FR_FR2	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.5	22.0	22.0	22.0	22.0	22.0
FR_MULTIPLATE	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.5	22.0	22.0	22.0	22.0	22.0
Technician Initials	JZL	JZL	JZL	JZL	JZL	RZJ	RZJ	RZJ	RZJ	RZJ	RZJ	RZJ	RZJ	RZJ

Thermometer: 6

Conductivity (µS)

Sample ID/Conc.	Day													
	7	8		9		10		11		12		13		14
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Lab Control	425	431	425	430	427	431	424	430	424	430	422	431	427	432
FR_UFR1	335	339	349	355	352	357	351	356	349	355	350	357	352	357
FR_FR4	614	615	637	639	642	637	639	639	630	640	636	643	638	645
FR_FRRD	868	864	878	874	880	878	879	874	866	870	866	869	863	860
FR_FR2	531	531	597	595	600	601	606	601	601	606	603	603	604	606
FR_MULTIPLATE	492	492	516	515	518	523	519	523	515	522	517	523	519	523
Technician Initials	JZL	JZL	JZL	JZL	JZL	RZJ	RZJ	RZJ	RZJ	RZJ	RZJ	RZJ	RZJ	RZJ

Conductivity meter: 313

Comments:

Reviewed by: JCu

Date Reviewed: Sept 13/21

Chronic *H. azteca* Water-Only Toxicity Test Data Sheet
Water Quality

Client: Teck
Work Order No.: 21262
Sample ID: Various - see below

Start Date: July 1, 2021
Termination Date: July 29 2021
Test Organism: *Hyalella azteca*

Dissolved Oxygen (mg/L)

Sample ID/Conc.	Day													
	7	8		9		10		11		12		13		14
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Lab Control	8.3	5.5	8.4	5.6	8.4	6.0	8.3	6.5	8.4	6.1	8.5	8 (RU) 5.4	8.4	5.7
FR-UFR1	7.8	5.5	8.2	5.8	8.0	6.4	8.2	6.8	8.2	6.3	8.0	5.9	8.1	5.9
FR-FR4	7.8	5.6	8.1	5.7	8.1	5.9	8.3	6.4	8.2	6.2	8.3	6.2	8.2	6.4
FR-FRRD	7.9	5.9	8.2	5.9	8.2	6.0	8.2	6.5	8.2	6.0	8.3	6.1	8.1	6.2
FR-FR2	7.9	5.2	8.3	5.4	8.3	5.8	8.2	6.4	8.2	5.9	8.4	5.8	8.2	6.1
FR-MULTIPLATE	8.0	5.8	8.2	6.0	8.3	6.0	8.2	6.7	8.2	6.3	8.3	6.2	8.1	6.2
Technician Initials	JR	JR	JR	JR	JR	RZS	RZS	RZS	RZS	RZ	RZS	RZ	RZS	RZ

DO meter: 3/3

pH

Sample ID/Conc.	Day													
	7	8		9		10		11		12		13		14
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
① 7.7 Lab Control	7.8	7.1	~~7.5~~	7.1	7.7	7.1	7.8	7.1	7.8	7.1	7.7	7.1	7.8	7.1
FR-UFR1	7.9	7.4	8.0	7.6	8.0	7.6	8.0	7.6	8.0	7.6	7.9	7.6	8.0	7.5
FR-FR4	8.1	7.7	8.0	7.7	8.0	7.7	8.1	7.8	8.0	7.8	8.0	7.8	8.1	7.8
FR-FRRD	8.1	7.9	7.8	7.9	8.0	7.9	8.1	8.0	8.0	7.9	8.1	8.0	8.1	7.9
FR-FR2	8.0	7.6	8.0	7.7	8.1	7.7	8.1	7.8	8.1	7.8	8.1	7.8	8.1	7.8
FR-MULTIPLATE	8.0	7.6	7.9	7.6	8.0	7.6	8.0	7.7	8.0	7.7	8.0	7.7	8.0	7.7
Technician Initials	JR	JR	JR	JR	JR	RZS	RZS	RZS	RZS	RZS	RZ	RZS	RZS	RZS

pH meter: 3/3

Light meter: Lit-1
Light intensity (Lux): 420-950

Comments:

Reviewed by: JR
Date Reviewed: Sep. 13/21

Chronic *H. azteca* Water-Only Toxicity Test Data Sheet
Water Quality

Client: Teck
Work Order No.: 21262
Sample ID: Various - see below

Start Date: July 1, 2021
Termination Date: July 29, 2021
CER #: 6
Test Organism: *Hyalella azteca*

Temperature (°C)

Sample ID/Conc.	Day													
	14	15		16		17		18		19		20		21
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Lab Control	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0
FR-UFR1	22.5	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0
FR-FR4	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0
FR-FRRD	22.5	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0
FR-FR2	22.5	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0
FR-MULTIPLATE	22.5	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0
Technician Initials	RZ	JZL	JZL	JZL	JZL	RZS	RZ	RZS	RZS	RZS	RZS	RZS	RZS	JZL

Thermometer: 6

Conductivity (µS)

Sample ID/Conc.	Day													
	14	15		16		17		18		19		20		21
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Lab Control	426	435	427	433	428	431	427	436	428	431	428	433	428	435
FR-UFR1	362	369	366	371	365	369	366	373	370	374	370	375	372	380
FR-FR4	784	810	816	812	813	808	809	819	813	816	815	818	817	824
FR-FRRD	986	1019	1024	1008	1015	1001	995	989	1011	1003	1002	992	986	983
FR-FR2	678	684	692	684	688	690	690	697	691	691	691	693	692	700
FR-MULTIPLATE	620	633	638	636	636	638	639	643	641	640	641	647	643	648
Technician Initials	RZS	JZL	JZL	JZL	JZL	RZS	RZ	RZS	RZS	RZS	RZS	RZ	RZ	JZL

Conductivity meter: 3/3

Comments:

Reviewed by: JCh

Date Reviewed: Sep. 13/21

Chronic *H. azteca* Water-Only Toxicity Test Data Sheet
Water Quality

Client: Teck
Work Order No.: 211262
Sample ID: Various - see below

Start Date: July 1, 2021
Termination Date: July 29, 2021
Test Organism: *Hyalella azteca*

Dissolved Oxygen (mg/L)

Sample ID/Conc.	Day													
	14	15		16		17		18		19		20		21
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Lab Control	8.4	6.0	8.4	5.5	8.4	6.2	8.5	5.9	8.4	5.5	8.4	6.1	8.4	6.3
FR-UFR1	8.5	6.4	8.1	6.1	8.1	6.0	8.2	5.7	8.0	5.4	7.9	5.5	7.9	5.6
FR-FR4	8.6	6.5	8.1	6.1	8.1	6.1	8.2	6.1	8.1	5.9	7.9	5.8	7.9	5.9
FR-FRRD	8.5	6.2	8.2	6.2	8.1	6.0	8.1	6.3	8.1	5.8	7.9	6.1	8.0	5.6
FR-FR2	8.5	6.5	8.1	5.8	8.2	6.1	8.1	6.2	8.0	5.8	7.8	6.0	7.8	5.8
FR-MULTIPLATE	8.5	6.9	8.2	6.1	8.0	6.5	8.1	6.5	8.1	6.1	7.8	6.1	7.9	6.1
Technician Initials	RZS	JOL	JOL	JOL	JOL	RZS	RZS	RZS	RZS	RZS	RZS	RZS	RZS	JOL

DO meter: 3/3

pH

Sample ID/Conc.	Day													
	14	15		16		17		18		19		20		21
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Lab Control	7.8	7.2	7.8	7.4	7.8	7.2	7.8	7.1	7.8	7.2	7.8	7.2	7.8	7.2
FR-UFR1	7.9	7.8	8.1	7.7	8.1	7.6	8.1	7.6	7.9	7.6	8.0	7.5	8.0	7.5
FR-FR4	8.1	8.0	8.2	8.0	8.2	7.9	8.3	8.0	8.2	8.0	8.2	8.0	8.2	8.0
FR-FRRD	7.8	8.1	8.0	8.1	8.1	8.0	8.1	8.0	7.9	8.0	7.9	8.0	7.9	8.0
FR-FR2	8.1	8.1	8.2	7.9	8.2	7.9	8.2	7.9	8.2	7.9	8.2	7.9	8.2	7.9
FR-MULTIPLATE	7.9	7.9	8.1	7.8	8.1	7.9	8.2	7.9	8.1	7.9	8.1	7.8	8.2	7.9
Technician Initials	RZS	JOL	JOL	JOL	JOL	RZS	RZS	RZS	RZS	RZS	RZS	RZS	RZS	JOL

pH meter: 3/3

Light meter: Lit-1
Light intensity (Lux): 420-950

Comments:

Reviewed by: JOL
Date Reviewed: Sept. 13/21

Chronic *H. azteca* Water-Only Toxicity Test Data Sheet
Water Quality

Client: Teck
Work Order No.: 211262
Sample ID: Various - see below

Start Date: July 1, 2021
Termination Date: July 29, 2021
CER #: 6
Test Organism: *Hyalella azteca*

Temperature (°C)

Sample ID/Conc.	Day													
	21	22		23		24		25		26		27		28
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Lab Control	22.0	22.5	22.0	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.0	22.5
FR-UFR1	22.5	22.5	23.0	22.5	23.0	22.5	22.5	22.5	23.0	22.5	23.0	22.5	23.0	22.5
FR-FR4	22.5	22.5	23.0	22.5	23.0	22.5	22.5	22.5	23.0	22.5	23.0	22.5	23.0	22.5
FR-FRD	22.5	22.5	23.0	22.5	23.0	22.5	22.5	22.5	23.0	22.5	23.0	22.5	23.0	22.5
FR-FR2	22.5	22.5	23.0	22.5	23.0	22.5	22.5	22.5	23.0	22.5	23.0	22.5	23.0	22.5
FR-MULTIPLATE	22.5	22.5	23.0	22.5	23.0	22.5	22.5	22.5	23.0	22.5	23.0	22.5	23.0	22.5
Technician Initials	JZL	JZL	JZL	ML	ML	RZS	RZS	RZS	RZS	RZS	RZS	RZS	RZS	RZS

Thermometer: 6

Conductivity (µS)

Sample ID/Conc.	Day													
	21	22		23		24		25		26		27		28
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Lab Control	425	435	428	435	428	434	430	437	429	434	428	440	430	438
FR-UFR1	382	384	382	388	382	391	385	393	386	393	386	396	389	398
FR-FR4	916	906	916	922	917	923	920	926	925	922	923	930	926	936
FR-FRD	1109	1088	1100	1088	1108	1085	1065	1061	1086	1069	1076	1066	1060	1055
FR-FR2	744	737	742	731	741	741	742	746	741	731	733	740	724	739
FR-MULTIPLATE	690	688	691	690	690	697	697	702	696	723	716	702	712	705
Technician Initials	JZL	JZL	JZL	ML	ML	RZS	RZS	RZS	RZS	RZS	RZS	RZS	RZ	RZ

Conductivity meter: 3/3

Comments:

Reviewed by: JZL

Date Reviewed: Sept. 13/21

Chronic *H. azteca* Water-Only Toxicity Test Data Sheet
Water Quality

Client: Teck
Work Order No.: 21262
Sample ID: Various - see below

Start Date: July 1, 2021
Termination Date: July 29, 2021
Test Organism: *Hyalella azteca*

Dissolved Oxygen (mg/L)

Sample ID/Conc.	Day													
	21	22		23		24		25		26		27		28
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Lab Control	8.4	5.0	8.2	5.8	8.2	5.5	8.2	5.5	8.2	5.8	8.4	6.0	8.4	6.4
FR-UFR1	8.0	5.5	7.8	5.8	7.9	5.8	7.9	5.8	7.8	5.4	7.9	5.5	7.8	5.6
FR-FR4	8.0	5.6	7.8	5.9	7.6	5.7	7.8	5.5	7.8	5.5	7.9	5.5	7.9	5.8
FR-FRRD	8.0	5.4	8.0	5.8	7.9	5.5	7.9	5.4	7.9	5.5	8.0	5.6	7.9	5.5
FR-FR2	7.9	5.9	7.9	6.1	7.6	5.3	7.9	5.3	7.8	5.2	8.0	5.3	7.8	5.4
FR-MULTIPLATE	8.1	5.9	7.9	6.2	7.8	5.9	8.0	5.7	7.9	5.8	8.0	5.5	7.8	5.9
Technician Initials	JZL	JZL	JZL	JZL	JZL	RZS	RZS	RZS	RZS	RZS	RZS	RZS	RZS	RZS

DO meter: 3/3

pH

Sample ID/Conc.	Day													
	21	22		23		24		25		26		27		28
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Lab Control	7.8	7.2	7.8	7.2	7.8	7.2	7.8	7.2	7.8	7.2	7.8	7.2	7.8	7.2
FR-UFR1	8.0	7.7	8.0	7.7	8.0	7.7	8.0	7.7	8.0	7.6	8.0	7.6	8.0	7.6
FR-FR4	8.2	8.0	8.2	8.0	8.2	8.0	8.2	8.0	8.3	8.0	8.3	8.0	8.3	8.0
FR-FRRD	7.8	8.1	8.0	8.0	8.0	8.0	8.0	8.0	7.9	8.0	7.8	7.9	7.8	7.9
FR-FR2	8.2	8.0	8.2	8.0	8.2	7.8	8.2	7.9	8.1	7.8	8.1	7.8	8.1	7.8
FR-MULTIPLATE	8.0	7.9	8.1	7.9	8.1	7.9	8.2	7.9	8.2	7.8	8.2	7.8	8.2	7.8
Technician Initials	JZL	JZL	JZL	JZL	JZL	RZS	RZS	RZS	RZS	RZS	RZS	RZS	RZS	RZS

pH meter: 3/3

Light meter: Li-1

Light intensity (Lux): 420-950

Comments:

Reviewed by: JCh

Date Reviewed: Sept. 13/21

Water Only RZS

H. azteca ~~Sediment~~ Toxicity Test Data Sheet

Freshwater ~~Sediment~~ ~~14-d~~ RZS Survival and Weight

Water Only RZS 28-d

Client: Teck

Work Order No: 211262

Sample ID: Various - see below

Start Date: July 1, 2021

Termination Date: July 29, 2021

Test Organism: *Hyalella azteca*

Balance: 1

Sample ID	Pan No. (Q2-1 Red)	Rep	No. alive	No. dead	No. missing	Initials	Pan weight (mg)	Pan + organism (mg)	No. weighed	Initials
Control ~~Sediment~~ RZS	1	A	10	0	0	RZS	1008.97	1013.90	10	MDO
	2	B	9	0	1	↓	1011.44	1013.46	9	MDO
	3	C	10	0	0	↓	1000.53	1004.11	10	MDO
	4	D	9	0	1	↓	1002.69	1005.22	9	MDO
	5	E	10	0	0	↓	1001.71	1003.69	10	MDO
FR-UFR1	6	A	10	0	0	KDL	1004.05	1006.19	10	MDO
	7	B	9	0	1	↓	1014.06	1017.45	9	↓
	8	C	10	0	0	↓	1000.33	1004.06	10	↓
	9	D	9	0	1	↓	1010.16	1014.11	9	↓
	10	E	8	0	2	↓	999.21	1002.65	8	↓
FR-FR4	11	A	10	0	0	MDO	1006.56	1011.17	10	↓
	12	B	10	0	0	↓	996.77	1002.51	10	↓
	13	C	10	0	0	↓	995.45	999.60	10	↓
	14	D	10	0	0	↓	1012.43	1018.32	10	↓
	15	E	9	0	1	↓	1010.22	1013.68	9	↓
FR-FRRD	16	A	9	0	1	RZS	1006.34	1010.85	9	↓
	17	B	10	0	0	↓	1001.25	1005.93	10	↓
	18	C	9	0	1	↓	1011.11	1014.00	9	↓
	19	D	10	0	0	↓	1009.14	1012.68	10	↓
	20	E	8	0	2	↓	1001.71	1003.84	8	↓

Date/time pan placed in oven: July 29, 2021 @ 1000

Date/time pan removed from oven: Aug 3, 2021 @ 0930

Date/time pan + organisms placed in oven: Aug 5, 2021 @ 1015

Date/time pan + organisms removed from oven: Aug 6, 2021 @ 1030

Comments: 10% reweigh: FR_FR4_11: 1011.18, FR_FRRD_18: 1014.02, FR_MULTIPLATE_28: 1011.31

Reviewed by: JM

Date Reviewed: Sept 13/21

Water Only RZ1

H. azteca ~~Sediment~~ Toxicity Test Data Sheet

Freshwater ~~Sediment~~ ~~14-d~~ Survival and Weight

RZ5 RZ5 Water Only 28-d

Client: Teck

Work Order No: 241262

Sample ID: Various - see below

Start Date: July 1, 2021

Termination Date: July 29, 2021

Test Organism: *Hyalella azteca*

Balance: 1

Sample ID	Q2-1 Pan No. Red	Rep	No. alive	No. dead	No. missing	Initials	Pan weight (mg)	Pan + organism (mg)	No. weighed	Initials
Control ~~Sediment~~	21	A	10	0	0	MDO	999.24	1004.93	10	MDO
RZ5	22	B	10		0		997.33	1003.38	10	
FR-FR2	23	C	10		0		1003.27	1007.76	10	
	24	D	9		1		1013.17	1017.03	9	
	25	E	10		0		1007.47	1010.76	10	
FR-MULTIPLATE	26	A	10	0	0	KTV	1006.10	1009.84	10	
	27	B	10		0		1008.08	1011.03	10	
	28	C	10		0		1008.75	1011.29	10	
	29	D	9		1		1001.34	1003.18	9	
	30	E	8		2		1007.91	1009.01	8	
		A								
		B								
		C								
		D								
		E								
		A								
		B								
		C								
		D								
		E								

Date/time pan placed in oven: July 29, 2021 @ 1000

Date/time pan removed from oven: Aug 3, 2021 @ 0930

Date/time pan + organisms placed in oven: Aug 5/21 @ 10:15 h

Date/time pan + organisms removed from oven: Aug 6/21 @ 10:30 h

Comments:

Reviewed by:

Date Reviewed: Sep. 13/21

CETIS Summary Report

Test Code/ID: 211262 / 20-9495-5108

Hyalella 28-d Survival and Growth ~~Sediment~~ Water only Test

Nautilus Environmental

Batch ID:	08-8986-8955	**Test Type:**	Survival-Growth	**Analyst:**	Mikayla Oldach
Start Date:	01 Jul-21 ✓	**Protocol:**	EPA/600/R-99/064 (2000)(modified)	**Diluent:**	Reconstituted Water
Ending Date:	29 Jul-21 ✓	**Species:**	Hyalella azteca	**Brine:**	
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	Aquatic Biosystems, CO **Age:** 7-8d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
Lab Control	20-7542-0573	01 Jul-21	01 Jul-21	n/a	Teck Coal	
FR_UFR1	17-4923-4990	29 Jun-21 09:49 ✓	30 Jun-21 09:38 ✓	38h (18.3 °C) ✓		
FR_FR4	04-4020-7661	29 Jun-21 11:36 ✓	30 Jun-21 09:38 ✓	36h (19.5 °C) ✓		
FR_FRRD	08-3256-7665	29 Jun-21 12:03 ✓	30 Jun-21 09:38 ✓	36h (20.6 °C) ✓		
FR_FR2	16-6218-6131	29 Jun-21 11:06 ✓	30 Jun-21 09:38 ✓	37h (19.6 °C) ✓		
FR_MULTIPLATE	20-8036-0563	29 Jun-21 10:34 ✓	30 Jun-21 09:38 ✓	37h (18.3 °C) ✓		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
Lab Control	Water Sample	Teck Coal	Lab Control	
FR_UFR1	Water Sample	Teck Coal	FR_UFR1_WS_2021-06-29	
FR_FR4	Water Sample	Teck Coal	FR_FR4_WS_2021-0629_	
FR_FRRD	Water Sample	Teck Coal	FR_FRRD_WS_2021-0629	
FR_FR2	Water Sample	Teck Coal	FR_FR2_WS_2021-0629_	
FR_MULTIPLATE	Water Sample	Teck Coal	FR_MULTIPLATE_WS_202	

SIngle Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
00-4156-3838	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9762	FR_UFR1 passed mean dry weight-mg	1
00-4156-3838	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9762	FR_FR4 passed mean dry weight-mg	1
00-4156-3838	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9762	FR_FRRD passed mean dry weight-mg	1
00-4156-3838	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9762	FR_MULTIPLATE passed mean dry weight	1
00-4156-3838	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9762	FR_FR2 passed mean dry weight-mg	1
00-4156-3838	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9762	Lab Control passed mean dry weight-mg	1
00-4156-3838	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9999	FR_UFR1 passed mean dry weight-mg	1
00-4156-3838	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9999	Lab Control passed mean dry weight-mg	1
00-4156-3838	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9999	FR_FR4 passed mean dry weight-mg	1
00-4156-3838	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9999	FR_MULTIPLATE passed mean dry weight	1
00-4156-3838	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9999	FR_FRRD passed mean dry weight-mg	1
00-4156-3838	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9999	FR_FR2 passed mean dry weight-mg	1
00-4156-3838	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9879	FR_MULTIPLATE passed mean dry weight	1
00-4156-3838	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9879	FR_UFR1 passed mean dry weight-mg	1
00-4156-3838	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9879	Lab Control passed mean dry weight-mg	1
00-4156-3838	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9879	FR_FR4 passed mean dry weight-mg	1
00-4156-3838	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9879	FR_FR2 passed mean dry weight-mg	1
00-4156-3838	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9879	FR_FRRD passed mean dry weight-mg	1
00-4156-3838	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9999	FR_MULTIPLATE passed mean dry weight	1
00-4156-3838	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9999	FR_FR2 passed mean dry weight-mg	1
00-4156-3838	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9999	Lab Control passed mean dry weight-mg	1
00-4156-3838	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9999	FR_FRRD passed mean dry weight-mg	1
00-4156-3838	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9999	FR_FR4 passed mean dry weight-mg	1
00-4156-3838	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9999	FR_UFR1 passed mean dry weight-mg	1
00-4156-3838	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.4620	FR_MULTIPLATE passed mean dry weight	1
00-4156-3838	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.4620	FR_FR2 passed mean dry weight-mg	1
00-4156-3838	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.4620	Lab Control passed mean dry weight-mg	1
00-4156-3838	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.4620	FR_UFR1 passed mean dry weight-mg	1
00-4156-3838	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.4620	FR_FR4 passed mean dry weight-mg	1
00-4156-3838	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.4620	FR_FRRD passed mean dry weight-mg	1
08-2771-3834	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed survival rate	1
08-2771-3834	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed survival rate	1
08-2771-3834	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Lab Control passed survival rate	1
08-2771-3834	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed survival rate	1

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Hyalella 28-d Survival and Growth ~~Sediment~~ Water Only Test Nautilus Environmental

SIngle Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
08-2771-3834	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed survival rate	1
08-2771-3834	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed survival rate	1
08-2771-3834	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed survival rate	1
08-2771-3834	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed survival rate	1
08-2771-3834	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed survival rate	1
08-2771-3834	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed survival rate	1
08-2771-3834	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed survival rate	1
08-2771-3834	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Lab Control passed survival rate	1
08-2771-3834	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed survival rate	1
08-2771-3834	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed survival rate	1
08-2771-3834	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed survival rate	1
08-2771-3834	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed survival rate	1
08-2771-3834	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed survival rate	1
08-2771-3834	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Lab Control passed survival rate	1
08-2771-3834	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed survival rate	1
08-2771-3834	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed survival rate	1
08-2771-3834	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed survival rate	1
08-2771-3834	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed survival rate	1
08-2771-3834	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed survival rate	1
08-2771-3834	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Lab Control passed survival rate	1
08-2771-3834	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed survival rate	1
08-2771-3834	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed survival rate	1
08-2771-3834	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed survival rate	1
08-2771-3834	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed survival rate	1
08-2771-3834	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed survival rate	1
08-2771-3834	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Lab Control passed survival rate	1

Test Acceptability

Analysis ID	Endpoint	Attribute	Test Stat	TAC Limits Lower	TAC Limits Upper	Overlap	Decision
08-2771-3834	Survival Rate	Control Resp	0.96	0.8	>>	Yes	Passes Criteria

Mean Dry Weight-mg Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
Lab Control	N	5	0.3109	0.1634	0.4585	0.198	0.493	0.05315	0.1188	38.22%	0.00%
FR_UFR1		5	0.3665	0.2543	0.4787	0.214	0.4389	0.04042	0.09038	24.66%	-17.88%
FR_FR4		5	0.4847	0.3697	0.5997	0.3844	0.589	0.04143	0.09263	19.11%	-55.89%
FR_FRRD		5	0.3821	0.2588	0.5054	0.2663	0.5011	0.04442	0.09934	26.00%	-22.89%
FR_FR2		5	0.4762	0.3376	0.6148	0.329	0.605	0.04992	0.1116	23.44%	-53.16%
FR_MULTIPLATE		5	0.253	0.1418	0.3642	0.1375	0.374	0.04007	0.08959	35.41%	18.63%

Survival Rate Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
Lab Control	N	5	0.9600	0.8920	1.0000	0.9000	1.0000	0.0245	0.0548	5.71%	0.00%
FR_UFR1		5	0.9200	0.8161	1.0000	0.8000	1.0000	0.0374	0.0837	9.09%	4.17%
FR_FR4		5	0.9800	0.9245	1.0000	0.9000	1.0000	0.0200	0.0447	4.56%	-2.08%
FR_FRRD		5	0.9200	0.8161	1.0000	0.8000	1.0000	0.0374	0.0837	9.09%	4.17%
FR_FR2		5	0.9800	0.9245	1.0000	0.9000	1.0000	0.0200	0.0447	4.56%	-2.08%
FR_MULTIPLATE		5	0.9400	0.8289	1.0000	0.8000	1.0000	0.0400	0.0894	9.52%	2.08%

Hyalella 28-d Survival and Growth ~~Sediment~~ Water Only Test
Nautilus Environmental

Mean Dry Weight-mg Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
Lab Control	N	0.493	0.2244	0.358	0.2811	0.198
FR_UFR1		0.214	0.3767	0.373	0.4389	0.43
FR_FR4		0.461	0.574	0.415	0.589	0.3844
FR_FRRD		0.5011	0.468	0.3211	0.354	0.2663
FR_FR2		0.569	0.605	0.449	0.4289	0.329
FR_MULTIPLATE		0.374	0.295	0.254	0.2044	0.1375

Survival Rate Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
Lab Control	N	1.0000	0.9000	1.0000	0.9000	1.0000
FR_UFR1		1.0000	0.9000	1.0000	0.9000	0.8000
FR_FR4		1.0000	1.0000	1.0000	1.0000	0.9000
FR_FRRD		0.9000	1.0000	0.9000	1.0000	0.8000
FR_FR2		1.0000	1.0000	1.0000	0.9000	1.0000
FR_MULTIPLATE		1.0000	1.0000	1.0000	0.9000	0.8000

Survival Rate Binomials

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
Lab Control	N	10/10	9/10	10/10	9/10	10/10
FR_UFR1		10/10	9/10	10/10	9/10	8/10
FR_FR4		10/10	10/10	10/10	10/10	9/10
FR_FRRD		9/10	10/10	9/10	10/10	8/10
FR_FR2		10/10	10/10	10/10	9/10	10/10
FR_MULTIPLATE		10/10	10/10	10/10	9/10	8/10

CETIS Analytical Report

Hyalella 28-d Survival and Growth ~~Sediment~~ Water only Test

Nautilus Environmental

Analysis ID:	08-2771-3834	**Endpoint:**	Survival Rate	**CETIS Version:**	CETISv1.9.4
Analyzed:	05 Aug-21 15:53	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1
Batch ID:	08-8986-8955	**Test Type:**	Survival-Growth	**Analyst:**	Mikayla Oldach
Start Date:	01 Jul-21	**Protocol:**	EPA/600/R-99/064 (2000) (modified)	**Diluent:**	Reconstituted Water
Ending Date:	29 Jul-21	**Species:**	Hyalella azteca	**Brine:**	
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	Aquatic Biosystems, CO **Age:** 7-8d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
Lab Control	20-7542-0573	01 Jul-21	01 Jul-21	n/a	Teck Coal	
FR_UFR1	17-4923-4990	29 Jun-21 09:49	30 Jun-21 09:38	38h (18.3 °C)		
FR_FR4	04-4020-7661	29 Jun-21 11:36	30 Jun-21 09:38	36h (19.5 °C)		
FR_FRRD	08-3256-7665	29 Jun-21 12:03	30 Jun-21 09:38	36h (20.6 °C)		
FR_FR2	16-6218-6131	29 Jun-21 11:06	30 Jun-21 09:38	37h (19.6 °C)		
FR_MULTIPLATE	20-8036-0563	29 Jun-21 10:34	30 Jun-21 09:38	37h (18.3 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
Lab Control	Water Sample	Teck Coal	Lab Control	
FR_UFR1	Water Sample	Teck Coal	FR_UFR1_WS_2021-06-29	
FR_FR4	Water Sample	Teck Coal	FR_FR4_WS_2021-0629_	
FR_FRRD	Water Sample	Teck Coal	FR_FRRD_WS_2021-0629	
FR_FR2	Water Sample	Teck Coal	FR_FR2_WS_2021-0629_	
FR_MULTIPLATE	Water Sample	Teck Coal	FR_MULTIPLATE_WS_202	

Fisher Exact/Bonferroni-Holm Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
Negative Control		FR_UFR1	0.3389	Exact	1.0000	Non-Significant Effect
		FR_FR4	0.8788	Exact	1.0000	Non-Significant Effect
		FR_FRRD	0.3389	Exact	1.0000	Non-Significant Effect
		FR_FR2	0.8788	Exact	1.0000	Non-Significant Effect
		FR_MULTIPLATE	0.5000	Exact	1.0000	Non-Significant Effect

Test Acceptability Criteria

		TAC Limits			
Attribute	**Test Stat**	**Lower**	**Upper**	**Overlap**	**Decision**
Control Resp	0.96	0.8	>>	Yes	Passes Criteria

Data Summary

Sample	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
Lab Control	N	48	2	50	0.96	0.04	2.04%
FR_UFR1		46	4	50	0.92	0.08	6.12%
FR_FR4		49	1	50	0.98	0.02	0.0%
FR_FRRD		46	4	50	0.92	0.08	6.12%
FR_FR2		49	1	50	0.98	0.02	0.0%
FR_MULTIPLATE		47	3	50	0.94	0.06	4.08%

Survival Rate Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
Lab Control	N	1.0000	0.9000	1.0000	0.9000	1.0000
FR_UFR1		1.0000	0.9000	1.0000	0.9000	0.8000
FR_FR4		1.0000	1.0000	1.0000	1.0000	0.9000
FR_FRRD		0.9000	1.0000	0.9000	1.0000	0.8000
FR_FR2		1.0000	1.0000	1.0000	0.9000	1.0000
FR_MULTIPLATE		1.0000	1.0000	1.0000	0.9000	0.8000

CETIS Analytical Report

Report Date: 05 Aug-21 15:54 (p 2 of 2)
Test Code/ID: 211262 / 20-9495-5108

Hyalella 28-d Survival and Growth ~~Sediment~~ Test Water only

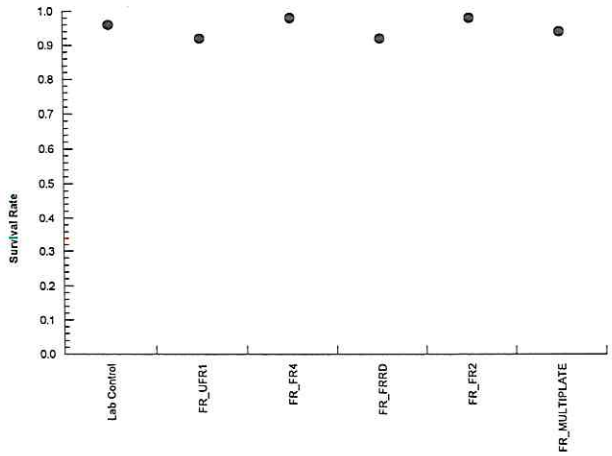
Nautilus Environmental

Analysis ID:	08-2771-3834	**Endpoint:**	Survival Rate	**CETIS Version:**	CETISv1.9.4
Analyzed:	05 Aug-21 15:53	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1

Survival Rate Binomials

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
Lab Control	N	10/10	9/10	10/10	9/10	10/10
FR_UFR1		10/10	9/10	10/10	9/10	8/10
FR_FR4		10/10	10/10	10/10	10/10	9/10
FR_FRRD		9/10	10/10	9/10	10/10	8/10
FR_FR2		10/10	10/10	10/10	9/10	10/10
FR_MULTIPLATE		10/10	10/10	10/10	9/10	8/10

Graphics



CETIS Analytical Report

Hyalella 28-d Survival and Growth ~~Sediment~~ (pH) Water Only Test

Nautilus Environmental

Analysis ID:	00-4156-3838	**Endpoint:**	Mean Dry Weight-mg	**CETIS Version:**	CETISv1.9.4
Analyzed:	05 Aug-21 15:54	**Analysis:**	Parametric-Control vs Treatments	**Status Level:**	1
Batch ID:	08-8986-8955	**Test Type:**	Survival-Growth	**Analyst:**	Mikayla Oldach
Start Date:	01 Jul-21	**Protocol:**	EPA/600/R-99/064 (2000) (modified)	**Diluent:**	Reconstituted Water
Ending Date:	29 Jul-21	**Species:**	Hyalella azteca	**Brine:**	
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	Aquatic Biosystems, CO **Age:** 7-8d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
Lab Control	20-7542-0573	01 Jul-21	01 Jul-21	n/a	Teck Coal	
FR_UFR1	17-4923-4990	29 Jun-21 09:49	30 Jun-21 09:38	38h (18.3 °C)		
FR_FR4	04-4020-7661	29 Jun-21 11:36	30 Jun-21 09:38	36h (19.5 °C)		
FR_FRRD	08-3256-7665	29 Jun-21 12:03	30 Jun-21 09:38	36h (20.6 °C)		
FR_FR2	16-6218-6131	29 Jun-21 11:06	30 Jun-21 09:38	37h (19.6 °C)		
FR_MULTIPLATE	20-8036-0563	29 Jun-21 10:34	30 Jun-21 09:38	37h (18.3 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
Lab Control	Water Sample	Teck Coal	Lab Control	
FR_UFR1	Water Sample	Teck Coal	FR_UFR1_WS_2021-06-29	
FR_FR4	Water Sample	Teck Coal	FR_FR4_WS_2021-0629_	
FR_FRRD	Water Sample	Teck Coal	FR_FRRD_WS_2021-0629	
FR_FR2	Water Sample	Teck Coal	FR_FR2_WS_2021-0629_	
FR_MULTIPLATE	Water Sample	Teck Coal	FR_MULTIPLATE_WS_202	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	FR_UFR1 passed mean dry weight-mg	48.53%
		FR_FR4 passed mean dry weight-mg	48.53%
		FR_FRRD passed mean dry weight-mg	48.53%
		FR_FR2 passed mean dry weight-mg	48.53%
		FR_MULTIPLATE passed mean dry weight-m	48.53%

Dunnett Multiple Comparison Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Negative Control		FR_UFR1	-0.8703	2.362	0.151	8	CDF	0.9762	Non-Significant Effect
		FR_FR4	-2.72	2.362	0.151	8	CDF	0.9999	Non-Significant Effect
		FR_FRRD	-1.114	2.362	0.151	8	CDF	0.9879	Non-Significant Effect
		FR_FR2	-2.587	2.362	0.151	8	CDF	0.9999	Non-Significant Effect
		FR_MULTIPLATE	0.9066	2.362	0.151	8	CDF	0.4620	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.20647	0.041294	5	4.047	0.0083	Significant Effect
Error	0.244908	0.0102045	24			
Total	0.451379		29			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance Test	0.5278	15.09	0.9911	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9645	0.9031	0.4004	Normal Distribution

Mean Dry Weight-mg Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
Lab Control	N	5	0.3109	0.1634	0.4585	0.2811	0.198	0.493	0.05315	38.22%	0.00%
FR_UFR1		5	0.3665	0.2543	0.4787	0.3767	0.214	0.4389	0.04042	24.66%	-17.88%
FR_FR4		5	0.4847	0.3697	0.5997	0.461	0.3844	0.589	0.04143	19.11%	-55.89%
FR_FRRD		5	0.3821	0.2588	0.5054	0.354	0.2663	0.5011	0.04442	26.00%	-22.89%
FR_FR2		5	0.4762	0.3376	0.6148	0.449	0.329	0.605	0.04992	23.44%	-53.16%
FR_MULTIPLATE		5	0.253	0.1418	0.3642	0.254	0.1375	0.374	0.04007	35.41%	18.63%

JGu

Hyalella 28-d Survival and Growth ~~Sediment~~ Water Only Test (23)

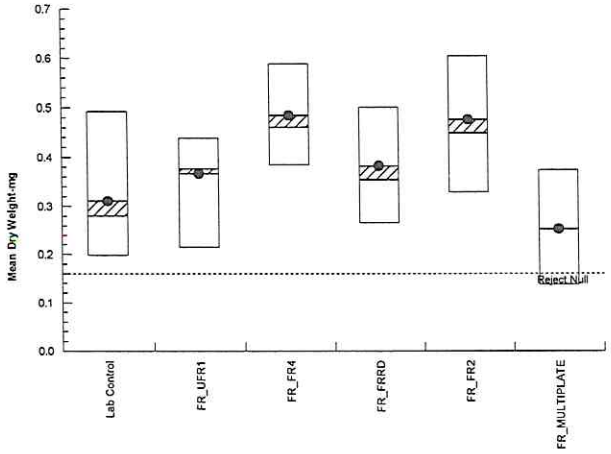
Nautilus Environmental

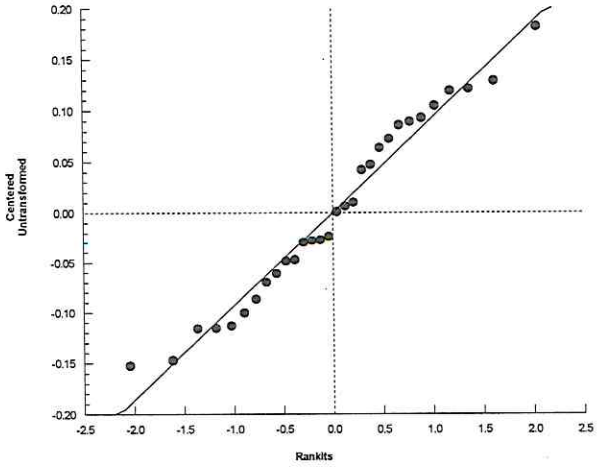
Analysis ID: 00-4156-3838 **Endpoint:** Mean Dry Weight-mg **CETIS Version:** CETISv1.9.4
Analyzed: 05 Aug-21 15:54 **Analysis:** Parametric-Control vs Treatments **Status Level:** 1

Mean Dry Weight-mg Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
Lab Control	N	0.493	0.2244	0.358	0.2811	0.198
FR_UFR1		0.214	0.3767	0.373	0.4389	0.43
FR_FR4		0.461	0.574	0.415	0.589	0.3844
FR_FRRD		0.5011	0.468	0.3211	0.354	0.2663
FR_FR2		0.569	0.605	0.449	0.4289	0.329
FR_MULTIPLATE		0.374	0.295	0.254	0.2044	0.1375

Graphics





CETIS Analytical Report

Hyalella 28-d Survival and Growth ~~Sediment~~ Water only Test

Nautilus Environmental

Analysis ID:	11-5938-4420	**Endpoint:**	Survival Rate	**CETIS Version:**	CETISv1.9.4
Analyzed:	05 Aug-21 15:55	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1
Batch ID:	08-8986-8955	**Test Type:**	Survival-Growth	**Analyst:**	Mikayla Oldach
Start Date:	01 Jul-21	**Protocol:**	EPA/600/R-99/064 (2000) (modified	**Diluent:**	Reconstituted Water
Ending Date:	29 Jul-21	**Species:**	Hyalella azteca	**Brine:**	
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	Aquatic Biosystems, CO **Age:** 7-8d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
FR_UFR1	17-4923-4990	29 Jun-21 09:49	30 Jun-21 09:38	38h (18.3 °C)	Teck Coal	
FR_FR4	04-4020-7661	29 Jun-21 11:36	30 Jun-21 09:38	36h (19.5 °C)		
FR_FRRD	08-3256-7665	29 Jun-21 12:03	30 Jun-21 09:38	36h (20.6 °C)		
FR_FR2	16-6218-6131	29 Jun-21 11:06	30 Jun-21 09:38	37h (19.6 °C)		
FR_MULTIPLATE	20-8036-0563	29 Jun-21 10:34	30 Jun-21 09:38	37h (18.3 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_UFR1	Water Sample	Teck Coal	FR_UFR1_WS_2021-06-29	
FR_FR4	Water Sample	Teck Coal	FR_FR4_WS_2021-0629_	
FR_FRRD	Water Sample	Teck Coal	FR_FRRD_WS_2021-0629	
FR_FR2	Water Sample	Teck Coal	FR_FR2_WS_2021-0629_	
FR_MULTIPLATE	Water Sample	Teck Coal	FR_MULTIPLATE_WS_202	

Fisher Exact/Bonferroni-Holm Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
Site Control		FR_FR4	0.9719	Exact	1.0000	Non-Significant Effect
		FR_FRRD	0.6425	Exact	1.0000	Non-Significant Effect
		FR_FR2	0.9719	Exact	1.0000	Non-Significant Effect
		FR_MULTIPLATE	0.7820	Exact	1.0000	Non-Significant Effect

Data Summary

Sample	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
FR_UFR1	XC	46	4	50	0.92	0.08	6.12%
FR_FR4		49	1	50	0.98	0.02	0.0%
FR_FRRD		46	4	50	0.92	0.08	6.12%
FR_FR2		49	1	50	0.98	0.02	0.0%
FR_MULTIPLATE		47	3	50	0.94	0.06	4.08%

Survival Rate Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
FR_UFR1	XC	1.0000	0.9000	1.0000	0.9000	0.8000
FR_FR4		1.0000	1.0000	1.0000	1.0000	0.9000
FR_FRRD		0.9000	1.0000	0.9000	1.0000	0.8000
FR_FR2		1.0000	1.0000	1.0000	0.9000	1.0000
FR_MULTIPLATE		1.0000	1.0000	1.0000	0.9000	0.8000

Survival Rate Binomials

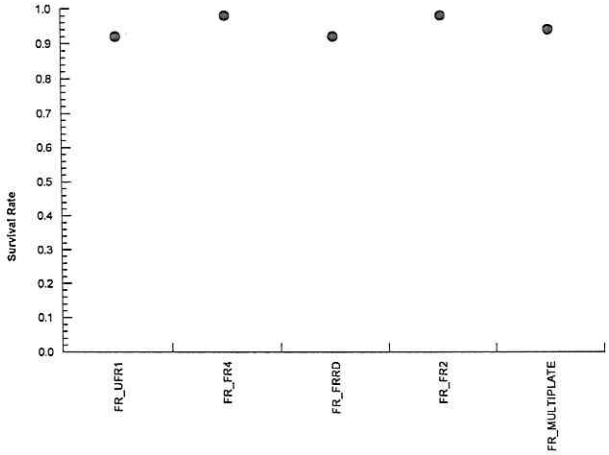
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
FR_UFR1	XC	10/10	9/10	10/10	9/10	8/10
FR_FR4		10/10	10/10	10/10	10/10	9/10
FR_FRRD		9/10	10/10	9/10	10/10	8/10
FR_FR2		10/10	10/10	10/10	9/10	10/10
FR_MULTIPLATE		10/10	10/10	10/10	9/10	8/10

p2)

Hyalella 28-d Survival and Growth ~~Sediment~~ Water Only Test **Nautilus Environmental**

Analysis ID:	11-5938-4420	**Endpoint:**	Survival Rate	**CETIS Version:**	CETISv1.9.4
Analyzed:	05 Aug-21 15:55	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1

Graphics



Analyst: MDO QA: Sep 13/21

CETIS Analytical Report

p2

Hyalella 28-d Survival and Growth ~~Sediment~~ Water Only Test — **Nautilus Environmental**

Analysis ID:	11-0340-8830	**Endpoint:**	Mean Dry Weight-mg	**CETIS Version:**	CETISv1.9.4
Analyzed:	05 Aug-21 15:56	**Analysis:**	Parametric-Control vs Treatments	**Status Level:**	1
Batch ID:	08-8986-8955	**Test Type:**	Survival-Growth	**Analyst:**	Mikayla Oldach
Start Date:	01 Jul-21	**Protocol:**	EPA/600/R-99/064 (2000)(modified)	**Diluent:**	Reconstituted Water
Ending Date:	29 Jul-21	**Species:**	Hyalella azteca	**Brine:**	
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	Aquatic Biosystems, CO **Age:** 7-8d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
FR_UFR1	17-4923-4990	29 Jun-21 09:49	30 Jun-21 09:38	38h (18.3 °C)	Teck Coal	
FR_FR4	04-4020-7661	29 Jun-21 11:36	30 Jun-21 09:38	36h (19.5 °C)		
FR_FRRD	08-3256-7665	29 Jun-21 12:03	30 Jun-21 09:38	36h (20.6 °C)		
FR_FR2	16-6218-6131	29 Jun-21 11:06	30 Jun-21 09:38	37h (19.6 °C)		
FR_MULTIPLATE	20-8036-0563	29 Jun-21 10:34	30 Jun-21 09:38	37h (18.3 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_UFR1	Water Sample	Teck Coal	FR_UFR1_WS_2021-06-29	
FR_FR4	Water Sample	Teck Coal	FR_FR4_WS_2021-0629_	
FR_FRRD	Water Sample	Teck Coal	FR_FRRD_WS_2021-0629	
FR_FR2	Water Sample	Teck Coal	FR_FR2_WS_2021-0629_	
FR_MULTIPLATE	Water Sample	Teck Coal	FR_MULTIPLATE_WS_202	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	FR_FR4 passed mean dry weight-mg	38.60%
		FR_FRRD passed mean dry weight-mg	38.60%
		FR_FR2 passed mean dry weight-mg	38.60%
		FR_MULTIPLATE passed mean dry weight-m	38.60%

Dunnett Multiple Comparison Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Site Control		FR_FR4	-1.925	2.305	0.142	8	CDF	0.9983	Non-Significant Effect
		FR_FRRD	-0.2538	2.305	0.142	8	CDF	0.8719	Non-Significant Effect
		FR_FR2	-1.786	2.305	0.142	8	CDF	0.9974	Non-Significant Effect
		FR_MULTIPLATE	1.849	2.305	0.142	8	CDF	0.1143	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.178738	0.0446846	4	4.743	0.0074	Significant Effect
Error	0.188419	0.009421	20			
Total	0.367158		24			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance Test	0.2554	13.28	0.9925	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9431	0.8877	0.1745	Normal Distribution

Mean Dry Weight-mg Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
FR_UFR1	XC	5	0.3665	0.2543	0.4787	0.3767	0.214	0.4389	0.04042	24.66%	0.00%
FR_FR4		5	0.4847	0.3697	0.5997	0.461	0.3844	0.589	0.04143	19.11%	-32.24%
FR_FRRD		5	0.3821	0.2588	0.5054	0.354	0.2663	0.5011	0.04442	26.00%	-4.25%
FR_FR2		5	0.4762	0.3376	0.6148	0.449	0.329	0.605	0.04992	23.44%	-29.92%
FR_MULTIPLATE		5	0.253	0.1418	0.3642	0.254	0.1375	0.374	0.04007	35.41%	30.97%

Hyalella 28-d Survival and Growth ~~Sediment~~ Water Only Test

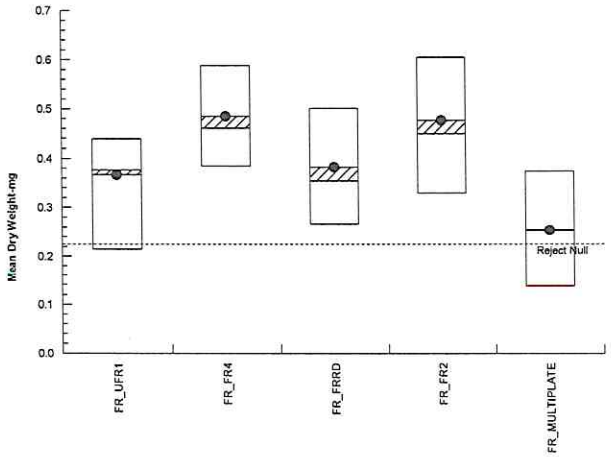
Nautilus Environmental

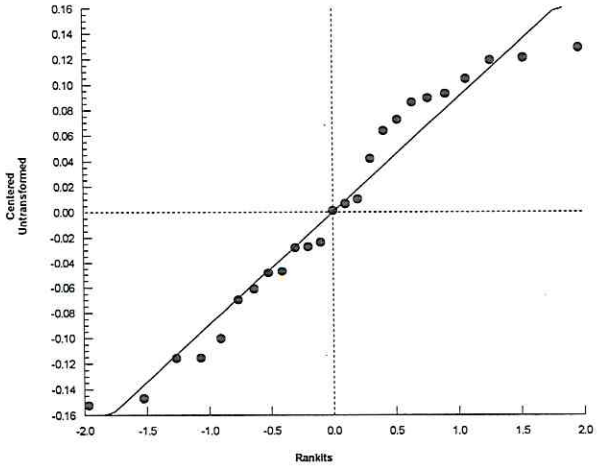
Analysis ID:	11-0340-8830	**Endpoint:**	Mean Dry Weight-mg	**CETIS Version:**	CETISv1.9.4
Analyzed:	05 Aug-21 15:56	**Analysis:**	Parametric-Control vs Treatments	**Status Level:**	1

Mean Dry Weight-mg Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
FR_UFR1	XC	0.214	0.3767	0.373	0.4389	0.43
FR_FR4		0.461	0.574	0.415	0.589	0.3844
FR_FRRD		0.5011	0.468	0.3211	0.354	0.2663
FR_FR2		0.569	0.605	0.449	0.4289	0.329
FR_MULTIPLATE		0.374	0.295	0.254	0.2044	0.1375

Graphics





Client: Teck

W.O.#: 211262

Hardness and Alkalinity Datasheet

		Alkalinity						Hardness			
Sample ID	Subsample Date	Date Measured	Sample Volume (mL)	(mL) 0.02N HCL/H_2SO_4 used to pH 4.5	(mL) of 0.02N HCL/H_2SO_4 used to pH 4.2	Total Alkalinity (mg/L$CaCO_3$)		Sample Volume (mL)	Volume of 0.01M EDTA Used (mL)	Total Hardness (mg/L $CaCO_3$)	Technician
~~Week 1 Day 0~~		~~Aug 7/21~~	~~50~~					~~50~~	~~6.8~~		
Lab Control	July 1, 21	Aug 7/21	50	3.6	3.7	70		50	6.8	136	MDO
FR-UFR1			~~10~~ 50	6.4	6.6	124		10①	1.3	130	
FR-FR4			~~10~~ 50	~~2.9~~ 7.7	7.9	150		10①	2.9	290	
FR-FRD			10①	1.9	2.0	180		10①	4.2	420	
FR-FR2			10①	1.3	1.5	110		10①	2.4	240	
FR-MULTIPLATE			10①	1.2	1.3	110		10①	2.1	210	
Week 2											
Lab Control	July 8/21	Aug 7/21	50	3.7	3.8	72		10①	1.3	130	MDO
FR-UFR1		Aug 7/21	50	6.7	6.9	130		10①	1.4	140	
FR-FR4		Aug 7/21	50	7.9	8.0	156		10①	3.1	310	
FR-FRD		Aug 7/21	50	10.4	10.6	204		10①	4.4	440	
FR-FR2			50	7.9	8.0	156		10①	2.9	290	
FR-MULTIPLATE			50	6.6	6.8	128		10①	2.4	240	

Notes: ① Diluted to 100mL w/ DI water

Reviewed by: JCh Date Reviewed: Sep 22/21

Client: Teck

W.O.#: 211262

Hardness and Alkalinity Datasheet

	Alkalinity						Hardness			
Sample ID	Subsample Date	Date Measured	Sample Volume (mL)	(mL) 0.02N HCL/H_2SO_4 used to pH 4.5	(mL) of 0.02N HCL/H_2SO_4 used to pH 4.2	Total Alkalinity ($mg/LCaCO_3$)	Sample Volume (mL)	Volume of 0.01M EDTA Used (mL)	Total Hardness ($mg/L\ CaCO_3$)	Technician
Week 3		RH					50 JW			
Lab Control	July 15/21	~~Aug~~ Sept. 13/21	50	3.7	3.8	72	~~10~~ 50 ①	7.0	140	JW
FR-UFR1	↓	↓	50	7.2	7.4	140	10 ①	1.6	160	JW
FR-FR4			50	9.1	9.3	178	10 ①	4.2	420	EC
FR-FRD			50	11.8	12.0	232	10 ①	5.8	580	JW
FR-FR2			50	8.9	9.1	174	10 ①	3.7	370	KV/EC
FR-MULTIPLATE			50	16.4	16.6	324	~~10~~ KV	~~11.1~~ KV	222	KV/EC
							50	11.1	~~222~~ KV	
Week 4		RH					50			
Lab Control	July 22/21	~~Aug~~ Sept. 14/21	50	3.9	4.1	74	~~10~~ JW	7.4	148	JW
FR-UFR1	↓	↓	50	7.5	7.7	146	10 ①	1.8	180	JW
FR-FR4			50	9.0	9.1	178	10 ①	5.5	550	KV/EC
FR-FRD			~~50~~ 10 ① JW	~~22~~ 2.2	2.4	40	10 ①	5.9	590	EC
FR-FR2			50 JW	6.5	6.6	128	10 ①	3.1	310	KV/EC
FR-MULTIPLATE	↓	↓	50	8.4	8.6	168	10 ①	3.6	360	KV/EC

Notes: ① Diluted to 100mL w/ DI water

Reviewed by: JGH Date Reviewed: Sep. 22/21

Client: Teck

W.O.#: 211262

Hardness and Alkalinity Datasheet

	Alkalinity						Hardness			
Sample ID	Subsample Date	Date Measured	Sample Volume (mL)	(mL) 0.02N HCL/H_2SO_4 used to pH 4.5	(mL) of 0.02N HCL/H_2SO_4 used to pH 4.2	Total Alkalinity ($mg/LCaCO_3$)	Sample Volume (mL)	Volume of 0.01M EDTA Used (mL)	Total Hardness ($mg/L\ CaCO_3$)	Technician
Day 28										
Lab Control	July 29/21	Aug 1/21	50	3.0	3.2	56	10①	1.4	140	KV/SC
FR-UFR1	↓		50	7.4	7.5	146	10①	1.9	190	KV/SC
FR-FR4			50	2.63	2.5	92	10①	5.8	580	KV/SC
FR-FRD			50	9.0	9.1	178	10①	6.2	620	KV/CB
FR-FR2			50	8.6	8.8	168	10①	24.1	410	KV/CB
FR-MULTIRATE	↓		50	7.3	7.4	144	10①	1.9 & 2.3	230	KV/CB

Notes: ① Diluted to 100mL w/ DI water

Reviewed by: JGh Date Reviewed: Sept. 22/21

APPENDIX D – *Oncorhynchus mykiss* toxicity test data

Embryo-Alevin Test Summary Sheet

Client: Teck
Work Order No.: 210963
Test Date: May 19 - June 18, 2021
Test Species: *Oncorhynchus mykiss*

Sample Information:

Sample ID: Various - see table below
Sample Date: May 18, 25, June 1, 8 and 15, 2021
Date Received: May 19, 26, June 2, 9 and 16, 2021
Sample Volume: (1-5) x 20 L per refresh

Dilution Water:

Type: Dechlorinated Tap Water
Hardness (mg/L CaCO3): 12 - 17
Alkalinity (mg/L CaCO3): 13 - 15

Test Organism Information:

Batch No: 051921
Source: Ted's Trout, Campbell Lake, BC
Number male broodstock used: 4
Loading Density: 1.24 g/L
Number female broodstock used: 4
Sperm motility check: Verification of sperm motility using a compound microscope

SDS Reference Toxicant Results:

Reference Toxicant ID: RTE156
Stock Solution ID: 21S01
Date Initiated: May 19, 2021
7-d EC50 (95% CL): 5.3 (5.0 - 5.6) mg/L SDS

Reference Toxicant Mean and Range: 4.8 (2.2 - 10.4) mg/L SDS
Reference Toxicant CV (%): 41

Test Results:

Sample ID	Survival (%) (Mean ± SD)	Normal (%) (Mean ± SD)	Length (mm) (Mean ± SD)	Wet weight (mg) (Mean ± SD)
Dechlor Control	92.3 ± 10.7	85.7 ± 8.4	19.9 ± 0.5	82.5 ± 12.0
Dechlor + 20 †	75.6 ± 11.7 *	71.1 ± 11.7	20.2 ± 0.2	85.8 ± 12.2
FR_UFR1 †	95.4 ± 5.3	94.3 ± 4.0	20.8 ± 0.2 ✓	87.5 ± 11.6 ✓
GH_ER2 †	92.0 ± 5.3	83.0 ± 3.5	20.4 ± 0.6	97.8 ± 14.4
CM_MC1 †	92.3 ± 6.9	89.0 ± 5.1 ✓	20.7 ± 0.2	92.2 ± 10.3
LC_SLC †	87.8 ± 10.2	85.6 ± 10.2	20.2 ± 0.5	95.2 ± 8.3
FR_FRABCH †	89.0 ± 4.7	84.6 ± 7.9	20.6 ± 0.4	99.5 ± 12.7
FR_FRCP1 †	91.1 ± 1.9	88.9 ± 3.8	20.3 ± 0.4	96.9 ± 9.4
GH_FR1 †	81.8 ± 14.0 [1]	79.6 ± 14.9 [1]	20.6 ± 0.2	98.6 ± 10.3
GH_ERC †	90.0 ± 8.8	88.9 ± 8.4	20.9 ± 0.0	105.4 ± 11.2
CM_MC2 †	89.9 ± 6.7	89.9 ± 6.7	20.8 ± 0.5	100.5 ± 18.4
EV_MC2 †	92.5 ± 8.1	83.8 ± 11.6	20.8 ± 0.5	100.7 ± 13.0
EV_HC1 †	93.1 ± 12.0	89.7 ± 9.2	20.5 ± 0.6	99.6 ± 10.6
LC_DCDS †	94.4 ± 3.8	93.3 ± 5.8	21.3 ± 0.5	108.6 ± 13.2
LC_LC3 †	90.1± 3.0	86.8 ± 5.5	21.0 ± 0.2	100.6 ± 17.1
LC_LC5 †	77.4 ± 9.4 [1]	77.4 ± 9.4 [1]	21.1 ± 0.2	104.2 ± 20.4
LC_LCDSSLCC †	92.3 ± 2.0	91.2 ± 2.0	21.1 ± 0.1	111.5 ± 13.0
FR_FR4 †	85.4 ± 5.0	81.0 ± 4.8	20.7 ± 0.1	97.5 ± 9.7
FR_FRRD †	84.6 ± 13.5	81.3 ± 15.0	20.6 ± 0.3	94.7 ± 13.9
FR_FR2 †	87.7 ± 6.8	87.7 ± 6.8	20.8 ± 0.5	97.4 ± 14.8
FR_MULTIPLATE †	83.4 ± 9.5	78.9 ± 13.0 [1]	20.7 ± 0.6	106.6 ± 11.8

† + 20 µg/L Cu

* Indicates results that were significantly lower relative to the laboratory control (dechlor)
[c] Indicates results that were significantly lower relative to the copper control (dechlor + 20 µg/L Cu)
[1] Indicates results that were significantly lower relative to reference site FR_UFR1
[2] Indicates results that were significantly lower relative to reference site GH_ER2
[3] Indicates results that were significantly lower relative to reference site CM_MC1
[4] Indicates results that were significantly lower relative to reference site LC_SLC

Reviewed by: JCh
Date reviewed: Aug-24/21

Embryo-Alevin Freshwater Toxicity Test
Initial and Final Water Quality Measurements

Client: Teck
Sample ID: (various)
Work Order #: 210963

Start Date & Time: May 19, 2021 @ 1735h
Stop Date & Time: June 18, 2021 @ 0805h
Test Species: *Oncorhynchus mykiss*

Dechlor Control Concentration	Days												
	0	1		2		3		4		5		6	
	init.	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	13.5	14.0	13.5	14.0	13.5	14.0	13.0	~~15.0~~	14.0	~~14.5~~	13.5	14.5	13.5
DO (mg/L)	10.0	9.9	10.0	9.8	10.1	10.0	10.3	9.9	9.4	9.9	9.8	9.8	10.0
pH	6.7	6.6	6.7	6.9	7.1	7.0	7.1	6.6	6.7	6.7	6.9	6.9	7.1
Cond. (µS/cm)	32	32		32		33		31		31		31	
Initials	MM	MM		MM		IMC		PVM		PVM		MM	

Dechlor + 20 mg/L Cu Concentration	Days												
	0	1		2		3		4		5		6	
	init.	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	13.5	14.0	13.5	14.0	13.5	14.0	13.0	14.5	14.0	14.5	13.5	14.5	14.0
DO (mg/L)	9.8	9.8	10.1	9.7	10.2	9.9	10.2	10.2	9.9	10.2	9.9	9.6	10.1
pH	6.6	6.8	6.7	6.9	7.1	6.9	7.0	6.6	6.7	6.6	6.8	6.7	7.1
Cond. (µS/cm)	33	33 ~~MM~~		33		33		32		32		33	
Initials	MM	MM		MM		IMC		PVM		PVM		MM	

FR_UFR1 Concentration + 20 mg/L Cu	Days												
	0	1		2		3		4		5		6	
	init.	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	13.5	13.0	13.5	13.0	13.5	14.0	13.0	14.0	14.0	14.0	13.5	14.5	13.5
DO (mg/L)	9.4	10.2	10.1	10.3	10.1	10.0	10.3	10.0	9.8	9.6	9.9	9.9	10.1
pH	7.5	7.8	8.0	7.9	7.9	7.9	7.9	7.5	7.7	~~7.5~~	7.6	7.8	8.0
Cond. (µS/cm)	208	204 ~~MM~~		204		206		203		204		204	
Initials	MM	MM		MM		IMC		PVM		PVM		MM	

GH_ER2 Concentration + 20 mg/L Cu	Days												
	0	1		2		3		4		5		6	
	init.	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	13.5	13.0	13.5	13.0	13.5	13.5	13.0	14.0	14.0	14.5	14.0	14.0	13.5
DO (mg/L)	9.4	10.2	10.0	10.2	10.0	10.0	10.1	10.0	9.9	10.0	9.8	10.0	10.0
pH	7.7	7.9	8.2	7.9	8.0	7.9	8.1	7.6	7.9	7.6	7.9	7.9	8.0
Cond. (µS/cm)	271	269		268		273		267		268		269	
Initials	MM	MM		MM		IMC		PVM		PVM		MM	

Thermometer: ~~GER#3~~ **DO meter/probe:** 6 / 6 **pH meter/probe:** 6 / 6 **Conductivity meter/probe:** 6 / 6

week1

	Dechlor Control	Dechlor + 20	FR_UFR1	GH_ER2
Hardness*	12	12	108	144
Alkalinity*	13	13	108	146

* mg/L as CaCO3

Analysts: IMC, PVK, MM
Reviewed by: CJ
Date reviewed: Aug. 13/21

Sample Description: FR_UFR1 - clear, no colour, no odour, some particulates
GH_ER2 - clear, brownish-yellow, no odour, ~~some~~ many particulates

Comments: @14.5°C; used stock soln 20 CuSO4 (100 mg/L Cu)

Embryo-Alevin Freshwater Toxicity Test
Initial and Final Water Quality Measurements

Client: Teck
Sample ID: (various)
Work Order #: 210963

Start Date & Time: May 19, 2021 @ 1735h
Stop Date & Time: June 18, 2021 @ 0805h
Test Species: *Oncorhynchus mykiss*

CM_MCl Concentration + 20 mg/L Cu	Days												
	0	1		2		3		4		5		6	
	init.	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.0	13.0	13.5	13.0	13.5	13.5	13.0	14.0	14.0	14.5	14.0	14.0	13.5
DO (mg/L)	9.5	10.0	10.0	10.1	10.1	10.0	10.1	10.2	9.8	10.1	10.0	9.9	10.0
pH	7.6	7.6	7.9	7.7	8.0	7.6	8.0	7.5	7.6	7.5	7.6	7.6	7.9
Cond. (µS/cm)	172	171		171		174		170		170		171	
Initials	MM	MM		MM		IMC		PYK		PYK		MM	

LC-SLC Concentration + 20 mg/L Cu	Days												
	0	1		2		3		4		5		6	
	init.	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.0	13.0	13.5	13.0	13.5	13.0	13.0	14.0	14.0	14.5	14.0	14.0	14.0
DO (mg/L)	9.5	10.1	10.0	10.2	10.0	10.1	9.9	10.1	9.7	10.1	9.9	9.9	9.9
pH	7.7	7.9	8.2	7.9	8.0	7.9	8.1	7.7	7.7	7.7	7.7	7.8	8.1
Cond. (µS/cm)	215	213		214		218		213		212		214	
Initials	MM	MM		MM		IMC		PYK		PYK		MM	

FR_FRABCH Concentration + 20 mg/L Cu	Days												
	0	1		2		3		4		5		6	
	init.	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.0	13.0	13.5	13.0	13.5	13.0	13.0	14.0	14.0	14.5	13.5	14.0	13.5
DO (mg/L)	9.7	10.2	10.1	10.2	10.0	9.8	9.9	10.0	9.8	9.9	9.9	10.0	10.0
pH	7.8	7.8	8.3	7.8	8.1	7.9	8.0	7.8	7.9	7.8	8.0	7.9	8.2
Cond. (µS/cm)	587	578		577		587		574		572		577	
Initials	MM	MM		MM		IMC		PYK		PYK		MM	

FR_FRCP1 Concentration + 20 mg/L Cu	Days												
	0	1		2		3		4		5		6	
	init.	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.5	13.0	13.5	13.0	13.5	13.0	13.0	14.0	14.0	14.5	14.0	14.0	13.5
DO (mg/L)	9.2	10.2	10.0	10.1	10.0	10.0	10.0	9.9	9.9	10.1	10.0	10.0	10.0
pH	7.8	8.0	8.2	8.0	8.1	8.0	8.2	7.8	7.8	7.9	8.0	7.9	8.2
Cond. (µS/cm)	491	485		487		496		483		481		486	
Initials	MM	MM		MM		IMC		PYK		PYK		MM	

Thermometer: CER#3 **DO meter/probe:** 6 / 6 **pH meter/probe:** 6 / 6 **Conductivity meter/probe:** 6 / 6

week1	CM_MCl ~~Control~~	LC_SLC	FR_FRABCH	FR_FRCP1
Hardness*	94	112	320	290
Alkalinity*	90	116	154	146

* mg/L as CaCO3

Analysts: IMC, PYK, MM

Reviewed by: JOH

Date reviewed: Aug. 13/21

Sample Description: CM_MCl - clear, yellow, no odour, some particulates
LC_SLC, FR_FRABCH, FR_FRCP1 - clear, no colour, no odour, some particulates

Comments: used stock soln 20CuSO4 (100 mg/L Cu)

Embryo-Alevin Freshwater Toxicity Test
Initial and Final Water Quality Measurements

Client: Teck
Sample ID: (various)
Work Order #: 210963

Start Date & Time: May 19, 2021 @ 1735h
Stop Date & Time: June 18, 2021 @ 0805h
Test Species: *Oncorhynchus mykiss*

GH-FR1 Concentration + 20 µg/L Cu	Days												
	0	1		2		3		4		5		6	
	init.	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.0	13.0	13.5	13.0	13.5	13.0	13.0	14.0	14.0	14.5	14.0	14.0	14.0
DO (mg/L)	9.2	10.2	9.9	10.0	10.1	9.9	10.1	10.0	9.8	10.0	9.9	10.1	10.0
pH	7.8	8.0	8.3	8.0	8.2	8.0	8.3	7.8	7.8	7.9	8.0	8.0	8.2
Cond. (µS/cm)	496	493		494		503		491		491		493	
Initials	IMC	IMC		IMC		IMC		PYK		PYK		IMC	

GH-ERC Concentration + 20 µg/L Cu	Days												
	0	1		2		3		4		5		6	
	init.	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.5	13.0	13.5	13.0	13.5	13.0	13.0	14.0	14.0	14.0	14.0	14.0	14.0
DO (mg/L)	9.3	10.3	9.9	10.1	10.0	10.0	10.2	10.1	9.8	9.9	9.9	10.0	9.9
pH	7.8	8.0	8.3	8.0	8.2	8.1	8.3	7.8	7.8	7.7	7.9	8.0	8.1
Cond. (µS/cm)	294	291		292		298		289		290		291	
Initials	IMC	IMC		IMC		IMC		PYK		PYK		IMC	

CM-MC2 Concentration + 20 µg/L Cu	Days												
	0	1		2		3		4		5		6	
	init.	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	13.5	13.0	13.5	13.0	13.5	13.0	13.0	14.0	14.0	14.0	14.0	14.0	14.0
DO (mg/L)	9.7	10.3	10.0	10.1	10.0	10.1	10.1	10.0	9.8	10.1	9.9	10.0	9.9
pH	7.8	8.0	8.2	7.9	8.1	7.8	8.0	7.89	7.89	7.9	8.0	8.0	8.1
Cond. (µS/cm)	499	501		503		~~503~~ 510		499		499		500	
Initials	IMC	IMC		IMC		IMC		PYK		PYK		IMC	

EV-MC2 Concentration + 20 µg/L Cu	Days												
	0	1		2		3		4		5		6	
	init.	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	13.0	13.0	13.5	13.0	13.5	13.0	13.5	14.0	14.0	14.0	14.0	14.0	14.0
DO (mg/L)	10.0	10.3	10.0	10.1	10.1	10.1	10.0	9.9	9.8	9.8	9.9	9.9	9.9
pH	7.7	7.9	8.0	7.8	7.9	7.8	8.0	7.6	7.6	7.7	7.6	7.7	7.8
Cond. (µS/cm)	216	217		217		220		217		217		219	
Initials	IMC	IMC		IMC		IMC		PYK		PYK		IMC	

Thermometer: CER#3 **DO meter/probe:** 6 / 6 **pH meter/probe:** 6 / 6 **Conductivity meter/probe:** 6 / 6

week 1	GH-FR1 ~~Control~~	GH-ERC	CM-MC2	EV-MC2
Hardness*	250	160	240	114
Alkalinity*	152	150	142	96

* mg/L as $CaCO_3$

Analysts: IMC, PYK, YMC
Reviewed by: JOH
Date reviewed: Aug. 13/21

Sample Description: GH-FR1 - clear, brown-yellow, no odour, some particulates
GH-ERC - clear, light brown, no odour, some particulates
CM-MC2 - clear, no colour, no odour, some particulates
EV-MC2 - clear, yellow, no odour, some particulates

Comments: Used Stock soln 20Cu04 (100 µg/L Cu)

Embryo-Alevin Freshwater Toxicity Test
Initial and Final Water Quality Measurements

Client: Teck
Sample ID: (various)
Work Order #: 210963

Start Date & Time: May 19 2021 @ 1735h
Stop Date & Time: June 18 2021 @ 0805h
Test Species: *Oncorhynchus mykiss*

EV-HCl Concentration +20 mg/L Cu	Days												
	0	1		2		3		4		5		6	
	init.	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	13.5	13.0	13.5	13.0	13.5	13.0	13.5	14.0	14.0	14.0	14.0	14.5	14.0
DO (mg/L)	10.0	10.3	10.1	10.1	10.1	10.0	10.2	10.1	9.8	9.9	9.9	9.8	10.0
pH	7.8	8.1	8.3	7.8	8.2	8.0	8.3	7.9	7.9	8.0	8.0	8.0	8.2
Cond. (µS/cm)	392	398		395		404		396		394		397	
Initials	MM	MM		MM		IMC		PYR		PYR		MM	

LC-DCDS Concentration +20 mg/L Cu	Days												
	0	1		2		3		4		5		6	
	init.	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	13.5	13.0	13.5	13.0	13.5	13.0	13.5	14.0	14.0	14.0	14.0	14.5	14.0
DO (mg/L)	10.0	10.3	10.1	10.2	10.1	9.9	10.0	9.9	9.9	9.8	9.9	9.8	10.0
pH	7.7	8.0	8.2	7.7	8.1	7.9	8.0	7.8	7.8	7.8	7.8	7.9	8.0
Cond. (µS/cm)	462	455		456		464		454		453		456	
Initials	MM	MM		MM		IMC		PYR		PYR		MM	

LC-LC3 Concentration +20 mg/L Cu	Days												
	0	1		2		3		4		5		6	
	init.	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	13.5	13.0	13.5	13.0	13.5	13.0	13.5	14.0	14.0	14.0	14.0	14.5	14.0
DO (mg/L)	10.0	10.2	10.1	10.1	10.2	10.1	10.2	10.0	9.9	10.0	10.0	10.0	10.1
pH	7.6	7.8	8.3	7.7	8.2	7.9	8.1	7.9	8.0	8.0	8.1	8.0	8.2
Cond. (µS/cm)	732	722		724		736		718		717		720	
Initials	MM	MM		MM		IMC		PYR		PYR		MM	

LC-LC5 Concentration +20 mg/L Cu	Days												
	0	1		2		3		4		5		6	
	init.	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.0	13.0	13.5	13.0	14.0	13.0	13.5	14.0	14.0	14.0	14.0	14.5	14.0
DO (mg/L)	10.1	10.2	10.1	10.1	10.1	10.0	10.1	9.8	9.9	9.9	9.8	9.9	10.0
pH	7.9	8.1	8.2	7.9	8.2	7.9	8.1	7.9	7.9	8.0	8.0	8.0	8.2
Cond. (µS/cm)	504	498		499		508		498		497		499	
Initials	MM	MM		MM		IMC		PYR		PYR		MM	

Thermometer: CER3 **DO meter/probe:** 6 / 6 **pH meter/probe:** 6 / 6 **Conductivity meter/probe:** 6 / 6

week 1	EV-HCl ~~Control~~	LC-DCDS	LC-LC3	LC-LC5
Hardness*	210	250	400	280
Alkalinity*	166	118	180	158

* mg/L as CaCO3

Analysts: IMC, PYR, MM

Reviewed by: JGC

Date reviewed: Aug 13/21

Sample Description: EV-HCl, LC-LC3, LC-LC5 - clear, no colour, no odour, some particulates
LC-DCDS - clear, yellow, no odour, some particulates

Comments: used stock soln 20Cu04 (600 mg/L Cu)

Embryo-Alevin Freshwater Toxicity Test
Initial and Final Water Quality Measurements

Client: Teck
Sample ID: (various)
Work Order #: 210963

Start Date & Time: May 19, 2021 @ 1735h
Stop Date & Time: June 18, 2021 @ 0805h
Test Species: *Oncorhynchus mykiss*

LC_LCDSSLCC Concentration ± 20 mg/L Cu	Days												
	0	1		2		3		4		5		6	
	init.	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.0	13.0	13.5	13.0	13.5	13.0	13.5	14.0	14.0	14.0	14.0	14.5	14.0
DO (mg/L)	10.1	10.3	10.1	10.2	10.1	10.1	10.1	10.0	9.9	9.8	10.0	9.9	10.0
pH	7.8	8.0	8.2	7.9	8.1	7.9	8.0	7.9	7.8	7.9	7.9	8.0	8.2
Cond. (µS/cm)	466	464		465		475		464		465		464	
Initials	MM	MM		MM		IMC		PYR		PYR		MM	

FR_FR4 Concentration ± 20 mg/L Cu	Days												
	0	1		2		3		4		5		6	
	init.	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.0	13.0	13.5	13.0	13.5	13.0	13.5	14.0	14.0	14.0	14.0	14.5	14.0
DO (mg/L)	10.2	10.3	10.1	10.2	10.0	10.1	10.0	10.0	9.8	9.8	9.9	10.0	10.1
pH	7.7	8.0	8.2	7.8	8.1	7.8	8.1	7.8	7.8	7.9	7.9	7.9	8.1
Cond. (µS/cm)	426	426		427		435		425		425		426	
Initials	MM	MM		MM		IMC		PYR		PYR		MM	

FR_FRRD Concentration ± 20 mg/L Cu	Days												
	0	1		2		3		4		5		6	
	init.	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.0	13.0	13.5	13.0	13.5	13.0	13.5	14.0	14.0	14.0	14.0	14.5	14.0
DO (mg/L)	10.1	10.3	10.1	10.1	10.1	10.1	10.1	10.0	9.7	10.0	9.7	10.0	10.0
pH	7.6	7.9	8.1	7.8	8.12	7.9	7.9	7.8	7.8	7.9	8.0	7.9	8.0
Cond. (µS/cm)	640	635		636		649		632		630		633	
Initials	MM	MM		MM		IMC		PYR		PYR		MM	

FR_FR2 Concentration ± 20 mg/L Cu	Days												
	0	1		2		3		4		5		6	
	init.	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	13.5	13.0	14.0	13.0	14.0	~~14.0~~ 13.0	13.5	14.0	14.0	14.0	14.0	14.0	14.0
DO (mg/L)	10.1	10.2	10.0	10.1	10.0	10.0	10.1	10.1	9.9	9.8	9.8	9.8	10.1
pH	7.8	8.1	8.3	7.9	8.12	7.9	8.0	7.9	7.8	7.9	7.9	8.0	8.1
Cond. (µS/cm)	391	390		389		399		396		389		391	
Initials	MM	MM		MM		IMC		PYR		PYR		MM	

Thermometer: ~~CERA3~~ **DO meter/probe:** 6 / 6 **pH meter/probe:** 6 / 6 **Conductivity meter/probe:** 6 / 6

week1	LC_LCDSSLCC ~~Control~~	FR_FR4	FR_FRRD	FR_FR2
Hardness*	270	250	380	220
Alkalinity*	146	136	166	132

* mg/L as CaCO3

Analysts: IMC, PYR, MM
Reviewed by: JGW
Date reviewed: Aug. 13/21

Sample Description: LC_LCDSSLCC, FR_FR4, FR_FRRD, FR_FR2 - clear, no colour, no odour, some particulates

Comments: 08.0 ; used stock solln 20Cu04 (100 mg/L Cu)

Embryo-Alevin Freshwater Toxicity Test
Initial and Final Water Quality Measurements

Client: Teck
Sample ID: (various)
Work Order #: 210963

Start Date & Time: May 19, 2021 @ 1735h
Stop Date & Time: June 19, 2021 @ 0805h
Test Species: *Oncorhynchus mykiss*

FR_MULTIPLATE Concentration + 20ug/L Cu	Days												
	0	1		2		3		4		5		6	
	init.	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	13.5	13.0	14.0	13.0	14.0	13.0	13.5	14.0	14.0	14.0	14.0	14.0	14.0
DO (mg/L)	10.1	10.2	10.0	10.2	10.0	10.2	10.0	9.8	9.9	9.8	9.9	10.0	10.0
pH	7.7	8.0	8.2	7.8	8.1	7.8	8.0	7.8	7.8	7.8	7.9	7.9	8.1
Cond. (µS/cm)	377	376		376		394		375		375		375	
Initials	MM	MM		MM		IMC		PVK		PVK		MM	

Concentration	Days												
	init.	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)													
DO (mg/L)													
pH													
Cond. (µS/cm)													
Initials													

Concentration	Days												
	init.	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)													
DO (mg/L)													
pH													
Cond. (µS/cm)													
Initials													

Concentration	Days												
	init.	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)													
DO (mg/L)													
pH													
Cond. (µS/cm)													
Initials													

Thermometer: CFRU3 **DO meter/probe:** 6 / 6 **pH meter/probe:** 6 / 6 **Conductivity meter/probe:** 6 / 6

week1	FR_MULTIPLATE ~~Control~~			
Hardness*	200			
Alkalinity*	126			

* mg/L as CaCO3

Analysts: IMC, PVK, MM

Reviewed by: JC

Date reviewed: Aug 13/21

Sample Description: FR_MULTIPLATE - clear, no colour, no odour, some particulates

Comments: used stock soln 20Cu04 (100 mg/L Cu)

Embryo-Alevin Freshwater Toxicity Test
Initial and Final Water Quality Measurements

Client: Teck
Sample ID: (various)
Work Order #: 210963

Start Date & Time: May 19, 2021 @ 1735h
Stop Date & Time: June 18, 2021 @ 0805h
Test Species: *Oncorhynchus mykiss*

Dechlor Control Concentration	Days													
	7		8		9		10		11		12		13	
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.5	13.5	14.5	14.0	14.5	13.5	14.5	14.0	14.5	14.0	14.0	13.5	14.5	13.5
DO (mg/L)	9.8	10.1	9.8	9.8	10.0	10.0	9.9	10.0	9.7	9.8	10.0	10.0	9.8	10.0
pH	6.8	6.9	6.8	6.7	6.7	7.0	6.8	6.9	6.9	6.9	6.7	6.9	6.9	7.0
Cond. (µS/cm)	31		32		32		32		33		33		33	
Initials	HM		A		HM		IMC		PYK		HM		YMC	

Dechlor + 20 mg/L Cu Concentration	Days													
	7		8		9		10		11		12		13	
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.0	13.5	14.0	14.0	14.0	13.5	14.0	14.0	14.5	13.5	14.5	13.5	14.5	13.5
DO (mg/L)	9.6	10.1	10.0	9.9	9.8	10.0	9.7	10.0	10.1	10.0	9.9	10.0	9.8	9.8
pH	6.9	6.9	6.7	6.8	6.6	7.1	6.7	7.0	6.9	7.0	7.0	6.9	6.8	7.0
Cond. (µS/cm)	32		33		33		35		34		34		34	
Initials	HM		A		HM		IMC		PYK		HM		YMC	

FR_UFR1 Concentration + 20 mg/L Cu	Days													
	7		8		9		10		11		12		13	
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	13.5	13.5	13.0	14.0	14.0	13.5	14.0	14.0	14.5	14.5	14.5	13.5	14.0	13.5
DO (mg/L)	9.9	10.0	10.1	9.9	9.9	10.1	9.8	10.0	10.1	10.0	9.8	10.1	9.8	9.8
pH	7.8	8.0	7.9	8.0	7.8	7.9	7.7	7.8	7.8	7.7	7.9	7.9	7.8	7.9
Cond. (µS/cm)	206		228		229		234		228		229		229	
Initials	HM		A		HM		IMC		PYK		HM		YMC	

GH_ER2 Concentration + 20 mg/L Cu	Days													
	7		8		9		10		11		12		13	
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	13.5	13.5	13.0	14.0	14.0	13.5	14.0	14.0	14.5	13.5	14.0	13.5	14.0	13.5
DO (mg/L)	10.0	10.2	10.1	9.9	10.1	10.1	10.0	10.2	9.9	9.8	9.8	10.1	9.7	10.1
pH	7.9	8.2	7.9	8.1	7.8	8.0	7.7	8.0	7.7	7.9	7.9	8.0	7.9	8.0
Cond. (µS/cm)	270		278		279		279		278		279		280	
Initials	HM		A		HM		IMC		PYK		HM		YMC	

Thermometer: CER43 **DO meter/probe:** 6 / 6 **pH meter/probe:** 6 / 6 **Conductivity meter/probe:** 6 / 6

Week 2	Dechlor Control	Dechlor +20	FR_UFR1	GH_ER2
Hardness*	16	16	120	148
Alkalinity*	14	14	118	148

* mg/L as CaCO3

Analysts: IMC, PYK, AMD, YMC

Reviewed by: [signature]

Date reviewed: Aug 13/21

Sample Description: FR_UFR1 - clear, no colour, no odour, some particulates.
GH_ER2 - clear, light brown, no odour, some particulates

Comments: ① 13.5 °; used stock solution 20CuO4 (100 mg/L Cu)

Embryo-Alevin Freshwater Toxicity Test
Initial and Final Water Quality Measurements

Client: Teck
Sample ID: (various)
Work Order #: 210963

Start Date & Time: May 19, 2021 @ 1735h
Stop Date & Time: Jun 13, 2021 @ 0805h
Test Species: *Oncorhynchus mykiss*

CM_MCl Concentration ± 20 mg/L CV	Days													
	7		8		9		10		11		12		13	
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	13.5	13.5	13.0	14.0	14.0	13.5	14.0	14.0	14.5	13.5	14.0	13.5	14.0	13.5
DO (mg/L)	10.1	10.0	10.2	9.9	10.0	10.1	9.9	10.1	10.1	9.9	9.8	10.1	9.9	10.1
pH	7.7	7.9	7.9	8.0	7.7	7.8	7.8	8.0	7.6	7.7	7.7	8.0	7.7	7.9
Cond. (µS/cm)	172		192		193		190		193		193		195	
Initials	IMC		[illegible]		IMC		IMC		PYK		IMC		IMC	

LC_SLC Concentration ± 20 mg/L CV	Days													
	7		8		9		10		11		12		13	
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.0	13.5	13.0	14.0	14.0	13.5	14.0	14.0	14.0	14.0	14.0	13.5	14.0	13.5
DO (mg/L)	10.0	10.0	10.2	9.9	10.1	10.2	10.0	10.1	10.1	9.9	9.9	10.0	9.9	10.0
pH	7.9	8.0	7.9	8.1	7.9	8.0	7.9	8.0	7.8	7.8	7.9	8.0	7.9	8.0
Cond. (µS/cm)	215		252		252		258		251		253		253	
Initials	IMC		[illegible]		IMC		IMC		PYK		IMC		IMC	

FR_FRABCH Concentration ± 20 mg/L CV	Days													
	7		8		9		10		11		12		13	
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.0	13.5	13.0	14.0	14.0	13.5	14.0	14.0	14.5	~~14.0~~	14.0	13.5	14.0	13.5
DO (mg/L)	10.0	10.1	10.3	10.0	10.0	10.1	10.1	10.1	9.9	9.9	9.9	10.0	9.8	10.1
pH	7.9	8.3	7.9	8.2	7.8	8.2	7.9	8.1	8.0	8.1	8.0	8.2	8.0	8.3
Cond. (µS/cm)	578		818		825		826		815		827		827	
Initials	IMC		[illegible]		IMC		IMC		PYK		IMC		IMC	

FR_FRCP1 Concentration ± 20 mg/L CV	Days													
	7		8		9		10		11		12		13	
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.0	13.5	13.0	14.0	14.0	14.0	14.0	14.0	14.5	13.5	14.0	13.5	14.0	13.5
DO (mg/L)	10.1	10.0	10.3	9.9	10.0	10.1	9.9	10.1	10.0	9.9	9.8	10.0	9.9	10.0
pH	8.0	8.2	7.9	8.2	7.9	8.2	7.9	8.2	8.0	8.1	8.0	8.2	8.0	8.2
Cond. (µS/cm)	4888		721		723		720		718		721		721	
Initials	IMC		[illegible]		IMC		IMC		PYK		IMC		IMC	

Thermometer: ERB3 **DO meter/probe:** 6 / 6 **pH meter/probe:** 6 / 6 **Conductivity meter/probe:** 6 / 6

week 2	CM_MCl ~~Control~~	LC_SLC	FR_FRABCH	FR_FRCP1
Hardness*	100	132	430	380
Alkalinity*	102	110	200	180

* mg/L as CaCO3

Analysts: IMC, PYK, AWD, YMS

Reviewed by: JGL

Date reviewed: Aug 18/21

Sample Description: CM_MCl - clear, brown, no odour, ~~some~~ many particulates
" LC_SLC, FR_FRABCH, FR_FRCP1 - clear, no colour, no odour, some particulates.

Comments: ① 13.5°C; used stock soln 2CuO4 (100 mg/L Cu)

Embryo-Alevin Freshwater Toxicity Test
Initial and Final Water Quality Measurements

Client: Teck
Sample ID: (Various)
Work Order #: 210963

Start Date & Time: May 19, 2021 @ 1735h
Stop Date & Time: June 18, 2021 @ 0805h
Test Species: *Oncorhynchus mykiss*

GH-FR1 Concentration + 20 mg/L Cu	Days													
	7		8		9		10		11		12		13	
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.0	13.5	13.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	13.5	14.0	13.5
DO (mg/L)	10.0	10.1	10.3	9.9	10.0	10.0	9.9	10.0	10.0	9.8	9.8	10.0	9.9	10.1
pH	8.0	8.2	8.0	8.2	8.0	8.2	8.1	8.1	8.1	8.1	8.1	8.2	8.1	8.2
Cond. (µS/cm)	492		656		657		660		656		656		657	
Initials	IMC		[illegible]		IMC		IMC		PVK		IMC		IMC	

GH-ERC Concentration + 20 mg/L Cu	Days													
	7		8		9		10		11		12		13	
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.0	13.5	13.0	14.0	14.0	14.0	14.0	14.0	14.0	13.5	14.0	13.5	14.0	13.5
DO (mg/L)	10.1	10.1	10.2	9.9	9.9	10.0	9.8	9.9	9.9	10.0	9.7	9.9	9.8	10.0
pH	7.9	8.2	7.9	8.2	7.9	8.1	8.0	8.1	7.9	7.9	8.0	8.1	7.9	8.1
Cond. (µS/cm)	290		296		298		303		298		296		296	
Initials	IMC		[illegible]		IMC		IMC		PVK		IMC		IMC	

CM-MC2 Concentration + 20 mg/L Cu	Days													
	7		8		9		10		11		12		13	
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.0	14.0	13.0	14.0	14.0	14.0	14.0	14.0	14.5	13.5	14.0	13.5	14.0	14.0
DO (mg/L)	10.0	10.0	10.3	10.0	10.0	10.1	9.9	10.1	10.0	9.8	9.9	10.0	9.8	10.0
pH	8.0	8.2	8.0	8.2	8.0	8.2	8.1	8.1	8.0	8.1	8.0	8.2	8.0	8.2
Cond. (µS/cm)	502		620		621		625		620		622		621	
Initials	IMC		[illegible]		IMC		IMC		PVK		IMC		IMC	

EV-MC2 Concentration + 20 mg/L Cu	Days													
	7		8		9		10		11		12		13	
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.0	14.0	13.0	14.0	14.0	14.0	14.0	14.0	14.5	13.5	14.0	13.5	14.0	14.0
DO (mg/L)	9.9	10.1	10.2	9.9	9.9	10.0	9.9	10.0	9.9	9.8	9.8	10.1	9.7	10.0
pH	7.9	7.9	8.0	8.0	7.8	8.0	7.7	7.9	7.8	7.9	7.8	8.0	7.8	8.0
Cond. (µS/cm)	220		304		303		308		303		302		303	
Initials	IMC		[illegible]		IMC		IMC		PVK		IMC		IMC	

Thermometer: TERR3 **DO meter/probe:** 6 / 6 **pH meter/probe:** 6 / 6 **Conductivity meter/probe:** 6 / 6

week 2	~~Control~~ GH-FR1	GH-ERC	CM-MC2	EV-MC2
Hardness*	330	156	320	150
Alkalinity*	182	148	162	114

* mg/L as $CaCO_3$

Analysts: IMC, PVK, AWD, MMC

Reviewed by: JMC

Date reviewed: Aug. 20/21

Sample Description: GH-FR1, GH-ERC - clear, light brown, no odour, some particulates
CM-MC2 - clear, no colour, no odour, some particulates
EV-MC2 - clear, yellow-brown, no odour, some particulates

Comments: used stock soln 20CU04 (100 mg/L Cu)

Embryo-Alevin Freshwater Toxicity Test
Initial and Final Water Quality Measurements

Client: Teck
Sample ID: (Various)
Work Order #: 210963

Start Date & Time: May 19, 2021 @ 1735h
Stop Date & Time: June 18, 2021 @ 0805h
Test Species: *Oncorhynchus mykiss*

EV_HCl Concentration +20 mg/L Cu	Days 7		8		9		10		11		12		13	
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.0	14.0	13.0	14.0	14.0	14.0	14.5	14.0	14.5	13.5	14.5	13.5	14.5	14.0
DO (mg/L)	10.0	10.1	10.2	9.9	10.1	9.9	10.0	10.1	10.0	10.1	9.8	10.0	9.7	10.0
pH	8.1	8.2	8.0	8.2	8.0	8.2	8.1	8.1	7.9	8.2	8.1	8.2	8.1	8.2
Cond. (µS/cm)	398		503		505		508		498		504		504	
Initials	HM		[illegible]		HM		IMC		PVK		HM		HM	

LC_DCDS Concentration +20 mg/L Cu	Days 7		8		9		10		11		12		13	
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.0	14.0	13.0	14.0	14.5	14.0	14.5	14.0	14.5	13.5	14.5	13.5	14.5	14.0
DO (mg/L)	10.1	10.0	10.3	9.8	10.1	9.9	9.9	10.0	9.9	9.9	9.7	10.0	9.8	10.0
pH	7.9	8.1	7.9	8.2	7.9	8.0	7.9	8.0	7.8	7.9	8.0	8.1	8.0	8.1
Cond. (µS/cm)	456		506		506		507		507		505		506	
Initials	HM		[illegible]		HM		IMC		PVK		HM		HM	

LC_LC3 Concentration +20 mg/L Cu	Days 7		8		9		10		11		12		13	
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.0	14.0	13.0	14.0	14.5	14.0	14.5	14.0	14.5	13.5	14.5	14.0	14.5	14.0
DO (mg/L)	10.0	10.1	10.3	9.9	10.1	10.0	10.0	10.0	9.9	9.7	9.7	10.0	9.8	9.9
pH	8.1	8.3	8.0	8.2	7.8	8.2	7.9	8.0	8.0	8.0	8.0	8.2	8.1	8.2
Cond. (µS/cm)	720		760		764		771		756		763		763	
Initials	HM		[illegible]		HM		IMC		PVK		HM		HM	

LC_LC5 Concentration +20 mg/L Cu	Days 7		8		9		10		11		12		13	
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.0	14.0	13.0	14.0	14.5	14.0	14.0	14.0	14.5	13.5	14.5	14.0	14.5	14.0
DO (mg/L)	10.0	9.9	10.3	9.9	10.1	9.9	9.9	10.0	10.0	10.0	9.8	10.0	9.8	9.9
pH	8.1	8.2	8.0	8.2	8.2	8.2	8.0	8.1	8.0	8.1	8.1	8.3	8.2	8.2
Cond. (µS/cm)	501		587		590		583		587		589		589	
Initials	HM		[illegible]		HM		IMC		PVK		HM		HM	

Thermometer: CTERM3 **DO meter/probe:** 6 / 6 **pH meter/probe:** 6 / 6 **Conductivity meter/probe:** 6 / 6

week 2	EV-HCl ~~Control~~	LC-DCDS	LC-LC3	LC-LC5
Hardness*	270	270	420	330
Alkalinity*	180	108	178	156

* mg/L as CaCO3

Analysts: IMC, PVK, AWD, YHC

Reviewed by: JGa

Date reviewed: Aug 13/21

Sample Description: EV-HCl - clear, light yellow, no odour, some particulates
LC-DCDS, LC-LC3, LC-LC5 - clear, no colour, no odour, some particulates

Comments: used stock soln 20C004 (100 mg/L Cu)

Embryo-Alevin Freshwater Toxicity Test
Initial and Final Water Quality Measurements

Client: TRCK
Sample ID: (various)
Work Order #: 210963

Start Date & Time: May 19, 2021 @ 1735h
Stop Date & Time: June 18, 2021 @ 0805h
Test Species: *Oncorhynchus mykiss*

LC_LCDSSLCC Concentration + 20 mg/L Cu

	Days													
	7		8		9		10		11		12		13	
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.0	14.0	13.0	14.0	14.5	14.0	14.5	14.0	14.5	13.5	14.5	14.0	14.5	14.0
DO (mg/L)	10.0	10.0	10.3	9.8	9.9	9.8	9.9	9.9	9.8	10.0	9.8	10.0	9.8	9.9
pH	8.0	8.2	7.9	8.2	8.1	8.2	8.0	8.2	8.0	8.0	8.1	8.2	8.1	8.2
Cond. (µS/cm)	467		530		531		533		529		530		531	
Initials	HM		HM		HM		IMC		PVR		HM		HM	

FR_FR4 Concentration + 20 mg/L Cu

	Days													
	7		8		9		10		11		12		13	
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.0	14.0	13.0	14.0	14.0	14.0	14.5	14.0	14.5	13.5	14.5	14.0	14.5	14.0
DO (mg/L)	9.9	10.1	10.3	9.9	9.9	9.9	9.8	9.9	9.9	9.9	9.8	10.0	9.9	9.9
pH	8.0	8.2	8.0	8.2	8.0	8.2	8.1	8.1	8.0	8.1	8.1	8.2	8.1	8.2
Cond. (µS/cm)	427		626		626		621		625		626		627	
Initials	HM		A		HM		IMC		PVR		HM		HM	

FR_FRRD Concentration + 20 mg/L Cu

	Days													
	7		8		9		10		11		12		13	
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.0	14.0	13.0	14.0	14.0	14.0	14.0	14.0	14.5	13.5	14.0	14.0	14.0	14.0
DO (mg/L)	10.0	10.1	10.2	9.9	9.9	9.9	10.0	9.9	9.8	9.7	9.8	9.9	9.9	9.8
pH	8.1	8.2	8.0	8.2	7.9	8.3	8.0	8.2	8.0	8.1	8.0	8.1	8.1	8.3
Cond. (µS/cm)	634		882		880		885		877		878		879	
Initials	HM		A		HM		IMC		PVR		HM		HM	

FR_FR2 Concentration + 20 mg/L Cu

	Days													
	7		8		9		10		11		12		13	
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.0	14.0	13.0	14.0	14.0	14.0	14.0	14.0	14.5	13.5	14.0	14.0	14.0	14.0
DO (mg/L)	10.0	10.1	10.3	9.9	10.0	9.9	9.8	9.9	9.6	9.8	9.9	9.9	9.9	9.9
pH	8.0	8.2	8.0	8.2	8.1	8.1	7.9	8.1	8.0	8.1	8.1	8.1	8.1	8.2
Cond. (µS/cm)	392		519		517		519		514		514		517	
Initials	HM		A		HM		IMC		PVR		HM		HM	

Thermometer: ~~CER#3~~ **DO meter/probe:** 6 / 6 **pH meter/probe:** 6 / 6 **Conductivity meter/probe:** 6 / 6

week 2

	~~Control~~ LC_LCDSSLCC	FR_FR4	FR_FRRD	FR_FR2
Hardness*	240	300	460	240
Alkalinity*	154	154	184	136

* mg/L as CaCO3

Analysts: IMC, PVR, AWD, HM

Reviewed by: JCL
Date reviewed: Aug. 18/21

Sample Description: LC_LCDSSLCC, FR_FR4, FR_FRRD, FR_FR2 - clear, no colour, no odour, some particulates

Comments: used stock soln 20 CuSO4 (100 mg/L Cu)

Embryo-Alevin Freshwater Toxicity Test
Initial and Final Water Quality Measurements

Client: Teck
Sample ID: (various)
Work Order #: 210963

Start Date & Time: May 19, 2021 @ 1735h
Stop Date & Time: June 13, 2021 @ 0805h
Test Species: *Oncorhynchus mykiss*

FR_MULTIPLATE Concentration + 20 mg/L Cu	Days													
	7		8		9		10		11		12		13	
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.0	14.0	13.0	14.0	14.0	14.0	14.0	14.0	14.0	13.5	14.0	14.0	14.0	14.0
DO (mg/L)	10.1	10.0	10.3	12.0	10.0	9.9	9.9	10.1	10.1	9.9	9.9	10.0	9.9	10.0
pH	8.0	8.2	8.0	8.2	8.0	8.1	7.9	8.0	7.9	8.1	8.0	8.1	8.0	8.2
Cond. (µS/cm)	376		496		488		492		487		488		489	
Initials	HW		[illegible]		HW		JME		PYK		HW		HW	

Concentration	Days													
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)														
DO (mg/L)														
pH														
Cond. (µS/cm)														
Initials														

Concentration	Days													
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)														
DO (mg/L)														
pH														
Cond. (µS/cm)														
Initials														

Concentration	Days													
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)														
DO (mg/L)														
pH														
Cond. (µS/cm)														
Initials														

Thermometer: CER#3 **DO meter/probe:** 6 / 6 **pH meter/probe:** 6 / 6 **Conductivity meter/probe:** 6 / 6

week 2	FR_MULTIPLATE ~~Control~~			
Hardness*	250			
Alkalinity*	130			

* mg/L as CaCO3

Analysts: IMC, PYK, AWD, HW

Reviewed by: [signature]

Date reviewed: Aug-18/21

Sample Description: FR_MULTIPLATE - clear, no colour, no odour, some particulates.

Comments: used stock soln 20Cu04 (100 mg/L Cu)

Embryo-Alevin Freshwater Toxicity Test
Initial and Final Water Quality Measurements

Client: Teck
Sample ID: (various)
Work Order #: 210963

Start Date & Time: May 19, 2021 @ 1735h
Stop Date & Time: June 18, 2021 @ 0805h
Test Species: *Oncorhynchus mykiss*

Dechlor Control Concentration	Days													
	~~X~~ 14		~~8~~ 15		~~9~~ 16		~~10~~ 17		~~11~~ 18		~~12~~ 19		~~13~~ 20	
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.0	14.0	14.5	13.5	14.0	13.5	14.0	13.5	14.5	13.5	14.5	13.5	14.0	13.5
DO (mg/L)	9.9	10.0	10.0	10.2	9.8	10.0	9.9	10.0	9.8	9.4	9.9	10.0	9.9	9.9
pH	6.7	6.8	6.6	6.8	6.9	6.8	6.9	6.9	6.6	6.9	6.8	7.0	6.8	7.0
Cond. (µS/cm)	34		34		34		33		33		33		33	
Initials	HM		HM		HM		JMC		PVK		HM		HM	

Dechlor + 20 mg/L Cu Concentration	Days													
	14		15		16		17		18		19		20	
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.5	14.0	14.5	13.5	14.5	13.5	14.0	13.5	14.5	13.5	14.5	13.5	14.5	13.5
DO (mg/L)	9.8	10.0	10.0	10.1	9.8	10.0	9.8	9.9	9.7	9.6	9.7	10.1	9.8	9.9
pH	6.6	6.8	6.7	6.8	6.9	6.7	6.9	6.9	6.6	7.0	6.9	7.0	6.7	7.0
Cond. (µS/cm)	34		34		34		34		34		34		34	
Initials	HM		HM		HM		JMC		PVK		HM		HM	

FR_UTR1 Concentration + 20 mg/L Cu	Days													
	14		15		16		17		18		19		20	
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.0	14.0	14.0	13.5	13.0	13.5	13.5	13.5	14.5	13.5	14.5	13.5	14.5	13.5
DO (mg/L)	9.8	9.9	10.1	10.1	10.1	10.0	10.0	10.1	9.8	9.6	9.8	10.1	9.8	9.9
pH	7.5	7.9	7.7	7.9	7.8	7.9	7.7	7.9	7.4	7.7	7.7	7.9	7.6	8.0
Cond. (µS/cm)	230		215		214		212		214		215		216	
Initials	HM		HM		HM		JMC		PVK		HM		HM	

GH_ER2 Concentration + 20 mg/L Cu	Days													
	14		15		16		17		18		19		20	
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.0	14.0	14.0	13.5	13.0	13.5	13.5	13.5	14.0	13.5	14.0	13.5	14.5	13.5
DO (mg/L)	9.9	9.9	10.0	10.0	10.2	10.1	10.1	10.1	9.7	9.6	9.8	10.1	9.8	10.0
pH	7.7	8.0	7.7	8.1	7.8	8.0	7.8	8.1	7.6	7.9	7.9	8.1	7.8	8.2
Cond. (µS/cm)	280		269		269		273		267		270		273	
Initials	HM		HM		HM		JMC		PVK		HM		HM	

Thermometer: TER#3 DO meter/probe: 6 / 6 pH meter/probe: 6 / 6 Conductivity meter/probe: 6 / 6

week 3	Dechlor Control	Dechlor+20	FR_UTR1	GH_ER2
Hardness*	16	16	110	142
Alkalinity*	14	14	106	134

* mg/L as CaCO3

Analysts: JMC, PVK, HM

Reviewed by: [signature]

Date reviewed: Aug. 18/21

Sample Description: FR_UTR1 - clear, light yellow, no odour, some particulates
GH_ER2 - clear, light brown, no odour, some particulates

Comments: used stock sol'n 20 CuSO4 (100 mg/L Cu)

Embryo-Alevin Freshwater Toxicity Test
Initial and Final Water Quality Measurements

Client: Teck
Sample ID: (various)
Work Order #: 210963

Start Date & Time: May 19, 2021 @ 1735h
Stop Date & Time: June 18, 2021 @ 0805h
Test Species: *Oncorhynchus mykiss*

CM-MC1 Concentration + 20 mg/L Cu

	Days 14		15		16		17		18		19		20	
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.0	14.0	14.0	13.5	13.0	13.5	13.5	13.5	14.5	13.5	14.0	13.5	14.0	13.5
DO (mg/L)	9.9	10.1	10.1	10.1	10.1	10.1	9.9	10.1	9.6	9.6	9.7	9.9	9.9	10.0
pH	7.5	7.8	7.6	7.9	7.7	8.0	7.8	8.0	7.5	7.8	7.6	8.1	7.7	7.9
Cond. (µS/cm)	198		170		171		178		170		171		171	
Initials	MM		MM		MM		IMC		PYR		MM		MM	

LC_SLC Concentration + 20 mg/L Cu

	Days 14		15		16		17		18		19		20	
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.0	14.0	14.0	13.5	13.0	13.5	13.5	13.5	14.0	13.5	14.0	13.5	14.0	13.5
DO (mg/L)	9.8	10.1	10.2	10.1	10.2	10.0	10.0	10.1	9.6	9.4	9.8	10.0	9.8	9.9
pH	7.8	8.0	7.8	8.0	7.9	8.0	7.8	8.0	7.6	7.8	7.8	8.0	7.8	8.0
Cond. (µS/cm)	254		213		214		226		213		214		214	
Initials	MM		MM		MM		IMC		PYR		MM		MM	

FR_FRABCH Concentration + 20 mg/L Cu

	Days 14		15		16		17		18		19		20	
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.0	14.0	14.0	13.5	13.0	13.5	13.5	13.5	14.0	13.5	14.0	13.5	14.0	13.5
DO (mg/L)	9.8	9.9	10.1	10.1	10.2	10.1	10.1	10.1	9.7	9.6	9.8	10.0	9.9	10.0
pH	8.0	8.2	7.8	8.3	7.9	8.2	7.8	8.2	7.8	8.1	7.9	8.3	7.9	8.3
Cond. (µS/cm)	829		629①		628		633		625		629		631	
Initials	MM		MM		MM		IMC		PYR		MM		MM	

FR_FRCP1 Concentration + 20 mg/L Cu

	Days 14		15		16		17		18		19		20	
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.0	14.0	14.0	13.5	13.0	13.5	13.5	13.5	14.0	13.5	14.0	13.5	14.0	13.5
DO (mg/L)	9.8	10.0	10.1	10.1	10.1	10.1	10.0	10.2	9.6	9.6	9.8	10.1	10.0	10.0
pH	8.0	8.2	7.9	8.3	8.0	8.2	7.9	8.2	7.8	8.0	8.0	8.3	8.0	8.3
Cond. (µS/cm)	722		552①		554		559		551		553		553	
Initials	MM		MM		MM		IMC		PYR		MM		MM	

Thermometer: ~~CFR#3~~ **DO meter/probe:** 6 / 6 **pH meter/probe:** 6 / 6 **Conductivity meter/probe:** 6 / 6

week 3	~~Control~~ CM_MC1	LC_SLC	FR_FRABCH	FR_FRCP1
Hardness*	86	114	350	270
Alkalinity*	88	108	154	148

* mg/L as CaCO3

Analysts: IMC, PYR, MM
Reviewed by: JCW
Date reviewed: Aug. 18/21

Sample Description: CM_MC1, LC_SLC – clear, light yellow, no odour, some particulates
FR_FRABCH, FR_FRCP1 – clear, no colour, no odour, some particulates

Comments: ① confirmed w/ 2nd C-meter; used stock soln 20CuSO4 (100 mg/L Cu)

Embryo-Alevin Freshwater Toxicity Test
Initial and Final Water Quality Measurements

Client: Teck
Sample ID: (various)
Work Order #: 210963

Start Date & Time: May 19, 2021 @ 1735h
Stop Date & Time: June 18, 2021 @ 0805h
Test Species: *Oncorhynchus mykiss*

GH-TR1 Concentration + 20 mg/L Ca	Days													
	14		15		16		17		18		19		20	
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.0	14.0	14.0	13.5	13.0	13.5	13.5	13.5	14.0	13.5	14.0	13.5	14.0	13.5
DO (mg/L)	9.9	10.0	10.1	10.1	10.1	10.0	16.0	10.0	9.4	9.5	9.8	9.9	9.8	9.9
pH	8.0	8.2	8.0	8.3	8.1	8.2	8.0	8.2	7.9	8.1	8.0	8.3	8.1	8.3
Cond. (µS/cm)	658		516①		517		521		514		517		518	
Initials	YMC		YMC		YMC		IMC		PYK		YMC		YMC	

GH-ERC Concentration + 20 mg/L Ca	Days													
	14		15		16		17		18		19		20	
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.0	14.0	14.0	14.0	13.0	13.5	13.5	13.5	14.0	14.0	14.0	13.5	14.0	13.5
DO (mg/L)	10.0	9.9	10.1	10.0	10.2	10.1	10.0	10.1	9.8	9.5	9.7	10.0	9.8	10.0
pH	7.9	8.0	7.9	8.1	8.0	8.1	8.0	8.2	7.8	7.9	8.0	8.2	8.0	8.2
Cond. (µS/cm)	296		285		285		289		286		286		287	
Initials	YMC		YMC		YMC		IMC		PYK		YMC		YMC	

CM_MC2 Concentration + 20 mg/L Ca	Days													
	14		15		16		17		18		19		20	
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.0	14.0	14.0	14.0	13.0	13.5	13.5	13.5	14.0	13.5	14.0	13.5	14.5	13.5
DO (mg/L)	9.9	10.0	10.1	10.1	10.3	10.1	10.2	10.0	9.8	9.3	9.8	10.0	9.8	10.0
pH	8.0	8.1	8.0	8.2	8.1	8.2	8.0	8.1	7.9	8.0	8.0	8.2	8.0	8.2
Cond. (µS/cm)	622		4760		477		482		475		476		477	
Initials	YMC		YMC		YMC		IMC		PYK		YMC		YMC	

EV_MC2 Concentration + 20 mg/L Ca	Days													
	14		15		16		17		18		19		20	
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.0	14.0	14.0	14.0	13.0	13.5	13.5	13.5	14.0	14.0	14.0	13.5	14.5	13.5
DO (mg/L)	9.8	10.0	10.0	10.1	10.2	10.2	10.0	10.1	9.7	9.4	9.8	10.0	9.9	10.1
pH	7.9	7.9	7.7	8.0	7.6	8.0	7.7	8.0	7.6	7.8	7.8	8.0	7.8	8.1
Cond. (µS/cm)	304		253		293		302		293		293		294	
Initials	YMC		YMC		YMC		IMC		PYK		YMC		YMC	

Thermometer: ~~CERT3~~ **DO meter/probe:** 6 / 6 **pH meter/probe:** 6 / 6 **Conductivity meter/probe:** 6 / 6

Week 3	GH-TR1 ~~Control~~	GH-ERC	CM_MC2	EV_MC2
Hardness*	240	154	240	218
Alkalinity*	148	138	128	124

* mg/L as CaCO3

Analysts: IMC, PYK, YMC
Reviewed by: JGW
Date reviewed: Aug. 18/21

Sample Description: GH-TR1, GH-ERC - clear, ~~no colour~~ light brown, no odour, some particulates
CM_MC2 - clear, light yellow, no odour, some particulates
EV_MC2 - clear, yellow-brown, no odour, some particulates.

Comments: ① confirmed w/ 2nd c-meter; used stock soln 20CaCO4 (100 mg/L Ca)

Embryo-Alevin Freshwater Toxicity Test
Initial and Final Water Quality Measurements

Client: Teck
Sample ID: (various)
Work Order #: 210963

Start Date & Time: May 19, 2021 @ 1735h
Stop Date & Time: June 18, 2021 @ 0805h
Test Species: *Oncorhynchus mykiss*

EV-HCl Concentration ± 20 mg/L CaCO3

	Days 14		15		16		17		18		19		20	
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.0	14.0	14.0	14.0	13.0	13.5	13.5	13.5	14.0	14.0	14.5	14.0	14.5	13.5
DO (mg/L)	9.8	10.0	10.0	10.0	10.1	10.0	9.9	10.1	9.7	9.5	9.8	10.1	9.8	10.0
pH	8.1	8.2	8.0	8.3	8.0	8.3	8.1	8.3	7.9	8.1	8.0	8.1	8.1	8.3
Cond. (µS/cm)	505		414		413		418		412		414		415	
Initials	YMM		YMM		YMM		IMC		PVR		YMM		YMM	

LC-DCDS Concentration ± 20 mg/L CaCO3

	Days 14		15		16		17		18		19		20	
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.0	14.0	14.5	14.0	13.0	13.5	13.5	13.5	14.0	13.5	14.5	14.0	14.5	13.5
DO (mg/L)	9.9	9.9	10.1	10.0	10.2	10.1	9.9	10.0	9.5	9.6	9.8	10.1	9.8	10.1
pH	7.9	8.0	7.9	8.1	8.0	8.1	8.0	8.2	7.8	8.0	8.0	8.1	7.9	8.2
Cond. (µS/cm)	507		433		437		439		433		434		435	
Initials	YMM		YMM		YMM		IMC		PVR		YMM		YMM	

LC-LC3 Concentration ± 20 mg/L CaCO3

	Days 14		15		16		17		18		19		20	
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.0	14.0	14.5	14.0	13.0	13.5	13.5	13.5	14.0	13.5	14.5	13.5	14.5	13.5
DO (mg/L)	9.7	10.0	10.2	10.0	10.2	10.1	10.1	10.1	9.5	9.5	9.8	10.0	9.8	10.0
pH	8.1	8.2	7.7	8.3	7.8	8.3	8.0	8.3	7.9	8.2	8.0	8.3	8.1	8.3
Cond. (µS/cm)	764		647		649		652		644		647		647	
Initials	YMM		YMM		YMM		IMC		PVR		YMM		YMM	

LC-LC5 Concentration ± 20 mg/L CaCO3

	Days 14		15		16		17		18		19		20	
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.0	14.0	14.5	14.0	13.0	13.5	13.5	13.5	14.0	13.5	14.5	13.5	14.5	13.5
DO (mg/L)	9.8	10.0	10.0	10.1	10.2	10.1	10.0	10.2	9.7	9.5	9.7	10.1	9.8	10.0
pH	8.1	8.2	8.1	8.3	8.1	8.3	8.0	8.3	7.9	8.1	8.1	8.3	8.2	8.3
Cond. (µS/cm)	591		502		502		509		503		505		505	
Initials	YMM		YMM		YMM		IMC		PVR		YMM		YMM	

Thermometer: ~~CER#3~~ **DO meter/probe:** 6 / 6 **pH meter/probe:** 6 / 6 **Conductivity meter/probe:** 6 / 6

Week 3	~~Control~~ EV-HCl	LC-DCDS	LC-LC3	LC-LC5
Hardness*	240	220	300	230
Alkalinity*	150	112	160	146

* mg/L as CaCO3

Analysts: IMC, PVR, YMM
Reviewed by: JGa
Date reviewed: Aug 18/21

Sample Description: EV-HCl - clear, yellow-brown, no odour, some particulates
LC-DCDS, LC-LC3, LC-LC5 - clear, no colour, no odour, some particulates

Comments: ① Confirmed w/ 2nd C-meter; used stock soln 2CuSO4 (100 mg/L Cu)

Embryo-Alevin Freshwater Toxicity Test
Initial and Final Water Quality Measurements

Client: Teck
Sample ID: (various)
Work Order #: 210963

Start Date & Time: May 19, 2021 @ 1735h
Stop Date & Time: June 18, 2021 @ 0805h
Test Species: *Oncorhynchus mykiss*

LC-LCOSSLCC Concentration ± 20 mg/L CaCO3	Days													
	14		15		16		17		18		19		20	
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.0	14.0	14.5	14.0	13.0	13.5	13.5	13.5	14.0	13.5	14.5	13.5	14.0	13.5
DO (mg/L)	9.9	9.9	10.0	10.0	10.1	10.1	9.9	10.1	9.6	9.4	9.7	10.0	9.9	9.9
pH	8.1	8.2	7.9	8.2	7.9	8.2	8.0	8.2	7.8	7.9	8.1	8.2	8.1	8.3
Cond. (µS/cm)	533		431①		437		436		430		432		432	
Initials	HM		HM		HM		IMC		PVK		HM		HM	

FR-FR4 Concentration ± 20 mg/L CaCO3	Days													
	14		15		16		17		18		19		20	
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.0	14.0	14.0	14.0	13.0	13.5	13.5	13.5	14.5	14.0	14.5	13.5	14.5	13.5
DO (mg/L)	9.9	9.9	10.1	10.0	10.1	10.0	10.0	10.0	9.6	9.5	9.7	10.0	9.8	9.8
pH	8.1	8.2	7.9	8.2	8.0	8.2	8.0	8.1	7.9	7.9	8.1	8.2	8.1	8.2
Cond. (µS/cm)	630		442①		442		445		443		444		445	
Initials	HM		HM		HM		IMC		PVK		HM		HM	

FR-FRRD Concentration ± 20 mg/L CaCO3	Days													
	14		15		16		17		18		19		20	
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.0	14.0	14.0	14.0	13.0	14.0	13.5	13.5	14.5	14.0	14.5	14.0	14.0	14.0
DO (mg/L)	9.9	9.9	10.0	10.1	10.2	10.0	10.0	10.0	9.5	9.5	9.8	10.0	9.8	9.9
pH	8.1	8.3	8.0	8.3	7.9	8.3	8.0	8.3	7.9	8.1	8.0	8.3	8.1	8.3
Cond. (µS/cm)	884		699①		702		705		698		699		700	
Initials	HM		HM		HM		IMC		PVK		HM		HM	

FR-FR2 Concentration ± 20 mg/L CaCO3	Days													
	14		15		16		17		18		19		20	
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.0	14.0	14.0	14.0	13.0	14.0	13.5	13.5	14.5	14.0	14.5	14.0	14.5	14.0
DO (mg/L)	9.9	10.0	10.0	10.0	10.2	10.0	10.1	10.0	9.6	9.6	9.8	10.0	9.7	9.8
pH	8.1	8.1	8.0	8.2	8.0	8.2	7.9	8.1	7.8	8.0	8.0	8.2	8.1	8.2
Cond. (µS/cm)	516		378①		377		381		379		379		380	
Initials	HM		HM		HM		IMC		PVK		HM		HM	

Thermometer: CER43 DO meter/probe: 6 / 6 pH meter/probe: 6 / 6 Conductivity meter/probe: 6 / 6

Week 3	~~Control~~ LC-LCOSSLCC	FR-FR4	FR-FRRD	FR-FR2
Hardness*	210	210	340	180
Alkalinity*	130	132	166	126

* mg/L as CaCO3

Analysts: IMC, PVK, HM
Reviewed by: JCM
Date reviewed: Aug 18/21

Sample Description: LC-LCOSSLCC, FR-FR4, FR-FR2 - clear, no colour, no odour, some particulates.
FR-FRRD - clear, light yellow, no odour, some particulates.

Comments: ① confirmed w/ 2nd C-meter; used stock soln 20Cu04 (100 mg/L Cu)

AB 18/30

Embryo-Alevin Freshwater Toxicity Test
Initial and Final Water Quality Measurements

Client: Teck
Sample ID: (various)
Work Order #: 210963

Start Date & Time: May 19, 2021 @ 1735h
Stop Date & Time: June 18, 2021 @ 0805h
Test Species: *Oncorhynchus mykiss*

FR_MULTIPLATE Concentration +20 mg/L (u)	Days													
	14		15		16		17		18		19		20	
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.0	14.0	14.0	14.0	13.0	14.0	13.5	13.5	14.5	14.0	14.5	14.0	14.5	14.2
DO (mg/L)	9.9	10.0	10.0	10.0	10.1	10.0	9.9	10.0	9.7	9.6	9.7	9.9	9.8	9.9
pH	8.0	8.1	7.9	8.2	8.0	8.1	8.0	8.2	7.9	7.9	8.0	8.2	8.1	8.2
Cond. (µS/cm)	491		376		377		379		377		377		378	
Initials	MM		MM		MM		IMC		PYR		MM		MM	

Concentration	Days													
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)														
DO (mg/L)														
pH														
Cond. (µS/cm)														
Initials														

Concentration	Days													
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)														
DO (mg/L)														
pH														
Cond. (µS/cm)														
Initials														

Concentration	Days													
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)														
DO (mg/L)														
pH														
Cond. (µS/cm)														
Initials														

Thermometer: CERT3 DO meter/probe: 6 / 6 pH meter/probe: 6 / 6 Conductivity meter/probe: 6 / 6

week 3	FR_MULTIPLATE ~~Control~~			
Hardness*	170			
Alkalinity*	116			

* mg/L as CaCO3

Analysts: IMC, PYR, MM

Reviewed by: CJC

Date reviewed: Aug. 19/21

Sample Description: FR_MULTIPLATE - clear, no colour, no odour, some particulates

Comments: used stock soln 20CuSO4 (100 mg/L Cu)

Embryo-Alevin Freshwater Toxicity Test
Initial and Final Water Quality Measurements

Client: Teck
Sample ID: (various)
Work Order #: 210963

Start Date & Time: May 19, 2021 @1735h
Stop Date & Time: Jun 18, 2021 @0805h
Test Species: *Oncorhynchus mykiss*

Dechlor Control Concentration	Days													
	21		22		23		24		25		26		27	
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.0	13.5	14.0	13.5	14.0	13.5	14.0	13.5	14.5	13.5	14.5	13.5	14.5	13.5
DO (mg/L)	10.0	9.9	10.0	10.2	10.1	10.0	10.0	10.0	9.9	9.9	10.1	10.1	9.8	10.0
pH	6.8	7.0	6.7	7.0	6.8	7.1	6.8	7.1	7.1	6.9	6.9	7.1	6.8	7.1
Cond. (µS/cm)	34		33		34		34		33		33		33	
Initials	MM		MM		MM		JMC		PYK		MM		MM	

Dechlor +20 mg/L Cu Concentration	Days													
	21		22		23		24		25		26		27	
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.5	13.5	14.0	13.5	14.0	13.5	14.0	13.5	~~14.5~~	~~13.5~~	14.0	13.5	14.0	13.5
DO (mg/L)	9.9	10.0	9.9	10.1	10.0	10.0	10.0	10.1	~~10.2~~	~~9.6~~	10.0	10.1	9.8	10.0
pH	7.0	7.0	6.8	7.0	6.8	7.1	6.8	7.1	~~7.2~~	~~7.3~~	6.9	7.1	6.8	7.1
Cond. (µS/cm)	34		34		35		34		~~347~~ 33		34		34	
Initials	MM		MM		MM		JMC		PYK		MM		MM	

FR_UTR1 Concentration +20 mg/L Cu	Days													
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.0	13.5	13.5	13.5	13.5	13.5	14.0	13.5	14.5	13.5	14.5	13.5	14.5	13.5
DO (mg/L)	9.7	10.0	10.1	10.0	10.2	9.9	9.9	10.0	9.9	9.7	9.9	10.1	9.9	10.0
pH	7.8	8.0	7.8	8.0	7.9	8.0	7.9	8.0	7.8	7.8	7.9	8.0	7.9	8.0
Cond. (µS/cm)	216		223		224		230		223		224		224	
Initials	MM		MM		MM		JMC		PYK		MM		MM	

GH_ER2 Concentration +20 mg/L Cu	Days													
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.0	13.5	13.5	13.5	13.5	13.5	14.0	13.5	14.0	13.5	14.0	13.5	14.0	13.5
DO (mg/L)	9.8	10.0	10.2	10.0	10.1	10.0	9.9	10.0	9.9	9.6	10.0	10.0	9.8	10.1
pH	7.9	8.2	8.0	8.2	7.8	8.1	7.9	8.1	7.9	8.0	7.9	8.2	7.9	8.1
Cond. (µS/cm)	274		259		260		263		259		259		259	
Initials	MM		MM		MM		JMC		PYK		MM		MM	

Thermometer: ~~TER#3~~ **DO meter/probe:** 6 / 6 **pH meter/probe:** 6 / 6 **Conductivity meter/probe:** 6 / 6

week 4	Dechlor Control	Dechlor+20	FR_UTR1	GH_ER2
Hardness*	17	17	120	140
Alkalinity*	15	15	106	120

* mg/L as $CaCO_3$

Analysts: JMC, PYK, MM

Reviewed by: JMC

Date reviewed: Aug. 18/21

Sample Description: FR_UTR1 - clear, no colour, no odour, some particulates
GH_ER2 - clear, light brown, no odour, ~~some~~ many particulates

Comments: ① Worked w/ C-1, solution remade ② 9.9 mg/L; used stock soln 20 CuSO4 (100 mg/L Cu)
~~Alkalinity~~ WQ values: T(°C) : 14.5
DO (mg/L) = 10.0
pH : 7.1

Embryo-Alevin Freshwater Toxicity Test
Initial and Final Water Quality Measurements

Client: Teck
Sample ID: (various)
Work Order #: 210963

Start Date & Time: May 19, 2021 @ 1735h
Stop Date & Time: June 18, 2021 @ 0805h
Test Species: *Oncorhynchus mykiss*

CM_MCl Concentration +20 mg/L CaCO3	Days													
	21		22		23		24		25		26		27	
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.0	13.5	13.5	13.5	13.5	13.5	13.5	13.5	14.0	13.5	14.0	13.5	14.0	14.0
DO (mg/L)	9.7	9.9	10.2	10.1	10.3	10.0	10.1	10.2	9.9	9.5	9.9	10.0	9.8	9.9
pH	7.7	8.0	7.7	8.0	7.7	7.9	7.8	7.9	7.8	7.8	7.8	7.9	7.8	8.0
Cond. (µS/cm)	172		180		181		181		180		191		191	
Initials	YMM		YMM		YMM		IMC		PYK		YMM		YMM	

LC_SLC Concentration +20 mg/L CaCO3	Days													
	21		22		23		24		25		26		27	
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.0	13.5	13.5	13.5	13.5	13.5	13.5	13.5	14.0	13.5	14.0	13.5	14.0	14.0
DO (mg/L)	9.7	10.0	10.2	10.0	10.2	10.1	10.0	10.0	9.9	9.6	9.9	10.0	9.9	10.0
pH	7.9	8.1	7.9	8.1	7.9	8.0	7.8	7.9	7.9	7.9	8.0	8.0	8.0	8.1
Cond. (µS/cm)	215		236		238		241		236		237		237	
Initials	YMM		YMM		YMM		IMC		PYK		YMM		YMM	

FR_FRABCH Concentration +20 mg/L CaCO3	Days													
	21		22		23		24		25		26		27	
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.0	13.5	13.0	13.5	13.5	13.5	13.5	13.5	14.0	13.5	14.0	13.5	14.0	13.5
DO (mg/L)	9.8	10.0	10.3	10.0	10.2	10.1	9.9	10.1	9.8	9.6	10.0	10.1	9.8	10.0
pH	8.1	8.3	7.9	8.3	7.9	8.3	7.9	8.2	8.1	8.2	8.0	8.2	8.0	8.3
Cond. (µS/cm)	628		771 ①		776		775		767		772		772	
Initials	YMM		YMM		YMM		IMC		PYK		YMM		YMM	

FR_FRCP1 Concentration +20 mg/L CaCO3	Days													
	21		22		23		24		25		26		27	
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.0	13.5	13.0	13.5	13.5	13.5	13.5	13.5	14.0	13.5	14.0	13.5	14.0	13.5
DO (mg/L)	9.8	10.1	10.2	10.0	10.2	10.1	10.1	10.1	9.8	9.8	10.0	10.1	9.8	10.1
pH	8.2	8.3	7.9	8.3	7.9	8.3	7.9	8.2	8.0	8.2	8.1	8.2	8.1	8.3
Cond. (µS/cm)	554		688 ①		688		689		684		685		684	
Initials	YMM		YMM		YMM		IMC		PYK		YMM		YMM	

Thermometer: ~~CORE3~~ **DO meter/probe:** 6 / 6 **pH meter/probe:** 6 / 6 **Conductivity meter/probe:** 6 / 6

Week 4	~~Control~~ CM_MCl	LC_SLC	FR_FRABCH	FR_FRCP1
Hardness*	96	124	450	390
Alkalinity*	86	110	192	180

* mg/L as CaCO3

Analysts: IMC, PYK, YMM
Reviewed by: JGH
Date reviewed: Aug. 18/21

Sample Description: CM_MCl - clear, brown, no odour, some particulates
LC-SLC, FR_FRCP1 - clear, no colour, no odour some particulates.
FR_FRABCH - clear, light brown, no odour, some particulates

Comments: ① confirmed w/ 2nd meter, used stock soln 20L of 0.4 (100 mg/L CaCO3)

Embryo-Alevin Freshwater Toxicity Test
Initial and Final Water Quality Measurements

Client: Teck
Sample ID: (various)
Work Order #: 210963

Start Date & Time: May 19, 2021 @ 1735h
Stop Date & Time: June 18, 2021 @ 0805h
Test Species: *Oncorhynchus mykiss*

GH-FR1 Concentration +20 mg/L Cu	Days													
	21		22		23		24		25		26		27	
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.0	13.5	13.5	13.5	13.5	13.5	13.5	13.5	14.0	14.0	14.0	14.0	14.0	14.0
DO (mg/L)	9.7	9.9	10.2	10.1	10.1	10.0	9.9	10.0	9.9	9.5	10.0	9.9	9.9	10.0
pH	8.1	8.3	8.0	8.3	8.0	8.2	8.0	8.1	8.0	8.0	8.1	8.2	8.1	8.2
Cond. (µS/cm)	517		605		605		609		661		603		604	
Initials	MM		MM		MM		IMC		PVK		MM		MM	

GH-ERC Concentration +20 mg/L Cu	Days													
	21		22		23		24		25		26		27	
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.5	13.5	13.5	13.5	13.5	13.5	13.5	13.5	14.0	14.0	14.0	14.0	14.0	14.0
DO (mg/L)	9.8	9.9	10.2	10.0	10.2	10.0	10.1	10.2	10.0	9.6	10.1	10.0	9.9	10.0
pH	8.1	8.3	7.9	8.2	7.9	8.1	7.9	8.0	7.9	8.0	8.0	8.1	8.0	8.1
Cond. (µS/cm)	286		278		277		281		276		277		277	
Initials	MM		MM		MM		IMC		PVK		MM		MM	

CM-MC2 Concentration +20 mg/L Cu	Days													
	21		22		23		24		25		26		27	
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.5	14.0	13.5	13.5	13.5	13.5	13.5	13.5	14.0	14.0	14.5	14.0	14.0	14.0
DO (mg/L)	9.9	10.0	10.1	10.0	10.2	10.1	10.1	10.0	9.9	9.4	9.9	9.9	10.0	9.9
pH	8.2	8.3	8.1	8.2	8.0	8.1	8.0	8.1	8.0	8.0	8.0	8.1	8.1	8.2
Cond. (µS/cm)	479		545		547		551		543		544		544	
Initials	MM		MM		MM		IMC		PVK		MM		MM	

EV-MC2 Concentration +20 mg/L Cu	Days													
	21		22		23		24		25		26		27	
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.5	14.0	13.5	13.5	13.5	13.5	14.0	13.5	14.5	14.0	14.5	14.0	14.5	14.0
DO (mg/L)	9.7	9.9	10.1	10.0	10.2	10.1	10.1	10.1	9.8	8.5	9.9	10.0	10.0	9.9
pH	7.9	8.2	7.8	8.1	7.8	8.0	7.8	8.0	7.9	7.9	7.9	7.9	7.9	8.1
Cond. (µS/cm)	295		302		296		309		300		302		303	
Initials	MM		MM		MM		IMC		PVK		MM		MM	

Thermometer: ~~CER#3~~ **DO meter/probe:** 6 / 6 **pH meter/probe:** 6 / 6 **Conductivity meter/probe:** 6 / 6

week 4

	~~Control~~ GH-FR1	GH-ERC	CM-MC2	EV-MC2
Hardness*	340	146	280	146
Alkalinity*	160	128	136	100

* mg/L as $CaCO_3$

Analysts: IMC, PVK, MM

Reviewed by: JOL

Date reviewed: Aug. 18/21

Sample Description: GH-FR1, GH-ERC - clear, light brown, no odour, some particulates
CM-MC2 - clear, brown, no odour, some particulates
EV-MC2 - clear, yellow-brown, no odour, some particulates.

Comments: used stock soln 20Cu04 (100 mg/L Cu)

Embryo-Alevin Freshwater Toxicity Test
Initial and Final Water Quality Measurements

Client: Teck
Sample ID: (various)
Work Order #: 210963

Start Date & Time: May 19, 2021 @ 1735h
Stop Date & Time: June 18, 2021 @ 0805h
Test Species: *Oncorhynchus mykiss*

EV-HCl Concentration ± 20 mg/L Cu	Days													
	21		22		23		24		25		26		27	
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.5	14.0	13.5	13.5	13.5	13.5	14.0	13.5	14.0	14.0	14.5	14.0	14.5	14.0
DO (mg/L)	9.7	10.0	10.1	10.0	10.2	10.1	10.1	10.1	9.8	9.7	9.9	9.8	9.9	10.0
pH	8.2	8.3	8.2	8.3	8.1	8.2	8.1	8.3	8.1	8.1	8.1	8.2	8.1	8.2
Cond. (µS/cm)	414		449		451		454		448		449		449	
Initials	YMK		YMK		YMK		IMC		PYK		YMK		YMK	

LC-DCDS Concentration ± 20 mg/L Cu	Days													
	21		22		23		24		25		26		27	
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.5	14.0	13.5	13.5	13.5	13.5	14.0	13.5	14.0	13.5	14.5	14.0	14.5	14.0
DO (mg/L)	9.8	10.0	10.2	10.0	10.1	10.0	10.0	10.1	9.7	9.8	9.8	9.9	9.8	9.9
pH	8.1	8.2	8.1	8.1	8.0	8.0	8.0	8.1	8.0	7.9	8.0	8.0	8.0	8.1
Cond. (µS/cm)	434		465		470		473		464		465		466	
Initials	YMK		YMK		YMK		IMC		PYK		YMK		YMK	

LC-LC3 Concentration ± 20 mg/L Cu	Days													
	21		22		23		24		25		26		27	
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.5	13.5	13.5	13.5	13.5	13.5	14.0	13.5	14.0	13.5	14.5	14.0	14.5	14.0
DO (mg/L)	9.7	10.0	10.2	10.0	10.2	10.0	10.1	10.0	9.9	9.8	9.9	9.9	9.8	9.8
pH	8.2	8.4	7.8	8.3	7.8	8.2	7.9	8.1	7.9	8.1	7.9	8.2	8.0	8.3
Cond. (µS/cm)	646		587		582		593		585		586		585	
Initials	YMK		YMK		YMK		IMC		PYK		YMK		YMK	

LC-LC5 Concentration ± 20 mg/L Cu	Days													
	21		22		23		24		25		26		27	
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.5	14.0	13.5	13.5	13.5	13.5	14.0	13.5	14.0	13.5	14.5	14.0	14.5	14.0
DO (mg/L)	9.7	10.0	10.2	10.1	10.2	10.0	10.0	10.0	9.8	9.8	9.9	9.9	9.7	10.0
pH	8.3	8.4	8.2	8.3	8.1	8.2	8.0	8.1	8.1	8.1	8.2	8.2	8.2	8.3
Cond. (µS/cm)	505		545		546		550		544		545		545	
Initials	YMK		YMK		YMK		IMC		PYK		YMK		YMK	

Thermometer: ~~CER43~~ **DO meter/probe:** 6 / 6 **pH meter/probe:** 6 / 6 **Conductivity meter/probe:** 6 / 6

Week 4	EV-HCl ~~Control~~	LC-DCDS	LC-LC3	LC-LC5
Hardness*	260	250	290	270
Alkalinity*	150	106	150	152

* mg/L as CaCO3

Analysts: IMC, PYK, YMK
Reviewed by: JGH
Date reviewed: Aug-18/21

Sample Description: EV-HCl - clear, yellow-brown, no odour, some particulates
LC-DCDS - clear, light yellow, no odour, some particulates
LC-LC3 - clear, no colour, no odour, some particulates
LC-LC5 - clear, ~~light~~ light brown, no odour, some particulates

Comments: used stock soln $CuSO_4$ (100 mg/L Cu)

Embryo-Alevin Freshwater Toxicity Test
Initial and Final Water Quality Measurements

Client: Teck
Sample ID: (various)
Work Order #: 210963

Start Date & Time: May 19, 2021 @ 1735h
Stop Date & Time: Jun 18, 2021 @ 0805h
Test Species: *Oncorhynchus mykiss*

LC-LCDSSLCC Concentration ± 20 mg/L Cu	Days													
	21		22		23		24		25		26		27	
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.5	13.5	13.5	13.5	13.5	13.5	13.5	13.5	14.0	13.5	14.5	14.0	14.5	14.0
DO (mg/L)	9.8	10.1	10.1	10.0	10.1	10.0	10.0	10.0	9.9	9.5	9.9	10.0	9.8	10.0
pH	8.2	8.3	8.1	8.3	8.0	8.2	8.1	8.1	8.0	8.0	8.1	8.2	8.2	8.2
Cond. (µS/cm)	433		482		483		488		483		481		481	
Initials	HM		HM		HM		IMC		PYK		HM		HM	

FR-FR4 Concentration ± 20 mg/L Cu	Days													
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.5	14.0	13.5	13.5	14.0	13.5	13.5	13.5	14.5	13.5	14.5	14.0	14.5	14.0
DO (mg/L)	9.7	10.0	10.2	10.0	10.1	10.1	10.1	10.0	9.8	9.7	9.9	9.9	9.8	9.9
pH	8.2	8.3	8.0	8.3	8.0	8.2	8.1	8.3	8.1	8.1	8.1	8.2	8.2	8.3
Cond. (µS/cm)	445		5720 ①		577		581		572		570		570	
Initials	HM		HM		HM		IMC		PYK		HM		HM	

FR-FRRD Concentration ± 20 mg/L Cu	Days													
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.5	14.0	13.5	14.0	14.0	14.0	14.0	13.5	14.5	14.0	14.5	14.0	14.5	14.0
DO (mg/L)	9.7	10.0	10.3	10.0	10.1	9.9	10.0	10.1	9.8	9.5	10.0	10.0	9.7	9.9
pH	8.3	8.4	7.9	8.3	8.0	8.3	8.0	8.3	8.1	8.2	8.0	8.2	8.2	8.2
Cond. (µS/cm)	701		866 ①		870		874		863		862		863	
Initials	HM		HM		HM		IMC		PYK		HM		HM	

FR-FR2 Concentration ± 20 mg/L Cu	Days													
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.5	14.0	13.5	14.0	14.0	14.0	14.0	13.5	14.5	14.0	14.5	14.0	14.5	14.0
DO (mg/L)	9.8	10.0	10.3	10.0	10.2	10.1	10.0	10.2	10.0	9.4	9.9	10.0	9.9	10.0
pH	8.1	8.3	8.1	8.3	8.1	8.1	8.1	8.2	8.1	8.0	8.1	8.0	8.2	8.1
Cond. (µS/cm)	379		454		457		459		457		455		455	
Initials	HM		HM		HM		IMC		PYK		HM		HM	

Thermometer: CER#3 **DO meter/probe:** 6 / 6 **pH meter/probe:** 6 / 6 **Conductivity meter/probe:** 6 / 6

week 4	LC-LCDSSLCC + ~~Control~~	FR-FR4	FR-FRRD	FR-FR2
Hardness*	280	350	450	230
Alkalinity*	136	152	196	140

* mg/L as CaCO3

Analysts: IMC, PYK, HM

Reviewed by: [signature]

Date reviewed: Aug-18/21

Sample Description: LC-LCDSSLCC, FR-FR4, FR-FRRD, FR-FR2 – clear, no colour, no odour, some particulates

Comments: ① confirmed w/ 2nd C-meter & used stock soln 20C004 (100 mg/L Cu)

AS 24130

Embryo-Alevin Freshwater Toxicity Test
Initial and Final Water Quality Measurements

Client: Teck
Sample ID: (Various)
Work Order #: 210963

Start Date & Time: May 19, 2021 @ 1735h
Stop Date & Time: June 18, 2021 @ 0805h
Test Species: *Oncorhynchus mykiss*

FR_MULTIPLATE Concentration ± 20 mg/L (u)	Days													
	21		22		23		24		25		26		27	
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.5	14.0	13.5	14.0	14.5	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0
DO (mg/L)	9.8	10.1	10.2	9.9	10.0	10.0	10.1	10.0	9.9	9.5	9.9	10.0	9.9	9.9
pH	8.1	8.2	8.0	8.2	8.0	8.1	8.0	8.2	8.0	8.0	8.0	8.1	8.1	8.1
Cond. (µS/cm)	377		411		413		416		412		410		410	
Initials	HMC		HMC		HMC		IMC		PYK		HMC		HMC	

Concentration	Days													
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)														
DO (mg/L)														
pH														
Cond. (µS/cm)														
Initials														

Concentration	Days													
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)														
DO (mg/L)														
pH														
Cond. (µS/cm)														
Initials														

Concentration	Days													
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)														
DO (mg/L)														
pH														
Cond. (µS/cm)														
Initials														

Thermometer: CER#3 **DO meter/probe:** 6 / 6 **pH meter/probe:** 6 / 6 **Conductivity meter/probe:** 6 / 6

Week 4	FR_MULTIPLATE ~~Control~~			
Hardness*	200			
Alkalinity*	120			

* mg/L as CaCO3

Analysts: IMC, PYK, HMC

Reviewed by: JSh

Date reviewed: Aug. 18/21

Sample Description: FR_MULTIPLATE - clear, no colour, no odour, some particulates

Comments: used stock soln 20CU04 (100 mg/L (u)

Embryo-Alevin Freshwater Toxicity Test
Initial and Final Water Quality Measurements

Client: Teck
Sample ID: Various
Work Order #: 210963

Start Date & Time: May 19, 2021 @ 1735h
Stop Date & Time: June 18, 2021 @ 0805h
Test Species: *Oncorhynchus mykiss*

Dechlor (Control) Concentration	Days													
	28		29		30 final									
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.0	13.5	14.0	13.5	\	13.5								
DO (mg/L)	9.9	10.0	10.0	10.0	\	9.9								
pH	6.9	7.2	7.0	7.1	\	6.7								
Cond. (µS/cm)	33		34		37									
Initials	YMW		YMW		YMW									

Dechlor + 20 µg/L Cu Concentration	Days													
	28		29		30 final									
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.5	13.5	14.5	13.5	\	13.5								
DO (mg/L)	9.9	10.1	10.0	9.9	\	9.9								
pH	6.9	7.2	7.0	7.1	\	6.7								
Cond. (µS/cm)	34		34		37									
Initials	YMW		YMW		YMW									

FR-UFR1 Concentration + 20 µg/L Cu	Days													
	28		29		30 final									
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.0	13.5	14.0	13.5	\	13.5								
DO (mg/L)	9.8	10.1	10.1	9.9	\	10.0								
pH	7.8	8.0	7.8	8.0	\	7.78								
Cond. (µS/cm)	225		227		232									
Initials	YMW		YMW		YMW									

GH-ER2 Concentration + 20 µg/L Cu	Days													
	28		29		30 final									
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.0	13.5	14.0	13.5	\	13.5								
DO (mg/L)	9.8	10.1	10.0	10.0	\	10.0								
pH	7.9	8.1	7.8	8.1	\	7.9								
Cond. (µS/cm)	261		252		258									
Initials	YMW		YMW		YMW									

Thermometer: CER#3 DO meter/probe: 6 / 6 pH meter/probe: 6 / 6 Conductivity meter/probe: 6 / 6

week 5	Control	Dechlor + 20	FR-UFR1	GH-ER2
Hardness*	17	17	150	160
Alkalinity*	15	15	146	152

* mg/L as $CaCO_3$

Analysts: YMW
Reviewed by: JCM
Date reviewed: Aug. 18/21

Sample Description: FR-UFR1, ~~GH-ER2~~ clear, no colour, no odour, some particulates
GH-ER2 - turbid, brown, no odour, some particulates

Comments: used stock soln $2CuO_4$ (100 mg/L Cu)

Embryo-Alevin Freshwater Toxicity Test
Initial and Final Water Quality Measurements

Client: TECK
Sample ID: (Various)
Work Order #: 210963

Start Date & Time: May 19 2021 @ 1735h
Stop Date & Time: June 18, 2021 @ 0905h
Test Species: *Oncorhynchus mykiss*

CM_MCl Concentration ± 20 mg/L Cu	Days													
	28		29		30 final									
	new	old	new	old	new	~~old~~	new	old	new	old	new	old	new	old
Temperature (°C)	14.0	13.5	14.0	13.5	\	13.5								
DO (mg/L)	9.8	10.1	10.1	10.0	\	10.0								
pH	7.7	7.9	7.8	7.9	\	7.8								
Cond. (µS/cm)	181		184		188									
Initials	HM		HM		HM									

LC_SLC Concentration ± 20 mg/L Cu	Days													
	28		29		30 final									
	new	old	new	old	new	~~old~~	new	old	new	old	new	old	new	old
Temperature (°C)	14.0	13.5	14.0	13.5	\	13.5								
DO (mg/L)	9.8	10.1	10.1	10.0	\	10.0								
pH	7.9	8.0	7.9	8.0	\	7.9								
Cond. (µS/cm)	238		211		226									
Initials	HM		HM		HM									

FR_FRABCH Concentration ± 20 mg/L Cu	Days													
	28		29		30 final									
	new	old	new	old	new	~~old~~	new	old	new	old	new	old	new	old
Temperature (°C)	14.0	13.5	14.0	13.5	\	13.5								
DO (mg/L)	9.9	10.1	10.0	9.9	\	10.2								
pH	8.0	8.2	7.9	8.2	\	8.1								
Cond. (µS/cm)	772		627①		689									
Initials	HM		HM		HM									

FR_FRCPI Concentration ± 20 mg/L Cu	Days													
	28		29		30 final									
	new	old	new	old	new	~~old~~	new	old	new	old	new	old	new	old
Temperature (°C)	14.0	13.5	14.0	13.5	\	13.5								
DO (mg/L)	9.8	10.2	10.2	9.9	\	10.1								
pH	8.1	8.3	8.0	8.3	\	8.1								
Cond. (µS/cm)	685		541①		605									
Initials	HM		HM		HM									

Thermometer: CER13 DO meter/probe: 6 / 6 pH meter/probe: 6 / 6 Conductivity meter/probe: 6 / 6

week 5	CM_MCl ~~Control~~	LC_SLC	FR_FRABCH	FR_FRCPI
Hardness*	122	142	390	460
Alkalinity*	120	134	134	166

* mg/L as CaCO3

Analysts: HM
Reviewed by: JGH
Date reviewed: Aug. 18/21

Sample Description: CM_MCl, LC_SLC, FR_FRABCH, FR_FRCPI - clear, no colour, no odour, some particulates

Comments: ① confirmed w/ 2nd C-meter; used stock soln 20CU04 (100 mg/L Cu)

Embryo-Alevin Freshwater Toxicity Test
Initial and Final Water Quality Measurements

Client: Teck
Sample ID: (Various)
Work Order #: 210963

Start Date & Time: May 19, 2021 @ 1735h
Stop Date & Time: June 18, 2021 @ 0805h
Test Species: *Oncorhynchus mykiss*

GH-FR1 Concentration + 20 mg/L Cu	Days													
	28		29		30 final									
	new	old	new	old	new	~~old~~	new	old	new	old	new	old	new	old
Temperature (°C)	14.0	14.0	14.0	13.5		13.5								
DO (mg/L)	9.9	10.1	10.0	10.1		10.0								
pH	8.1	8.2	8.1	8.2		8.0								
Cond. (µS/cm)	604		540		568									
Initials	NM		NM		NM									

GH-ERC Concentration + 20 mg/L Cu	Days													
	28		29		30 final									
	new	old	new	old	new	~~old~~	new	old	new	old	new	old	new	old
Temperature (°C)	14.0	14.0	14.0	13.5		13.5								
DO (mg/L)	10.0	10.1	10.1	10.0		10.0								
pH	8.0	8.1	8.0	8.1		8.0								
Cond. (µS/cm)	277		267		275									
Initials	NM		NM		NM									

CM_MC2 Concentration + 20 mg/L Cu	Days													
	28		29		30 final									
	new	old	new	old	new	~~old~~	new	old	new	old	new	old	new	old
Temperature (°C)	14.0	14.0	14.0	13.5		13.5								
DO (mg/L)	9.8	10.0	10.1	10.0		10.0								
pH	8.1	8.2	8.0	8.2		8.0								
Cond. (µS/cm)	548		462		499									
Initials	NM		NM		NM									

EV_MC2 Concentration + 20 mg/L Cu	Days													
	28		29		30 final									
	new	old	new	old	new	~~old~~	new	old	new	old	new	old	new	old
Temperature (°C)	14.0	14.0	14.0	13.5		13.5								
DO (mg/L)	9.8	10.1	10.1	10.0		10.1								
pH	7.9	8.1	7.9	8.0		7.9								
Cond. (µS/cm)	304		332		324									
Initials	NM		NM		NM									

Thermometer: CER#3 **DO meter/probe:** 6 / 6 **pH meter/probe:** 6 / 6 **Conductivity meter/probe:** 6 / 6

week 5	GH-FR1 ~~Control~~	GH_ERC	CM_MC2	EV_MC2
Hardness*	490	184	300	228
Alkalinity*	162	168	188	160

* mg/L as CaCO3

Analysts: NM

Reviewed by: JGL
Date reviewed: Aug. 18/21

Sample Description: GH-FR1, CM_MC2, EV_MC2 - clear, no colour, no odour, some particulates
GH-ERC - turbid, brown, no odour, some particulates

Comments: used stock sol'n 20CuO4 (100 mg/L Cu)

Embryo-Alevin Freshwater Toxicity Test
Initial and Final Water Quality Measurements

Client: Teck
Sample ID: (various)
Work Order #: 210963

Start Date & Time: May 19, 2021 @ 1735h
Stop Date & Time: June 18, 2021 @ 0805h
Test Species: *Oncorhynchus mykiss*

EV_HCl Concentration ± 20 mg/L CaCO3	Days													
	28		29		30 final									
	new	old	new	old	new	~~old~~	new	old	new	old	new	old	new	old
Temperature (°C)	14.0	14.0	14.0	13.5	\	13.5								
DO (mg/L)	10.0	10.1	10.0	10.0	\	10.1								
pH	8.1	8.2	8.1	8.2	\	8.0								
Cond. (µS/cm)	451		534		503									
Initials	MM		MM		MM									

LC_DCDS Concentration ± 20 mg/L CaCO3	Days													
	28		29		30 final									
	new	old	new	old	new	~~old~~	new	old	new	old	new	old	new	old
Temperature (°C)	14.0	14.0	14.0	13.5	\	13.5								
DO (mg/L)	10.0	10.1	10.1	10.0	\	10.0								
pH	8.0	8.0	8.1	8.0	\	7.9								
Cond. (µS/cm)	467		572①		535									
Initials	MM		MM		MM									

LC_LC3 Concentration ± 20 mg/L CaCO3	Days													
	28		29		30 final									
	new	old	new	old	new	~~old~~	new	old	new	old	new	old	new	old
Temperature (°C)	14.0	14.0	14.0	13.5	\	13.5								
DO (mg/L)	9.9	10.0	10.2	9.9	\	10.0								
pH	8.1	8.2	7.9	8.2	\	8.1								
Cond. (µS/cm)	587		741①		668									
Initials	MM		MM		MM									

LC_LC5 Concentration ± 20 mg/L CaCO3	Days													
	28		29		30 final									
	new	old	new	old	new	~~old~~	new	old	new	old	new	old	new	old
Temperature (°C)	14.0	14.0	14.0	13.5	\	13.5								
DO (mg/L)	9.9	10.1	10.0	9.9	\	10.1								
pH	8.2	8.2	8.2	8.2	\	8.1								
Cond. (µS/cm)	548		546		550									
Initials	MM		MM		MM									

Thermometer: CER83 DO meter/probe: 6 / 6 pH meter/probe: 6 / 6 Conductivity meter/probe: 6 / 6

week 5	~~Control~~ EV_HCl	LC_DCDS	LC_LC3	LC_LC5
Hardness*	330	540	410	320
Alkalinity*	150	190	156	136

* mg/L as CaCO3

Analysts: MM
Reviewed by: JM
Date reviewed: Aug. 18/21

Sample Description: EV_HCl, LC_DCDS, LC_LC3, LC_LC5 - clear, no colour, no odour, some particulates

Comments: ① confirmed w/ 2nd E-meter; used stock soln 2CuO4 (100 mg/L Cu)

Embryo-Alevin Freshwater Toxicity Test
Initial and Final Water Quality Measurements

Client: Teck
Sample ID: (various)
Work Order #: 20963

Start Date & Time: May 19, 2021 @ 1735h
Stop Date & Time: June 18, 2021 @ 0905h
Test Species: *Oncorhynchus mykiss*

LC_LCDSSLCC Concentration + 20 mg/L Cu	Days													
	28		29		30 final									
	new	old	new	old	new	~~old~~	new	old	new	old	new	old	new	old
Temperature (°C)	14.0	14.0	14.0	13.5		13.5								
DO (mg/L)	9.8	10.1	10.0	10.0		10.0								
pH	8.1	8.2	8.1	8.2		8.0								
Cond. (µS/cm)	482		497		493									
Initials	HM		HM		HM									

FR_FR4 Concentration + 20 mg/L Cu	Days													
	28		29		30 final									
	new	old	new	old	new	~~old~~	new	old	new	old	new	old	new	old
Temperature (°C)	14.5	14.0	14.5	13.5		13.5								
DO (mg/L)	9.8	10.0	10.0	10.0		10.0								
pH	8.1	8.2	8.1	8.2		8.0								
Cond. (µS/cm)	574		464 ①		506									
Initials	HM		HM		HM									

FR_FRRD Concentration + 20 mg/L Cu	Days													
	28		29		30 final									
	new	old	new	old	new	~~old~~	new	old	new	old	new	old	new	old
Temperature (°C)	14.5	14.0	14.0	14.0		14.0								
DO (mg/L)	9.8	10.1	10.2	10.0		9.9								
pH	8.2	8.2	8.0	8.3		8.1								
Cond. (µS/cm)	867		737 ①		786									
Initials	HM		HM		HM									

FR_FR2 Concentration + 20 mg/L Cu	Days													
	28		29		30 final									
	new	old	new	old	new	~~old~~	new	old	new	old	new	old	new	old
Temperature (°C)	14.5	14.0	14.0	14.0		14.0								
DO (mg/L)	9.9	10.0	10.1	9.9		9.8								
pH	8.1	8.1	8.1	8.1		7.9								
Cond. (µS/cm)	458		386		420									
Initials	HM		HM		HM									

Thermometer: ~~VER03~~ **DO meter/probe:** 6 / 6 **pH meter/probe:** 6 / 6 **Conductivity meter/probe:** 6 / 6

Week 5 — LC_LCDSSLCC

~~Control~~	FR_FR4	FR_FRRD	FR_FR2
Hardness*	390	440	540	290
Alkalinity*	188	132	134	182

* mg/L as CaCO3

Analysts: YHL
Reviewed by: JOH
Date reviewed: Aug. 18/21

Sample Description: LC_LCDSSLCC, FR_FR4, FR_FRRD, FR_FR2 - clear, no colour, no odour, some ~~algae~~ yn particulates

Comments: ① confirmed w/ 2nd C-meter; used stock soln 20C004 (100 mg/L Cu)

Embryo-Alevin Freshwater Toxicity Test
Initial and Final Water Quality Measurements

Client: Teck
Sample ID: (Various)
Work Order #: 210963

Start Date & Time: May 19, 2021 @ 1735h
Stop Date & Time: June 18, 2021 @ 0805h
Test Species: *Oncorhynchus mykiss*

FR_MULTIPLATE Concentration + 20 ug/L Cu	Days													
	28		29		30 final									
	new	old	new	old	new	~~old~~	new	old	new	old	new	old	new	old
Temperature (°C)	14.5	14.0	14.5	14.0		14.0								
DO (mg/L)	9.8	10.0	10.0	9.9		9.8								
pH	8.1	8.1	8.0	8.1		7.9								
Cond. (µS/cm)	413		352		384									
Initials	MM		MM		MM									

Concentration	Days													
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)														
DO (mg/L)														
pH														
Cond. (µS/cm)														
Initials														

Concentration	Days													
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)														
DO (mg/L)														
pH														
Cond. (µS/cm)														
Initials														

Concentration	Days													
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)														
DO (mg/L)														
pH														
Cond. (µS/cm)														
Initials														

Thermometer: CER#3 **DO meter/probe:** 6 / 6 **pH meter/probe:** 6 / 6 **Conductivity meter/probe:** 6 / 6

week 5	FR_MULTIPLATE ~~Control~~			
Hardness*	300			
Alkalinity*	170			

* mg/L as CaCO3

Analysts: YYL
Reviewed by: JGA
Date reviewed: Aug. 18/21

Sample Description: FR_MULTIPLATE - clear, no colour, no odour, some particulates.

Comments: used stock soln 20(100 mg/L Cu)

Rainbow Trout Embryo-Alevin Toxicity Test - Overall Results

Client: Teck
WO#: 210963

Test Initiation Date: May 19, 2021
Test Termination Date: June 18, 2021

	Test Conc.		Mortality Counts													
	(% v/v)	Rep	Day 1 - 12	Day 13 - 24	Day 25 - 30	Total Dead	Abnormal Alevins	Normal Alevins	Total No. Alevins	Total No. Exposed	Survival			Normal Alevins		
Dechlor	Control	1	0	0	0	0	2	28	30	30	100.0			93.3		
		2	30	0	0	30	0	0	0	30	0.0			0.0		
		3	0	0	6	6	1	23	24	30	80.0	Mean	SD	76.7	Mean	SD
		4	0	0	1	1	3	27	30	31	96.8	69.2	47.0	87.1	64.3	43.4
Dechlor	Control	1	1	3	0	4	1	25	26	30	86.7			83.3		
+ 20 µg/L Cu		2	23	5	1	29	0	1	1	30	3.3			3.3		
		3	2	3	2	7	2	21	23	30	76.7	Mean	SD	70.0	Mean	SD
		4	2	8	1	11	1	18	19	30	63.3	57.5	37.4	60.0	54.2	35.2
1	100	1	0	0	0	0	1	29	30	30	100.0			96.7		
FR_UFR1		2	29	1	0	30	0	0	0	30	0.0			0.0		
+ 20 µg/L Cu		3	1	2	0	3	0	26	26	29	89.7	Mean	SD	89.7	Mean	SD
		4	1	0	0	1	0	29	29	30	96.7	71.6	47.9	96.7	70.7	47.3
2	100	1	0	1	3	4	0	25	25	29	86.2			86.2		
GH_ER2		2	27	3	0	30	0	0	0	30	0.0			0.0		
+ 20 µg/L Cu		3	1	1	0	2	3	25	28	30	93.3	Mean	SD	83.3	Mean	SD
		4	0	1	0	1	5	23	28	29	96.6	69.0	46.2	79.3	62.2	41.6
3	100	1	2	0	1	3	0	28	28	31	90.3			90.3		
CM_MC1		2	28	1	0	29	0	1	1	30	3.3			3.3		
+ 20 µg/L Cu		3	0	0	4	4	1	25	26	30	86.7	Mean	SD	83.3	Mean	SD
		4	0	0	0	0	2	28	30	30	100.0	70.1	44.9	93.3	67.6	43.0
4	100	1	1	0	0	1	0	29	29	30	96.7			96.7		
LC_SLC		2	28	2	0	30	0	0	0	30	0.0			0.0		
+ 20 µg/L Cu		3	1	2	4	7	0	23	23	30	76.7	Mean	SD	76.7	Mean	SD
		4	0	0	3	3	2	25	27	30	90.0	65.8	44.7	83.3	64.2	43.6
5	100	1	0	1	1	2	0	27	27	29	93.1			93.1		
FR_FRABCH		2	26	2	2	30	0	0	0	30	0.0			0.0		
+ 20 µg/L Cu		3	1	1	3	5	2	24	26	31	83.9	Mean	SD	77.4	Mean	SD
		4	1	1	1	3	2	25	27	30	90.0	66.7	44.7	83.3	63.5	42.8
6	100	1	1	1	1	3	1	26	27	30	90.0			86.7		
FR_FRCP1		2	24	4	1	29	0	1	1	30	3.3			3.3		
+ 20 µg/L Cu		3	0	0	2	2	0	28	28	30	93.3	Mean	SD	93.3	Mean	SD
		4	0	2	1	3	1	26	27	30	90.0	69.2	43.9	86.7	67.5	42.9
7	100	1	1	2	0	3	1	25	26	29	89.7			86.2		
GH_FR1		2	28	0	0	28	0	2	2	30	6.7			6.7		
+ 20 µg/L Cu		3	1	7	3	11	1	20	21	32	65.6	Mean	SD	62.5	Mean	SD
		4	0	2	1	3	0	27	27	30	90.0	63.0	39.2	90.0	61.3	38.4
8	100	1	2	0	0	2	1	27	28	30	93.3			90.0		
GH_ERC		2	26	3	1	30	0	0	0	30	0.0			0.0		
+ 20 µg/L Cu		3	2	1	3	6	0	24	24	30	80.0	Mean	SD	80.0	Mean	SD
		4	1	0	0	1	0	29	29	30	96.7	67.5	45.6	96.7	66.7	45.0
9	100	1	1	0	0	1	0	29	29	30	96.7			96.7		
CM_MC2		2	30	1	0	31	0	0	0	31	0.0			0.0		
+ 20 µg/L Cu		3	2	3	0	5	0	25	25	30	83.3	Mean	SD	83.3	Mean	SD
		4	2	0	1	3	0	26	26	29	89.7	67.4	45.3	89.7	67.4	45.3
10	100	1	0	0	0	0	1	29	30	30	100.0			96.7		
EV_MC2		2	30	0	0	30	0	0	0	30	0.0			0.0		
+ 20 µg/L Cu		3	3	2	0	5	3	23	26	31	83.9	Mean	SD	74.2	Mean	SD
		4	0	2	0	2	4	25	29	31	93.5	69.4	46.7	80.6	62.9	43.0
11	100	1	0	0	0	0	2	27	29	29	100.0			93.1		
EV_HC1		2	27	2	1	30	0	0	0	30	0.0			0.0		
+ 20 µg/L Cu		3	0	1	5	6	0	23	23	29	79.3	Mean	SD	79.3	Mean	SD
		4	0	0	0	0	1	29	30	30	100.0	69.8	47.6	96.7	67.3	45.5
12	100	1	0	1	0	1	0	29	29	30	96.7			96.7		
LC_DCDS		2	22	5	0	27	0	3	3	30	10.0			10.0		
+ 20 µg/L Cu		3	0	2	1	3	1	26	27	30	90.0	Mean	SD	86.7	Mean	SD
		4	1	0	0	1	0	29	29	30	96.7	73.3	42.3	96.7	72.5	41.9
13	100	1	1	1	0	2	0	27	27	29	93.1			93.1		
LC_LC3		2	23	7	0	30	0	0	0	30	0.0			0.0		
+ 20 µg/L Cu		3	0	1	3	4	1	26	27	31	87.1	Mean	SD	83.9	Mean	SD
		4	0	1	2	3	2	25	27	30	90.0	67.6	45.1	83.3	65.1	43.6
14	100	1	2	1	1	4	0	28	28	32	87.5			87.5		
LC_LC5		2	28	2	0	30	0	0	0	30	0.0			0.0		
+ 20 µg/L Cu		3	2	3	2	7	0	22	22	29	75.9	Mean	SD	75.9	Mean	SD
		4	1	5	3	9	0	20	20	29	69.0	58.1	39.5	69.0	58.1	39.5
15	100	1	0	2	0	2	1	27	28	30	93.3			90.0		
LC_LCDSSLCC		2	28	1	1	30	0	0	0	30	0.0			0.0		
+ 20 µg/L Cu		3	1	1	0	2	0	29	29	31	93.5	Mean	SD	93.5	Mean	SD
		4	0	3	0	3	0	27	27	30	90.0	69.2	46.2	90.0	68.4	45.6
16	100	1	0	1	2	3	3	24	27	30	90.0			80.0		
FR_FR4		2	24	4	0	28	0	2	2	30	6.7			6.7		
+ 20 µg/L Cu		3	0	0	4	4	0	25	25	29	86.2	Mean	SD	86.2	Mean	SD
		4	2	1	3	6	1	23	24	30	80.0	65.7	39.6	76.7	62.4	37.4
17	100	1	1	0	0	1	0	28	28	29	96.6			96.6		
FR_FRRD		2	29	2	0	31	0	0	0	31	0.0			0.0		
+ 20 µg/L Cu		3	2	6	1	9	1	20	21	30	70.0	Mean	SD	66.7	Mean	SD
		4	0	1	3	4	2	25	27	31	87.1	63.4	43.7	80.6	61.0	42.4
18	100	1	0	2	1	3	0	27	27	30	90.0			90.0		
FR_FR2		2	28	1	1	30	0	0	0	30	0.0			0.0		
+ 20 µg/L Cu		3	2	2	2	6	0	24	24	30	80.0	Mean	SD	80.0	Mean	SD
		4	0	1	1	2	0	27	27	29	93.1	65.8	44.2	93.1	65.8	44.2
19	100	1	0	0	2	2	0	27	27	29	93.1			93.1		
FR_MULTIPLATE		2	26	4	0	30	0	0	0	30	0.0			0.0		
+ 20 µg/L Cu		3	1	2	2	5	2	22	24	29	82.8	Mean	SD	75.9	Mean	SD
		4	1	5	2	8	2	21	23	31	74.2	62.5	42.4	67.7	59.2	40.8

JCL
Aug. 23/21

Embryo-Alevin Toxicity Test
Daily Mortality

Client: Teck
Sample ID: (various)
Work Order #: 210963

Start Date & Time: May 19, 2021 @ 1735h
Stop Date & Time: June 18, 2021 @ 0805h
Test Species: *Oncorhynchus mykiss*

Concentration	Rep	Day of Test - No. of Mortalities												Total Dead Eggs/Embryos/ Alevins
		1	2	3	4	5	6	7	8	9	10	11	12	
Dechlor	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Control	2	↓	↓	↓	↓	10	6	3	4	4	↓	2	1	30
	3	↓	↓	↓	↓	0	0	0	0	0	↓	0	0	0
	4	↓	↓	↓	↓	↓	↓	↓	0	↓	↓	↓	↓	0
Dechlor	1	↓	↓	↓	↓	↓	↓	↓	1	↓	↓	↓	↓	1
+ 20 mg/L Cu	2	↓	↓	↓	↓	10	4	3	3	1	↓	↓	2	23
	3	↓	↓	↓	↓	0	0	0	0	2	↓	↓	0	2
	4	↓	↓	↓	↓	↓	↓	↓	↓	0	↓	2	↓	2
FR-UFR1	1	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	0	↓	0
+ 20 mg/L Cu	2	↓	↓	↓	↓	14	6	2	4	↓	↓	1	2	29
	3	↓	↓	↓	↓	1	0	0	0	↓	↓	0	0	1
	4	↓	↓	↓	↓	0	↓	↓	↓	↓	↓	1	↓	1
GH-ER2	1	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	0	↓	0
+ 20 mg/L Cu	2	↓	↓	↓	↓	10	5	5	3	4	↓	↓	↓	27
	3	↓	↓	↓	↓	0	0	0	0	0	↓	1	↓	1
	4	↓	↓	↓	↓	↓	↓	0	0	↓	↓	0	↓	0
CM-MC1	1	↓	↓	↓	↓	↓	↓	1	1	↓	↓	0	↓	~~1~~ 2
+ 20 mg/L Cu	2	↓	↓	↓	↓	9	8	2	6	1	↓	2	↓	28
	3	↓	↓	↓	↓	0	0	0	0	0	↓	0	↓	0
	4	↓	↓	↓	↓	↓	↓	0	↓	↓	↓	↓	↓	0
LC-SLC	1	↓	↓	↓	↓	↓	↓	1	↓	↓	↓	↓	↓	1
+ 20 mg/L Cu	2	↓	↓	↓	↓	12	6	5	5	↓	↓	↓	↓	28
	3	↓	↓	↓	↓	1	0	0	0	↓	↓	↓	↓	1
	4	↓	↓	↓	↓	0	↓	↓	↓	↓	↓	↓	↓	0
FR-FRABCH	1	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	0
+ 20 mg/L Cu	2	↓	↓	↓	↓	10	3	6	3	2	↓	↓	2	26
	3	↓	↓	↓	↓	0	0	0	0	0	↓	1	0	1
	4	↓	↓	↓	↓	↓	1	↓	0	↓	↓	0	↓	1
FR-FRCP1	1	↓	↓	↓	↓	↓	0	↓	1	↓	↓	↓	↓	1
+ 20 mg/L Cu	2	↓	↓	↓	↓	8	4	1	7	2	↓	2	↓	24
	3	↓	↓	↓	↓	0	0	0	0	0	↓	0	↓	0
	4	↓	↓	↓	↓	↓	0	0	0	0	↓	↓	↓	0
Tech Initials		MW	MW	MC	AK	PM	MW	MW	MW	MW	MC	PM	MW	MW

Comments:

Reviewed by: JCW **Date reviewed:** Aug. 18/21

Embryo-Alevin Toxicity Test
Daily Mortality

Client: Teck
Sample ID: (various)
Work Order #: 210963

Start Date & Time: May 19, 2021 @ 1735h
Stop Date & Time: June 18 2021 @ 0805h
Test Species: *Oncorhynchus mykiss*

Concentration	Rep	Day of Test - No. of Mortalities												Total Dead Eggs/Embryos/ Alevins
		1	2	3	4	5	6	7	8	9	10	11	12	
GH-FR1	1	0	0	0	0	0	0	0	0	1	0	0	0	1
+ 20 mg/L Cu	2	↓	↓	↓	↓	13	7	4	0	0	↓	4	↓	28
	3	↓	↓	↓	↓	0	0	0	1	↓	↓	0	↓	1
	4	↓	↓	↓	↓	↓	↓	↓	0	↓	↓	↓	1	0
GH_ERC	1	↓	↓	↓	↓	1	↓	↓	0	↓	↓	↓	1	2
+ 20 mg/L Cu	2	↓	↓	↓	↓	14	5	2	1	4	↓	↓	0	26
	3	↓	↓	↓	↓	0	0	0	0	0	↓	2	↓	2
	4	↓	↓	↓	↓	↓	↓	0	↓	↓	↓	↓	↓	1
CM_MC2	1	↓	↓	↓	↓	↓	↓	1	↓	↓	↓	0	↓	1
+ 20 mg/L Cu	2	↓	↓	↓	↓	~~11~~ 9	9	3	4	3	↓	~~11~~ 12	↓	30
	3	↓	↓	↓	↓	1	0	0	0	0	↓	1	↓	2
	4	↓	↓	↓	↓	0	↓	↓	↓	↓	↓	2	↓	2
EV_MC2	1	↓	↓	↓	↓	0	↓	↓	↓	↓	↓	0	↓	0
+ 20 mg/L Cu	2	↓	↓	↓	↓	15	1	6	4	2	2	———	———	30
	3	↓	↓	↓	↓	1	0	0	1	0	0	1	0	3
	4	↓	↓	↓	↓	0	↓	↓	0	↓	↓	0	↓	0
EV_HCl	1	↓	↓	↓	↓	~~Dead~~	↓	↓	0	↓	↓	0	↓	0
+ 20 mg/L Cu	2	↓	↓	↓	↓	~~Dead~~ 10	7	5	2	↓	↓	1	2	27
	3	↓	↓	↓	↓	~~Dead~~ 0	0	0	0	↓	↓	0	0	0
	4	↓	↓	↓	↓	0	↓	↓	↓	↓	↓	↓	↓	0
LC_DCDS	1	↓	↓	↓	↓	~~20~~	↓	↓	↓	↓	↓	↓	↓	0
+ 20 mg/L Cu	2	↓	↓	↓	↓	~~Dead~~ ~~23~~	1	5	4	1	↓	1	↓	22
	3	↓	↓	↓	↓	↓	0	0	0	0	0	0	↓	0
	4	↓	↓	↓	↓	↓	0	↓	↓	↓	↓	1	↓	1
LC_LC3	1	↓	↓	↓	↓	↓	1	↓	↓	↓	↓	0	↓	1
+ 20 mg/L Cu	2	↓	↓	↓	↓	11	3	4	4	↓	↓	↓	1	23
	3	↓	↓	↓	↓	0	0	0	0	↓	↓	↓	0	0
	4	↓	↓	↓	↓	↓	0	0	↓	↓	↓	↓	↓	0
LC_LC5	1	↓	↓	↓	↓	↓	1	1	↓	↓	↓	↓	↓	2
+ 20 mg/L Cu	2	↓	↓	↓	↓	~~18~~	9	5	3	1	1	1	↓	28
	3	↓	↓	↓	↓	1	0	1	0	0	0	0	↓	2
	4	↓	↓	↓	↓	0	0	0	0	1	0	↓	↓	1
Tech Initials		MM	MM	TMC	AM	AM	MM	MM	MM	MM	TMC	AM	MM	MM

Comments: (1) D

Reviewed by: [signature] **Date reviewed:** Aug. 13/21

Embryo-Alevin Toxicity Test
Daily Mortality

Client: Teck
Sample ID: (Various)
Work Order #: 210963

Start Date & Time: May 19 2021 @ 1735h
Stop Date & Time: June 18, 2021 @ 0805h
Test Species: *Oncorhynchus mykiss*

~~Concentration~~ Sample ID	Rep	Day of Test - No. of Mortalities												Total Dead Eggs/Embryos/ Alevins
		1	2	3	4	5	6	7	8	9	10	11	12	
LC-LCDSSLCC	1	0	0	0	0	0	0	0	0	0	0	0	0	0
+20 mg/L Cu	2	↓	↓	↓	↓	13	2	4	1	1	↓	3	4	28
	3	↓	↓	↓	↓	0	0	1	0	0	↓	0	0	1
	4	↓	↓	↓	↓	↓	↓	0	↓	↓	↓	↓	↓	0
FR-FR4	1	↓	↓	↓	↓	↓	↓	0	↓	↓	↓	↓	↓	0
+20 mg/L Cu	2	↓	↓	↓	↓	14	2	6	↓	1	↓	1	↓	24
	3	↓	↓	↓	↓	0	0	0	↓	0	↓	0	↓	0
	4	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	2	↓	2
FR-FRRD	1	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	1	↓	1
+20 mg/L Cu	2	↓	↓	↓	↓	13	7	4	2	1	↓	0	2	29
	3	↓	↓	↓	↓	0	0	~~2~~ 2	0	0	↓	↓	0	2
	4	↓	↓	↓	↓	↓	↓	0	↓	↓	↓	↓	↓	0
FR-FR2	1	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	0
+20 mg/L Cu	2	↓	↓	↓	↓	17	3	↓	4	1	↓	1	2	28
	3	↓	↓	↓	↓	0	0	1	0	0	1	0	0	2
	4	↓	↓	↓	↓	↓	↓	0	↓	↓	0	↓	↓	0
FR_MULTIPLATE	1	↓	↓	↓	↓	↓	↓	0	↓	↓	↓	↓	↓	0
+20 mg/L Cu	2	↓	↓	↓	↓	15	2	2	3	1	↓	~~13~~ 3	↓	26
	3	↓	↓	↓	↓	0	1	0	0	0	↓	0	↓	1
	4	↓	↓	↓	↓	↓	0	0	0	0	1	↓	↓	1
	1													
	2													
	3													
	4													
	1													
	2													
	3													
	4													
	1													
	2													
	3													
	4													
Tech Initials														

Comments:

Reviewed by: JCh **Date reviewed:** Aug. 13/21

B3419

Embryo-Alevin Toxicity Test
Daily Mortality

Client: Teck
Sample ID: (various)
Work Order #: 210963

Start Date & Time: May 19, 2021 @ 1735h
Stop Date & Time: June 18, 2021 @ 0805h
Test Species: *Oncorhynchus mykiss*

Concentration	Rep	Day of Test - No. of Mortalities												Total Dead Eggs/Embryos/ Alevins
		13	14 ①	15	16	17	18	19	20	21	22	23	24	
Rechlor Control	1	0	0	0	0	0	0	0	0	0	0	0 ②	0 ③	0
	2	—	—	—	—	—	—	—	—	—	—	—	—	—
	3	0	0	0	0	0	0	0	0	0	0 ②	0 ③	0	0
	4	↓	↓	↓	↓	↓	↓	↓	↓	↓	0 ②	0 ③	↓	0
Rechlor + 20 ug/L Cu	1	↓	↓	↓	↓	↓	↓	↓	↓	↓	1 ②	2 ③	↓	3
	2	1	1	↓	1	1	1	1	↓	↓	0	0 ②	③	5
	3	↓	0	↓	0	0	0	0	②	2	0 ③	1	↓	3
	4	↓	↓	↓	↓	0	↓	↓	↓ ②	1	4 ③	3	↓	8
FR-UFR1 + 20 ug/L Cu	1	↓	↓	↓	↓	0	↓	↓	0	0 ②	0	0	↓ ③	0
	2	↓	↓	1	—	—	—	—	—	—	—	—	—	1
	3	↓	↓	0	0	0	0	0	0	0 ②	1 ③	0	Fm 1	2
	4	↓	↓	↓	↓	↓	↓	↓	↓	↓ ②	0 ③	↓	0	0
GH-ER2 + 20 ug/L Cu	1	↓	↓	↓	↓	↓	↓	↓	↓	↓	1 ②	↓	0 ③	1
	2	1	↓	↓	↓	1	↓	↓	↓	↓	1	—	—	3
	3	0	↓	↓	↓	0	↓	↓	↓	1 ②	0 ③	0	0	1
	4	↓	↓	↓	↓	1	↓	↓	↓	0	②	1	③	1
CM-MC1 + 20 ug/L Cu	1	↓	↓	↓	↓	0	↓	↓	↓	↓	Fm	2 ③	↓	0
	2	↓	↓	↓	↓	1	↓	↓	↓	↓	↓	3	↓	1
	3	↓	↓	↓	↓	0	↓	↓	↓	↓	2	↓	↓	0
	4	↓	↓	↓	↓	1	↓	↓	②	↓	3	↓	↓	0
LC-SLC + 20 ug/L Cu	1	↓	↓	↓	↓	↓	↓	↓	↓	↓ ②	↓	↓ ③	↓	0
	2	↓	↓	↓	↓	↓	↓	↓	↓	1	↓	1	—	2
	3	↓	↓	↓	↓	↓	↓	↓	②	0	1	1 ③	0	2
	4	↓	↓	↓	↓	↓	↓	↓	②	0 ③	0	0	↓	0
FR-FRABCH +20 ug/L Cu	1	↓	↓	↓	↓	↓	↓	↓	↓	1	1 ②	↓	③	1
	2	↓	1	↓	↓	↓	1	↓	↓	0	↓	↓	↓	2
	3	↓	0	↓	↓	↓	0	↓	↓	1 ②	③	↓	1	1
	4	↓	↓	↓	↓	↓	↓	↓	1	↓	② ③	↓	0	1
FR-FRCP1 +20 ug/L Cu	1	1	↓	↓	↓	↓	↓	↓	0	↓	②	③	0	1
	2	0	↓	↓	1	1	1	↓	↓	↓	↓	②	1 ③	4
	3	↓	↓	↓	0	0	0	↓	②	↓	③	↓	0	0
	4	↓	↓	↓	0	0	↓	↓	↓	1	②	↓ ③	1	2
Tech Initials		MW	MW	MW	MW	JMC	MW	MW	MW	MW	MW	MW	JMC	MW

Comments: ① at eyed stage ② starting to hatch ③ >50% hatched

Reviewed by: JCh **Date reviewed:** Aug. 13/21

Embryo-Alevin Toxicity Test
Daily Mortality

Client: Teck
Sample ID: (various)
Work Order #: 210963

Start Date & Time: May 19, 2021 @ 1735h
Stop Date & Time: June 18, 2021 @ 0805h
Test Species: *Oncorhynchus mykiss*

Concentration	Rep	Day of Test - No. of Mortalities												Total Dead Eggs/Embryos/ Alevins
		13	14 ①	15	16	17	18	19	20	21	22	23	24	
GH_FR1	1	0	0	0	0	1	0	0	0	0 ②	0 ③	0	1	2
+20 mg/L CW	2	|	|	|	↓	0	|	|	|	0	0 ②	0 ③	0	0
	3	|	|	|	↓	|	|	|	|	1 ②	1 ③	4	1	7
	4	|	|	|	1	|	|	|	|	0 ②	0 ③	0	1	2
GH_ERC	1	|	|	↓	0	|	↓	↓	|	|	| ②	↓ ③	0	0	0
+20 mg/L CW	2	|	|	1	|	|	1	|	|	|	|	↓	|	3
	3	|	|	0	|	|	0	0	②	|	③	1	|	1
	4	|	|	|	|	|	0	|	|	②	③	0	↓	0
CM_MC2	1	|	|	|	|	↓	0	↓	↓	↓ ②	↓ ③	0	↓	0
+20 mg/L CW	2	|	|	|	|	1	—	—	—	—	—	—	—	1
	3	|	|	|	|	0	0	0	0	2 ②	0 ③	0	1	3
	4	|	|	|	|	↓	↓	↓	↓	0 ②	↓ ③	↓	0	0
EV_MC2	1	↓	↓	↓	↓	↓	↓	↓	↓	0	↓ ② ③	↓	0	0
+20 mg/L CW	2	—	—	—	—	—	—	—	—	—	—	—	—	—
	3	0	1	0	0	0	0	0	0	0 ②	0 ③	1	0	2
	4	|	0	|	1	|	1	|	|	| ②	③	0	|	2
EV_HC1	1	|	0	|	0	|	0	|	|	|	② ③	|	|	0
+20 mg/L CW	2	|	1	|	1	|	|	|	|	|	↓	|	|	2
	3	|	0	|	0	|	|	| ②	|	1 ③	|	|	1
	4	|	|	|	|	|	|	↓	②	0 ③	|	|	1 + 0
LC_DCDS	1	↓	↓	|	|	|	|	|	1	②	③	↓	|	1
+20 mg/L CW	2	|	|	|	|	|	|	|	0	↓ ②	|	3 ③	|	5
	3	0	0	|	|	|	|	|	|	1 ②	③	1	|	2
	4	|	0	|	|	|	|	|	|	0 ②	③	0	|	0
LC_LC3	1	|	1	↓	|	↓	↓	↓	|	0	↓ ②	0 ③	↓	1	1
+20 mg/L CW	2	|	0	1	|	1	2	1	|	1	1	—	—	—	7
	3	|	|	0	|	0	0	0	|	0 ②	0 ③	1	0	1
	4	|	|	|	|	|	1	|	|	② ③	↓	0	0	1
LC_LC5	1	↓	↓	↓	↓	↓	0	↓	↓	↓ ②	↓ ③	0	1	1
+20 mg/L CW	2	1	1	—	—	—	—	—	—	—	—	—	—	2
	3	2	0	0	0	0	0	0	0	0 ②	0 ③	1	0	3
	4	1	0	0	0	0	1	0	1	1 ② ③	2	0	0	5
Tech Initials		MW	MW	MW	MW	JMC	MW	MW	MW	MW	MW	MW	JMC	MW

Comments: ① at eyed stage ② starting to hatch ③ > 50% hatched.

Reviewed by: [signature] **Date reviewed:** Aug. 13/21

Embryo-Alevin Toxicity Test
Daily Mortality

Client: Teck
Sample ID: (various)
Work Order #: 210963

Start Date & Time: May 19, 2021 @ 1735h
Stop Date & Time: June 18, 2021 @ 0805h
Test Species: *Oncorhynchus mykiss*

Concentration	Rep	Day of Test - No. of Mortalities												Total Dead Eggs/Embryos/ Alevins
		13	14 ①	15	16	17	18	19	20	21	22	23	24	
LC-LCDSSLCC	1	1	0	0	0	0	0	0	0	0	1 ③ ③	0	0	= 2
+20 mg/L Cu	2	0	1	↓	↓	↓	↓	↓	↓	↓ ②	0	↓	0	= 1
	3	↓	0	↓	↓	↓	↓	↓	↓	↓ ②	0 ③	↓	1	= 1
	4	↓	↓	↓	↓	↓	↓	↓	↓	1 ③ ③	1	1	0	= 3
FR_FR4	1	↓	↓	↓	↓	↓	↓	↓	↓ ②	1	0 ③	0	↓	1
+20 mg/L Cu	2	↓	↓	↓	↓	1	1	1	1	0	1 ②	↓ ③	↓	4
	3	↓	↓	↓	↓	0	0	0	0 ③	↓	↓ ③	↓	↓	0
	4	1	↓	↓	↓	↓	↓	↓	0	↓ ②	↓ ③	↓	↓	1
FR_FRRD	1	0	↓	↓	↓	↓	↓	↓	1	↓ ②	↓ ③	↓	↓	0
+20 mg/L Cu	2	0	2	—	—	—	—	—	—	—	—	—	—	2
	3	1	0	0	0	0	0	0	0	1 ②	2 ③	2	0	6
	4	0 ~~0~~ 1	↓	↓	↓	↓	↓	↓	↓	1 ②	0 ③	0	↓	1
FR_FR2	1	1	↓	↓	↓	↓	↓	↓	↓	0 ②	1 ③	1	↓	2
+20 mg/L Cu	2	1	↓	↓	↓	↓	↓	↓	↓	↓	↓	0	↓	1
	3	0	↓	↓	↓	↓	↓	↓	↓ ②	↓ ③	1	1	↓	2
	4	↓	↓	↓	↓	↓	↓	↓	↓ ②	↓ ③	1	0	↓	1
FR_MULTIPLATE	1	↓	↓	↓	↓	↓	↓	↓	↓	↓	0 ③ ③	0	↓	0
+20 mg/L Cu	2	↓	2	↓	1	↓	↓	↓	1	—	—	—	—	4
	3	1	0	↓	0	↓	↓	↓	0	0 ② ③	0	1	0	2
	4	0	0	↓	1	↓	~~↓~~	3	0 ②	0 ③	1	0	0	5
	1													
	2													
	3													
	4													
	1													
	2													
	3													
	4													
	1													
	2													
	3													
	4													
Tech Initials														

Comments: ① at eyed stage ② starting to hatch ③ >50% hatched

Reviewed by: _____ **Date reviewed:** Aug. 13/21

Embryo-Alevin Toxicity Test
Daily Mortality

Client: Teck
Sample ID: (various)
Work Order #: 210963

Start Date & Time: May 19, 2021 @ 1735h
Stop Date & Time: June 18, 2021 @ 0805h
Test Species: *Oncorhynchus mykiss*

Concentration	Rep	Day of Test - No. of Mortalities							Total Dead Embryos/ Alevins (Test)	Total Undeveloped/ Unhatched (Abnormal Alevins)	Total No. Alevins - Normal	Total Exposed Eggs
		25	26	27	28	29	30	Total morts Day 25-30				
Dechlor Control	1	0	0	0	0	0	0	0	0	2	28	30
	2	—	—	—	—	—	—	—	30	0	0	30
	3	1	0	2	0	3	0	6	6	1	23	30
	4	0	↓	0	1	0	↓	1	1	3	27	31
Dechlor +20 ug/L Cu	1	↓	↓	↓	0	↓	↓	0	4	1	25	30
	2	1	↓	↓	↓	↓	↓	1	29	0	1	30
	3	0	1	1	↓	↓	↓	2	7	2	21	30
	4	↓	0	1	↓	↓	↓	1	11	1	18	30
FR_UFR1 +20 ug/L Cu	1	↓	0	0	↓	↓	↓	0	0	1	29	30
	2	—	—	—	—	—	—	—	30	0	0	30
	3	0	0	0	0	0	0	0	3	0	26	29
	4	↓	↓	↓	↓	0	0	0	1	1 + 0	29	~~31~~ 30
GH_ER2 +20 ug/L Cu	1	1	↓	↓	↓	1	1	3	4	0	25	29
	2	—	—	—	—	—	—	—	30	0	0	30
	3	0	0	0	0	0	0	0	2	3	25	30
	4	↓	↓	↓	↓	↓	0	0	1	5	23	~~30~~ 28
CH_MCI +20 ug/L Cu	1	↓	↓	↓	↓	↓	1	1	1 + 3	0	28	~~29~~ 31
	2	↓	↓	↓	↓	↓	0	0	29	0	1	30
	3	4	↓	↓	↓	↓	↓	4	4	1	25	30
	4	0	↓	↓	↓	↓	↓	0	0	2	28	30
LC_SLC +20 ug/L Cu	1	0	↓	↓	↓	↓	↓	0	1	0	29	30
	2	—	—	—	—	—	—	—	30	0	0	30
	3	2	0	2	0	0	0	4	7	0	23	30
	4	~~10~~	1	0	1	1	1	3	3	2	25	30
FR_FRABCH +20 ug/L Cu	1	0	1	0	↓	0	↓	1	2	0	27	29
	2	1	0	1	—	—	—	2	30	0	0	30
	3	0	1	1	1	0	0	3	5	2	24	31
	4	↓	1	0	0	↓	0	1	3	2	25	30
FR_FRCP1 +20 ug/L Cu	1	↓	0	↓	0	↓	1	1	3	1	26	30
	2	↓	↓	↓	1	↓	0	1	29	0	1	30
	3	1	↓	↓	0	1	↓	2	2	0	28	30
	4	0	1	↓	0	0	↓	1	3	1	26	30
Tech Initials		MM	MM	MM	MM	MM	MM	MM	MM	MM	MM	MM

Comments: Sample 21B was excluded in the final statistical analyses due to potential poor egg quality.

Reviewed by: JCh **Date reviewed:** Aug-18/21

Embryo-Alevin Toxicity Test
Daily Mortality

Client: Teck
Sample ID: (various)
Work Order #: 210963

Start Date & Time: May 19, 2021 @ 1735h
Stop Date & Time: Jun 18, 2021 @ 0805h
Test Species: *Oncorhynchus mykiss*

Concentration	Rep	Day of Test - No. of Mortalities							Total Dead Embryos/ Alevins (Test)	Total Undeveloped/ Unhatched	Total No. Alevins Normal (Abnormal Alevins)	Total Exposed Eggs
		25	26	27	28	29	30	Total Mort's Day 25-30				
GH-FR1	1	0	0	0	0	0	0	0	3	1	25	29
+20 ug/L Cu	2	↓	0	0	|	|	|	0	28	0	2	30
	3	1	1	1	|	|	|	3	11	1	20	32
	4	0	1	0	|	|	|	1	3	0	27	30
GH-ERC	1	|	0	0	↓	↓	↓	0	2	1	27	30
+20 ug/L Cu	2	↓	1	—	—	—	—	=1	30	0	0	30
	3	2	0	1	0	0	0	3	6	0	24	30
	4	0	↓	0	↓	↓	↓	0	1	=0	29	30
CM-MC2	1	↓	↓	0	↓	↓	↓	0	1	0	29	30
+20 ug/L Cu	2	—	—	—	—	—	—	-	31	0	0	31
	3	0	0	0	0	0	0	0	5	0	25	30
	4	1	↓	↓	↓	↓	↓	1	3	0	26	29
EV-MC2	1	0	↓	↓	↓	↓	↓	0	0	1	29	30
+20 ug/L Cu	2	—	—	—	—	—	—	-	30	0	0	30
	3	0	0	0	0	=0	0	0	5	3	23	31
	4	|	↓	↓	↓	0	|	0	2	4	25	31
EV-HC1	1	|	↓	↓	↓	0	↓	0	0	2	27	29
+20 ug/L Cu	2	↓	1	—	—	—	—	1	30	0	0	30
	3	1	0	0	1	1	2	5	6	0	23	29
	4	0	|	|	0	0	0	0	0	1	29	30
LC-DCDS	1	|	|	|	|	|	|	0	1	0	29	30
+20 ug/L Cu	2	↓	|	|	|	|	|	0	27	0	3	30
	3	1	|	|	|	|	|	1	3	1	26	30
	4	0	|	|	↓	|	|	0	1	0	29	30
LC-LC3	1	↓	↓	↓	↓	↓	↓	0	2	0	27	29
+20 ug/L Cu	2	—	—	—	—	—	—	-	30	0	0	30
	3	1	1	1	0	0	0	3	4	1	26	31
	4	0	1	0	1	↓	↓	2	3	2	25	30
LC-LC5	1	↓	1	0	0	↓	↓	1	4	0	28	32
+20 ug/L Cu	2	—	—	—	—	—	—	-	30	0	0	30
	3	0	2	0	0	0	0	2	7	0	22	29
	4	↓	1	1	0	1	0	3	9	0	20	29
Tech Initials		MH	MH	MH	MH	MH	MH	MH	MH	MH	MH	MH

Comments: Sample 2/B was excluded in the final statistical analyses due to possible poor egg quality

Reviewed by: [signature]
Date reviewed: Aug. 13/21

P3 9/9

Embryo-Alevin Toxicity Test
Daily Mortality

Client: Teck
Sample ID: (various)
Work Order #: 210963

Start Date & Time: May 19, 2021 @ 1735h
Stop Date & Time: June 18, 2021 @ 0805h
Test Species: *Oncorhynchus mykiss*

Concentration	Rep	Day of Test - No. of Mortalities: 25	26	27	28	29	30	Total morts - Day 25-30	Total Dead Embryos/ Alevins (Test)	Total Undeveloped/ Unhatched (Abnormal Alevins)	Total No. Alevins - Normal	Total Exposed Eggs
LC_LCDSSLCC	1	0	0	0	0	0	0	0	2	1	27	30
+ 20 µg/L Cu	2			1				1	30	0	0	30
	3			0	0	0	0	0	2	0	29	31
	4							0	3	0	27	30
FR_FR4	1	1	1					2	3	3	24	30
+ 20 µg/L Cu	2	0	0					0	28	0	2	30
	3			1	2		1	4	4	0	25	29
	4			0	0		3	3	6	1	23	30
FR_FRRD	1			0	0		0	0	1	0	28	29
+ 20 µg/L Cu	2							–	31	0	0	31
	3	0	0	1	0	0	0	1	9	1	20	30
	4		1	1			1	3	4	2	25	31
FR_FR2	1		0	1				1	3	0	27	30
+ 20 µg/L Cu	2	1						1	30	0	0	30
	3	0	1	1	0	0	0	2	6	0	24	30
	4		1	0				1	2	0	27	29
FR_MULTIPLATE	1		0	2				2	2	0	27	29
+ 20 µg/L Cu	2							–	30	0	0	30
	3	1	0	0	1	0	0	2	5	2	22	29
	4	0	1	0	1	0	0	2	8	2	21	31
	1											
	2											
	3											
	4											
	1											
	2											
	3											
	4											
	1											
	2											
	3											
	4											
Tech Initials		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Comments: Sample 2/B was excluded in the final statistical analyses due to potential poor egg quality.

Reviewed by: [signature]

Date reviewed: Aug. 13/21

Embryo-Alevin Toxicity Test
Daily Microbial Observations

Client: Teck
Sample ID: (various)
Work Order #: 210963

Start Date & Time: May 19, 2021 @ 1735h
Stop Date & Time: June 18, 2021 @ 0805h
Test Species: *Oncorhynchus mykiss*

~~Concentration~~ Sample ID	Rep	Day of Test													
		1		2		3		4		5		6		7	
		Live	Dead	Live	Dead	Live	Dead	Live	Dead	Live	Dead	Live	Dead	Live	Dead
Dechlor	1	0	0	0	0	0	0	0	0	0	0	?	0	0	0
Control	2	↓	↓	↓	↓	↓	↓	↓	0	↓	↓	↓	↓	↓	↓
	3	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
	4	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
Dechlor	1	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
+20 µg/L Cu	2	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
	3	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
	4	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
FR_VTR1	1	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
+20 µg/L Cu	2	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
	3	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
	4	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
GH-ER2	1	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
+20 µg/L Cu	2	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
	3	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
	4	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
CM_MC1	1	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
+20 µg/L Cu	2	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
	3	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
	4	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
LI_SLC	1	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
+20 µg/L Cu	2	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
	3	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
	4	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
FR_FRABCH	1	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	1
+20 µg/L Cu	2	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	1①
	3	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	0
	4	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
FR_FRCP1	1	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
+20 µg/L Cu	2	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
	3	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
	4	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
Tech Initials		MM	MM	MM	MM	EMC	EMC	PVP	PVP	PVP	PVP	MM	MM	MM	MM

Comments: ① fungal growth appears typical

Reviewed by: [signature] **Date reviewed:** Aug. 18/21

Embryo-Alevin Toxicity Test
Daily Microbial Observations

Client: Teck
Sample ID: (Various)
Work Order #: 210963

Start Date & Time: May 19, 2021 @ 1735h
Stop Date & Time: June 18, 2021 @ 0805h
Test Species: *Oncorhynchus mykiss*

~~Concentration~~ Sample ID	Rep	Day of Test													
		1		2		3		4		5		6		7	
		Live	Dead	Live	Dead	Live	Dead	Live	Dead	Live	Dead	Live	Dead	Live	Dead
GH-FR1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+20 µg/L Cu	2	|	|	|	|	|	|	|	|	|	|	|	|	|	|
	3	|	|	|	|	|	|	|	|	|	|	|	|	|
	4	|	|	|	|	|	|	|	|	|	|	|	|	|	|
GH-ERC	1	|	|	|	|	|	|	|	|	|	|	|	|	|	|
+20 µg/L Cu	2	|	|	|	|	|	|	|	|	|	|	|	|	|	|
	3	|	|	|	|	|	|	|	|	|	|	|	|	|	|
	4	|	|	|	|	|	|	|	|	|	|	|	|	|	|
CM-MC2	1	|	|	|	|	|	|	|	|	|	|	|	|	|	|
+20 µg/L Cu	2	|	|	|	|	|	|	|	|	|	|	|	|	|	|
	3	|	|	|	|	|	|	|	|	|	|	|	|	|	|
	4	|	|	|	|	|	|	|	|	|	|	|	|	|	|
EV-MC2	1	|	|	|	|	|	|	|	|	|	|	|	|	|	|
+20 µg/L Cu	2	|	|	|	|	|	|	|	|	|	|	|	|	|	|
	3	|	|	|	|	|	|	|	|	|	|	|	|	|	|
	4	|	|	|	|	|	|	|	|	|	|	|	|	|	|
EV-HC1	1	|	|	|	|	|	|	|	|	|	|	|	|	|	|
+20 µg/L Cu	2	|	|	|	|	|	|	|	|	|	|	|	|	|	|
	3	|	|	|	|	|	|	|	|	|	|	|	|	|	|
	4	|	|	|	|	|	|	|	|	|	|	|	|	|	|
LC-DCDS	1	|	|	|	|	|	|	|	|	|	|	|	|	|	|
+20 µg/L Cu	2	|	|	|	|	|	|	|	|	|	|	|	|	|	|
	3	|	|	|	|	|	|	|	|	|	|	|	|	|	|
	4	|	|	|	|	|	|	|	|	|	|	|	|	|	|
LC-LC3	1	|	|	|	|	|	|	|	|	|	|	|	|	|	|
+20 µg/L Cu	2	|	|	|	|	|	|	|	|	|	|	|	|	|	|
	3	|	|	|	|	|	|	|	|	|	|	|	|	|	|
	4	|	|	|	|	|	|	|	|	|	|	|	|	|	|
LC-LC5	1	|	|	|	|	|	|	|	|	|	|	|	|	|	|
+20 µg/L Cu	2	|	|	|	|	|	|	|	|	|	|	|	|	|	|
	3	|	|	|	|	|	|	|	|	|	|	|	|	|	|
	4	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
Tech Initials		MM	MM	MM	MM	EMC	EMC	PMH	PMH	PMH	PMH	MM	MM	MM	MM

Comments:

Reviewed by: JCh **Date reviewed:** Aug. 18/21

Embryo-Alevin Toxicity Test
Daily Microbial Observations

B.3115

Client: Teck
Sample ID: (various)
Work Order #: 210963

Start Date & Time: May 19, 2021 @ 0 1735h
Stop Date & Time: June 18, 2021 @ 08 05h
Test Species: *Oncorhynchus mykiss*

~~Concentration~~ Sample ID	Rep	Day of Test													
		1		2		3		4		5		6		7	
		Live	Dead	Live	Dead	Live	Dead	Live	Dead	Live	Dead	Live	Dead	Live	Dead
LC-LCDSSLCC	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+ 20 ug/L Cu	2														
	3														
	4														
FR-FR4	1														
+ 20 ug/L Cu	2														
	3														
	4														
FR-FRRD	1														
+ 20 ug/L Cu	2												1 ①		
	3														
	4														
FR-FR2	1														
+ 20 ug/L Cu	2														
	3														
	4														
FR-MULTIPLATE	1														
+ 20 ug/L Cu	2														
	3														
	4														
	1														
	2														
	3														
	4														
	1														
	2														
	3														
	4														
	1														
	2														
	3														
	4														
Tech Initials		UM	UM	UM	UM	IMC	IMC	PYR	PYN	PYN	PYN	UM	UM	UM	UM

Comments: ① fungal growth appears typical

Version 1.1 Issued May 25, 2021

Reviewed by: [signature]

Date reviewed: Aug-18/21

Nautilus Environmental Company Inc.

Embryo-Alevin Toxicity Test
Daily Microbial Observations

RS 4/15

Client: Teck
Sample ID: (Various)
Work Order #: 210963

Start Date & Time: May 19 2021 @ 1735h
Stop Date & Time: June 1st 2021 @ 0805h
Test Species: *Oncorhynchus mykiss*

Sample ID	Rep	Day of Test													
		8		9		10		11		12		13		14	
		Live	Dead	Live	Dead	Live	Dead	Live	Dead	Live	Dead	Live	Dead	Live	Dead
Dechlor Control	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	2	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓				
	3											0	0	0	0
	4											↓	↓	↓	↓
Dechlor + 20 ug/L Cu	1										↓				
	2										10				
	3										0				
	4										↓				
FR_UFR1 + 20 ug/L Cu	1														
	2														
	3														
	4														
GH_ER2 + 20 ug/L Cu	1														
	2														
	3														
	4														
CM_MC1 + 20 ug/L Cu	1														
	2														
	3														
	4														
LC_SLC + 20 ug/L Cu	1		↓												
	2		10												
	3		0												
	4		↓												
FR_FRABCH + 20 ug/L Cu	1														
	2														
	3														
	4														
FR_FRCP1 + 20 ug/L Cu	1		↓												
	2		10												
	3		0												
	4	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
Tech Initials		MM	MM	MM	MM	JMC	JMC	PJM	PJM	MM	MM	MM	MM	MM	MM

Comments: 0 fungal growth appears typical

Version 1.1 Issued October 6, 2015

Reviewed by: JCM **Date reviewed:** Aug-18/21

Nautilus Environmental Company Inc.

Embryo-Alevin Toxicity Test
Daily Microbial Observations

RS 5/15

Client: Teck
Sample ID: (Various)
Work Order #: 210963

Start Date & Time: May 19, 2021 @ 1735h
Stop Date & Time: June 18, 2021 @ 0805h
Test Species: *Oncorhynchus mykiss*

Sample ID	Rep	Day of Test													
		8		9		10		11		12		13		14	
		Live	Dead	Live	Dead	Live	Dead	Live	Dead	Live	Dead	Live	Dead	Live	Dead
GH_FR1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	
+20 µg/L Cu	2														
	3														
	4														
GH_ERC	1														
+20 µg/L Cu	2														
	3														
	4														
CM_MC2	1														
+20 µg/L Cu	2														
	3														
	4														
EV_MC2	1														
+20 µg/L Cu	2														
	3							0	0			0	0	0	0
	4														
EV_HC1	1														
+20 µg/L Cu	2														
	3														
	4														
LC_DCDS	1														
+20 µg/L Cu	2														
	3														
	4														
LC_LC3	1														
+20 µg/L Cu	2														
	3														
	4														
LC_LC5	1														
+20 µg/L Cu	2														
	3														
	4														
Tech Initials		[illegible]	[illegible]	[illegible]	[illegible]	JMC	JMC	PYN	PYN	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Comments:

Version 1.1 Issued October 6, 2015

Reviewed by: [signature]

Date reviewed: Aug 18/21

Embryo-Alevin Toxicity Test
Daily Microbial Observations

#36/15

Client: Teck
Sample ID: (Various)
Work Order #: 210963

Start Date & Time: May 19, 2021 @ 1735h
Stop Date & Time: Jun 18, 2021 @ 0805h
Test Species: *Oncorhynchus mykiss*

Sample ID	Rep	Day of Test													
		8		9		10		11		12		13		14	
		Live	Dead	Live	Dead	Live	Dead	Live	Dead	Live	Dead	Live	Dead	Live	Dead
LC-LCOSSLCC	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+20 ug/L Cu	2										10				
	3										0				
	4														
FR-FR4	1														
+20 ug/L Cu	2														
	3														
	4														
FR-FRRD	1														
+20 ug/L Cu	2														
	3														
	4														
FR-FR2	1														
+20 ug/L Cu	2														
	3														
	4														
FR_MULTIPLATE	1														
+20 ug/L Cu	2														
	3														
	4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	1														
	2														
	3														
	4														
	1														
	2														
	3														
	4														
	1														
	2														
	3														
	4														
Tech Initials															

Comments: ① fungal growth appears typical

Version 1.1 Issued October 6, 2015

Reviewed by: [signature] **Date reviewed:** Aug. 18/21

Embryo-Alevin Toxicity Test
Daily Microbial Observations

PB 7/15

Client: Teck
Sample ID: (Various)
Work Order #: 210963

Start Date & Time: May 19, 2021 @ 1735h
Stop Date & Time: June 18, 2021 @ 0805h
Test Species: *Oncorhynchus mykiss*

Sample ID	Rep	Day of Test													
		15		16		17		18		19		20		21	
		Live	Dead	Live	Dead	Live	Dead	Live	Dead	Live	Dead	Live	Dead	Live	Dead
Dechlor Control	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	2														
	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4														
Dechlor + 20 µg/L Cu	1														
	2														
	3														1 ①
	4														0
FR_UFR1 + 20 µg/L Cu	1														0
	2														
	3			0	0	0	0	0	0	0	0	0	0	0	0
	4														
GH_ER2 + 20 µg/L Cu	1														
	2														
	3														
	4														
CM_MC1 + 20 µg/L Cu	1														
	2														
	3														
	4														
LC_SLC + 20 µg/L Cu	1														
	2														
	3														
	4														
FR_FRABCH + 20 µg/L Cu	1														
	2														
	3														
	4														
FR_FRCP1 + 20 µg/L Cu	1														
	2														
	3														
	4														
Tech Initials		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Comments: ① fungal growth appears typical

Version 1.1 Issued October 6, 2015

Reviewed by: [signature]

Date reviewed: Aug 18/21

Embryo-Alevin Toxicity Test
Daily Microbial Observations

PS 8/15

Client: Teck
Sample ID: (various)
Work Order #: 210963

Start Date & Time: May 19, 2021 @ 1735h
Stop Date & Time: June 18, 2021 @ 0805h
Test Species: *Oncorhynchus mykiss*

Sample ID	Rep	Day of Test													
		15		16		17		18		19		20		21	
		Live	Dead	Live	Dead	Live	Dead	Live	Dead	Live	Dead	Live	Dead	Live	Dead
GH_FR1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+20 mg/L Cu	2	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
	3	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
	4	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
GH_ERL	1	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
+20 mg/L Cu	2	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
	3	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
	4	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
CM_MC2	1	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
+20 mg/L Cu	2	↓	↓	↓	↓	↓	↓	—	—	—	—	—	—	—	—
	3	↓	↓	↓	↓	↓	↓	0	0	0	0	0	0	0	10
	4	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	0
EV_MC2	1	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	0
+20 mg/L Cu	2	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
EV_HC1	1	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
+20 mg/L Cu	2	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
	3	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
	4	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
LC_DCDS	1	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
+20 mg/L Cu	2	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
	3	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	10
	4	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	0
LC_LC3	1	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
+20 mg/L Cu	2	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
	3	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
	4	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
LC_LC5	1	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
+20 mg/L Cu	2	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tech Initials		MM	MM	MM	MM	IME	IME	PMW	PMW	MM	MM	MM	MM	MM	MM

Comments: ① fungal growth appears typical

Version 1.1 Issued October 6, 2015

Reviewed by: [signature] **Date reviewed:** Aug. 18/21

Nautilus Environmental Company Inc.

Embryo-Alevin Toxicity Test
Daily Microbial Observations

P39/15

Client: Teck
Sample ID: (various)
Work Order #: 210963

Start Date & Time: May 19, 2021 @ 1735h
Stop Date & Time: June 18, 2021 @ 0805h
Test Species: *Oncorhynchus mykiss*

Sample ID	Rep	Day of Test													
		15		16		17		18		19		20		21	
		Live	Dead	Live	Dead	Live	Dead	Live	Dead	Live	Dead	Live	Dead	Live	Dead
LC-LCDSSLCC	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+ 20 µg/L Cu	2	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
	3	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
	4	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	1①
FR_FR4	1	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	0
+ 20 µg/L Cu	2	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
	3	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
	4	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
FR_FRRD	1	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
+ 20 µg/L Cu	2	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
FR_FR2	1	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
+ 20 µg/L Cu	2	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
	3	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
	4	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
FR_MULTIPLATE	1	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
+ 20 µg/L Cu	2	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	—	—
	3	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	0	0
	4	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	0	0
	1														
	2														
	3														
	4														
	1														
	2														
	3														
	4														
	1														
	2														
	3														
	4														
Tech Initials		MM	MM	MM	MM	[illegible]	[illegible]	[illegible]	[illegible]	MM	MM	MM	MM	MM	MM

Comments: ① fungal growth appears atypical

Version 1.1 Issued October 6, 2015

Reviewed by: [signature] **Date reviewed:** Aug-18/21

Embryo-Alevin Toxicity Test
Daily Microbial Observations

B10/15

Client: Teck
Sample ID: (various)
Work Order #: 210963

Start Date & Time: May 19, 2021 @ 1735h
Stop Date & Time: Jun 18, 2021 @ 0805h
Test Species: *Oncorhynchus mykiss*

Sample ID	Rep	Day of Test													
		22		23		24		25		26		27		28	
		Live	Dead	Live	Dead	Live	Dead	Live	Dead	Live	Dead	Live	Dead	Live	Dead
Dechlor control	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	2	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	3	0	0	0	0	0	0	0	0	0	1	0	0	0	0
	4	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
Dechlor + 20 µg/L Cu	1	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
	2	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
	3	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
	4	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
FR_VFR1 + 20 µg/L Cu	1	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
	2	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	3	0	0	0	0	0 (1 Jmc)	10	0	0	0	0	0	0	0	0
	4	0	0	↓	↓	0	0	↓	↓	↓	↓	↓	↓	↓	↓
GH_ER2 + 20 µg/L Cu	1	0 ~~1~~	10	↓	↓	0	0	N/O	0	↓	↓	↓	↓	↓	↓
	2	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
CM_MC1 +20 µg/L Cu	1	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
	2	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
	3	↓	↓	↓	↓	↓	↓	↓	3 (0)	↓	↓	↓	↓	↓	↓
	4	↓	↓	↓	↓	↓	↓	↓	6	↓	↓	↓	↓	↓	↓
LC_SLC +20 µg/L Cu	1	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
	2	↓	↓	↓	1	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
	3	↓	↓	↓	0	↓	↓	↓	1	↓	↓	↓	↓	↓	↓
	4	↓	↓	↓	0	↓	↓	↓	0	0 ~~1~~	1	↓	↓	↓	↓
FR_FRABCH +20 µg/L Cu	1	↓	↓	↓	↓	↓	↓	↓	↓	↓	0	↓	↓	↓	↓
	2	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
	3	↓	↓	↓	↓	10 (0 Jmc)	10	↓	↓	↓	↓	↓	10	0	0
	4	↓	↓	↓	↓	↓	0	↓	↓	↓	↓	↓	0	↓	↓
FR_FRCP1 +20 µg/L Cu	1	↓	↓	↓	↓	↓	0	↓	↓	↓	↓	↓	↓	↓	↓
	2	↓	↓	↓	↓	↓	10	↓	↓	↓	↓	↓	↓	↓	↓
	3	↓	↓	↓	↓	↓	0	↓	1	↓	↓	↓	↓	↓	↓
	4	↓	↓	↓	↓	↓	0	↓	0	↓	↓	↓	↓	↓	↓
Tech Initials		MW	MW	MW	MW	JMC	JMC	BM	BM	MW	MW	MW	MW	MW	MW

Comments: ① fungal growth appears typical
② Atypical, fuzzy fungal growth on 2 eggs, typical on the other one
③

Version 1.1 Issued October 6, 2015

Reviewed by: JCh **Date reviewed:** Aug. 18/21

Nautilus Environmental Company Inc.

Embryo-Alevin Toxicity Test
Daily Microbial Observations

m3 11/13

Client: Teck
Sample ID: (various)
Work Order #: 210963

Start Date & Time: May 19, 2021 @ 1735h
Stop Date & Time: June 19, 2021 @ 0805h
Test Species: *Oncorhynchus mykiss*

Sample ID	Rep	Day of Test													
		22		23		24		25		26		27		28	
		Live	Dead	Live	Dead	Live	Dead	Live	Dead	Live	Dead	Live	Dead	Live	Dead
GH-FR1	1	0	0	0	0	0	10	0	0	0	0	0	0	0	0
+20 mg/L Cu	2		0		0		0						0		
	3		1①		30		10						10		
	4		0		0		10						0		
GH-ERC	1						0						0		
+20 mg/L Cu	2														
	3				1①				10			0	0	0	0
	4				0				0						
CM-MC2	1				0										
+20 mg/L Cu	2														
	3	0	0	0	0	0	10		0	0	0	0	0	0	0
	4						0								
EV-MC2	1						0								
+20 mg/L Cu	2														
	3	0	0	0	10	0	0		0	0	0	0	0	0	0
	4				0										
EV-MC1	1														
+20 mg/L Cu	2								12②						
	3		1①						0			0	0	0	0
	4		0												
LC-DCDS	1														
+20 mg/L Cu	2														
	3														
	4														
LC-LC3	1														
+20 mg/L Cu	2														
	3			0	10	0	0		10	0	0	0	0	0	0
	4				0	0	0		0		10				
LC-ES	1				0	0	0								
+20 mg/L Cu	2														
	3	0	0	0	0	0	0		0	0	1①	0	0	0	0
	4	0	20①	0	0	0	0		0	0	0	0	10	0	0
Tech Initials		MM	MM	MM	MM	JMC	DMC	PM	PM	MM	MM	MM	MM	MM	MM

Comments: ① fungal growth appears typical
② Atypical, fuzzy fungal growth

Reviewed by: JCM **Date reviewed:** Aug. 18/21

Embryo-Alevin Toxicity Test
Daily Microbial Observations

AB. 12/15

Client: Teck
Sample ID: (various)
Work Order #: 210963

Start Date & Time: May 19, 2021 @ 17354
Stop Date & Time: June 18, 2021 @ 08054
Test Species: *Oncorhynchus mykiss*

Sample ID	Rep	Day of Test													
		22		23		24		25		26		27		28	
		Live	Dead	Live	Dead	Live	Dead	Live	Dead	Live	Dead	Live	Dead	Live	Dead
LC_LCDSSLCC	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+ 20 mg/L Cu	2	↓	↓	↓	↓	↓	0	↓	↓	↓	↓	↓	↓	↓	↓
	3	↓	↓	↓	↓	↓	1①	↓	↓	↓	↓	↓	↓	↓	↓
	4	↓	1①	↓	↓	↓	0	↓	↓	↓	↓	↓	↓	↓	↓
FR_FR4	1	↓	0	↓	↓	↓	↓	↓	1①	↓	1①	↓	↓	↓	↓
+ 20 mg/L Cu	2	↓	↓	↓	↓	↓	↓	↓	0	↓	0	↓	↓	↓	↓
	3	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
	4	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
FR_FRRD	1	↓	↓	↓	↓	↓	↓			↓	↓	↓	↓	↓	↓
+ 20 mg/L Cu	2	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	3	0	20	0	1①	0	0	0		0	0	0	0	0	0
	4	↓	0	↓	0	↓	↓	↓	↓	↓	↓	↓	1①	↓	↓
FR_FR2	1	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
+ 20 mg/L Cu	2	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	1①	↓	↓
	3	↓	↓	↓	↓	↓	↓	↓	↓	↓	0	0	0	0	0
	4	↓	1①	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	0	↓
FR_MULTIPLATE	1	↓	0	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	0	↓
+ 20 mg/L Cu	2	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	3	0	0	0	0	0	0	0	1②	0	0	0	0	0	0
	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	1														
	2														
	3														
	4														
	1														
	2														
	3														
	4														
	1														
	2														
	3														
	4														
Tech Initials		MM	MM	MM	MM	DMC	JMC	AM	AM	MM	MM	MM	MM	MM	MM

Comments: ① fungal growth appears typical
② fuzzy, atypical fungal growth

Reviewed by: JCh **Date reviewed:** Aug. 18/21

Embryo-Alevin Toxicity Test
Daily Microbial Observations

P3.13.15

Client: Teck
Sample ID: (Various)
Work Order #: 2109363

Start Date & Time: May 19, 2021 @ 1735h
Stop Date & Time: June 18, 2021 @ 0805h
Test Species: *Oncorhynchus mykiss*

Sample ID	Rep	Day of Test													
		29		30		31									
		Live	Dead	Live	Dead	Live	Dead	Live	Dead	Live	Dead	Live	Dead	Live	Dead
Dechlor Control	1	0	0	0	0										
	2	—	—	—	—										
	3	0	0	0	0										
	4	↓	↓	↓	↓										
Dechlor + 20 mg/L Cu	1	↓	↓	↓	↓										
	2	↓	↓	↓	↓										
	3	↓	↓	↓	↓										
	4	↓	↓	↓	↓										
FR_UFR1 + 20 mg/L Cu	1	↓	↓	↓	↓										
	2	—	—	—	—										
	3	0	0	0	0										
	4	↓	↓	↓	↓										
GH_ER2 + 20 mg/L Cu	1	↓	↓	↓	↓										
	2	—	—	—	—										
	3	0	0	0	0										
	4	↓	↓	↓	↓										
CM_MC1 + 20 mg/L Cu	1	↓	↓	↓	↓										
	2	↓	↓	↓	↓										
	3	↓	↓	↓	↓										
	4	↓	↓	↓	↓										
LL_SLC + 20 mg/L Cu	1	↓	↓	↓	↓										
	2	—	—	—	—										
	3	0	0	0	0										
	4	↓	↓	↓	↓										
FR_FRABCH + 20 mg/L Cu	1	↓	↓	↓	↓										
	2	—	—	—	—										
	3	0	0	0	0										
	4	↓	↓	↓	↓										
FR_FRCP1 + 20 mg/L Cu	1	↓	↓	↓	↓										
	2	↓	↓	↓	↓										
	3	↓	10	↓	↓										
	4	↓	0	↓	↓										
Tech Initials		MW	MW	MW	MW										

Comments: 0 fungal growth appears typical

Version 1.1 Issued October 6, 2015

Reviewed by: JCH **Date reviewed:** Aug. 18/21

Embryo-Alevin Toxicity Test
Daily Microbial Observations

B19115

Client: Teck
Sample ID: (various)
Work Order #: 210963

Start Date & Time: May 19, 2021 @ 1735h
Stop Date & Time: ~~Ha~~ June 18, 2021 @ 0805h
Test Species: *Oncorhynchus mykiss*

Sample ID	Rep	Day of Test													
		29		30		31									
		Live	Dead	Live	Dead	Live	Dead	Live	Dead	Live	Dead	Live	Dead	Live	Dead
GH-FR1	1	0	0	0	0										
+20 mg/L Cu	2	↓	↓	↓	↓										
	3	↓	↓	↓	↓										
	4	↓	↓	↓	↓										
GH-ERC	1	↓	↓	↓	↓										
+20 mg/L Cu	2	—	—	—	—										
	3	0	0	0	0										
	4	↓	↓	↓	↓										
CM-MC2	1	↓	↓	↓	↓										
+20 mg/L Cu	2	—	—	—	—										
	3	0	0	0	0										
	4	↓	↓	↓	↓										
EV-MC2	1	↓	↓	↓	↓										
+20 mg/L Cu	2	—	—	—	—										
	3	0	0	0	0										
	4	↓	↓	↓	↓										
EV-HC1	1	↓	↓	↓	↓										
+20 mg/L Cu	2	—	—	—	—										
	3	0	0	0	0										
	4	↓	↓	↓	↓										
LC-DCDS	1	↓	↓	↓	↓										
+20 mg/L Cu	2	↓	↓	↓	↓										
	3	↓	↓	↓	↓										
	4	↓	↓	↓	↓										
LC-LC3	1	↓	↓	↓	↓										
+20 mg/L Cu	2	—	—	—	—										
	3	0	0	0	0										
	4	↓	↓	↓	↓										
LC-LC5	1	↓	↓	↓	↓										
+20 mg/L Cu	2	—	—	—	—										
	3	0	0	0	0										
	4	0	1①	0	0										
Tech Initials		MM	MM	MM	MM										

Comments: ① fungal growth appears typical

Version 1.1 Issued October 6, 2015

Reviewed by: JCM **Date reviewed:** Aug. 18/21

Embryo-Alevin Toxicity Test
Daily Microbial Observations

PS 15/15

Client: Teck
Sample ID: (various)
Work Order #: 210963

Start Date & Time: May 19 2021 @ 1735h
Stop Date & Time: June 18, 2021 @ 0805h
Test Species: *Oncorhynchus mykiss*

Sample ID	Rep	Day of Test													
		29		30		31									
		Live	Dead	Live	Dead	Live	Dead	Live	Dead	Live	Dead	Live	Dead	Live	Dead
LC_LCDSSLCC	1	0	0	0	0										
+20 mg/L Cu	2	—													
	3	0	0	0	0										
	4	↓	↓	↓	↓										
FR_FR4	1	↓	↓	↓	↓										
+20 mg/L Cu	2	↓	↓	↓	↓										
	3	↓	↓	↓	↓										
	4	↓	↓	↓	↓										
FR_FRRD	1	↓	↓	↓	↓										
+20 mg/L Cu	2	—													
	3	0	0	0	0										
FR2	4	↓	↓	↓	↓										
~~FR_MULTIPLATE~~	1	↓	↓	↓	↓										
+20 mg/L Cu	2	—													
	3	0	0	0	0										
	4	↓	↓	↓	↓										
FR_MULTIPLATE	1	↓	↓	↓	↓										
+20 mg/L Cu	2	—													
	3	0	0	0	0										
	4	0	0	0	0										
	1														
	2														
	3														
	4														
	1														
	2														
	3														
	4														
	1														
	2														
	3														
	4														
Tech Initials		MM	MM	MM	MM										

Comments:

Reviewed by: JCh **Date reviewed:** Aug. 18/21

Embryo - Alevin Test Termination Data Sheet
Length, Wet Weight, Abnormalities

Client: **Teck**

Sample ID: **Dechlor Control**

Work Order No.: **210963**

Start Date: **May 19, 2021**

Termination Date: **June 18, 2021**

Treatment (% v/v) and Replicate	Fish	Length (mm)	Normal	Abnormal	Comments
A	1	19.5	✓		
	2	19.5			
	3	19.5			
	4	19.5			
	5	19.0			
	6	18.5			
	7	18.5			
	8	20.0			
	9	19.5			
	10	19.5			
	11	19.5			
	12	19.5			
	13	20.0			
	14	19.0			
	15	19.5			
	16	20.5			
	17	19.0			
	18	19.5			
	19	19.5			
	20	20.0			
	21	21.0			
	22	19.5			
	23	20.5			
	24	20.5			
	25	19.5			
	26	19.5			
	27	19.5			
	28	19.5	✓		
	29	16.0		✓	yolk sac edema
	30	16.5		✓	scoliosis
	31				
	32				
	33				
	34				
	35				

Total wet weight (pooled): 2.11 g

Number of survivors: 30

Number of abnormal/have difficulty swimming: 2 / 1

Initials: AZ, YM

Reviewed by: JCM

Date Reviewed: Aug. 18/21

ks-2/69

Embryo - Alevin Test Termination Data Sheet
Length, Wet Weight, Abnormalities

Client: **Teck**

Sample ID: **Dechlor Control**

Work Order No.: **210963**

Start Date: **May 19, 2021**

Termination Date: **June 18, 2021**

Treatment (% v/v) and Replicate	Fish	Length (mm)	Normal	Abnormal	Comments
C	1	20.0	✓		
	2	22.0			
	3	22.0			
	4	21.5			
	5	20.0			
	6	21.0			
	7	20.0			
	8	20.5			
	9	19.5			
	10	20.5			
	11	21.0			
	12	21.0			
	13	21.0			
	14	21.5			
	15	20.0			
	16	20.0			
	17	20.0			
	18	20.0			
	19	18.5			
	20	21.5			
	21	20.0			
	22	21.0			
	23	21.0			
	24	17.0		✓	yolksac edema
	25				
	26				
	27				
	28				
	29				
	30				
	31				
	32				
	33				
	34				
	35				

Total wet weight (pooled): 1.99 g

Number of survivors: 24

Number of abnormal/have difficulty swimming: 1 / 0

Initials: [illegible]

Reviewed by: [illegible]

Date Reviewed: Aug. 18/21

RS 3/69

Embryo - Alevin Test Termination Data Sheet
Length, Wet Weight, Abnormalities

Client: **Teck**

Sample ID: **Dechlor Control**

Work Order No.: **210963**

Start Date: **May 19, 2021**

Termination Date: **June 18, 2021**

Treatment (% v/v) and Replicate	Fish	Length (mm)	Normal	Abnormal	Comments
D	1	20.5	✓		
	2	21.0			
	3	20.5			
	4	20.0			
	5	19.5			
	6	21.0			
	7	20.0			
	8	21.0			
	9	19.0			
	10	21.0			
	11	18.5			
	12	19.5			
	13	17.0			
	14	21.5			
	15	21.0			
	16	20.5			
	17	19.5			
	18	20.0			
	19	21.0			
	20	20.5			
	21	20.5			
	22	20.5			
	23	21.0			
	24	20.5			
	25	20.0			
	26	19.0			
	27	21.0	✓		
	28	18.0		✓	kyphosis
	29	18.5		✓	Kyphosis
	30	18.0		✓	Kyphosis
	31				
	32				
	33				
	34				
	35				

Total wet weight (pooled): 2.83 g

Number of survivors: 30

Number of abnormal/have difficulty swimming: 3 / 3

Initials: AWD / YWL

Reviewed by: JGh

Date Reviewed: Aug. 18/21

PB 4/69

Embryo - Alevin Test Termination Data Sheet
Length, Wet Weight, Abnormalities

Client: **Teck**

Sample ID: **Dechlor Control + 20 µg/L Cu**

Work Order No.: **210963**

Start Date: **May 19, 2021**

Termination Date: **June 18, 2021**

Treatment (% v/v) and Replicate	Fish	Length (mm)	Normal	Abnormal	Comments
A	1	20.0	✓		
	2	19.5			
	3	19.5			
	4	~~20~~ 21.0			
	5	18.5			
	6	18.0			
	7	21.0			
	8	21.0			
	9	20.0			
	10	21.0			
	11	21.0			
	12	20.5			
	13	20.0			
	14	21.0			
	15	20.5			
	16	21.0			
	17	20.5			
	18	21.0			
	19	20.5			
	20	20.0			
	21	20.0			
	22	18.5			
	23	21.0			
	24	21.0			
	25	20.0	✓		
	26	16.0	~~✓~~	✓	yolksac edema
	27				
	28				
	29				
	30				
	31				
	32				
	33				
	34				
	35				

Total wet weight (pooled): 1.90 g

Number of survivors: 26

Number of abnormal/have difficulty swimming: 1 / 1

Initials: [signature]

Reviewed by: [signature]

Date Reviewed: Aug. 18/21

PB5169

Embryo - Alevin Test Termination Data Sheet
Length, Wet Weight, Abnormalities

Client: **Teck**

Sample ID: **Dechlor Control + 20 µg/L Cu**

Work Order No.: **210963**

Start Date: **May 19, 2021**

Termination Date: **June 18, 2021**

Treatment (% v/v) and Replicate	Fish	Length (mm)	Normal	Abnormal	Comments
B	1	20.5	✓		
	2				
	3				
	4				
	5				
	6				
	7				
	8				
	9				
	10				
	11				
	12				
	13				
	14				
	15				
	16				
	17				
	18				
	19				
	20				
	21				
	22				
	23				
	24				
	25				
	26				
	27				
	28				
	29				
	30				
	31				
	32				
	33				
	34				
	35				

Total wet weight (pooled): ~~0.27~~ 0.12g

Number of survivors: 1

Number of abnormal/have difficulty swimming: 0 / 0

Initials: AMM

Reviewed by: JCK

Date Reviewed: Aug. 18/21

PS 6/69

Embryo - Alevin Test Termination Data Sheet
Length, Wet Weight, Abnormalities

Client: **Teck**

Sample ID: **Dechlor Control + 20 µg/L Cu**

Work Order No.: **210963**

Start Date: **May 19, 2021**

Termination Date: **June 18, 2021**

Treatment (% v/v) and Replicate	Fish	Length (mm)	Normal	Abnormal	Comments
C	1	19.5	✓		
	2	21.0			
	3	21.5			
	4	21.5			
	5	19.5			
	6	21.0			
	7	20.0			
	8	19.0			
	9	21.0			
	10	21.0			
	11	22.5			
	12	19.5			
	13	21.0			
	14	21.0			
	15	19.5			
	16	19.0			
	17	21.0			
	18	20.5			
	19	20.0			
	20	20.0			
	21	17.0	↓		
	22	18.0		✓	yolksac edema
	23	17.0		✓	yolksac edema
	24				
	25				
	26				
	27				
	28				
	29				
	30				
	31				
	32				
	33				
	34				
	35				

Total wet weight (pooled): 2.00 g

Number of survivors: 23

Number of abnormal/have difficulty swimming: 2 / 1

Initials: AS, MM

Reviewed by: JGh

Date Reviewed: Aug. 18/21

P37/69

Embryo - Alevin Test Termination Data Sheet
Length, Wet Weight, Abnormalities

Client: **Teck**

Sample ID: **Dechlor Control + 20 µg/L Cu**

Work Order No.: **210963**

Start Date: **May 19, 2021**

Termination Date: **June 18, 2021**

Treatment (% v/v) and Replicate	Fish	Length (mm)	Normal	Abnormal	Comments
D	1	21.0	✓		
	2	21.0			
	3	22.0			
	4	19.0			
	5	21.0			
	6	22.0			
	7	20.0			
	8	21.5			
	9	20.0			
	10	20.0			
	11	20.5			
	12	20.5			
	13	20.0			
	14	20.5			
	15	21.5			
	16	20.0			
	17	18.5			
	18	20.0			
	19	18.5		✓	bent tail
	20				
	21				
	22				
	23				
	24				
	25				
	26				
	27				
	28				
	29				
	30				
	31				
	32				
	33				
	34				
	35				

Total wet weight (pooled): 1.85 g

Number of survivors: 19

Number of abnormal/have difficulty swimming: 1/1

Initials: AMM

Reviewed by: JCH

Date Reviewed: Aug. 18/21

RS 8169

Embryo - Alevin Test Termination Data Sheet
Length, Wet Weight, Abnormalities

Client: **Teck**

Start Date: **May 19, 2021**

Sample ID: **FR_UFR1 + 20 µg/L Cu**

Termination Date: **June 18, 2021**

Work Order No.: **210963**

Treatment (% v/v) and Replicate	Fish	Length (mm)	Normal	Abnormal	Comments
100 A	1	20.5	✓		
	2	21.5			
	3	21.0			
	4	21.0			
	5	20.5			
	6	21.5			
	7	20.5			
	8	20.5			
	9	20.5			
	10	21.5			
	11	21.0			
	12	19.5			
	13	20.5			
	14	21.5			
	15	19.0			
	16	20.0			
	17	20.5			
	18	20.5			
	19	20.0			
	20	20.5			
	21	21.0			
	22	20.0			
	23	21.0			
	24	21.0			
	25	21.5			
	26	21.0			
	27	21.5			
	28	20.0			
	29	20.5	↓		
	30	16.0		✓	scoliosis
	31				
	32				
	33				
	34				
	35				

Total wet weight (pooled): 2.37 g

Number of survivors: 30

Number of abnormal/have difficulty swimming: 1 / 1

Initials: AJ, MM

Reviewed by: JCM

Date Reviewed: Aug. 19/21

P39/69

Embryo - Alevin Test Termination Data Sheet

Length, Wet Weight, Abnormalities

Client: **Teck**

Sample ID: **FR_UFR1 + 20 µg/L Cu**

Work Order No.: **210963**

Start Date: **May 19, 2021**

Termination Date: **June 18, 2021**

Treatment (% v/v) and Replicate	Fish	Length (mm)	Normal	Abnormal	Comments
100 C	1	21.5	✓		
	2	20.0			
	3	21.0			
	4	21.0			
	5	21.5			
	6	20.0			
	7	21.0			
	8	22.5			
	9	18.5			
	10	22.0			
	11	21.0			
	12	21.0			
	13	21.5			
	14	20.5			
	15	20.5			
	16	20.0			
	17	20.5			
	18	22.5			
	19	20.5			
	20	21.0			
	21	22.5			
	22	20.5			
	23	22.0			
	24	21.0			
	25	21.0			
	26	19.5	-		
	27				
	28				
	29				
	30				
	31				
	32				
	33				
	34				
	35				

Total wet weight (pooled): 2.09 g

Number of survivors: 26

Number of abnormal/have difficulty swimming: 0/0

Initials: AM

Reviewed by: JM

Date Reviewed: Aug. 19/21

AS 10/69

Embryo - Alevin Test Termination Data Sheet
Length, Wet Weight, Abnormalities

Client: **Teck**

Sample ID: **FR_UFR1 + 20 µg/L Cu**

Work Order No.: **210963**

Start Date: **May 19, 2021**

Termination Date: **June 18, 2021**

Treatment (% v/v) and Replicate	Fish	Length (mm)	Normal	Abnormal	Comments
100 D	1	21.5	✓		
	2	20.0			
	3	21.5			
	4	20.0			
	5	20.0			
	6	21.5			
	7	21.5			
	8	22.5			
	9	21.0			
	10	22.0			
	11	20.5			
	12	20.0			
	13	21.0			
	14	21.0			
	15	20.5			
	16	22.5			
	17	21.5			
	18	21.0			
	19	22.0			
	20	21.5			
	21	22.0			
	22	20.5			
	23	21.0			
	24	18.5			
	25	21.5			
	26	21.0			
	27	19.5			
	28	20.5			
	29	19.5	⊥		
	30				
	31				
	32				
	33				
	34				
	35				

Total wet weight (pooled): 2.99 g

Number of survivors: 29

Number of abnormal/have difficulty swimming: 0/0

Initials: AS, MM

Reviewed by: JCM

Date Reviewed: Aug. 19/21

PB 11/69

Embryo - Alevin Test Termination Data Sheet
Length, Wet Weight, Abnormalities

Client: **Teck**

Start Date: **May 19, 2021**

Sample ID: **GH_ER2 + 20 µg/L Cu**

Termination Date: **June 18, 2021**

Work Order No.: **210963**

Treatment (% v/v) and Replicate	Fish	Length (mm)	Normal	Abnormal	Comments
100 A	1	21.0	✓		
	2	21.5			
	3	21.0			
	4	20.0			
	5	20.5			
	6	20.0			
	7	21.5			
	8	21.5			
	9	21.5			
	10	21.0			
	11	21.0			
	12	20.0			
	13	20.5			
	14	21.5			
	15	21.0			
	16	21.5			
	17	21.0			
	18	21.0			
	19	21.0			
	20	21.0			
	21	21.0			
	22	20.0			
	23	20.5			
	24	20.0			
	25	21.5	✓		
	26				
	27				
	28				
	29				
	30				
	31				
	32				
	33				
	34				
	35				

Total wet weight (pooled): 2.26 g

Number of survivors: 25

Number of abnormal/have difficulty swimming: 0 / 0

Initials: AM

Reviewed by: JCh

Date Reviewed: Aug. 19/21

23.12/69

Embryo - Alevin Test Termination Data Sheet
Length, Wet Weight, Abnormalities

Client: **Teck**

Sample ID: **GH_ER2 + 20 µg/L Cu**

Work Order No.: **210963**

Start Date: **May 19, 2021**

Termination Date: **June 18, 2021**

Treatment (% v/v) and Replicate	Fish	Length (mm)	Normal	Abnormal	Comments
100 C	1	21.0	✓		
	2	20.0	|		
	3	21.5	|		
	4	20.0	|		
	5	21.0	|		
	6	21.0	|		
	7	20.5	|		
	8	22.0	|		
	9	19.0	|		
	10	19.0	|		
	11	20.5	|		
	12	19.0	|		
	13	21.5	|		
	14	19.0	|		
	15	20.5	|		
	16	19.5	|		
	17	21.0	|		
	18	21.0	⊥		
	19	16.5		✓	yolksac edema
	20	18.5		✓	yolksac edema
	21	16.5		✓	yolksac edema
	22	22.5	✓		
	23	21.0	|		
	24	16.5	|		
	25	18.0	|		
	26	16.5	|		
	27	19.0	|		
	28	21.0	⊥		
	29				
	30				
	31				
	32				
	33				
	34				
	35				

Total wet weight (pooled): 2.48 g

Number of survivors: 28

Number of abnormal/have difficulty swimming: 3 / 0

Initials: AO, MW

Reviewed by: JBy

Date Reviewed: Aug-19/21

Embryo - Alevin Test Termination Data Sheet

Length, Wet Weight, Abnormalities

Client: **Teck**

Sample ID: **GH_ER2 + 20 µg/L Cu**

Work Order No.: **210963**

Start Date: **May 19, 2021**

Termination Date: **June 18, 2021**

Treatment (% v/v) and Replicate	Fish	Length (mm)	Normal	Abnormal	Comments
100 D	1	20.5	✓		
	2	20.5			
	3	20.0			
	4	20.5			
	5	21.5			
	6	20.5			
	7	21.0			
	8	21.5			
	9	22.0			
	10	20.5			
	11	20.0			
	12	20.0			
	13	21.0			
	14	20.5			
	15	20.0			
	16	20.5			
	17	21.0			
	18	20.5			
	19	19.5			
	20	22.0			
	21	20.5			
	22	21.5			
	23	21.0			
	24	20.5		✓	abnormal eye
	25	17.0			Kyphosis
	26	20.0			Kyphosis
	27	20.0			Kyphosis
	28	20.5			Kyphosis
	29				
	30				
	31				
	32				
	33				
	34				
	35				

Total wet weight (pooled): 3.20 g

Number of survivors: 28

Number of abnormal/have difficulty swimming: 5 / 4

Initials: AG MM

Reviewed by: JM

Date Reviewed: Aug. 19/21

PB.14/69

Embryo - Alevin Test Termination Data Sheet
Length, Wet Weight, Abnormalities

Client: **Teck**

Sample ID: **CM_MC1 + 20 µg/L Cu**

Work Order No.: **210963**

Start Date: **May 19, 2021**

Termination Date: **June 18, 2021**

Treatment (% v/v) and Replicate	Fish	Length (mm)	Normal	Abnormal	Comments
100 A	1	21.5	✓		
	2	21.0			
	3	21.5			
	4	21.0			
	5	21.5			
	6	21.5			
	7	21.0			
	8	21.0			
	9	21.5			
	10	20.5			
	11	21.0			
	12	21.5			
	13	21.5			
	14	21.0			
	15	21.0			
	16	21.0			
	17	20.5			
	18	20.5			
	19	20.5			
	20	21.0			
	21	20.5			
	22	20.5			
	23	20.5			
	24	20.0			
	25	20.5			
	26	21.5			
	27	21.0			
	28	19.5			
	29				
	30				
	31				
	32				
	33				
	34				
	35				

Total wet weight (pooled): 2.31 g

Number of survivors: 28

Number of abnormal/have difficulty swimming: 0 / 0

Initials: [illegible]

Reviewed by: [illegible]

Date Reviewed: Aug. 19/21

R3.15169

Embryo - Alevin Test Termination Data Sheet
Length, Wet Weight, Abnormalities

Client: **Teck**

Sample ID: **CM_MC1 + 20 µg/L Cu**

Work Order No.: **210963**

Start Date: **May 19, 2021**

Termination Date: **June 18, 2021**

Treatment (% v/v) and Replicate	Fish	Length (mm)	Normal	Abnormal	Comments
100 B	1	21.5	✓		
	2				
	3				
	4				
	5				
	6				
	7				
	8				
	9				
	10				
	11				
	12				
	13				
	14				
	15				
	16				
	17				
	18				
	19				
	20				
	21				
	22				
	23				
	24				
	25				
	26				
	27				
	28				
	29				
	30				
	31				
	32				
	33				
	34				
	35				

Total wet weight (pooled): 0.12 g

Number of survivors: 1

Number of abnormal/have difficulty swimming: 0/0

Initials: AMM

Reviewed by: JCM

Date Reviewed: Aug. 19/21

Embryo - Alevin Test Termination Data Sheet
Length, Wet Weight, Abnormalities

Client: **Teck**

Sample ID: **CM_MC1 + 20 µg/L Cu**

Work Order No.: **210963**

Start Date: **May 19, 2021**

Termination Date: **June 18, 2021**

Treatment (% v/v) and Replicate	Fish	Length (mm)	Normal	Abnormal	Comments
100 C	1	20.0	✓		
	2	21.5			
	3	22.0			
	4	19.5			
	5	21.5			
	6	20.0			
	7	20.0			
	8	21.5			
	9	20.0			
	10	22.0			
	11	19.5			
	12	21.5			
	13	21.0			
	14	21.5			
	15	20.5			
	16	19.5			
	17	22.0			
	18	20.0			
	19	20.5			
	20	20.5			
	21	19.0			
	22	20.0			
	23	20.5			
	24	20.0			
	25	20.5			
	26	18.5		✓	yolksac edema
	27				
	28				
	29				
	30				
	31				
	32				
	33				
	34				
	35				

Total wet weight (pooled): 2.37 g

Number of survivors: 26

Number of abnormal/have difficulty swimming: 1/0

Initials: [illegible]

Reviewed by: [illegible]

Date Reviewed: Aug. 19/21

pg 17/69

Embryo - Alevin Test Termination Data Sheet
Length, Wet Weight, Abnormalities

Client: **Teck**

Start Date: **May 19, 2021**

Sample ID: **CM_MC1 + 20 µg/L Cu**

Termination Date: **June 18, 2021**

Work Order No.: **210963**

Treatment (% v/v) and Replicate	Fish	Length (mm)	Normal	Abnormal	Comments
100 D	1	22.0	✓		
	2	20.0			
	3	22.0			
	4	22.0			
	5	20.5			
	6	19.5			
	7	22.0			
	8	19.5			
	9	22.0			
	10	21.0			
	11	21.5			
	12	21.0			
	13	21.5			
	14	21.5			
	15	21.0			
	16	21.0			
	17	20.5			
	18	21.0			
	19	20.5			
	20	20.0			
	21	21.0			
	22	17.0			
	23	22.5			
	24	21.5			
	25	20.5			
	26	20.5			
	27	20.0			
	28	20.0			
	29	19.5		✓	kyphosis
	30	19.5		✓	kyphosis
	31				
	32				
	33				
	34				
	35				

Total wet weight (pooled): 3.09 g

Number of survivors: 30

Number of abnormal/have difficulty swimming: 2 | 2

Initials: [illegible]

Reviewed by: JCh

Date Reviewed: Aug. 19/21

PS 18/69

Embryo - Alevin Test Termination Data Sheet
Length, Wet Weight, Abnormalities

Client: **Teck**

Sample ID: **LC_SLC + 20 µg/L Cu**

Work Order No.: **210963**

Start Date: **May 19, 2021**

Termination Date: **June 18, 2021**

Treatment (% v/v) and Replicate	Fish	Length (mm)	Normal	Abnormal	Comments
100 A	1	20.0	✓		
	2	21.0			
	3	19.5			
	4	20.0			
	5	20.5			
	6	21.0			
	7	19.5			
	8	19.5			
	9	19.0			
	10	20.5			
	11	21.0			
	12	20.0			
	13	20.0			
	14	19.5			
	15	20.0			
	16	20.0			
	17	19.5			
	18	20.0			
	19	19.5			
	20	19.5			
	21	20.0			
	22	A 19.55			
	23	20.0			
	24	20.0			
	25	20.0			
	26	20.0			
	27	19.5			
	28	19.0			
	29	20.0			
	30				
	31				
	32				
	33				
	34				
	35				

Total wet weight (pooled): 2.49 g

Number of survivors: 29

Number of abnormal/have difficulty swimming: 0/0

Initials: [illegible]

Reviewed by: [illegible]

Date Reviewed: Aug. 19/21

Embryo - Alevin Test Termination Data Sheet
Length, Wet Weight, Abnormalities

Client: Teck

Sample ID: LC_SLC + 20 µg/L Cu

Work Order No.: 210963

Start Date: May 19, 2021

Termination Date: June 18, 2021

Treatment (% v/v) and Replicate	Fish	Length (mm)	Normal	Abnormal	Comments
100 C	1	21.0	✓		
	2	19.0			
	3	20.0			
	4	21.0			
	5	21.5			
	6	22.0			
	7	21.0			
	8	20.5			
	9	20.0			
	10	19.5			
	11	21.5			
	12	20.5			
	13	20.0			
	14	21.0			
	15	21.5			
	16	21.0			
	17	21.5			
	18	21.0			
	19	21.0			
	20	19.0			
	21	22.5			
	22	22.5			
	23	21.0			
	24				
	25				
	26				
	27				
	28				
	29				
	30				
	31				
	32				
	33				
	34				
	35				

Total wet weight (pooled): 2.34 g

Number of survivors: 23

Number of abnormal/have difficulty swimming: 0/0

Initials: [illegible], [illegible]

Reviewed by: [illegible]

Date Reviewed: Aug. 19/21

Embryo - Alevin Test Termination Data Sheet
Length, Wet Weight, Abnormalities

Client: **Teck**

Sample ID: **LC_SLC + 20 µg/L Cu**

Work Order No.: **210963**

Start Date: **May 19, 2021**

Termination Date: **June 18, 2021**

Treatment (% v/v) and Replicate	Fish	Length (mm)	Normal	Abnormal	Comments
100 D	1	20.0	✓		
	2	19.5			
	3	21.0			
	4	20.0			
	5	19.5			
	6	19.0			
	7	21.0			
	8	21.5			
	9	21.0			
	10	20.5			
	11	20.5			
	12	19.0			
	13	20.5			
	14	19.5			
	15	20.0			
	16	19.0			
	17	21.0			
	18	20.5			
	19	21.0			
	20	20.5			
	21	20.0			
	22	19.0			
	23	20.0			
	24	20.0			
	25	18.0	↓		
	26	20.0		✓	Kyphosis
	27	18.5		✓	Kyphosis
	28				
	29				
	30				
	31				
	32				
	33				
	34				
	35				

Total wet weight (pooled): 2.65 g

Number of survivors: 27

Number of abnormal/have difficulty swimming: 2 | 2

Initials: AS, HM

Reviewed by: JCM

Date Reviewed: Aug. 19/21

P3.21/69

Embryo - Alevin Test Termination Data Sheet
Length, Wet Weight, Abnormalities

Client: **Teck**
Start Date: **May 19, 2021**
Sample ID: **FR_FRABCH + 20 µg/L Cu**
Termination Date: **June 18, 2021**
Work Order No.: **210963**

Treatment (% v/v) and Replicate	Fish	Length (mm)	Normal	Abnormal	Comments
100 A	1	21.0	✓		
	2	21.0			
	3	21.0			
	4	21.5			
	5	20.5			
	6	20.5			
	7	22.0			
	8	22.0			
	9	22.0			
	10	21.5			
	11	21.5			
	12	21.0			
	13	21.0			
	14	21.0			
	15	21.5			
	16	21.5			
	17	21.5			
	18	21.0			
	19	21.0			
	20	21.5			
	21	20.5			
	22	20.0			
	23	20.5			
	24	20.5			
	25	20.5			
	26	19.5			
	27	21.0			
	28				
	29				
	30				
	31				
	32				
	33				
	34				
	35				

Total wet weight (pooled): 2.39 g
Number of survivors: 27
Number of abnormal/have difficulty swimming: 0/0
Initials: AS, YM

Reviewed by: JGH
Date Reviewed: Aug. 19/21

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Embryo - Alevin Test Termination Data Sheet
Length, Wet Weight, Abnormalities

Client: **Teck**

Sample ID: **FR_FRABCH + 20 µg/L Cu**

Work Order No.: **210963**

Start Date: **May 19, 2021**

Termination Date: **June 18, 2021**

Treatment (% v/v) and Replicate	Fish	Length (mm)	Normal	Abnormal	Comments
100 C	1	21.0	✓		
	2	18.0			
	3	21.0			
	4	20.5			
	5	19.0			
	6	20.0			
	7	20.0			
	8	22.0			
	9	21.5			
	10	20.5			
	11	22.0			
	12	21.0			
	13	19.5			
	14	21.0			
	15	21.5			
	16	20.5			
	17	17.0			
	18	21.0			
	19	22.5			
	20	20.0			
	21	19.0			
	22	20.0			
	23	21.5			
	24	19.0			
	25	19.0		✓	yolksac edema
	26	18.0		✓	yolksac edema
	27				
	28				
	29				
	30				
	31				
	32				
	33				
	34				
	35				

Total wet weight (pooled): 2.51 g

Number of survivors: 26

Number of abnormal/have difficulty swimming: 2/0

Initials: AS, MM

Reviewed by: JCM

Date Reviewed: Aug. 19/21

Embryo - Alevin Test Termination Data Sheet
Length, Wet Weight, Abnormalities

Client: **Teck**

Sample ID: **FR_FRABCH + 20 µg/L Cu**

Work Order No.: **210963**

Start Date: **May 19, 2021**

Termination Date: **June 18, 2021**

Treatment (% v/v) and Replicate	Fish	Length (mm)	Normal	Abnormal	Comments
100 D	1	21.0	✓		
	2	21.0			
	3	21.0			
	4	20.5			
	5	20.0			
	6	19.0			
	7	20.0			
	8	21.0			
	9	21.0			
	10	21.0			
	11	20.5			
	12	21.0			
	13	20.5			
	14	20.5			
	15	22.0			
	16	21.0			
	17	21.0			
	18	21.0			
	19	22.0			
	20	22.5			
	21	21.5			
	22	20.0			
	23	20.5			
	24	20.5			
	25	19.5			
	26	19.5	A	✓	volksac edema
	27	18.5	A	✓	kyphosis
	28				
	29				
	30				
	31				
	32				
	33				
	34				
	35				

Total wet weight (pooled): 3.060 g

Number of survivors: 27

Number of abnormal/have difficulty swimming: 2 | 1

Initials: AC, MW

Reviewed by: JCM

Date Reviewed: Aug. 19/21

RS: 24/69

Embryo - Alevin Test Termination Data Sheet
Length, Wet Weight, Abnormalities

Client: **Teck**

Sample ID: **FR_FRCP1 + 20 µg/L Cu**

Work Order No.: **210963**

Start Date: **May 19, 2021**

Termination Date: **June 18, 2021**

Treatment (% v/v) and Replicate	Fish	Length (mm)	Normal	Abnormal	Comments
100 A	1	20.5	✓		
	2	20.0			
	3	20.0			
	4	21.0			
	5	21.0			
	6	20.5			
	7	20.0			
	8	21.0			
	9	20.5			
	10	20.0			
	11	21.0			
	12	20.5			
	13	20.0			
	14	20.0			
	15	21.0			
	16	20.0			
	17	21.5			
	18	20.5			
	19	21.0			
	20	21.0			
	21	19.5			
	22	20.0			
	23	20.0			
	24	20.5			
	25	20.5			
	26	21.5	✓		
	27	18.0		✓	SCOLIOSIS
	28				
	29				
	30				
	31				
	32				
	33				
	34				
	35				

Total wet weight (pooled): 2.34 g

Number of survivors: 27

Number of abnormal/have difficulty swimming: 1 1 1

Initials: AS, MM

Reviewed by: JOL

Date Reviewed: Aug. 19/21

RB.25/69

Embryo - Alevin Test Termination Data Sheet
Length, Wet Weight, Abnormalities

Client: **Teck**

Sample ID: **FR_FRCP1 + 20 µg/L Cu**

Work Order No.: **210963**

Start Date: **May 19, 2021**

Termination Date: **June 18, 2021**

Treatment (% v/v) and Replicate	Fish	Length (mm)	Normal	Abnormal	Comments
100 B	1	20.0	✓		
	2				
	3				
	4				
	5				
	6				
	7				
	8				
	9				
	10				
	11				
	12				
	13				
	14				
	15				
	16				
	17				
	18				
	19				
	20				
	21				
	22				
	23				
	24				
	25				
	26				
	27				
	28				
	29				
	30				
	31				
	32				
	33				
	34				
	35				

Total wet weight (pooled): 0.14 g

Number of survivors: 6

Number of abnormal/have difficulty swimming: 0 10

Initials: AS, WM

Reviewed by: [signature]

Date Reviewed: Aug. 19/21

Aug. 26/69

Embryo - Alevin Test Termination Data Sheet
Length, Wet Weight, Abnormalities

Client: **Teck**

Sample ID: **FR_FRCP1 + 20 µg/L Cu**

Work Order No.: **210963**

Start Date: **May 19, 2021**

Termination Date: **June 18, 2021**

Treatment (% v/v) and Replicate	Fish	Length (mm)	Normal	Abnormal	Comments
100 C	1	21.5	✓		
	2	19.0			
	3	18.5			
	4	20.0			
	5	21.0			
	6	20.5			
	7	20.0			
	8	20.0			
	9	18.0			
	10	19.0			
	11	20.0			
	12	20.0			
	13	20.5			
	14	20.5			
	15	20.0			
	16	22.0			
	17	20.0			
	18	19.0			
	19	18.5			
	20	21.5			
	21	18.6			
	22	19.0			
	23	19.5			
	24	20.0			
	25	19.0			
	26	19.5			
	27	19.0			
	28	20.0	✓		
	29				
	30				
	31				
	32				
	33				
	34				
	35				

Total wet weight (pooled): 2.77 g

Number of survivors: 28

Number of abnormal/have difficulty swimming: 0 / 0

Initials: AM, NM

Reviewed by: JCh

Date Reviewed: Aug. 19/21

RJ 27/69

Embryo - Alevin Test Termination Data Sheet
Length, Wet Weight, Abnormalities

Client: **Teck**

Start Date: **May 19, 2021**

Sample ID: **FR_FRCP1 + 20 µg/L Cu**

Termination Date: **June 18, 2021**

Work Order No.: **210963**

Treatment (% v/v) and Replicate	Fish	Length (mm)	Normal	Abnormal	Comments
100 D	1	20.0	✓		
	2	22.0			
	3	20.0			
	4	18.0			
	5	20.5			
	6	20.0			
	7	21.5			
	8	21.5			
	9	20.0			
	10	20.5			
	11	20.0			
	12	21.0			
	13	21.0			
	14	21.5			
	15	22.0			
	16	22.0			
	17	21.0			
	18	21.0			
	19	19.0			
	20	20.0			
	21	20.0			
	22	21.5			
	23	21.5			
	24	21.5			
	25	19.0			
	26	20.~~28.5~~	✓		
	27	21.0 ~~18.5~~	✓	✓	yolksac edema
	28				
	29				
	30				
	31				
	32				
	33				
	34				
	35				

Total wet weight (pooled): 2.84 g

Number of survivors: ~~26~~ 27

Number of abnormal/have difficulty swimming: 1/0

Initials: AS, MM

Reviewed by: JCh

Date Reviewed: Aug. 19/21

Embryo - Alevin Test Termination Data Sheet
Length, Wet Weight, Abnormalities

Client: **Teck**

Sample ID: **GH_FR1 + 20 µg/L Cu**

Work Order No.: **210963**

Start Date: **May 19, 2021**

Termination Date: **June 18, 2021**

Treatment (% v/v) and Replicate	Fish	Length (mm)	Normal	Abnormal	Comments
100 A	1	21.0	✓		
	2	21.0			
	3	20.0			
	4	20.5			
	5	21.0			
	6	20.0			
	7	21.0			
	8	21.0			
	9	20.5			
	10	21.5			
	11	20.5			
	12	21.0			
	13	21.0			
	14	20.0			
	15	21.0			
	16	21.0			
	17	19.5			
	18	20.0			
	19	21.5			
	20	22.0			
	21	21.0			
	22	22.0			
	23	21.0			
	24	22.0			
	25	21.5	—		
	26	17.0		✓	yolk sac edema
	27				
	28				
	29				
	30				
	31				
	32				
	33				
	34				
	35				

Total wet weight (pooled): 2.44 g

Number of survivors: 26

Number of abnormal/have difficulty swimming: 1 / 0

Initials: AMS, MM

Reviewed by: JCL

Date Reviewed: Aug. 19/21

RS.29/69

Embryo - Alevin Test Termination Data Sheet
Length, Wet Weight, Abnormalities

Client: **Teck**

Sample ID: **GH_FR1 + 20 µg/L Cu**

Work Order No.: **210963**

Start Date: **May 19, 2021**

Termination Date: **June 18, 2021**

Treatment (% v/v) and Replicate	Fish	Length (mm)	Normal	Abnormal	Comments
100 B	1	20.5	✓		
	2	22.0	✓		
	3				
	4				
	5				
	6				
	7				
	8				
	9				
	10				
	11				
	12				
	13				
	14				
	15				
	16				
	17				
	18				
	19				
	20				
	21				
	22				
	23				
	24				
	25				
	26				
	27				
	28				
	29				
	30				
	31				
	32				
	33				
	34				
	35				

Total wet weight (pooled): 0.26 g

Number of survivors: 2

Number of abnormal/have difficulty swimming: 0/0

Initials: [illegible]

Reviewed by: [illegible]

Date Reviewed: Aug. 19/21

Embryo - Alevin Test Termination Data Sheet
Length, Wet Weight, Abnormalities

Client: **Teck**

Sample ID: **GH_FR1 + 20 µg/L Cu**

Work Order No.: **210963**

Start Date: **May 19, 2021**

Termination Date: **June 18, 2021**

Treatment (% v/v) and Replicate	Fish	Length (mm)	Normal	Abnormal	Comments
100 C	1	20.0	✓		
	2	19.0			
	3	19.5			
	4	20.0			
	5	20.0			
	6	21.5			
	7	22.5			
	8	20.5			
	9	20.0			
	10	18.0			
	11	22.0			
	12	20.0			
	13	20.5			
	14	20.5			
	15	20.5			
	16	22.0			
	17	21.5			
	18	21.5			
	19	21.0			
	20	17.0	✓	✓	yolksac edema
	21	20.5	✓		
	22				
	23				
	24				
	25				
	26				
	27				
	28				
	29				
	30				
	31				
	32				
	33				
	34				
	35				

Total wet weight (pooled): 1.92 g

Number of survivors: 21

Number of abnormal/have difficulty swimming: 1 / 0

Initials: AMS, YMM

Reviewed by: JCh

Date Reviewed: Aug. 19/21

RS 31/69

Embryo - Alevin Test Termination Data Sheet
Length, Wet Weight, Abnormalities

Client: **Teck**

Start Date: **May 19, 2021**

Sample ID: **GH_FR1 + 20 µg/L Cu**

Termination Date: **June 18, 2021**

Work Order No.: **210963**

Treatment (% v/v) and Replicate	Fish	Length (mm)	Normal	Abnormal	Comments
100 D	1	21.0	✓		
	2	21.5			
	3	21.5			
	4	16.5			
	5	21.5			
	6	21.0			
	7	21.0			
	8	19.5			
	9	22.5			
	10	20.5			
	11	21.5			
	12	20.0			
	13	20.5			
	14	20.5			
	15	21.0			
	16	21.0			
	17	21.5			
	18	20.5			
	19	20.5			
	20	21.0			
	21	21.0			
	22	20.5			
	23	20.0			
	24	20.5			
	25	20.0			
	26	22.0			
	27	21.5			
	28				
	29				
	30				
	31				
	32				
	33				
	34				
	35				

Total wet weight (pooled): 2.98 g

Number of survivors: 27

Number of abnormal/have difficulty swimming: 0 / 0

Initials: [illegible]

Reviewed by: JCh

Date Reviewed: Aug. 19/21

Embryo - Alevin Test Termination Data Sheet
Length, Wet Weight, Abnormalities

Client: Teck

Sample ID: GH_ERC + 20 µg/L Cu

Work Order No.: 210963

Start Date: May 19, 2021

Termination Date: June 18, 2021

Treatment (% v/v) and Replicate	Fish	Length (mm)	Normal	Abnormal	Comments
100 A	1	21.5	✓		
	2	21.0			
	3	20.5			
	4	21.0			
	5	19.0			
	6	22.0			
	7	21.5			
	8	21.5			
	9	21.5			
	10	21.5			
	11	21.5			
	12	20.0			
	13	20.5			
	14	20.5			
	15	20.5			
	16	20.5			
	17	21.5			
	18	21.0			
	19	21.5			
	20	21.5			
	21	21.0			
	22	21.0			
	23	21.0			
	24	21.0			
	25	20.5			
	26	21.0			
	27	22.0			
	28	19.0		✓	scoliosis
	29				
	30				
	31				
	32				
	33				
	34				
	35				

Total wet weight (pooled): 2.79 g

Number of survivors: 28

Number of abnormal/have difficulty swimming: 1 / 1

Initials: [illegible]

Reviewed by: [illegible]

Date Reviewed: Aug. 19/21

PB.33/69

Embryo - Alevin Test Termination Data Sheet
Length, Wet Weight, Abnormalities

Client: **Teck**

Sample ID: **GH_ERC + 20 µg/L Cu**

Work Order No.: **210963**

Start Date: **May 19, 2021**

Termination Date: **June 18, 2021**

Treatment (% v/v) and Replicate	Fish	Length (mm)	Normal	Abnormal	Comments
100 C	1	22.0	✓		
	2	21.0			
	3	22.0			
	4	18.0			
	5	22.5			
	6	20.5			
	7	22.0			
	8	20.5			
	9	20.0			
	10	19.5			
	11	20.5			
	12	19.5			
	13	21.0			
	14	20.0			
	15	22.0			
	16	20.5			
	17	21.0			
	18	21.5			
	19	22.0			
	20	20.5			
	21	21.0			
	22	21.0			
	23	22.0			
	24	22.5			
	25				
	26				
	27				
	28				
	29				
	30				
	31				
	32				
	33				
	34				
	35				

Total wet weight (pooled): 2.36g

Number of survivors: 24

Number of abnormal/have difficulty swimming: 0/0

Initials: AM, YM

Reviewed by: JCh

Date Reviewed: Aug. 19/21

Embryo - Alevin Test Termination Data Sheet
Length, Wet Weight, Abnormalities

Client: **Teck**

Sample ID: **GH_ERC + 20 µg/L Cu**

Work Order No.: **210963**

Start Date: **May 19, 2021**

Termination Date: **June 18, 2021**

Treatment (% v/v) and Replicate	Fish	Length (mm)	Normal	Abnormal	Comments
100 D	1	21.5	✓		
	2	18.5			
	3	22.0			
	4	20.5			
	5	21.0			
	6	21.5			
	7	22.5			
	8	21.5			
	9	20.5			
	10	20.5			
	11	21.0			
	12	22.5			
	13	21.0			
	14	19.5			
	15	22.5			
	16	21.0			
	17	21.5			
	18	20.5			
	19	21.0			
	20	20.0			
	21	20.5			
	22	20.5			
	23	20.5			
	24	20.0			
	25	21.0			
	26	20.0			
	27	21.0			
	28	21.5			
	29	21.0			
	30				
	31				
	32				
	33				
	34				
	35				

Total wet weight (pooled): 3.43 g

Number of survivors: 29

Number of abnormal/have difficulty swimming: 0 10

Initials: [illegible]

Reviewed by: [illegible]

Date Reviewed: Aug. 19/21

Embryo - Alevin Test Termination Data Sheet
Length, Wet Weight, Abnormalities

Client: Teck

Sample ID: CM_MC2 + 20 µg/L Cu

Work Order No.: 210963

Start Date: May 19, 2021

Termination Date: June 18, 2021

Treatment (% v/v) and Replicate	Fish	Length (mm)	Normal	Abnormal	Comments
100 A	1	21.5	✓		
	2	22.5			
	3	20.0			
	4	20.5			
	5	21.5			
	6	20.5			
	7	22.0			
	8	21.5			
	9	21.0			
	10	20.5			
	11	20.5			
	12	22.0			
	13	20.5			
	14	20.5			
	15	21.0			
	16	20.0			
	17	20.5			
	18	20.5			
	19	20.0			
	20	21.0			
	21	19.5			
	22	20.0			
	23	21.0			
	24	21.0			
	25	21.5			
	26	20.5			
	27	21.0			
	28	20.5			
	29	21.0	✓		
	30				
	31				
	32				
	33				
	34				
	35				

Total wet weight (pooled): 2.46 g

Number of survivors: 29

Number of abnormal/have difficulty swimming: 0/0

Initials: [illegible]

Reviewed by: [illegible]

Date Reviewed: Aug. 19/21

Embryo - Alevin Test Termination Data Sheet
Length, Wet Weight, Abnormalities

Client: **Teck**

Start Date: **May 19, 2021**

Sample ID: **CM_MC2 + 20 µg/L Cu**

Termination Date: **June 18, 2021**

Work Order No.: **210963**

Treatment (% v/v) and Replicate	Fish	Length (mm)	Normal	Abnormal	Comments
100 C	1	18.0	✓		
	2	21.5			
	3	20.0			
	4	21.0			
	5	21.0			
	6	21.5			
	7	20.5			
	8	22.0			
	9	20.0			
	10	20.0			
	11	19.0			
	12	19.0			
	13	20.5			
	14	21.0			
	15	20.0			
	16	20.5			
	17	20.0			
	18	20.5			
	19	21.0			
	20	20.0			
	21	20.5			
	22	20.0			
	23	21.0			
	24	20.0			
	25	19.5			
	26				
	27				
	28				
	29				
	30				
	31				
	32				
	33				
	34				
	35				

Total wet weight (pooled): 2.40 g

Number of survivors: 25

Number of abnormal/have difficulty swimming: 0 / 0

Initials: AM

Reviewed by: JCM

Date Reviewed: Aug. 19/21

AB.37/69

Embryo - Alevin Test Termination Data Sheet
Length, Wet Weight, Abnormalities

Client: **Teck**

Start Date: **May 19, 2021**

Sample ID: **CM_MC2 + 20 µg/L Cu**

Termination Date: **June 18, 2021**

Work Order No.: **210963**

Treatment (% v/v) and Replicate	Fish	Length (mm)	Normal	Abnormal	Comments
100 D	1	21.0	✓		
	2	22.0			
	3	20.0			
	4	21.0			
	5	21.5			
	6	22.0			
	7	21.5			
	8	21.0			
	9	22.0			
	10	21.5			
	11	19.5			
	12	22.5			
	13	21.5			
	14	21.5			
	15	22.0			
	16	22.0			
	17	22.0			
	18	21.0			
	19	21.0			
	20	21.5			
	21	21.0			
	22	22.0			
	23	22.0			
	24	20.0			
	25	20.5			
	26	21.0	✓		
	27				
	28				
	29				
	30				
	31				
	32				
	33				
	34				
	35				

Total wet weight (pooled): 3.14 g

Number of survivors: 26

Number of abnormal/have difficulty swimming: 0 / 0

Initials: ~~AJ~~ YM

Reviewed by: JCh

Date Reviewed: Aug. 19/21

Embryo - Alevin Test Termination Data Sheet

Length, Wet Weight, Abnormalities

Client: **Teck**

Sample ID: **EV_MC2 + 20 µg/L Cu**

Work Order No.: **210963**

Start Date: **May 19, 2021**

Termination Date: **June 18, 2021**

Treatment (% v/v) and Replicate	Fish	Length (mm)	Normal	Abnormal	Comments
100 A	1	21.0	✓		
	2	20.5	↓		
	3	19.5			
	4	20.5			
	5	21.5			
	6	21.0			
	7	22.5			
	8	20.5			
	9	20.5			
	10	21.0			
	11	20.5			
	12	21.0			
	13	21.0			
	14	20.0			
	15	21.5			
	16	21.0			
	17	21.0			
	18	20.5			
	19	21.0			
	20	21.0			
	21	21.0			
	22	19.5			
	23	21.0			
	24	21.0			
	25	20.5			
	26	20.5			
	27	22.0			
	28	20.5			
	29	20.5	↓		
	30	16.5		✓	scoliosis, missing tail fin
	31				
	32				
	33				
	34				
	35				

Total wet weight (pooled): 2.61 g

Number of survivors: 30

Number of abnormal/have difficulty swimming: 1 / 1

Initials: AS, MW

Reviewed by: JCh

Date Reviewed: Aug-19/21

PB 39/69

Embryo - Alevin Test Termination Data Sheet
Length, Wet Weight, Abnormalities

Client: **Teck**

Sample ID: **EV_MC2 + 20 µg/L Cu**

Work Order No.: **210963**

Start Date: **May 19, 2021**

Termination Date: **June 18, 2021**

Treatment (% v/v) and Replicate	Fish	Length (mm)	Normal	Abnormal	Comments
100 C	1	~~22.0~~	~~2~~ ✓		
	2	20.0			
	3	18.0			
	4	20.0			
	5	22.0			
	6	22.0			
	7	20.0			
	8	21.0			
	9	21.5			
	10	20.0			
	11	18.0			
	12	21.5			
	13	20.0			
	14	21.0			
	15	22.0			
	16	22.0			
	17	21.5			
	18	22.5			
	19	21.5			
	20	21.5			
	21	21.0			
	22	18.0			
	23	19.5			
	24	18.5		✓	yolksac edema
	25	18.5		✓	yolksac edema
	26	19.5		✓	scoliosis
	27				
	28				
	29				
	30				
	31				
	32				
	33				
	34				
	35				

Total wet weight (pooled): 2.66 g

Number of survivors: 26

Number of abnormal/have difficulty swimming: 3 / 1

Initials: A, Hw

Reviewed by: Jan

Date Reviewed: Aug. 19/21

RJ 40/69

Embryo - Alevin Test Termination Data Sheet
Length, Wet Weight, Abnormalities

Client: **Teck**

Sample ID: **EV_MC2 + 20 µg/L Cu**

Work Order No.: **210963**

Start Date: **May 19, 2021**

Termination Date: **June 18, 2021**

Treatment (% v/v) and Replicate	Fish	Length (mm)	Normal	Abnormal	Comments
100 D	1	22.0 ~~A~~	✓		
	2	21.5			
	3	22.5			
	4	21.0			
	5	22.0			
	6	22.5			
	7	23.0			
	8	21.0			
	9	21.5			
	10	20.5			
	11	21.0			
	12	22.5			
	13	21.0			
	14	20.5			
	15	22.0			
	16	22.0			
	17	21.0			
	18	21.0			
	19	22.0			
	20	21.5			
	21	21.0			
	22	22.0			
	23	22.0			
	24	21.5			
	25	20.5			
	26	19.0	~~✓~~	✓	kyphosis
	27	19.5	~~✓~~	✓	kyphosis
	28	20.5	~~✓~~	✓	yolksac edema
	29	19.5	~~✓~~	✓	extra growth on yolksac
	30				
	31				
	32				
	33				
	34				
	35				

Total wet weight (pooled): 3.27 g

Number of survivors: 29

Number of abnormal/have difficulty swimming: ~~0/0~~ 4/2

Initials: A, YM

Reviewed by: [signature]

Date Reviewed: Aug. 19/21

Embryo - Alevin Test Termination Data Sheet

Length, Wet Weight, Abnormalities

Client: **Teck**

Sample ID: **EV_HC1 + 20 µg/L Cu**

Work Order No.: **210963**

Start Date: **May 19, 2021**

Termination Date: **June 18, 2021**

Treatment (% v/v) and Replicate	Fish	Length (mm)	Normal	Abnormal	Comments
100 A	1	22.0	✓		
	2	21.5			
	3	21.5			
	4	22.0			
	5	20.0			
	6	21.5			
	7	20.5			
	8	21.5			
	9	21.5			
	10	21.0			
	11	20.5			
	12	21.5			
	13	20.0			
	14	19.5			
	15	20.5			
	16	21.5			
	17	21.5			
	18	21.0			
	19	21.5			
	20	21.0			
	21	21.0			
	22	21.5			
	23	21.0			
	24	20.5			
	25	21.0			
	26	21.5			
	27	20.0	✓		
	28	20.0	✓	✓	Kyphosis
	29	17.5		✓	Scoliosis
	30				
	31				
	32				
	33				
	34				
	35				

Total wet weight (pooled): 2.98 g

Number of survivors: 29

Number of abnormal/have difficulty swimming: 2 | 2

Initials: A, MM

Reviewed by: JCM

Date Reviewed: Aug. 19/21

B42169

Embryo - Alevin Test Termination Data Sheet
Length, Wet Weight, Abnormalities

Client: **Teck**

Start Date: **May 19, 2021**

Sample ID: **EV_HC1 + 20 µg/L Cu**

Termination Date: **June 18, 2021**

Work Order No.: **210963**

Treatment (% v/v) and Replicate	Fish	Length (mm)	Normal	Abnormal	Comments
100 C	1	21.5 ~~fm~~	✓		
	2	19.0			
	3	20.0			
	4	20.5			
	5	20.0			
	6	20.0			
	7	20.0			
	8	19.5			
	9	21.0			
	10	20.0			
	11	21.0			
	12	20.0			
	13	20.0			
	14	20.0			
	15	18.0			
	16	20.0			
	17	22.0			
	18	21.0			
	19	20.5			
	20	18.5			
	21	18.0			
	22	16.0			
	23	18.5			
	24				
	25				
	26				
	27				
	28				
	29				
	30				
	31				
	32				
	33				
	34				
	35				

Total wet weight (pooled): 2.02 g

Number of survivors: 23

Number of abnormal/have difficulty swimming: 0/0

Initials: AM

Reviewed by: JCM

Date Reviewed: Aug. 19/21

Embryo - Alevin Test Termination Data Sheet
Length, Wet Weight, Abnormalities

Client: Teck

Sample ID: EV_HC1 + 20 µg/L Cu

Work Order No.: 210963

Start Date: May 19, 2021

Termination Date: June 18, 2021

Treatment (% v/v) and Replicate	Fish	Length (mm)	Normal	Abnormal	Comments
100 D	1	20.0	✓		
	2	21.0			
	3	21.0			
	4	21.5			
	5	21.0			
	6	22.0			
	7	22.0			
	8	20.0			
	9	21.5			
	10	20.0			
	11	19.0			
	12	20.5			
	13	21.0			
	14	22.0			
	15	21.5			
	16	19.5			
	17	20.0			
	18	19.5			
	19	20.0			
	20	20.0			
	21	21.5			
	22	21.5			
	23	21.0			
	24	20.0			
	25	19.0			
	26	21.5			
	27	22.0			
	28	22.0			
	29	20.0			
	30	21.5		✓	Kyphosis
	31				
	32				
	33				
	34				
	35				

Total wet weight (pooled): 3.25 g

Number of survivors: 30

Number of abnormal/have difficulty swimming: 1 / 0

Initials: [illegible]

Reviewed by: [illegible]

Date Reviewed: Aug 19/21

PB-44169

Embryo - Alevin Test Termination Data Sheet
Length, Wet Weight, Abnormalities

Client: **Teck**

Start Date: **May 19, 2021**

Sample ID: **LC_DCDS + 20 µg/L Cu**

Termination Date: **June 18, 2021**

Work Order No.: **210963**

Treatment (% v/v) and Replicate	Fish	Length (mm)	Normal	Abnormal	Comments
100 A	1	21.5	✓		
	2	21.0			
	3	22.0			
	4	21.0			
	5	21.5			
	6	21.0			
	7	21.5			
	8	20.5			
	9	20.0			
	10	21.5			
	11	21.5			
	12	21.5			
	13	21.5			
	14	21.5			
	15	21.5			
	16	21.5			
	17	21.0			
	18	21.0			
	19	21.0			
	20	21.0			
	21	21.0			
	22	20.5			
	23	21.5			
	24	21.0			
	25	21.0			
	26	21.0			
	27	21.0			
	28	21.5			
	29	21.5	✓		
	30				
	31				
	32				
	33				
	34				
	35				

Total wet weight (pooled): 3.02 g

Number of survivors: 29

Number of abnormal/have difficulty swimming: 0 / 0

Initials: A, MW

Reviewed by: JCM

Date Reviewed: Aug-19/21

P3 45/69

Embryo - Alevin Test Termination Data Sheet
Length, Wet Weight, Abnormalities

Client: **Teck**

Sample ID: **LC_DCDS + 20 µg/L Cu**

Work Order No.: **210963**

Start Date: **May 19, 2021**

Termination Date: **June 18, 2021**

Treatment (% v/v) and Replicate	Fish	Length (mm)	Normal	Abnormal	Comments
100 B	1	21.0	✓		
	2	21.0	↓		
	3	20.0	↓		
	4				
	5				
	6				
	7				
	8				
	9				
	10				
	11				
	12				
	13				
	14				
	15				
	16				
	17				
	18				
	19				
	20				
	21				
	22				
	23				
	24				
	25				
	26				
	27				
	28				
	29				
	30				
	31				
	32				
	33				
	34				
	35				

Total wet weight (pooled): 0.28 g

Number of survivors: 3

Number of abnormal/have difficulty swimming: 0 / 0

Initials: [illegible]

Reviewed by: [illegible]

Date Reviewed: Aug. 19/21

PS 46169

Embryo - Alevin Test Termination Data Sheet

Length, Wet Weight, Abnormalities

Client: **Teck**

Start Date: **May 19, 2021**

Sample ID: **LC_DCDS + 20 µg/L Cu**

Termination Date: **June 18, 2021**

Work Order No.: **210963**

Treatment (% v/v) and Replicate	Fish	Length (mm)	Normal	Abnormal	Comments
100 C	1	22.5	✓		
	2	20.0			
	3	22.0			
	4	22.0			
	5	20.0			
	6	22.0			
	7	19.0			
	8	22.0			
	9	21.0			
	10	21.5			
	11	21.0			
	12	23.0			
	13	21.0			
	14	21.0			
	15	21.0			
	16	20.5			
	17	20.0			
	18	20.5			
	19	20.5			
	20	21.0			
	21	23.0			
	22	19.5			
	23	21.0			
	24	20.5			
	25	21.0			
	26	20.5	✓		
	27	16.5		✓	yolksac edema
	28				
	29				
	30				
	31				
	32				
	33				
	34				
	35				

Total wet weight (pooled): 2.65 g

Number of survivors: 27

Number of abnormal/have difficulty swimming: 1/0

Initials: AM

Reviewed by: JCh

Date Reviewed: Aug. 19/21

PS 47/69

Embryo - Alevin Test Termination Data Sheet
Length, Wet Weight, Abnormalities

Client: **Teck**

Start Date: **May 19, 2021**

Sample ID: **LC_DCDS + 20 µg/L Cu**

Termination Date: **June 18, 2021**

Work Order No.: **210963**

Treatment (% v/v) and Replicate	Fish	Length (mm)	Normal	Abnormal	Comments
100 D	1	22.0	✓		
	2	21.5			
	3	20.5			
	4	21.0			
	5	22.5			
	6	22.5			
	7	21.0			
	8	22.0			
	9	22.5			
	10	22.5			
	11	22.5			
	12	21.5			
	13	22.0			
	14	22.0			
	15	22.0			
	16	22.0			
	17	22.0			
	18	21.5			
	19	20.0			
	20	22.5			
	21	22.0			
	22	21.75			
	23	20.5			
	24	23.0			
	25	22.0			
	26	22.0			
	27	21.5			
	28	21.0			
	29	22.0			
	30				
	31				
	32				
	33				
	34				
	35				

Total wet weight (pooled): 3.58 g

Number of survivors: 29

Number of abnormal/have difficulty swimming: 0/0

Initials: AT, YM

Reviewed by: _____

Date Reviewed: _____

PS.48/69

Embryo - Alevin Test Termination Data Sheet
Length, Wet Weight, Abnormalities

Client: **Teck**

Sample ID: **LC_LC3 + 20 µg/L Cu**

Work Order No.: **210963**

Start Date: **May 19, 2021**

Termination Date: **June 18, 2021**

Treatment (% v/v) and Replicate	Fish	Length (mm)	Normal	Abnormal	Comments
100 A	1	~~20~~ 21.5	✓		
	2	20.0			
	3	21.0			
	4	20.5			
	5	21.5			
	6	20.0			
	7	19.5			
	8	21.0			
	9	21.5			
	10	21.0			
	11	21.0			
	12	21.5			
	13	20.5			
	14	21.5			
	15	20.0			
	16	21.5			
	17	21.5			
	18	21.0			
	19	22.0			
	20	22.5			
	21	21.0			
	22	21.0			
	23	21.0			
	24	21.0			
	25	20.5			
	26	21.5			
	27	21.0			
	28				
	29				
	30				
	31				
	32				
	33				
	34				
	35				

Total wet weight (pooled): 2.42 g

Number of survivors: 27

Number of abnormal/have difficulty swimming: 0 / 0

Initials: [illegible]

Reviewed by: [illegible]

Date Reviewed: Aug. 19/21

RS.49169

Embryo - Alevin Test Termination Data Sheet
Length, Wet Weight, Abnormalities

Client: **Teck**

Sample ID: **LC_LC3 + 20 µg/L Cu**

Work Order No.: **210963**

Start Date: **May 19, 2021**

Termination Date: **June 18, 2021**

Treatment (% v/v) and Replicate	Fish	Length (mm)	Normal	Abnormal	Comments
100 C	1	21.0	✓		
	2	20.5			
	3	21.0			
	4	21.0			
	5	21.5			
	6	21.0			
	7	20.0			
	8	22.0			
	9	22.0			
	10	21.0			
	11	22.5			
	12	22.5			
	13	22.5			
	14	21.5			
	15	19.5			
	16	20.0			
	17	21.0			
	18	20.0			
	19	20.0			
	20	21.5			
	21	23.0			
	22	19.5			
	23	21.0			
	24	23.0			
	25	20.0			
	26	22.0			
	27	22.0		✓	scoliosis
	28				
	29				
	30				
	31				
	32				
	33				
	34				
	35	NA			

Total wet weight (pooled): 2.48 g

Number of survivors: 27

Number of abnormal/have difficulty swimming: 1 / 1

Initials: AM

Reviewed by: JOL

Date Reviewed: Aug. 19/21

PB.50/69

Embryo - Alevin Test Termination Data Sheet
Length, Wet Weight, Abnormalities

Client: **Teck**

Sample ID: **LC_LC3 + 20 µg/L Cu**

Work Order No.: **210963**

Start Date: **May 19, 2021**

Termination Date: **June 18, 2021**

Treatment (% v/v) and Replicate	Fish	Length (mm)	Normal	Abnormal	Comments
100 D	1	22.0	✓		
	2	21.0			
	3	21.0			
	4	21.0			
	5	21.0			
	6	20.5			
	7	20.5			
	8	21.5			
	9	21.5			
	10	22.5			
	11	21.0			
	12	19.0			
	13	21.5			
	14	20.5			
	15	22.5			
	16	22.0			
	17	21.0			
	18	19.5			
	19	20.5			
	20	20.5			
	21	19.5			
	22	22.5			
	23	20.0			
	24	22.0			
	25	21.0	✓		
	26	18.5		✓	kyphosis
	27	17.5		✓	yolksac edema
	28				
	29				
	30				
	31				
	32				
	33				
	34				
	35				

Total wet weight (pooled): 3.25 g

Number of survivors: 27

Number of abnormal/have difficulty swimming: 2/1

Initials: AS/MW

Reviewed by: JCH

Date Reviewed: Aug. 19/21

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Embryo - Alevin Test Termination Data Sheet
Length, Wet Weight, Abnormalities

Client: **Teck**

Sample ID: **LC_LC5 + 20 µg/L Cu**

Work Order No.: **210963**

Start Date: **May 19, 2021**

Termination Date: **June 18, 2021**

Treatment (% v/v) and Replicate	Fish	Length (mm)	Normal	Abnormal	Comments
100 A	1	20.0	✓		
	2	21.0			
	3	21.5			
	4	22.0			
	5	22.0			
	6	22.5			
	7	21.0			
	8	20.5			
	9	21.5			
	10	21.5			
	11	21.0			
	12	21.5			
	13	21.0			
	14	21.5			
	15	20.5			
	16	22.0			
	17	20.5			
	18	21.0			
	19	22.0			
	20	21.5			
	21	20.5			
	22	21.0			
	23	20.5			
	24	21.0			
	25	21.0			
	26	21.0			
	27	21.5			
	28	21.5			
	29				
	30				
	31				
	32				
	33				
	34				
	35				

Total wet weight (pooled): 2.79 g

Number of survivors: 28

Number of abnormal/have difficulty swimming: 0/0

Initials: A, YM

Reviewed by: JGh

Date Reviewed: Aug. 19/21

Embryo - Alevin Test Termination Data Sheet
Length, Wet Weight, Abnormalities

Client: **Teck**

Sample ID: **LC_LC5 + 20 µg/L Cu**

Work Order No.: **210963**

Start Date: **May 19, 2021**

Termination Date: **June 18, 2021**

Treatment (% v/v) and Replicate	Fish	Length (mm)	Normal	Abnormal	Comments
100 C	1	~~21.5~~ A	✓		
	2	22.5			
	3	21.5			
	4	19.5			
	5	20.5			
	6	20.0			
	7	22.0			
	8	22.5			
	9	20.5			
	10	21.5			
	11	21.0			
	12	20.0			
	13	20.5			
	14	21.0			
	15	19.0			
	16	22.0			
	17	21.0			
	18	19.5			
	19	21.5			
	20	22.0			
	21	20.0			
	22	21.0	~		
	23	~~20.5~~ A			
	24				
	25				
	26				
	27				
	28				
	29				
	30				
	31				
	32				
	33				
	34				
	35				

Total wet weight (pooled): 1.90 g

Number of survivors: 22

Number of abnormal/have difficulty swimming: 0 / 0

Initials: ~~A~~, MM

Reviewed by: JCh

Date Reviewed: Aug. 19/21

R&S3169

Embryo - Alevin Test Termination Data Sheet
Length, Wet Weight, Abnormalities

Client: **Teck**

Sample ID: **LC_LC5 + 20 µg/L Cu**

Work Order No.: **210963**

Start Date: **May 19, 2021**

Termination Date: **June 18, 2021**

Treatment (% v/v) and Replicate	Fish	Length (mm)	Normal	Abnormal	Comments
100 D	1	20.5	✓		
	2	21.0			
	3	22.0			
	4	19.0			
	5	21.0			
	6	21.5			
	7	21.0			
	8	22.0			
	9	21.5			
	10	21.0			
	11	21.5			
	12	22.0			
	13	21.5			
	14	20.5			
	15	19.0			
	16	21.5			
	17	21.0			
	18	~22.5			
	19	22.0			
	20	21.5	✓		
	21				
	22				
	23				
	24				
	25				
	26				
	27				
	28				
	29				
	30				
	31				
	32				
	33				
	34				
	35				

Total wet weight (pooled): 2.53 g

Number of survivors: 20

Number of abnormal/have difficulty swimming: 0/0

Initials: A, MW

Reviewed by: JBh

Date Reviewed: Aug. 19/21

PB-54169

Embryo - Alevin Test Termination Data Sheet
Length, Wet Weight, Abnormalities

Client: **Teck**

Sample ID: **LC_LCDSSLCC + 20 µg/L Cu**

Work Order No.: **210963**

Start Date: **May 19, 2021**

Termination Date: **June 18, 2021**

Treatment (% v/v) and Replicate	Fish	Length (mm)	Normal	Abnormal	Comments
100 A	1	21.5	✓		
	2	21.5			
	3	21.5			
	4	20.5			
	5	20.0			
	6	22.0			
	7	21.0			
	8	21.5			
	9	22.0			
	10	21.5			
	11	22.0			
	12	21.5			
	13	20.5			
	14	22.0			
	15	22.0			
	16	21.5			
	17	20.5			
	18	21.0			
	19	21.0			
	20	20.5			
	21	21.0			
	22	22.0			
	23	21.5			
	24	21.5			
	25	21.0			
	26	22.0			
	27	21.5			
	28	16.5		✓	yolksac edema
	29				
	30				
	31				
	32				
	33				
	34				
	35				

Total wet weight (pooled): 3.18 g

Number of survivors: 28

Number of abnormal/have difficulty swimming: 1 0 1 0

Initials: AS, MM

Reviewed by: JCh

Date Reviewed: Aug-19/21

PB.55169

Embryo - Alevin Test Termination Data Sheet
Length, Wet Weight, Abnormalities

Client: Teck

Sample ID: LC_LCDSSLCC + 20 µg/L Cu

Work Order No.: 210963

Start Date: May 19, 2021

Termination Date: June 18, 2021

Treatment (% v/v) and Replicate	Fish	Length (mm)	Normal	Abnormal	Comments
100 C	1	~~✓~~ 21.0	✓		
	2	22.0			
	3	22.0			
	4	19.0			
	5	21.0			
	6	21.0			
	7	19.5			
	8	22.0			
	9	23.0			
	10	20.5			
	11	21.5			
	12	21.0			
	13	19.5			
	14	22.5			
	15	21.0			
	16	23.0			
	17	21.0			
	18	19.5			
	19	21.0			
	20	22.0			
	21	21.5			
	22	21.5			
	23	22.0			
	24	19.0			
	25	20.5			
	26	20.5			
	27	20.5			
	28	20.0			
	29	20.5			
	30				
	31				
	32				
	33				
	34				
	35				

Total wet weight (pooled): 2.83 g

Number of survivors: 29

Number of abnormal/have difficulty swimming: 0/0

Initials: A. [illegible]

Reviewed by: [illegible]

Date Reviewed: Aug. 19/21

Pg. 56/69

Embryo - Alevin Test Termination Data Sheet
Length, Wet Weight, Abnormalities

Client: **Teck**

Sample ID: **LC_LCDSSLCC + 20 µg/L Cu**

Work Order No.: **210963**

Start Date: **May 19, 2021**

Termination Date: **June 18, 2021**

Treatment (% v/v) and Replicate	Fish	Length (mm)	Normal	Abnormal	Comments
100 D	1	21.0	✓		
	2	22.0			
	3	21.0			
	4	21.0			
	5	22.0			
	6	19.5			
	7	21.0			
	8	21.5			
	9	21.5			
	10	22.0			
	11	22.0			
	12	20.5			
	13	21.0			
	14	21.5			
	15	21.5			
	16	22.0			
	17	21.0			
	18	21.5			
	19	21.5			
	20	20.0			
	21	21.0			
	22	20.0			
	23	20.0			
	24	22.0			
	25	21.0			
	26	19.5			
	27	21.0			
	28				
	29				
	30				
	31				
	32				
	33				
	34				
	35				

Total wet weight (pooled): 3.33 g

Number of survivors: 27

Number of abnormal/have difficulty swimming: 0/0

Initials: [illegible]

Reviewed by: [illegible]

Date Reviewed: Aug. 19/21

RS 57/69

Embryo - Alevin Test Termination Data Sheet
Length, Wet Weight, Abnormalities

Client: **Teck**

Sample ID: **FR_FR4 + 20 µg/L Cu**

Work Order No.: **210963**

Start Date: **May 19, 2021**

Termination Date: **June 18, 2021**

Treatment (% v/v) and Replicate	Fish	Length (mm)	Normal	Abnormal	Comments
100 A	1	21.0	✓		
	2	21.0			
	3	21.0			
	4	21.0			
	5	22.5			
	6	19.5			
	7	19.0			
	8	20.0			
	9	21.0			
	10	22.0			
	11	21.0			
	12	20.0			
	13	22.5			
	14	21.0			
	15	20.0			
	16	20.0			
	17	21.0			
	18	21.0			
	19	19.0			
	20	22.0			
	21	21.0			
	22	22.0			
	23	21.0			
	24	20.0			
	25	19.0		✓	kyphosis
	26	20.5		✓	kyphosis
	27	20.5		✓	yolksac edema
	28				
	29				
	30				
	31				
	32				
	33				
	34				
	35				

Total wet weight (pooled): 2.93 g

Number of survivors: 27

Number of abnormal/have difficulty swimming: 3/2

Initials: A. MM

Reviewed by: JCh

Date Reviewed: Aug. 19/21

PS58169

Embryo - Alevin Test Termination Data Sheet
Length, Wet Weight, Abnormalities

Client: **Teck**

Sample ID: **FR_FR4 + 20 µg/L Cu**

Work Order No.: **210963**

Start Date: **May 19, 2021**

Termination Date: **June 18, 2021**

Treatment (% v/v) and Replicate	Fish	Length (mm)	Normal	Abnormal	Comments
100 B	1	~~20.0~~	✓		
	2	19.0	✓		
	3				
	4				
	5				
	6				
	7				
	8				
	9				
	10				
	11				
	12				
	13				
	14				
	15				
	16				
	17				
	18				
	19				
	20				
	21				
	22				
	23				
	24				
	25				
	26				
	27				
	28				
	29				
	30				
	31				
	32				
	33				
	34				
	35				

Total wet weight (pooled): 0.21 g

Number of survivors: 2

Number of abnormal/have difficulty swimming: 0 | 0

Initials: ~~A~~ AM

Reviewed by: JCh

Date Reviewed: Aug. 19/21

Embryo - Alevin Test Termination Data Sheet
Length, Wet Weight, Abnormalities

Client: **Teck**

Sample ID: **FR_FR4 + 20 µg/L Cu**

Work Order No.: **210963**

Start Date: **May 19, 2021**

Termination Date: **June 18, 2021**

Treatment (% v/v) and Replicate	Fish	Length (mm)	Normal	Abnormal	Comments
100 C	1	20.5	✓		
	2	22.5			
	3	21.5			
	4	21.0			
	5	20.5			
	6	20.0			
	7	20.5			
	8	22.0			
	9	20.5			
	10	20.0			
	11	20.5			
	12	22.0			
	13	21.5			
	14	20.5			
	15	23.0			
	16	18.5			
	17	21.0			
	18	19.0			
	19	20.5			
	20	21.0			
	21	19.0			
	22	19.0			
	23	20.5			
	24	20.5			
	25	20.0	↓		
	26				
	27				
	28				
	29				
	30				
	31				
	32				
	33				
	34				
	35				

Total wet weight (pooled): 2.35g

Number of survivors: 25

Number of abnormal/have difficulty swimming: 0 / 0

Initials: AWD / YYL

Reviewed by: JGH

Date Reviewed: Aug. 19/21

Embryo - Alevin Test Termination Data Sheet
Length, Wet Weight, Abnormalities

Client: **Teck**

Sample ID: **FR_FR4 + 20 µg/L Cu**

Work Order No.: **210963**

Start Date: **May 19, 2021**

Termination Date: **June 18, 2021**

Treatment (% v/v) and Replicate	Fish	Length (mm)	Normal	Abnormal	Comments
100 D	1	21.5	✓		
	2	22.0			
	3	20.5			
	4	20.5			
	5	21.0			
	6	20.0			
	7	21.0			
	8	20.0			
	9	20.0			
	10	20.5			
	11	20.5			
	12	21.0			
	13	21.0			
	14	21.5			
	15	20.5			
	16	21.5			
	17	20.5			
	18	21.0			
	19	21.5			
	20	21.0			
	21	21.0			
	22	20.5			
	23	21.5			
	24	20.0		✓	yolksac edema
	25				
	26				
	27				
	28				
	29				
	30				
	31				
	32				
	33				
	34				
	35				

Total wet weight (pooled): 2.16 g

Number of survivors: 24

Number of abnormal/have difficulty swimming: 1/0

Initials: AS, HM

Reviewed by: JCH

Date Reviewed: Aug. 19/21

PS 61/69

Embryo - Alevin Test Termination Data Sheet
Length, Wet Weight, Abnormalities

Client: **Teck**

Sample ID: **FR_FRRD + 20 µg/L Cu**

Work Order No.: **210963**

Start Date: **May 19, 2021**

Termination Date: **June 18, 2021**

Treatment (% v/v) and Replicate	Fish	Length (mm)	Normal	Abnormal	Comments
100 A	1	20.5	✓		
	2	20.0			
	3	22.0			
	4	19.5			
	5	20.0			
	6	21.0			
	7	19.5			
	8	19.0			
	9	18.0			
	10	21.0			
	11	21.5			
	12	21.5			
	13	20.0			
	14	20.0			
	15	19.5			
	16	20.0			
	17	20.0			
	18	21.5			
	19	21.0			
	20	20.0			
	21	20.0			
	22	20.0			
	23	20.5			
	24	20.0			
	25	21.0			
	26	20.0			
	27	19.5			
	28	20.5	✓		
	29				
	30				
	31				
	32				
	33				
	34				
	35				

Total wet weight (pooled): 2.39 g

Number of survivors: 28

Number of abnormal/have difficulty swimming: 0 / 0

Initials: AM

Reviewed by: JCh

Date Reviewed: Aug. 19/21

P3.62/69

Embryo - Alevin Test Termination Data Sheet
Length, Wet Weight, Abnormalities

Client: **Teck**

Start Date: **May 19, 2021**

Sample ID: **FR_FRRD + 20 µg/L Cu**

Termination Date: **June 18, 2021**

Work Order No.: **210963**

Treatment (% v/v) and Replicate	Fish	Length (mm)	Normal	Abnormal	Comments
100 C	1	22.0	✓		
	2	22.0			
	3	22.5			
	4	21.0			
	5	20.5			
	6	20.0			
	7	19.5			
	8	21.5			
	9	21.0			
	10	21.5			
	11	20.0			
	12	22.0			
	13	21.0			
	14	21.0			
	15	20.0			
	16	19.0			
	17	21.5			
	18	22.0			
	19	20.0			
	20	20.0			
	21	20.0		✓	yolksac edema
	22				
	23				
	24				
	25				
	26				
	27				
	28				
	29				
	30				
	31				
	32				
	33				
	34				
	35				

Total wet weight (pooled): 1.85 g

Number of survivors: 21

Number of abnormal/have difficulty swimming: 1/0

Initials: [illegible]

Reviewed by: [illegible]

Date Reviewed: Aug. 19/21

Embryo - Alevin Test Termination Data Sheet
Length, Wet Weight, Abnormalities

Client: **Teck**

Sample ID: **FR_FRRD + 20 µg/L Cu**

Work Order No.: **210963**

Start Date: **May 19, 2021**

Termination Date: **June 18, 2021**

Treatment (% v/v) and Replicate	Fish	Length (mm)	Normal	Abnormal	Comments
100 D	1	23.0 A	✓		
	2	20.0			
	3	22.0			
	4	21.0			
	5	21.0			
	6	22.5			
	7	21.0			
	8	20.5			
	9	20.5			
	10	22.0			
	11	20.5			
	12	20.5			
	13	20.5			
	14	20.0			
	15	23.0			
	16	17.5			
	17	21.5			
	18	18.0			
	19	21.5			
	20	22.0			
	21	18.0			
	22	21.5			
	23	22.0			
	24	21.5			
	25	18.5	✓		
	26	18.0		✓	yolksac edema
	27	18.0		✓	yolksac edema
	28				
	29				
	30				
	31				
	32				
	33				
	34				
	35				

Total wet weight (pooled): 2.99 g

Number of survivors: 27

Number of abnormal/have difficulty swimming: 2 / 0

Initials: A, MM

Reviewed by: JCH

Date Reviewed: Aug. 19/21

RS 64/69

Embryo - Alevin Test Termination Data Sheet
Length, Wet Weight, Abnormalities

Client: **Teck**

Sample ID: **FR_FR2 + 20 µg/L Cu**

Work Order No.: **210963**

Start Date: **May 19, 2021**

Termination Date: **June 18, 2021**

Treatment (% v/v) and Replicate	Fish	Length (mm)	Normal	Abnormal	Comments
100 A	1	20.0	✓		
	2	20.0			
	3	20.5			
	4	20.5			
	5	21.0			
	6	20.0			
	7	20.5			
	8	21.0			
	9	20.0			
	10	21.0			
	11	20.0			
	12	19.0			
	13	19.5			
	14	20.5			
	15	20.0			
	16	21.0			
	17	20.5			
	18	20.5			
	19	19.5			
	20	21.0			
	21	21.0			
	22	21.0			
	23	20.5			
	24	19.5			
	25	21.0			
	26	21.5			
	27	21.5			
	28				
	29				
	30				
	31				
	32				
	33				
	34				
	35				

Total wet weight (pooled): 2.45 g

Number of survivors: 27

Number of abnormal/have difficulty swimming: 0/0

Initials: [illegible]

Reviewed by: [illegible]

Date Reviewed: Aug. 19/21

PJ.65/69

Embryo - Alevin Test Termination Data Sheet
Length, Wet Weight, Abnormalities

Client: **Teck**

Sample ID: **FR_FR2 + 20 µg/L Cu**

Work Order No.: **210963**

Start Date: **May 19, 2021**

Termination Date: **June 18, 2021**

Treatment (% v/v) and Replicate	Fish	Length (mm)	Normal	Abnormal	Comments
100 C	1	~~18.5~~	✓		
	2	21.0			
	3	22.0			
	4	21.0			
	5	19.0			
	6	20.5			
	7	20.0			
	8	21.5			
	9	22.0			
	10	20.0			
	11	23.0			
	12	20.5			
	13	19.5			
	14	22.5			
	15	20.0			
	16	22.0			
	17	22.0			
	18	18.5			
	19	20.5			
	20	20.0			
	21	20.0			
	22	20.0			
	23	18.5			
	24	20.0			
	25				
	26				
	27				
	28				
	29				
	30				
	31				
	32				
	33				
	34				
	35				

Total wet weight (pooled): 2.09 g

Number of survivors: 24

Number of abnormal/have difficulty swimming: 0 / 0

Initials: AJ, MM

Reviewed by: JCh

Date Reviewed: Aug. 19/21

RS.66/69

Embryo - Alevin Test Termination Data Sheet
Length, Wet Weight, Abnormalities

Client: **Teck**

Sample ID: **FR_FR2 + 20 µg/L Cu**

Work Order No.: **210963**

Start Date: **May 19, 2021**

Termination Date: **June 18, 2021**

Treatment (% v/v) and Replicate	Fish	Length (mm)	Normal	Abnormal	Comments
100 D	1	21.5 A	✓		
	2	23.0			
	3	22.0			
	4	20.0			
	5	21.5			
	6	21.0			
	7	21.5			
	8	20.50 A			
	9	20.5			
	10	20.5			
	11	22.0			
	12	22.0			
	13	22.0			
	14	22.0			
	15	21.0			
	16	21.0			
	17	22.5			
	18	19.5			
	19	22.0			
	20	22.5			
	21	21.5			
	22	22.0			
	23	20.0			
	24	21.5			
	25	22.0			
	26	20.5			
	27	20.5	✓		
	28				
	29				
	30				
	31				
	32				
	33				
	34				
	35				

Total wet weight (pooled): 3.09 g

Number of survivors: 27

Number of abnormal/have difficulty swimming: 0 | 0

Initials: A, MM

Reviewed by: JCM

Date Reviewed: Aug. 19/21

PS 67/69

Embryo - Alevin Test Termination Data Sheet
Length, Wet Weight, Abnormalities

Client: **Teck**

Sample ID: **FR_MULTIPLATE + 20 µg/L Cu**

Work Order No.: **210963**

Start Date: **May 19, 2021**

Termination Date: **June 18, 2021**

Treatment (% v/v) and Replicate	Fish	Length (mm)	Normal	Abnormal	Comments
100 A	1	20.0	✓		
	2	20.5			
	3	20.5			
	4	20.5			
	5	20.5			
	6	21.0			
	7	20.5			
	8	18.5			
	9	21.0			
	10	21.0			
	11	20.5			
	12	21.5			
	13	18.5			
	14	19.0			
	15	21.0			
	16	21.0			
	17	20.5			
	18	21.0			
	19	21.5			
	20	21.0			
	21	19.5			
	22	19.5			
	23	20.0			
	24	20.5			
	25	21.0			
	26	20.5			
	27	20.0	✓		
	28				
	29				
	30				
	31				
	32				
	33				
	34				
	35				

Total wet weight (pooled): 2.51 g

Number of survivors: 27

Number of abnormal/have difficulty swimming: 0 | 0

Initials: [signature]

Reviewed by: [signature]

Date Reviewed: Aug. 19/21

Embryo - Alevin Test Termination Data Sheet
Length, Wet Weight, Abnormalities

Client: **Teck**

Sample ID: **FR_MULTIPLATE + 20 µg/L Cu**

Work Order No.: **210963**

Start Date: **May 19, 2021**

Termination Date: **June 18, 2021**

Treatment (% v/v) and Replicate	Fish	Length (mm)	Normal	Abnormal	Comments
100 C	1	21.0	✓		
	2	21.5			
	3	18.5			
	4	20.5			
	5	20.0			
	6	19.0			
	7	19.5			
	8	20.0			
	9	21.0			
	10	20.0			
	11	19.5			
	12	21.5			
	13	20.0			
	14	22.5			
	15	21.0			
	16	22.0			
	17	21.5			
	18	20.5			
	19	21.0			
	20	22.0			
	21	19.5			
	22	18.5			
	23	18.5		✓	extra growth on head
	24	19.5		✓	yolk sac edema
	25				
	26				
	27				
	28				
	29				
	30				
	31				
	32				
	33				
	34				
	35				

Total wet weight (pooled): 2.723

Number of survivors: 24

Number of abnormal/have difficulty swimming: 2 | 0

Initials: AS, MW

Reviewed by: JCh

Date Reviewed: Aug. 19/21

Embryo - Alevin Test Termination Data Sheet
Length, Wet Weight, Abnormalities

Client: **Teck**

Sample ID: **FR_MULTIPLATE + 20 µg/L Cu**

Work Order No.: **210963**

Start Date: **May 19, 2021**

Termination Date: **June 18, 2021**

Treatment (% v/v) and Replicate	Fish	Length (mm)	Normal	Abnormal	Comments
100 D	1	20.0 ~~20.5~~	✓		
	2	21.0			
	3	21.0			
	4	22.5			
	5	22.5			
	6	20.0			
	7	20.0			
	8	20.5			
	9	21.0			
	10	22.0			
	11	22.5			
	12	21.5			
	13	22.5			
	14	22.0			
	15	22.5			
	16	~~20~~ 23.0			
	17	21.0			
	18	22.0			
	19	21.0			
	20	20.0			
	21	20.0			
	22	23.0		✓	YP/RSac edema
	23	19.0		✓	kyphosis
	24				
	25				
	26				
	27				
	28				
	29				
	30				
	31				
	32				
	33				
	34				
	35				

Total wet weight (pooled): 2.61 g

Number of survivors: 23

Number of abnormal/have difficulty swimming: 2 / 1

Initials: ~~AY~~ YM

Reviewed by: [signature]

Date Reviewed: Aug. 19/21

23.1/11

Embryo-Alevin Test - Lengths, Wet Weights, Normality Assessment

Client: Teck WO#:210963

	DECHLOR CONTROL				DECHLOR + 20 µg/L Cu			
Fish #	**A**	**B**	**C**	**D**	**A**	**B**	**C**	**D**
1	19.5		20.0	20.5	20.0	20.5	19.5	21.0
2	19.5		22.0	21.0	19.5		21.0	21.0
3	19.5		22.0	20.5	19.5		21.5	22.0
4	19.5		21.5	20.0	21.0		21.5	19.0
5	19.0		20.0	19.5	18.5		19.5	21.0
6	18.5		21.0	21.0	18.0		21.0	22.0
7	18.5		20.0	20.0	21.0		20.0	20.0
8	20.0		20.5	21.0	21.0		19.0	21.5
9	19.5		19.5	19.0	20.0		21.0	20.0
10	19.5		20.5	21.0	21.0		21.0	20.0
11	19.5		21.0	18.5	21.0		22.5	20.5
12	19.5		21.0	19.5	20.5		19.5	20.5
13	20.0		21.0	17.0	20.0		21.0	20.0
14	19.0		21.5	21.5	21.0		21.0	20.5
15	19.5		20.0	21.0	20.5		19.5	21.5
16	20.5		20.0	20.5	21.0		19.0	20.0
17	19.0		20.0	19.5	20.5		21.0	18.5
18	19.5		20.0	20.0	21.0		20.5	20.0
19	19.5		18.5	21.0	20.5		20.0	18.5
20	20.0		21.5	20.5	20.0		20.0	
21	21.0		20.0	20.5	20.0		17.0	
22	19.5		21.0	20.5	18.5		18.0	
23	20.5		21.0	21.0	21.0		17.0	
24	20.5		17.0	20.5	21.0			
25	19.5			20.0	20.0			
26	19.5			19.0	16.0			
27	19.5			21.0				
28	19.5			18.0				
29	16.0			18.5				
30	16.5			18.0				
31								
# Survivors	30	0	24	30	26	1	23	19
Average Length (mm)	**19.367**	**#DIV/0!**	**20.438**	**19.983**	**20.077**	**20.500**	**20.043**	**20.395**
Pooled Weight (g)	2.11	0.00	1.99	2.83	1.90	0.12	2.00	1.85
Pooled Weight (mg)	**2110**	**0**	**1990**	**2830**	**1900**	**120**	**2000**	**1850**
Average Weight (g)	0.070	#DIV/0!	0.083	0.094	0.073	0.120	0.087	0.097
= abnormal								

Aug-19/21

AB. 2/11

Embryo - Alevin Test - Lengths, Wet Weights, Normality Assessment

Client: Teck WO#: 210963

	FR_UFR1 + 20 µg/L Cu				GH_ER2 + 20 µg/L Cu			
Fish #	**100 A**	**100 B**	**100 C**	**100 D**	**100 A**	**100 B**	**100 C**	**100 D**
1	20.5		21.5	21.5	21.0		21.0	20.5
2	21.5		20.0	20.0	21.5		20.0	20.5
3	21.0		21.0	21.5	21.0		21.5	20.0
4	21.0		21.0	20.0	20.0		20.0	20.5
5	20.5		21.5	20.0	20.5		21.0	21.5
6	21.5		20.0	21.5	20.0		21.0	20.5
7	20.5		21.0	21.5	21.5		20.5	21.0
8	20.5		22.5	22.5	21.5		22.0	21.5
9	20.5		18.5	21.0	21.5		19.0	22.0
10	21.5		22.0	22.0	21.0		19.0	20.5
11	21.0		21.0	20.5	21.0		20.5	20.0
12	19.5		21.0	20.0	20.0		19.0	20.0
13	20.5		21.5	21.0	20.5		21.5	21.0
14	21.5		20.5	21.0	21.5		17.0	20.5
15	19.0		20.5	20.5	21.0		20.5	20.0
16	20.0		20.0	22.5	21.5		19.5	20.5
17	20.5		20.5	21.5	21.0		21.0	21.0
18	20.5		22.5	21.0	21.0		21.0	20.5
19	20.0		20.5	22.0	21.0		16.5	19.5
20	20.5		21.0	21.5	21.0		18.5	22.0
21	21.0		22.5	22.0	21.0		16.5	20.5
22	20.0		20.5	20.5	20.0		22.5	21.5
23	21.0		22.0	21.0	20.5		21.0	21.0
24	21.0		21.0	18.5	20.0		16.5	20.5
25	21.5		21.0	21.5	21.5		18.0	17.0
26	21.0		19.5	21.0			16.5	20.0
27	21.5			19.5			19.0	20.0
28	20.0			20.5			21.0	20.5
29	20.5			19.5				
30	16.0							
31								
# Survivors	30	0	26	29	25	0	28	28
Average Length (mm)	**20.517**	**#DIV/0!**	**20.942**	**20.931**	**20.880**	**#DIV/0!**	**19.679**	**20.518**
Pooled Weight (g)	2.37	0.00	2.09	2.99	2.26	0.00	2.48	3.20
Pooled Weight (mg)	**2370**	**0**	**2090**	**2990**	**2260**	**0**	**2480**	**3200**
Average Weight (g)	0.079	#DIV/0!	0.080	0.103	0.090	#DIV/0!	0.089	0.114

= abnormal

JCW Aug. 20/21

ns. 3/11

Embryo - Alevin Test - Lengths, Wet Weights, Normality Assessment

Client: Teck WO#: 210963

	CM_MC1 + 20 µg/L Cu				LC_SLC + 20 µg/L Cu			
Fish #	**100 A**	**100 B**	**100 C**	**100 D**	**100 A**	**100 B**	**100 C**	**100 D**
1	21.5	21.5	20.0	22.0	20.0		21.0	20.0
2	21.0		21.5	20.0	21.0		19.0	19.5
3	21.5		22.0	22.0	19.5		20.0	21.0
4	21.0		19.5	22.0	20.0		21.0	20.0
5	21.5		21.5	20.5	20.5		21.5	19.5
6	21.5		20.0	19.5	21.0		22.0	19.0
7	21.0		20.0	22.0	19.5		21.0	21.0
8	21.0		21.5	19.5	19.5		20.5	21.5
9	21.5		20.0	22.0	19.0		20.0	21.0
10	20.5		22.0	21.0	20.5		19.5	20.5
11	21.0		19.5	21.5	21.0		21.5	20.5
12	21.5		21.5	21.0	20.0		20.5	19.0
13	21.5		21.0	21.5	20.0		20.0	20.5
14	21.0		21.5	21.5	19.5		21.0	19.5
15	21.0		20.5	21.0	20.0		21.5	20.0
16	21.0		19.5	21.0	20.0		21.0	19.0
17	20.5		22.0	20.5	19.5		21.5	21.0
18	20.5		20.0	21.0	20.0		21.0	20.5
19	20.5		20.5	20.5	19.5		21.0	21.0
20	21.0		20.5	20.0	19.5		19.0	20.5
21	20.5		19.0	21.0	20.0		22.5	20.0
22	20.5		20.0	17.0	19.5		22.5	19.0
23	20.5		20.5	22.5	20.0		21.0	20.0
24	20.0		20.0	21.5	20.0			20.0
25	20.5		20.5	20.5	20.0			18.0
26	21.5		18.5	20.5	20.0			20.0
27	21.0			20.0	19.5			18.5
28	19.5			20.0	19.0			
29				19.5	20.0			
30				19.5				
31								
# Survivors	28	1	26	30	29	0	23	27
Average Length (mm)	**20.911**	**21.500**	**20.500**	**20.733**	**19.914**	**#DIV/0!**	**20.848**	**20.000**
Pooled Weight (g)	2.31	0.12	2.37	3.09	2.49	0.00	2.34	2.65
Pooled Weight (mg)	**2310**	**120**	**2370**	**3090**	**2490**	**0**	**2340**	**2650**
Average Weight (g)	0.083	0.120	0.091	0.103	0.086	#DIV/0!	0.102	0.098

= abnormal

JCW Aug 19/21

Embryo - Alevin Test - Lengths, Wet Weights, Normality Assessment

Client: Teck WO#: 210963

	FR_FRABCH + 20 µg/L Cu				FR_FRCP1 + 20 µg/L Cu			
Fish #	**100 A**	**100 B**	**100 C**	**100 D**	**100 A**	**100 B**	**100 C**	**100 D**
1	21.0		21.0	21.0	20.5	20.0	21.5	20.0
2	21.0		18.0	21.0	20.0		19.0	22.0
3	21.0		21.0	21.0	20.0		18.5	20.0
4	21.5		20.5	20.5	21.0		20.0	18.0
5	20.5		19.0	20.0	21.0		21.0	20.5
6	20.5		20.0	19.0	20.5		20.5	20.0
7	22.0		20.0	20.0	20.0		20.0	21.5
8	22.0		22.0	21.0	21.0		20.0	21.5
9	22.0		21.5	21.0	20.5		18.0	20.0
10	21.5		20.5	21.0	20.0		19.0	20.5
11	21.5		22.0	20.5	21.0		20.0	20.0
12	21.0		21.0	21.0	20.5		20.0	21.0
13	21.0		19.5	20.5	20.0		20.5	21.0
14	21.0		21.0	20.5	20.0		20.5	21.5
15	21.5		21.5	22.0	21.0		20.0	22.0
16	21.5		20.5	21.0	20.0		22.0	22.0
17	21.5		17.0	21.0	21.5		20.0	21.0
18	21.0		21.0	21.0	20.5		19.0	21.0
19	21.0		22.5	22.0	21.0		18.5	19.0
20	21.5		20.0	22.5	21.0		21.5	20.0
21	20.5		19.0	21.5	19.5		18.5	20.0
22	20.0		20.0	20.0	20.0		19.0	21.5
23	20.5		21.5	20.5	20.0		19.5	21.5
24	20.5		19.0	20.5	20.5		20.0	21.5
25	20.5		19.0	19.5	20.5		19.0	19.0
26	19.5		18.0	19.5	21.5		19.5	20.0
27	21.0			18.5	18.0		19.0	21.0
28							20.0	
29								
30								
31								
# Survivors	27	0	26	27	27	1	28	27
Average Length (mm)	**21.037**	**#DIV/0!**	**20.231**	**20.648**	**20.407**	**20.000**	**19.786**	**20.630**
Pooled Weight (g)	2.39	0.00	2.51	3.06	2.34	0.14	2.77	2.84
Pooled Weight (mg)	**2390**	**0**	**2510**	**3060**	**2340**	**140**	**2770**	**2840**
Average Weight (g)	0.089	#DIV/0!	0.097	0.113	0.087	0.140	0.099	0.105
= abnormal								

JCH Aug. 20/21

M.5/11

Embryo - Alevin Test - Lengths, Wet Weights, Normality Assessment

Client: Teck WO#: 210963

	GH_FR1 + 20 µg/L Cu				GH_ERC + 20 µg/L Cu			
Fish #	**100 A**	**100 B**	**100 C**	**100 D**	**100 A**	**100 B**	**100 C**	**100 D**
1	21.0	20.5	20.0	21.0	21.5		22.0	21.5
2	21.0	22.0	19.0	21.5	21.0		21.0	18.5
3	20.0		19.5	21.5	20.5		22.0	22.0
4	20.5		20.0	18.5	21.0		18.0	20.5
5	21.0		20.0	21.5	19.0		22.5	21.0
6	20.0		21.5	21.0	22.0		20.5	21.5
7	21.0		22.5	21.0	21.5		22.0	22.5
8	21.0		20.5	19.5	21.5		20.5	21.5
9	20.5		20.0	22.5	21.5		20.0	20.5
10	21.5		18.0	20.5	21.5		19.5	20.5
11	20.5		22.0	21.5	21.5		20.5	21.0
12	21.0		20.0	20.0	20.0		19.5	22.5
13	21.0		20.5	20.5	20.5		21.0	21.0
14	20.0		20.5	20.5	20.5		20.0	19.5
15	21.0		20.5	21.0	20.5		22.0	22.5
16	21.0		22.0	21.0	20.5		20.5	21.0
17	19.5		21.5	21.5	21.5		21.0	21.5
18	20.0		21.5	20.5	21.0		21.5	20.5
19	21.5		21.0	20.5	21.5		22.0	21.0
20	22.0		17.0	21.0	21.5		20.5	20.0
21	21.0		20.5	21.0	21.0		21.0	20.5
22	22.0			20.5	21.0		21.0	20.5
23	21.0			20.0	21.0		22.0	20.5
24	22.0			20.5	21.0		22.5	20.0
25	21.5			20.0	20.5			21.0
26	17.0			22.0	21.0			20.0
27				21.5	22.0			21.0
28					19.0			21.5
29								21.0
30								
31								
# Survivors	26	2	21	27	28	0	24	29
Average Length (mm)	**20.750**	**21.250**	**20.381**	**20.815**	**20.946**	**#DIV/0!**	**20.958**	**20.914**
Pooled Weight (g)	2.44	0.26	1.92	2.98	2.79	0.00	2.36	3.43
Pooled Weight (mg)	**2440**	**260**	**1920**	**2980**	**2790**	**0**	**2360**	**3430**
Average Weight (g)	0.094	0.130	0.091	0.110	0.100	#DIV/0!	0.098	0.118
= abnormal								

JCole Aug. 20/21

Pg. 6/11

Embryo - Alevin Test - Lengths, Wet Weights, Normality Assessment

Client: Teck WO#: 210963

	CM_MC2 + 20 µg/L Cu				EV_MC2 + 20 µg/L Cu			
Fish #	**100 A**	**100 B**	**100 C**	**100 D**	**100 A**	**100 B**	**100 C**	**100 D**
1	21.5		18.0	21.0	21.0		22.0	22.0
2	22.5		21.5	22.0	20.0		20.0	21.5
3	20.0		20.0	20.0	19.5		18.0	22.5
4	20.5		21.0	21.0	20.5		20.0	21.0
5	21.5		21.0	21.5	21.5		22.0	22.0
6	20.5		21.5	22.0	21.0		22.0	22.5
7	22.0		20.5	21.5	22.5		20.0	23.0
8	21.5		22.0	21.0	20.5		21.0	21.0
9	21.0		20.0	22.0	20.5		21.5	21.5
10	20.5		20.0	21.5	21.0		20.0	20.5
11	20.5		19.0	19.5	20.0		18.0	21.0
12	22.0		19.0	22.5	21.0		21.5	22.5
13	20.5		20.5	21.5	21.0		20.0	21.0
14	20.5		21.0	21.5	20.0		21.0	20.5
15	21.0		20.0	22.0	21.0		22.0	22.0
16	20.0		20.5	22.0	21.0		22.0	22.0
17	20.5		20.0	22.0	21.0		21.5	21.0
18	20.5		20.5	21.0	20.5		22.5	21.0
19	20.0		21.0	21.0	21.0		21.5	22.0
20	21.0		20.0	21.5	21.0		21.5	21.5
21	19.5		20.5	21.0	21.0		21.0	21.0
22	20.0		20.0	22.0	19.5		18.0	22.0
23	21.0		21.0	22.0	21.0		19.5	22.0
24	21.0		20.0	20.0	21.0		18.5	21.5
25	21.5		19.5	20.5	20.5		18.5	20.5
26	20.5			21.0	20.5		19.5	19.0
27	21.0				22.0			19.5
28	20.5				20.5			20.5
29	21.0				20.5			19.5
30					11.5			
31								
# Survivors	29	0	25	26	30	0	26	29
Average Length (mm)	**20.828**	**#DIV/0!**	**20.320**	**21.327**	**20.450**	**#DIV/0!**	**20.500**	**21.293**
Pooled Weight (g)	2.46	0.00	2.40	3.14	2.61	0.00	2.66	3.27
Pooled Weight (mg)	**2460**	**0**	**2400**	**3140**	**2610**	**0**	**2660**	**3270**
Average Weight (g)	0.085	#DIV/0!	0.096	0.121	0.087	#DIV/0!	0.102	0.113
= abnormal								

JOL Aug-19/21

PS 7/11

Embryo - Alevin Test - Lengths, Wet Weights, Normality Assessment

Client: Teck WO#: 210963

	EV_HC1 + 20 µg/L Cu				LC_DCDS + 20 µg/L Cu			
Fish #	**100 A**	**100 B**	**100 C**	**100 D**	**100 A**	**100 B**	**100 C**	**100 D**
1	22.0		21.5	20.0	21.5	21.0	22.0	22.0
2	21.5		19.0	21.0	21.0	21.0	20.0	21.5
3	21.5		20.0	21.0	22.0	20.0	22.0	20.5
4	22.0		20.5	21.5	21.0		22.0	21.0
5	20.0		20.0	21.0	21.5		20.0	22.5
6	21.5		20.0	22.0	21.0		22.0	22.5
7	20.5		20.0	22.0	21.5		19.0	21.0
8	21.5		19.5	20.0	20.5		22.0	22.0
9	21.5		21.0	21.5	20.0		21.0	22.5
10	21.0		20.0	20.0	21.5		21.5	22.5
11	20.5		21.0	19.0	21.5		21.0	22.5
12	21.5		20.0	20.5	21.5		23.0	21.5
13	20.0		20.0	21.0	21.5		21.0	22.0
14	19.5		20.0	22.0	21.5		21.0	22.0
15	20.5		18.0	21.5	21.5		21.0	22.0
16	21.5		20.0	19.5	21.5		20.5	22.0
17	21.5		22.0	20.0	21.0		20.0	22.0
18	21.0		21.0	19.5	21.0		20.5	21.5
19	21.5		20.5	20.0	21.0		20.5	20.0
20	21.0		18.5	20.0	21.0		21.0	22.5
21	21.0		18.0	21.5	21.0		23.0	22.0
22	21.5		16.0	21.5	20.5		19.5	21.5
23	21.0		18.5	21.0	21.5		21.0	20.5
24	20.5			20.0	21.0		20.5	23.0
25	21.0			19.0	21.0		21.0	22.0
26	21.5			21.5	21.0		20.5	22.0
27	20.0			22.0	21.0		16.5	21.5
28	20.0			22.0	21.5			21.0
29	17.5			20.0	21.5			22.0
30				21.5				
31								
# Survivors	29	0	23	30	29	3	27	29
Average Length (mm)	**20.879**	**#DIV/0!**	**19.783**	**20.767**	**21.190**	**20.667**	**20.852**	**21.776**
Pooled Weight (g)	2.98	0.00	2.02	3.25	3.02	0.28	2.65	3.58
Pooled Weight (mg)	**2980**	**0**	**2020**	**3250**	**3024**	**280**	**2650**	**3580**
Average Weight (g)	0.103	#DIV/0!	0.088	0.108	0.104	0.093	0.098	0.123
= abnormal								

Aug. 19/21

RS 8/11

Embryo - Alevin Test - Lengths, Wet Weights, Normality Assessment

Client: Teck WO#: 210963

	LC_LC3 + 20 µg/L Cu				LC_LC5 + 20 µg/L Cu			
Fish #	**100 A**	**100 B**	**100 C**	**100 D**	**100 A**	**100 B**	**100 C**	**100 D**
1	21.5		21.0	22.0	20.0		21.5	20.5
2	20.0		20.5	21.0	21.0		22.0	21.0
3	21.0		21.0	21.0	21.5		21.5	22.0
4	20.5		21.0	21.0	22.0		19.5	19.0
5	21.5		21.5	21.0	22.0		20.5	21.0
6	20.0		21.0	20.5	22.5		20.0	21.5
7	19.5		20.0	20.5	21.0		22.0	21.0
8	21.0		22.0	21.5	20.5		22.5	22.0
9	21.5		22.0	21.5	21.5		20.5	21.5
10	21.0		21.0	22.5	21.5		21.5	21.0
11	21.0		22.5	21.0	21.0		21.0	21.5
12	21.5		22.5	19.0	21.5		20.0	22.0
13	20.5		22.5	21.5	21.0		20.5	21.5
14	21.5		21.5	20.5	21.5		21.0	20.5
15	20.0		19.5	22.5	20.5		19.0	19.0
16	21.5		20.0	22.0	22.0		22.0	21.5
17	21.5		21.0	21.0	20.5		21.0	21.0
18	21.0		20.0	19.5	21.0		19.5	22.5
19	22.0		20.0	20.5	22.0		21.5	22.0
20	22.5		21.5	20.5	21.5		22.0	21.5
21	21.0		23.0	19.5	20.5		20.0	
22	21.0		19.5	22.5	21.0		21.0	
23	21.0		21.0	20.0	20.5			
24	21.0		23.0	22.0	21.0			
25	20.5		20.0	21.0	21.0			
26	21.5		22.0	18.5	21.0			
27	21.0		22.0	17.5	21.5			
28					21.5			
29								
30								
31								
# Survivors	27	0	27	27	28	0	22	20
Average Length (mm)	**21.019**	**#DIV/0!**	**21.204**	**20.796**	**21.214**	**#DIV/0!**	**20.909**	**21.175**
Pooled Weight (g)	2.42	0.00	2.48	3.25	2.79	0.00	1.90	2.53
Pooled Weight (mg)	**2420**	**0**	**2480**	**3250**	**2790**	**0**	**1900**	**2530**
Average Weight (g)	0.090	#DIV/0!	0.092	0.120	0.100	#DIV/0!	0.086	0.127

= abnormal

JGa
Aug. 19/21

Embryo - Alevin Test - Lengths, Wet Weights, Normality Assessment

PS. 9/11

Client: Teck WO#: 210963

	LC_LCDSSLCC + 20 µg/L Cu				FR_FR4 + 20 µg/L Cu			
Fish #	**100 A**	**100 B**	**100 C**	**100 D**	**100 A**	**100 B**	**100 C**	**100 D**
1	21.5		21.0	21.0	21.0	20.0	20.5	21.5
2	21.5		22.0	22.0	21.0	19.0	22.5	22.0
3	21.5		22.0	21.0	21.0		21.5	20.5
4	20.5		19.0	21.0	21.0		21.0	20.5
5	20.0		21.0	22.0	22.5		20.5	21.0
6	22.0		21.0	19.5	19.5		20.0	20.0
7	21.0		19.5	21.0	19.0		20.5	21.0
8	21.5		22.0	21.5	20.0		22.0	20.0
9	22.0		23.0	21.5	21.0		20.5	20.0
10	21.5		20.5	22.0	22.0		20.0	20.5
11	22.0		21.5	22.0	21.0		20.5	20.5
12	21.5		21.0	20.5	20.0		22.0	21.0
13	20.5		19.5	21.0	22.5		21.5	21.0
14	22.0		22.5	21.5	21.0		20.5	21.5
15	22.0		21.0	21.5	20.0		23.0	20.5
16	21.5		23.0	22.0	20.0		18.5	21.5
17	20.5		21.0	21.0	21.0		21.0	20.5
18	21.0		19.5	21.5	21.0		19.0	21.0
19	21.0		21.0	21.5	19.0		20.5	21.5
20	20.5		22.0	20.0	22.0		21.0	21.0
21	21.0		21.5	21.0	21.0		19.0	21.0
22	22.0		21.5	20.0	22.0		19.0	20.5
23	21.5		22.0	20.0	21.0		20.5	21.5
24	21.5		19.0	22.0	20.0		20.5	20.0
25	21.0		20.5	21.0	19.0		20.0	
26	22.0		20.5	19.5	20.5			
27	21.5		20.5	21.0	20.5			
28	16.5		20.0					
29			20.5					
30								
31								
# Survivors	28	0	29	27	27	2	25	24
Average Length (mm)	**21.161**	**#DIV/0!**	**21.000**	**21.093**	**20.722**	**19.500**	**20.620**	**20.833**
Pooled Weight (g)	3.18	0.00	2.83	3.33	2.93	0.20	2.35	2.16
Pooled Weight (mg)	**3180**	**0**	**2830**	**3330**	**2930**	**200**	**2350**	**2160**
Average Weight (g)	0.114	#DIV/0!	0.098	0.123	0.109	0.100	0.094	0.090
= abnormal								

JCW Aug. 19/21

RS 10/11

Embryo - Alevin Test - Lengths, Wet Weights, Normality Assessment

Client: Teck WO#: 210963

	FR_FRRD + 20 µg/L Cu				FR_FR2 + 20 µg/L Cu			
Fish #	**100 A**	**100 B**	**100 C**	**100 D**	**100 A**	**100 B**	**100 C**	**100 D**
1	20.5		22.0	23.0	20.0		18.5	21.5
2	20.0		22.0	20.0	20.0		21.0	23.0
3	22.0		22.5	22.0	20.5		22.0	22.0
4	19.5		21.0	21.0	20.5		21.0	20.0
5	20.0		20.5	21.0	21.0		19.0	21.5
6	21.0		20.0	22.5	20.0		20.5	21.0
7	19.5		19.5	21.0	20.5		20.0	21.5
8	19.0		21.5	20.5	21.0		21.5	20.0
9	18.0		21.0	20.5	20.0		22.0	20.5
10	21.0		21.5	22.0	21.0		20.0	20.5
11	21.5		20.0	20.5	20.0		23.0	22.0
12	21.5		22.0	20.5	19.0		20.5	22.0
13	20.0		21.0	20.5	19.5		19.5	22.0
14	20.0		21.0	20.0	20.5		22.5	22.0
15	19.5		20.0	23.0	20.0		20.0	21.0
16	20.0		19.0	17.5	21.0		22.0	21.0
17	20.0		21.5	21.5	20.5		22.0	22.5
18	21.5		22.0	18.0	20.5		18.5	19.5
19	21.0		20.0	21.5	19.5		20.5	22.0
20	20.0		20.0	22.0	21.0		20.0	22.5
21	20.0		20.0	18.0	21.0		20.0	21.5
22	20.0			21.5	21.0		20.0	22.0
23	20.5			22.0	20.5		18.5	20.0
24	20.0			21.5	19.5		20.0	21.5
25	21.0			18.5	21.0			22.0
26	20.0			18.0	21.5			20.5
27	19.5			18.0	21.5			20.5
28	20.5							
29								
30								
31								
# Survivors	28	0	21	27	27	0	24	27
Average Length (mm)	**20.250**	**#DIV/0!**	**20.857**	**20.593**	**20.444**	**#DIV/0!**	**20.521**	**21.333**
Pooled Weight (g)	2.39	0.00	1.85	2.99	2.45	0.00	2.09	3.09
Pooled Weight (mg)	**2390**	**0**	**1850**	**2990**	**2450**	**0**	**2090**	**3090**
Average Weight (g)	0.085	#DIV/0!	0.088	0.111	0.091	#DIV/0!	0.087	0.114
= abnormal								

JGu Aug-19/21

Embryo - Alevin Test - Lengths, Wet Weights, Normality Assessment

PB-11/11

Client: Teck WO#: 210963

	FR_MULTIPLATE + 20 µg/L Cu			
Fish #	**100 A**	**100 B**	**100 C**	**100 D**
1	20.0		21.0	20.0
2	20.5		21.5	21.0
3	20.5		18.5	21.0
4	20.5		20.5	22.5
5	20.5		20.0	22.5
6	21.0		19.0	20.0
7	20.5		19.5	20.0
8	18.5		20.0	20.5
9	21.0		21.0	21.0
10	21.0		20.0	22.0
11	20.5		19.5	22.5
12	21.5		21.5	21.5
13	18.5		20.0	22.5
14	19.0		22.5	22.0
15	21.0		21.0	22.5
16	21.0		22.0	23.0
17	20.5		21.5	21.0
18	21.0		20.5	22.0
19	21.5		21.0	21.0
20	21.0		22.0	20.0
21	19.5		19.5	20.0
22	19.5		18.5	23.0
23	20.0		18.5	19.0
24	20.5		19.5	
25	21.0			
26	20.5			
27	20.0			
28				
29				
30				
31				
# Survivors	27	0	24	23
Average Length (mm)	**20.389**	**#DIV/0!**	**20.354**	**21.326**
Pooled Weight (g)	2.51	0.00	2.72	2.61
Pooled Weight (mg)	**2510**	**0**	**2720**	**2610**
Average Weight (g)	0.093	#DIV/0!	0.113	0.113
= abnormal				

JCH
Aug. 19/21

CETIS Summary Report

Salmonid Embryo-Alevin Survival and Development Test — **Nautilus Environmental**

Batch ID:	16-7967-5486	**Test Type:**	Survival-Development	**Analyst:**	Yvonne Lam
Start Date:	19 May-21 17:35	**Protocol:**	EC/EPS 1/RM/28	**Diluent:**	Dechlorinated Tap Water
Ending Date:	18 Jun-21 08:05	**Species:**	Oncorhynchus mykiss	**Brine:**	
Test Length:	29d 14h	**Taxon:**	Actinopterygii	**Source:**	Ted's Trout, Campbell Lake **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
Dechlor	14-3692-6103	19 May-21	19 May-21	18h	Teck Coal	
Dechlor + 20	14-4597-7512	19 May-21	19 May-21	18h		
① FR_UFR1	12-4424-2146	18 May-21	19 May-21 11:20	42h (2.3 °C)		
① GH_ER2	02-4275-7088	18 May-21 09:55	19 May-21 11:20	32h (0.4 °C)		
① CM_MC1	01-4263-6393	18 May-21 11:08	19 May-21 11:20	30h (1.1 °C)		
① LC_SLC	12-1662-7355	18 May-21 09:45	19 May-21 11:20	32h (4.1 °C)		
FR_FRABCH	05-6713-4959	18 May-21	19 May-21 11:20	42h (1.9 °C)		
FR_FRCP1	19-8027-7867	18 May-21	19 May-21 11:20	42h (1.2 °C)		
GH_FR1	15-9886-5398	18 May-21 12:30	19 May-21 11:20	29h (0.1 °C)		
GH_ERC	21-0704-4941	18 May-21 11:20	19 May-21 11:20	30h (0.6 °C)		
CM_MC2	17-6814-6287	18 May-21 09:50	19 May-21 11:20	32h (1.1 °C)		
EV_MC2	15-5628-9197	18 May-21 13:00	19 May-21 11:20	29h (3.6 °C)		
EV_HC1	05-8730-9056	18 May-21 11:20	19 May-21 11:20	30h (4.8 °C)		
LC_DCDS	20-0340-1068	18 May-21 11:00	19 May-21 11:20	31h (4.6 °C)		
LC_LC3	18-4816-9590	18 May-21 10:15	19 May-21 11:20	31h (4.7 °C)		
LC_LC5	03-8768-2280	18 May-21 09:50	19 May-21 11:20	32h (5.2 °C)		
LC_LCDSSLCC	02-2977-6783	18 May-21 11:00	19 May-21 11:20	31h (4.3 °C)		
FR_FR4	17-1641-7069	18 May-21 09:29	19 May-21 11:20	32h (4.6 °C)		
FR_FRRD	06-3190-8505	18 May-21 08:22	19 May-21 11:20	33h (3.4 °C)		
FR_FR2	11-2149-8709	18 May-21 10:28	19 May-21 11:20	31h (4.6 °C)		
FR_MULTIPLATE	16-7235-2081	18 May-21 11:21	19 May-21 11:20	30h (3.4 °C)		

Aside from Dechlor Control, all samples spiked with 20 ug/L Cu.

① Reference sites

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
Dechlor	Control water	Teck Coal	Dechlor	
Dechlor + 20	Contol+Cu	Teck Coal	Dechlor + 20 ug/L Cu	
① FR_UFR1	Water Sample	Teck Coal	FR_UFR1_WEK_2021-05-1	
① GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-05-18_	
① CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-05-18	
① LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-05-18_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_WEK_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_WEK_2021-05	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-05-18_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-05-18	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-05-18	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2020_Q2_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2020_Q2_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-05-18	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-05-18_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-05-18_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	
FR_FR4	Water Sample	Teck Coal	FR_FR4_WS_2021-05-18_	
FR_FRRD	Water Sample	Teck Coal	FR_FRRD_WS_2021-05-18	
FR_FR2	Water Sample	Teck Coal	FR_FR2_WS_2021-05-18_	
FR_MULTIPLATE	Water Sample	Teck Coal	FR_MULTIPLATE_WS_202	

SIngle Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	0.2646	LC_LC5 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	0.2646	FR_FR2 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	0.2646	CM_MC1 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	0.2646	FR_FRRD passed proportion normal	1

Salmonid Embryo-Alevin Survival and Development Test — Nautilus Environmental

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	0.2646	LC_SLC passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	0.2646	FR_FR4 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	0.2646	FR_FRABCH passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	0.2646	FR_FRCP1 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	0.2646	GH_ER2 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	0.2646	GH_ERC passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	0.2646	LC_LCDSSLCC passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	0.2646	GH_FR1 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	0.2646	LC_LC3 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	0.2646	FR_UFR1 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	0.2646	FR_MULTIPLATE passed proportion norm	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	0.2646	LC_DCDS passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	0.2646	CM_MC2 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	0.2646	Dechlor + 20 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	0.2646	Dechlor passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	0.2646	EV_MC2 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	0.2646	EV_HC1 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	0.9869	FR_MULTIPLATE passed proportion norm	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	0.9869	CM_MC1 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	0.9869	FR_FRRD passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	0.9869	Dechlor + 20 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	0.9869	LC_SLC passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	0.9869	FR_FR4 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	0.9869	LC_LC5 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	0.9869	LC_LCDSSLCC passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	0.9869	EV_HC1 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	0.9869	CM_MC2 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	0.9869	FR_FRCP1 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	0.9869	FR_FR2 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	0.9869	LC_DCDS passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	0.9869	GH_FR1 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	0.9869	LC_LC3 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	0.9869	Dechlor passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	0.9869	FR_FRABCH passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	0.9869	EV_MC2 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	0.9869	FR_UFR1 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	0.9869	GH_ER2 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	0.9869	GH_ERC passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	Dechlor passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	Dechlor + 20 passed proportion normal	1

Salmonid Embryo-Alevin Survival and Development Test **Nautilus Environmental**

SIngle Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed proportion norm	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	Dechlor + 20 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	Dechlor passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed proportion norm	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	Dechlor + 20 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed proportion norm	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	Dechlor passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed proportion normal	1

Salmonid Embryo-Alevin Survival and Development Test **Nautilus Environmental**

SIngle Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	Dechlor + 20 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	Dechlor passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed proportion norm	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	Dechlor + 20 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed proportion norm	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	Dechlor passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	Dechlor passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	Dechlor + 20 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed proportion norm	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed proportion normal	1

Salmonid Embryo-Alevin Survival and Development Test **Nautilus Environmental**

SIngle Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	Dechlor + 20 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	Dechlor passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed proportion norm	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	Dechlor passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	Dechlor + 20 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed proportion norm	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	Dechlor passed proportion normal	1

Salmonid Embryo-Alevin Survival and Development Test **Nautilus Environmental**

SIngle Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed proportion norm	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	Dechlor + 20 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	Dechlor + 20 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	Dechlor passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed proportion norm	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	Dechlor + 20 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed proportion normal	1

Salmonid Embryo-Alevin Survival and Development Test **Nautilus Environmental**

SIngle Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	Dechlor passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed proportion norm	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	Dechlor passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed proportion norm	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	Dechlor + 20 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed proportion norm	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	Dechlor + 20 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	Dechlor passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	Dechlor + 20 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed proportion normal	1

Salmonid Embryo-Alevin Survival and Development Test **Nautilus Environmental**

SIngle Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed proportion norm	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	Dechlor passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed proportion norm	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	Dechlor passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	Dechlor + 20 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed proportion norm	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	Dechlor + 20 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	Dechlor passed proportion normal	1

Salmonid Embryo-Alevin Survival and Development Test **Nautilus Environmental**

SIngle Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	Dechlor + 20 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed proportion norm	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	Dechlor passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	Dechlor + 20 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	Dechlor passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed proportion norm	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed proportion normal	1
02-4564-2342	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed proportion normal	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.0357	GH_ERC failed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.0357	FR_FRRD failed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.0357	FR_MULTIPLATE failed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.0357	LC_LC3 failed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.0357	LC_SLC failed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.0357	LC_LC5 failed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.0357	GH_ER2 failed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.0357	FR_FRCP1 failed survival rate	1

Salmonid Embryo-Alevin Survival and Development Test **Nautilus Environmental**

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.0357	LC_LCDSSLCC failed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.0357	GH_FR1 failed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.0357	Dechlor + 20 failed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.0357	FR_FR4 failed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.0357	FR_UFR1 failed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.0357	FR_FR2 failed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.0357	LC_DCDS failed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.0357	CM_MC1 failed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.0357	CM_MC2 failed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.0357	EV_HC1 failed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.0357	Dechlor failed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.0357	FR_FRABCH failed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.0357	EV_MC2 failed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.8868	LC_SLC passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.8868	FR_FR4 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.8868	FR_MULTIPLATE passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.8868	FR_FRRD passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.8868	CM_MC1 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.8868	FR_FRABCH passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.8868	LC_LCDSSLCC passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.8868	FR_FRCP1 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.8868	LC_LC5 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.8868	GH_FR1 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.8868	LC_LC3 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.8868	LC_DCDS passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.8868	CM_MC2 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.8868	EV_HC1 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.8868	Dechlor + 20 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.8868	FR_FR2 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.8868	Dechlor passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.8868	EV_MC2 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.8868	FR_UFR1 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.8868	GH_ER2 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.8868	GH_ERC passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Dechlor passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Dechlor + 20 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed survival rate	1

Salmonid Embryo-Alevin Survival and Development Test **Nautilus Environmental**

SIngle Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Dechlor passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Dechlor + 20 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Dechlor + 20 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Dechlor passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed survival rate	1

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Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Dechlor + 20 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Dechlor passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Dechlor + 20 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Dechlor passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.4222	FR_UFR1 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.4222	FR_FR4 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.4222	CM_MC2 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.4222	Dechlor passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.4222	EV_HC1 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.4222	FR_MULTIPLATE passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.4222	EV_MC2 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.4222	FR_FR2 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.4222	LC_LC5 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.4222	GH_ER2 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.4222	FR_FRRD passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.4222	Dechlor + 20 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.4222	CM_MC1 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.4222	LC_LC3 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.4222	GH_FR1 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.4222	LC_LCDSSLCC passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.4222	FR_FRCP1 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.4222	GH_ERC passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.4222	LC_SLC passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.4222	LC_DCDS passed survival rate	1

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SIngle Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.4222	FR_FRABCH passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Dechlor + 20 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Dechlor passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Dechlor + 20 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Dechlor passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Dechlor passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Dechlor + 20 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed survival rate	1

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Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Dechlor + 20 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Dechlor passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Dechlor + 20 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Dechlor passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed survival rate	1

Salmonid Embryo-Alevin Survival and Development Test **Nautilus Environmental**

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Dechlor passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Dechlor + 20 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.0977	FR_MULTIPLATE passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.0977	LC_LC5 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.0977	GH_ER2 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.0977	LC_DCDS passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.0977	LC_LC3 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.0977	FR_FR4 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.0977	EV_HC1 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.0977	Dechlor + 20 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.0977	FR_FRCP1 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.0977	CM_MC1 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.0977	FR_FRRD passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.0977	FR_UFR1 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.0977	GH_ERC passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.0977	GH_FR1 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.0977	FR_FRABCH passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.0977	CM_MC2 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.0977	Dechlor passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.0977	LC_SLC passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.0977	LC_LCDSSLCC passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.0977	FR_FR2 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.0977	EV_MC2 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Dechlor + 20 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed survival rate	1

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Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Dechlor passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Dechlor passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Dechlor + 20 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Dechlor + 20 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Dechlor passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Dechlor + 20 passed survival rate	1

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Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Dechlor passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.8310	FR_FRRD passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.8310	LC_LCDSSLCC passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.8310	FR_FR2 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.8310	LC_LC5 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.8310	LC_LC3 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.8310	FR_FR4 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.8310	LC_DCDS passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.8310	EV_HC1 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.8310	GH_ERC passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.8310	EV_MC2 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.8310	Dechlor + 20 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.8310	CM_MC2 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.8310	Dechlor passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.8310	GH_FR1 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.8310	FR_FRCP1 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.8310	FR_FRABCH passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.8310	LC_SLC passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.8310	CM_MC1 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.8310	GH_ER2 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.8310	FR_UFR1 passed survival rate	1
10-0117-8415	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.8310	FR_MULTIPLATE passed survival rate	1

Salmonid Embryo-Alevin Survival and Development Test **Nautilus Environmental**

Proportion Normal Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
Dechlor	N	3	0.8570	0.6478	1.0000	0.7667	0.9333	0.0486	0.0842	9.83%	0.00%
Dechlor + 20		3	0.7111	0.4203	1.0000	0.6000	0.8333	0.0676	0.1171	16.46%	17.02%
① FR_UFR1		3	0.9433	0.8427	1.0000	0.8966	0.9667	0.0234	0.0405	4.29%	-10.07%
① GH_ER2		3	0.8295	0.7434	0.9156	0.7931	0.8621	0.0200	0.0346	4.18%	3.21%
① CM_MC1		3	0.8900	0.7625	1.0000	0.8333	0.9333	0.0296	0.0513	5.76%	-3.85%
① LC_SLC		3	0.8556	0.6026	1.0000	0.7667	0.9667	0.0588	0.1018	11.90%	0.17%
FR_FRABCH		3	0.8462	0.6494	1.0000	0.7742	0.9310	0.0457	0.0792	9.36%	1.26%
FR_FRCP1		3	0.8889	0.7933	0.9845	0.8667	0.9333	0.0222	0.0385	4.33%	-3.72%
GH_FR1		3	0.7957	0.4255	1.0000	0.6250	0.9000	0.0860	0.1490	18.73%	7.15%
GH_ERC		3	0.8889	0.6805	1.0000	0.8000	0.9667	0.0484	0.0839	9.44%	-3.72%
CM_MC2		3	0.8989	0.7332	1.0000	0.8333	0.9667	0.0385	0.0667	7.42%	-4.88%
EV_MC2		3	0.8384	0.5509	1.0000	0.7419	0.9667	0.0668	0.1157	13.80%	2.17%
EV_HC1		3	0.8969	0.6692	1.0000	0.7931	0.9667	0.0529	0.0917	10.22%	-4.66%
LC_DCDS		3	0.9333	0.7899	1.0000	0.8667	0.9667	0.0333	0.0577	6.19%	-8.91%
LC_LC3		3	0.8677	0.7313	1.0000	0.8333	0.9310	0.0317	0.0549	6.33%	-1.25%
LC_LC5		3	0.7744	0.5417	1.0000	0.6897	0.8750	0.0541	0.0937	12.10%	9.63%
LC_LCDSSLCC		3	0.9118	0.8609	0.9627	0.9000	0.9355	0.0118	0.0205	2.25%	-6.40%
FR_FR4		3	0.8096	0.6893	0.9299	0.7667	0.8621	0.0280	0.0484	5.98%	5.53%
FR_FRRD		3	0.8129	0.4414	1.0000	0.6667	0.9655	0.0863	0.1495	18.39%	5.15%
FR_FR2		3	0.8770	0.7069	1.0000	0.8000	0.9310	0.0395	0.0685	7.81%	-2.34%
FR_MULTIPLATE		3	0.7890	0.4673	1.0000	0.6774	0.9310	0.0748	0.1295	16.41%	7.93%

Survival Rate Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
Dechlor	N	3	0.9226	0.6558	1.0000	0.8000	1.0000	0.0620	0.1074	11.64%	0.00%
Dechlor + 20		3	0.7556	0.4648	1.0000	0.6333	0.8667	0.0676	0.1171	15.49%	18.10%
① FR_UFR1		3	0.9544	0.8232	1.0000	0.8966	1.0000	0.0305	0.0528	5.53%	-3.45%
① GH_ER2		3	0.9203	0.7888	1.0000	0.8621	0.9655	0.0306	0.0529	5.75%	0.25%
① CM_MC1		3	0.9233	0.7522	1.0000	0.8667	1.0000	0.0398	0.0689	7.46%	-0.08%
① LC_SLC		3	0.8778	0.6248	1.0000	0.7667	0.9667	0.0588	0.1018	11.60%	4.86%
FR_FRABCH		3	0.8899	0.7732	1.0000	0.8387	0.9310	0.0271	0.0470	5.28%	3.54%
FR_FRCP1		3	0.9111	0.8633	0.9589	0.9000	0.9333	0.0111	0.0193	2.11%	1.24%
GH_FR1		3	0.8176	0.4705	1.0000	0.6562	0.9000	0.0807	0.1397	17.09%	11.38%
GH_ERC		3	0.9000	0.6809	1.0000	0.8000	0.9667	0.0509	0.0882	9.80%	2.45%
CM_MC2		3	0.8989	0.7332	1.0000	0.8333	0.9667	0.0385	0.0667	7.42%	2.57%
EV_MC2		3	0.9247	0.7231	1.0000	0.8387	1.0000	0.0469	0.0812	8.78%	-0.23%
EV_HC1		3	0.9310	0.6343	1.0000	0.7931	1.0000	0.0690	0.1195	12.83%	-0.92%
LC_DCDS		3	0.9444	0.8488	1.0000	0.9000	0.9667	0.0222	0.0385	4.08%	-2.37%
LC_LC3		3	0.9007	0.8260	0.9753	0.8710	0.9310	0.0173	0.0300	3.34%	2.38%
LC_LC5		3	0.7744	0.5417	1.0000	0.6897	0.8750	0.0541	0.0937	12.10%	16.06%
LC_LCDSSLCC		3	0.9229	0.8735	0.9724	0.9000	0.9355	0.0115	0.0199	2.16%	-0.04%
FR_FR4		3	0.8540	0.7286	0.9794	0.8000	0.9000	0.0292	0.0505	5.91%	7.43%
FR_FRRD		3	0.8455	0.5112	1.0000	0.7000	0.9655	0.0777	0.1346	15.92%	8.36%
FR_FR2		3	0.8770	0.7069	1.0000	0.8000	0.9310	0.0395	0.0685	7.81%	4.94%
FR_MULTIPLATE		3	0.8335	0.5983	1.0000	0.7419	0.9310	0.0547	0.0947	11.36%	9.65%

① Reference sites

Analyst: [illegible] QA: Aug. 23/21

Salmonid Embryo-Alevin Survival and Development Test **Nautilus Environmental**

Proportion Normal Detail

Sample	Code	Rep 1	Rep 2	Rep 3
Dechlor	N	0.9333	0.7667	0.8710
Dechlor + 20		0.8333	0.7000	0.6000
FR_UFR1		0.9667	0.8966	0.9667
GH_ER2		0.8621	0.8333	0.7931
CM_MC1		0.9032	0.8333	0.9333
LC_SLC		0.9667	0.7667	0.8333
FR_FRABCH		0.9310	0.7742	0.8333
FR_FRCP1		0.8667	0.9333	0.8667
GH_FR1		0.8621	0.6250	0.9000
GH_ERC		0.9000	0.8000	0.9667
CM_MC2		0.9667	0.8333	0.8966
EV_MC2		0.9667	0.7419	0.8065
EV_HC1		0.9310	0.7931	0.9667
LC_DCDS		0.9667	0.8667	0.9667
LC_LC3		0.9310	0.8387	0.8333
LC_LC5		0.8750	0.7586	0.6897
LC_LCDSSLCC		0.9000	0.9355	0.9000
FR_FR4		0.8000	0.8621	0.7667
FR_FRRD		0.9655	0.6667	0.8065
FR_FR2		0.9000	0.8000	0.9310
FR_MULTIPLATE		0.9310	0.7586	0.6774

Survival Rate Detail

Sample	Code	Rep 1	Rep 2	Rep 3
Dechlor	N	1.0000	0.8000	0.9677
Dechlor + 20		0.8667	0.7667	0.6333
FR_UFR1		1.0000	0.8966	0.9667
GH_ER2		0.8621	0.9333	0.9655
CM_MC1		0.9032	0.8667	1.0000
LC_SLC		0.9667	0.7667	0.9000
FR_FRABCH		0.9310	0.8387	0.9000
FR_FRCP1		0.9000	0.9333	0.9000
GH_FR1		0.8966	0.6562	0.9000
GH_ERC		0.9333	0.8000	0.9667
CM_MC2		0.9667	0.8333	0.8966
EV_MC2		1.0000	0.8387	0.9355
EV_HC1		1.0000	0.7931	1.0000
LC_DCDS		0.9667	0.9000	0.9667
LC_LC3		0.9310	0.8710	0.9000
LC_LC5		0.8750	0.7586	0.6897
LC_LCDSSLCC		0.9333	0.9355	0.9000
FR_FR4		0.9000	0.8621	0.8000
FR_FRRD		0.9655	0.7000	0.8710
FR_FR2		0.9000	0.8000	0.9310
FR_MULTIPLATE		0.9310	0.8276	0.7419

Reference sites

Salmonid Embryo-Alevin Survival and Development Test **Nautilus Environmental**

Proportion Normal Binomials

Sample	Code	Rep 1	Rep 2	Rep 3
Dechlor	N	28/30	23/30	27/31
Dechlor + 20		25/30	21/30	18/30
① FR_UFR1		29/30	26/29	29/30
① GH_ER2		25/29	25/30	23/29
① CM_MC1		28/31	25/30	28/30
① LC_SLC		29/30	23/30	25/30
FR_FRABCH		27/29	24/31	25/30
FR_FRCP1		26/30	28/30	26/30
GH_FR1		25/29	20/32	27/30
GH_ERC		27/30	24/30	29/30
CM_MC2		29/30	25/30	26/29
EV_MC2		29/30	23/31	25/31
EV_HC1		27/29	23/29	29/30
LC_DCDS		29/30	26/30	29/30
LC_LC3		27/29	26/31	25/30
LC_LC5		28/32	22/29	20/29
LC_LCDSSLCC		27/30	29/31	27/30
FR_FR4		24/30	25/29	23/30
FR_FRRD		28/29	20/30	25/31
FR_FR2		27/30	24/30	27/29
FR_MULTIPLATE		27/29	22/29	21/31

Survival Rate Binomials

Sample	Code	Rep 1	Rep 2	Rep 3
Dechlor	N	30/30	24/30	30/31
Dechlor + 20		26/30	23/30	19/30
① FR_UFR1		30/30	26/29	29/30
① GH_ER2		25/29	28/30	28/29
① CM_MC1		28/31	26/30	30/30
① LC_SLC		29/30	23/30	27/30
FR_FRABCH		27/29	26/31	27/30
FR_FRCP1		27/30	28/30	27/30
GH_FR1		26/29	21/32	27/30
GH_ERC		28/30	24/30	29/30
CM_MC2		29/30	25/30	26/29
EV_MC2		30/30	26/31	29/31
EV_HC1		29/29	23/29	30/30
LC_DCDS		29/30	27/30	29/30
LC_LC3		27/29	27/31	27/30
LC_LC5		28/32	22/29	20/29
LC_LCDSSLCC		28/30	29/31	27/30
FR_FR4		27/30	25/29	24/30
FR_FRRD		28/29	21/30	27/31
FR_FR2		27/30	24/30	27/29
FR_MULTIPLATE		27/29	24/29	23/31

① Reference STHDs

Analyst: MW QA: Aug. 23/21

Salmonid Embryo-Alevin Survival and Development Test

Nautilus Environmental

Analysis ID:	10-0117-8415	**Endpoint:**	Survival Rate	**CETIS Version:**	CETISv1.9.4
Analyzed:	20 Aug-21 16:43	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1
Batch ID:	16-7967-5486	**Test Type:**	Survival-Development	**Analyst:**	Yvonne Lam
Start Date:	19 May-21 17:35	**Protocol:**	EC/EPS 1/RM/28	**Diluent:**	Dechlorinated Tap Water
Ending Date:	18 Jun-21 08:05	**Species:**	Oncorhynchus mykiss	**Brine:**	
Test Length:	29d 14h	**Taxon:**	Actinopterygii	**Source:**	Ted's Trout, Campbell Lake **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
Dechlor	14-3692-6103	19 May-21	19 May-21	18h	Teck Coal	
Dechlor + 20	14-4597-7512	19 May-21	19 May-21	18h		
① FR_UFR1	12-4424-2146	18 May-21	19 May-21 11:20	42h (2.3 °C)		
① GH_ER2	02-4275-7088	18 May-21 09:55	19 May-21 11:20	32h (0.4 °C)		
① CM_MC1	01-4263-6393	18 May-21 11:08	19 May-21 11:20	30h (1.1 °C)		
① LC_SLC	12-1662-7355	18 May-21 09:45	19 May-21 11:20	32h (4.1 °C)		
FR_FRABCH	05-6713-4959	18 May-21	19 May-21 11:20	42h (1.9 °C)		
FR_FRCP1	19-8027-7867	18 May-21	19 May-21 11:20	42h (1.2 °C)		
GH_FR1	15-9886-5398	18 May-21 12:30	19 May-21 11:20	29h (0.1 °C)		
GH_ERC	21-0704-4941	18 May-21 11:20	19 May-21 11:20	30h (0.6 °C)		
CM_MC2	17-6814-6287	18 May-21 09:50	19 May-21 11:20	32h (1.1 °C)		
EV_MC2	15-5628-9197	18 May-21 13:00	19 May-21 11:20	29h (3.6 °C)		
EV_HC1	05-8730-9056	18 May-21 11:20	19 May-21 11:20	30h (4.8 °C)		
LC_DCDS	20-0340-1068	18 May-21 11:00	19 May-21 11:20	31h (4.6 °C)		
LC_LC3	18-4816-9590	18 May-21 10:15	19 May-21 11:20	31h (4.7 °C)		
LC_LC5	03-8768-2280	18 May-21 09:50	19 May-21 11:20	32h (5.2 °C)		
LC_LCDSSLCC	02-2977-6783	18 May-21 11:00	19 May-21 11:20	31h (4.3 °C)		
FR_FR4	17-1641-7069	18 May-21 09:29	19 May-21 11:20	32h (4.6 °C)		
FR_FRRD	06-3190-8505	18 May-21 08:22	19 May-21 11:20	33h (3.4 °C)		
FR_FR2	11-2149-8709	18 May-21 10:28	19 May-21 11:20	31h (4.6 °C)		
FR_MULTIPLATE	16-7235-2081	18 May-21 11:21	19 May-21 11:20	30h (3.4 °C)		

Aside from Dechlor Control, all samples spiked with 20 ug/L Cu

① Reference Sites

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
Dechlor	Control water	Teck Coal	Dechlor	
Dechlor + 20	Contol+Cu	Teck Coal	Dechlor + 20 ug/L Cu	
① FR_UFR1	Water Sample	Teck Coal	FR_UFR1_WEK_2021-05-1	
① GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-05-18_	
① CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-05-18	
① LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-05-18_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_WEK_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_WEK_2021-05	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-05-18_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-05-18	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-05-18	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2020_Q2_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2020_Q2_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-05-18	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-05-18_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-05-18_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	
FR_FR4	Water Sample	Teck Coal	FR_FR4_WS_2021-05-18_	
FR_FRRD	Water Sample	Teck Coal	FR_FRRD_WS_2021-05-18	
FR_FR2	Water Sample	Teck Coal	FR_FR2_WS_2021-05-18_	
FR_MULTIPLATE	Water Sample	Teck Coal	FR_MULTIPLATE_WS_202	

Fisher Exact/Bonferroni-Holm Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
Negative Control		Dechlor + 20*	0.0018	Exact	0.0357	Significant Effect
		① FR_UFR1	0.8868	Exact	0.8868	Non-Significant Effect

Salmonid Embryo-Alevin Survival and Development Test — **Nautilus Environmental**

Analysis ID: 10-0117-8415 **Endpoint:** Survival Rate **CETIS Version:** CETISv1.9.4
Analyzed: 20 Aug-21 16:43 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Fisher Exact/Bonferroni-Holm Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
		GH_ER2	0.5834	Exact	1.0000	Non-Significant Effect
		CM_MC1	0.6090	Exact	1.0000	Non-Significant Effect
		LC_SLC	0.2211	Exact	1.0000	Non-Significant Effect
		FR_FRABCH	0.2973	Exact	1.0000	Non-Significant Effect
		FR_FRCP1	0.4910	Exact	1.0000	Non-Significant Effect
		GH_FR1	0.0235	Exact	0.4222	Non-Significant Effect
		GH_ERC	0.3882	Exact	1.0000	Non-Significant Effect
		CM_MC2	0.3791	Exact	1.0000	Non-Significant Effect
		EV_MC2	0.6172	Exact	1.0000	Non-Significant Effect
		EV_HC1	0.6949	Exact	1.0000	Non-Significant Effect
		LC_DCDS	0.8090	Exact	1.0000	Non-Significant Effect
		LC_LC3	0.3882	Exact	1.0000	Non-Significant Effect
		LC_LC5	0.0051	Exact	0.0977	Non-Significant Effect
		LC_LCDSSLCC	0.6090	Exact	1.0000	Non-Significant Effect
		FR_FR4	0.1075	Exact	1.0000	Non-Significant Effect
		FR_FRRD	0.0773	Exact	1.0000	Non-Significant Effect
		FR_FR2	0.2136	Exact	1.0000	Non-Significant Effect
		FR_MULTIPLATE	0.0489	Exact	0.8310	Non-Significant Effect

Data Summary

Sample	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
Dechlor	N	84	7	91	0.9231	0.07692	0.0%
Dechlor + 20		68	22	90	0.7556	0.2444	18.15%
FR_UFR1		85	4	89	0.9551	0.04494	-3.46%
GH_ER2		81	7	88	0.9205	0.07955	0.28%
CM_MC1		84	7	91	0.9231	0.07692	0.0%
LC_SLC		79	11	90	0.8778	0.1222	4.91%
FR_FRABCH		80	10	90	0.8889	0.1111	3.7%
FR_FRCP1		82	8	90	0.9111	0.08889	1.3%
GH_FR1		74	17	91	0.8132	0.1868	11.9%
GH_ERC		81	9	90	0.9	0.1	2.5%
CM_MC2		80	9	89	0.8989	0.1011	2.62%
EV_MC2		85	7	92	0.9239	0.07609	-0.09%
EV_HC1		82	6	88	0.9318	0.06818	-0.95%
LC_DCDS		85	5	90	0.9444	0.05556	-2.32%
LC_LC3		81	9	90	0.9	0.1	2.5%
LC_LC5		70	20	90	0.7778	0.2222	15.74%
LC_LCDSSLCC		84	7	91	0.9231	0.07692	0.0%
FR_FR4		76	13	89	0.8539	0.1461	7.49%
FR_FRRD		76	14	90	0.8444	0.1556	8.52%
FR_FR2		78	11	89	0.8764	0.1236	5.06%
FR_MULTIPLATE		74	15	89	0.8315	0.1685	9.93%

① Reference Sites

Salmonid Embryo-Alevin Survival and Development Test — **Nautilus Environmental**

Analysis ID:	10-0117-8415	**Endpoint:**	Survival Rate	**CETIS Version:**	CETISv1.9.4
Analyzed:	20 Aug-21 16:43	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1

Survival Rate Detail

Sample	Code	Rep 1	Rep 2	Rep 3
Dechlor	N	1.0000	0.8000	0.9677
Dechlor + 20		0.8667	0.7667	0.6333
① FR_UFR1		1.0000	0.8966	0.9667
① GH_ER2		0.8621	0.9333	0.9655
① CM_MC1		0.9032	0.8667	1.0000
① LC_SLC		0.9667	0.7667	0.9000
FR_FRABCH		0.9310	0.8387	0.9000
FR_FRCP1		0.9000	0.9333	0.9000
GH_FR1		0.8966	0.6562	0.9000
GH_ERC		0.9333	0.8000	0.9667
CM_MC2		0.9667	0.8333	0.8966
EV_MC2		1.0000	0.8387	0.9355
EV_HC1		1.0000	0.7931	1.0000
LC_DCDS		0.9667	0.9000	0.9667
LC_LC3		0.9310	0.8710	0.9000
LC_LC5		0.8750	0.7586	0.6897
LC_LCDSSLCC		0.9333	0.9355	0.9000
FR_FR4		0.9000	0.8621	0.8000
FR_FRRD		0.9655	0.7000	0.8710
FR_FR2		0.9000	0.8000	0.9310
FR_MULTIPLATE		0.9310	0.8276	0.7419

Survival Rate Binomials

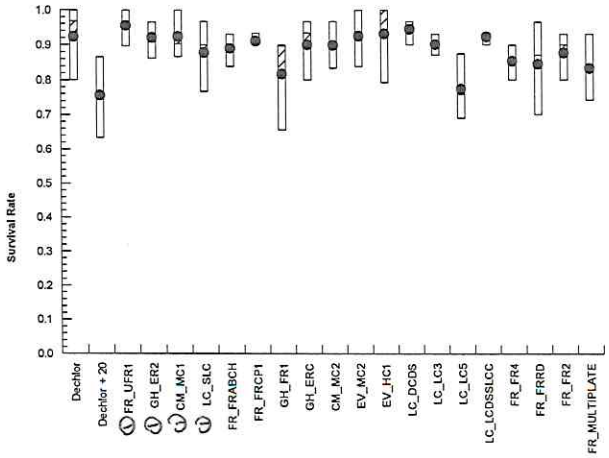
Sample	Code	Rep 1	Rep 2	Rep 3
Dechlor	N	30/30	24/30	30/31
Dechlor + 20		26/30	23/30	19/30
① FR_UFR1		30/30	26/29	29/30
① GH_ER2		25/29	28/30	28/29
① CM_MC1		28/31	26/30	30/30
① LC_SLC		29/30	23/30	27/30
FR_FRABCH		27/29	26/31	27/30
FR_FRCP1		27/30	28/30	27/30
GH_FR1		26/29	21/32	27/30
GH_ERC		28/30	24/30	29/30
CM_MC2		29/30	25/30	26/29
EV_MC2		30/30	26/31	29/31
EV_HC1		29/29	23/29	30/30
LC_DCDS		29/30	27/30	29/30
LC_LC3		27/29	27/31	27/30
LC_LC5		28/32	22/29	20/29
LC_LCDSSLCC		28/30	29/31	27/30
FR_FR4		27/30	25/29	24/30
FR_FRRD		28/29	21/30	27/31
FR_FR2		27/30	24/30	27/29
FR_MULTIPLATE		27/29	24/29	23/31

① Reference Sites

Salmonid Embryo-Alevin Survival and Development Test — **Nautilus Environmental**

Analysis ID:	10-0117-8415	**Endpoint:**	Survival Rate	**CETIS Version:**	CETISv1.9.4
Analyzed:	20 Aug-21 16:43	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1

Graphics



① Reference sites

Analyst: UW QA: Aug. 23/21

CETIS Analytical Report

Salmonid Embryo-Alevin Survival and Development Test — **Nautilus Environmental**

Analysis ID:	02-4564-2342	**Endpoint:**	Proportion Normal	**CETIS Version:**	CETISv1.9.4
Analyzed:	20 Aug-21 16:43	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1
Batch ID:	16-7967-5486	**Test Type:**	Survival-Development	**Analyst:**	Yvonne Lam
Start Date:	19 May-21 17:35	**Protocol:**	EC/EPS 1/RM/28	**Diluent:**	Dechlorinated Tap Water
Ending Date:	18 Jun-21 08:05	**Species:**	Oncorhynchus mykiss	**Brine:**	
Test Length:	29d 14h	**Taxon:**	Actinopterygii	**Source:**	Ted's Trout, Campbell Lake **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
Dechlor	14-3692-6103	19 May-21	19 May-21	18h	Teck Coal	
Dechlor + 20	14-4597-7512	19 May-21	19 May-21	18h		
① FR_UFR1	12-4424-2146	18 May-21	19 May-21 11:20	42h (2.3 °C)		
① GH_ER2	02-4275-7088	18 May-21 09:55	19 May-21 11:20	32h (0.4 °C)		
① CM_MC1	01-4263-6393	18 May-21 11:08	19 May-21 11:20	30h (1.1 °C)		
① LC_SLC	12-1662-7355	18 May-21 09:45	19 May-21 11:20	32h (4.1 °C)		
FR_FRABCH	05-6713-4959	18 May-21	19 May-21 11:20	42h (1.9 °C)		
FR_FRCP1	19-8027-7867	18 May-21	19 May-21 11:20	42h (1.2 °C)		
GH_FR1	15-9886-5398	18 May-21 12:30	19 May-21 11:20	29h (0.1 °C)		
GH_ERC	21-0704-4941	18 May-21 11:20	19 May-21 11:20	30h (0.6 °C)		
CM_MC2	17-6814-6287	18 May-21 09:50	19 May-21 11:20	32h (1.1 °C)		
EV_MC2	15-5628-9197	18 May-21 13:00	19 May-21 11:20	29h (3.6 °C)		
EV_HC1	05-8730-9056	18 May-21 11:20	19 May-21 11:20	30h (4.8 °C)		
LC_DCDS	20-0340-1068	18 May-21 11:00	19 May-21 11:20	31h (4.6 °C)		
LC_LC3	18-4816-9590	18 May-21 10:15	19 May-21 11:20	31h (4.7 °C)		
LC_LC5	03-8768-2280	18 May-21 09:50	19 May-21 11:20	32h (5.2 °C)		
LC_LCDSSLCC	02-2977-6783	18 May-21 11:00	19 May-21 11:20	31h (4.3 °C)		
FR_FR4	17-1641-7069	18 May-21 09:29	19 May-21 11:20	32h (4.6 °C)		
FR_FRRD	06-3190-8505	18 May-21 08:22	19 May-21 11:20	33h (3.4 °C)		
FR_FR2	11-2149-8709	18 May-21 10:28	19 May-21 11:20	31h (4.6 °C)		
FR_MULTIPLATE	16-7235-2081	18 May-21 11:21	19 May-21 11:20	30h (3.4 °C)		

Aside from Dechlor Control, all samples spiked with 20 ug/L Cu

① Reference sites

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
Dechlor	Control water	Teck Coal	Dechlor	
Dechlor + 20	Contol+Cu	Teck Coal	Dechlor + 20 ug/L Cu	
① FR_UFR1	Water Sample	Teck Coal	FR_UFR1_WEK_2021-05-1	
① GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-05-18_	
① CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-05-18	
① LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-05-18_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_WEK_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_WEK_2021-05	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-05-18_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-05-18	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-05-18	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2020_Q2_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2020_Q2_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-05-18	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-05-18_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-05-18_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	
FR_FR4	Water Sample	Teck Coal	FR_FR4_WS_2021-05-18_	
FR_FRRD	Water Sample	Teck Coal	FR_FRRD_WS_2021-05-18	
FR_FR2	Water Sample	Teck Coal	FR_FR2_WS_2021-05-18_	
FR_MULTIPLATE	Water Sample	Teck Coal	FR_MULTIPLATE_WS_202	

Fisher Exact/Bonferroni-Holm Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
Negative Control		Dechlor + 20	0.0132	Exact	0.2646	Non-Significant Effect
		① FR_UFR1	0.9869	Exact	0.9869	Non-Significant Effect

Salmonid Embryo-Alevin Survival and Development Test **Nautilus Environmental**

Analysis ID: 02-4564-2342 **Endpoint:** Proportion Normal **CETIS Version:** CETISv1.9.4
Analyzed: 20 Aug-21 16:43 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Fisher Exact/Bonferroni-Holm Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
	①	GH_ER2	0.3811	Exact	1.0000	Non-Significant Effect
	①	CM_MC1	0.8137	Exact	1.0000	Non-Significant Effect
	①	LC_SLC	0.5717	Exact	1.0000	Non-Significant Effect
		FR_FRABCH	0.4875	Exact	1.0000	Non-Significant Effect
		FR_FRCP1	0.8061	Exact	1.0000	Non-Significant Effect
		GH_FR1	0.1652	Exact	1.0000	Non-Significant Effect
		GH_ERC	0.8061	Exact	1.0000	Non-Significant Effect
		CM_MC2	0.8605	Exact	1.0000	Non-Significant Effect
		EV_MC2	0.4312	Exact	1.0000	Non-Significant Effect
		EV_HC1	0.8542	Exact	1.0000	Non-Significant Effect
		LC_DCDS	0.9735	Exact	1.0000	Non-Significant Effect
		LC_LC3	0.6554	Exact	1.0000	Non-Significant Effect
		LC_LC5	0.1169	Exact	1.0000	Non-Significant Effect
		LC_LCDSSLCC	0.9186	Exact	1.0000	Non-Significant Effect
		FR_FR4	0.2526	Exact	1.0000	Non-Significant Effect
		FR_FRRD	0.2636	Exact	1.0000	Non-Significant Effect
		FR_FR2	0.7250	Exact	1.0000	Non-Significant Effect
		FR_MULTIPLATE	0.1482	Exact	1.0000	Non-Significant Effect

Data Summary

Sample	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
Dechlor	N	78	13	91	0.8571	0.1429	3.7%
Dechlor + 20		64	26	90	0.7111	0.2889	20.11%
① FR_UFR1		84	5	89	0.9438	0.05618	-6.03%
① GH_ER2		73	15	88	0.8295	0.1705	6.8%
① CM_MC1		81	10	91	0.8901	0.1099	0.0%
① LC_SLC		77	13	90	0.8556	0.1444	3.88%
FR_FRABCH		76	14	90	0.8444	0.1556	5.13%
FR_FRCP1		80	10	90	0.8889	0.1111	0.14%
GH_FR1		72	19	91	0.7912	0.2088	11.11%
GH_ERC		80	10	90	0.8889	0.1111	0.14%
CM_MC2		80	9	89	0.8989	0.1011	-0.98%
EV_MC2		77	15	92	0.837	0.163	5.97%
EV_HC1		79	9	88	0.8977	0.1023	-0.86%
LC_DCDS		84	6	90	0.9333	0.06667	-4.86%
LC_LC3		78	12	90	0.8667	0.1333	2.63%
LC_LC5		70	20	90	0.7778	0.2222	12.62%
LC_LCDSSLCC		83	8	91	0.9121	0.08791	-2.47%
FR_FR4		72	17	89	0.809	0.191	9.11%
FR_FRRD		73	17	90	0.8111	0.1889	8.88%
FR_FR2		78	11	89	0.8764	0.1236	1.54%
FR_MULTIPLATE		70	19	89	0.7865	0.2135	11.64%

① Reference STHs

Salmonid Embryo-Alevin Survival and Development Test — **Nautilus Environmental**

Analysis ID:	02-4564-2342	**Endpoint:**	Proportion Normal	**CETIS Version:**	CETISv1.9.4
Analyzed:	20 Aug-21 16:43	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1

Proportion Normal Detail

Sample	Code	Rep 1	Rep 2	Rep 3
Dechlor	N	0.9333	0.7667	0.8710
Dechlor + 20		0.8333	0.7000	0.6000
① FR_UFR1		0.9667	0.8966	0.9667
① GH_ER2		0.8621	0.8333	0.7931
① CM_MC1		0.9032	0.8333	0.9333
① LC_SLC		0.9667	0.7667	0.8333
FR_FRABCH		0.9310	0.7742	0.8333
FR_FRCP1		0.8667	0.9333	0.8667
GH_FR1		0.8621	0.6250	0.9000
GH_ERC		0.9000	0.8000	0.9667
CM_MC2		0.9667	0.8333	0.8966
EV_MC2		0.9667	0.7419	0.8065
EV_HC1		0.9310	0.7931	0.9667
LC_DCDS		0.9667	0.8667	0.9667
LC_LC3		0.9310	0.8387	0.8333
LC_LC5		0.8750	0.7586	0.6897
LC_LCDSSLCC		0.9000	0.9355	0.9000
FR_FR4		0.8000	0.8621	0.7667
FR_FRRD		0.9655	0.6667	0.8065
FR_FR2		0.9000	0.8000	0.9310
FR_MULTIPLATE		0.9310	0.7586	0.6774

Proportion Normal Binomials

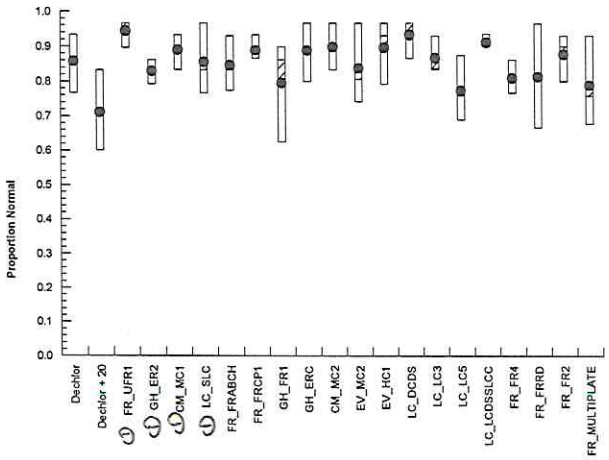
Sample	Code	Rep 1	Rep 2	Rep 3
Dechlor	N	28/30	23/30	27/31
Dechlor + 20		25/30	21/30	18/30
① FR_UFR1		29/30	26/29	29/30
① GH_ER2		25/29	25/30	23/29
① CM_MC1		28/31	25/30	28/30
① LC_SLC		29/30	23/30	25/30
FR_FRABCH		27/29	24/31	25/30
FR_FRCP1		26/30	28/30	26/30
GH_FR1		25/29	20/32	27/30
GH_ERC		27/30	24/30	29/30
CM_MC2		29/30	25/30	26/29
EV_MC2		29/30	23/31	25/31
EV_HC1		27/29	23/29	29/30
LC_DCDS		29/30	26/30	29/30
LC_LC3		27/29	26/31	25/30
LC_LC5		28/32	22/29	20/29
LC_LCDSSLCC		27/30	29/31	27/30
FR_FR4		24/30	25/29	23/30
FR_FRRD		28/29	20/30	25/31
FR_FR2		27/30	24/30	27/29
FR_MULTIPLATE		27/29	22/29	21/31

① Reference sites

Salmonid Embryo-Alevin Survival and Development Test — **Nautilus Environmental**

Analysis ID:	02-4564-2342	**Endpoint:**	Proportion Normal	**CETIS Version:**	CETISv1.9.4
Analyzed:	20 Aug-21 16:43	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1

Graphics



① Reference Sites

Analyst: _____ QA: _____ 23/21

CETIS Analytical Report

Salmonid Embryo-Alevin Survival and Development Test — **Nautilus Environmental**

Analysis ID:	11-2444-5801	**Endpoint:**	Survival Rate	**CETIS Version:**	CETISv1.9.4
Analyzed:	20 Aug-21 16:46	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1
Batch ID:	16-7967-5486	**Test Type:**	Survival-Development	**Analyst:**	Yvonne Lam
Start Date:	19 May-21 17:35	**Protocol:**	EC/EPS 1/RM/28	**Diluent:**	Dechlorinated Tap Water
Ending Date:	18 Jun-21 08:05	**Species:**	Oncorhynchus mykiss	**Brine:**	
Test Length:	29d 14h	**Taxon:**	Actinopterygii	**Source:**	Ted's Trout, Campbell Lake **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
Dechlor + 20	14-4597-7512	19 May-21	19 May-21	18h	Teck Coal	
① FR_UFR1	12-4424-2146	18 May-21	19 May-21 11:20	42h (2.3 °C)		
① GH_ER2	02-4275-7088	18 May-21 09:55	19 May-21 11:20	32h (0.4 °C)		
① CM_MC1	01-4263-6393	18 May-21 11:08	19 May-21 11:20	30h (1.1 °C)		
① LC_SLC	12-1662-7355	18 May-21 09:45	19 May-21 11:20	32h (4.1 °C)		
FR_FRABCH	05-6713-4959	18 May-21	19 May-21 11:20	42h (1.9 °C)		
FR_FRCP1	19-8027-7867	18 May-21	19 May-21 11:20	42h (1.2 °C)		
GH_FR1	15-9886-5398	18 May-21 12:30	19 May-21 11:20	29h (0.1 °C)		
GH_ERC	21-0704-4941	18 May-21 11:20	19 May-21 11:20	30h (0.6 °C)		
CM_MC2	17-6814-6287	18 May-21 09:50	19 May-21 11:20	32h (1.1 °C)		
EV_MC2	15-5628-9197	18 May-21 13:00	19 May-21 11:20	29h (3.6 °C)		
EV_HC1	05-8730-9056	18 May-21 11:20	19 May-21 11:20	30h (4.8 °C)		
LC_DCDS	20-0340-1068	18 May-21 11:00	19 May-21 11:20	31h (4.6 °C)		
LC_LC3	18-4816-9590	18 May-21 10:15	19 May-21 11:20	31h (4.7 °C)		
LC_LC5	03-8768-2280	18 May-21 09:50	19 May-21 11:20	32h (5.2 °C)		
LC_LCDSSLCC	02-2977-6783	18 May-21 11:00	19 May-21 11:20	31h (4.3 °C)		
FR_FR4	17-1641-7069	18 May-21 09:29	19 May-21 11:20	32h (4.6 °C)		
FR_FRRD	06-3190-8505	18 May-21 08:22	19 May-21 11:20	33h (3.4 °C)		
FR_FR2	11-2149-8709	18 May-21 10:28	19 May-21 11:20	31h (4.6 °C)		
FR_MULTIPLATE	16-7235-2081	18 May-21 11:21	19 May-21 11:20	30h (3.4 °C)		

All samples spiked with 20 ug/L Cu

① Reference sites

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
Dechlor + 20	Contol+Cu	Teck Coal	Dechlor + 20 ug/L Cu	
① FR_UFR1	Water Sample	Teck Coal	FR_UFR1_WEK_2021-05-1	
① GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-05-18_	
① CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-05-18	
① LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-05-18_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_WEK_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_WEK_2021-05	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-05-18_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-05-18	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-05-18	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2020_Q2_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2020_Q2_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-05-18	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-05-18_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-05-18_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	
FR_FR4	Water Sample	Teck Coal	FR_FR4_WS_2021-05-18_	
FR_FRRD	Water Sample	Teck Coal	FR_FRRD_WS_2021-05-18	
FR_FR2	Water Sample	Teck Coal	FR_FR2_WS_2021-05-18_	
FR_MULTIPLATE	Water Sample	Teck Coal	FR_MULTIPLATE_WS_202	

Fisher Exact/Bonferroni-Holm Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
Lab Water (Dechlor+20)		① FR_UFR1	1.0000	Exact	1.0000	Non-Significant Effect
		① GH_ER2	0.9994	Exact	1.0000	Non-Significant Effect
		① CM_MC1	0.9996	Exact	1.0000	Non-Significant Effect
		① LC_SLC	0.9901	Exact	1.0000	Non-Significant Effect

Analyst: YL QA: Aug. 23/21

Salmonid Embryo-Alevin Survival and Development Test — **Nautilus Environmental**

Analysis ID: 11-2444-5801 **Endpoint:** Survival Rate **CETIS Version:** CETISv1.9.4
Analyzed: 20 Aug-21 16:46 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Fisher Exact/Bonferroni-Holm Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
		FR_FRABCH	0.9948	Exact	1.0000	Non-Significant Effect
		FR_FRCP1	0.9989	Exact	1.0000	Non-Significant Effect
		GH_FR1	0.8695	Exact	1.0000	Non-Significant Effect
		GH_ERC	0.9974	Exact	1.0000	Non-Significant Effect
		CM_MC2	0.9972	Exact	1.0000	Non-Significant Effect
		EV_MC2	0.9996	Exact	1.0000	Non-Significant Effect
		EV_HC1	0.9998	Exact	1.0000	Non-Significant Effect
		LC_DCDS	1.0000	Exact	1.0000	Non-Significant Effect
		LC_LC3	0.9974	Exact	1.0000	Non-Significant Effect
		LC_LC5	0.7013	Exact	1.0000	Non-Significant Effect
		LC_LCDSSLCC	0.9996	Exact	1.0000	Non-Significant Effect
		FR_FR4	0.9682	Exact	1.0000	Non-Significant Effect
		FR_FRRD	0.9537	Exact	1.0000	Non-Significant Effect
		FR_FR2	0.9891	Exact	1.0000	Non-Significant Effect
		FR_MULTIPLATE	0.9252	Exact	1.0000	Non-Significant Effect

Data Summary

Sample	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
Dechlor + 20	L	68	22	90	0.7556	0.2444	18.15%
① FR_UFR1		85	4	89	0.9551	0.04494	-3.46%
① GH_ER2		81	7	88	0.9205	0.07955	0.28%
① CM_MC1		84	7	91	0.9231	0.07692	0.0%
① LC_SLC		79	11	90	0.8778	0.1222	4.91%
FR_FRABCH		80	10	90	0.8889	0.1111	3.7%
FR_FRCP1		82	8	90	0.9111	0.08889	1.3%
GH_FR1		74	17	91	0.8132	0.1868	11.9%
GH_ERC		81	9	90	0.9	0.1	2.5%
CM_MC2		80	9	89	0.8989	0.1011	2.62%
EV_MC2		85	7	92	0.9239	0.07609	-0.09%
EV_HC1		82	6	88	0.9318	0.06818	-0.95%
LC_DCDS		85	5	90	0.9444	0.05556	-2.32%
LC_LC3		81	9	90	0.9	0.1	2.5%
LC_LC5		70	20	90	0.7778	0.2222	15.74%
LC_LCDSSLCC		84	7	91	0.9231	0.07692	0.0%
FR_FR4		76	13	89	0.8539	0.1461	7.49%
FR_FRRD		76	14	90	0.8444	0.1556	8.52%
FR_FR2		78	11	89	0.8764	0.1236	5.06%
FR_MULTIPLATE		74	15	89	0.8315	0.1685	9.93%

① Reference sites

Salmonid Embryo-Alevin Survival and Development Test — **Nautilus Environmental**

Analysis ID:	11-2444-5801	**Endpoint:**	Survival Rate	**CETIS Version:**	CETISv1.9.4
Analyzed:	20 Aug-21 16:46	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1

Survival Rate Detail

Sample	Code	Rep 1	Rep 2	Rep 3
Dechlor + 20	L	0.8667	0.7667	0.6333
① FR_UFR1		1.0000	0.8966	0.9667
① GH_ER2		0.8621	0.9333	0.9655
① CM_MC1		0.9032	0.8667	1.0000
① LC_SLC		0.9667	0.7667	0.9000
FR_FRABCH		0.9310	0.8387	0.9000
FR_FRCP1		0.9000	0.9333	0.9000
GH_FR1		0.8966	0.6562	0.9000
GH_ERC		0.9333	0.8000	0.9667
CM_MC2		0.9667	0.8333	0.8966
EV_MC2		1.0000	0.8387	0.9355
EV_HC1		1.0000	0.7931	1.0000
LC_DCDS		0.9667	0.9000	0.9667
LC_LC3		0.9310	0.8710	0.9000
LC_LC5		0.8750	0.7586	0.6897
LC_LCDSSLCC		0.9333	0.9355	0.9000
FR_FR4		0.9000	0.8621	0.8000
FR_FRRD		0.9655	0.7000	0.8710
FR_FR2		0.9000	0.8000	0.9310
FR_MULTIPLATE		0.9310	0.8276	0.7419

Survival Rate Binomials

Sample	Code	Rep 1	Rep 2	Rep 3
Dechlor + 20	L	26/30	23/30	19/30
① FR_UFR1		30/30	26/29	29/30
① GH_ER2		25/29	28/30	28/29
① CM_MC1		28/31	26/30	30/30
① LC_SLC		29/30	23/30	27/30
FR_FRABCH		27/29	26/31	27/30
FR_FRCP1		27/30	28/30	27/30
GH_FR1		26/29	21/32	27/30
GH_ERC		28/30	24/30	29/30
CM_MC2		29/30	25/30	26/29
EV_MC2		30/30	26/31	29/31
EV_HC1		29/29	23/29	30/30
LC_DCDS		29/30	27/30	29/30
LC_LC3		27/29	27/31	27/30
LC_LC5		28/32	22/29	20/29
LC_LCDSSLCC		28/30	29/31	27/30
FR_FR4		27/30	25/29	24/30
FR_FRRD		28/29	21/30	27/31
FR_FR2		27/30	24/30	27/29
FR_MULTIPLATE		27/29	24/29	23/31

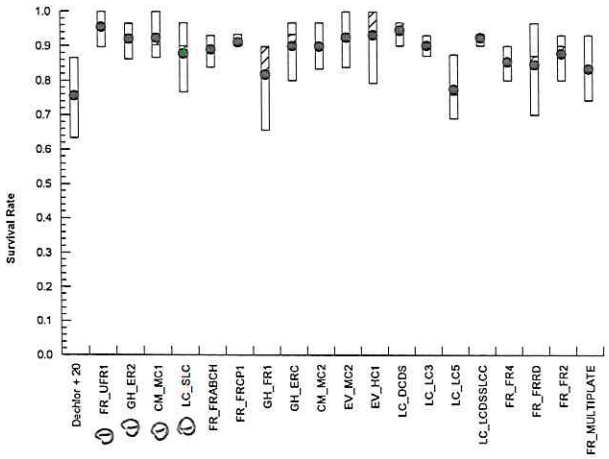
① Reference Sites

Analyst: UW QA: JGe Aug. 23/21

Salmonid Embryo-Alevin Survival and Development Test — **Nautilus Environmental**

Analysis ID:	11-2444-5801	**Endpoint:**	Survival Rate	**CETIS Version:**	CETISv1.9.4
Analyzed:	20 Aug-21 16:46	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1

Graphics



① Reference Sites

Salmonid Embryo-Alevin Survival and Development Test — **Nautilus Environmental**

Analysis ID:	14-6287-9001	**Endpoint:**	Proportion Normal	**CETIS Version:**	CETISv1.9.4
Analyzed:	20 Aug-21 16:46	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1
Batch ID:	16-7967-5486	**Test Type:**	Survival-Development	**Analyst:**	Yvonne Lam
Start Date:	19 May-21 17:35	**Protocol:**	EC/EPS 1/RM/28	**Diluent:**	Dechlorinated Tap Water
Ending Date:	18 Jun-21 08:05	**Species:**	Oncorhynchus mykiss	**Brine:**	
Test Length:	29d 14h	**Taxon:**	Actinopterygii	**Source:**	Ted's Trout, Campbell Lake **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
Dechlor + 20	14-4597-7512	19 May-21	19 May-21	18h	Teck Coal	
① FR_UFR1	12-4424-2146	18 May-21	19 May-21 11:20	42h (2.3 °C)		
① GH_ER2	02-4275-7088	18 May-21 09:55	19 May-21 11:20	32h (0.4 °C)		
① CM_MC1	01-4263-6393	18 May-21 11:08	19 May-21 11:20	30h (1.1 °C)		
① LC_SLC	12-1662-7355	18 May-21 09:45	19 May-21 11:20	32h (4.1 °C)		
FR_FRABCH	05-6713-4959	18 May-21	19 May-21 11:20	42h (1.9 °C)		
FR_FRCP1	19-8027-7867	18 May-21	19 May-21 11:20	42h (1.2 °C)		
GH_FR1	15-9886-5398	18 May-21 12:30	19 May-21 11:20	29h (0.1 °C)		
GH_ERC	21-0704-4941	18 May-21 11:20	19 May-21 11:20	30h (0.6 °C)		
CM_MC2	17-6814-6287	18 May-21 09:50	19 May-21 11:20	32h (1.1 °C)		
EV_MC2	15-5628-9197	18 May-21 13:00	19 May-21 11:20	29h (3.6 °C)		
EV_HC1	05-8730-9056	18 May-21 11:20	19 May-21 11:20	30h (4.8 °C)		
LC_DCDS	20-0340-1068	18 May-21 11:00	19 May-21 11:20	31h (4.6 °C)		
LC_LC3	18-4816-9590	18 May-21 10:15	19 May-21 11:20	31h (4.7 °C)		
LC_LC5	03-8768-2280	18 May-21 09:50	19 May-21 11:20	32h (5.2 °C)		
LC_LCDSSLCC	02-2977-6783	18 May-21 11:00	19 May-21 11:20	31h (4.3 °C)		
FR_FR4	17-1641-7069	18 May-21 09:29	19 May-21 11:20	32h (4.6 °C)		
FR_FRRD	06-3190-8505	18 May-21 08:22	19 May-21 11:20	33h (3.4 °C)		
FR_FR2	11-2149-8709	18 May-21 10:28	19 May-21 11:20	31h (4.6 °C)		
FR_MULTIPLATE	16-7235-2081	18 May-21 11:21	19 May-21 11:20	30h (3.4 °C)		

All samples spiked with 20 ug/L Cu

① Reference Sites

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
Dechlor + 20	Contol+Cu	Teck Coal	Dechlor + 20 ug/L Cu	
① FR_UFR1	Water Sample	Teck Coal	FR_UFR1_WEK_2021-05-1	
① GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-05-18_	
① CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-05-18	
① LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-05-18_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_WEK_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_WEK_2021-05	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-05-18_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-05-18	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-05-18	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2020_Q2_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2020_Q2_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-05-18	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-05-18_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-05-18_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	
FR_FR4	Water Sample	Teck Coal	FR_FR4_WS_2021-05-18_	
FR_FRRD	Water Sample	Teck Coal	FR_FRRD_WS_2021-05-18	
FR_FR2	Water Sample	Teck Coal	FR_FR2_WS_2021-05-18_	
FR_MULTIPLATE	Water Sample	Teck Coal	FR_MULTIPLATE_WS_202	

Fisher Exact/Bonferroni-Holm Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
Lab Water (Dechlor + 20)		① FR_UFR1	1.0000	Exact	1.0000	Non-Significant Effect
		① GH_ER2	0.9805	Exact	1.0000	Non-Significant Effect
		① CM_MC1	0.9994	Exact	1.0000	Non-Significant Effect
		① LC_SLC	0.9946	Exact	1.0000	Non-Significant Effect

Salmonid Embryo-Alevin Survival and Development Test — **Nautilus Environmental**

Analysis ID: 14-6287-9001 **Endpoint:** Proportion Normal **CETIS Version:** CETISv1.9.4
Analyzed: 20 Aug-21 16:46 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Fisher Exact/Bonferroni-Holm Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
		FR_FRABCH	0.9905	Exact	1.0000	Non-Significant Effect
		FR_FRCP1	0.9993	Exact	1.0000	Non-Significant Effect
		GH_FR1	0.9222	Exact	1.0000	Non-Significant Effect
		GH_ERC	0.9993	Exact	1.0000	Non-Significant Effect
		CM_MC2	0.9997	Exact	1.0000	Non-Significant Effect
		EV_MC2	0.9867	Exact	1.0000	Non-Significant Effect
		EV_HC1	0.9996	Exact	1.0000	Non-Significant Effect
		LC_DCDS	1.0000	Exact	1.0000	Non-Significant Effect
		LC_LC3	0.9972	Exact	1.0000	Non-Significant Effect
		LC_LC5	0.8843	Exact	1.0000	Non-Significant Effect
		LC_LCDSSLCC	0.9999	Exact	1.0000	Non-Significant Effect
		FR_FR4	0.9565	Exact	1.0000	Non-Significant Effect
		FR_FRRD	0.9601	Exact	1.0000	Non-Significant Effect
		FR_FR2	0.9984	Exact	1.0000	Non-Significant Effect
		FR_MULTIPLATE	0.9093	Exact	1.0000	Non-Significant Effect

Data Summary

Sample	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
Dechlor + 20	L	64	26	90	0.7111	0.2889	20.11%
FR_UFR1		84	5	89	0.9438	0.05618	-6.03%
GH_ER2		73	15	88	0.8295	0.1705	6.8%
CM_MC1		81	10	91	0.8901	0.1099	0.0%
LC_SLC		77	13	90	0.8556	0.1444	3.88%
FR_FRABCH		76	14	90	0.8444	0.1556	5.13%
FR_FRCP1		80	10	90	0.8889	0.1111	0.14%
GH_FR1		72	19	91	0.7912	0.2088	11.11%
GH_ERC		80	10	90	0.8889	0.1111	0.14%
CM_MC2		80	9	89	0.8989	0.1011	-0.98%
EV_MC2		77	15	92	0.837	0.163	5.97%
EV_HC1		79	9	88	0.8977	0.1023	-0.86%
LC_DCDS		84	6	90	0.9333	0.06667	-4.86%
LC_LC3		78	12	90	0.8667	0.1333	2.63%
LC_LC5		70	20	90	0.7778	0.2222	12.62%
LC_LCDSSLCC		83	8	91	0.9121	0.08791	-2.47%
FR_FR4		72	17	89	0.809	0.191	9.11%
FR_FRRD		73	17	90	0.8111	0.1889	8.88%
FR_FR2		78	11	89	0.8764	0.1236	1.54%
FR_MULTIPLATE		70	19	89	0.7865	0.2135	11.64%

Reference sites

Salmonid Embryo-Alevin Survival and Development Test — **Nautilus Environmental**

Analysis ID: 14-6287-9001 **Endpoint:** Proportion Normal **CETIS Version:** CETISv1.9.4
Analyzed: 20 Aug-21 16:46 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Proportion Normal Detail

Sample	Code	Rep 1	Rep 2	Rep 3
Dechlor + 20	L	0.8333	0.7000	0.6000
① FR_UFR1		0.9667	0.8966	0.9667
① GH_ER2		0.8621	0.8333	0.7931
① CM_MC1		0.9032	0.8333	0.9333
① LC_SLC		0.9667	0.7667	0.8333
FR_FRABCH		0.9310	0.7742	0.8333
FR_FRCP1		0.8667	0.9333	0.8667
GH_FR1		0.8621	0.6250	0.9000
GH_ERC		0.9000	0.8000	0.9667
CM_MC2		0.9667	0.8333	0.8966
EV_MC2		0.9667	0.7419	0.8065
EV_HC1		0.9310	0.7931	0.9667
LC_DCDS		0.9667	0.8667	0.9667
LC_LC3		0.9310	0.8387	0.8333
LC_LC5		0.8750	0.7586	0.6897
LC_LCDSSLCC		0.9000	0.9355	0.9000
FR_FR4		0.8000	0.8621	0.7667
FR_FRRD		0.9655	0.6667	0.8065
FR_FR2		0.9000	0.8000	0.9310
FR_MULTIPLATE		0.9310	0.7586	0.6774

Proportion Normal Binomials

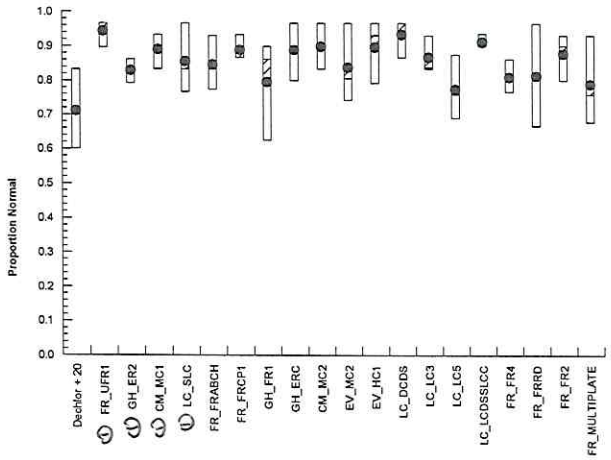
Sample	Code	Rep 1	Rep 2	Rep 3
Dechlor + 20	L	25/30	21/30	18/30
① FR_UFR1		29/30	26/29	29/30
① GH_ER2		25/29	25/30	23/29
① CM_MC1		28/31	25/30	28/30
① LC_SLC		29/30	23/30	25/30
FR_FRABCH		27/29	24/31	25/30
FR_FRCP1		26/30	28/30	26/30
GH_FR1		25/29	20/32	27/30
GH_ERC		27/30	24/30	29/30
CM_MC2		29/30	25/30	26/29
EV_MC2		29/30	23/31	25/31
EV_HC1		27/29	23/29	29/30
LC_DCDS		29/30	26/30	29/30
LC_LC3		27/29	26/31	25/30
LC_LC5		28/32	22/29	20/29
LC_LCDSSLCC		27/30	29/31	27/30
FR_FR4		24/30	25/29	23/30
FR_FRRD		28/29	20/30	25/31
FR_FR2		27/30	24/30	27/29
FR_MULTIPLATE		27/29	22/29	21/31

① Reference Sites

Salmonid Embryo-Alevin Survival and Development Test — **Nautilus Environmental**

Analysis ID:	14-6287-9001	**Endpoint:**	Proportion Normal	**CETIS Version:**	CETISv1.9.4
Analyzed:	20 Aug-21 16:46	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1

Graphics



① Reference Sites

CETIS Analytical Report

Salmonid Embryo-Alevin Survival and Development Test — **Nautilus Environmental**

Analysis ID:	20-0957-4211	**Endpoint:**	Survival Rate	**CETIS Version:**	CETISv1.9.4
Analyzed:	20 Aug-21 16:48	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1
Batch ID:	16-7967-5486	**Test Type:**	Survival-Development	**Analyst:**	Yvonne Lam
Start Date:	19 May-21 17:35	**Protocol:**	EC/EPS 1/RM/28	**Diluent:**	Dechlorinated Tap Water
Ending Date:	18 Jun-21 08:05	**Species:**	Oncorhynchus mykiss	**Brine:**	
Test Length:	29d 14h	**Taxon:**	Actinopterygii	**Source:**	Ted's Trout, Campbell Lake **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
① FR_UFR1	12-4424-2146	18 May-21	19 May-21 11:20	42h (2.3 °C)	Teck Coal	
① GH_ER2	02-4275-7088	18 May-21 09:55	19 May-21 11:20	32h (0.4 °C)		
① CM_MC1	01-4263-6393	18 May-21 11:08	19 May-21 11:20	30h (1.1 °C)		
① LC_SLC	12-1662-7355	18 May-21 09:45	19 May-21 11:20	32h (4.1 °C)		
FR_FRABCH	05-6713-4959	18 May-21	19 May-21 11:20	42h (1.9 °C)		
FR_FRCP1	19-8027-7867	18 May-21	19 May-21 11:20	42h (1.2 °C)		
GH_FR1	15-9886-5398	18 May-21 12:30	19 May-21 11:20	29h (0.1 °C)		
GH_ERC	21-0704-4941	18 May-21 11:20	19 May-21 11:20	30h (0.6 °C)		
CM_MC2	17-6814-6287	18 May-21 09:50	19 May-21 11:20	32h (1.1 °C)		
EV_MC2	15-5628-9197	18 May-21 13:00	19 May-21 11:20	29h (3.6 °C)		
EV_HC1	05-8730-9056	18 May-21 11:20	19 May-21 11:20	30h (4.8 °C)		
LC_DCDS	20-0340-1068	18 May-21 11:00	19 May-21 11:20	31h (4.6 °C)		
LC_LC3	18-4816-9590	18 May-21 10:15	19 May-21 11:20	31h (4.7 °C)		
LC_LC5	03-8768-2280	18 May-21 09:50	19 May-21 11:20	32h (5.2 °C)		
LC_LCDSSLCC	02-2977-6783	18 May-21 11:00	19 May-21 11:20	31h (4.3 °C)		
FR_FR4	17-1641-7069	18 May-21 09:29	19 May-21 11:20	32h (4.6 °C)		
FR_FRRD	06-3190-8505	18 May-21 08:22	19 May-21 11:20	33h (3.4 °C)		
FR_FR2	11-2149-8709	18 May-21 10:28	19 May-21 11:20	31h (4.6 °C)		
FR_MULTIPLATE	16-7235-2081	18 May-21 11:21	19 May-21 11:20	30h (3.4 °C)		

All samples spiked with 20 ug/L Cu

① Reference sites

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
① FR_UFR1	Water Sample	Teck Coal	FR_UFR1_WEK_2021-05-1	
① GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-05-18_	
① CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-05-18	
① LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-05-18_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_WEK_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_WEK_2021-05	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-05-18_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-05-18	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-05-18	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2020_Q2_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2020_Q2_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-05-18	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-05-18_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-05-18_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	
FR_FR4	Water Sample	Teck Coal	FR_FR4_WS_2021-05-18_	
FR_FRRD	Water Sample	Teck Coal	FR_FRRD_WS_2021-05-18	
FR_FR2	Water Sample	Teck Coal	FR_FR2_WS_2021-05-18_	
FR_MULTIPLATE	Water Sample	Teck Coal	FR_MULTIPLATE_WS_202	

Fisher Exact/Bonferroni-Holm Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
① Upstream Control (FR_UFR1)		① GH_ER2	0.2613	Exact	1.0000	Non-Significant Effect
		① CM_MC1	0.2808	Exact	1.0000	Non-Significant Effect
		① LC_SLC	0.0539	Exact	0.6469	Non-Significant Effect
		FR_FRABCH	0.0844	Exact	0.9284	Non-Significant Effect
		FR_FRCP1	0.1909	Exact	1.0000	Non-Significant Effect
		GH_FR1*	0.0026	Exact	0.0436	Significant Effect

Analyst: YL QA: JOL Aug. 23/21

Salmonid Embryo-Alevin Survival and Development Test — **Nautilus Environmental**

Analysis ID: 20-0957-4211 **Endpoint:** Survival Rate **CETIS Version:** CETISv1.9.4
Analyzed: 20 Aug-21 16:48 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Fisher Exact/Bonferroni-Holm Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
		GH_ERC	0.1288	Exact	1.0000	Non-Significant Effect
		CM_MC2	0.1243	Exact	1.0000	Non-Significant Effect
		EV_MC2	0.2873	Exact	0.8618	Non-Significant Effect
		EV_HC1	0.3662	Exact	0.7325	Non-Significant Effect
		LC_DCDS	0.5070	Exact	0.5070	Non-Significant Effect
		LC_LC3	0.1288	Exact	1.0000	Non-Significant Effect
		LC_LC5*	0.0004	Exact	0.0070	Significant Effect
		LC_LCDSSLCC	0.2808	Exact	1.0000	Non-Significant Effect
		FR_FR4	0.0193	Exact	0.2707	Non-Significant Effect
		FR_FRRD	0.0123	Exact	0.1842	Non-Significant Effect
		FR_FR2	0.0514	Exact	0.6686	Non-Significant Effect
		FR_MULTIPLATE	0.0067	Exact	0.1071	Non-Significant Effect

Data Summary

Sample	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
FR_UFR1	U	85	4	89	0.9551	0.04494	-3.46%
GH_ER2		81	7	88	0.9205	0.07955	0.28%
CM_MC1		84	7	91	0.9231	0.07692	0.0%
LC_SLC		79	11	90	0.8778	0.1222	4.91%
FR_FRABCH		80	10	90	0.8889	0.1111	3.7%
FR_FRCP1		82	8	90	0.9111	0.08889	1.3%
GH_FR1		74	17	91	0.8132	0.1868	11.9%
GH_ERC		81	9	90	0.9	0.1	2.5%
CM_MC2		80	9	89	0.8989	0.1011	2.62%
EV_MC2		85	7	92	0.9239	0.07609	-0.09%
EV_HC1		82	6	88	0.9318	0.06818	-0.95%
LC_DCDS		85	5	90	0.9444	0.05556	-2.32%
LC_LC3		81	9	90	0.9	0.1	2.5%
LC_LC5		70	20	90	0.7778	0.2222	15.74%
LC_LCDSSLCC		84	7	91	0.9231	0.07692	0.0%
FR_FR4		76	13	89	0.8539	0.1461	7.49%
FR_FRRD		76	14	90	0.8444	0.1556	8.52%
FR_FR2		78	11	89	0.8764	0.1236	5.06%
FR_MULTIPLATE		74	15	89	0.8315	0.1685	9.93%

Reference Sites

Salmonid Embryo-Alevin Survival and Development Test — **Nautilus Environmental**

Analysis ID:	20-0957-4211	**Endpoint:**	Survival Rate	**CETIS Version:**	CETISv1.9.4
Analyzed:	20 Aug-21 16:48	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1

Survival Rate Detail

Sample	Code	Rep 1	Rep 2	Rep 3
FR_UFR1	U	1.0000	0.8966	0.9667
GH_ER2		0.8621	0.9333	0.9655
CM_MC1		0.9032	0.8667	1.0000
LC_SLC		0.9667	0.7667	0.9000
FR_FRABCH		0.9310	0.8387	0.9000
FR_FRCP1		0.9000	0.9333	0.9000
GH_FR1		0.8966	0.6562	0.9000
GH_ERC		0.9333	0.8000	0.9667
CM_MC2		0.9667	0.8333	0.8966
EV_MC2		1.0000	0.8387	0.9355
EV_HC1		1.0000	0.7931	1.0000
LC_DCDS		0.9667	0.9000	0.9667
LC_LC3		0.9310	0.8710	0.9000
LC_LC5		0.8750	0.7586	0.6897
LC_LCDSSLCC		0.9333	0.9355	0.9000
FR_FR4		0.9000	0.8621	0.8000
FR_FRRD		0.9655	0.7000	0.8710
FR_FR2		0.9000	0.8000	0.9310
FR_MULTIPLATE		0.9310	0.8276	0.7419

Survival Rate Binomials

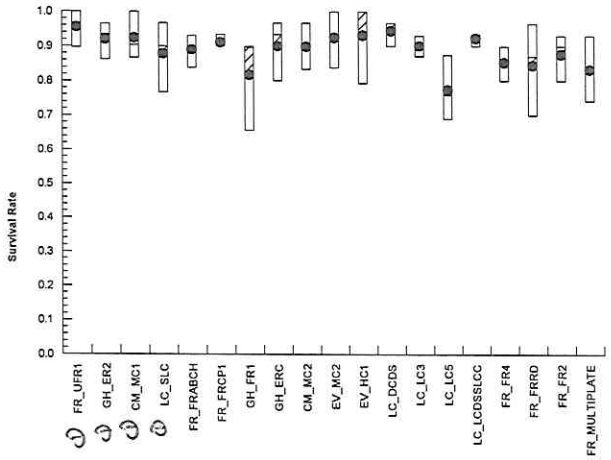
Sample	Code	Rep 1	Rep 2	Rep 3
FR_UFR1	U	30/30	26/29	29/30
GH_ER2		25/29	28/30	28/29
CM_MC1		28/31	26/30	30/30
LC_SLC		29/30	23/30	27/30
FR_FRABCH		27/29	26/31	27/30
FR_FRCP1		27/30	28/30	27/30
GH_FR1		26/29	21/32	27/30
GH_ERC		28/30	24/30	29/30
CM_MC2		29/30	25/30	26/29
EV_MC2		30/30	26/31	29/31
EV_HC1		29/29	23/29	30/30
LC_DCDS		29/30	27/30	29/30
LC_LC3		27/29	27/31	27/30
LC_LC5		28/32	22/29	20/29
LC_LCDSSLCC		28/30	29/31	27/30
FR_FR4		27/30	25/29	24/30
FR_FRRD		28/29	21/30	27/31
FR_FR2		27/30	24/30	27/29
FR_MULTIPLATE		27/29	24/29	23/31

① Redrawn STHS

Salmonid Embryo-Alevin Survival and Development Test — **Nautilus Environmental**

Analysis ID:	20-0957-4211	**Endpoint:**	Survival Rate	**CETIS Version:**	CETISv1.9.4
Analyzed:	20 Aug-21 16:48	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1

Graphics



D Reference STHS

CETIS Analytical Report

Salmonid Embryo-Alevin Survival and Development Test — **Nautilus Environmental**

Analysis ID:	08-3748-5034	**Endpoint:**	Proportion Normal	**CETIS Version:**	CETISv1.9.4
Analyzed:	20 Aug-21 16:48	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1
Batch ID:	16-7967-5486	**Test Type:**	Survival-Development	**Analyst:**	Yvonne Lam
Start Date:	19 May-21 17:35	**Protocol:**	EC/EPS 1/RM/28	**Diluent:**	Dechlorinated Tap Water
Ending Date:	18 Jun-21 08:05	**Species:**	Oncorhynchus mykiss	**Brine:**	
Test Length:	29d 14h	**Taxon:**	Actinopterygii	**Source:**	Ted's Trout, Campbell Lake **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
① FR_UFR1	12-4424-2146	18 May-21	19 May-21 11:20	42h (2.3 °C)	Teck Coal	
② GH_ER2	02-4275-7088	18 May-21 09:55	19 May-21 11:20	32h (0.4 °C)		
③ CM_MC1	01-4263-6393	18 May-21 11:08	19 May-21 11:20	30h (1.1 °C)		
④ LC_SLC	12-1662-7355	18 May-21 09:45	19 May-21 11:20	32h (4.1 °C)		
FR_FRABCH	05-6713-4959	18 May-21	19 May-21 11:20	42h (1.9 °C)		
FR_FRCP1	19-8027-7867	18 May-21	19 May-21 11:20	42h (1.2 °C)		
GH_FR1	15-9886-5398	18 May-21 12:30	19 May-21 11:20	29h (0.1 °C)		
GH_ERC	21-0704-4941	18 May-21 11:20	19 May-21 11:20	30h (0.6 °C)		
CM_MC2	17-6814-6287	18 May-21 09:50	19 May-21 11:20	32h (1.1 °C)		
EV_MC2	15-5628-9197	18 May-21 13:00	19 May-21 11:20	29h (3.6 °C)		
EV_HC1	05-8730-9056	18 May-21 11:20	19 May-21 11:20	30h (4.8 °C)		
LC_DCDS	20-0340-1068	18 May-21 11:00	19 May-21 11:20	31h (4.6 °C)		
LC_LC3	18-4816-9590	18 May-21 10:15	19 May-21 11:20	31h (4.7 °C)		
LC_LC5	03-8768-2280	18 May-21 09:50	19 May-21 11:20	32h (5.2 °C)		
LC_LCDSSLCC	02-2977-6783	18 May-21 11:00	19 May-21 11:20	31h (4.3 °C)		
FR_FR4	17-1641-7069	18 May-21 09:29	19 May-21 11:20	32h (4.6 °C)		
FR_FRRD	06-3190-8505	18 May-21 08:22	19 May-21 11:20	33h (3.4 °C)		
FR_FR2	11-2149-8709	18 May-21 10:28	19 May-21 11:20	31h (4.6 °C)		
FR_MULTIPLATE	16-7235-2081	18 May-21 11:21	19 May-21 11:20	30h (3.4 °C)		

All samples spiked with 20 µg/L Cu

① Reference STHS

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
① FR_UFR1	Water Sample	Teck Coal	FR_UFR1_WEK_2021-05-1	
② GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-05-18_	
③ CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-05-18	
④ LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-05-18_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_WEK_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_WEK_2021-05	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-05-18_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-05-18	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-05-18	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2020_Q2_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2020_Q2_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-05-18	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-05-18_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-05-18_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	
FR_FR4	Water Sample	Teck Coal	FR_FR4_WS_2021-05-18_	
FR_FRRD	Water Sample	Teck Coal	FR_FRRD_WS_2021-05-18	
FR_FR2	Water Sample	Teck Coal	FR_FR2_WS_2021-05-18_	
FR_MULTIPLATE	Water Sample	Teck Coal	FR_MULTIPLATE_WS_202	

Fisher Exact/Bonferroni-Holm Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
① Upstream Control (FR_UFR1)		② GH_ER2	0.0143	Exact	0.1854	Non-Significant Effect
		③ CM_MC1	0.1506	Exact	0.7532	Non-Significant Effect
		④ LC_SLC	0.0420	Exact	0.4198	Non-Significant Effect
		FR_FRABCH	0.0265	Exact	0.2913	Non-Significant Effect
		FR_FRCP1	0.1454	Exact	1.0000	Non-Significant Effect
		GH_FR1*	0.0022	Exact	0.0347	Significant Effect

Analyst: YL QA: Aug. 23/21

Salmonid Embryo-Alevin Survival and Development Test — **Nautilus Environmental**

Analysis ID:	08-3748-5034	**Endpoint:**	Proportion Normal	**CETIS Version:**	CETISv1.9.4
Analyzed:	20 Aug-21 16:48	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1

Fisher Exact/Bonferroni-Holm Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
		GH_ERC	0.1454	Exact	1.0000	Non-Significant Effect
		CM_MC2	0.2023	Exact	0.6068	Non-Significant Effect
		EV_MC2	0.0187	Exact	0.2239	Non-Significant Effect
		EV_HC1	0.1960	Exact	0.7840	Non-Significant Effect
		LC_DCDS	0.5078	Exact	0.5078	Non-Significant Effect
		LC_LC3	0.0651	Exact	0.5857	Non-Significant Effect
		LC_LC5*	0.0011	Exact	0.0201	Significant Effect
		LC_LCDSSLCC	0.2977	Exact	0.5953	Non-Significant Effect
		FR_FR4	0.0054	Exact	0.0814	Non-Significant Effect
		FR_FRRD	0.0059	Exact	0.0825	Non-Significant Effect
		FR_FR2	0.0944	Exact	0.7555	Non-Significant Effect
		FR_MULTIPLATE*	0.0018	Exact	0.0305	Significant Effect

Data Summary

Sample	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
① FR_UFR1	U	84	5	89	0.9438	0.05618	-6.03%
① GH_ER2		73	15	88	0.8295	0.1705	6.8%
① CM_MC1		81	10	91	0.8901	0.1099	0.0%
① LC_SLC		77	13	90	0.8556	0.1444	3.88%
FR_FRABCH		76	14	90	0.8444	0.1556	5.13%
FR_FRCP1		80	10	90	0.8889	0.1111	0.14%
GH_FR1		72	19	91	0.7912	0.2088	11.11%
GH_ERC		80	10	90	0.8889	0.1111	0.14%
CM_MC2		80	9	89	0.8989	0.1011	-0.98%
EV_MC2		77	15	92	0.837	0.163	5.97%
EV_HC1		79	9	88	0.8977	0.1023	-0.86%
LC_DCDS		84	6	90	0.9333	0.06667	-4.86%
LC_LC3		78	12	90	0.8667	0.1333	2.63%
LC_LC5		70	20	90	0.7778	0.2222	12.62%
LC_LCDSSLCC		83	8	91	0.9121	0.08791	-2.47%
FR_FR4		72	17	89	0.809	0.191	9.11%
FR_FRRD		73	17	90	0.8111	0.1889	8.88%
FR_FR2		78	11	89	0.8764	0.1236	1.54%
FR_MULTIPLATE		70	19	89	0.7865	0.2135	11.64%

① Reference Sites

Salmonid Embryo-Alevin Survival and Development Test — **Nautilus Environmental**

Analysis ID:	08-3748-5034	**Endpoint:**	Proportion Normal	**CETIS Version:**	CETISv1.9.4
Analyzed:	20 Aug-21 16:48	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1

Proportion Normal Detail

Sample	Code	Rep 1	Rep 2	Rep 3
① FR_UFR1	U	0.9667	0.8966	0.9667
① GH_ER2		0.8621	0.8333	0.7931
① CM_MC1		0.9032	0.8333	0.9333
① LC_SLC		0.9667	0.7667	0.8333
FR_FRABCH		0.9310	0.7742	0.8333
FR_FRCP1		0.8667	0.9333	0.8667
GH_FR1		0.8621	0.6250	0.9000
GH_ERC		0.9000	0.8000	0.9667
CM_MC2		0.9667	0.8333	0.8966
EV_MC2		0.9667	0.7419	0.8065
EV_HC1		0.9310	0.7931	0.9667
LC_DCDS		0.9667	0.8667	0.9667
LC_LC3		0.9310	0.8387	0.8333
LC_LC5		0.8750	0.7586	0.6897
LC_LCDSSLCC		0.9000	0.9355	0.9000
FR_FR4		0.8000	0.8621	0.7667
FR_FRRD		0.9655	0.6667	0.8065
FR_FR2		0.9000	0.8000	0.9310
FR_MULTIPLATE		0.9310	0.7586	0.6774

Proportion Normal Binomials

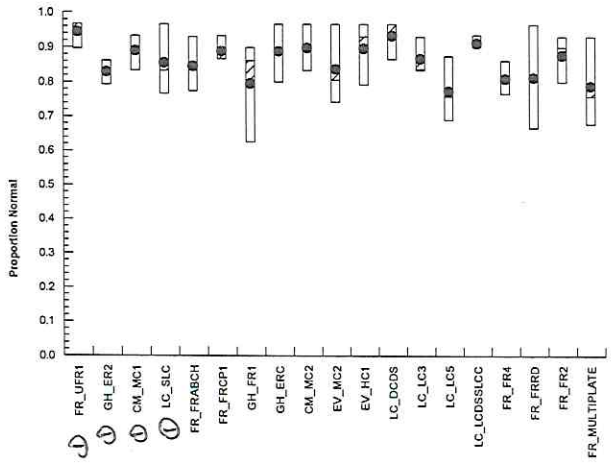
Sample	Code	Rep 1	Rep 2	Rep 3
① FR_UFR1	U	29/30	26/29	29/30
① GH_ER2		25/29	25/30	23/29
① CM_MC1		28/31	25/30	28/30
① LC_SLC		29/30	23/30	25/30
FR_FRABCH		27/29	24/31	25/30
FR_FRCP1		26/30	28/30	26/30
GH_FR1		25/29	20/32	27/30
GH_ERC		27/30	24/30	29/30
CM_MC2		29/30	25/30	26/29
EV_MC2		29/30	23/31	25/31
EV_HC1		27/29	23/29	29/30
LC_DCDS		29/30	26/30	29/30
LC_LC3		27/29	26/31	25/30
LC_LC5		28/32	22/29	20/29
LC_LCDSSLCC		27/30	29/31	27/30
FR_FR4		24/30	25/29	23/30
FR_FRRD		28/29	20/30	25/31
FR_FR2		27/30	24/30	27/29
FR_MULTIPLATE		27/29	22/29	21/31

① Reference Sites

Salmonid Embryo-Alevin Survival and Development Test — **Nautilus Environmental**

Analysis ID:	08-3748-5034	**Endpoint:**	Proportion Normal	**CETIS Version:**	CETISv1.9.4
Analyzed:	20 Aug-21 16:48	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1

Graphics



① Reference Sites

CETIS Analytical Report

Salmonid Embryo-Alevin Survival and Development Test — **Nautilus Environmental**

Analysis ID:	16-4619-6190	**Endpoint:**	Survival Rate	**CETIS Version:**	CETISv1.9.4
Analyzed:	20 Aug-21 16:50	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1
Batch ID:	16-7967-5486	**Test Type:**	Survival-Development	**Analyst:**	Yvonne Lam
Start Date:	19 May-21 17:35	**Protocol:**	EC/EPS 1/RM/28	**Diluent:**	Dechlorinated Tap Water
Ending Date:	18 Jun-21 08:05	**Species:**	Oncorhynchus mykiss	**Brine:**	
Test Length:	29d 14h	**Taxon:**	Actinopterygii	**Source:**	Ted's Trout, Campbell Lake **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
D FR_UFR1	12-4424-2146	18 May-21	19 May-21 11:20	42h (2.3 °C)	Teck Coal	
D GH_ER2	02-4275-7088	18 May-21 09:55	19 May-21 11:20	32h (0.4 °C)		
D CM_MC1	01-4263-6393	18 May-21 11:08	19 May-21 11:20	30h (1.1 °C)		
D LC_SLC	12-1662-7355	18 May-21 09:45	19 May-21 11:20	32h (4.1 °C)		
FR_FRABCH	05-6713-4959	18 May-21	19 May-21 11:20	42h (1.9 °C)		
FR_FRCP1	19-8027-7867	18 May-21	19 May-21 11:20	42h (1.2 °C)		
GH_FR1	15-9886-5398	18 May-21 12:30	19 May-21 11:20	29h (0.1 °C)		
GH_ERC	21-0704-4941	18 May-21 11:20	19 May-21 11:20	30h (0.6 °C)		
CM_MC2	17-6814-6287	18 May-21 09:50	19 May-21 11:20	32h (1.1 °C)		
EV_MC2	15-5628-9197	18 May-21 13:00	19 May-21 11:20	29h (3.6 °C)		
EV_HC1	05-8730-9056	18 May-21 11:20	19 May-21 11:20	30h (4.8 °C)		
LC_DCDS	20-0340-1068	18 May-21 11:00	19 May-21 11:20	31h (4.6 °C)		
LC_LC3	18-4816-9590	18 May-21 10:15	19 May-21 11:20	31h (4.7 °C)		
LC_LC5	03-8768-2280	18 May-21 09:50	19 May-21 11:20	32h (5.2 °C)		
LC_LCDSSLCC	02-2977-6783	18 May-21 11:00	19 May-21 11:20	31h (4.3 °C)		
FR_FR4	17-1641-7069	18 May-21 09:29	19 May-21 11:20	32h (4.6 °C)		
FR_FRRD	06-3190-8505	18 May-21 08:22	19 May-21 11:20	33h (3.4 °C)		
FR_FR2	11-2149-8709	18 May-21 10:28	19 May-21 11:20	31h (4.6 °C)		
FR_MULTIPLATE	16-7235-2081	18 May-21 11:21	19 May-21 11:20	30h (3.4 °C)		

All samples spiked with 20 mg/L Cu

D Reference Sites

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
D FR_UFR1	Water Sample	Teck Coal	FR_UFR1_WEK_2021-05-1	
D GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-05-18_	
D CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-05-18	
D LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-05-18_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_WEK_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_WEK_2021-05	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-05-18_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-05-18	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-05-18	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2020_Q2_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2020_Q2_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-05-18	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-05-18_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-05-18_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	
FR_FR4	Water Sample	Teck Coal	FR_FR4_WS_2021-05-18_	
FR_FRRD	Water Sample	Teck Coal	FR_FRRD_WS_2021-05-18	
FR_FR2	Water Sample	Teck Coal	FR_FR2_WS_2021-05-18_	
FR_MULTIPLATE	Water Sample	Teck Coal	FR_MULTIPLATE_WS_202	

Fisher Exact/Bonferroni-Holm Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
D Receiving Water (GH-ER2)		D FR_UFR1	0.8977	Exact	0.8977	Non-Significant Effect
		D CM_MC1	0.6343	Exact	1.0000	Non-Significant Effect
		D LC_SLC	0.2440	Exact	1.0000	Non-Significant Effect
		FR_FRABCH	0.3231	Exact	1.0000	Non-Significant Effect
		FR_FRCP1	0.5184	Exact	1.0000	Non-Significant Effect
		GH_FR1	0.0286	Exact	0.4863	Non-Significant Effect

Analyst: WW QA: Aug. 23/21

Salmonid Embryo-Alevin Survival and Development Test — **Nautilus Environmental**

Analysis ID: 16-4619-6190 **Endpoint:** Survival Rate **CETIS Version:** CETISv1.9.4
Analyzed: 20 Aug-21 16:50 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Fisher Exact/Bonferroni-Holm Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
		GH_ERC	0.4156	Exact	1.0000	Non-Significant Effect
		CM_MC2	0.4063	Exact	1.0000	Non-Significant Effect
		EV_MC2	0.6423	Exact	1.0000	Non-Significant Effect
		EV_HC1	0.7170	Exact	1.0000	Non-Significant Effect
		LC_DCDS	0.8253	Exact	1.0000	Non-Significant Effect
		LC_LC3	0.4156	Exact	1.0000	Non-Significant Effect
		LC_LC5	0.0066	Exact	0.1195	Non-Significant Effect
		LC_LCDSSLCC	0.6343	Exact	1.0000	Non-Significant Effect
		FR_FR4	0.1227	Exact	1.0000	Non-Significant Effect
		FR_FRRD	0.0896	Exact	1.0000	Non-Significant Effect
		FR_FR2	0.2361	Exact	1.0000	Non-Significant Effect
		FR_MULTIPLATE	0.0578	Exact	0.9247	Non-Significant Effect

Data Summary

Sample	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
① FR_UFR1		85	4	89	0.9551	0.04494	-3.46%
① GH_ER2	R	81	7	88	0.9205	0.07955	0.28%
① CM_MC1		84	7	91	0.9231	0.07692	0.0%
① LC_SLC		79	11	90	0.8778	0.1222	4.91%
FR_FRABCH		80	10	90	0.8889	0.1111	3.7%
FR_FRCP1		82	8	90	0.9111	0.08889	1.3%
GH_FR1		74	17	91	0.8132	0.1868	11.9%
GH_ERC		81	9	90	0.9	0.1	2.5%
CM_MC2		80	9	89	0.8989	0.1011	2.62%
EV_MC2		85	7	92	0.9239	0.07609	-0.09%
EV_HC1		82	6	88	0.9318	0.06818	-0.95%
LC_DCDS		85	5	90	0.9444	0.05556	-2.32%
LC_LC3		81	9	90	0.9	0.1	2.5%
LC_LC5		70	20	90	0.7778	0.2222	15.74%
LC_LCDSSLCC		84	7	91	0.9231	0.07692	0.0%
FR_FR4		76	13	89	0.8539	0.1461	7.49%
FR_FRRD		76	14	90	0.8444	0.1556	8.52%
FR_FR2		78	11	89	0.8764	0.1236	5.06%
FR_MULTIPLATE		74	15	89	0.8315	0.1685	9.93%

① Reference STATS

Analyst: MM QA: Aug. 23/21

Salmonid Embryo-Alevin Survival and Development Test — **Nautilus Environmental**

Analysis ID: 16-4619-6190 **Endpoint:** Survival Rate **CETIS Version:** CETISv1.9.4
Analyzed: 20 Aug-21 16:50 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Survival Rate Detail

Sample	Code	Rep 1	Rep 2	Rep 3
FR_UFR1		1.0000	0.8966	0.9667
GH_ER2	R	0.8621	0.9333	0.9655
CM_MC1		0.9032	0.8667	1.0000
LC_SLC		0.9667	0.7667	0.9000
FR_FRABCH		0.9310	0.8387	0.9000
FR_FRCP1		0.9000	0.9333	0.9000
GH_FR1		0.8966	0.6562	0.9000
GH_ERC		0.9333	0.8000	0.9667
CM_MC2		0.9667	0.8333	0.8966
EV_MC2		1.0000	0.8387	0.9355
EV_HC1		1.0000	0.7931	1.0000
LC_DCDS		0.9667	0.9000	0.9667
LC_LC3		0.9310	0.8710	0.9000
LC_LC5		0.8750	0.7586	0.6897
LC_LCDSSLCC		0.9333	0.9355	0.9000
FR_FR4		0.9000	0.8621	0.8000
FR_FRRD		0.9655	0.7000	0.8710
FR_FR2		0.9000	0.8000	0.9310
FR_MULTIPLATE		0.9310	0.8276	0.7419

Survival Rate Binomials

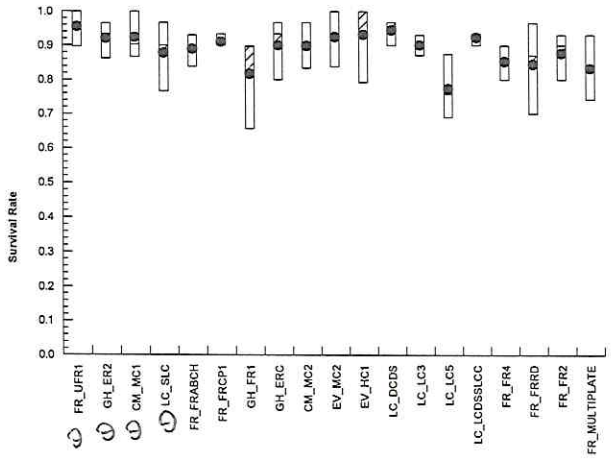
Sample	Code	Rep 1	Rep 2	Rep 3
FR_UFR1		30/30	26/29	29/30
GH_ER2	R	25/29	28/30	28/29
CM_MC1		28/31	26/30	30/30
LC_SLC		29/30	23/30	27/30
FR_FRABCH		27/29	26/31	27/30
FR_FRCP1		27/30	28/30	27/30
GH_FR1		26/29	21/32	27/30
GH_ERC		28/30	24/30	29/30
CM_MC2		29/30	25/30	26/29
EV_MC2		30/30	26/31	29/31
EV_HC1		29/29	23/29	30/30
LC_DCDS		29/30	27/30	29/30
LC_LC3		27/29	27/31	27/30
LC_LC5		28/32	22/29	20/29
LC_LCDSSLCC		28/30	29/31	27/30
FR_FR4		27/30	25/29	24/30
FR_FRRD		28/29	21/30	27/31
FR_FR2		27/30	24/30	27/29
FR_MULTIPLATE		27/29	24/29	23/31

① Reference Sites

Salmonid Embryo-Alevin Survival and Development Test — **Nautilus Environmental**

Analysis ID:	16-4619-6190	**Endpoint:**	Survival Rate	**CETIS Version:**	CETISv1.9.4
Analyzed:	20 Aug-21 16:50	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1

Graphics



① Reference sites

CETIS Analytical Report

Salmonid Embryo-Alevin Survival and Development Test — **Nautilus Environmental**

Analysis ID:	04-2108-1300	**Endpoint:**	Proportion Normal	**CETIS Version:**	CETISv1.9.4
Analyzed:	20 Aug-21 16:51	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1
Batch ID:	16-7967-5486	**Test Type:**	Survival-Development	**Analyst:**	Yvonne Lam
Start Date:	19 May-21 17:35	**Protocol:**	EC/EPS 1/RM/28	**Diluent:**	Dechlorinated Tap Water
Ending Date:	18 Jun-21 08:05	**Species:**	Oncorhynchus mykiss	**Brine:**	
Test Length:	29d 14h	**Taxon:**	Actinopterygii	**Source:**	Ted's Trout, Campbell Lake **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
① FR_UFR1	12-4424-2146	18 May-21	19 May-21 11:20	42h (2.3 °C)	Teck Coal	
① GH_ER2	02-4275-7088	18 May-21 09:55	19 May-21 11:20	32h (0.4 °C)		
① CM_MC1	01-4263-6393	18 May-21 11:08	19 May-21 11:20	30h (1.1 °C)		
① LC_SLC	12-1662-7355	18 May-21 09:45	19 May-21 11:20	32h (4.1 °C)		
FR_FRABCH	05-6713-4959	18 May-21	19 May-21 11:20	42h (1.9 °C)		
FR_FRCP1	19-8027-7867	18 May-21	19 May-21 11:20	42h (1.2 °C)		
GH_FR1	15-9886-5398	18 May-21 12:30	19 May-21 11:20	29h (0.1 °C)		
GH_ERC	21-0704-4941	18 May-21 11:20	19 May-21 11:20	30h (0.6 °C)		
CM_MC2	17-6814-6287	18 May-21 09:50	19 May-21 11:20	32h (1.1 °C)		
EV_MC2	15-5628-9197	18 May-21 13:00	19 May-21 11:20	29h (3.6 °C)		
EV_HC1	05-8730-9056	18 May-21 11:20	19 May-21 11:20	30h (4.8 °C)		
LC_DCDS	20-0340-1068	18 May-21 11:00	19 May-21 11:20	31h (4.6 °C)		
LC_LC3	18-4816-9590	18 May-21 10:15	19 May-21 11:20	31h (4.7 °C)		
LC_LC5	03-8768-2280	18 May-21 09:50	19 May-21 11:20	32h (5.2 °C)		
LC_LCDSSLCC	02-2977-6783	18 May-21 11:00	19 May-21 11:20	31h (4.3 °C)		
FR_FR4	17-1641-7069	18 May-21 09:29	19 May-21 11:20	32h (4.6 °C)		
FR_FRRD	06-3190-8505	18 May-21 08:22	19 May-21 11:20	33h (3.4 °C)		
FR_FR2	11-2149-8709	18 May-21 10:28	19 May-21 11:20	31h (4.6 °C)		
FR_MULTIPLATE	16-7235-2081	18 May-21 11:21	19 May-21 11:20	30h (3.4 °C)		

All samples spiked with 20 mg/L Cu

① Reference Sites

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
① FR_UFR1	Water Sample	Teck Coal	FR_UFR1_WEK_2021-05-1	
① GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-05-18_	
① CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-05-18	
① LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-05-18_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_WEK_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_WEK_2021-05	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-05-18_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-05-18	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-05-18	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2020_Q2_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2020_Q2_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-05-18	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-05-18_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-05-18_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	
FR_FR4	Water Sample	Teck Coal	FR_FR4_WS_2021-05-18_	
FR_FRRD	Water Sample	Teck Coal	FR_FRRD_WS_2021-05-18	
FR_FR2	Water Sample	Teck Coal	FR_FR2_WS_2021-05-18_	
FR_MULTIPLATE	Water Sample	Teck Coal	FR_MULTIPLATE_WS_202	

Fisher Exact/Bonferroni-Holm Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
① Receiving Water (GH_ER2)		① FR_UFR1	0.9965	Exact	0.9965	Non-Significant Effect
		① CM_MC1	0.9172	Exact	1.0000	Non-Significant Effect
		① LC_SLC	0.7523	Exact	1.0000	Non-Significant Effect
		FR_FRABCH	0.6814	Exact	1.0000	Non-Significant Effect
		FR_FRCP1	0.9126	Exact	1.0000	Non-Significant Effect
		GH_FR1	0.3221	Exact	1.0000	Non-Significant Effect

Analyst: YL QA: Aug. 23 KL

Salmonid Embryo-Alevin Survival and Development Test — **Nautilus Environmental**

Analysis ID:	04-2108-1300	**Endpoint:**	Proportion Normal	**CETIS Version:**	CETISv1.9.4
Analyzed:	20 Aug-21 16:51	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1

Fisher Exact/Bonferroni-Holm Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
		GH_ERC	0.9126	Exact	1.0000	Non-Significant Effect
		CM_MC2	0.9420	Exact	1.0000	Non-Significant Effect
		EV_MC2	0.6307	Exact	1.0000	Non-Significant Effect
		EV_HC1	0.9386	Exact	1.0000	Non-Significant Effect
		LC_DCDS	0.9921	Exact	1.0000	Non-Significant Effect
		LC_LC3	0.8156	Exact	1.0000	Non-Significant Effect
		LC_LC5	0.2485	Exact	1.0000	Non-Significant Effect
		LC_LCDSSLCC	0.9702	Exact	1.0000	Non-Significant Effect
		FR_FR4	0.4366	Exact	1.0000	Non-Significant Effect
		FR_FRRD	0.4505	Exact	1.0000	Non-Significant Effect
		FR_FR2	0.8628	Exact	1.0000	Non-Significant Effect
		FR_MULTIPLATE	0.2963	Exact	1.0000	Non-Significant Effect

Data Summary

Sample	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
① FR_UFR1		84	5	89	0.9438	0.05618	-6.03%
② GH_ER2	R	73	15	88	0.8295	0.1705	6.8%
③ CM_MC1		81	10	91	0.8901	0.1099	0.0%
④ LC_SLC		77	13	90	0.8556	0.1444	3.88%
FR_FRABCH		76	14	90	0.8444	0.1556	5.13%
FR_FRCP1		80	10	90	0.8889	0.1111	0.14%
GH_FR1		72	19	91	0.7912	0.2088	11.11%
GH_ERC		80	10	90	0.8889	0.1111	0.14%
CM_MC2		80	9	89	0.8989	0.1011	-0.98%
EV_MC2		77	15	92	0.837	0.163	5.97%
EV_HC1		79	9	88	0.8977	0.1023	-0.86%
LC_DCDS		84	6	90	0.9333	0.06667	-4.86%
LC_LC3		78	12	90	0.8667	0.1333	2.63%
LC_LC5		70	20	90	0.7778	0.2222	12.62%
LC_LCDSSLCC		83	8	91	0.9121	0.08791	-2.47%
FR_FR4		72	17	89	0.809	0.191	9.11%
FR_FRRD		73	17	90	0.8111	0.1889	8.88%
FR_FR2		78	11	89	0.8764	0.1236	1.54%
FR_MULTIPLATE		70	19	89	0.7865	0.2135	11.64%

① Reference sites

Analyst: NM QA: Aug. 23/21

Salmonid Embryo-Alevin Survival and Development Test — **Nautilus Environmental**

Analysis ID:	04-2108-1300	**Endpoint:**	Proportion Normal	**CETIS Version:**	CETISv1.9.4
Analyzed:	20 Aug-21 16:51	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1

Proportion Normal Detail

Sample	Code	Rep 1	Rep 2	Rep 3
FR_UFR1		0.9667	0.8966	0.9667
GH_ER2	R	0.8621	0.8333	0.7931
CM_MC1		0.9032	0.8333	0.9333
LC_SLC		0.9667	0.7667	0.8333
FR_FRABCH		0.9310	0.7742	0.8333
FR_FRCP1		0.8667	0.9333	0.8667
GH_FR1		0.8621	0.6250	0.9000
GH_ERC		0.9000	0.8000	0.9667
CM_MC2		0.9667	0.8333	0.8966
EV_MC2		0.9667	0.7419	0.8065
EV_HC1		0.9310	0.7931	0.9667
LC_DCDS		0.9667	0.8667	0.9667
LC_LC3		0.9310	0.8387	0.8333
LC_LC5		0.8750	0.7586	0.6897
LC_LCDSSLCC		0.9000	0.9355	0.9000
FR_FR4		0.8000	0.8621	0.7667
FR_FRRD		0.9655	0.6667	0.8065
FR_FR2		0.9000	0.8000	0.9310
FR_MULTIPLATE		0.9310	0.7586	0.6774

Proportion Normal Binomials

Sample	Code	Rep 1	Rep 2	Rep 3
FR_UFR1		29/30	26/29	29/30
GH_ER2	R	25/29	25/30	23/29
CM_MC1		28/31	25/30	28/30
LC_SLC		29/30	23/30	25/30
FR_FRABCH		27/29	24/31	25/30
FR_FRCP1		26/30	28/30	26/30
GH_FR1		25/29	20/32	27/30
GH_ERC		27/30	24/30	29/30
CM_MC2		29/30	25/30	26/29
EV_MC2		29/30	23/31	25/31
EV_HC1		27/29	23/29	29/30
LC_DCDS		29/30	26/30	29/30
LC_LC3		27/29	26/31	25/30
LC_LC5		28/32	22/29	20/29
LC_LCDSSLCC		27/30	29/31	27/30
FR_FR4		24/30	25/29	23/30
FR_FRRD		28/29	20/30	25/31
FR_FR2		27/30	24/30	27/29
FR_MULTIPLATE		27/29	22/29	21/31

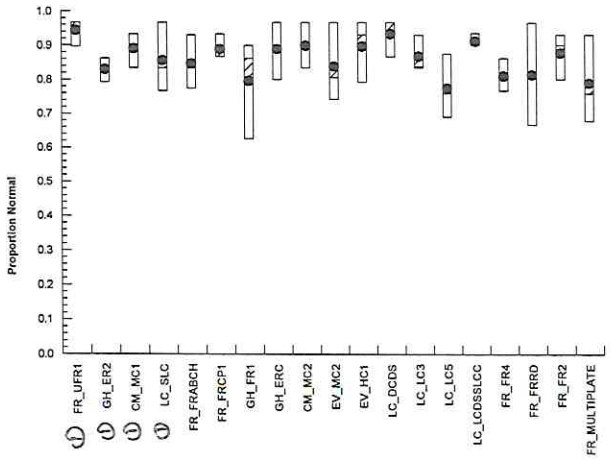
Reference STTes

Analyst: WM QA: Aug 23/21

Salmonid Embryo-Alevin Survival and Development Test — **Nautilus Environmental**

Analysis ID:	04-2108-1300	**Endpoint:**	Proportion Normal	**CETIS Version:**	CETISv1.9.4
Analyzed:	20 Aug-21 16:51	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1

Graphics



D Reference STHS

Salmonid Embryo-Alevin Survival and Development Test — **Nautilus Environmental**

Analysis ID:	10-7031-0710	**Endpoint:**	Survival Rate	**CETIS Version:**	CETISv1.9.4
Analyzed:	20 Aug-21 16:56	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1
Batch ID:	16-7967-5486	**Test Type:**	Survival-Development	**Analyst:**	Yvonne Lam
Start Date:	19 May-21 17:35	**Protocol:**	EC/EPS 1/RM/28	**Diluent:**	Dechlorinated Tap Water
Ending Date:	18 Jun-21 08:05	**Species:**	Oncorhynchus mykiss	**Brine:**	
Test Length:	29d 14h	**Taxon:**	Actinopterygii	**Source:**	Ted's Trout, Campbell Lake **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
① FR_UFR1	12-4424-2146	18 May-21	19 May-21 11:20	42h (2.3 °C)	Teck Coal	
② GH_ER2	02-4275-7088	18 May-21 09:55	19 May-21 11:20	32h (0.4 °C)		
③ CM_MC1	01-4263-6393	18 May-21 11:08	19 May-21 11:20	30h (1.1 °C)		
④ LC_SLC	12-1662-7355	18 May-21 09:45	19 May-21 11:20	32h (4.1 °C)		
FR_FRABCH	05-6713-4959	18 May-21	19 May-21 11:20	42h (1.9 °C)		
FR_FRCP1	19-8027-7867	18 May-21	19 May-21 11:20	42h (1.2 °C)		
GH_FR1	15-9886-5398	18 May-21 12:30	19 May-21 11:20	29h (0.1 °C)		
GH_ERC	21-0704-4941	18 May-21 11:20	19 May-21 11:20	30h (0.6 °C)		
CM_MC2	17-6814-6287	18 May-21 09:50	19 May-21 11:20	32h (1.1 °C)		
EV_MC2	15-5628-9197	18 May-21 13:00	19 May-21 11:20	29h (3.6 °C)		
EV_HC1	05-8730-9056	18 May-21 11:20	19 May-21 11:20	30h (4.8 °C)		
LC_DCDS	20-0340-1068	18 May-21 11:00	19 May-21 11:20	31h (4.6 °C)		
LC_LC3	18-4816-9590	18 May-21 10:15	19 May-21 11:20	31h (4.7 °C)		
LC_LC5	03-8768-2280	18 May-21 09:50	19 May-21 11:20	32h (5.2 °C)		
LC_LCDSSLCC	02-2977-6783	18 May-21 11:00	19 May-21 11:20	31h (4.3 °C)		
FR_FR4	17-1641-7069	18 May-21 09:29	19 May-21 11:20	32h (4.6 °C)		
FR_FRRD	06-3190-8505	18 May-21 08:22	19 May-21 11:20	33h (3.4 °C)		
FR_FR2	11-2149-8709	18 May-21 10:28	19 May-21 11:20	31h (4.6 °C)		
FR_MULTIPLATE	16-7235-2081	18 May-21 11:21	19 May-21 11:20	30h (3.4 °C)		

All samples spiked with 20 ug/L Cu

① Reference sites

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
① FR_UFR1	Water Sample	Teck Coal	FR_UFR1_WEK_2021-05-1	
② GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-05-18_	
③ CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-05-18	
④ LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-05-18_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_WEK_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_WEK_2021-05	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-05-18_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-05-18	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-05-18	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2020_Q2_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2020_Q2_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-05-18	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-05-18_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-05-18_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	
FR_FR4	Water Sample	Teck Coal	FR_FR4_WS_2021-05-18_	
FR_FRRD	Water Sample	Teck Coal	FR_FRRD_WS_2021-05-18	
FR_FR2	Water Sample	Teck Coal	FR_FR2_WS_2021-05-18_	
FR_MULTIPLATE	Water Sample	Teck Coal	FR_MULTIPLATE_WS_202	

Fisher Exact/Bonferroni-Holm Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
③ Site Control (CM_MC1)		① FR_UFR1	0.8868	Exact	0.8868	Non-Significant Effect
		② GH_ER2	0.5834	Exact	1.0000	Non-Significant Effect
		④ LC_SLC	0.2211	Exact	1.0000	Non-Significant Effect
		FR_FRABCH	0.2973	Exact	1.0000	Non-Significant Effect
		FR_FRCP1	0.4910	Exact	1.0000	Non-Significant Effect
		GH_FR1	0.0235	Exact	0.3987	Non-Significant Effect

Salmonid Embryo-Alevin Survival and Development Test — **Nautilus Environmental**

Analysis ID: 10-7031-0710 **Endpoint:** Survival Rate **CETIS Version:** CETISv1.9.4
Analyzed: 20 Aug-21 16:56 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Fisher Exact/Bonferroni-Holm Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
		GH_ERC	0.3882	Exact	1.0000	Non-Significant Effect
		CM_MC2	0.3791	Exact	1.0000	Non-Significant Effect
		EV_MC2	0.6172	Exact	1.0000	Non-Significant Effect
		EV_HC1	0.6949	Exact	1.0000	Non-Significant Effect
		LC_DCDS	0.8090	Exact	1.0000	Non-Significant Effect
		LC_LC3	0.3882	Exact	1.0000	Non-Significant Effect
		LC_LC5	0.0051	Exact	0.0925	Non-Significant Effect
		LC_LCDSSLCC	0.6090	Exact	1.0000	Non-Significant Effect
		FR_FR4	0.1075	Exact	1.0000	Non-Significant Effect
		FR_FRRD	0.0773	Exact	1.0000	Non-Significant Effect
		FR_FR2	0.2136	Exact	1.0000	Non-Significant Effect
		FR_MULTIPLATE	0.0489	Exact	0.7821	Non-Significant Effect

Data Summary

Sample	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
① FR_UFR1		85	4	89	0.9551	0.04494	-3.46%
① GH_ER2		81	7	88	0.9205	0.07955	0.28%
① CM_MC1	XC	84	7	91	0.9231	0.07692	0.0%
① LC_SLC		79	11	90	0.8778	0.1222	4.91%
FR_FRABCH		80	10	90	0.8889	0.1111	3.7%
FR_FRCP1		82	8	90	0.9111	0.08889	1.3%
GH_FR1		74	17	91	0.8132	0.1868	11.9%
GH_ERC		81	9	90	0.9	0.1	2.5%
CM_MC2		80	9	89	0.8989	0.1011	2.62%
EV_MC2		85	7	92	0.9239	0.07609	-0.09%
EV_HC1		82	6	88	0.9318	0.06818	-0.95%
LC_DCDS		85	5	90	0.9444	0.05556	-2.32%
LC_LC3		81	9	90	0.9	0.1	2.5%
LC_LC5		70	20	90	0.7778	0.2222	15.74%
LC_LCDSSLCC		84	7	91	0.9231	0.07692	0.0%
FR_FR4		76	13	89	0.8539	0.1461	7.49%
FR_FRRD		76	14	90	0.8444	0.1556	8.52%
FR_FR2		78	11	89	0.8764	0.1236	5.06%
FR_MULTIPLATE		74	15	89	0.8315	0.1685	9.93%

① Reference STRS

Salmonid Embryo-Alevin Survival and Development Test — **Nautilus Environmental**

Analysis ID:	10-7031-0710	**Endpoint:**	Survival Rate	**CETIS Version:**	CETISv1.9.4
Analyzed:	20 Aug-21 16:56	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1

Survival Rate Detail

Sample	Code	Rep 1	Rep 2	Rep 3
FR_UFR1		1.0000	0.8966	0.9667
GH_ER2		0.8621	0.9333	0.9655
CM_MC1	XC	0.9032	0.8667	1.0000
LC_SLC		0.9667	0.7667	0.9000
FR_FRABCH		0.9310	0.8387	0.9000
FR_FRCP1		0.9000	0.9333	0.9000
GH_FR1		0.8966	0.6562	0.9000
GH_ERC		0.9333	0.8000	0.9667
CM_MC2		0.9667	0.8333	0.8966
EV_MC2		1.0000	0.8387	0.9355
EV_HC1		1.0000	0.7931	1.0000
LC_DCDS		0.9667	0.9000	0.9667
LC_LC3		0.9310	0.8710	0.9000
LC_LC5		0.8750	0.7586	0.6897
LC_LCDSSLCC		0.9333	0.9355	0.9000
FR_FR4		0.9000	0.8621	0.8000
FR_FRRD		0.9655	0.7000	0.8710
FR_FR2		0.9000	0.8000	0.9310
FR_MULTIPLATE		0.9310	0.8276	0.7419

Survival Rate Binomials

Sample	Code	Rep 1	Rep 2	Rep 3
FR_UFR1		30/30	26/29	29/30
GH_ER2		25/29	28/30	28/29
CM_MC1	XC	28/31	26/30	30/30
LC_SLC		29/30	23/30	27/30
FR_FRABCH		27/29	26/31	27/30
FR_FRCP1		27/30	28/30	27/30
GH_FR1		26/29	21/32	27/30
GH_ERC		28/30	24/30	29/30
CM_MC2		29/30	25/30	26/29
EV_MC2		30/30	26/31	29/31
EV_HC1		29/29	23/29	30/30
LC_DCDS		29/30	27/30	29/30
LC_LC3		27/29	27/31	27/30
LC_LC5		28/32	22/29	20/29
LC_LCDSSLCC		28/30	29/31	27/30
FR_FR4		27/30	25/29	24/30
FR_FRRD		28/29	21/30	27/31
FR_FR2		27/30	24/30	27/29
FR_MULTIPLATE		27/29	24/29	23/31

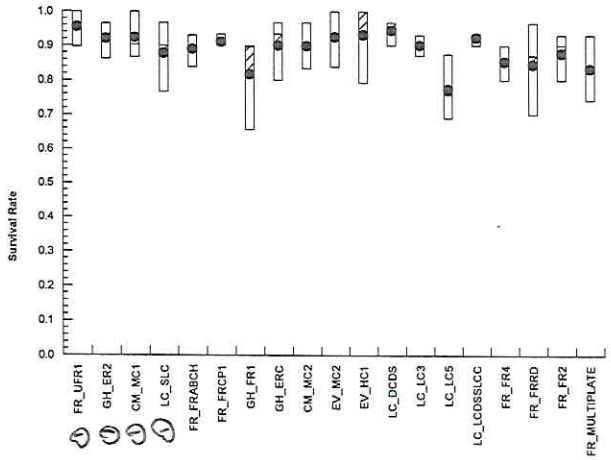
Reference Sites

Analyst: UM QA: Aug-23/21

Salmonid Embryo-Alevin Survival and Development Test — **Nautilus Environmental**

Analysis ID:	10-7031-0710	**Endpoint:**	Survival Rate	**CETIS Version:**	CETISv1.9.4
Analyzed:	20 Aug-21 16:56	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1

Graphics



① Reference Sites

CETIS Analytical Report

Salmonid Embryo-Alevin Survival and Development Test — **Nautilus Environmental**

Analysis ID:	17-0673-1602	**Endpoint:**	Proportion Normal	**CETIS Version:**	CETISv1.9.4
Analyzed:	20 Aug-21 16:56	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1
Batch ID:	16-7967-5486	**Test Type:**	Survival-Development	**Analyst:**	Yvonne Lam
Start Date:	19 May-21 17:35	**Protocol:**	EC/EPS 1/RM/28	**Diluent:**	Dechlorinated Tap Water
Ending Date:	18 Jun-21 08:05	**Species:**	Oncorhynchus mykiss	**Brine:**	
Test Length:	29d 14h	**Taxon:**	Actinopterygii	**Source:**	Ted's Trout, Campbell Lake **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
① FR_UFR1	12-4424-2146	18 May-21	19 May-21 11:20	42h (2.3 °C)	Teck Coal	
① GH_ER2	02-4275-7088	18 May-21 09:55	19 May-21 11:20	32h (0.4 °C)		
① CM_MC1	01-4263-6393	18 May-21 11:08	19 May-21 11:20	30h (1.1 °C)		
① LC_SLC	12-1662-7355	18 May-21 09:45	19 May-21 11:20	32h (4.1 °C)		
FR_FRABCH	05-6713-4959	18 May-21	19 May-21 11:20	42h (1.9 °C)		
FR_FRCP1	19-8027-7867	18 May-21	19 May-21 11:20	42h (1.2 °C)		
GH_FR1	15-9886-5398	18 May-21 12:30	19 May-21 11:20	29h (0.1 °C)		
GH_ERC	21-0704-4941	18 May-21 11:20	19 May-21 11:20	30h (0.6 °C)		
CM_MC2	17-6814-6287	18 May-21 09:50	19 May-21 11:20	32h (1.1 °C)		
EV_MC2	15-5628-9197	18 May-21 13:00	19 May-21 11:20	29h (3.6 °C)		
EV_HC1	05-8730-9056	18 May-21 11:20	19 May-21 11:20	30h (4.8 °C)		
LC_DCDS	20-0340-1068	18 May-21 11:00	19 May-21 11:20	31h (4.6 °C)		
LC_LC3	18-4816-9590	18 May-21 10:15	19 May-21 11:20	31h (4.7 °C)		
LC_LC5	03-8768-2280	18 May-21 09:50	19 May-21 11:20	32h (5.2 °C)		
LC_LCDSSLCC	02-2977-6783	18 May-21 11:00	19 May-21 11:20	31h (4.3 °C)		
FR_FR4	17-1641-7069	18 May-21 09:29	19 May-21 11:20	32h (4.6 °C)		
FR_FRRD	06-3190-8505	18 May-21 08:22	19 May-21 11:20	33h (3.4 °C)		
FR_FR2	11-2149-8709	18 May-21 10:28	19 May-21 11:20	31h (4.6 °C)		
FR_MULTIPLATE	16-7235-2081	18 May-21 11:21	19 May-21 11:20	30h (3.4 °C)		

All samples spiked with 20 ug/L Cu

① Reference Sites

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
① FR_UFR1	Water Sample	Teck Coal	FR_UFR1_WEK_2021-05-1	
① GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-05-18_	
① CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-05-18	
① LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-05-18_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_WEK_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_WEK_2021-05	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-05-18_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-05-18	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-05-18	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2020_Q2_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2020_Q2_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-05-18	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-05-18_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-05-18_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	
FR_FR4	Water Sample	Teck Coal	FR_FR4_WS_2021-05-18_	
FR_FRRD	Water Sample	Teck Coal	FR_FRRD_WS_2021-05-18	
FR_FR2	Water Sample	Teck Coal	FR_FR2_WS_2021-05-18_	
FR_MULTIPLATE	Water Sample	Teck Coal	FR_MULTIPLATE_WS_202	

Fisher Exact/Bonferroni-Holm Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
① Site Control (CM_MC1)		① FR_UFR1	0.9435	Exact	0.9435	Non-Significant Effect
		① GH_ER2	0.1704	Exact	1.0000	Non-Significant Effect
		① LC_SLC	0.3178	Exact	1.0000	Non-Significant Effect
		FR_FRABCH	0.2465	Exact	1.0000	Non-Significant Effect
		FR_FRCP1	0.5831	Exact	1.0000	Non-Significant Effect
		GH_FR1	0.0520	Exact	0.8323	Non-Significant Effect

Analyst: YL QA: JCL Aug. 23/21

Salmonid Embryo-Alevin Survival and Development Test **Nautilus Environmental**

Analysis ID: 17-0673-1602 **Endpoint:** Proportion Normal **CETIS Version:** CETISv1.9.4
Analyzed: 20 Aug-21 16:56 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Fisher Exact/Bonferroni-Holm Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
		GH_ERC	0.5831	Exact	1.0000	Non-Significant Effect
		CM_MC2	0.6671	Exact	1.0000	Non-Significant Effect
		EV_MC2	0.2031	Exact	1.0000	Non-Significant Effect
		EV_HC1	0.6576	Exact	1.0000	Non-Significant Effect
		LC_DCDS	0.9014	Exact	1.0000	Non-Significant Effect
		LC_LC3	0.3995	Exact	1.0000	Non-Significant Effect
		LC_LC5	0.0329	Exact	0.5918	Non-Significant Effect
		LC_LCDSSLCC	0.7714	Exact	1.0000	Non-Significant Effect
		FR_FR4	0.0940	Exact	1.0000	Non-Significant Effect
		FR_FRRD	0.0995	Exact	1.0000	Non-Significant Effect
		FR_FR2	0.4782	Exact	1.0000	Non-Significant Effect
		FR_MULTIPLATE	0.0453	Exact	0.7693	Non-Significant Effect

Data Summary

Sample	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
① FR_UFR1		84	5	89	0.9438	0.05618	-6.03%
① GH_ER2		73	15	88	0.8295	0.1705	6.8%
① CM_MC1	XC	81	10	91	0.8901	0.1099	0.0%
① LC_SLC		77	13	90	0.8556	0.1444	3.88%
FR_FRABCH		76	14	90	0.8444	0.1556	5.13%
FR_FRCP1		80	10	90	0.8889	0.1111	0.14%
GH_FR1		72	19	91	0.7912	0.2088	11.11%
GH_ERC		80	10	90	0.8889	0.1111	0.14%
CM_MC2		80	9	89	0.8989	0.1011	-0.98%
EV_MC2		77	15	92	0.837	0.163	5.97%
EV_HC1		79	9	88	0.8977	0.1023	-0.86%
LC_DCDS		84	6	90	0.9333	0.06667	-4.86%
LC_LC3		78	12	90	0.8667	0.1333	2.63%
LC_LC5		70	20	90	0.7778	0.2222	12.62%
LC_LCDSSLCC		83	8	91	0.9121	0.08791	-2.47%
FR_FR4		72	17	89	0.809	0.191	9.11%
FR_FRRD		73	17	90	0.8111	0.1889	8.88%
FR_FR2		78	11	89	0.8764	0.1236	1.54%
FR_MULTIPLATE		70	19	89	0.7865	0.2135	11.64%

① Reference States

Salmonid Embryo-Alevin Survival and Development Test — **Nautilus Environmental**

Analysis ID: 17-0673-1602 **Endpoint:** Proportion Normal **CETIS Version:** CETISv1.9.4
Analyzed: 20 Aug-21 16:56 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Proportion Normal Detail

Sample	Code	Rep 1	Rep 2	Rep 3
① FR_UFR1		0.9667	0.8966	0.9667
① GH_ER2		0.8621	0.8333	0.7931
① CM_MC1	XC	0.9032	0.8333	0.9333
① LC_SLC		0.9667	0.7667	0.8333
FR_FRABCH		0.9310	0.7742	0.8333
FR_FRCP1		0.8667	0.9333	0.8667
GH_FR1		0.8621	0.6250	0.9000
GH_ERC		0.9000	0.8000	0.9667
CM_MC2		0.9667	0.8333	0.8966
EV_MC2		0.9667	0.7419	0.8065
EV_HC1		0.9310	0.7931	0.9667
LC_DCDS		0.9667	0.8667	0.9667
LC_LC3		0.9310	0.8387	0.8333
LC_LC5		0.8750	0.7586	0.6897
LC_LCDSSLCC		0.9000	0.9355	0.9000
FR_FR4		0.8000	0.8621	0.7667
FR_FRRD		0.9655	0.6667	0.8065
FR_FR2		0.9000	0.8000	0.9310
FR_MULTIPLATE		0.9310	0.7586	0.6774

Proportion Normal Binomials

Sample	Code	Rep 1	Rep 2	Rep 3
① FR_UFR1		29/30	26/29	29/30
① GH_ER2		25/29	25/30	23/29
① CM_MC1	XC	28/31	25/30	28/30
① LC_SLC		29/30	23/30	25/30
FR_FRABCH		27/29	24/31	25/30
FR_FRCP1		26/30	28/30	26/30
GH_FR1		25/29	20/32	27/30
GH_ERC		27/30	24/30	29/30
CM_MC2		29/30	25/30	26/29
EV_MC2		29/30	23/31	25/31
EV_HC1		27/29	23/29	29/30
LC_DCDS		29/30	26/30	29/30
LC_LC3		27/29	26/31	25/30
LC_LC5		28/32	22/29	20/29
LC_LCDSSLCC		27/30	29/31	27/30
FR_FR4		24/30	25/29	23/30
FR_FRRD		28/29	20/30	25/31
FR_FR2		27/30	24/30	27/29
FR_MULTIPLATE		27/29	22/29	21/31

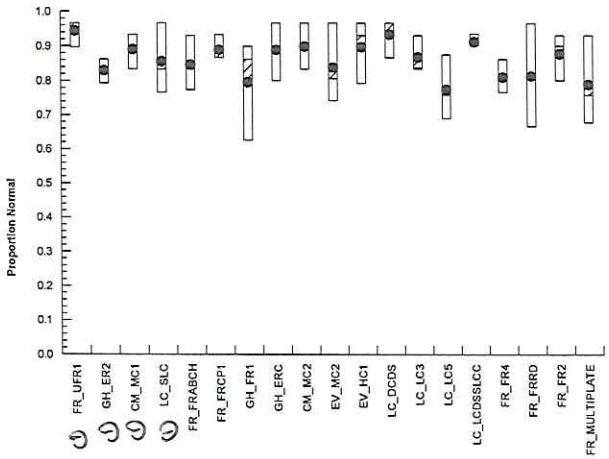
① Reference Sites

Analyst: MW QA: Aug. 23/21

Salmonid Embryo-Alevin Survival and Development Test — **Nautilus Environmental**

Analysis ID:	17-0673-1602	**Endpoint:**	Proportion Normal	**CETIS Version:**	CETISv1.9.4
Analyzed:	20 Aug-21 16:56	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1

Graphics



① reference SHS

CETIS Analytical Report

Salmonid Embryo-Alevin Survival and Development Test — **Nautilus Environmental**

Analysis ID:	07-7755-3438	**Endpoint:**	Survival Rate	**CETIS Version:**	CETISv1.9.4
Analyzed:	20 Aug-21 16:58	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1
Batch ID:	16-7967-5486	**Test Type:**	Survival-Development	**Analyst:**	Yvonne Lam
Start Date:	19 May-21 17:35	**Protocol:**	EC/EPS 1/RM/28	**Diluent:**	Dechlorinated Tap Water
Ending Date:	18 Jun-21 08:05	**Species:**	Oncorhynchus mykiss	**Brine:**	
Test Length:	29d 14h	**Taxon:**	Actinopterygii	**Source:**	Ted's Trout, Campbell Lake **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
FR_UFR1	12-4424-2146	18 May-21	19 May-21 11:20	42h (2.3 °C)	Teck Coal	
GH_ER2	02-4275-7088	18 May-21 09:55	19 May-21 11:20	32h (0.4 °C)		
CM_MC1	01-4263-6393	18 May-21 11:08	19 May-21 11:20	30h (1.1 °C)		
LC_SLC	12-1662-7355	18 May-21 09:45	19 May-21 11:20	32h (4.1 °C)		
FR_FRABCH	05-6713-4959	18 May-21	19 May-21 11:20	42h (1.9 °C)		
FR_FRCP1	19-8027-7867	18 May-21	19 May-21 11:20	42h (1.2 °C)		
GH_FR1	15-9886-5398	18 May-21 12:30	19 May-21 11:20	29h (0.1 °C)		
GH_ERC	21-0704-4941	18 May-21 11:20	19 May-21 11:20	30h (0.6 °C)		
CM_MC2	17-6814-6287	18 May-21 09:50	19 May-21 11:20	32h (1.1 °C)		
EV_MC2	15-5628-9197	18 May-21 13:00	19 May-21 11:20	29h (3.6 °C)		
EV_HC1	05-8730-9056	18 May-21 11:20	19 May-21 11:20	30h (4.8 °C)		
LC_DCDS	20-0340-1068	18 May-21 11:00	19 May-21 11:20	31h (4.6 °C)		
LC_LC3	18-4816-9590	18 May-21 10:15	19 May-21 11:20	31h (4.7 °C)		
LC_LC5	03-8768-2280	18 May-21 09:50	19 May-21 11:20	32h (5.2 °C)		
LC_LCDSSLCC	02-2977-6783	18 May-21 11:00	19 May-21 11:20	31h (4.3 °C)		
FR_FR4	17-1641-7069	18 May-21 09:29	19 May-21 11:20	32h (4.6 °C)		
FR_FRRD	06-3190-8505	18 May-21 08:22	19 May-21 11:20	33h (3.4 °C)		
FR_FR2	11-2149-8709	18 May-21 10:28	19 May-21 11:20	31h (4.6 °C)		
FR_MULTIPLATE	16-7235-2081	18 May-21 11:21	19 May-21 11:20	30h (3.4 °C)		

All samples spiked with 20 ug/L Cu

9 Reference sites

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_UFR1	Water Sample	Teck Coal	FR_UFR1_WEK_2021-05-1	
GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-05-18_	
CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-05-18	
LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-05-18_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_WEK_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_WEK_2021-05	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-05-18_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-05-18	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-05-18	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2020_Q2_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2020_Q2_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-05-18	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-05-18_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-05-18_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	
FR_FR4	Water Sample	Teck Coal	FR_FR4_WS_2021-05-18_	
FR_FRRD	Water Sample	Teck Coal	FR_FRRD_WS_2021-05-18	
FR_FR2	Water Sample	Teck Coal	FR_FR2_WS_2021-05-18_	
FR_MULTIPLATE	Water Sample	Teck Coal	FR_MULTIPLATE_WS_202	

Fisher Exact/Bonferroni-Holm Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
Unamended Sample (LC_SLC)		FR_UFR1	0.9852	Exact	0.9852	Non-Significant Effect
		GH_ER2	0.8839	Exact	1.0000	Non-Significant Effect
		CM_MC1	0.8978	Exact	1.0000	Non-Significant Effect
		FR_FRABCH	0.6784	Exact	1.0000	Non-Significant Effect
		FR_FRCP1	0.8339	Exact	1.0000	Non-Significant Effect
		GH_FR1	0.1597	Exact	1.0000	Non-Significant Effect

Analyst: YVL QA: JGL Aug. 23/21

Salmonid Embryo-Alevin Survival and Development Test — **Nautilus Environmental**

Analysis ID: 07-7755-3438 **Endpoint:** Survival Rate **CETIS Version:** CETISv1.9.4
Analyzed: 20 Aug-21 16:58 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Fisher Exact/Bonferroni-Holm Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
		GH_ERC	0.7612	Exact	1.0000	Non-Significant Effect
		CM_MC2	0.7529	Exact	1.0000	Non-Significant Effect
		EV_MC2	0.9020	Exact	1.0000	Non-Significant Effect
		EV_HC1	0.9318	Exact	1.0000	Non-Significant Effect
		LC_DCDS	0.9680	Exact	1.0000	Non-Significant Effect
		LC_LC3	0.7612	Exact	1.0000	Non-Significant Effect
		LC_LC5	0.0566	Exact	1.0000	Non-Significant Effect
		LC_LCDSSLCC	0.8978	Exact	1.0000	Non-Significant Effect
		FR_FR4	0.4019	Exact	1.0000	Non-Significant Effect
		FR_FRRD	0.3336	Exact	1.0000	Non-Significant Effect
		FR_FR2	0.5788	Exact	1.0000	Non-Significant Effect
		FR_MULTIPLATE	0.2526	Exact	1.0000	Non-Significant Effect

Data Summary

Sample	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
FR_UFR1		85	4	89	0.9551	0.04494	-3.46%
GH_ER2		81	7	88	0.9205	0.07955	0.28%
CM_MC1		84	7	91	0.9231	0.07692	0.0%
LC_SLC	US	79	11	90	0.8778	0.1222	4.91%
FR_FRABCH		80	10	90	0.8889	0.1111	3.7%
FR_FRCP1		82	8	90	0.9111	0.08889	1.3%
GH_FR1		74	17	91	0.8132	0.1868	11.9%
GH_ERC		81	9	90	0.9	0.1	2.5%
CM_MC2		80	9	89	0.8989	0.1011	2.62%
EV_MC2		85	7	92	0.9239	0.07609	-0.09%
EV_HC1		82	6	88	0.9318	0.06818	-0.95%
LC_DCDS		85	5	90	0.9444	0.05556	-2.32%
LC_LC3		81	9	90	0.9	0.1	2.5%
LC_LC5		70	20	90	0.7778	0.2222	15.74%
LC_LCDSSLCC		84	7	91	0.9231	0.07692	0.0%
FR_FR4		76	13	89	0.8539	0.1461	7.49%
FR_FRRD		76	14	90	0.8444	0.1556	8.52%
FR_FR2		78	11	89	0.8764	0.1236	5.06%
FR_MULTIPLATE		74	15	89	0.8315	0.1685	9.93%

1) Reference Sites

Analyst: [illegible] QA: Aug. 23/21

Salmonid Embryo-Alevin Survival and Development Test — **Nautilus Environmental**

Analysis ID:	07-7755-3438	**Endpoint:**	Survival Rate	**CETIS Version:**	CETISv1.9.4
Analyzed:	20 Aug-21 16:58	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1

Survival Rate Detail

Sample	Code	Rep 1	Rep 2	Rep 3
1 FR_UFR1		1.0000	0.8966	0.9667
1 GH_ER2		0.8621	0.9333	0.9655
1 CM_MC1		0.9032	0.8667	1.0000
1 LC_SLC	US	0.9667	0.7667	0.9000
FR_FRABCH		0.9310	0.8387	0.9000
FR_FRCP1		0.9000	0.9333	0.9000
GH_FR1		0.8966	0.6562	0.9000
GH_ERC		0.9333	0.8000	0.9667
CM_MC2		0.9667	0.8333	0.8966
EV_MC2		1.0000	0.8387	0.9355
EV_HC1		1.0000	0.7931	1.0000
LC_DCDS		0.9667	0.9000	0.9667
LC_LC3		0.9310	0.8710	0.9000
LC_LC5		0.8750	0.7586	0.6897
LC_LCDSSLCC		0.9333	0.9355	0.9000
FR_FR4		0.9000	0.8621	0.8000
FR_FRRD		0.9655	0.7000	0.8710
FR_FR2		0.9000	0.8000	0.9310
FR_MULTIPLATE		0.9310	0.8276	0.7419

Survival Rate Binomials

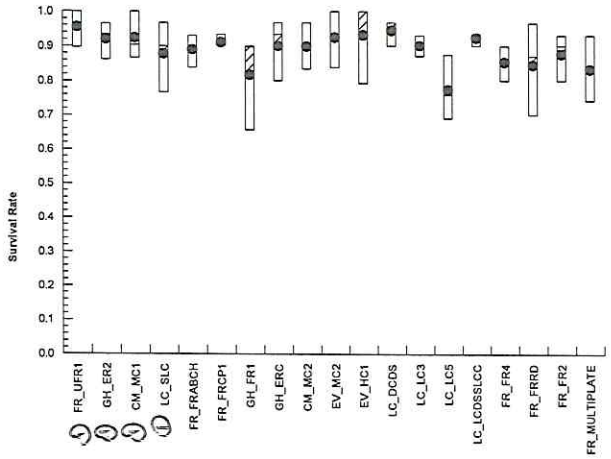
Sample	Code	Rep 1	Rep 2	Rep 3
1 FR_UFR1		30/30	26/29	29/30
1 GH_ER2		25/29	28/30	28/29
1 CM_MC1		28/31	26/30	30/30
1 LC_SLC	US	29/30	23/30	27/30
FR_FRABCH		27/29	26/31	27/30
FR_FRCP1		27/30	28/30	27/30
GH_FR1		26/29	21/32	27/30
GH_ERC		28/30	24/30	29/30
CM_MC2		29/30	25/30	26/29
EV_MC2		30/30	26/31	29/31
EV_HC1		29/29	23/29	30/30
LC_DCDS		29/30	27/30	29/30
LC_LC3		27/29	27/31	27/30
LC_LC5		28/32	22/29	20/29
LC_LCDSSLCC		28/30	29/31	27/30
FR_FR4		27/30	25/29	24/30
FR_FRRD		28/29	21/30	27/31
FR_FR2		27/30	24/30	27/29
FR_MULTIPLATE		27/29	24/29	23/31

1 Reference Sites

Salmonid Embryo-Alevin Survival and Development Test — **Nautilus Environmental**

Analysis ID:	07-7755-3438	**Endpoint:**	Survival Rate	**CETIS Version:**	CETISv1.9.4
Analyzed:	20 Aug-21 16:58	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1

Graphics



Reference Sites

Analyst: MM QA: Aug-23/21

CETIS Analytical Report

Salmonid Embryo-Alevin Survival and Development Test — **Nautilus Environmental**

Analysis ID:	13-1207-6724	**Endpoint:**	Proportion Normal	**CETIS Version:**	CETISv1.9.4
Analyzed:	20 Aug-21 16:58	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1
Batch ID:	16-7967-5486	**Test Type:**	Survival-Development	**Analyst:**	Yvonne Lam
Start Date:	19 May-21 17:35	**Protocol:**	EC/EPS 1/RM/28	**Diluent:**	Dechlorinated Tap Water
Ending Date:	18 Jun-21 08:05	**Species:**	Oncorhynchus mykiss	**Brine:**	
Test Length:	29d 14h	**Taxon:**	Actinopterygii	**Source:**	Ted's Trout, Campbell Lake **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
⑤ FR_UFR1	12-4424-2146	18 May-21	19 May-21 11:20	42h (2.3 °C)	Teck Coal	
④ GH_ER2	02-4275-7088	18 May-21 09:55	19 May-21 11:20	32h (0.4 °C)		
③ CM_MC1	01-4263-6393	18 May-21 11:08	19 May-21 11:20	30h (1.1 °C)		
① LC_SLC	12-1662-7355	18 May-21 09:45	19 May-21 11:20	32h (4.1 °C)		
FR_FRABCH	05-6713-4959	18 May-21	19 May-21 11:20	42h (1.9 °C)		
FR_FRCP1	19-8027-7867	18 May-21	19 May-21 11:20	42h (1.2 °C)		
GH_FR1	15-9886-5398	18 May-21 12:30	19 May-21 11:20	29h (0.1 °C)		
GH_ERC	21-0704-4941	18 May-21 11:20	19 May-21 11:20	30h (0.6 °C)		
CM_MC2	17-6814-6287	18 May-21 09:50	19 May-21 11:20	32h (1.1 °C)		
EV_MC2	15-5628-9197	18 May-21 13:00	19 May-21 11:20	29h (3.6 °C)		
EV_HC1	05-8730-9056	18 May-21 11:20	19 May-21 11:20	30h (4.8 °C)		
LC_DCDS	20-0340-1068	18 May-21 11:00	19 May-21 11:20	31h (4.6 °C)		
LC_LC3	18-4816-9590	18 May-21 10:15	19 May-21 11:20	31h (4.7 °C)		
LC_LC5	03-8768-2280	18 May-21 09:50	19 May-21 11:20	32h (5.2 °C)		
LC_LCDSSLCC	02-2977-6783	18 May-21 11:00	19 May-21 11:20	31h (4.3 °C)		
FR_FR4	17-1641-7069	18 May-21 09:29	19 May-21 11:20	32h (4.6 °C)		
FR_FRRD	06-3190-8505	18 May-21 08:22	19 May-21 11:20	33h (3.4 °C)		
FR_FR2	11-2149-8709	18 May-21 10:28	19 May-21 11:20	31h (4.6 °C)		
FR_MULTIPLATE	16-7235-2081	18 May-21 11:21	19 May-21 11:20	30h (3.4 °C)		

All samples spiked with 20 µg/L Cu

5 Reference sites

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
① FR_UFR1	Water Sample	Teck Coal	FR_UFR1_WEK_2021-05-1	
⑤ GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-05-18_	
③ CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-05-18	
② LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-05-18_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_WEK_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_WEK_2021-05	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-05-18_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-05-18	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-05-18	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2020_Q2_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2020_Q2_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-05-18	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-05-18_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-05-18_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	
FR_FR4	Water Sample	Teck Coal	FR_FR4_WS_2021-05-18_	
FR_FRRD	Water Sample	Teck Coal	FR_FRRD_WS_2021-05-18	
FR_FR2	Water Sample	Teck Coal	FR_FR2_WS_2021-05-18_	
FR_MULTIPLATE	Water Sample	Teck Coal	FR_MULTIPLATE_WS_202	

Fisher Exact/Bonferroni-Holm Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
① Unamended Sample (LC_SLC)		⑤ FR_UFR1	0.9877	Exact	0.9877	Non-Significant Effect
		④ GH_ER2	0.3934	Exact	1.0000	Non-Significant Effect
		③ CM_MC1	0.8214	Exact	1.0000	Non-Significant Effect
		FR_FRABCH	0.5000	Exact	1.0000	Non-Significant Effect
		FR_FRCP1	0.8139	Exact	1.0000	Non-Significant Effect
		GH_FR1	0.1738	Exact	1.0000	Non-Significant Effect

JGH

Salmonid Embryo-Alevin Survival and Development Test — **Nautilus Environmental**

Analysis ID:	13-1207-6724	**Endpoint:**	Proportion Normal	**CETIS Version:**	CETISv1.9.4
Analyzed:	20 Aug-21 16:58	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1

Fisher Exact/Bonferroni-Holm Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
		GH_ERC	0.8139	Exact	1.0000	Non-Significant Effect
		CM_MC2	0.8667	Exact	1.0000	Non-Significant Effect
		EV_MC2	0.4438	Exact	1.0000	Non-Significant Effect
		EV_HC1	0.8606	Exact	1.0000	Non-Significant Effect
		LC_DCDS	0.9750	Exact	1.0000	Non-Significant Effect
		LC_LC3	0.6664	Exact	1.0000	Non-Significant Effect
		LC_LC5	0.1238	Exact	1.0000	Non-Significant Effect
		LC_LCDSSLCC	0.9227	Exact	1.0000	Non-Significant Effect
		FR_FR4	0.2633	Exact	1.0000	Non-Significant Effect
		FR_FRRD	0.2745	Exact	1.0000	Non-Significant Effect
		FR_FR2	0.7348	Exact	1.0000	Non-Significant Effect
		FR_MULTIPLATE	0.1562	Exact	1.0000	Non-Significant Effect

Data Summary

Sample	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
① FR_UFR1		84	5	89	0.9438	0.05618	-6.03%
① GH_ER2		73	15	88	0.8295	0.1705	6.8%
① CM_MC1		81	10	91	0.8901	0.1099	0.0%
① LC_SLC	US	77	13	90	0.8556	0.1444	3.88%
FR_FRABCH		76	14	90	0.8444	0.1556	5.13%
FR_FRCP1		80	10	90	0.8889	0.1111	0.14%
GH_FR1		72	19	91	0.7912	0.2088	11.11%
GH_ERC		80	10	90	0.8889	0.1111	0.14%
CM_MC2		80	9	89	0.8989	0.1011	-0.98%
EV_MC2		77	15	92	0.837	0.163	5.97%
EV_HC1		79	9	88	0.8977	0.1023	-0.86%
LC_DCDS		84	6	90	0.9333	0.06667	-4.86%
LC_LC3		78	12	90	0.8667	0.1333	2.63%
LC_LC5		70	20	90	0.7778	0.2222	12.62%
LC_LCDSSLCC		83	8	91	0.9121	0.08791	-2.47%
FR_FR4		72	17	89	0.809	0.191	9.11%
FR_FRRD		73	17	90	0.8111	0.1889	8.88%
FR_FR2		78	11	89	0.8764	0.1236	1.54%
FR_MULTIPLATE		70	19	89	0.7865	0.2135	11.64%

① Reference sites

Salmonid Embryo-Alevin Survival and Development Test — **Nautilus Environmental**

Analysis ID:	13-1207-6724	**Endpoint:**	Proportion Normal	**CETIS Version:**	CETISv1.9.4
Analyzed:	20 Aug-21 16:58	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1

Proportion Normal Detail

Sample	Code	Rep 1	Rep 2	Rep 3
① FR_UFR1		0.9667	0.8966	0.9667
① GH_ER2		0.8621	0.8333	0.7931
① CM_MC1		0.9032	0.8333	0.9333
① LC_SLC	US	0.9667	0.7667	0.8333
FR_FRABCH		0.9310	0.7742	0.8333
FR_FRCP1		0.8667	0.9333	0.8667
GH_FR1		0.8621	0.6250	0.9000
GH_ERC		0.9000	0.8000	0.9667
CM_MC2		0.9667	0.8333	0.8966
EV_MC2		0.9667	0.7419	0.8065
EV_HC1		0.9310	0.7931	0.9667
LC_DCDS		0.9667	0.8667	0.9667
LC_LC3		0.9310	0.8387	0.8333
LC_LC5		0.8750	0.7586	0.6897
LC_LCDSSLCC		0.9000	0.9355	0.9000
FR_FR4		0.8000	0.8621	0.7667
FR_FRRD		0.9655	0.6667	0.8065
FR_FR2		0.9000	0.8000	0.9310
FR_MULTIPLATE		0.9310	0.7586	0.6774

Proportion Normal Binomials

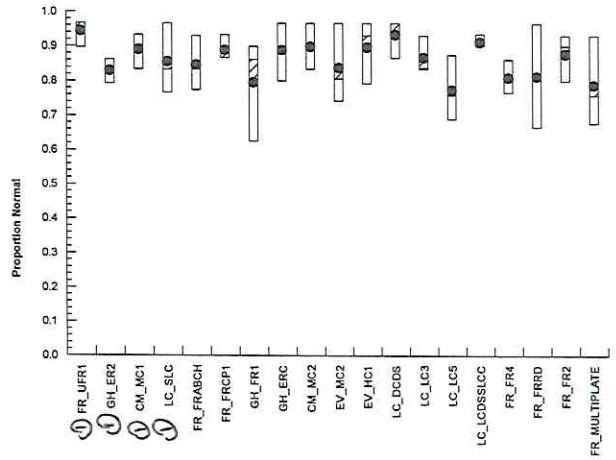
Sample	Code	Rep 1	Rep 2	Rep 3
① FR_UFR1		29/30	26/29	29/30
① GH_ER2		25/29	25/30	23/29
① CM_MC1		28/31	25/30	28/30
① LC_SLC	US	29/30	23/30	25/30
FR_FRABCH		27/29	24/31	25/30
FR_FRCP1		26/30	28/30	26/30
GH_FR1		25/29	20/32	27/30
GH_ERC		27/30	24/30	29/30
CM_MC2		29/30	25/30	26/29
EV_MC2		29/30	23/31	25/31
EV_HC1		27/29	23/29	29/30
LC_DCDS		29/30	26/30	29/30
LC_LC3		27/29	26/31	25/30
LC_LC5		28/32	22/29	20/29
LC_LCDSSLCC		27/30	29/31	27/30
FR_FR4		24/30	25/29	23/30
FR_FRRD		28/29	20/30	25/31
FR_FR2		27/30	24/30	27/29
FR_MULTIPLATE		27/29	22/29	21/31

① Reference Sites

Salmonid Embryo-Alevin Survival and Development Test — **Nautilus Environmental**

Analysis ID:	13-1207-6724	**Endpoint:**	Proportion Normal	**CETIS Version:**	CETISv1.9.4
Analyzed:	20 Aug-21 16:58	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1

Graphics



① Reference STHds

Analyst: MW QA: Aug. 23/21

CETIS Summary Report

Salmonid Embryo-Alevin-~~Fry~~ Survival Development and Growth Test — **Nautilus Environmental**

Batch ID:	07-9799-9310	**Test Type:**	Survival-Development-Growth	**Analyst:**	Yvonne Lam
Start Date:	19 May-21 17:35	**Protocol:**	EC/EPS 1/RM/28	**Diluent:**	Dechlorinated Tap Water
Ending Date:	18 Jun-21 08:05	**Species:**	Oncorhynchus mykiss	**Brine:**	
Test Length:	29d 14h	**Taxon:**	Actinopterygii	**Source:**	Ted's Trout, Campbell Lake **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
Dechlor	14-3692-6103	19 May-21	19 May-21	18h	Teck Coal	
Dechlor + 20	14-4597-7512	19 May-21	19 May-21	18h		
① FR_UFR1	12-4424-2146	18 May-21	19 May-21 11:20	42h (2.3 °C)		
① GH_ER2	02-4275-7088	18 May-21 09:55	19 May-21 11:20	32h (0.4 °C)		
① CM_MC1	01-4263-6393	18 May-21 11:08	19 May-21 11:20	30h (1.1 °C)		
① LC_SLC	12-1662-7355	18 May-21 09:45	19 May-21 11:20	32h (4.1 °C)		
FR_FRABCH	05-6713-4959	18 May-21	19 May-21 11:20	42h (1.9 °C)		
FR_FRCP1	19-8027-7867	18 May-21	19 May-21 11:20	42h (1.2 °C)		
GH_FR1	15-9886-5398	18 May-21 12:30	19 May-21 11:20	29h (0.1 °C)		
GH_ERC	21-0704-4941	18 May-21 11:20	19 May-21 11:20	30h (0.6 °C)		
CM_MC2	17-6814-6287	18 May-21 09:50	19 May-21 11:20	32h (1.1 °C)		
EV_MC2	15-5628-9197	18 May-21 13:00	19 May-21 11:20	29h (3.6 °C)		
EV_HC1	05-8730-9056	18 May-21 11:20	19 May-21 11:20	30h (4.8 °C)		
LC_DCDS	20-0340-1068	18 May-21 11:00	19 May-21 11:20	31h (4.6 °C)		
LC_LC3	18-4816-9590	18 May-21 10:15	19 May-21 11:20	31h (4.7 °C)		
LC_LC5	03-8768-2280	18 May-21 09:50	19 May-21 11:20	32h (5.2 °C)		
LC_LCDSSLCC	02-2977-6783	18 May-21 11:00	19 May-21 11:20	31h (4.3 °C)		
FR_FR4	17-1641-7069	18 May-21 09:29	19 May-21 11:20	32h (4.6 °C)		
FR_FRRD	06-3190-8505	18 May-21 08:22	19 May-21 11:20	33h (3.4 °C)		
FR_FR2	11-2149-8709	18 May-21 10:28	19 May-21 11:20	31h (4.6 °C)		
FR_MULTIPLATE	16-7235-2081	18 May-21 11:21	19 May-21 11:20	30h (3.4 °C)		

Aside from Dechlor Control, all samples spiked with 20 ug/L Cu

① Reference sites

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
Dechlor	Control water	Teck Coal	Dechlor	
Dechlor + 20	Contol+Cu	Teck Coal	Dechlor + 20 ug/L Cu	
① FR_UFR1	Water Sample	Teck Coal	FR_UFR1_WEK_2021-05-1	
① GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-05-18_	
① CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-05-18	
① LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-05-18_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_WEK_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_WEK_2021-05	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-05-18_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-05-18	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-05-18	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2020_Q2_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2020_Q2_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-05-18	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-05-18_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-05-18_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	
FR_FR4	Water Sample	Teck Coal	FR_FR4_WS_2021-05-18_	
FR_FRRD	Water Sample	Teck Coal	FR_FRRD_WS_2021-05-18	
FR_FR2	Water Sample	Teck Coal	FR_FR2_WS_2021-05-18_	
FR_MULTIPLATE	Water Sample	Teck Coal	FR_MULTIPLATE_WS_202	

SIngle Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	0.9956	LC_SLC passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	0.9956	LC_DCDS passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	0.9956	Dechlor passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	0.9956	FR_FRCP1 passed length-mm	1

Analyst: [illegible] QA: [illegible] Aug 24/21

Salmonid Embryo-Alevin-~~Fry~~ Survival Development and Growth Test **Nautilus Environmental**

SIngle Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	0.9956	FR_UFR1 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	0.9956	LC_LC5 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	0.9956	FR_FR2 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	0.9956	FR_FR4 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	0.9956	GH_ERC passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	0.9956	CM_MC1 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	0.9956	EV_HC1 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	0.9956	Dechlor + 20 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	0.9956	GH_ER2 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	0.9956	CM_MC2 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	0.9956	LC_LCDSSLCC passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	0.9956	LC_LC3 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	0.9956	GH_FR1 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	0.9956	FR_MULTIPLATE passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	0.9956	FR_FRRD passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	0.9956	FR_FRABCH passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	0.9956	EV_MC2 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	FR_FR4 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	EV_MC2 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	FR_FRCP1 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	LC_LC3 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	FR_UFR1 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	CM_MC2 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	FR_MULTIPLATE passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	LC_LC5 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	Dechlor passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	GH_ERC passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	FR_FRRD passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	Dechlor + 20 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	LC_SLC passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	GH_ER2 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	CM_MC1 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	GH_FR1 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	EV_HC1 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	LC_DCDS passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	FR_FRABCH passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	LC_LCDSSLCC passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	FR_FR2 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	0.9996	GH_ER2 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	0.9996	FR_FR2 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	0.9996	CM_MC1 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	0.9996	FR_FRCP1 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	0.9996	FR_FR4 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	0.9996	LC_LC3 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	0.9996	Dechlor + 20 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	0.9996	EV_MC2 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	0.9996	LC_LCDSSLCC passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	0.9996	FR_MULTIPLATE passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	0.9996	FR_FRABCH passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	0.9996	CM_MC2 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	0.9996	LC_SLC passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	0.9996	GH_ERC passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	0.9996	LC_DCDS passed length-mm	1

Salmonid Embryo-Alevin-Fry Survival Development and Growth Test **Nautilus Environmental**

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	0.9996	EV_HC1 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	0.9996	LC_LC5 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	0.9996	GH_FR1 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	0.9996	Dechlor passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	0.9996	FR_FRRD passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	0.9996	FR_UFR1 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	FR_FRCP1 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	LC_LC5 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	FR_FR4 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	LC_SLC passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	CM_MC1 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	FR_FRABCH passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	LC_LCDSSLCC passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	LC_LC3 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	FR_MULTIPLATE passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	CM_MC2 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	GH_ER2 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	FR_FRRD passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	EV_MC2 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	GH_ERC passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	Dechlor + 20 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	GH_FR1 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	FR_FR2 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	FR_UFR1 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	Dechlor passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	EV_HC1 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	LC_DCDS passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	0.9983	GH_FR1 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	0.9983	EV_HC1 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	0.9983	LC_LC5 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	0.9983	Dechlor + 20 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	0.9983	GH_ERC passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	0.9983	LC_SLC passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	0.9983	FR_FRABCH passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	0.9983	CM_MC2 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	0.9983	FR_FR2 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	0.9983	Dechlor passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	0.9983	FR_UFR1 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	0.9983	CM_MC1 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	0.9983	LC_DCDS passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	0.9983	FR_MULTIPLATE passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	0.9983	LC_LCDSSLCC passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	0.9983	FR_FRCP1 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	0.9983	EV_MC2 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	0.9983	LC_LC3 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	0.9983	FR_FRRD passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	0.9983	GH_ER2 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	0.9983	FR_FR4 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	FR_MULTIPLATE passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	CM_MC2 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	FR_FRABCH passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	LC_LC5 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	Dechlor passed length-mm	1

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Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	LC_DCDS passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	GH_FR1 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	FR_FRCP1 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	LC_LC3 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	EV_HC1 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	Dechlor + 20 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	FR_UFR1 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	FR_FR4 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	CM_MC1 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	FR_FR2 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	LC_LCDSSLCC passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	GH_ERC passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	LC_SLC passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	EV_MC2 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	GH_ER2 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	FR_FRRD passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	0.9987	GH_FR1 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	0.9987	FR_UFR1 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	0.9987	FR_FRCP1 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	0.9987	FR_FR4 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	0.9987	EV_MC2 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	0.9987	CM_MC1 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	0.9987	FR_MULTIPLATE passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	0.9987	FR_FR2 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	0.9987	GH_ER2 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	0.9987	Dechlor + 20 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	0.9987	LC_LC3 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	0.9987	LC_SLC passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	0.9987	EV_HC1 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	0.9987	LC_DCDS passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	0.9987	Dechlor passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	0.9987	LC_LC5 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	0.9987	FR_FRRD passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	0.9987	GH_ERC passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	0.9987	FR_FRABCH passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	0.9987	LC_LCDSSLCC passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	0.9987	CM_MC2 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	FR_FRRD passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	LC_DCDS passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	GH_FR1 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	FR_UFR1 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	Dechlor passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	EV_HC1 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	Dechlor + 20 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	GH_ERC passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	CM_MC2 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	FR_MULTIPLATE passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	EV_MC2 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	FR_FR2 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	FR_FRABCH passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	LC_SLC passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	FR_FR4 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	CM_MC1 passed length-mm	1

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SIngle Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	LC_LC3 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	LC_LC5 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	FR_FRCP1 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	LC_LCDSSLCC passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	GH_ER2 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	CM_MC1 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	FR_FRABCH passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	GH_FR1 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	Dechlor + 20 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	FR_FR2 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	EV_HC1 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	LC_LC3 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	LC_LCDSSLCC passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	GH_ERC passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	FR_FR4 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	Dechlor passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	LC_SLC passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	CM_MC2 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	FR_MULTIPLATE passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	LC_DCDS passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	FR_UFR1 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	GH_ER2 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	FR_FRCP1 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	FR_FRRD passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	LC_LC5 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	EV_MC2 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	LC_LCDSSLCC passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	LC_LC5 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	FR_FRABCH passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	CM_MC2 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	GH_ERC passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	FR_MULTIPLATE passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	EV_MC2 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	FR_FR2 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	FR_FRCP1 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	FR_FRRD passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	EV_HC1 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	LC_SLC passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	Dechlor + 20 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	FR_FR4 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	GH_FR1 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	LC_LC3 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	FR_UFR1 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	GH_ER2 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	LC_DCDS passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	Dechlor passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	CM_MC1 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	LC_DCDS passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	LC_LC5 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	FR_FR4 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	FR_FRRD passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	EV_HC1 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	GH_ERC passed length-mm	1

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Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	LC_LC3 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	LC_LCDSSLCC passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	FR_FR2 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	FR_MULTIPLATE passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	CM_MC2 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	EV_MC2 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	GH_ER2 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	LC_SLC passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	Dechlor passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	FR_UFR1 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	CM_MC1 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	FR_FRCP1 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	Dechlor + 20 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	GH_FR1 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	FR_FRABCH passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	0.9999	LC_DCDS passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	0.9999	LC_SLC passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	0.9999	LC_LC3 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	0.9999	FR_FR2 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	0.9999	Dechlor passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	0.9999	FR_FRRD passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	0.9999	EV_HC1 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	0.9999	GH_ER2 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	0.9999	FR_FRCP1 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	0.9999	FR_FR4 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	0.9999	CM_MC1 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	0.9999	Dechlor + 20 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	0.9999	EV_MC2 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	0.9999	FR_FRABCH passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	0.9999	FR_MULTIPLATE passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	0.9999	GH_ERC passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	0.9999	LC_LC5 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	0.9999	FR_UFR1 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	0.9999	LC_LCDSSLCC passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	0.9999	CM_MC2 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	0.9999	GH_FR1 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	FR_FRRD passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	LC_DCDS passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	GH_ER2 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	FR_FRCP1 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	GH_FR1 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	FR_FR4 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	FR_FRABCH passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	CM_MC1 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	LC_LC5 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	LC_LCDSSLCC passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	LC_SLC passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	LC_LC3 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	FR_MULTIPLATE passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	Dechlor passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	FR_FR2 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	EV_HC1 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	EV_MC2 passed length-mm	1

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SIngle Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	Dechlor + 20 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	GH_ERC passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	FR_UFR1 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	CM_MC2 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	FR_FRABCH passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	LC_SLC passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	FR_FR2 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	FR_FR4 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	GH_ERC passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	FR_MULTIPLATE passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	EV_MC2 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	CM_MC2 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	GH_ER2 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	LC_LCDSSLCC passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	LC_LC3 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	CM_MC1 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	LC_LC5 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	LC_DCDS passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	EV_HC1 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	Dechlor + 20 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	FR_UFR1 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	FR_FRRD passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	FR_FRCP1 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	GH_FR1 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	Dechlor passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	CM_MC2 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	FR_FRRD passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	LC_LCDSSLCC passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	FR_MULTIPLATE passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	GH_ERC passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	LC_SLC passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	Dechlor + 20 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	CM_MC1 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	LC_LC3 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	EV_HC1 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	LC_LC5 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	FR_FRCP1 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	FR_FR4 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	FR_FR2 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	LC_DCDS passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	GH_FR1 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	Dechlor passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	GH_ER2 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	EV_MC2 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	FR_FRABCH passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	FR_UFR1 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	GH_ER2 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	EV_MC2 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	LC_LCDSSLCC passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	FR_UFR1 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	Dechlor + 20 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	CM_MC1 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	FR_FRRD passed length-mm	1

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SIngle Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	FR_FR4 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	GH_ERC passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	FR_FR2 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	LC_SLC passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	FR_FRABCH passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	LC_DCDS passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	EV_HC1 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	Dechlor passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	GH_FR1 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	LC_LC5 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	FR_FRCP1 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	FR_MULTIPLATE passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	CM_MC2 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	LC_LC3 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	EV_HC1 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	FR_FRCP1 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	FR_FR4 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	LC_DCDS passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	FR_UFR1 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	FR_FRRD passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	LC_LC3 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	Dechlor + 20 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	Dechlor passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	FR_FR2 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	EV_MC2 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	FR_MULTIPLATE passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	CM_MC2 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	GH_ERC passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	GH_FR1 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	LC_SLC passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	FR_FRABCH passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	CM_MC1 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	LC_LC5 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	GH_ER2 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	LC_LCDSSLCC passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	GH_FR1 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	EV_MC2 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	LC_LCDSSLCC passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	LC_DCDS passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	FR_FRRD passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	LC_LC3 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	LC_SLC passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	LC_LC5 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	FR_FR2 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	EV_HC1 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	Dechlor passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	FR_FRCP1 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	GH_ERC passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	FR_FRABCH passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	CM_MC2 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	FR_FR4 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	CM_MC1 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	GH_ER2 passed length-mm	1

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SIngle Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	Dechlor + 20 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	FR_MULTIPLATE passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	FR_UFR1 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	FR_MULTIPLATE passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	EV_MC2 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	FR_FR2 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	CM_MC1 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	Dechlor passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	EV_HC1 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	LC_LC5 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	CM_MC2 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	GH_ERC passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	FR_FRRD passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	LC_LCDSSLCC passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	GH_ER2 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	FR_UFR1 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	LC_SLC passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	LC_DCDS passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	FR_FRABCH passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	GH_FR1 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	LC_LC3 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	Dechlor + 20 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	FR_FRCP1 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	FR_FR4 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	CM_MC1 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	LC_LC3 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	FR_FR4 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	GH_ERC passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	FR_FRABCH passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	CM_MC2 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	FR_UFR1 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	FR_MULTIPLATE passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	GH_ER2 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	EV_MC2 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	EV_HC1 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	Dechlor passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	LC_SLC passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	FR_FR2 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	LC_LC5 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	FR_FRCP1 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	FR_FRRD passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	LC_LCDSSLCC passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	GH_FR1 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	Dechlor + 20 passed length-mm	1
16-3397-0402	Length-mm	Dunnett Multiple Comparison Test	1.0000	LC_DCDS passed length-mm	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.8000	FR_FRCP1 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.8000	GH_ERC passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.8000	Dechlor passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.8000	LC_DCDS passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.8000	FR_UFR1 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.8000	LC_LC3 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.8000	LC_SLC passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.8000	Dechlor + 20 passed mean dry weight-mg	1

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SIngle Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.8000	GH_ER2 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.8000	GH_FR1 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.8000	LC_LC5 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.8000	FR_FRRD passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.8000	FR_FRABCH passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.8000	LC_LCDSSLCC passed mean dry weight-	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.8000	CM_MC1 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.8000	FR_MULTIPLATE passed mean dry weight	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.8000	FR_FR4 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.8000	FR_FR2 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.8000	EV_MC2 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.8000	CM_MC2 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.8000	EV_HC1 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.6500	FR_MULTIPLATE passed mean dry weight	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.6500	LC_LC3 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.6500	FR_FR2 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.6500	GH_ER2 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.6500	CM_MC2 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.6500	GH_FR1 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.6500	LC_LC5 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.6500	FR_UFR1 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.6500	FR_FRRD passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.6500	FR_FRABCH passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.6500	FR_FRCP1 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.6500	LC_LCDSSLCC passed mean dry weight-	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.6500	EV_HC1 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.6500	CM_MC1 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.6500	Dechlor passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.6500	GH_ERC passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.6500	LC_SLC passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.6500	Dechlor + 20 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.6500	EV_MC2 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.6500	LC_DCDS passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.6500	FR_FR4 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9000	FR_FRRD passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9000	FR_FRCP1 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9000	GH_ER2 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9000	FR_FR4 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9000	FR_MULTIPLATE passed mean dry weight	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9000	LC_LC5 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9000	EV_MC2 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9000	LC_LCDSSLCC passed mean dry weight-	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9000	CM_MC1 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9000	FR_FRABCH passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9000	GH_ERC passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9000	LC_SLC passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9000	GH_FR1 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9000	Dechlor + 20 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9000	LC_LC3 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9000	FR_FR2 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9000	FR_UFR1 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9000	CM_MC2 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9000	LC_DCDS passed mean dry weight-mg	1

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Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9000	EV_HC1 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9000	Dechlor passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.8000	FR_FRCP1 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.8000	LC_DCDS passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.8000	EV_MC2 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.8000	FR_FR2 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.8000	Dechlor passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.8000	FR_FRABCH passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.8000	LC_SLC passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.8000	FR_FR4 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.8000	EV_HC1 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.8000	Dechlor + 20 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.8000	GH_ERC passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.8000	CM_MC1 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.8000	GH_ER2 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.8000	LC_LC3 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.8000	FR_MULTIPLATE passed mean dry weight	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.8000	CM_MC2 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.8000	LC_LC5 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.8000	FR_UFR1 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.8000	GH_FR1 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.8000	FR_FRRD passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.8000	LC_LCDSSLCC passed mean dry weight-	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	FR_FRCP1 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	CM_MC2 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	EV_HC1 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	LC_SLC passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	GH_FR1 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	Dechlor passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	LC_LC3 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	FR_MULTIPLATE passed mean dry weight	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	LC_LC5 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	LC_DCDS passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	FR_FRABCH passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	LC_LCDSSLCC passed mean dry weight-	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	FR_UFR1 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	FR_FR4 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	CM_MC1 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	GH_ER2 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	FR_FR2 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	GH_ERC passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	Dechlor + 20 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	EV_MC2 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	FR_FRRD passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	CM_MC2 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	FR_FRABCH passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	FR_FR2 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	LC_LC3 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	FR_FRCP1 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	LC_LC5 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	GH_FR1 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	FR_FRRD passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	GH_ER2 passed mean dry weight-mg	1

Salmonid Embryo-Alevin-Fry Survival Development and Growth Test **Nautilus Environmental**

SIngle Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	LC_DCDS passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	FR_UFR1 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	Dechlor passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	FR_FR4 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	CM_MC1 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	LC_LCDSSLCC passed mean dry weight-	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	GH_ERC passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	Dechlor + 20 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	LC_SLC passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	EV_HC1 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	FR_MULTIPLATE passed mean dry weight	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	EV_MC2 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	EV_HC1 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	Dechlor passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	FR_FRRD passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	FR_FRCP1 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	CM_MC2 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	LC_LC3 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	LC_DCDS passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	FR_UFR1 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	FR_FR2 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	GH_FR1 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	GH_ERC passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	Dechlor + 20 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	CM_MC1 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	LC_LCDSSLCC passed mean dry weight-	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	GH_ER2 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	EV_MC2 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	LC_SLC passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	LC_LC5 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	FR_FR4 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	FR_FRABCH passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	FR_MULTIPLATE passed mean dry weight	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9000	FR_MULTIPLATE passed mean dry weight	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9000	FR_FR4 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9000	FR_FRRD passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9000	GH_FR1 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9000	LC_DCDS passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9000	LC_LC5 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9000	EV_MC2 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9000	LC_SLC passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9000	CM_MC1 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9000	Dechlor + 20 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9000	Dechlor passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9000	LC_LCDSSLCC passed mean dry weight-	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9000	FR_FR2 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9000	GH_ER2 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9000	GH_ERC passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9000	FR_UFR1 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9000	LC_LC3 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9000	FR_FRCP1 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9000	CM_MC2 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9000	EV_HC1 passed mean dry weight-mg	1

Analyst: JCC QA: Aug 24/21

Salmonid Embryo-Alevin-Fry Survival Development and Growth Test **Nautilus Environmental**

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9000	FR_FRABCH passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	GH_ER2 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	Dechlor + 20 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	LC_SLC passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	LC_DCDS passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	FR_FR2 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	CM_MC2 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	Dechlor passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	EV_HC1 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	CM_MC1 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	FR_FR4 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	FR_FRCP1 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	FR_MULTIPLATE passed mean dry weight	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	FR_FRABCH passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	LC_LC5 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	FR_FRRD passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	GH_FR1 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	FR_UFR1 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	LC_LCDSSLCC passed mean dry weight-	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	LC_LC3 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	GH_ERC passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	EV_MC2 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	EV_MC2 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	GH_ERC passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	FR_MULTIPLATE passed mean dry weight	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	FR_FRRD passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	LC_LCDSSLCC passed mean dry weight-	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	CM_MC1 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	CM_MC2 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	LC_LC5 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	FR_FR4 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	FR_FRABCH passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	GH_ER2 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	FR_FRCP1 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	Dechlor passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	GH_FR1 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	Dechlor + 20 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	EV_HC1 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	LC_LC3 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	FR_FR2 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	FR_UFR1 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	LC_SLC passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	LC_DCDS passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	LC_LC3 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	FR_MULTIPLATE passed mean dry weight	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	LC_DCDS passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	EV_HC1 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	LC_LC5 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	FR_FRRD passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	FR_FR2 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	LC_LCDSSLCC passed mean dry weight-	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	GH_ERC passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	FR_FR4 passed mean dry weight-mg	1

Salmonid Embryo-Alevin ~~Fry~~ Survival Development and Growth Test **Nautilus Environmental**

SIngle Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	GH_ER2 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	FR_FRABCH passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	FR_FRCP1 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	EV_MC2 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	GH_FR1 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	CM_MC1 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	CM_MC2 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	Dechlor + 20 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	LC_SLC passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	FR_UFR1 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	Dechlor passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	FR_FR4 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	CM_MC1 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	Dechlor passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	Dechlor + 20 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	EV_HC1 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	FR_FR2 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	LC_DCDS passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	FR_FRRD passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	GH_FR1 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	FR_UFR1 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	EV_MC2 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	FR_FRABCH passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	LC_LC5 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	LC_LCDSSLCC passed mean dry weight-	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	LC_LC3 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	GH_ERC passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	LC_SLC passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	FR_MULTIPLATE passed mean dry weight	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	GH_ER2 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	FR_FRCP1 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	CM_MC2 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	FR_FRABCH passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	GH_FR1 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	LC_LC5 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	FR_FR4 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	LC_SLC passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	LC_LC3 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	LC_LCDSSLCC passed mean dry weight-	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	CM_MC1 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	FR_FRCP1 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	GH_ER2 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	LC_DCDS passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	EV_MC2 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	FR_FR2 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	Dechlor passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	FR_MULTIPLATE passed mean dry weight	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	Dechlor + 20 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	CM_MC2 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	GH_ERC passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	FR_FRRD passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	FR_UFR1 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	EV_HC1 passed mean dry weight-mg	1

Salmonid Embryo-Alevin-Fry Survival Development and Growth Test **Nautilus Environmental**

SIngle Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9000	CM_MC2 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9000	LC_LC5 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9000	FR_FRCP1 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9000	LC_LC3 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9000	FR_MULTIPLATE passed mean dry weight	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9000	FR_FRABCH passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9000	EV_MC2 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9000	FR_FR2 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9000	GH_ERC passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9000	GH_FR1 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9000	GH_ER2 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9000	FR_UFR1 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9000	FR_FR4 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9000	FR_FRRD passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9000	Dechlor + 20 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9000	LC_DCDS passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9000	LC_SLC passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9000	Dechlor passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9000	CM_MC1 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9000	LC_LCDSSLCC passed mean dry weight-	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9000	EV_HC1 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	EV_MC2 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	GH_ER2 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	CM_MC1 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	FR_FR2 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	Dechlor + 20 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	FR_FRRD passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	LC_SLC passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	LC_LC5 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	LC_LCDSSLCC passed mean dry weight-	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	FR_FR4 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	FR_UFR1 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	GH_ERC passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	EV_HC1 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	GH_FR1 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	LC_LC3 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	FR_FRABCH passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	LC_DCDS passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	Dechlor passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	CM_MC2 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	FR_FRCP1 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	FR_MULTIPLATE passed mean dry weight	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	GH_ER2 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	CM_MC2 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	FR_FRCP1 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	FR_FR2 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	EV_HC1 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	CM_MC1 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	EV_MC2 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	LC_DCDS passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	FR_UFR1 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	FR_FR4 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	GH_FR1 passed mean dry weight-mg	1

SIngle Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	FR_MULTIPLATE passed mean dry weight	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	Dechlor + 20 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	LC_LCDSSLCC passed mean dry weight-	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	LC_SLC passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	LC_LC3 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	FR_FRABCH passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	Dechlor passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	GH_ERC passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	FR_FRRD passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	LC_LC5 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9000	FR_FR2 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9000	GH_ER2 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9000	GH_ERC passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9000	LC_LC5 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9000	FR_MULTIPLATE passed mean dry weight	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9000	LC_SLC passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9000	FR_FR4 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9000	LC_DCDS passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9000	FR_UFR1 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9000	EV_MC2 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9000	GH_FR1 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9000	FR_FRCP1 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9000	Dechlor passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9000	LC_LCDSSLCC passed mean dry weight-	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9000	LC_LC3 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9000	Dechlor + 20 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9000	FR_FRABCH passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9000	FR_FRRD passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9000	CM_MC2 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9000	CM_MC1 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9000	EV_HC1 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9000	FR_UFR1 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9000	GH_FR1 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9000	EV_HC1 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9000	FR_FRRD passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9000	EV_MC2 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9000	Dechlor passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9000	LC_DCDS passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9000	LC_SLC passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9000	GH_ERC passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9000	LC_LC5 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9000	LC_LC3 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9000	CM_MC2 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9000	CM_MC1 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9000	LC_LCDSSLCC passed mean dry weight-	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9000	FR_MULTIPLATE passed mean dry weight	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9000	GH_ER2 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9000	Dechlor + 20 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9000	FR_FRCP1 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9000	FR_FR4 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9000	FR_FR2 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9000	FR_FRABCH passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9000	EV_MC2 passed mean dry weight-mg	1

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9000	Dechlor passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9000	FR_FR2 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9000	CM_MC2 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9000	FR_MULTIPLATE passed mean dry weight	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9000	GH_ERC passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9000	FR_UFR1 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9000	LC_DCDS passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9000	LC_LCDSSLCC passed mean dry weight-	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9000	Dechlor + 20 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9000	FR_FRCP1 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9000	FR_FR4 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9000	CM_MC1 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9000	GH_ER2 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9000	LC_LC5 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9000	EV_HC1 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9000	FR_FRRD passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9000	LC_LC3 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9000	GH_FR1 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9000	LC_SLC passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9000	FR_FRABCH passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	CM_MC2 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	CM_MC1 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	LC_LCDSSLCC passed mean dry weight-	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	FR_FRABCH passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	GH_ERC passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	Dechlor passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	LC_LC3 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	LC_DCDS passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	FR_UFR1 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	EV_MC2 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	FR_FR2 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	FR_FRCP1 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	FR_FR4 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	LC_SLC passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	LC_LC5 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	FR_MULTIPLATE passed mean dry weight	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	EV_HC1 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	FR_FRRD passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	GH_FR1 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	Dechlor + 20 passed mean dry weight-mg	1
03-5086-9992	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.9500	GH_ER2 passed mean dry weight-mg	1

Salmonid Embryo-Alevin-Fry Survival Development and Growth Test **Nautilus Environmental**

Length-mm Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
Dechlor	N	3	19.93	18.59	21.26	19.37	20.44	0.3103	0.5375	2.70%	0.00%
Dechlor + 20		3	20.17	19.69	20.65	20.04	20.4	0.1121	0.1942	0.96%	-1.22%
FR_UFR1		3	20.8	20.19	21.4	20.52	20.94	0.1399	0.2423	1.16%	-4.35%
GH_ER2		3	20.36	18.83	21.89	19.68	20.88	0.3557	0.6161	3.03%	-2.16%
CM_MC1		3	20.71	20.2	21.23	20.5	20.91	0.119	0.2061	1.00%	-3.94%
LC_SLC		3	20.25	18.97	21.54	19.91	20.85	0.298	0.5162	2.55%	-1.63%
FR_FRABCH		3	20.64	19.64	21.64	20.23	21.04	0.2327	0.4031	1.95%	-3.56%
FR_FRCP1		3	20.27	19.19	21.36	19.79	20.63	0.2525	0.4374	2.16%	-1.73%
GH_FR1		3	20.65	20.07	21.23	20.38	20.82	0.1351	0.2341	1.13%	-3.61%
GH_ERC		3	20.94	20.88	21	20.91	20.96	0.01313	0.02275	0.11%	-5.07%
CM_MC2		3	20.82	19.57	22.08	20.32	21.33	0.2907	0.5035	2.42%	-4.49%
EV_MC2		3	20.75	19.57	21.92	20.45	21.29	0.273	0.4729	2.28%	-4.11%
EV_HC1		3	20.48	18.98	21.97	19.78	20.88	0.3482	0.603	2.95%	-2.74%
LC_DCDS		3	21.27	20.11	22.43	20.85	21.78	0.2699	0.4675	2.20%	-6.74%
LC_LC3		3	21.01	20.5	21.51	20.8	21.2	0.1179	0.2043	0.97%	-5.40%
LC_LC5		3	21.1	20.69	21.51	20.91	21.21	0.09583	0.166	0.79%	-5.87%
LC_LCDSSLCC		3	21.08	20.88	21.29	21	21.16	0.04666	0.08082	0.38%	-5.80%
FR_FR4		3	20.73	20.46	20.99	20.62	20.83	0.06151	0.1065	0.51%	-3.99%
FR_FRRD		3	20.57	19.81	21.32	20.25	20.86	0.1757	0.3044	1.48%	-3.20%
FR_FR2		3	20.77	19.54	21.99	20.44	21.33	0.2844	0.4925	2.37%	-4.20%
FR_MULTIPLATE		3	20.69	19.32	22.06	20.35	21.33	0.3183	0.5514	2.66%	-3.82%

Mean Dry Weight-mg Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
Dechlor	N	3	82.53	52.71	112.3	70.33	94.33	6.931	12	14.55%	0.00%
Dechlor + 20		3	85.8	55.53	116.1	73.08	97.37	7.036	12.19	14.20%	-3.97%
FR_UFR1		3	87.5	53.88	121.1	79	103.1	7.814	13.53	15.47%	-6.02%
GH_ER2		3	97.75	62.11	133.4	88.57	114.3	8.284	14.35	14.68%	-18.45%
CM_MC1		3	92.22	66.65	117.8	82.5	103	5.942	10.29	11.16%	-11.74%
LC_SLC		3	95.25	74.57	115.9	85.86	101.7	4.807	8.326	8.74%	-15.42%
FR_FRABCH		3	99.46	68.01	130.9	88.52	113.3	7.311	12.66	12.73%	-20.52%
FR_FRCP1		3	96.93	73.53	120.3	86.67	105.2	5.439	9.42	9.72%	-17.45%
GH_FR1		3	98.55	72.94	124.2	91.43	110.4	5.952	10.31	10.46%	-19.41%
GH_ERC		3	105.4	77.71	133.1	98.33	118.3	6.44	11.16	10.58%	-27.74%
CM_MC2		3	100.5	54.84	146.2	84.83	120.8	10.62	18.39	18.30%	-21.82%
EV_MC2		3	100.7	68.51	132.9	87	112.8	7.48	12.96	12.87%	-22.01%
EV_HC1		3	99.64	73.3	126	87.83	108.3	6.122	10.6	10.64%	-20.73%
LC_DCDS		3	108.6	75.73	141.4	98.15	123.4	7.633	13.22	12.18%	-31.57%
LC_LC3		3	100.6	58.03	143.2	89.63	120.4	9.897	17.14	17.04%	-21.92%
LC_LC5		3	104.2	53.37	155	86.36	126.5	11.81	20.45	19.63%	-26.22%
LC_LCDSSLCC		3	111.5	79.21	143.8	97.59	123.3	7.505	13	11.66%	-35.10%
FR_FR4		3	97.51	73.3	121.7	90	108.5	5.626	9.744	9.99%	-18.15%
FR_FRRD		3	94.73	60.12	129.3	85.36	110.7	8.044	13.93	14.71%	-14.79%
FR_FR2		3	97.42	60.52	134.3	87.08	114.4	8.576	14.85	15.25%	-18.05%
FR_MULTIPLATE		3	106.6	77.27	135.9	92.96	113.5	6.814	11.8	11.07%	-29.16%

① Reference sites

Salmonid Embryo-Alevin-~~Ery~~ Survival Development and Growth Test — **Nautilus Environmental**

Length-mm Detail

Sample	Code	Rep 1	Rep 2	Rep 3
Dechlor	N	19.37	20.44	19.98
Dechlor + 20		20.08	20.04	20.4
FR_UFR1		20.52	20.94	20.93
GH_ER2		20.88	19.68	20.52
CM_MC1		20.91	20.5	20.73
LC_SLC		19.91	20.85	20
FR_FRABCH		21.04	20.23	20.65
FR_FRCP1		20.41	19.79	20.63
GH_FR1		20.75	20.38	20.82
GH_ERC		20.95	20.96	20.91
CM_MC2		20.83	20.32	21.33
EV_MC2		20.45	20.5	21.29
EV_HC1		20.88	19.78	20.77
LC_DCDS		21.19	20.85	21.78
LC_LC3		21.02	21.2	20.8
LC_LC5		21.21	20.91	21.17
LC_LCDSSLCC		21.16	21	21.09
FR_FR4		20.72	20.62	20.83
FR_FRRD		20.25	20.86	20.59
FR_FR2		20.44	20.52	21.33
FR_MULTIPLATE		20.39	20.35	21.33

Mean ~~Dry~~ Wet Weight-mg Detail

Sample	Code	Rep 1	Rep 2	Rep 3
Dechlor	N	70.33	82.92	94.33
Dechlor + 20		73.08	86.96	97.37
FR_UFR1		79	80.38	103.1
GH_ER2		90.4	88.57	114.3
CM_MC1		82.5	91.15	103
LC_SLC		85.86	101.7	98.15
FR_FRABCH		88.52	96.54	113.3
FR_FRCP1		86.67	98.93	105.2
GH_FR1		93.85	91.43	110.4
GH_ERC		99.64	98.33	118.3
CM_MC2		84.83	96	120.8
EV_MC2		87	102.3	112.8
EV_HC1		102.8	87.83	108.3
LC_DCDS		104.1	98.15	123.4
LC_LC3		89.63	91.85	120.4
LC_LC5		99.64	86.36	126.5
LC_LCDSSLCC		113.6	97.59	123.3
FR_FR4		108.5	94	90
FR_FRRD		85.36	88.1	110.7
FR_FR2		90.74	87.08	114.4
FR_MULTIPLATE		92.96	113.3	113.5

① Reference sites

CETIS Analytical Report

Salmonid Embryo-Alevin-Fry Survival Development and Growth Test — **Nautilus Environmental**

Analysis ID:	16-3397-0402	**Endpoint:**	Length-mm	**CETIS Version:**	CETISv1.9.4
Analyzed:	20 Aug-21 17:09	**Analysis:**	Parametric-Control vs Treatments	**Status Level:**	1
Batch ID:	07-9799-9310	**Test Type:**	Survival-Development-Growth	**Analyst:**	Yvonne Lam
Start Date:	19 May-21 17:35	**Protocol:**	EC/EPS 1/RM/28	**Diluent:**	Dechlorinated Tap Water
Ending Date:	18 Jun-21 08:05	**Species:**	Oncorhynchus mykiss	**Brine:**	
Test Length:	29d 14h	**Taxon:**	Actinopterygii	**Source:**	Ted's Trout, Campbell Lake **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
Dechlor	14-3692-6103	19 May-21	19 May-21	18h	Teck Coal	
Dechlor + 20	14-4597-7512	19 May-21	19 May-21	18h		
FR_UFR1	12-4424-2146	18 May-21	19 May-21 11:20	42h (2.3 °C)		
GH_ER2	02-4275-7088	18 May-21 09:55	19 May-21 11:20	32h (0.4 °C)		
CM_MC1	01-4263-6393	18 May-21 11:08	19 May-21 11:20	30h (1.1 °C)		
LC_SLC	12-1662-7355	18 May-21 09:45	19 May-21 11:20	32h (4.1 °C)		
FR_FRABCH	05-6713-4959	18 May-21	19 May-21 11:20	42h (1.9 °C)		
FR_FRCP1	19-8027-7867	18 May-21	19 May-21 11:20	42h (1.2 °C)		
GH_FR1	15-9886-5398	18 May-21 12:30	19 May-21 11:20	29h (0.1 °C)		
GH_ERC	21-0704-4941	18 May-21 11:20	19 May-21 11:20	30h (0.6 °C)		
CM_MC2	17-6814-6287	18 May-21 09:50	19 May-21 11:20	32h (1.1 °C)		
EV_MC2	15-5628-9197	18 May-21 13:00	19 May-21 11:20	29h (3.6 °C)		
EV_HC1	05-8730-9056	18 May-21 11:20	19 May-21 11:20	30h (4.8 °C)		
LC_DCDS	20-0340-1068	18 May-21 11:00	19 May-21 11:20	31h (4.6 °C)		
LC_LC3	18-4816-9590	18 May-21 10:15	19 May-21 11:20	31h (4.7 °C)		
LC_LC5	03-8768-2280	18 May-21 09:50	19 May-21 11:20	32h (5.2 °C)		
LC_LCDSSLCC	02-2977-6783	18 May-21 11:00	19 May-21 11:20	31h (4.3 °C)		
FR_FR4	17-1641-7069	18 May-21 09:29	19 May-21 11:20	32h (4.6 °C)		
FR_FRRD	06-3190-8505	18 May-21 08:22	19 May-21 11:20	33h (3.4 °C)		
FR_FR2	11-2149-8709	18 May-21 10:28	19 May-21 11:20	31h (4.6 °C)		
FR_MULTIPLATE	16-7235-2081	18 May-21 11:21	19 May-21 11:20	30h (3.4 °C)		

Aside from Dechlor control all samples spiked with 20 ug/L Cu

Reference Sites

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
Dechlor	Control water	Teck Coal	Dechlor	
Dechlor + 20	Contol+Cu	Teck Coal	Dechlor + 20 ug/L Cu	
FR_UFR1	Water Sample	Teck Coal	FR_UFR1_WEK_2021-05-1	
GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-05-18_	
CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-05-18	
LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-05-18_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_WEK_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_WEK_2021-05	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-05-18_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-05-18	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-05-18	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2020_Q2_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2020_Q2_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-05-18	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-05-18_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-05-18_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	
FR_FR4	Water Sample	Teck Coal	FR_FR4_WS_2021-05-18_	
FR_FRRD	Water Sample	Teck Coal	FR_FRRD_WS_2021-05-18	
FR_FR2	Water Sample	Teck Coal	FR_FR2_WS_2021-05-18_	
FR_MULTIPLATE	Water Sample	Teck Coal	FR_MULTIPLATE_WS_202	

Analyst: YL QA: AM 24/8/21

Salmonid Embryo-Alevin-Fry Survival Development and Growth Test **Nautilus Environmental**

Analysis ID: 16-3397-0402 **Endpoint:** Length-mm **CETIS Version:** CETISv1.9.4
Analyzed: 20 Aug-21 17:09 **Analysis:** Parametric-Control vs Treatments **Status Level:** 1

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	Dechlor + 20 passed length-mm	4.44%
		FR_UFR1 passed length-mm	4.44%
		GH_ER2 passed length-mm	4.44%
		CM_MC1 passed length-mm	4.44%
		LC_SLC passed length-mm	4.44%
		FR_FRABCH passed length-mm	4.44%
		FR_FRCP1 passed length-mm	4.44%
		GH_FR1 passed length-mm	4.44%
		GH_ERC passed length-mm	4.44%
		CM_MC2 passed length-mm	4.44%
		EV_MC2 passed length-mm	4.44%
		EV_HC1 passed length-mm	4.44%
		LC_DCDS passed length-mm	4.44%
		LC_LC3 passed length-mm	4.44%
		LC_LC5 passed length-mm	4.44%
		LC_LCDSSLCC passed length-mm	4.44%
		FR_FR4 passed length-mm	4.44%
		FR_FRRD passed length-mm	4.44%
		FR_FR2 passed length-mm	4.44%
		FR_MULTIPLATE passed length-mm	4.44%

Reference sites

Dunnett Multiple Comparison Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Negative Control		Dechlor + 20	-0.7523	2.748	0.885	4	CDF	0.9956	Non-Significant Effect
		FR_UFR1	-2.692	2.748	0.885	4	CDF	1.0000	Non-Significant Effect
		GH_ER2	-1.334	2.748	0.885	4	CDF	0.9996	Non-Significant Effect
		CM_MC1	-2.438	2.748	0.885	4	CDF	1.0000	Non-Significant Effect
		LC_SLC	-1.008	2.748	0.885	4	CDF	0.9983	Non-Significant Effect
		FR_FRABCH	-2.202	2.748	0.885	4	CDF	1.0000	Non-Significant Effect
		FR_FRCP1	-1.071	2.748	0.885	4	CDF	0.9987	Non-Significant Effect
		GH_FR1	-2.233	2.748	0.885	4	CDF	1.0000	Non-Significant Effect
		GH_ERC	-3.135	2.748	0.885	4	CDF	1.0000	Non-Significant Effect
		CM_MC2	-2.78	2.748	0.885	4	CDF	1.0000	Non-Significant Effect
		EV_MC2	-2.54	2.748	0.885	4	CDF	1.0000	Non-Significant Effect
		EV_HC1	-1.698	2.748	0.885	4	CDF	0.9999	Non-Significant Effect
		LC_DCDS	-4.17	2.748	0.885	4	CDF	1.0000	Non-Significant Effect
		LC_LC3	-3.343	2.748	0.885	4	CDF	1.0000	Non-Significant Effect
		LC_LC5	-3.632	2.748	0.885	4	CDF	1.0000	Non-Significant Effect
		LC_LCDSSLCC	-3.587	2.748	0.885	4	CDF	1.0000	Non-Significant Effect
		FR_FR4	-2.47	2.748	0.885	4	CDF	1.0000	Non-Significant Effect
		FR_FRRD	-1.978	2.748	0.885	4	CDF	1.0000	Non-Significant Effect
		FR_FR2	-2.597	2.748	0.885	4	CDF	1.0000	Non-Significant Effect
		FR_MULTIPLATE	-2.36	2.748	0.885	4	CDF	1.0000	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	6.71521	0.33576	20	2.157	0.0179	Significant Effect
Error	6.53742	0.155653	42			
Total	13.2526		62			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance Test	24.44	37.57	0.2239	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9797	0.9481	0.3817	Normal Distribution

Salmonid Embryo-Alevin-~~Fry~~ Survival Development and Growth Test — Nautilus Environmental

Analysis ID: 16-3397-0402 Endpoint: Length-mm CETIS Version: CETISv1.9.4
Analyzed: 20 Aug-21 17:09 Analysis: Parametric-Control vs Treatments Status Level: 1

Length-mm Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
Dechlor	N	3	19.93	18.59	21.26	19.98	19.37	20.44	0.3103	2.70%	0.00%
Dechlor + 20		3	20.17	19.69	20.65	20.08	20.04	20.4	0.1121	0.96%	-1.22%
FR_UFR1		3	20.8	20.19	21.4	20.93	20.52	20.94	0.1399	1.16%	-4.35%
GH_ER2		3	20.36	18.83	21.89	20.52	19.68	20.88	0.3557	3.03%	-2.16%
CM_MC1		3	20.71	20.2	21.23	20.73	20.5	20.91	0.119	0.99%	-3.94%
LC_SLC		3	20.25	18.97	21.54	20	19.91	20.85	0.298	2.55%	-1.63%
FR_FRABCH		3	20.64	19.64	21.64	20.65	20.23	21.04	0.2327	1.95%	-3.56%
FR_FRCP1		3	20.27	19.19	21.36	20.41	19.79	20.63	0.2525	2.16%	-1.73%
GH_FR1		3	20.65	20.07	21.23	20.75	20.38	20.82	0.1352	1.13%	-3.61%
GH_ERC		3	20.94	20.88	21	20.95	20.91	20.96	0.01321	0.11%	-5.07%
CM_MC2		3	20.82	19.57	22.08	20.83	20.32	21.33	0.2907	2.42%	-4.49%
EV_MC2		3	20.75	19.57	21.92	20.5	20.45	21.29	0.2731	2.28%	-4.11%
EV_HC1		3	20.48	18.98	21.97	20.77	19.78	20.88	0.3482	2.95%	-2.74%
LC_DCDS		3	21.27	20.11	22.43	21.19	20.85	21.78	0.2699	2.20%	-6.74%
LC_LC3		3	21.01	20.5	21.51	21.02	20.8	21.2	0.118	0.97%	-5.40%
LC_LC5		3	21.1	20.69	21.51	21.18	20.91	21.21	0.09582	0.79%	-5.87%
LC_LCDSSLCC		3	21.08	20.88	21.29	21.09	21	21.16	0.0467	0.38%	-5.80%
FR_FR4		3	20.73	20.46	20.99	20.72	20.62	20.83	0.06149	0.51%	-3.99%
FR_FRRD		3	20.57	19.81	21.32	20.59	20.25	20.86	0.1757	1.48%	-3.20%
FR_FR2		3	20.77	19.54	21.99	20.52	20.44	21.33	0.2844	2.37%	-4.20%
FR_MULTIPLATE		3	20.69	19.32	22.06	20.39	20.35	21.33	0.3183	2.66%	-3.82%

Length-mm Detail

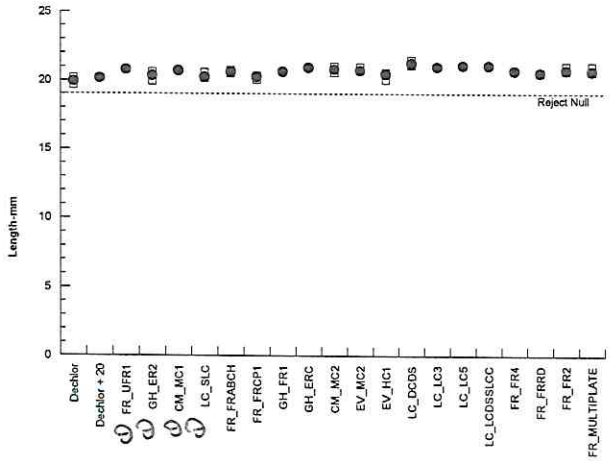
Sample	Code	Rep 1	Rep 2	Rep 3
Dechlor	N	19.37	20.44	19.98
Dechlor + 20		20.08	20.04	20.4
FR_UFR1		20.52	20.94	20.93
GH_ER2		20.88	19.68	20.52
CM_MC1		20.91	20.5	20.73
LC_SLC		19.91	20.85	20
FR_FRABCH		21.04	20.23	20.65
FR_FRCP1		20.41	19.79	20.63
GH_FR1		20.75	20.38	20.82
GH_ERC		20.95	20.96	20.91
CM_MC2		20.83	20.32	21.33
EV_MC2		20.45	20.5	21.29
EV_HC1		20.88	19.78	20.77
LC_DCDS		21.19	20.85	21.78
LC_LC3		21.02	21.2	20.8
LC_LC5		21.21	20.91	21.17
LC_LCDSSLCC		21.16	21	21.09
FR_FR4		20.72	20.62	20.83
FR_FRRD		20.25	20.86	20.59
FR_FR2		20.44	20.52	21.33
FR_MULTIPLATE		20.39	20.35	21.33

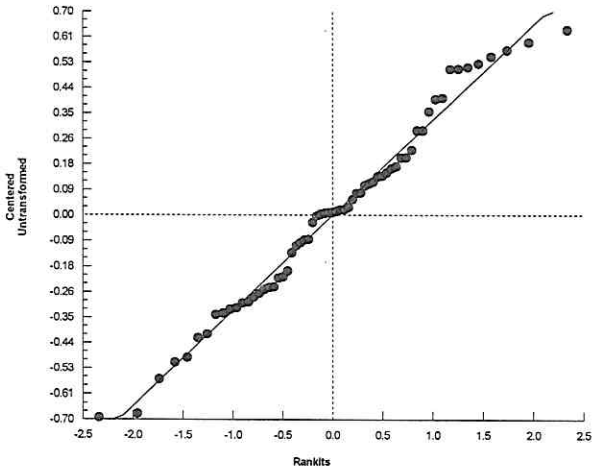
① Reference sites

Salmonid Embryo-Alevin-Fry Survival Development and Growth Test — **Nautilus Environmental**

Analysis ID:	16-3397-0402	**Endpoint:**	Length-mm	**CETIS Version:**	CETISv1.9.4
Analyzed:	20 Aug-21 17:09	**Analysis:**	Parametric-Control vs Treatments	**Status Level:**	1

Graphics





Reference sites

Analyst: NM QA: Aug. 24/21

CETIS Analytical Report

Salmonid Embryo-Alevin-~~Fry~~ Survival Development and Growth Test — **Nautilus Environmental**

Analysis ID:	10-8173-9201	**Endpoint:**	Mean ~~Dry~~ Weight-mg	**CETIS Version:**	CETISv1.9.4
Analyzed:	23 Aug-21 14:59	**Analysis:**	Nonparametric-Two Sample	**Status Level:**	1
Batch ID:	07-9799-9310	**Test Type:**	Survival-Development-Growth	**Analyst:**	Yvonne Lam
Start Date:	19 May-21 17:35	**Protocol:**	EC/EPS 1/RM/28	**Diluent:**	Dechlorinated Tap Water
Ending Date:	18 Jun-21 08:05	**Species:**	Oncorhynchus mykiss	**Brine:**	
Test Length:	29d 14h	**Taxon:**	Actinopterygii	**Source:**	Ted's Trout, Campbell Lake **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
Dechlor	14-3692-6103	19 May-21	19 May-21	18h	Teck Coal	
Dechlor + 20	14-4597-7512	19 May-21	19 May-21	18h		
FR_UFR1	12-4424-2146	18 May-21	19 May-21 11:20	42h (2.3 °C)		
GH_ER2	02-4275-7088	18 May-21 09:55	19 May-21 11:20	32h (0.4 °C)		
CM_MC1	01-4263-6393	18 May-21 11:08	19 May-21 11:20	30h (1.1 °C)		
LC_SLC	12-1662-7355	18 May-21 09:45	19 May-21 11:20	32h (4.1 °C)		
FR_FRABCH	05-6713-4959	18 May-21	19 May-21 11:20	42h (1.9 °C)		
FR_FRCP1	19-8027-7867	18 May-21	19 May-21 11:20	42h (1.2 °C)		
GH_FR1	15-9886-5398	18 May-21 12:30	19 May-21 11:20	29h (0.1 °C)		
GH_ERC	21-0704-4941	18 May-21 11:20	19 May-21 11:20	30h (0.6 °C)		
CM_MC2	17-6814-6287	18 May-21 09:50	19 May-21 11:20	32h (1.1 °C)		
EV_MC2	15-5628-9197	18 May-21 13:00	19 May-21 11:20	29h (3.6 °C)		
EV_HC1	05-8730-9056	18 May-21 11:20	19 May-21 11:20	30h (4.8 °C)		
LC_DCDS	20-0340-1068	18 May-21 11:00	19 May-21 11:20	31h (4.6 °C)		
LC_LC3	18-4816-9590	18 May-21 10:15	19 May-21 11:20	31h (4.7 °C)		
LC_LC5	03-8768-2280	18 May-21 09:50	19 May-21 11:20	32h (5.2 °C)		
LC_LCDSSLCC	02-2977-6783	18 May-21 11:00	19 May-21 11:20	31h (4.3 °C)		
FR_FR4	17-1641-7069	18 May-21 09:29	19 May-21 11:20	32h (4.6 °C)		
FR_FRRD	06-3190-8505	18 May-21 08:22	19 May-21 11:20	33h (3.4 °C)		
FR_FR2	11-2149-8709	18 May-21 10:28	19 May-21 11:20	31h (4.6 °C)		
FR_MULTIPLATE	16-7235-2081	18 May-21 11:21	19 May-21 11:20	30h (3.4 °C)		

Aside from Dechlor Control, all samples spiked with 20 ug/L Cu

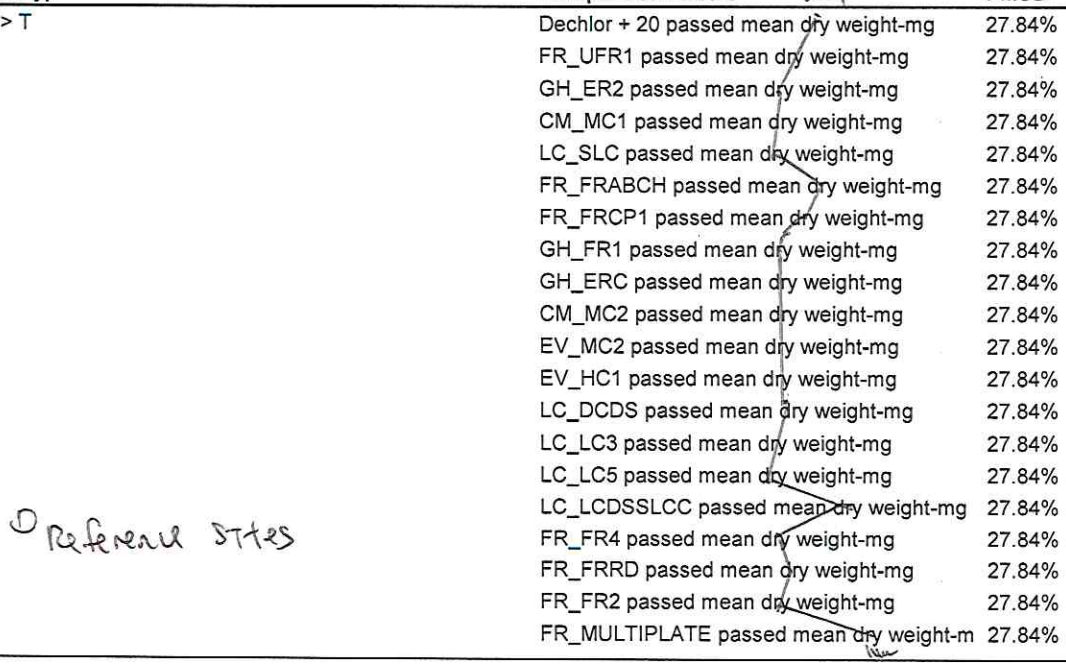
Reference sites

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
Dechlor	Control water	Teck Coal	Dechlor	
Dechlor + 20	Contol+Cu	Teck Coal	Dechlor + 20 ug/L Cu	
FR_UFR1	Water Sample	Teck Coal	FR_UFR1_WEK_2021-05-1	
GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-05-18_	
CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-05-18	
LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-05-18_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_WEK_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_WEK_2021-05	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-05-18_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-05-18	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-05-18	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2020_Q2_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2020_Q2_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-05-18	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-05-18_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-05-18_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	
FR_FR4	Water Sample	Teck Coal	FR_FR4_WS_2021-05-18_	
FR_FRRD	Water Sample	Teck Coal	FR_FRRD_WS_2021-05-18	
FR_FR2	Water Sample	Teck Coal	FR_FR2_WS_2021-05-18_	
FR_MULTIPLATE	Water Sample	Teck Coal	FR_MULTIPLATE_WS_202	

Salmonid Embryo-Alevin-Fry Survival Development and Growth Test — **Nautilus Environmental**

Analysis ID: 10-8173-9201 **Endpoint:** Mean Dry Weight-mg **CETIS Version:** CETISv1.9.4
Analyzed: 23 Aug-21 14:59 **Analysis:** Nonparametric-Two Sample **Status Level:** 1

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	Dechlor + 20 passed mean dry weight-mg	27.84%
		FR_UFR1 passed mean dry weight-mg	27.84%
		GH_ER2 passed mean dry weight-mg	27.84%
		CM_MC1 passed mean dry weight-mg	27.84%
		LC_SLC passed mean dry weight-mg	27.84%
		FR_FRABCH passed mean dry weight-mg	27.84%
		FR_FRCP1 passed mean dry weight-mg	27.84%
		GH_FR1 passed mean dry weight-mg	27.84%
		GH_ERC passed mean dry weight-mg	27.84%
		CM_MC2 passed mean dry weight-mg	27.84%
		EV_MC2 passed mean dry weight-mg	27.84%
		EV_HC1 passed mean dry weight-mg	27.84%
		LC_DCDS passed mean dry weight-mg	27.84%
		LC_LC3 passed mean dry weight-mg	27.84%
		LC_LC5 passed mean dry weight-mg	27.84%
		LC_LCDSSLCC passed mean dry weight-mg	27.84%
		FR_FR4 passed mean dry weight-mg	27.84%
		FR_FRRD passed mean dry weight-mg	27.84%
		FR_FR2 passed mean dry weight-mg	27.84%
		FR_MULTIPLATE passed mean dry weight-m	27.84%



Wilcoxon Rank Sum Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)
Negative Control		Dechlor + 20	12	n/a	0	4	Exact	0.8000	Non-Significant Effect
		FR_UFR1	11	n/a	0	4	Exact	0.6500	Non-Significant Effect
		GH_ER2	13	n/a	0	4	Exact	0.9000	Non-Significant Effect
		CM_MC1	12	n/a	0	4	Exact	0.8000	Non-Significant Effect
		LC_SLC	14	n/a	0	4	Exact	0.9500	Non-Significant Effect
		FR_FRABCH	14	n/a	0	4	Exact	0.9500	Non-Significant Effect
		FR_FRCP1	14	n/a	0	4	Exact	0.9500	Non-Significant Effect
		GH_FR1	13	n/a	0	4	Exact	0.9000	Non-Significant Effect
		GH_ERC	15	n/a	0	4	Exact	0.9500	Non-Significant Effect
		CM_MC2	14	n/a	0	4	Exact	0.9500	Non-Significant Effect
		EV_MC2	14	n/a	0	4	Exact	0.9500	Non-Significant Effect
		EV_HC1	14	n/a	0	4	Exact	0.9500	Non-Significant Effect
		LC_DCDS	15	n/a	0	4	Exact	0.9500	Non-Significant Effect
		LC_LC3	13	n/a	0	4	Exact	0.9000	Non-Significant Effect
		LC_LC5	14	n/a	0	4	Exact	0.9500	Non-Significant Effect
		LC_LCDSSLCC	15	n/a	0	4	Exact	0.9500	Non-Significant Effect
		FR_FR4	13	n/a	0	4	Exact	0.9000	Non-Significant Effect
		FR_FRRD	13	n/a	0	4	Exact	0.9000	Non-Significant Effect
		FR_FR2	13	n/a	0	4	Exact	0.9000	Non-Significant Effect
		FR_MULTIPLATE	14	n/a	0	4	Exact	0.9500	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	3111.65	155.583	20	0.8927	0.5969	Non-Significant Effect
Error	7320.18	174.29	42			
Total	10431.8		62			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance Test	3.533	37.57	1.0000	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9325	0.9481	0.0019	Non-Normal Distribution

Salmonid Embryo-Alevin-~~Fry~~ Survival Development and Growth Test — **Nautilus Environmental**

Analysis ID: 10-8173-9201 **Endpoint:** Mean ~~Dry~~ Weight-mg **CETIS Version:** CETISv1.9.4
Analyzed: 23 Aug-21 14:59 **Analysis:** Nonparametric-Two Sample **Status Level:** 1

Mean Dry Weight-mg Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
Dechlor	N	3	82.53	52.71	112.3	82.92	70.33	94.33	6.931	14.55%	0.00%
Dechlor + 20		3	85.8	55.53	116.1	86.96	73.08	97.37	7.036	14.20%	-3.97%
FR_UFR1		3	87.5	53.88	121.1	80.38	79	103.1	7.814	15.47%	-6.02%
GH_ER2		3	97.75	62.11	133.4	90.4	88.57	114.3	8.284	14.68%	-18.45%
CM_MC1		3	92.22	66.65	117.8	91.15	82.5	103	5.942	11.16%	-11.74%
LC_SLC		3	95.25	74.57	115.9	98.15	85.86	101.7	4.807	8.74%	-15.42%
FR_FRABCH		3	99.46	68.01	130.9	96.54	88.52	113.3	7.311	12.73%	-20.52%
FR_FRCP1		3	96.93	73.53	120.3	98.93	86.67	105.2	5.439	9.72%	-17.45%
GH_FR1		3	98.55	72.94	124.2	93.85	91.43	110.4	5.952	10.46%	-19.41%
GH_ERC		3	105.4	77.71	133.1	99.64	98.33	118.3	6.44	10.58%	-27.74%
CM_MC2		3	100.5	54.84	146.2	96	84.83	120.8	10.62	18.30%	-21.82%
EV_MC2		3	100.7	68.51	132.9	102.3	87	112.8	7.48	12.87%	-22.01%
EV_HC1		3	99.64	73.3	126	102.8	87.83	108.3	6.122	10.64%	-20.73%
LC_DCDS		3	108.6	75.73	141.4	104.1	98.15	123.4	7.633	12.18%	-31.57%
LC_LC3		3	100.6	58.03	143.2	91.85	89.63	120.4	9.897	17.04%	-21.92%
LC_LC5		3	104.2	53.37	155	99.64	86.36	126.5	11.81	19.63%	-26.22%
LC_LCDSSLCC		3	111.5	79.21	143.8	113.6	97.59	123.3	7.505	11.66%	-35.10%
FR_FR4		3	97.51	73.3	121.7	94	90	108.5	5.626	9.99%	-18.15%
FR_FRRD		3	94.73	60.12	129.3	88.1	85.36	110.7	8.044	14.71%	-14.79%
FR_FR2		3	97.42	60.52	134.3	90.74	87.08	114.4	8.576	15.25%	-18.05%
FR_MULTIPLATE		3	106.6	77.27	135.9	113.3	92.96	113.5	6.814	11.07%	-29.16%

Mean Dry Weight-mg Detail

Sample	Code	Rep 1	Rep 2	Rep 3
Dechlor	N	70.33	82.92	94.33
Dechlor + 20		73.08	86.96	97.37
FR_UFR1		79	80.38	103.1
GH_ER2		90.4	88.57	114.3
CM_MC1		82.5	91.15	103
LC_SLC		85.86	101.7	98.15
FR_FRABCH		88.52	96.54	113.3
FR_FRCP1		86.67	98.93	105.2
GH_FR1		93.85	91.43	110.4
GH_ERC		99.64	98.33	118.3
CM_MC2		84.83	96	120.8
EV_MC2		87	102.3	112.8
EV_HC1		102.8	87.83	108.3
LC_DCDS		104.1	98.15	123.4
LC_LC3		89.63	91.85	120.4
LC_LC5		99.64	86.36	126.5
LC_LCDSSLCC		113.6	97.59	123.3
FR_FR4		108.5	94	90
FR_FRRD		85.36	88.1	110.7
FR_FR2		90.74	87.08	114.4
FR_MULTIPLATE		92.96	113.3	113.5

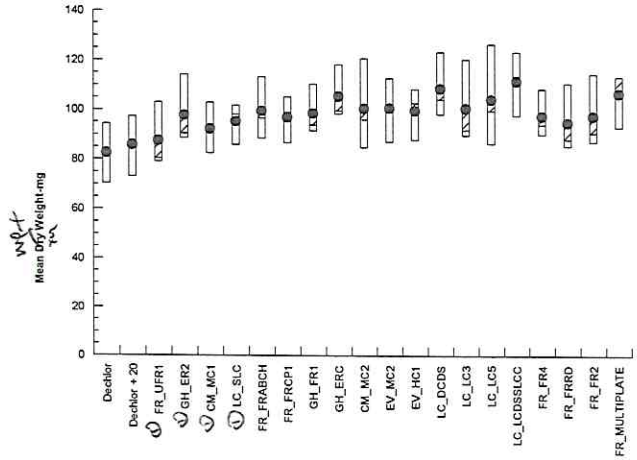
@ Reference sites

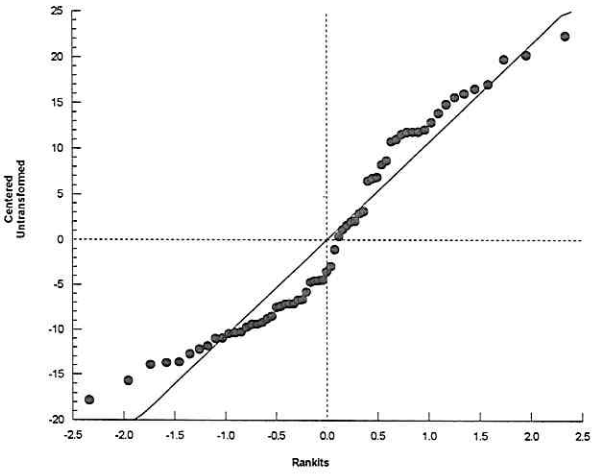
Analyst: ____ QA: ____ Aug 24/21

Salmonid Embryo-Alevin-Fry Survival Development and Growth Test — **Nautilus Environmental**

Analysis ID:	10-8173-9201	**Endpoint:**	Mean Dry Weight-mg	**CETIS Version:**	CETISv1.9.4
Analyzed:	23 Aug-21 14:59	**Analysis:**	Nonparametric-Two Sample	**Status Level:**	1

Graphics





① Reference Sites

Analyst: _____ QA: _____ Aug. 24/21

Salmonid Embryo-Alevin-~~Fry~~ Survival Development and Growth Test — **Nautilus Environmental**

Analysis ID:	03-3565-1041	**Endpoint:**	Length-mm	**CETIS Version:**	CETISv1.9.4
Analyzed:	20 Aug-21 17:12	**Analysis:**	Parametric-Control vs Treatments	**Status Level:**	1
Batch ID:	07-9799-9310	**Test Type:**	Survival-Development-Growth	**Analyst:**	Yvonne Lam
Start Date:	19 May-21 17:35	**Protocol:**	EC/EPS 1/RM/28	**Diluent:**	Dechlorinated Tap Water
Ending Date:	18 Jun-21 08:05	**Species:**	Oncorhynchus mykiss	**Brine:**	
Test Length:	29d 14h	**Taxon:**	Actinopterygii	**Source:**	Ted's Trout, Campbell Lake **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
Dechlor + 20	14-4597-7512	19 May-21	19 May-21	18h	Teck Coal	
FR_UFR1	12-4424-2146	18 May-21	19 May-21 11:20	42h (2.3 °C)		
GH_ER2	02-4275-7088	18 May-21 09:55	19 May-21 11:20	32h (0.4 °C)		
CM_MC1	01-4263-6393	18 May-21 11:08	19 May-21 11:20	30h (1.1 °C)		
LC_SLC	12-1662-7355	18 May-21 09:45	19 May-21 11:20	32h (4.1 °C)		
FR_FRABCH	05-6713-4959	18 May-21	19 May-21 11:20	42h (1.9 °C)		
FR_FRCP1	19-8027-7867	18 May-21	19 May-21 11:20	42h (1.2 °C)		
GH_FR1	15-9886-5398	18 May-21 12:30	19 May-21 11:20	29h (0.1 °C)		
GH_ERC	21-0704-4941	18 May-21 11:20	19 May-21 11:20	30h (0.6 °C)		
CM_MC2	17-6814-6287	18 May-21 09:50	19 May-21 11:20	32h (1.1 °C)		
EV_MC2	15-5628-9197	18 May-21 13:00	19 May-21 11:20	29h (3.6 °C)		
EV_HC1	05-8730-9056	18 May-21 11:20	19 May-21 11:20	30h (4.8 °C)		
LC_DCDS	20-0340-1068	18 May-21 11:00	19 May-21 11:20	31h (4.6 °C)		
LC_LC3	18-4816-9590	18 May-21 10:15	19 May-21 11:20	31h (4.7 °C)		
LC_LC5	03-8768-2280	18 May-21 09:50	19 May-21 11:20	32h (5.2 °C)		
LC_LCDSSLCC	02-2977-6783	18 May-21 11:00	19 May-21 11:20	31h (4.3 °C)		
FR_FR4	17-1641-7069	18 May-21 09:29	19 May-21 11:20	32h (4.6 °C)		
FR_FRRD	06-3190-8505	18 May-21 08:22	19 May-21 11:20	33h (3.4 °C)		
FR_FR2	11-2149-8709	18 May-21 10:28	19 May-21 11:20	31h (4.6 °C)		
FR_MULTIPLATE	16-7235-2081	18 May-21 11:21	19 May-21 11:20	30h (3.4 °C)		

All samples spiked with 20 ug/L Cu

① Reference sites

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
Dechlor + 20	Contol+Cu	Teck Coal	Dechlor + 20 ug/L Cu	
FR_UFR1	Water Sample	Teck Coal	FR_UFR1_WEK_2021-05-1	
GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-05-18_	
CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-05-18	
LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-05-18_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_WEK_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_WEK_2021-05	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-05-18_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-05-18	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-05-18	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2020_Q2_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2020_Q2_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-05-18	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-05-18_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-05-18_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	
FR_FR4	Water Sample	Teck Coal	FR_FR4_WS_2021-05-18_	
FR_FRRD	Water Sample	Teck Coal	FR_FRRD_WS_2021-05-18	
FR_FR2	Water Sample	Teck Coal	FR_FR2_WS_2021-05-18_	
FR_MULTIPLATE	Water Sample	Teck Coal	FR_MULTIPLATE_WS_202	

Salmonid Embryo-Alevin-~~Fry~~ Survival Development and Growth Test — **Nautilus Environmental**

Analysis ID:	03-3565-1041	**Endpoint:**	Length-mm	**CETIS Version:**	CETISv1.9.4
Analyzed:	20 Aug-21 17:12	**Analysis:**	Parametric-Control vs Treatments	**Status Level:**	1

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	FR_UFR1 passed length-mm	4.28%
		GH_ER2 passed length-mm	4.28%
		CM_MC1 passed length-mm	4.28%
		LC_SLC passed length-mm	4.28%
		FR_FRABCH passed length-mm	4.28%
		FR_FRCP1 passed length-mm	4.28%
		GH_FR1 passed length-mm	4.28%
		GH_ERC passed length-mm	4.28%
		CM_MC2 passed length-mm	4.28%
		EV_MC2 passed length-mm	4.28%
		EV_HC1 passed length-mm	4.28%
		LC_DCDS passed length-mm	4.28%
		LC_LC3 passed length-mm	4.28%
		LC_LC5 passed length-mm	4.28%
		LC_LCDSSLCC passed length-mm	4.28%
		FR_FR4 passed length-mm	4.28%
		FR_FRRD passed length-mm	4.28%
		FR_FR2 passed length-mm	4.28%
		FR_MULTIPLATE passed length-mm	4.28%

① reference sites

Dunnett Multiple Comparison Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Lab Water (Dechlor + 20)		① FR_UFR1	-1.983	2.738	0.863	4	CDF	1.0000	Non-Significant Effect
		① GH_ER2	-0.5944	2.738	0.863	4	CDF	0.9917	Non-Significant Effect
		① CM_MC1	-1.723	2.738	0.863	4	CDF	0.9999	Non-Significant Effect
		① LC_SLC	-0.2612	2.738	0.863	4	CDF	0.9759	Non-Significant Effect
		FR_FRABCH	-1.482	2.738	0.863	4	CDF	0.9997	Non-Significant Effect
		FR_FRCP1	-0.3258	2.738	0.863	4	CDF	0.9802	Non-Significant Effect
		GH_FR1	-1.514	2.738	0.863	4	CDF	0.9998	Non-Significant Effect
		GH_ERC	-2.436	2.738	0.863	4	CDF	1.0000	Non-Significant Effect
		CM_MC2	-2.073	2.738	0.863	4	CDF	1.0000	Non-Significant Effect
		EV_MC2	-1.828	2.738	0.863	4	CDF	0.9999	Non-Significant Effect
		EV_HC1	-0.9667	2.738	0.863	4	CDF	0.9978	Non-Significant Effect
		LC_DCDS	-3.493	2.738	0.863	4	CDF	1.0000	Non-Significant Effect
		LC_LC3	-2.648	2.738	0.863	4	CDF	1.0000	Non-Significant Effect
		LC_LC5	-2.943	2.738	0.863	4	CDF	1.0000	Non-Significant Effect
		LC_LCDSSLCC	-2.897	2.738	0.863	4	CDF	1.0000	Non-Significant Effect
		FR_FR4	-1.756	2.738	0.863	4	CDF	0.9999	Non-Significant Effect
		FR_FRRD	-1.253	2.738	0.863	4	CDF	0.9993	Non-Significant Effect
		FR_FR2	-1.886	2.738	0.863	4	CDF	1.0000	Non-Significant Effect
		FR_MULTIPLATE	-1.644	2.738	0.863	4	CDF	0.9999	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	5.00585	0.263466	19	1.768	0.0641	Non-Significant Effect
Error	5.95958	0.14899	40			
Total	10.9654		59			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance Test	23.99	36.19	0.1965	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9807	0.9459	0.4602	Normal Distribution

Salmonid Embryo-Alevin-~~Fry~~ Survival Development and Growth Test — **Nautilus Environmental**

Analysis ID:	03-3565-1041	**Endpoint:**	Length-mm	**CETIS Version:**	CETISv1.9.4
Analyzed:	20 Aug-21 17:12	**Analysis:**	Parametric-Control vs Treatments	**Status Level:**	1

Length-mm Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
Dechlor + 20	L	3	20.17	19.69	20.65	20.08	20.04	20.4	0.1121	0.96%	0.00%
① FR_UFR1		3	20.8	20.19	21.4	20.93	20.52	20.94	0.1399	1.16%	-3.10%
① GH_ER2		3	20.36	18.83	21.89	20.52	19.68	20.88	0.3557	3.03%	-0.93%
① CM_MC1		3	20.71	20.2	21.23	20.73	20.5	20.91	0.119	0.99%	-2.69%
① LC_SLC		3	20.25	18.97	21.54	20	19.91	20.85	0.298	2.55%	-0.41%
FR_FRABCH		3	20.64	19.64	21.64	20.65	20.23	21.04	0.2327	1.95%	-2.32%
FR_FRCP1		3	20.27	19.19	21.36	20.41	19.79	20.63	0.2525	2.16%	-0.51%
GH_FR1		3	20.65	20.07	21.23	20.75	20.38	20.82	0.1352	1.13%	-2.36%
GH_ERC		3	20.94	20.88	21	20.95	20.91	20.96	0.01321	0.11%	-3.81%
CM_MC2		3	20.82	19.57	22.08	20.83	20.32	21.33	0.2907	2.42%	-3.24%
EV_MC2		3	20.75	19.57	21.92	20.5	20.45	21.29	0.2731	2.28%	-2.86%
EV_HC1		3	20.48	18.98	21.97	20.77	19.78	20.88	0.3482	2.95%	-1.51%
LC_DCDS		3	21.27	20.11	22.43	21.19	20.85	21.78	0.2699	2.20%	-5.46%
LC_LC3		3	21.01	20.5	21.51	21.02	20.8	21.2	0.118	0.97%	-4.14%
LC_LC5		3	21.1	20.69	21.51	21.18	20.91	21.21	0.09582	0.79%	-4.60%
LC_LCDSSLCC		3	21.08	20.88	21.29	21.09	21	21.16	0.0467	0.38%	-4.53%
FR_FR4		3	20.73	20.46	20.99	20.72	20.62	20.83	0.06149	0.51%	-2.74%
FR_FRRD		3	20.57	19.81	21.32	20.59	20.25	20.86	0.1757	1.48%	-1.96%
FR_FR2		3	20.77	19.54	21.99	20.52	20.44	21.33	0.2844	2.37%	-2.95%
FR_MULTIPLATE		3	20.69	19.32	22.06	20.39	20.35	21.33	0.3183	2.66%	-2.57%

Length-mm Detail

Sample	Code	Rep 1	Rep 2	Rep 3
Dechlor + 20	L	20.08	20.04	20.4
① FR_UFR1		20.52	20.94	20.93
① GH_ER2		20.88	19.68	20.52
① CM_MC1		20.91	20.5	20.73
① LC_SLC		19.91	20.85	20
FR_FRABCH		21.04	20.23	20.65
FR_FRCP1		20.41	19.79	20.63
GH_FR1		20.75	20.38	20.82
GH_ERC		20.95	20.96	20.91
CM_MC2		20.83	20.32	21.33
EV_MC2		20.45	20.5	21.29
EV_HC1		20.88	19.78	20.77
LC_DCDS		21.19	20.85	21.78
LC_LC3		21.02	21.2	20.8
LC_LC5		21.21	20.91	21.17
LC_LCDSSLCC		21.16	21	21.09
FR_FR4		20.72	20.62	20.83
FR_FRRD		20.25	20.86	20.59
FR_FR2		20.44	20.52	21.33
FR_MULTIPLATE		20.39	20.35	21.33

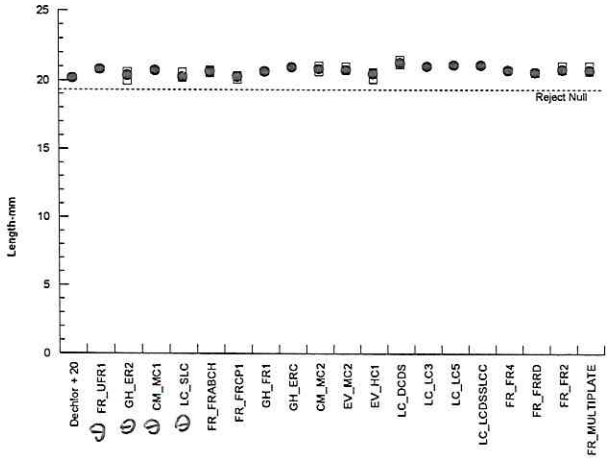
① Reference sites

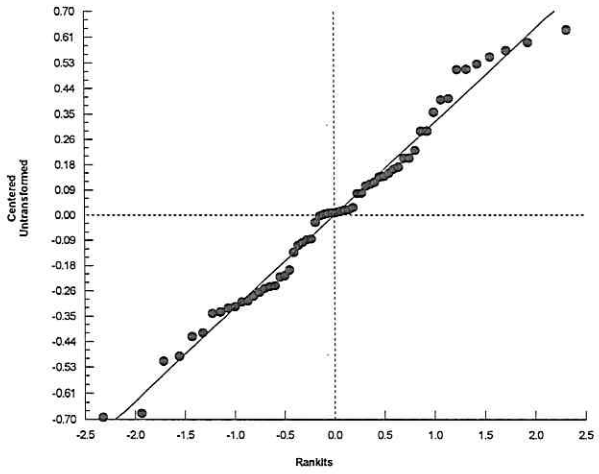
Analyst: UW QA: JCh Aug. 24/21

Salmonid Embryo-Alevin-~~Fry~~ Survival Development and Growth Test **Nautilus Environmental**

Analysis ID:	03-3565-1041	**Endpoint:**	Length-mm	**CETIS Version:**	CETISv1.9.4
Analyzed:	20 Aug-21 17:12	**Analysis:**	Parametric-Control vs Treatments	**Status Level:**	1

Graphics





① Reference Sites

Analyst: MM QA: JCH Aug. 24/21

CETIS Analytical Report

Salmonid Embryo-Alevin-Fry Survival Development and Growth Test — **Nautilus Environmental**

Analysis ID:	13-1282-9403	**Endpoint:**	Mean Dry Weight-mg	**CETIS Version:**	CETISv1.9.4
Analyzed:	23 Aug-21 15:00	**Analysis:**	Nonparametric-Two Sample	**Status Level:**	1
Batch ID:	07-9799-9310	**Test Type:**	Survival-Development-Growth	**Analyst:**	Yvonne Lam
Start Date:	19 May-21 17:35	**Protocol:**	EC/EPS 1/RM/28	**Diluent:**	Dechlorinated Tap Water
Ending Date:	18 Jun-21 08:05	**Species:**	Oncorhynchus mykiss	**Brine:**	
Test Length:	29d 14h	**Taxon:**	Actinopterygii	**Source:**	Ted's Trout, Campbell Lake **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
Dechlor + 20	14-4597-7512	19 May-21	19 May-21	18h	Teck Coal	
① FR_UFR1	12-4424-2146	18 May-21	19 May-21 11:20	42h (2.3 °C)		
① GH_ER2	02-4275-7088	18 May-21 09:55	19 May-21 11:20	32h (0.4 °C)		
① CM_MC1	01-4263-6393	18 May-21 11:08	19 May-21 11:20	30h (1.1 °C)		
① LC_SLC	12-1662-7355	18 May-21 09:45	19 May-21 11:20	32h (4.1 °C)		
FR_FRABCH	05-6713-4959	18 May-21	19 May-21 11:20	42h (1.9 °C)		
FR_FRCP1	19-8027-7867	18 May-21	19 May-21 11:20	42h (1.2 °C)		
GH_FR1	15-9886-5398	18 May-21 12:30	19 May-21 11:20	29h (0.1 °C)		
GH_ERC	21-0704-4941	18 May-21 11:20	19 May-21 11:20	30h (0.6 °C)		
CM_MC2	17-6814-6287	18 May-21 09:50	19 May-21 11:20	32h (1.1 °C)		
EV_MC2	15-5628-9197	18 May-21 13:00	19 May-21 11:20	29h (3.6 °C)		
EV_HC1	05-8730-9056	18 May-21 11:20	19 May-21 11:20	30h (4.8 °C)		
LC_DCDS	20-0340-1068	18 May-21 11:00	19 May-21 11:20	31h (4.6 °C)		
LC_LC3	18-4816-9590	18 May-21 10:15	19 May-21 11:20	31h (4.7 °C)		
LC_LC5	03-8768-2280	18 May-21 09:50	19 May-21 11:20	32h (5.2 °C)		
LC_LCDSSLCC	02-2977-6783	18 May-21 11:00	19 May-21 11:20	31h (4.3 °C)		
FR_FR4	17-1641-7069	18 May-21 09:29	19 May-21 11:20	32h (4.6 °C)		
FR_FRRD	06-3190-8505	18 May-21 08:22	19 May-21 11:20	33h (3.4 °C)		
FR_FR2	11-2149-8709	18 May-21 10:28	19 May-21 11:20	31h (4.6 °C)		
FR_MULTIPLATE	16-7235-2081	18 May-21 11:21	19 May-21 11:20	30h (3.4 °C)		

All Samples spiked with 20 ug/L Cu.

① Reference Sites

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
Dechlor + 20	Contol+Cu	Teck Coal	Dechlor + 20 ug/L Cu	
① FR_UFR1	Water Sample	Teck Coal	FR_UFR1_WEK_2021-05-1	
① GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-05-18_	
① CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-05-18	
① LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-05-18_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_WEK_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_WEK_2021-05	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-05-18_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-05-18	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-05-18	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2020_Q2_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2020_Q2_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-05-18	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-05-18_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-05-18_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	
FR_FR4	Water Sample	Teck Coal	FR_FR4_WS_2021-05-18_	
FR_FRRD	Water Sample	Teck Coal	FR_FRRD_WS_2021-05-18	
FR_FR2	Water Sample	Teck Coal	FR_FR2_WS_2021-05-18_	
FR_MULTIPLATE	Water Sample	Teck Coal	FR_MULTIPLATE_WS_202	

Analyst: YL QA: Aug. 24/21

Salmonid Embryo-Alevin-Fry Survival Development and Growth Test — **Nautilus Environmental**

Analysis ID: 13-1282-9403 **Endpoint:** Mean Dry Weight-mg **CETIS Version:** CETISv1.9.4
Analyzed: 23 Aug-21 15:00 **Analysis:** Nonparametric-Two Sample **Status Level:** 1

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	FR_UFR1 passed mean dry weight-mg	26.90%
		GH_ER2 passed mean dry weight-mg	26.90%
		CM_MC1 passed mean dry weight-mg	26.90%
		LC_SLC passed mean dry weight-mg	26.90%
		FR_FRABCH passed mean dry weight-mg	26.90%
		FR_FRCP1 passed mean dry weight-mg	26.90%
		GH_FR1 passed mean dry weight-mg	26.90%
		GH_ERC passed mean dry weight-mg	26.90%
		CM_MC2 passed mean dry weight-mg	26.90%
		EV_MC2 passed mean dry weight-mg	26.90%
		EV_HC1 passed mean dry weight-mg	26.90%
		LC_DCDS passed mean dry weight-mg	26.90%
		LC_LC3 passed mean dry weight-mg	26.90%
		LC_LC5 passed mean dry weight-mg	26.90%
		LC_LCDSSLCC passed mean dry weight-mg	26.90%
		FR_FR4 passed mean dry weight-mg	26.90%
		FR_FRRD passed mean dry weight-mg	26.90%
		FR_FR2 passed mean dry weight-mg	26.90%
		FR_MULTIPLATE passed mean dry weight-m	26.90%

① reference strs

Wilcoxon Rank Sum Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)
Lab Water (Dechlor+20)		① FR_UFR1	11	n/a	0	4	Exact	0.6500	Non-Significant Effect
		① GH_ER2	13	n/a	0	4	Exact	0.9000	Non-Significant Effect
		① CM_MC1	12	n/a	0	4	Exact	0.8000	Non-Significant Effect
		① LC_SLC	13	n/a	0	4	Exact	0.9000	Non-Significant Effect
		FR_FRABCH	13	n/a	0	4	Exact	0.9000	Non-Significant Effect
		FR_FRCP1	13	n/a	0	4	Exact	0.9000	Non-Significant Effect
		GH_FR1	13	n/a	0	4	Exact	0.9000	Non-Significant Effect
		GH_ERC	15	n/a	0	4	Exact	0.9500	Non-Significant Effect
		CM_MC2	12	n/a	0	4	Exact	0.8000	Non-Significant Effect
		EV_MC2	14	n/a	0	4	Exact	0.9500	Non-Significant Effect
		EV_HC1	14	n/a	0	4	Exact	0.9500	Non-Significant Effect
		LC_DCDS	15	n/a	0	4	Exact	0.9500	Non-Significant Effect
		LC_LC3	13	n/a	0	4	Exact	0.9000	Non-Significant Effect
		LC_LC5	13	n/a	0	4	Exact	0.9000	Non-Significant Effect
		LC_LCDSSLCC	15	n/a	0	4	Exact	0.9500	Non-Significant Effect
		FR_FR4	13	n/a	0	4	Exact	0.9000	Non-Significant Effect
		FR_FRRD	12	n/a	0	4	Exact	0.8000	Non-Significant Effect
		FR_FR2	13	n/a	0	4	Exact	0.9000	Non-Significant Effect
		FR_MULTIPLATE	14	n/a	0	4	Exact	0.9500	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	2332.43	122.759	19	0.6983	0.7983	Non-Significant Effect
Error	7031.95	175.799	40			
Total	9364.38		59			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance Test	3.502	36.19	1.0000	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9307	0.9459	0.0021	Non-Normal Distribution

Salmonid Embryo-Alevin-~~Fry~~ Survival Development and Growth Test — Nautilus Environmental

Analysis ID:	13-1282-9403	**Endpoint:**	Mean ~~Dry~~ Weight-mg	**CETIS Version:**	CETISv1.9.4
Analyzed:	23 Aug-21 15:00	**Analysis:**	Nonparametric-Two Sample	**Status Level:**	1

Mean ~~Dry~~ Weight-mg Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
Dechlor + 20	L	3	85.8	55.53	116.1	86.96	73.08	97.37	7.036	14.20%	0.00%
① FR_UFR1		3	87.5	53.88	121.1	80.38	79	103.1	7.814	15.47%	-1.98%
① GH_ER2		3	97.75	62.11	133.4	90.4	88.57	114.3	8.284	14.68%	-13.93%
① CM_MC1		3	92.22	66.65	117.8	91.15	82.5	103	5.942	11.16%	-7.48%
① LC_SLC		3	95.25	74.57	115.9	98.15	85.86	101.7	4.807	8.74%	-11.01%
FR_FRABCH		3	99.46	68.01	130.9	96.54	88.52	113.3	7.311	12.73%	-15.92%
FR_FRCP1		3	96.93	73.53	120.3	98.93	86.67	105.2	5.439	9.72%	-12.97%
GH_FR1		3	98.55	72.94	124.2	93.85	91.43	110.4	5.952	10.46%	-14.86%
GH_ERC		3	105.4	77.71	133.1	99.64	98.33	118.3	6.44	10.58%	-22.86%
CM_MC2		3	100.5	54.84	146.2	96	84.83	120.8	10.62	18.30%	-17.17%
EV_MC2		3	100.7	68.51	132.9	102.3	87	112.8	7.48	12.87%	-17.35%
EV_HC1		3	99.64	73.3	126	102.8	87.83	108.3	6.122	10.64%	-16.13%
LC_DCDS		3	108.6	75.73	141.4	104.1	98.15	123.4	7.633	12.18%	-26.55%
LC_LC3		3	100.6	58.03	143.2	91.85	89.63	120.4	9.897	17.04%	-17.27%
LC_LC5		3	104.2	53.37	155	99.64	86.36	126.5	11.81	19.63%	-21.41%
LC_LCDSSLCC		3	111.5	79.21	143.8	113.6	97.59	123.3	7.505	11.66%	-29.95%
FR_FR4		3	97.51	73.3	121.7	94	90	108.5	5.626	9.99%	-13.64%
FR_FRRD		3	94.73	60.12	129.3	88.1	85.36	110.7	8.044	14.71%	-10.41%
FR_FR2		3	97.42	60.52	134.3	90.74	87.08	114.4	8.576	15.25%	-13.55%
FR_MULTIPLATE		3	106.6	77.27	135.9	113.3	92.96	113.5	6.814	11.07%	-24.23%

Mean ~~Dry~~ Weight-mg Detail

Sample	Code	Rep 1	Rep 2	Rep 3
Dechlor + 20	L	73.08	86.96	97.37
① FR_UFR1		79	80.38	103.1
① GH_ER2		90.4	88.57	114.3
① CM_MC1		82.5	91.15	103
① LC_SLC		85.86	101.7	98.15
FR_FRABCH		88.52	96.54	113.3
FR_FRCP1		86.67	98.93	105.2
GH_FR1		93.85	91.43	110.4
GH_ERC		99.64	98.33	118.3
CM_MC2		84.83	96	120.8
EV_MC2		87	102.3	112.8
EV_HC1		102.8	87.83	108.3
LC_DCDS		104.1	98.15	123.4
LC_LC3		89.63	91.85	120.4
LC_LC5		99.64	86.36	126.5
LC_LCDSSLCC		113.6	97.59	123.3
FR_FR4		108.5	94	90
FR_FRRD		85.36	88.1	110.7
FR_FR2		90.74	87.08	114.4
FR_MULTIPLATE		92.96	113.3	113.5

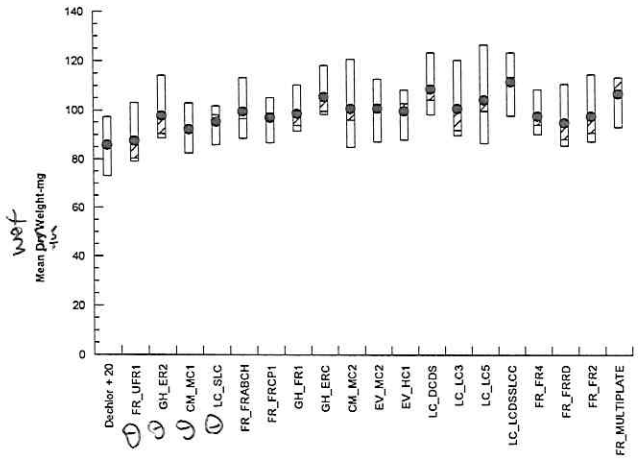
① Reference sites

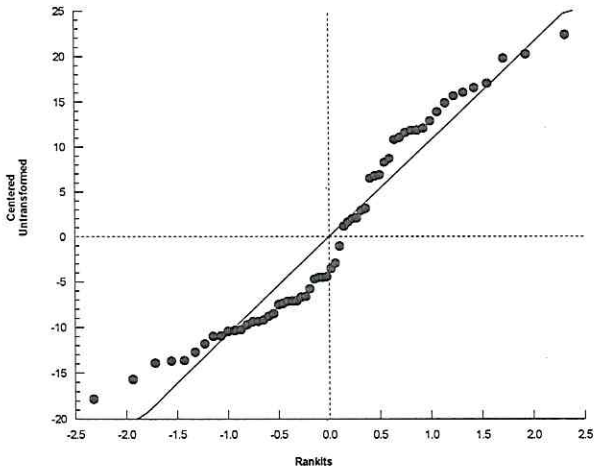
Analyst: [illegible] QA: Aug. 24/21

Salmonid Embryo-Alevin-Fry Survival Development and Growth Test — **Nautilus Environmental**

Analysis ID:	13-1282-9403	**Endpoint:**	Mean Dry Weight-mg	**CETIS Version:**	CETISv1.9.4
Analyzed:	23 Aug-21 15:00	**Analysis:**	Nonparametric-Two Sample	**Status Level:**	1

Graphics





① Reference Sites

Analyst: WW QA: Aug. 24/21

Salmonid Embryo-Alevin-Fry Survival Development and Growth Test — **Nautilus Environmental**

Analysis ID:	06-3809-3685	**Endpoint:**	Length-mm	**CETIS Version:**	CETISv1.9.4
Analyzed:	20 Aug-21 17:14	**Analysis:**	Parametric-Control vs Treatments	**Status Level:**	1
Batch ID:	07-9799-9310	**Test Type:**	Survival-Development-Growth	**Analyst:**	Yvonne Lam
Start Date:	19 May-21 17:35	**Protocol:**	EC/EPS 1/RM/28	**Diluent:**	Dechlorinated Tap Water
Ending Date:	18 Jun-21 08:05	**Species:**	Oncorhynchus mykiss	**Brine:**	
Test Length:	29d 14h	**Taxon:**	Actinopterygii	**Source:**	Ted's Trout, Campbell Lake **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
FR_UFR1	12-4424-2146	18 May-21	19 May-21 11:20	42h (2.3 °C)	Teck Coal	
GH_ER2	02-4275-7088	18 May-21 09:55	19 May-21 11:20	32h (0.4 °C)		
CM_MC1	01-4263-6393	18 May-21 11:08	19 May-21 11:20	30h (1.1 °C)		
LC_SLC	12-1662-7355	18 May-21 09:45	19 May-21 11:20	32h (4.1 °C)		
FR_FRABCH	05-6713-4959	18 May-21	19 May-21 11:20	42h (1.9 °C)		
FR_FRCP1	19-8027-7867	18 May-21	19 May-21 11:20	42h (1.2 °C)		
GH_FR1	15-9886-5398	18 May-21 12:30	19 May-21 11:20	29h (0.1 °C)		
GH_ERC	21-0704-4941	18 May-21 11:20	19 May-21 11:20	30h (0.6 °C)		
CM_MC2	17-6814-6287	18 May-21 09:50	19 May-21 11:20	32h (1.1 °C)		
EV_MC2	15-5628-9197	18 May-21 13:00	19 May-21 11:20	29h (3.6 °C)		
EV_HC1	05-8730-9056	18 May-21 11:20	19 May-21 11:20	30h (4.8 °C)		
LC_DCDS	20-0340-1068	18 May-21 11:00	19 May-21 11:20	31h (4.6 °C)		
LC_LC3	18-4816-9590	18 May-21 10:15	19 May-21 11:20	31h (4.7 °C)		
LC_LC5	03-8768-2280	18 May-21 09:50	19 May-21 11:20	32h (5.2 °C)		
LC_LCDSSLCC	02-2977-6783	18 May-21 11:00	19 May-21 11:20	31h (4.3 °C)		
FR_FR4	17-1641-7069	18 May-21 09:29	19 May-21 11:20	32h (4.6 °C)		
FR_FRRD	06-3190-8505	18 May-21 08:22	19 May-21 11:20	33h (3.4 °C)		
FR_FR2	11-2149-8709	18 May-21 10:28	19 May-21 11:20	31h (4.6 °C)		
FR_MULTIPLATE	16-7235-2081	18 May-21 11:21	19 May-21 11:20	30h (3.4 °C)		

All Samples spiked with 20 µg/L Cu

9 Reference sites

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_UFR1	Water Sample	Teck Coal	FR_UFR1_WEK_2021-05-1	
GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-05-18_	
CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-05-18	
LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-05-18_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_WEK_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_WEK_2021-05	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-05-18_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-05-18	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-05-18	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2020_Q2_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2020_Q2_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-05-18	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-05-18_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-05-18_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	
FR_FR4	Water Sample	Teck Coal	FR_FR4_WS_2021-05-18_	
FR_FRRD	Water Sample	Teck Coal	FR_FRRD_WS_2021-05-18	
FR_FR2	Water Sample	Teck Coal	FR_FR2_WS_2021-05-18_	
FR_MULTIPLATE	Water Sample	Teck Coal	FR_MULTIPLATE_WS_202	

Salmonid Embryo-Alevin-Fry Survival Development and Growth Test — **Nautilus Environmental**

Analysis ID:	06-3809-3685	**Endpoint:**	Length-mm	**CETIS Version:**	CETISv1.9.4
Analyzed:	20 Aug-21 17:14	**Analysis:**	Parametric-Control vs Treatments	**Status Level:**	1

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	GH_ER2 passed length-mm	4.21%
		CM_MC1 passed length-mm	4.21%
		LC_SLC passed length-mm	4.21%
		FR_FRABCH passed length-mm	4.21%
		FR_FRCP1 passed length-mm	4.21%
		GH_FR1 passed length-mm	4.21%
		GH_ERC passed length-mm	4.21%
		CM_MC2 passed length-mm	4.21%
		EV_MC2 passed length-mm	4.21%
		EV_HC1 passed length-mm	4.21%
		LC_DCDS passed length-mm	4.21%
		LC_LC3 passed length-mm	4.21%
		LC_LC5 passed length-mm	4.21%
		LC_LCDSSLCC passed length-mm	4.21%
		FR_FR4 passed length-mm	4.21%
		FR_FRRD passed length-mm	4.21%
		FR_FR2 passed length-mm	4.21%
		FR_MULTIPLATE passed length-mm	4.21%

① Reference sites

Dunnett Multiple Comparison Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
① Upstream Control (FR_UFRI)		① GH_ER2	1.362	2.727	0.876	4	CDF	0.4645	Non-Significant Effect
		① CM_MC1	0.2552	2.727	0.876	4	CDF	0.9024	Non-Significant Effect
		① LC_SLC	1.689	2.727	0.876	4	CDF	0.3153	Non-Significant Effect
		FR_FRABCH	0.4918	2.727	0.876	4	CDF	0.8402	Non-Significant Effect
		FR_FRCP1	1.626	2.727	0.876	4	CDF	0.3424	Non-Significant Effect
		GH_FR1	0.4606	2.727	0.876	4	CDF	0.8496	Non-Significant Effect
		GH_ERC	-0.444	2.727	0.876	4	CDF	0.9854	Non-Significant Effect
		CM_MC2	-0.08818	2.727	0.876	4	CDF	0.9583	Non-Significant Effect
		EV_MC2	0.1525	2.727	0.876	4	CDF	0.9231	Non-Significant Effect
		EV_HC1	0.997	2.727	0.876	4	CDF	0.6406	Non-Significant Effect
		LC_DCDS	-1.481	2.727	0.876	4	CDF	0.9997	Non-Significant Effect
		LC_LC3	-0.6526	2.727	0.876	4	CDF	0.9927	Non-Significant Effect
		LC_LC5	-0.942	2.727	0.876	4	CDF	0.9974	Non-Significant Effect
		LC_LCDSSLCC	-0.8964	2.727	0.876	4	CDF	0.9969	Non-Significant Effect
		FR_FR4	0.2231	2.727	0.876	4	CDF	0.9093	Non-Significant Effect
		FR_FRRD	0.7158	2.727	0.876	4	CDF	0.7618	Non-Significant Effect
		FR_FR2	0.09545	2.727	0.876	4	CDF	0.9330	Non-Significant Effect
		FR_MULTIPLATE	0.333	2.727	0.876	4	CDF	0.8843	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	4.11494	0.228608	18	1.476	0.1534	Non-Significant Effect
Error	5.88419	0.154847	38			
Total	9.99913		56			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance Test	22.89	34.81	0.1949	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9771	0.9434	0.3516	Normal Distribution

Analyst: _____ QA: _____ Aug 24/21

Salmonid Embryo-Alevin-Fry Survival Development and Growth Test — Nautilus Environmental

Analysis ID:	06-3809-3685	**Endpoint:**	Length-mm	**CETIS Version:**	CETISv1.9.4
Analyzed:	20 Aug-21 17:14	**Analysis:**	Parametric-Control vs Treatments	**Status Level:**	1

Length-mm Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
FR_UFR1	U	3	20.8	20.19	21.4	20.93	20.52	20.94	0.1399	1.16%	0.00%
GH_ER2		3	20.36	18.83	21.89	20.52	19.68	20.88	0.3557	3.03%	2.10%
CM_MC1		3	20.71	20.2	21.23	20.73	20.5	20.91	0.119	0.99%	0.39%
LC_SLC		3	20.25	18.97	21.54	20	19.91	20.85	0.298	2.55%	2.61%
FR_FRABCH		3	20.64	19.64	21.64	20.65	20.23	21.04	0.2327	1.95%	0.76%
FR_FRCP1		3	20.27	19.19	21.36	20.41	19.79	20.63	0.2525	2.16%	2.51%
GH_FR1		3	20.65	20.07	21.23	20.75	20.38	20.82	0.1352	1.13%	0.71%
GH_ERC		3	20.94	20.88	21	20.95	20.91	20.96	0.01321	0.11%	-0.69%
CM_MC2		3	20.82	19.57	22.08	20.83	20.32	21.33	0.2907	2.42%	-0.14%
EV_MC2		3	20.75	19.57	21.92	20.5	20.45	21.29	0.2731	2.28%	0.24%
EV_HC1		3	20.48	18.98	21.97	20.77	19.78	20.88	0.3482	2.95%	1.54%
LC_DCDS		3	21.27	20.11	22.43	21.19	20.85	21.78	0.2699	2.20%	-2.29%
LC_LC3		3	21.01	20.5	21.51	21.02	20.8	21.2	0.118	0.97%	-1.01%
LC_LC5		3	21.1	20.69	21.51	21.18	20.91	21.21	0.09582	0.79%	-1.46%
LC_LCDSSLCC		3	21.08	20.88	21.29	21.09	21	21.16	0.0467	0.38%	-1.38%
FR_FR4		3	20.73	20.46	20.99	20.72	20.62	20.83	0.06149	0.51%	0.34%
FR_FRRD		3	20.57	19.81	21.32	20.59	20.25	20.86	0.1757	1.48%	1.11%
FR_FR2		3	20.77	19.54	21.99	20.52	20.44	21.33	0.2844	2.37%	0.15%
FR_MULTIPLATE		3	20.69	19.32	22.06	20.39	20.35	21.33	0.3183	2.66%	0.51%

Length-mm Detail

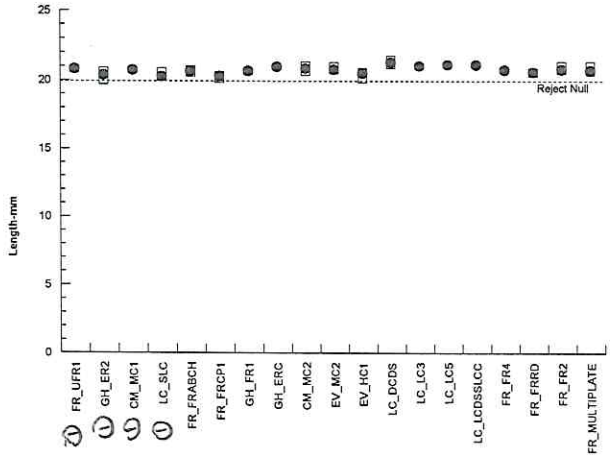
Sample	Code	Rep 1	Rep 2	Rep 3
FR_UFR1	U	20.52	20.94	20.93
GH_ER2		20.88	19.68	20.52
CM_MC1		20.91	20.5	20.73
LC_SLC		19.91	20.85	20
FR_FRABCH		21.04	20.23	20.65
FR_FRCP1		20.41	19.79	20.63
GH_FR1		20.75	20.38	20.82
GH_ERC		20.95	20.96	20.91
CM_MC2		20.83	20.32	21.33
EV_MC2		20.45	20.5	21.29
EV_HC1		20.88	19.78	20.77
LC_DCDS		21.19	20.85	21.78
LC_LC3		21.02	21.2	20.8
LC_LC5		21.21	20.91	21.17
LC_LCDSSLCC		21.16	21	21.09
FR_FR4		20.72	20.62	20.83
FR_FRRD		20.25	20.86	20.59
FR_FR2		20.44	20.52	21.33
FR_MULTIPLATE		20.39	20.35	21.33

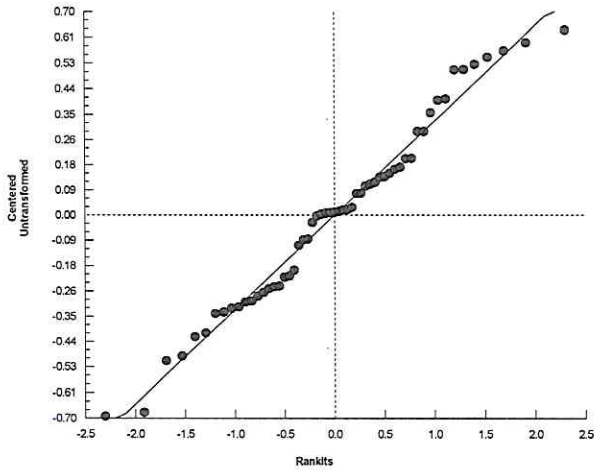
3 reference sites

Salmonid Embryo-Alevin-~~Fry~~ Survival Development and Growth Test — **Nautilus Environmental**

Analysis ID:	06-3809-3685	**Endpoint:**	Length-mm	**CETIS Version:**	CETISv1.9.4
Analyzed:	20 Aug-21 17:14	**Analysis:**	Parametric-Control vs Treatments	**Status Level:**	1

Graphics





① reference sites

CETIS Analytical Report

Salmonid Embryo-Alevin-~~Fry~~ Survival Development and Growth Test — **Nautilus Environmental**

Analysis ID:	15-6009-8145	**Endpoint:**	Mean Dry Weight-mg	**CETIS Version:**	CETISv1.9.4
Analyzed:	23 Aug-21 15:02	**Analysis:**	Nonparametric-Two Sample	**Status Level:**	1
Batch ID:	07-9799-9310	**Test Type:**	Survival-Development-Growth	**Analyst:**	Yvonne Lam
Start Date:	19 May-21 17:35	**Protocol:**	EC/EPS 1/RM/28	**Diluent:**	Dechlorinated Tap Water
Ending Date:	18 Jun-21 08:05	**Species:**	Oncorhynchus mykiss	**Brine:**	
Test Length:	29d 14h	**Taxon:**	Actinopterygii	**Source:**	Ted's Trout, Campbell Lake **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
FR_UFR1	12-4424-2146	18 May-21	19 May-21 11:20	42h (2.3 °C)	Teck Coal	
GH_ER2	02-4275-7088	18 May-21 09:55	19 May-21 11:20	32h (0.4 °C)		
CM_MC1	01-4263-6393	18 May-21 11:08	19 May-21 11:20	30h (1.1 °C)		
LC_SLC	12-1662-7355	18 May-21 09:45	19 May-21 11:20	32h (4.1 °C)		
FR_FRABCH	05-6713-4959	18 May-21	19 May-21 11:20	42h (1.9 °C)		
FR_FRCP1	19-8027-7867	18 May-21	19 May-21 11:20	42h (1.2 °C)		
GH_FR1	15-9886-5398	18 May-21 12:30	19 May-21 11:20	29h (0.1 °C)		
GH_ERC	21-0704-4941	18 May-21 11:20	19 May-21 11:20	30h (0.6 °C)		
CM_MC2	17-6814-6287	18 May-21 09:50	19 May-21 11:20	32h (1.1 °C)		
EV_MC2	15-5628-9197	18 May-21 13:00	19 May-21 11:20	29h (3.6 °C)		
EV_HC1	05-8730-9056	18 May-21 11:20	19 May-21 11:20	30h (4.8 °C)		
LC_DCDS	20-0340-1068	18 May-21 11:00	19 May-21 11:20	31h (4.6 °C)		
LC_LC3	18-4816-9590	18 May-21 10:15	19 May-21 11:20	31h (4.7 °C)		
LC_LC5	03-8768-2280	18 May-21 09:50	19 May-21 11:20	32h (5.2 °C)		
LC_LCDSSLCC	02-2977-6783	18 May-21 11:00	19 May-21 11:20	31h (4.3 °C)		
FR_FR4	17-1641-7069	18 May-21 09:29	19 May-21 11:20	32h (4.6 °C)		
FR_FRRD	06-3190-8505	18 May-21 08:22	19 May-21 11:20	33h (3.4 °C)		
FR_FR2	11-2149-8709	18 May-21 10:28	19 May-21 11:20	31h (4.6 °C)		
FR_MULTIPLATE	16-7235-2081	18 May-21 11:21	19 May-21 11:20	30h (3.4 °C)		

All samples spiked with 20 ug/L Cu

① Reference sites

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_UFR1	Water Sample	Teck Coal	FR_UFR1_WEK_2021-05-1	
GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-05-18_	
CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-05-18	
LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-05-18_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_WEK_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_WEK_2021-05	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-05-18_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-05-18	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-05-18	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2020_Q2_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2020_Q2_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-05-18	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-05-18_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-05-18_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	
FR_FR4	Water Sample	Teck Coal	FR_FR4_WS_2021-05-18_	
FR_FRRD	Water Sample	Teck Coal	FR_FRRD_WS_2021-05-18	
FR_FR2	Water Sample	Teck Coal	FR_FR2_WS_2021-05-18_	
FR_MULTIPLATE	Water Sample	Teck Coal	FR_MULTIPLATE_WS_202	

Analyst: YL QA: Aug. 24/21

Salmonid Embryo-Alevin-Fry Survival Development and Growth Test — **Nautilus Environmental**

Analysis ID: 15-6009-8145 **Endpoint:** Mean Dry Weight-mg **CETIS Version:** CETISv1.9.4
Analyzed: 23 Aug-21 15:02 **Analysis:** Nonparametric-Two Sample **Status Level:** 1

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	GH_ER2 passed mean dry weight-mg	26.48%
		CM_MC1 passed mean dry weight-mg	26.48%
		LC_SLC passed mean dry weight-mg	26.48%
		FR_FRABCH passed mean dry weight-mg	26.48%
		FR_FRCP1 passed mean dry weight-mg	26.48%
		GH_FR1 passed mean dry weight-mg	26.48%
		GH_ERC passed mean dry weight-mg	26.48%
		CM_MC2 passed mean dry weight-mg	26.48%
		EV_MC2 passed mean dry weight-mg	26.48%
		EV_HC1 passed mean dry weight-mg	26.48%
		LC_DCDS passed mean dry weight-mg	26.48%
		LC_LC3 passed mean dry weight-mg	26.48%
		LC_LC5 passed mean dry weight-mg	26.48%
		LC_LCDSSLCC passed mean dry weight-mg	26.48%
		FR_FR4 passed mean dry weight-mg	26.48%
		FR_FRRD passed mean dry weight-mg	26.48%
		FR_FR2 passed mean dry weight-mg	26.48%
		FR_MULTIPLATE passed mean dry weight-m	26.48%

① Reference sites

Wilcoxon Rank Sum Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)
② Upstream Control (FR_UFR1)		① GH_ER2	13	n/a	0	4	Exact	0.9000	Non-Significant Effect
		① CM_MC1	12	n/a	0	4	Exact	0.8000	Non-Significant Effect
		① LC_SLC	12	n/a	0	4	Exact	0.8000	Non-Significant Effect
		FR_FRABCH	13	n/a	0	4	Exact	0.9000	Non-Significant Effect
		FR_FRCP1	13	n/a	0	4	Exact	0.9000	Non-Significant Effect
		GH_FR1	13	n/a	0	4	Exact	0.9000	Non-Significant Effect
		GH_ERC	13	n/a	0	4	Exact	0.9000	Non-Significant Effect
		CM_MC2	13	n/a	0	4	Exact	0.9000	Non-Significant Effect
		EV_MC2	13	n/a	0	4	Exact	0.9000	Non-Significant Effect
		EV_HC1	13	n/a	0	4	Exact	0.9000	Non-Significant Effect
		LC_DCDS	14	n/a	0	4	Exact	0.9500	Non-Significant Effect
		LC_LC3	13	n/a	0	4	Exact	0.9000	Non-Significant Effect
		LC_LC5	13	n/a	0	4	Exact	0.9000	Non-Significant Effect
		LC_LCDSSLCC	14	n/a	0	4	Exact	0.9500	Non-Significant Effect
		FR_FR4	13	n/a	0	4	Exact	0.9000	Non-Significant Effect
		FR_FRRD	13	n/a	0	4	Exact	0.9000	Non-Significant Effect
		FR_FR2	13	n/a	0	4	Exact	0.9000	Non-Significant Effect
		FR_MULTIPLATE	14	n/a	0	4	Exact	0.9500	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	1778.72	98.8176	18	0.5576	0.9076	Non-Significant Effect
Error	6734.91	177.234	38			
Total	8513.62		56			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance Test	3.477	34.81	0.9999	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9273	0.9434	0.0021	Non-Normal Distribution

Salmonid Embryo-Alevin-~~Fry~~ Survival Development and Growth Test — Nautilus Environmental

Analysis ID:	15-6009-8145	**Endpoint:**	Mean ~~Dry~~ Weight-mg
Analyzed:	23 Aug-21 15:02	**Analysis:**	Nonparametric-Two Sample
CETIS Version:	CETISv1.9.4		
Status Level:	1		

Mean ~~Dry~~ Weight-mg Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
FR_UFR1	U	3	87.5	53.88	121.1	80.38	79	103.1	7.814	15.47%	0.00%
GH_ER2		3	97.75	62.11	133.4	90.4	88.57	114.3	8.284	14.68%	-11.72%
CM_MC1		3	92.22	66.65	117.8	91.15	82.5	103	5.942	11.16%	-5.40%
LC_SLC		3	95.25	74.57	115.9	98.15	85.86	101.7	4.807	8.74%	-8.86%
FR_FRABCH		3	99.46	68.01	130.9	96.54	88.52	113.3	7.311	12.73%	-13.68%
FR_FRCP1		3	96.93	73.53	120.3	98.93	86.67	105.2	5.439	9.72%	-10.78%
GH_FR1		3	98.55	72.94	124.2	93.85	91.43	110.4	5.952	10.46%	-12.63%
GH_ERC		3	105.4	77.71	133.1	99.64	98.33	118.3	6.44	10.58%	-20.48%
CM_MC2		3	100.5	54.84	146.2	96	84.83	120.8	10.62	18.30%	-14.90%
EV_MC2		3	100.7	68.51	132.9	102.3	87	112.8	7.48	12.87%	-15.08%
EV_HC1		3	99.64	73.3	126	102.8	87.83	108.3	6.122	10.64%	-13.88%
LC_DCDS		3	108.6	75.73	141.4	104.1	98.15	123.4	7.633	12.18%	-24.09%
LC_LC3		3	100.6	58.03	143.2	91.85	89.63	120.4	9.897	17.04%	-15.00%
LC_LC5		3	104.2	53.37	155	99.64	86.36	126.5	11.81	19.63%	-19.06%
LC_LCDSSLCC		3	111.5	79.21	143.8	113.6	97.59	123.3	7.505	11.66%	-27.43%
FR_FR4		3	97.51	73.3	121.7	94	90	108.5	5.626	9.99%	-11.44%
FR_FRRD		3	94.73	60.12	129.3	88.1	85.36	110.7	8.044	14.71%	-8.27%
FR_FR2		3	97.42	60.52	134.3	90.74	87.08	114.4	8.576	15.25%	-11.35%
FR_MULTIPLATE		3	106.6	77.27	135.9	113.3	92.96	113.5	6.814	11.07%	-21.82%

Mean ~~Dry~~ Weight-mg Detail

Sample	Code	Rep 1	Rep 2	Rep 3
FR_UFR1	U	79	80.38	103.1
GH_ER2		90.4	88.57	114.3
CM_MC1		82.5	91.15	103
LC_SLC		85.86	101.7	98.15
FR_FRABCH		88.52	96.54	113.3
FR_FRCP1		86.67	98.93	105.2
GH_FR1		93.85	91.43	110.4
GH_ERC		99.64	98.33	118.3
CM_MC2		84.83	96	120.8
EV_MC2		87	102.3	112.8
EV_HC1		102.8	87.83	108.3
LC_DCDS		104.1	98.15	123.4
LC_LC3		89.63	91.85	120.4
LC_LC5		99.64	86.36	126.5
LC_LCDSSLCC		113.6	97.59	123.3
FR_FR4		108.5	94	90
FR_FRRD		85.36	88.1	110.7
FR_FR2		90.74	87.08	114.4
FR_MULTIPLATE		92.96	113.3	113.5

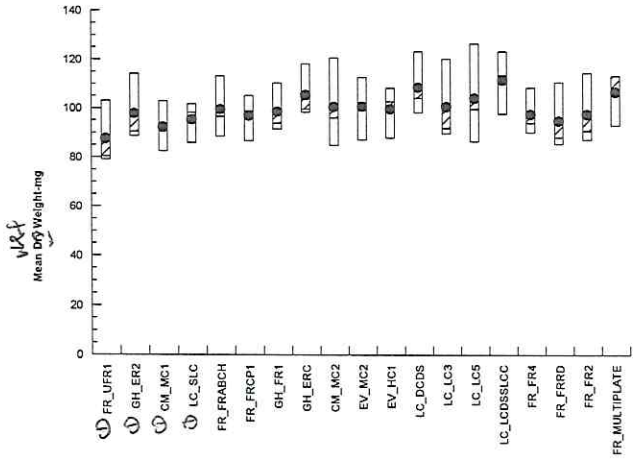
① Reference Sites

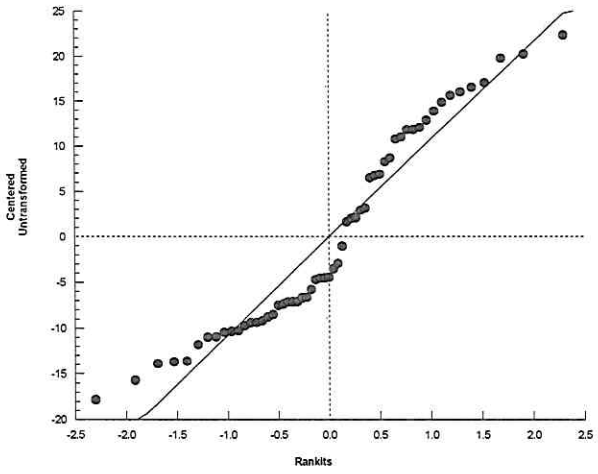
Analyst: ____ QA: Aug. 24/21

Salmonid Embryo-Alevin-~~Fry~~ Survival Development and Growth Test **Nautilus Environmental**

Analysis ID:	15-6009-8145	**Endpoint:**	Mean Dry Weight-mg	**CETIS Version:**	CETISv1.9.4
Analyzed:	23 Aug-21 15:02	**Analysis:**	Nonparametric-Two Sample	**Status Level:**	1

Graphics





① Reference Sites

CETIS Analytical Report

Salmonid Embryo-Alevin-~~Fry~~ Survival Development and Growth Test — **Nautilus Environmental**

Analysis ID:	02-3443-3419	**Endpoint:**	Length-mm	**CETIS Version:**	CETISv1.9.4
Analyzed:	20 Aug-21 17:20	**Analysis:**	Parametric-Control vs Treatments	**Status Level:**	1
Batch ID:	07-9799-9310	**Test Type:**	Survival-Development-Growth	**Analyst:**	Yvonne Lam
Start Date:	19 May-21 17:35	**Protocol:**	EC/EPS 1/RM/28	**Diluent:**	Dechlorinated Tap Water
Ending Date:	18 Jun-21 08:05	**Species:**	Oncorhynchus mykiss	**Brine:**	
Test Length:	29d 14h	**Taxon:**	Actinopterygii	**Source:**	Ted's Trout, Campbell Lake **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
① FR_UFR1	12-4424-2146	18 May-21	19 May-21 11:20	42h (2.3 °C)	Teck Coal	
④ GH_ER2	02-4275-7088	18 May-21 09:55	19 May-21 11:20	32h (0.4 °C)		
⑤ CM_MC1	01-4263-6393	18 May-21 11:08	19 May-21 11:20	30h (1.1 °C)		
⑦ LC_SLC	12-1662-7355	18 May-21 09:45	19 May-21 11:20	32h (4.1 °C)		
FR_FRABCH	05-6713-4959	18 May-21	19 May-21 11:20	42h (1.9 °C)		
FR_FRCP1	19-8027-7867	18 May-21	19 May-21 11:20	42h (1.2 °C)		
GH_FR1	15-9886-5398	18 May-21 12:30	19 May-21 11:20	29h (0.1 °C)		
GH_ERC	21-0704-4941	18 May-21 11:20	19 May-21 11:20	30h (0.6 °C)		
CM_MC2	17-6814-6287	18 May-21 09:50	19 May-21 11:20	32h (1.1 °C)		
EV_MC2	15-5628-9197	18 May-21 13:00	19 May-21 11:20	29h (3.6 °C)		
EV_HC1	05-8730-9056	18 May-21 11:20	19 May-21 11:20	30h (4.8 °C)		
LC_DCDS	20-0340-1068	18 May-21 11:00	19 May-21 11:20	31h (4.6 °C)		
LC_LC3	18-4816-9590	18 May-21 10:15	19 May-21 11:20	31h (4.7 °C)		
LC_LC5	03-8768-2280	18 May-21 09:50	19 May-21 11:20	32h (5.2 °C)		
LC_LCDSSLCC	02-2977-6783	18 May-21 11:00	19 May-21 11:20	31h (4.3 °C)		
FR_FR4	17-1641-7069	18 May-21 09:29	19 May-21 11:20	32h (4.6 °C)		
FR_FRRD	06-3190-8505	18 May-21 08:22	19 May-21 11:20	33h (3.4 °C)		
FR_FR2	11-2149-8709	18 May-21 10:28	19 May-21 11:20	31h (4.6 °C)		
FR_MULTIPLATE	16-7235-2081	18 May-21 11:21	19 May-21 11:20	30h (3.4 °C)		

All samples spiked with 20 mg/L Cu

① Reference Sites

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
① FR_UFR1	Water Sample	Teck Coal	FR_UFR1_WEK_2021-05-1	
④ GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-05-18_	
⑤ CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-05-18	
⑦ LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-05-18_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_WEK_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_WEK_2021-05	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-05-18_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-05-18	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-05-18	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2020_Q2_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2020_Q2_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-05-18	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-05-18_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-05-18_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	
FR_FR4	Water Sample	Teck Coal	FR_FR4_WS_2021-05-18_	
FR_FRRD	Water Sample	Teck Coal	FR_FRRD_WS_2021-05-18	
FR_FR2	Water Sample	Teck Coal	FR_FR2_WS_2021-05-18_	
FR_MULTIPLATE	Water Sample	Teck Coal	FR_MULTIPLATE_WS_202	

Analyst: YL QA: YL Aug. 24/21

Salmonid Embryo-Alevin-~~Fry~~ Survival Development and Growth Test — **Nautilus Environmental**

Analysis ID: 02-3443-3419 **Endpoint:** Length-mm **CETIS Version:** CETISv1.9.4
Analyzed: 20 Aug-21 17:20 **Analysis:** Parametric-Control vs Treatments **Status Level:** 1

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	FR_UFR1 passed length-mm	4.30%
		CM_MC1 passed length-mm	4.30%
		LC_SLC passed length-mm	4.30%
		FR_FRABCH passed length-mm	4.30%
		FR_FRCP1 passed length-mm	4.30%
		GH_FR1 passed length-mm	4.30%
		GH_ERC passed length-mm	4.30%
		CM_MC2 passed length-mm	4.30%
		EV_MC2 passed length-mm	4.30%
		EV_HC1 passed length-mm	4.30%
		LC_DCDS passed length-mm	4.30%
		LC_LC3 passed length-mm	4.30%
		LC_LC5 passed length-mm	4.30%
		LC_LCDSSLCC passed length-mm	4.30%
		FR_FR4 passed length-mm	4.30%
		FR_FRRD passed length-mm	4.30%
		FR_FR2 passed length-mm	4.30%
		FR_MULTIPLATE passed length-mm	4.30%

① Reference sites

Dunnett Multiple Comparison Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
① Receiving Water (GH_ER2)		① FR_UFR1	-1.362	2.727	0.876	4	CDF	0.9995	Non-Significant Effect
		① CM_MC1	-1.107	2.727	0.876	4	CDF	0.9986	Non-Significant Effect
		① LC_SLC	0.3268	2.727	0.876	4	CDF	0.8858	Non-Significant Effect
		FR_FRABCH	-0.8704	2.727	0.876	4	CDF	0.9966	Non-Significant Effect
		FR_FRCP1	0.2635	2.727	0.876	4	CDF	0.9006	Non-Significant Effect
		GH_FR1	-0.9016	2.727	0.876	4	CDF	0.9970	Non-Significant Effect
		GH_ERC	-1.806	2.727	0.876	4	CDF	0.9999	Non-Significant Effect
		CM_MC2	-1.45	2.727	0.876	4	CDF	0.9997	Non-Significant Effect
		EV_MC2	-1.21	2.727	0.876	4	CDF	0.9991	Non-Significant Effect
		EV_HC1	-0.3652	2.727	0.876	4	CDF	0.9813	Non-Significant Effect
		LC_DCDS	-2.844	2.727	0.876	4	CDF	1.0000	Non-Significant Effect
		LC_LC3	-2.015	2.727	0.876	4	CDF	1.0000	Non-Significant Effect
		LC_LC5	-2.304	2.727	0.876	4	CDF	1.0000	Non-Significant Effect
		LC_LCDSSLCC	-2.259	2.727	0.876	4	CDF	1.0000	Non-Significant Effect
		FR_FR4	-1.139	2.727	0.876	4	CDF	0.9988	Non-Significant Effect
		FR_FRRD	-0.6463	2.727	0.876	4	CDF	0.9925	Non-Significant Effect
		FR_FR2	-1.267	2.727	0.876	4	CDF	0.9993	Non-Significant Effect
		FR_MULTIPLATE	-1.029	2.727	0.876	4	CDF	0.9981	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	4.11494	0.228608	18	1.476	0.1534	Non-Significant Effect
Error	5.88419	0.154847	38			
Total	9.99913		56			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance Test	22.89	34.81	0.1949	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9771	0.9434	0.3516	Normal Distribution

Analyst: WW QA: Aug. 24/21

Salmonid Embryo-Alevin-Fry Survival Development and Growth Test — **Nautilus Environmental**

Analysis ID: 02-3443-3419 **Endpoint:** Length-mm **CETIS Version:** CETISv1.9.4
Analyzed: 20 Aug-21 17:20 **Analysis:** Parametric-Control vs Treatments **Status Level:** 1

Length-mm Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
① FR_UFR1		3	20.8	20.19	21.4	20.93	20.52	20.94	0.1399	1.16%	0.00%
① GH_ER2	R	3	20.36	18.83	21.89	20.52	19.68	20.88	0.3557	3.03%	2.10%
① CM_MC1		3	20.71	20.2	21.23	20.73	20.5	20.91	0.119	0.99%	0.39%
① LC_SLC		3	20.25	18.97	21.54	20	19.91	20.85	0.298	2.55%	2.61%
FR_FRABCH		3	20.64	19.64	21.64	20.65	20.23	21.04	0.2327	1.95%	0.76%
FR_FRCP1		3	20.27	19.19	21.36	20.41	19.79	20.63	0.2525	2.16%	2.51%
GH_FR1		3	20.65	20.07	21.23	20.75	20.38	20.82	0.1352	1.13%	0.71%
GH_ERC		3	20.94	20.88	21	20.95	20.91	20.96	0.01321	0.11%	-0.69%
CM_MC2		3	20.82	19.57	22.08	20.83	20.32	21.33	0.2907	2.42%	-0.14%
EV_MC2		3	20.75	19.57	21.92	20.5	20.45	21.29	0.2731	2.28%	0.24%
EV_HC1		3	20.48	18.98	21.97	20.77	19.78	20.88	0.3482	2.95%	1.54%
LC_DCDS		3	21.27	20.11	22.43	21.19	20.85	21.78	0.2699	2.20%	-2.29%
LC_LC3		3	21.01	20.5	21.51	21.02	20.8	21.2	0.118	0.97%	-1.01%
LC_LC5		3	21.1	20.69	21.51	21.18	20.91	21.21	0.09582	0.79%	-1.46%
LC_LCDSSLCC		3	21.08	20.88	21.29	21.09	21	21.16	0.0467	0.38%	-1.38%
FR_FR4		3	20.73	20.46	20.99	20.72	20.62	20.83	0.06149	0.51%	0.34%
FR_FRRD		3	20.57	19.81	21.32	20.59	20.25	20.86	0.1757	1.48%	1.11%
FR_FR2		3	20.77	19.54	21.99	20.52	20.44	21.33	0.2844	2.37%	0.15%
FR_MULTIPLATE		3	20.69	19.32	22.06	20.39	20.35	21.33	0.3183	2.66%	0.51%

Length-mm Detail

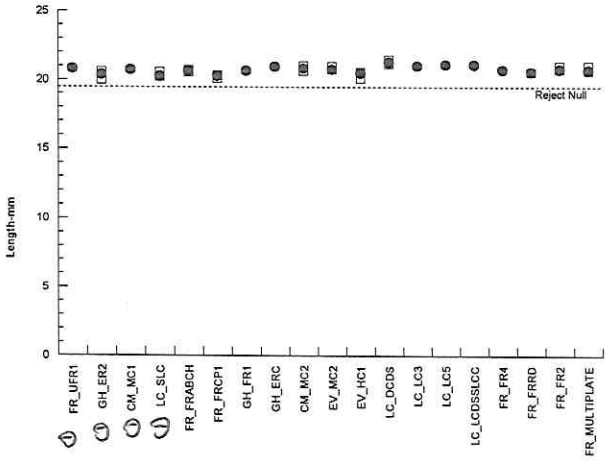
Sample	Code	Rep 1	Rep 2	Rep 3
① FR_UFR1		20.52	20.94	20.93
① GH_ER2	R	20.88	19.68	20.52
① CM_MC1		20.91	20.5	20.73
① LC_SLC		19.91	20.85	20
FR_FRABCH		21.04	20.23	20.65
FR_FRCP1		20.41	19.79	20.63
GH_FR1		20.75	20.38	20.82
GH_ERC		20.95	20.96	20.91
CM_MC2		20.83	20.32	21.33
EV_MC2		20.45	20.5	21.29
EV_HC1		20.88	19.78	20.77
LC_DCDS		21.19	20.85	21.78
LC_LC3		21.02	21.2	20.8
LC_LC5		21.21	20.91	21.17
LC_LCDSSLCC		21.16	21	21.09
FR_FR4		20.72	20.62	20.83
FR_FRRD		20.25	20.86	20.59
FR_FR2		20.44	20.52	21.33
FR_MULTIPLATE		20.39	20.35	21.33

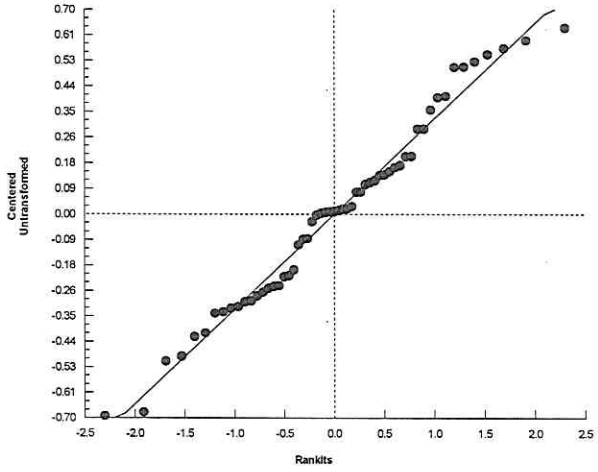
① Reference sites

Salmonid Embryo-Alevin-~~Fry~~ Survival Development and Growth Test **Nautilus Environmental**

Analysis ID:	02-3443-3419	**Endpoint:**	Length-mm	**CETIS Version:**	CETISv1.9.4
Analyzed:	20 Aug-21 17:20	**Analysis:**	Parametric-Control vs Treatments	**Status Level:**	1

Graphics





① Reference Sites

Analyst: WW QA: Aug. 29/21

CETIS Analytical Report

Salmonid Embryo-Alevin ~~Fry~~ Survival Development and Growth Test — **Nautilus Environmental**

Analysis ID:	07-6933-1693	**Endpoint:**	Mean ~~Dry~~ Weight-mg	**CETIS Version:**	CETISv1.9.4
Analyzed:	20 Aug-21 17:20	**Analysis:**	Nonparametric-Two Sample	**Status Level:**	1
Batch ID:	07-9799-9310	**Test Type:**	Survival-Development-Growth	**Analyst:**	Yvonne Lam
Start Date:	19 May-21 17:35	**Protocol:**	EC/EPS 1/RM/28	**Diluent:**	Dechlorinated Tap Water
Ending Date:	18 Jun-21 08:05	**Species:**	Oncorhynchus mykiss	**Brine:**	
Test Length:	29d 14h	**Taxon:**	Actinopterygii	**Source:**	Ted's Trout, Campbell Lake **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
FR_UFR1	12-4424-2146	18 May-21	19 May-21 11:20	42h (2.3 °C)	Teck Coal	
GH_ER2	02-4275-7088	18 May-21 09:55	19 May-21 11:20	32h (0.4 °C)		
CM_MC1	01-4263-6393	18 May-21 11:08	19 May-21 11:20	30h (1.1 °C)		
LC_SLC	12-1662-7355	18 May-21 09:45	19 May-21 11:20	32h (4.1 °C)		
FR_FRABCH	05-6713-4959	18 May-21	19 May-21 11:20	42h (1.9 °C)		
FR_FRCP1	19-8027-7867	18 May-21	19 May-21 11:20	42h (1.2 °C)		
GH_FR1	15-9886-5398	18 May-21 12:30	19 May-21 11:20	29h (0.1 °C)		
GH_ERC	21-0704-4941	18 May-21 11:20	19 May-21 11:20	30h (0.6 °C)		
CM_MC2	17-6814-6287	18 May-21 09:50	19 May-21 11:20	32h (1.1 °C)		
EV_MC2	15-5628-9197	18 May-21 13:00	19 May-21 11:20	29h (3.6 °C)		
EV_HC1	05-8730-9056	18 May-21 11:20	19 May-21 11:20	30h (4.8 °C)		
LC_DCDS	20-0340-1068	18 May-21 11:00	19 May-21 11:20	31h (4.6 °C)		
LC_LC3	18-4816-9590	18 May-21 10:15	19 May-21 11:20	31h (4.7 °C)		
LC_LC5	03-8768-2280	18 May-21 09:50	19 May-21 11:20	32h (5.2 °C)		
LC_LCDSSLCC	02-2977-6783	18 May-21 11:00	19 May-21 11:20	31h (4.3 °C)		
FR_FR4	17-1641-7069	18 May-21 09:29	19 May-21 11:20	32h (4.6 °C)		
FR_FRRD	06-3190-8505	18 May-21 08:22	19 May-21 11:20	33h (3.4 °C)		
FR_FR2	11-2149-8709	18 May-21 10:28	19 May-21 11:20	31h (4.6 °C)		
FR_MULTIPLATE	16-7235-2081	18 May-21 11:21	19 May-21 11:20	30h (3.4 °C)		

All samples spiked with 20 mg/L Cu

① Reference sites

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_UFR1	Water Sample	Teck Coal	FR_UFR1_WEK_2021-05-1	
GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-05-18_	
CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-05-18	
LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-05-18_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_WEK_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_WEK_2021-05	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-05-18_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-05-18	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-05-18	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2020_Q2_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2020_Q2_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-05-18	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-05-18_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-05-18_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	
FR_FR4	Water Sample	Teck Coal	FR_FR4_WS_2021-05-18_	
FR_FRRD	Water Sample	Teck Coal	FR_FRRD_WS_2021-05-18	
FR_FR2	Water Sample	Teck Coal	FR_FR2_WS_2021-05-18_	
FR_MULTIPLATE	Water Sample	Teck Coal	FR_MULTIPLATE_WS_202	

Analyst: UW QA: Aug. 24/21

Salmonid Embryo-Alevin-~~Fry~~ Survival Development and Growth Test **Nautilus Environmental**

Analysis ID: 07-6933-1693 **Endpoint:** Mean Dry Weight-mg **CETIS Version:** CETISv1.9.4
Analyzed: 20 Aug-21 17:20 **Analysis:** Nonparametric-Two Sample **Status Level:** 1

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	FR_UFR1 passed mean dry weight-mg	23.71%
		CM_MC1 passed mean dry weight-mg	23.71%
		LC_SLC passed mean dry weight-mg	23.71%
		FR_FRABCH passed mean dry weight-mg	23.71%
		FR_FRCP1 passed mean dry weight-mg	23.71%
		GH_FR1 passed mean dry weight-mg	23.71%
		GH_ERC passed mean dry weight-mg	23.71%
		CM_MC2 passed mean dry weight-mg	23.71%
		EV_MC2 passed mean dry weight-mg	23.71%
		EV_HC1 passed mean dry weight-mg	23.71%
		LC_DCDS passed mean dry weight-mg	23.71%
		LC_LC3 passed mean dry weight-mg	23.71%
		LC_LC5 passed mean dry weight-mg	23.71%
		LC_LCDSSLCC passed mean dry weight-mg	23.71%
		FR_FR4 passed mean dry weight-mg	23.71%
		FR_FRRD passed mean dry weight-mg	23.71%
		FR_FR2 passed mean dry weight-mg	23.71%
		FR_MULTIPLATE passed mean dry weight-m	23.71%

Wilcoxon Rank Sum Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)
Receiving Water (GH-ER2)		FR_UFR1	8	n/a	0	4	Exact	0.2000	Non-Significant Effect
		CM_MC1	10	n/a	0	4	Exact	0.5000	Non-Significant Effect
		LC_SLC	10	n/a	0	4	Exact	0.5000	Non-Significant Effect
		FR_FRABCH	10	n/a	0	4	Exact	0.5000	Non-Significant Effect
		FR_FRCP1	10	n/a	0	4	Exact	0.5000	Non-Significant Effect
		GH_FR1	12	n/a	0	4	Exact	0.8000	Non-Significant Effect
		GH_ERC	13	n/a	0	4	Exact	0.9000	Non-Significant Effect
		CM_MC2	11	n/a	0	4	Exact	0.6500	Non-Significant Effect
		EV_MC2	10	n/a	0	4	Exact	0.5000	Non-Significant Effect
		EV_HC1	10	n/a	0	4	Exact	0.5000	Non-Significant Effect
		LC_DCDS	13	n/a	0	4	Exact	0.9000	Non-Significant Effect
		LC_LC3	12	n/a	0	4	Exact	0.8000	Non-Significant Effect
		LC_LC5	11	n/a	0	4	Exact	0.6500	Non-Significant Effect
		LC_LCDSSLCC	13	n/a	0	4	Exact	0.9000	Non-Significant Effect
		FR_FR4	11	n/a	0	4	Exact	0.6500	Non-Significant Effect
		FR_FRRD	8	n/a	0	4	Exact	0.2000	Non-Significant Effect
		FR_FR2	11	n/a	0	4	Exact	0.6500	Non-Significant Effect
		FR_MULTIPLATE	12	n/a	0	4	Exact	0.8000	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	1778.72	98.8176	18	0.5576	0.9076	Non-Significant Effect
Error	6734.91	177.234	38			
Total	8513.62		56			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance Test	3.477	34.81	0.9999	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9273	0.9434	0.0021	Non-Normal Distribution

Salmonid Embryo-Alevin ~~Fry~~ Survival Development and Growth Test — **Nautilus Environmental**

Analysis ID:	07-6933-1693	**Endpoint:**	Mean ~~Dry~~ Weight-mg	**CETIS Version:**	CETISv1.9.4
Analyzed:	20 Aug-21 17:20	**Analysis:**	Nonparametric-Two Sample	**Status Level:**	1

Mean ~~Dry~~ Weight-mg Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
FR_UFR1		3	87.5	53.88	121.1	80.38	79	103.1	7.814	15.47%	0.00%
GH_ER2	R	3	97.75	62.11	133.4	90.4	88.57	114.3	8.284	14.68%	-11.72%
CM_MC1		3	92.22	66.65	117.8	91.15	82.5	103	5.942	11.16%	-5.40%
LC_SLC		3	95.25	74.57	115.9	98.15	85.86	101.7	4.807	8.74%	-8.86%
FR_FRABCH		3	99.46	68.01	130.9	96.54	88.52	113.3	7.311	12.73%	-13.68%
FR_FRCP1		3	96.93	73.53	120.3	98.93	86.67	105.2	5.439	9.72%	-10.78%
GH_FR1		3	98.55	72.94	124.2	93.85	91.43	110.4	5.952	10.46%	-12.63%
GH_ERC		3	105.4	77.71	133.1	99.64	98.33	118.3	6.44	10.58%	-20.48%
CM_MC2		3	100.5	54.84	146.2	96	84.83	120.8	10.62	18.30%	-14.90%
EV_MC2		3	100.7	68.51	132.9	102.3	87	112.8	7.48	12.87%	-15.08%
EV_HC1		3	99.64	73.3	126	102.8	87.83	108.3	6.122	10.64%	-13.88%
LC_DCDS		3	108.6	75.73	141.4	104.1	98.15	123.4	7.633	12.18%	-24.09%
LC_LC3		3	100.6	58.03	143.2	91.85	89.63	120.4	9.897	17.04%	-15.00%
LC_LC5		3	104.2	53.37	155	99.64	86.36	126.5	11.81	19.63%	-19.06%
LC_LCDSSLCC		3	111.5	79.21	143.8	113.6	97.59	123.3	7.505	11.66%	-27.43%
FR_FR4		3	97.51	73.3	121.7	94	90	108.5	5.626	9.99%	-11.44%
FR_FRRD		3	94.73	60.12	129.3	88.1	85.36	110.7	8.044	14.71%	-8.27%
FR_FR2		3	97.42	60.52	134.3	90.74	87.08	114.4	8.576	15.25%	-11.35%
FR_MULTIPLATE		3	106.6	77.27	135.9	113.3	92.96	113.5	6.814	11.07%	-21.82%

Mean ~~Dry~~ Weight-mg Detail

Sample	Code	Rep 1	Rep 2	Rep 3
FR_UFR1		79	80.38	103.1
GH_ER2	R	90.4	88.57	114.3
CM_MC1		82.5	91.15	103
LC_SLC		85.86	101.7	98.15
FR_FRABCH		88.52	96.54	113.3
FR_FRCP1		86.67	98.93	105.2
GH_FR1		93.85	91.43	110.4
GH_ERC		99.64	98.33	118.3
CM_MC2		84.83	96	120.8
EV_MC2		87	102.3	112.8
EV_HC1		102.8	87.83	108.3
LC_DCDS		104.1	98.15	123.4
LC_LC3		89.63	91.85	120.4
LC_LC5		99.64	86.36	126.5
LC_LCDSSLCC		113.6	97.59	123.3
FR_FR4		108.5	94	90
FR_FRRD		85.36	88.1	110.7
FR_FR2		90.74	87.08	114.4
FR_MULTIPLATE		92.96	113.3	113.5

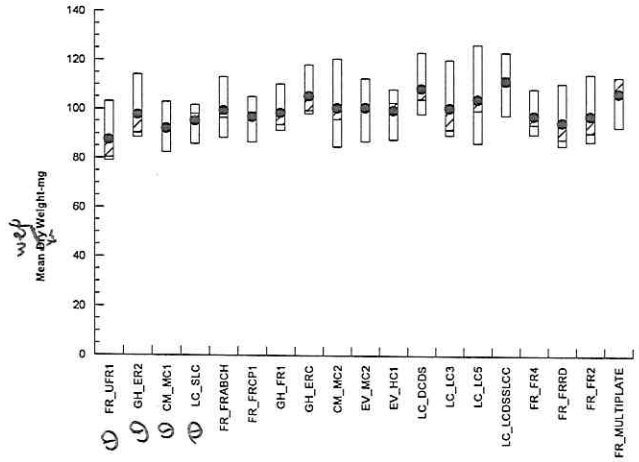
① Reference Sites

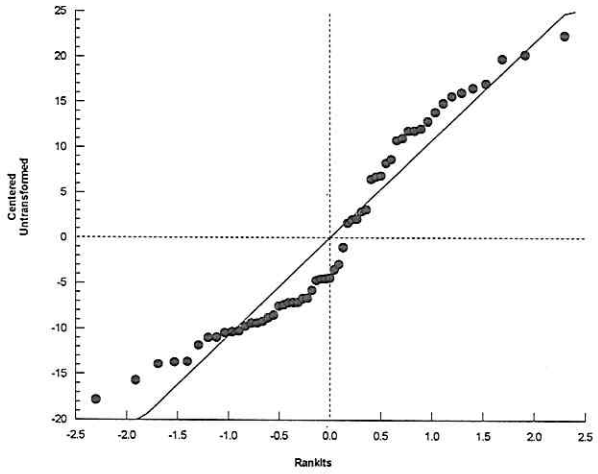
Analyst: _____ QA: Aug. 24/21

Salmonid Embryo-Alevin-~~Fry~~ Survival Development and Growth Test — **Nautilus Environmental**

Analysis ID:	07-6933-1693	**Endpoint:**	Mean Dry Weight-mg	**CETIS Version:**	CETISv1.9.4
Analyzed:	20 Aug-21 17:20	**Analysis:**	Nonparametric-Two Sample	**Status Level:**	1

Graphics





① Reference sites

Analyst: _____ QA: Aug 24/21

CETIS Analytical Report

Salmonid Embryo-Alevin-~~Fry~~ Survival Development and Growth Test — **Nautilus Environmental**

Analysis ID:	01-1302-6077	**Endpoint:**	Length-mm	**CETIS Version:**	CETISv1.9.4
Analyzed:	20 Aug-21 17:22	**Analysis:**	Parametric-Control vs Treatments	**Status Level:**	1
Batch ID:	07-9799-9310	**Test Type:**	Survival-Development-Growth	**Analyst:**	Yvonne Lam
Start Date:	19 May-21 17:35	**Protocol:**	EC/EPS 1/RM/28	**Diluent:**	Dechlorinated Tap Water
Ending Date:	18 Jun-21 08:05	**Species:**	Oncorhynchus mykiss	**Brine:**	
Test Length:	29d 14h	**Taxon:**	Actinopterygii	**Source:**	Ted's Trout, Campbell Lake **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
FR_UFR1	12-4424-2146	18 May-21	19 May-21 11:20	42h (2.3 °C)	Teck Coal	
GH_ER2	02-4275-7088	18 May-21 09:55	19 May-21 11:20	32h (0.4 °C)		
CM_MC1	01-4263-6393	18 May-21 11:08	19 May-21 11:20	30h (1.1 °C)		
LC_SLC	12-1662-7355	18 May-21 09:45	19 May-21 11:20	32h (4.1 °C)		
FR_FRABCH	05-6713-4959	18 May-21	19 May-21 11:20	42h (1.9 °C)		
FR_FRCP1	19-8027-7867	18 May-21	19 May-21 11:20	42h (1.2 °C)		
GH_FR1	15-9886-5398	18 May-21 12:30	19 May-21 11:20	29h (0.1 °C)		
GH_ERC	21-0704-4941	18 May-21 11:20	19 May-21 11:20	30h (0.6 °C)		
CM_MC2	17-6814-6287	18 May-21 09:50	19 May-21 11:20	32h (1.1 °C)		
EV_MC2	15-5628-9197	18 May-21 13:00	19 May-21 11:20	29h (3.6 °C)		
EV_HC1	05-8730-9056	18 May-21 11:20	19 May-21 11:20	30h (4.8 °C)		
LC_DCDS	20-0340-1068	18 May-21 11:00	19 May-21 11:20	31h (4.6 °C)		
LC_LC3	18-4816-9590	18 May-21 10:15	19 May-21 11:20	31h (4.7 °C)		
LC_LC5	03-8768-2280	18 May-21 09:50	19 May-21 11:20	32h (5.2 °C)		
LC_LCDSSLCC	02-2977-6783	18 May-21 11:00	19 May-21 11:20	31h (4.3 °C)		
FR_FR4	17-1641-7069	18 May-21 09:29	19 May-21 11:20	32h (4.6 °C)		
FR_FRRD	06-3190-8505	18 May-21 08:22	19 May-21 11:20	33h (3.4 °C)		
FR_FR2	11-2149-8709	18 May-21 10:28	19 May-21 11:20	31h (4.6 °C)		
FR_MULTIPLATE	16-7235-2081	18 May-21 11:21	19 May-21 11:20	30h (3.4 °C)		

All samples spiked with 20 ug/L Cu

0 Reference sites

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_UFR1	Water Sample	Teck Coal	FR_UFR1_WEK_2021-05-1	
GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-05-18_	
CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-05-18	
LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-05-18_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_WEK_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_WEK_2021-05	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-05-18_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-05-18	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-05-18	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2020_Q2_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2020_Q2_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-05-18	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-05-18_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-05-18_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	
FR_FR4	Water Sample	Teck Coal	FR_FR4_WS_2021-05-18_	
FR_FRRD	Water Sample	Teck Coal	FR_FRRD_WS_2021-05-18	
FR_FR2	Water Sample	Teck Coal	FR_FR2_WS_2021-05-18_	
FR_MULTIPLATE	Water Sample	Teck Coal	FR_MULTIPLATE_WS_202	

JGa

Analyst: IMW QA: Aug. 24/21

Salmonid Embryo-Alevin-~~Fry~~ Survival Development and Growth Test — **Nautilus Environmental**

Analysis ID:	01-1302-6077	**Endpoint:**	Length-mm	**CETIS Version:**	CETISv1.9.4
Analyzed:	20 Aug-21 17:22	**Analysis:**	Parametric-Control vs Treatments	**Status Level:**	1

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	FR_UFR1 passed length-mm	4.23%
		GH_ER2 passed length-mm	4.23%
		LC_SLC passed length-mm	4.23%
		FR_FRABCH passed length-mm	4.23%
		FR_FRCP1 passed length-mm	4.23%
		GH_FR1 passed length-mm	4.23%
		GH_ERC passed length-mm	4.23%
		CM_MC2 passed length-mm	4.23%
		EV_MC2 passed length-mm	4.23%
		EV_HC1 passed length-mm	4.23%
		LC_DCDS passed length-mm	4.23%
		LC_LC3 passed length-mm	4.23%
		LC_LC5 passed length-mm	4.23%
		LC_LCDSSLCC passed length-mm	4.23%
		FR_FR4 passed length-mm	4.23%
		FR_FRRD passed length-mm	4.23%
		FR_FR2 passed length-mm	4.23%
		FR_MULTIPLATE passed length-mm	4.23%

Dunnett Multiple Comparison Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Site Control (CM_MC1)		FR_UFR1	-0.2552	2.727	0.876	4	CDF	0.9740	Non-Significant Effect
		GH_ER2	1.107	2.727	0.876	4	CDF	0.5885	Non-Significant Effect
		LC_SLC	1.434	2.727	0.876	4	CDF	0.4302	Non-Significant Effect
		FR_FRABCH	0.2365	2.727	0.876	4	CDF	0.9065	Non-Significant Effect
		FR_FRCP1	1.37	2.727	0.876	4	CDF	0.4605	Non-Significant Effect
		GH_FR1	0.2054	2.727	0.876	4	CDF	0.9129	Non-Significant Effect
		GH_ERC	-0.6993	2.727	0.876	4	CDF	0.9938	Non-Significant Effect
		CM_MC2	-0.3434	2.727	0.876	4	CDF	0.9800	Non-Significant Effect
		EV_MC2	-0.1027	2.727	0.876	4	CDF	0.9600	Non-Significant Effect
		EV_HC1	0.7418	2.727	0.876	4	CDF	0.7516	Non-Significant Effect
		LC_DCDS	-1.737	2.727	0.876	4	CDF	0.9999	Non-Significant Effect
		LC_LC3	-0.9078	2.727	0.876	4	CDF	0.9971	Non-Significant Effect
		LC_LC5	-1.197	2.727	0.876	4	CDF	0.9991	Non-Significant Effect
		LC_LCDSSLCC	-1.152	2.727	0.876	4	CDF	0.9989	Non-Significant Effect
		FR_FR4	-0.03216	2.727	0.876	4	CDF	0.9516	Non-Significant Effect
		FR_FRRD	0.4606	2.727	0.876	4	CDF	0.8496	Non-Significant Effect
		FR_FR2	-0.1598	2.727	0.876	4	CDF	0.9658	Non-Significant Effect
		FR_MULTIPLATE	0.07781	2.727	0.876	4	CDF	0.9359	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	4.11494	0.228608	18	1.476	0.1534	Non-Significant Effect
Error	5.88419	0.154847	38			
Total	9.99913		56			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance Test	22.89	34.81	0.1949	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9771	0.9434	0.3516	Normal Distribution

Salmonid Embryo-Alevin-Fry Survival Development and Growth Test — **Nautilus Environmental**

Analysis ID:	01-1302-6077	**Endpoint:**	Length-mm	**CETIS Version:**	CETISv1.9.4
Analyzed:	20 Aug-21 17:22	**Analysis:**	Parametric-Control vs Treatments	**Status Level:**	1

Length-mm Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
FR_UFR1		3	20.8	20.19	21.4	20.93	20.52	20.94	0.1399	1.16%	0.00%
GH_ER2		3	20.36	18.83	21.89	20.52	19.68	20.88	0.3557	3.03%	2.10%
CM_MC1	XC	3	20.71	20.2	21.23	20.73	20.5	20.91	0.119	0.99%	0.39%
LC_SLC		3	20.25	18.97	21.54	20	19.91	20.85	0.298	2.55%	2.61%
FR_FRABCH		3	20.64	19.64	21.64	20.65	20.23	21.04	0.2327	1.95%	0.76%
FR_FRCP1		3	20.27	19.19	21.36	20.41	19.79	20.63	0.2525	2.16%	2.51%
GH_FR1		3	20.65	20.07	21.23	20.75	20.38	20.82	0.1352	1.13%	0.71%
GH_ERC		3	20.94	20.88	21	20.95	20.91	20.96	0.01321	0.11%	-0.69%
CM_MC2		3	20.82	19.57	22.08	20.83	20.32	21.33	0.2907	2.42%	-0.14%
EV_MC2		3	20.75	19.57	21.92	20.5	20.45	21.29	0.2731	2.28%	0.24%
EV_HC1		3	20.48	18.98	21.97	20.77	19.78	20.88	0.3482	2.95%	1.54%
LC_DCDS		3	21.27	20.11	22.43	21.19	20.85	21.78	0.2699	2.20%	-2.29%
LC_LC3		3	21.01	20.5	21.51	21.02	20.8	21.2	0.118	0.97%	-1.01%
LC_LC5		3	21.1	20.69	21.51	21.18	20.91	21.21	0.09582	0.79%	-1.46%
LC_LCDSSLCC		3	21.08	20.88	21.29	21.09	21	21.16	0.0467	0.38%	-1.38%
FR_FR4		3	20.73	20.46	20.99	20.72	20.62	20.83	0.06149	0.51%	0.34%
FR_FRRD		3	20.57	19.81	21.32	20.59	20.25	20.86	0.1757	1.48%	1.11%
FR_FR2		3	20.77	19.54	21.99	20.52	20.44	21.33	0.2844	2.37%	0.15%
FR_MULTIPLATE		3	20.69	19.32	22.06	20.39	20.35	21.33	0.3183	2.66%	0.51%

Length-mm Detail

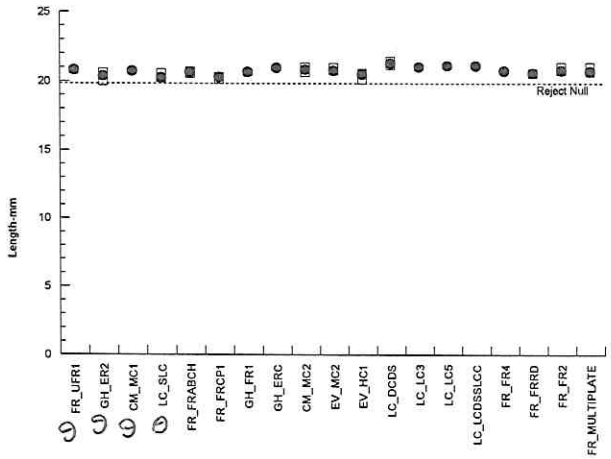
Sample	Code	Rep 1	Rep 2	Rep 3
FR_UFR1		20.52	20.94	20.93
GH_ER2		20.88	19.68	20.52
CM_MC1	XC	20.91	20.5	20.73
LC_SLC		19.91	20.85	20
FR_FRABCH		21.04	20.23	20.65
FR_FRCP1		20.41	19.79	20.63
GH_FR1		20.75	20.38	20.82
GH_ERC		20.95	20.96	20.91
CM_MC2		20.83	20.32	21.33
EV_MC2		20.45	20.5	21.29
EV_HC1		20.88	19.78	20.77
LC_DCDS		21.19	20.85	21.78
LC_LC3		21.02	21.2	20.8
LC_LC5		21.21	20.91	21.17
LC_LCDSSLCC		21.16	21	21.09
FR_FR4		20.72	20.62	20.83
FR_FRRD		20.25	20.86	20.59
FR_FR2		20.44	20.52	21.33
FR_MULTIPLATE		20.39	20.35	21.33

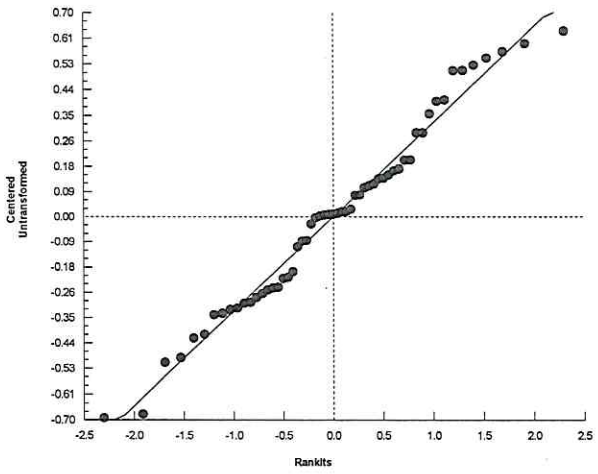
Reference sites

Salmonid Embryo-Alevin-~~Fry~~ Survival Development and Growth Test **Nautilus Environmental**

Analysis ID:	01-1302-6077	**Endpoint:**	Length-mm	**CETIS Version:**	CETISv1.9.4
Analyzed:	20 Aug-21 17:22	**Analysis:**	Parametric-Control vs Treatments	**Status Level:**	1

Graphics





Reference sites

Analyst: _____ QA: Aug. 24/21

Salmonid Embryo-Alevin-~~Fry~~ Survival Development and Growth Test — **Nautilus Environmental**

Analysis ID:	02-9969-2347	**Endpoint:**	Mean ~~Dry~~ Weight-mg	**CETIS Version:**	CETISv1.9.4
Analyzed:	20 Aug-21 17:22	**Analysis:**	Nonparametric-Two Sample	**Status Level:**	1
Batch ID:	07-9799-9310	**Test Type:**	Survival-Development-Growth	**Analyst:**	Yvonne Lam
Start Date:	19 May-21 17:35	**Protocol:**	EC/EPS 1/RM/28	**Diluent:**	Dechlorinated Tap Water
Ending Date:	18 Jun-21 08:05	**Species:**	Oncorhynchus mykiss	**Brine:**	
Test Length:	29d 14h	**Taxon:**	Actinopterygii	**Source:**	Ted's Trout, Campbell Lake **Age:**

	Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
①	FR_UFR1	12-4424-2146	18 May-21	19 May-21 11:20	42h (2.3 °C)	Teck Coal	
②	GH_ER2	02-4275-7088	18 May-21 09:55	19 May-21 11:20	32h (0.4 °C)		
③	CM_MC1	01-4263-6393	18 May-21 11:08	19 May-21 11:20	30h (1.1 °C)		
④	LC_SLC	12-1662-7355	18 May-21 09:45	19 May-21 11:20	32h (4.1 °C)		
	FR_FRABCH	05-6713-4959	18 May-21	19 May-21 11:20	42h (1.9 °C)		
	FR_FRCP1	19-8027-7867	18 May-21	19 May-21 11:20	42h (1.2 °C)		
	GH_FR1	15-9886-5398	18 May-21 12:30	19 May-21 11:20	29h (0.1 °C)		
	GH_ERC	21-0704-4941	18 May-21 11:20	19 May-21 11:20	30h (0.6 °C)		
	CM_MC2	17-6814-6287	18 May-21 09:50	19 May-21 11:20	32h (1.1 °C)		
	EV_MC2	15-5628-9197	18 May-21 13:00	19 May-21 11:20	29h (3.6 °C)		
	EV_HC1	05-8730-9056	18 May-21 11:20	19 May-21 11:20	30h (4.8 °C)		
	LC_DCDS	20-0340-1068	18 May-21 11:00	19 May-21 11:20	31h (4.6 °C)		
	LC_LC3	18-4816-9590	18 May-21 10:15	19 May-21 11:20	31h (4.7 °C)		
	LC_LC5	03-8768-2280	18 May-21 09:50	19 May-21 11:20	32h (5.2 °C)		
	LC_LCDSSLCC	02-2977-6783	18 May-21 11:00	19 May-21 11:20	31h (4.3 °C)		
	FR_FR4	17-1641-7069	18 May-21 09:29	19 May-21 11:20	32h (4.6 °C)		
	FR_FRRD	06-3190-8505	18 May-21 08:22	19 May-21 11:20	33h (3.4 °C)		
	FR_FR2	11-2149-8709	18 May-21 10:28	19 May-21 11:20	31h (4.6 °C)		
	FR_MULTIPLATE	16-7235-2081	18 May-21 11:21	19 May-21 11:20	30h (3.4 °C)		

All samples spiked with 20 mg/L Cu

① reference sites

	Sample Code	Material Type	Sample Source	Station Location	Lat/Long
①	FR_UFR1	Water Sample	Teck Coal	FR_UFR1_WEK_2021-05-1	
②	GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-05-18_	
③	CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-05-18	
④	LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-05-18_	
	FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_WEK_2021-	
	FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_WEK_2021-05	
	GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-05-18_	
	GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-05-18	
	CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-05-18	
	EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2020_Q2_W	
	EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2020_Q2_W	
	LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-05-18	
	LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-05-18_	
	LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-05-18_	
	LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	
	FR_FR4	Water Sample	Teck Coal	FR_FR4_WS_2021-05-18_	
	FR_FRRD	Water Sample	Teck Coal	FR_FRRD_WS_2021-05-18	
	FR_FR2	Water Sample	Teck Coal	FR_FR2_WS_2021-05-18_	
	FR_MULTIPLATE	Water Sample	Teck Coal	FR_MULTIPLATE_WS_202	

Salmonid Embryo-Alevin-~~Fry~~ Survival Development and Growth Test — **Nautilus Environmental**

Analysis ID:	02-9969-2347	**Endpoint:**	Mean ~~Dry~~ Weight-mg	**CETIS Version:**	CETISv1.9.4
Analyzed:	20 Aug-21 17:22	**Analysis:**	Nonparametric-Two Sample	**Status Level:**	1

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	FR_UFR1 passed mean dry weight-mg	25.13%
		GH_ER2 passed mean dry weight-mg	25.13%
		LC_SLC passed mean dry weight-mg	25.13%
		FR_FRABCH passed mean dry weight-mg	25.13%
		FR_FRCP1 passed mean dry weight-mg	25.13%
		GH_FR1 passed mean dry weight-mg	25.13%
		GH_ERC passed mean dry weight-mg	25.13%
		CM_MC2 passed mean dry weight-mg	25.13%
		EV_MC2 passed mean dry weight-mg	25.13%
		EV_HC1 passed mean dry weight-mg	25.13%
		LC_DCDS passed mean dry weight-mg	25.13%
		LC_LC3 passed mean dry weight-mg	25.13%
		LC_LC5 passed mean dry weight-mg	25.13%
		LC_LCDSSLCC passed mean dry weight-mg	25.13%
		FR_FR4 passed mean dry weight-mg	25.13%
		FR_FRRD passed mean dry weight-mg	25.13%
		FR_FR2 passed mean dry weight-mg	25.13%
		FR_MULTIPLATE passed mean dry weight-m	25.13%

Wilcoxon Rank Sum Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)
Site Control (CM_MC1)		FR_UFR1	9	n/a	0	4	Exact	0.3500	Non-Significant Effect
		GH_ER2	11	n/a	0	4	Exact	0.6500	Non-Significant Effect
		LC_SLC	11	n/a	0	4	Exact	0.6500	Non-Significant Effect
		FR_FRABCH	12	n/a	0	4	Exact	0.8000	Non-Significant Effect
		FR_FRCP1	12	n/a	0	4	Exact	0.8000	Non-Significant Effect
		GH_FR1	13	n/a	0	4	Exact	0.9000	Non-Significant Effect
		GH_ERC	13	n/a	0	4	Exact	0.9000	Non-Significant Effect
		CM_MC2	12	n/a	0	4	Exact	0.8000	Non-Significant Effect
		EV_MC2	12	n/a	0	4	Exact	0.8000	Non-Significant Effect
		EV_HC1	12	n/a	0	4	Exact	0.8000	Non-Significant Effect
		LC_DCDS	14	n/a	0	4	Exact	0.9500	Non-Significant Effect
		LC_LC3	12	n/a	0	4	Exact	0.8000	Non-Significant Effect
		LC_LC5	12	n/a	0	4	Exact	0.8000	Non-Significant Effect
		LC_LCDSSLCC	14	n/a	0	4	Exact	0.9500	Non-Significant Effect
		FR_FR4	12	n/a	0	4	Exact	0.8000	Non-Significant Effect
		FR_FRRD	11	n/a	0	4	Exact	0.6500	Non-Significant Effect
		FR_FR2	11	n/a	0	4	Exact	0.6500	Non-Significant Effect
		FR_MULTIPLATE	14	n/a	0	4	Exact	0.9500	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	1778.72	98.8176	18	0.5576	0.9076	Non-Significant Effect
Error	6734.91	177.234	38			
Total	8513.62		56			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance Test	3.477	34.81	0.9999	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9273	0.9434	0.0021	Non-Normal Distribution

Salmonid Embryo-Alevin-~~Fry~~ Survival Development and Growth Test — **Nautilus Environmental**

Analysis ID:	02-9969-2347	**Endpoint:**	Mean-~~Dry~~ wet Weight-mg	**CETIS Version:**	CETISv1.9.4
Analyzed:	20 Aug-21 17:22	**Analysis:**	Nonparametric-Two Sample	**Status Level:**	1

Mean ~~Dry~~ wet Weight-mg Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
① FR_UFR1		3	87.5	53.88	121.1	80.38	79	103.1	7.814	15.47%	0.00%
① GH_ER2		3	97.75	62.11	133.4	90.4	88.57	114.3	8.284	14.68%	-11.72%
① CM_MC1	XC	3	92.22	66.65	117.8	91.15	82.5	103	5.942	11.16%	-5.40%
① LC_SLC		3	95.25	74.57	115.9	98.15	85.86	101.7	4.807	8.74%	-8.86%
FR_FRABCH		3	99.46	68.01	130.9	96.54	88.52	113.3	7.311	12.73%	-13.68%
FR_FRCP1		3	96.93	73.53	120.3	98.93	86.67	105.2	5.439	9.72%	-10.78%
GH_FR1		3	98.55	72.94	124.2	93.85	91.43	110.4	5.952	10.46%	-12.63%
GH_ERC		3	105.4	77.71	133.1	99.64	98.33	118.3	6.44	10.58%	-20.48%
CM_MC2		3	100.5	54.84	146.2	96	84.83	120.8	10.62	18.30%	-14.90%
EV_MC2		3	100.7	68.51	132.9	102.3	87	112.8	7.48	12.87%	-15.08%
EV_HC1		3	99.64	73.3	126	102.8	87.83	108.3	6.122	10.64%	-13.88%
LC_DCDS		3	108.6	75.73	141.4	104.1	98.15	123.4	7.633	12.18%	-24.09%
LC_LC3		3	100.6	58.03	143.2	91.85	89.63	120.4	9.897	17.04%	-15.00%
LC_LC5		3	104.2	53.37	155	99.64	86.36	126.5	11.81	19.63%	-19.06%
LC_LCDSSLCC		3	111.5	79.21	143.8	113.6	97.59	123.3	7.505	11.66%	-27.43%
FR_FR4		3	97.51	73.3	121.7	94	90	108.5	5.626	9.99%	-11.44%
FR_FRRD		3	94.73	60.12	129.3	88.1	85.36	110.7	8.044	14.71%	-8.27%
FR_FR2		3	97.42	60.52	134.3	90.74	87.08	114.4	8.576	15.25%	-11.35%
FR_MULTIPLATE		3	106.6	77.27	135.9	113.3	92.96	113.5	6.814	11.07%	-21.82%

Mean ~~Dry~~ wet Weight-mg Detail

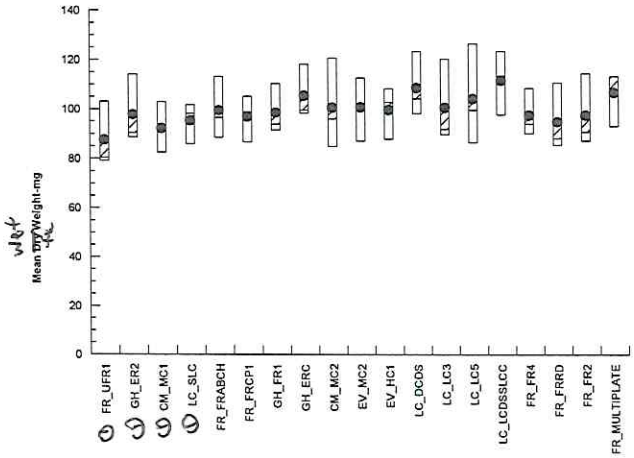
Sample	Code	Rep 1	Rep 2	Rep 3
① FR_UFR1		79	80.38	103.1
① GH_ER2		90.4	88.57	114.3
① CM_MC1	XC	82.5	91.15	103
① LC_SLC		85.86	101.7	98.15
FR_FRABCH		88.52	96.54	113.3
FR_FRCP1		86.67	98.93	105.2
GH_FR1		93.85	91.43	110.4
GH_ERC		99.64	98.33	118.3
CM_MC2		84.83	96	120.8
EV_MC2		87	102.3	112.8
EV_HC1		102.8	87.83	108.3
LC_DCDS		104.1	98.15	123.4
LC_LC3		89.63	91.85	120.4
LC_LC5		99.64	86.36	126.5
LC_LCDSSLCC		113.6	97.59	123.3
FR_FR4		108.5	94	90
FR_FRRD		85.36	88.1	110.7
FR_FR2		90.74	87.08	114.4
FR_MULTIPLATE		92.96	113.3	113.5

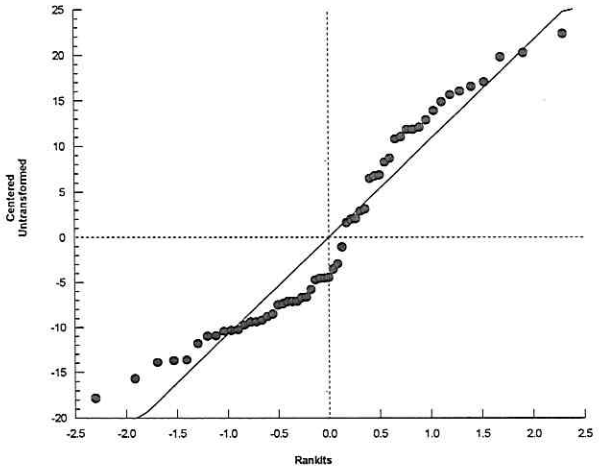
① Reference sites

Salmonid Embryo-Alevin-Fry Survival Development and Growth Test — **Nautilus Environmental**

Analysis ID:	02-9969-2347	**Endpoint:**	Mean Dry Weight-mg	**CETIS Version:**	CETISv1.9.4
Analyzed:	20 Aug-21 17:22	**Analysis:**	Nonparametric-Two Sample	**Status Level:**	1

Graphics





① Reference sites

Salmonid Embryo-Alevin-~~Fry~~ Survival Development and Growth Test — **Nautilus Environmental**

Analysis ID:	12-8427-3310	**Endpoint:**	Length-mm	**CETIS Version:**	CETISv1.9.4
Analyzed:	20 Aug-21 17:25	**Analysis:**	Parametric-Control vs Treatments	**Status Level:**	1
Batch ID:	07-9799-9310	**Test Type:**	Survival-Development-Growth	**Analyst:**	Yvonne Lam
Start Date:	19 May-21 17:35	**Protocol:**	EC/EPS 1/RM/28	**Diluent:**	Dechlorinated Tap Water
Ending Date:	18 Jun-21 08:05	**Species:**	Oncorhynchus mykiss	**Brine:**	
Test Length:	29d 14h	**Taxon:**	Actinopterygii	**Source:**	Ted's Trout, Campbell Lake **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
① FR_UFR1	12-4424-2146	18 May-21	19 May-21 11:20	42h (2.3 °C)	Teck Coal	
① GH_ER2	02-4275-7088	18 May-21 09:55	19 May-21 11:20	32h (0.4 °C)		
① CM_MC1	01-4263-6393	18 May-21 11:08	19 May-21 11:20	30h (1.1 °C)		
① LC_SLC	12-1662-7355	18 May-21 09:45	19 May-21 11:20	32h (4.1 °C)		
FR_FRABCH	05-6713-4959	18 May-21	19 May-21 11:20	42h (1.9 °C)		
FR_FRCP1	19-8027-7867	18 May-21	19 May-21 11:20	42h (1.2 °C)		
GH_FR1	15-9886-5398	18 May-21 12:30	19 May-21 11:20	29h (0.1 °C)		
GH_ERC	21-0704-4941	18 May-21 11:20	19 May-21 11:20	30h (0.6 °C)		
CM_MC2	17-6814-6287	18 May-21 09:50	19 May-21 11:20	32h (1.1 °C)		
EV_MC2	15-5628-9197	18 May-21 13:00	19 May-21 11:20	29h (3.6 °C)		
EV_HC1	05-8730-9056	18 May-21 11:20	19 May-21 11:20	30h (4.8 °C)		
LC_DCDS	20-0340-1068	18 May-21 11:00	19 May-21 11:20	31h (4.6 °C)		
LC_LC3	18-4816-9590	18 May-21 10:15	19 May-21 11:20	31h (4.7 °C)		
LC_LC5	03-8768-2280	18 May-21 09:50	19 May-21 11:20	32h (5.2 °C)		
LC_LCDSSLCC	02-2977-6783	18 May-21 11:00	19 May-21 11:20	31h (4.3 °C)		
FR_FR4	17-1641-7069	18 May-21 09:29	19 May-21 11:20	32h (4.6 °C)		
FR_FRRD	06-3190-8505	18 May-21 08:22	19 May-21 11:20	33h (3.4 °C)		
FR_FR2	11-2149-8709	18 May-21 10:28	19 May-21 11:20	31h (4.6 °C)		
FR_MULTIPLATE	16-7235-2081	18 May-21 11:21	19 May-21 11:20	30h (3.4 °C)		

All samples spiked with 20 mg/L Cu

① Reference sites

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
① FR_UFR1	Water Sample	Teck Coal	FR_UFR1_WEK_2021-05-1	
① GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-05-18_	
① CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-05-18	
① LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-05-18_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_WEK_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_WEK_2021-05	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-05-18_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-05-18	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-05-18	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2020_Q2_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2020_Q2_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-05-18	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-05-18_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-05-18_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	
FR_FR4	Water Sample	Teck Coal	FR_FR4_WS_2021-05-18_	
FR_FRRD	Water Sample	Teck Coal	FR_FRRD_WS_2021-05-18	
FR_FR2	Water Sample	Teck Coal	FR_FR2_WS_2021-05-18_	
FR_MULTIPLATE	Water Sample	Teck Coal	FR_MULTIPLATE_WS_202	

Salmonid Embryo-Alevin-~~Fry~~ Survival Development and Growth Test — **Nautilus Environmental**

Analysis ID:	12-8427-3310	**Endpoint:**	Length-mm	**CETIS Version:**	CETISv1.9.4
Analyzed:	20 Aug-21 17:25	**Analysis:**	Parametric-Control vs Treatments	**Status Level:**	1

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	FR_UFR1 passed length-mm	4.33%
		GH_ER2 passed length-mm	4.33%
		CM_MC1 passed length-mm	4.33%
		FR_FRABCH passed length-mm	4.33%
		FR_FRCP1 passed length-mm	4.33%
		GH_FR1 passed length-mm	4.33%
		GH_ERC passed length-mm	4.33%
		CM_MC2 passed length-mm	4.33%
		EV_MC2 passed length-mm	4.33%
		EV_HC1 passed length-mm	4.33%
		LC_DCDS passed length-mm	4.33%
		LC_LC3 passed length-mm	4.33%
		LC_LC5 passed length-mm	4.33%
	① Reference sites	LC_LCDSSLCC passed length-mm	4.33%
		FR_FR4 passed length-mm	4.33%
		FR_FRRD passed length-mm	4.33%
		FR_FR2 passed length-mm	4.33%
		FR_MULTIPLATE passed length-mm	4.33%

Dunnett Multiple Comparison Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
① Unamended Sampl		① FR_UFR1	-1.689	2.727	0.876	4	CDF	0.9999	Non-Significant Effect
(LC_SLC)		① GH_ER2	-0.3268	2.727	0.876	4	CDF	0.9790	Non-Significant Effect
		① CM_MC1	-1.434	2.727	0.876	4	CDF	0.9996	Non-Significant Effect
		FR_FRABCH	-1.197	2.727	0.876	4	CDF	0.9991	Non-Significant Effect
		FR_FRCP1	-0.06328	2.727	0.876	4	CDF	0.9554	Non-Significant Effect
		GH_FR1	-1.228	2.727	0.876	4	CDF	0.9992	Non-Significant Effect
		GH_ERC	-2.133	2.727	0.876	4	CDF	1.0000	Non-Significant Effect
		CM_MC2	-1.777	2.727	0.876	4	CDF	0.9999	Non-Significant Effect
		EV_MC2	-1.536	2.727	0.876	4	CDF	0.9998	Non-Significant Effect
		EV_HC1	-0.692	2.727	0.876	4	CDF	0.9936	Non-Significant Effect
		LC_DCDS	-3.17	2.727	0.876	4	CDF	1.0000	Non-Significant Effect
		LC_LC3	-2.342	2.727	0.876	4	CDF	1.0000	Non-Significant Effect
		LC_LC5	-2.631	2.727	0.876	4	CDF	1.0000	Non-Significant Effect
		LC_LCDSSLCC	-2.585	2.727	0.876	4	CDF	1.0000	Non-Significant Effect
		FR_FR4	-1.466	2.727	0.876	4	CDF	0.9997	Non-Significant Effect
		FR_FRRD	-0.9731	2.727	0.876	4	CDF	0.9977	Non-Significant Effect
		FR_FR2	-1.594	2.727	0.876	4	CDF	0.9998	Non-Significant Effect
		FR_MULTIPLATE	-1.356	2.727	0.876	4	CDF	0.9995	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	4.11494	0.228608	18	1.476	0.1534	Non-Significant Effect
Error	5.88419	0.154847	38			
Total	9.99913		56			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance Test	22.89	34.81	0.1949	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9771	0.9434	0.3516	Normal Distribution

Salmonid Embryo-Alevin-Fry Survival Development and Growth Test — Nautilus Environmental

Analysis ID: 12-8427-3310 Endpoint: Length-mm CETIS Version: CETISv1.9.4
Analyzed: 20 Aug-21 17:25 Analysis: Parametric-Control vs Treatments Status Level: 1

Length-mm Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
FR_UFR1		3	20.8	20.19	21.4	20.93	20.52	20.94	0.1399	1.16%	0.00%
GH_ER2		3	20.36	18.83	21.89	20.52	19.68	20.88	0.3557	3.03%	2.10%
CM_MC1		3	20.71	20.2	21.23	20.73	20.5	20.91	0.119	0.99%	0.39%
LC_SLC	US	3	20.25	18.97	21.54	20	19.91	20.85	0.298	2.55%	2.61%
FR_FRABCH		3	20.64	19.64	21.64	20.65	20.23	21.04	0.2327	1.95%	0.76%
FR_FRCP1		3	20.27	19.19	21.36	20.41	19.79	20.63	0.2525	2.16%	2.51%
GH_FR1		3	20.65	20.07	21.23	20.75	20.38	20.82	0.1352	1.13%	0.71%
GH_ERC		3	20.94	20.88	21	20.95	20.91	20.96	0.01321	0.11%	-0.69%
CM_MC2		3	20.82	19.57	22.08	20.83	20.32	21.33	0.2907	2.42%	-0.14%
EV_MC2		3	20.75	19.57	21.92	20.5	20.45	21.29	0.2731	2.28%	0.24%
EV_HC1		3	20.48	18.98	21.97	20.77	19.78	20.88	0.3482	2.95%	1.54%
LC_DCDS		3	21.27	20.11	22.43	21.19	20.85	21.78	0.2699	2.20%	-2.29%
LC_LC3		3	21.01	20.5	21.51	21.02	20.8	21.2	0.118	0.97%	-1.01%
LC_LC5		3	21.1	20.69	21.51	21.18	20.91	21.21	0.09582	0.79%	-1.46%
LC_LCDSSLCC		3	21.08	20.88	21.29	21.09	21	21.16	0.0467	0.38%	-1.38%
FR_FR4		3	20.73	20.46	20.99	20.72	20.62	20.83	0.06149	0.51%	0.34%
FR_FRRD		3	20.57	19.81	21.32	20.59	20.25	20.86	0.1757	1.48%	1.11%
FR_FR2		3	20.77	19.54	21.99	20.52	20.44	21.33	0.2844	2.37%	0.15%
FR_MULTIPLATE		3	20.69	19.32	22.06	20.39	20.35	21.33	0.3183	2.66%	0.51%

Length-mm Detail

Sample	Code	Rep 1	Rep 2	Rep 3
FR_UFR1		20.52	20.94	20.93
GH_ER2		20.88	19.68	20.52
CM_MC1		20.91	20.5	20.73
LC_SLC	US	19.91	20.85	20
FR_FRABCH		21.04	20.23	20.65
FR_FRCP1		20.41	19.79	20.63
GH_FR1		20.75	20.38	20.82
GH_ERC		20.95	20.96	20.91
CM_MC2		20.83	20.32	21.33
EV_MC2		20.45	20.5	21.29
EV_HC1		20.88	19.78	20.77
LC_DCDS		21.19	20.85	21.78
LC_LC3		21.02	21.2	20.8
LC_LC5		21.21	20.91	21.17
LC_LCDSSLCC		21.16	21	21.09
FR_FR4		20.72	20.62	20.83
FR_FRRD		20.25	20.86	20.59
FR_FR2		20.44	20.52	21.33
FR_MULTIPLATE		20.39	20.35	21.33

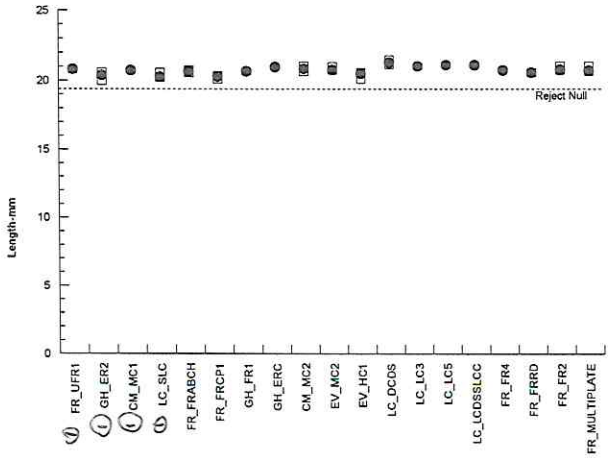
① Reference sites

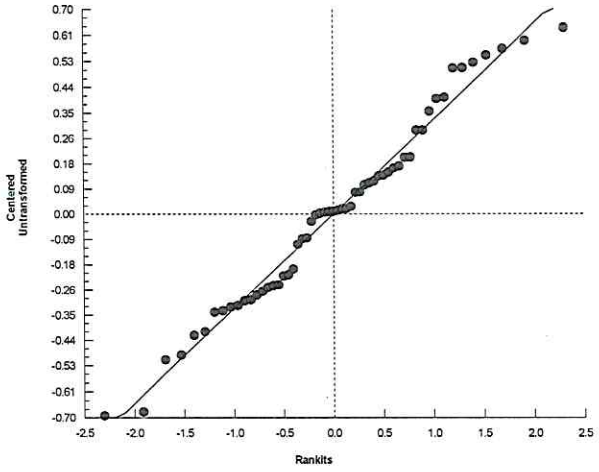
Analyst: JCM QA: Aug. 24/21

Salmonid Embryo-Alevin-~~Fry~~ Survival Development and Growth Test — **Nautilus Environmental**

Analysis ID:	12-8427-3310	**Endpoint:**	Length-mm	**CETIS Version:**	CETISv1.9.4
Analyzed:	20 Aug-21 17:25	**Analysis:**	Parametric-Control vs Treatments	**Status Level:**	1

Graphics





① reference sites

Analyst: WW QA: JGe Aug. 24/21

Salmonid Embryo-Alevin-~~Fry~~ Survival Development and Growth Test — **Nautilus Environmental**

Analysis ID:	05-2159-8148	**Endpoint:**	Mean Dry Weight-mg	**CETIS Version:**	CETISv1.9.4
Analyzed:	20 Aug-21 17:26	**Analysis:**	Nonparametric-Two Sample	**Status Level:**	1
Batch ID:	07-9799-9310	**Test Type:**	Survival-Development-Growth	**Analyst:**	Yvonne Lam
Start Date:	19 May-21 17:35	**Protocol:**	EC/EPS 1/RM/28	**Diluent:**	Dechlorinated Tap Water
Ending Date:	18 Jun-21 08:05	**Species:**	Oncorhynchus mykiss	**Brine:**	
Test Length:	29d 14h	**Taxon:**	Actinopterygii	**Source:**	Ted's Trout, Campbell Lake **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
① FR_UFR1	12-4424-2146	18 May-21	19 May-21 11:20	42h (2.3 °C)	Teck Coal	
① GH_ER2	02-4275-7088	18 May-21 09:55	19 May-21 11:20	32h (0.4 °C)		
① CM_MC1	01-4263-6393	18 May-21 11:08	19 May-21 11:20	30h (1.1 °C)		
① LC_SLC	12-1662-7355	18 May-21 09:45	19 May-21 11:20	32h (4.1 °C)		
FR_FRABCH	05-6713-4959	18 May-21	19 May-21 11:20	42h (1.9 °C)		
FR_FRCP1	19-8027-7867	18 May-21	19 May-21 11:20	42h (1.2 °C)		
GH_FR1	15-9886-5398	18 May-21 12:30	19 May-21 11:20	29h (0.1 °C)		
GH_ERC	21-0704-4941	18 May-21 11:20	19 May-21 11:20	30h (0.6 °C)		
CM_MC2	17-6814-6287	18 May-21 09:50	19 May-21 11:20	32h (1.1 °C)		
EV_MC2	15-5628-9197	18 May-21 13:00	19 May-21 11:20	29h (3.6 °C)		
EV_HC1	05-8730-9056	18 May-21 11:20	19 May-21 11:20	30h (4.8 °C)		
LC_DCDS	20-0340-1068	18 May-21 11:00	19 May-21 11:20	31h (4.6 °C)		
LC_LC3	18-4816-9590	18 May-21 10:15	19 May-21 11:20	31h (4.7 °C)		
LC_LC5	03-8768-2280	18 May-21 09:50	19 May-21 11:20	32h (5.2 °C)		
LC_LCDSSLCC	02-2977-6783	18 May-21 11:00	19 May-21 11:20	31h (4.3 °C)		
FR_FR4	17-1641-7069	18 May-21 09:29	19 May-21 11:20	32h (4.6 °C)		
FR_FRRD	06-3190-8505	18 May-21 08:22	19 May-21 11:20	33h (3.4 °C)		
FR_FR2	11-2149-8709	18 May-21 10:28	19 May-21 11:20	31h (4.6 °C)		
FR_MULTIPLATE	16-7235-2081	18 May-21 11:21	19 May-21 11:20	30h (3.4 °C)		

All samples spiked with 20 ug/L Cu

① Reference sites

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
① FR_UFR1	Water Sample	Teck Coal	FR_UFR1_WEK_2021-05-1	
① GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-05-18_	
① CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-05-18	
① LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-05-18_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_WEK_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_WEK_2021-05	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-05-18_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-05-18	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-05-18	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2020_Q2_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2020_Q2_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-05-18	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-05-18_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-05-18_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	
FR_FR4	Water Sample	Teck Coal	FR_FR4_WS_2021-05-18_	
FR_FRRD	Water Sample	Teck Coal	FR_FRRD_WS_2021-05-18	
FR_FR2	Water Sample	Teck Coal	FR_FR2_WS_2021-05-18_	
FR_MULTIPLATE	Water Sample	Teck Coal	FR_MULTIPLATE_WS_202	

Salmonid Embryo-Alevin-Fry Survival Development and Growth Test — **Nautilus Environmental**

Analysis ID: 05-2159-8148 **Endpoint:** Mean Dry Weight-mg **CETIS Version:** CETISv1.9.4
Analyzed: 20 Aug-21 17:26 **Analysis:** Nonparametric-Two Sample **Status Level:** 1

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	FR_UFR1 passed mean dry weight-mg	24.33%
		GH_ER2 passed mean dry weight-mg	24.33%
		CM_MC1 passed mean dry weight-mg	24.33%
		FR_FRABCH passed mean dry weight-mg	24.33%
		FR_FRCP1 passed mean dry weight-mg	24.33%
		GH_FR1 passed mean dry weight-mg	24.33%
		GH_ERC passed mean dry weight-mg	24.33%
		CM_MC2 passed mean dry weight-mg	24.33%
		EV_MC2 passed mean dry weight-mg	24.33%
		EV_HC1 passed mean dry weight-mg	24.33%
		LC_DCDS passed mean dry weight-mg	24.33%
		LC_LC3 passed mean dry weight-mg	24.33%
		LC_LC5 passed mean dry weight-mg	24.33%
		LC_LCDSSLCC passed mean dry weight-mg	24.33%
		FR_FR4 passed mean dry weight-mg	24.33%
		FR_FRRD passed mean dry weight-mg	24.33%
		FR_FR2 passed mean dry weight-mg	24.33%
		FR_MULTIPLATE passed mean dry weight-m	24.33%

① Reference sites

Wilcoxon Rank Sum Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)
① Unamended Sampl		①FR_UFR1	9	n/a	0	4	Exact	0.3500	Non-Significant Effect
(LC-SLC)		①GH_ER2	11	n/a	0	4	Exact	0.6500	Non-Significant Effect
		①CM_MC1	10	n/a	0	4	Exact	0.5000	Non-Significant Effect
		FR_FRABCH	11	n/a	0	4	Exact	0.6500	Non-Significant Effect
		FR_FRCP1	12	n/a	0	4	Exact	0.8000	Non-Significant Effect
		GH_FR1	11	n/a	0	4	Exact	0.6500	Non-Significant Effect
		GH_ERC	13	n/a	0	4	Exact	0.9000	Non-Significant Effect
		CM_MC2	10	n/a	0	4	Exact	0.5000	Non-Significant Effect
		EV_MC2	13	n/a	0	4	Exact	0.9000	Non-Significant Effect
		EV_HC1	13	n/a	0	4	Exact	0.9000	Non-Significant Effect
		LC_DCDS	13.5	n/a	1	4	Exact	0.9500	Non-Significant Effect
		LC_LC3	11	n/a	0	4	Exact	0.6500	Non-Significant Effect
		LC_LC5	12	n/a	0	4	Exact	0.8000	Non-Significant Effect
		LC_LCDSSLCC	13	n/a	0	4	Exact	0.9000	Non-Significant Effect
		FR_FR4	11	n/a	0	4	Exact	0.6500	Non-Significant Effect
		FR_FRRD	10	n/a	0	4	Exact	0.5000	Non-Significant Effect
		FR_FR2	11	n/a	0	4	Exact	0.6500	Non-Significant Effect
		FR_MULTIPLATE	13	n/a	0	4	Exact	0.9000	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	1778.72	98.8176	18	0.5576	0.9076	Non-Significant Effect
Error	6734.91	177.234	38			
Total	8513.62		56			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance Test	3.477	34.81	0.9999	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9273	0.9434	0.0021	Non-Normal Distribution

Salmonid Embryo-Alevin-Fry Survival Development and Growth Test — **Nautilus Environmental**

Analysis ID:	05-2159-8148	**Endpoint:**	Mean Dry Weight-mg
Analyzed:	20 Aug-21 17:26	**Analysis:**	Nonparametric-Two Sample
CETIS Version:	CETISv1.9.4		
Status Level:	1		

Mean Dry Weight-mg Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
① FR_UFR1		3	87.5	53.88	121.1	80.38	79	103.1	7.814	15.47%	0.00%
① GH_ER2		3	97.75	62.11	133.4	90.4	88.57	114.3	8.284	14.68%	-11.72%
① CM_MC1		3	92.22	66.65	117.8	91.15	82.5	103	5.942	11.16%	-5.40%
① LC_SLC	US	3	95.25	74.57	115.9	98.15	85.86	101.7	4.807	8.74%	-8.86%
FR_FRABCH		3	99.46	68.01	130.9	96.54	88.52	113.3	7.311	12.73%	-13.68%
FR_FRCP1		3	96.93	73.53	120.3	98.93	86.67	105.2	5.439	9.72%	-10.78%
GH_FR1		3	98.55	72.94	124.2	93.85	91.43	110.4	5.952	10.46%	-12.63%
GH_ERC		3	105.4	77.71	133.1	99.64	98.33	118.3	6.44	10.58%	-20.48%
CM_MC2		3	100.5	54.84	146.2	96	84.83	120.8	10.62	18.30%	-14.90%
EV_MC2		3	100.7	68.51	132.9	102.3	87	112.8	7.48	12.87%	-15.08%
EV_HC1		3	99.64	73.3	126	102.8	87.83	108.3	6.122	10.64%	-13.88%
LC_DCDS		3	108.6	75.73	141.4	104.1	98.15	123.4	7.633	12.18%	-24.09%
LC_LC3		3	100.6	58.03	143.2	91.85	89.63	120.4	9.897	17.04%	-15.00%
LC_LC5		3	104.2	53.37	155	99.64	86.36	126.5	11.81	19.63%	-19.06%
LC_LCDSSLCC		3	111.5	79.21	143.8	113.6	97.59	123.3	7.505	11.66%	-27.43%
FR_FR4		3	97.51	73.3	121.7	94	90	108.5	5.626	9.99%	-11.44%
FR_FRRD		3	94.73	60.12	129.3	88.1	85.36	110.7	8.044	14.71%	-8.27%
FR_FR2		3	97.42	60.52	134.3	90.74	87.08	114.4	8.576	15.25%	-11.35%
FR_MULTIPLATE		3	106.6	77.27	135.9	113.3	92.96	113.5	6.814	11.07%	-21.82%

Mean Dry Weight-mg Detail

Sample	Code	Rep 1	Rep 2	Rep 3
① FR_UFR1		79	80.38	103.1
① GH_ER2		90.4	88.57	114.3
① CM_MC1		82.5	91.15	103
① LC_SLC	US	85.86	101.7	98.15
FR_FRABCH		88.52	96.54	113.3
FR_FRCP1		86.67	98.93	105.2
GH_FR1		93.85	91.43	110.4
GH_ERC		99.64	98.33	118.3
CM_MC2		84.83	96	120.8
EV_MC2		87	102.3	112.8
EV_HC1		102.8	87.83	108.3
LC_DCDS		104.1	98.15	123.4
LC_LC3		89.63	91.85	120.4
LC_LC5		99.64	86.36	126.5
LC_LCDSSLCC		113.6	97.59	123.3
FR_FR4		108.5	94	90
FR_FRRD		85.36	88.1	110.7
FR_FR2		90.74	87.08	114.4
FR_MULTIPLATE		92.96	113.3	113.5

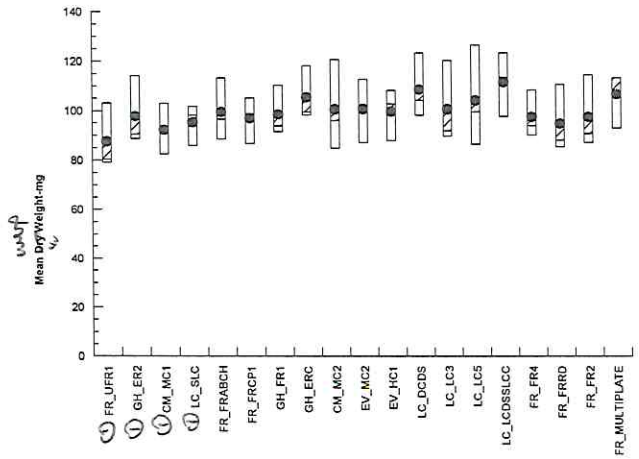
① Reference sites

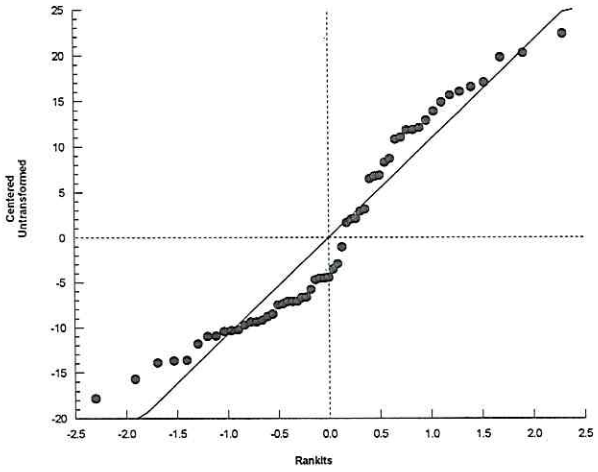
Analyst: _____ QA: _____ 24/2/1

Salmonid Embryo-Alevin-~~Fry~~ Survival Development and Growth Test — **Nautilus Environmental**

Analysis ID:	05-2159-8148	**Endpoint:**	Mean Dry Weight-mg	**CETIS Version:**	CETISv1.9.4
Analyzed:	20 Aug-21 17:26	**Analysis:**	Nonparametric-Two Sample	**Status Level:**	1

Graphics





① Reference sites

Analyst: _____ QA: JOH Aug. 24/21

Client: TECK

W.O.#: 210963

Hardness and Alkalinity Datasheet

		Alkalinity						Hardness			
	Sample ID Week 1	Subsample Date	Date Measured	Sample Volume (mL)	(mL) 0.02N HCL/H_2SO_4 used to pH 4.5	(mL) of 0.02N HCL/H_2SO_4 used to pH 4.2	Total Alkalinity ($mg/LCaCO_3$)	Sample Volume (mL)	Volume of 0.01M EDTA Used (mL)	Total Hardness ($mg/L\ CaCO_3$)	Technician
Dechlor	Lab Control / Dechlor H2O	May 20/21	May 29/21	~~50~~ 100	~~3.4~~ 1.4	~~3.5~~ 1.5	~~66~~ 13	~~50~~ 100	~~6.7~~ 1.2	~~134~~ 12	JZL/GJH
	FR-UFR1			50	5.5	5.6	108	50	5.4	108	
	GH-ER2			50	7.4	7.5	146	50	7.2	144	
	CM-MC1			50	4.7	4.9	90	50	4.7	94	
	LC-SLC			50	5.9	6.0	116	50	5.6	112	
	FR-FRABCH			50	7.9	8.1	154	10 ①	3.2	320	
	FR-FRCP2		↓	50	~~7.9~~ 7.4	7.5	146	10 ①	2.9	290	↓
	GH-FR1		May 31/21	50	7.7	7.8	152	10 ①	2.5	250	RZS
	GH-ERC			50	7.6	7.7	150	50	8.0	160	
	CM-MC2			50	7.3	7.5	142	10 ①	2.4	240	
	EV-MC2			50	4.9	5.0	96	50	5.7	114	
	EV-HC1			50	8.4	8.5	166	10 ①	2.1	210	
	LC-DCDS			50	6.1	6.3	118	10 ①	2.5	250	
	LC-LC3			50	9.2	9.4	180	10 ①	4.0	400	
	LC-LC5			50	8.0	8.1	158	10 ①	2.8	280	
	LC-LCDSSLCC			50	7.4 ~~6.5~~ RZS	7.5 ~~6.5~~ RZS	146	10 ①	2.7 ~~8.0~~ RZS	270	
FR-MULTIPLATE	~~RC-MIDAGE~~			50	6.~~5~~	6.~~7~~	128~~6~~	~~50~~ 10 ①	2~~8~~.0	~~160~~ 200	
	FR-FR4			50	6.9	7.0	136	10 ①	2.5	250	
	FR-FRRD			50	8.5	8.7	166	10 ①	3.8	380	
	FR-FR2	↓	↓	50	6.7	6.8	132	10 ①	2.2	220	↓

Notes: ① Sample was diluted to 100mL w. DI. water

Reviewed by: JGH

Date Reviewed: Aug. 13/21

Client: TECK

W.O.#: 210963

Hardness and Alkalinity Datasheet

	Alkalinity						Hardness			
Sample ID Week 2	Subsample Date	Date Measured	Sample Volume (mL)	(mL) 0.02N HCL/H_2SO_4 used to pH 4.5	(mL) of 0.02N HCL/H_2SO_4 used to pH 4.2	Total Alkalinity (mg/L$CaCO_3$)	Sample Volume (mL)	Volume of 0.01M EDTA Used (mL)	Total Hardness (mg/L $CaCO_3$)	Technician
Dechlor Lab Control/ Dechlor 20	May 26/21	June 6/21	~~50~~ 100	~~3.3~~ 1.5	~~3.4~~ 1.6	~~64~~ 14	~~50~~ 100	~~6.8~~ 1.6	~~136~~ 16	YML
FR-UFR1			50	6.0	6.1	118	50	6.0	120	JZL
GH-ER2			50	7.5	7.6	148	50	7.4	148	
CM-MC1			50	5.2	5.3	102	50	5.0	100	
LC-SLC			50	5.6	5.7	110	50	6.6	132	
FR-FRABCH			50	10.1	10.2	200	10 ①	4.3	430	
FR-FRCP1			50	9.2	9.4	180	10 ①	3.8	380	
GH-FR1			50	9.2	9.3	182	10 ①	3.3	330	
GH-ERC			50	7.6	7.8	148	50	7.8	156	
CM-MC2			50	8.3	8.5	162	10 ①	3.2	320	
EV-MC2			50	5.8	5.9	114	50	7.5	150	
EV-HC1			50	9.2	9.4	180	10 ①	2.7	270	
LC-DCDS			50	5.6	5.8	108	10 ①	2.7	270	JZL
LC-LC3			50	9.1	9.3	178	10 ①	4.2	420	
LC-LC5			50	8.0	8.2	156	10 ①	3.3	330	
LC-LCDSSLCC			50	7.8	7.9	154	10 ①	2.4	240	
FR-MULTIPLATE ~~RG-MIDAG~~ YML			50	6.~~7~~6	6.~~8~~7	13~~2~~0	~~50~~ 10 ①	~~10~~ 2.5	~~204~~ 250	
FR-FR4			50	7.8	7.9	154	10 ①	3.0	300	
FR-FRRD			50	9.4	9.6	184	10 ①	4.6	460	
FR-FR2			50	7.0	7.2	136	10 ①	2.4	240	

Notes: ① Sample was diluted to 100mL w. DI water

Reviewed by: JGu

Date Reviewed: Aug. 13/21

Client: TECK

W.O.#: 210963

Hardness and Alkalinity Datasheet

		Alkalinity						Hardness			
	Sample ID Week 3	Subsample Date	Date Measured	Sample Volume (mL)	(mL) 0.02N HCL/H_2SO_4 used to pH 4.5	(mL) of 0.02N HCL/H_2SO_4 used to pH 4.2	Total Alkalinity (mg/L$CaCO_3$)	Sample Volume (mL)	Volume of 0.01M EDTA Used (mL)	Total Hardness (mg/L $CaCO_3$)	Technician
Rechlor	Lab Control Rechlor-t2	June 2/21	June 9/21	~~50~~ 100	~~7.2~~ 1.5	~~3.3~~ 1.6	~~62~~ 14	~~50~~ 100	1.86	~~150~~ 16	JRL / GM
	FR-UFR1			50	5.4	5.5	106	50	5.5	110	
	GH-ER2			50	6.8	6.9	134	50	7.1	142	
	CM-MC1			50	4.5	4.6	88	50	4.3	86	
	LC-SLC			50	5.5	5.6	108	50	5.7	114	
	FR-FRABCH			50	8.0	8.3	154	10①	3.5	350	
	FR-FRCP1			50	7.6	7.8	148	10①	2.7	270	
	GH-FR1			50	7.6	7.8	148	10①	2.4	240	
	GH-ERC			50	7.0	7.1	138	~~10~~ 50	7.7	154	
	CM-MC2			50	6.5	6.6	128	10①	2.4	240	
	EV-MC2			50	6.4	6.6	124	50	10.9	218	
	EV-MC1			50	7.6	7.7	150	10①	2.4	240	
	LC-DCDS			50	5.7	5.8	112	10①	2.2	220	
	LC-LC3			50	8.3	8.6	160	10①	3.0	300	
	LC-LC5			50	7.5	7.7	146	10①	2.3	230	
	LC-LCDSSLCC			50	6.7	6.9	130	10①	2.1	210	
FR-MULTIPLATE	~~RG-MIDAG~~			50	~~5.8~~ 6.0	~~6.0~~ 6.2	~~112~~ 116	~~50~~ 100①	1.78	~~150~~ 170	
	FR-FR4			50	6.7	6.8	132	10①	2.1	210	
	FR-FRRD			50	8.5	8.7	166	10①	3.4	340	
	FR-FR2	↓	↓	50	6.4	6.5	126	10①	1.8	180	↓

Notes: ① sample was diluted to 100mL w/ DI. water

Reviewed by: JRL Date Reviewed: Aug. 13/21

Client: TECK

W.O.#: 210963

Hardness and Alkalinity Datasheet

	Alkalinity						Hardness			
Sample ID Week 4	Subsample Date	Date Measured	Sample Volume (mL)	(mL) 0.02N HCL/H_2SO_4 used to pH 4.5	(mL) of 0.02N HCL/H_2SO_4 used to pH 4.2	Total Alkalinity (mg/L$CaCO_3$)	Sample Volume (mL)	Volume of 0.01M EDTA Used (mL)	Total Hardness (mg/L $CaCO_3$)	Technician
Dechlor Lab Control + Dechlor+20	June 9/21	June 16/21	~~50~~ 100	~~3.2~~ 1.6	~~3.3~~ 1.7	~~62~~ 15	~~50~~ 100	~~6.8~~ 1.7	~~136~~ 17	RZS
FR-UFR1			50	5.4	5.5	106	50	6.0	120	
GH-ER2			50	6.2	6.4	120	50	7.0	140	
CM-MC1			50	4.4	4.5	86	50	4.8	96	
LC-SLC			50	5.7	5.9	110	50	6.2	124	
FR-FRABCH			50	9.8	10.0	192	10①	4.5	450	
FR-FRCP1			50	9.1	9.2	180	10①	3.9	390	
GH-FR1			50	8.3	8.6	160	10①	3.4	340	
GH-ERC			50	6.6	6.8	128	50	7.3	146	
CM-MC2			50	7.0	7.2	136	10①	2.8	280	
EV-MC2			50	5.2	5.4	100	50	7.3	146	
EV-HC1			50	7.7	7.9	150	10①	2.6	260	
LC-DCDS			50	5.5	5.7	106	10①	2.5	250	
LC-LC3			50	7.7	7.9	150	10①	2.9	290	
LC-LC5			50	7.8	8.0	152	10①	2.7	270	
LC-LCDSSLCC			50	7.1	7.4	136	10①	2.8	280	
FR-MULTIPLATE ~~RG-MIDAG~~			50	6.12	6.54	120	~~50~~ 10①	~~10~~ 20	200	
FR-FR4			50	7.8	8.0	152	10①	3.5	350	
FR-FRRD			50	10.0	10.2	196	10①	4.5	450	RZS
FR-FR2			50	7.1	7.2	140	10①	2.3	230	RZS

Notes: ① sample diluted to 100 mL w/ DI water

Reviewed by: [signature] Date Reviewed: Aug. 13/21

Version 1.1 Issued July 28, 2016

Nautilus Environmental Company Inc.

Client: Teck

W.O.#: 210963

Hardness and Alkalinity Datasheet

	Alkalinity							Hardness			
Sample ID (week 5)	Subsample Date	Date Measured	Sample Volume (mL)	(mL) 0.02N HCL/H_2SO_4 used to pH 4.5	(mL) of 0.02N HCL/H_2SO_4 used to pH 4.2	Total Alkalinity ($mg/LCaCO_3$)		Sample Volume (mL)	Volume of 0.01M EDTA Used (mL)	Total Hardness ($mg/L\ CaCO_3$)	Technician
FR_UFR1	June 16/21	July 12/21	50	7.4	7.5	146		50	7.5	150	MDO
GH-ER2			50	7.8	8.0	152		50	8.0	160	MDO
CM_MC1			50	6.1	6.2	120		50	6.1	122	MDO
LC_SLC			50	~~6.4~~ 6.8	6.9	134		50	7.1	142	MDO
FR_FRABCH			50	6.9	7.1	134		100	3.9	390	MDO
FR_FRCP1			50	8.5	8.7	166		10①	4.6	460	MDO/
GH-FR1			50	8.3	8.5	162		10①	4.9	490	MDO
GH-ERC			50	8.5	8.6	168		50	9.2	184	MDO
CM_MC2			50	9.6	9.8	188		100	3.0	300	MDO
EV_MC2			50	8.1	8.2	160		50	11.4	228	MDO
EV_MC1			50	7.7	7.9	150		100	3.3	330	MDO
LC-DCDS			50	~~9.6~~ 9.7	9.9	190		100	5.4	540	MDO
LC_LC3			50	8.0	8.2	156		100	4.1	410	MDO
LC_LCS			50	7.0	7.2	136		100	3.2	320	MDO
LC_LCDSSLCC			50	9.6	9.8	188		100	3.9	390	MDO
FR_FR4			50	6.8	7.0	132		10①	4.4	440	MDO
FR_FRRD			50	6.8	6.9	134		100	5.4	540	MDO
FR_FR2			50	9.3	9.5	182		100	2.9	290	MDO
FR_MULTIPLATE			50	8.7	8.9	170		100	3.0	300	MDO
Dechlor Lab Control	Dechlor 220	↓	100	1.6	1.7	15		100	1.7	17	MM

Notes: ① Diluted to 100 mL w/ DI water

Reviewed by: JGH Date Reviewed: Aug. 13/21

APPENDIX E - Chain-of-custody forms

Teck

COC ID: 5/18/2021 | TURNAROUND TIME: | RUSH:

PROJECT/CLIENT INFO				LABORATORY				OTHER INFO			
Facility Name / Job#	Fording River Operation			Lab Name	Nautilus Environmental - BC			Report Format / Distribution		Excel	PDF	EDD
Project Manager	Scott Roughead			Lab Contact				Email 1:	david.burroughs@teck.com	X	X	X
Email	scott.roughead@teck.com			Email	BCinfo@nautilusenvironmental.ca			Email 2:	britt.anderson@teck.com	X	X	X
Address				Address	8664 Commerce Court			Email 3:	scott.roughead@teck.com	X	X	X
								Email 4:	teckcoal@equisonline.com			X
City	Elkford	Province	BC	City	Burnaby	Province	BC	Email 5:	carlie.meyer@teck.com	X	X	X
Postal Code		Country	Canada	Postal Code	V5A 4N7	Country	Canada	Email 6:	cait.good@teck.com	X	X	X
Phone Number	1-250-433-6976			Phone Number	604-420-8773							

SAMPLE DETAILS / ANALYSIS REQUESTED

Filtered - F: Field, L: Lab, FL: Field & Lab, N: None

Sample ID	Sample Location (sys_loc_code)	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	TIR	PRESERV.	ANALYSIS: 7-d C.dubia P/F	7-d C.dubia P/F (EDTA)	72-hr P. subcapitata P/F	30-d embryo EA P/F	28-d Hyalella P/F	28-d Hyalella P/F (EDTA)				
FR_FR4_WS_2021-05-18_N	FR_FR4	WS	NO	5/18/2021	9:29	G	4			X			4	4					4.6-4.8
FR_FRRD_WS_2021-05-18_N	FR_FRRD	WS	NO	5/18/2021	8:22	G	4			X			4	4					3.4-3.8
FR_FR2_WS_2021-05-18_N	FR_FR2	WS	NO	5/18/2021	10:28	G	4			X			4	4					4.6-5.8
FR_MULTIPLATE_WS_2021-05-18_NP	FR_MULTIPLATE	WS	NO	5/18/2021	11:21	G	4			X			4	4					3.4-3.7
													210963	210964					

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
-Only 2 containers for FRRD arrived -2 containers for DC1 arrived			Tyrone Hamilton Nautilus - Burnaby	May 19/21 @ 11:20 Q2-W1

SERVICE REQUEST (rush - subject to availability)					
Regular (default)	X	Sampler's Name	Tyler Forbin	Mobile #	
Priority (2-3 business days) - 50% surcharge		Sampler's Signature		Date/Time	2021.05.18
Emergency (1 Business Day) - 100% surcharge					
For Emergency <1 Day, ASAP or Weekend - Contact ALS					

Teck

COC ID: 5/18/2021 | TURNAROUND TIME: | RUSH:

PROJECT/CLIENT INFO				LABORATORY				OTHER INFO				
Facility Name / Job#	Fording River Operation			Lab Name	Nautilus Environmental - BC			Report Format / Distribution		Excel	PDF	EDD
Project Manager	Scott Roughead			Lab Contact				Email 1:	david.burroughs@teck.com	X	X	X
Email	scott.roughead@teck.com			Email	BCinfo@nautilusenvironmental.ca			Email 2:	britt.anderson@teck.com	X	X	X
Address				Address	8664 Commerce Court			Email 3:	scott.roughead@teck.com	X	X	X
								Email 4:	teckcoal@equisonline.com			X
City	Elkford	Province	BC	City	Burnaby	Province	BC	Email 5:				
Postal Code		Country	Canada	Postal Code	V5A 4N7	Country	Canada	Email 6:	jared.cayenne@teck.com	X	X	X
Phone Number	1-250-433-6976			Phone Number	604-420-8773			VPO00741382				

SAMPLE DETAILS | **ANALYSIS REQUESTED** (Filtered - F: Field, L: Lab, FL: Field & Lab, N: None)

Sample ID	Sample Location (sys_loc_code)	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	Filt.	PRESERV.	ANALYSIS: 7-d C.dubia P/F	7-d C.dubia P/F (EDTA)	72-hr P. subcapitata P/F	30-d embryo EA P/F	28-d Hyalella P/F	28-d Hyalella P/F (EDTA)						
								NO	NO	NO	NO	NO	NO								
FR_FRCP1_WEK_2021-05-17_N	FR_FRCP1	WS	NO	5/18/2021		G	5			X	X	X	X	X	X					1.2-2.4	
FR_FRABCH_WEK_2021-05-17_N	FR_FRABCH	WS	NO	5/18/2021		G	4			X		X	X	X						1.9-2.8	
FR_UFR1_WEK_2021-05-17_N	FR_UFR1	WS	NO	5/18/2021		G	4			X		X	X	X						2.3-3.3	
										210962	210959	210961	210963	210964	210960						

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
7 COOLERS TOTAL	Cruz Canlas	May 18, 2021	Tyrone Hamilton	May 19/21 @1020
			Nautilus - Burnaby	Q2-Q1

SERVICE REQUEST (rush - subject to availability)

Regular (default)	X
Priority (2-3 business days) - 50% surcharge	
Emergency (1 Business Day) - 100% surcharge	
For Emergency <1 Day, ASAP or Weekend - Contact ALS	

Sampler's Name	Cruz Canlas	Mobile #	250-433-6166
Sampler's Signature		Date/Time	May 18, 2021

Teck

COC ID:	18 th of May, Chronic TOX_Naut	TURNAROUND TIME:	regular	RUSH:	

PROJECT/CLIENT INFO				LABORATORY				OTHER INFO				
Facility Name	Greenhills Operations			Lab Name	Nautilus Environmental			EDD delivery:				
Project Manager	Jeremy Enns			Lab Contact	Richard Chea			Email 1:		x	x	x
Email	jeremy.enns@teck.com			Email				Email 2:		x	x	x
Address	PO Box 5000			Address	8664 Commerce Court			Email 3:	teckcoal@equisonline.com			x
								Email 4:		x	x	x
City	Elkford	Province	BC	City	Burnaby	Province	BC	Email 5:		x	x	x
Postal Code	V0B 1H0	Country	Canada	Postal Code	V5A 4N7	Country	Can	Email 6:	DL-Equis-GHO-Field@teck.com	x	x	x
Phone Number	250 865 3274			Phone Number	403.253.7121			PO number		610307		

SAMPLE DETAILS / ANALYSIS REQUESTED

Please indicate below Filtered, Perserved or both (F, P, F/P)

Sample ID	Sample Location	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	ANALYSIS	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
									210962 7-d C.dubia P/F	210961 72-hr P. subcapitata P/F	210963 30-d embryo EA P/F	210964 28-d Hyalella P/F								
GH_ER2_WS_2021-05-18_N	GH_ER2	WS	N	18/05/2021	9:55	G	4		X	X	X	X							0.4 - 0.5	
GH_ERC_WS_2021-05-18_N	GH_ERC	WS	N	18/05/2021	11:20	G	4		X	X	X	X							0.6 - 1.0	
GH_FR1_WS_2021-05-18_N	GH_FR1	WS	N	18/05/2021	12:30	G	4		X	X	X	X							0.1 - 0.3	

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	Date	Time	Accepted By/Affiliation	Date	Time
				Tyrone Hamilton	May 19/21	@11:20
				Nautilus - Burnaby	02-W1	

SERVICE REQUEST (rush - subject to availability)					
Regular (default)	X	Sampler's Name	SS/RG	Mobile #	
Priority (2-3 business days) - 50% surcharge					
Emergency (1 Business Day) - 100% surcharge		Sampler's Signature		Date/Time	18th of May,2021
For Emergency <1 Day, ASAP or Weekend - Contact ALS					

Teck

COC ID:	20210518CRN1B	TURNAROUND TIME:		RUSH:	

PROJECT/CLIENT INFO				LABORATORY				OTHER INFO				
Facility Name / Job#	Elkview Operations			Lab Name	Nautilus Environmental			Report Format / Distribution		Excel	PDF	EDD
Job Description	Q1 Chronic Sampling			Lab Contact	Jeslin Wijaya			Email 1:	kennedy.Allen@teck.com	x	x	x
Project Manager	Jennifer Dane			Email	jeslin@nautilusenvironmental.ca			Email 2:	teckcoal@equisonline.com			x
Email	jennifer.dane@teck.com			Address	8664 Commerce Court			Email 3:	Colby.bracken@teck.com	x	x	x
Address	RR#1 HWY# 3				Imperial Square Lake City			Email 4:	Chris.emslie@teck.com	x	x	x
								Email 5:	Teck.Lab.Results@teck.com	x	x	x
City	Sparwood	Province	BC	City	Burnaby	Province	BC	PO number	VPO00678876			
Postal Code	V1C 4C3	Country	Canada	Postal Code	V5A 4N7	Country	Canada					
Phone Number	1-250-425-8137			Phone Number	604-420-8773							

SAMPLE DETAILS								ANALYSIS REQUESTED										Filtered - F: Field, L: Lab, FL: Field & Lab, N: None
								FILTERED	No	No	No	No						
								PRESERVED	No	No	No	No						
Sample ID	Sample Location	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	ANALYSIS	7-d C.dubia P/F	72-hr P. subcapitata P/F	30-d embryo EA P/F	28-d H. azteca P/F						
EV_HC1_WS_2020_Q2_WK1_N	EV_HC1	WS	N	5/18/2021	11:20	G	4				4						4.8-5.1	
EV_MC2_WS_2020_Q2_WK1_N	EV_MC2	WS	N	2/18/2021	13:00	G	4				4						3.6-3.8	
											210963	210964						
					Total		8											

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
Toxicity 96-Hr/48-HR = 96 Hr Rainbow Trout pass/fail & 48 Hr Daphnia pass/fail (Daphinia testing to occur at 20 degrees)	C. Bracken	18-May-21	Tyrone Hamilton Nautilus - Burnaby	May 19/21 @11:20 Q2 - W1

NB OF BOTTLES RETURNED/DESCRIPTION					
Regular (default)	X	Sampler's Name	C. Bracken	Mobile #	1-250-425-1101
Priority (2-3 business days) - 50% surcharge					
Emergency (1 Business Day) - 100% surcharge		Sampler's Signature	Colby B	Date/Time	May 18, 2021
For Emergency <1 Day, ASAP or Weekend - Contact ALS					

Teck

COC ID:	Q2_CHRONIC_05182021_Burn	TURNAROUND TIME:	Regular	RUSH:	No

PROJECT/CLIENT INFO				LABORATORY				OTHER INFO				
Facility Name / Job#	Coal Mountain Operations			Lab Name	Nautilus Environmental			Report Format / Distribution		Excel	PDF	EDD
Project Manager	Victoria Sharpe			Lab Contact	Armando Tang			Email 1:	Jay.jones@teck.com	X	X	X
Email	Victoria.Sharpe@teck.com			Email	armando@nautilusenvironmental.ca			Email 2:	teckcoal@equisonline.com			X
								Email 3:	Victoria.Sharpe@teck.com	X	X	X
								Email 4	Don.Sacino@teck.com	X	X	X
Address	PO Box 3000			Address	8664 commerce Court			Email 5:	Shelby.Holden@teck.com	X	X	X
City	Sparwood	Province	BC	City	Burnaby	Province	BC	PO number				
Postal Code	V0B 2G0	Country	Canada	Postal Code	V5A 4N7	Country	Canada					
Phone Number	1-250-425-7522			Phone Number	604-420-8773							

SAMPLE DETAILS								ANALYSIS REQUESTED												Filtered - F: Field, L: Lab, FL: Field & Lab, N: None
								Filt.												
								PRESERV.	210962	210959	210961	210963	210964	210960						
Sample ID	Sample Location	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	ANALYSIS	7-d C.dubia P/F	7-d C.dubia P/F (EDTA)	72-hr P. subcapitata P/F	30-d embryo EA P/F	28-d Hyalella P/F	28-d Hyalella P/F (EDTA)						
CM_MC2_WS_2021-05-18_N	CM_MC2	WS	No	5/18/2021	9:50	G	5		x	x	x	x	x	x					1.1-1.8	
CM_MC1_WS_2021-05-18_N	CM_MC1	WS	No	5/18/2021	11:08	G	4		x		x	x	x						1.1-1.2	
RG_MIDAG_WS_2021-05-18_N	RG_MIDAG	WS	No	5/18/2021	9:15	G	2		x	x			x	x					Q1-1.0	

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
			Tyrone Hamilton	May 19/21 @ 11:20
			Nautilus - Burnaby	Q2-W1

NB OF BOTTLES RETURNED/DESCRIPTION	
Regular (default)	X
Priority (2-3 business days) - 50% surcharge	
Emergency (1 Business Day) - 100% surcharge	
For Emergency <1 Day, ASAP or Weekend - Contact ALS	

Sampler's Name	SH/DS	Mobile #	250 425 7522
Sampler's Signature	SHDS	Date/Time	May 18, 2021

Teck

COC ID:	20210518 Chronic Tox Burn	TURNAROUND TIME:		RUSH:	

PROJECT/CLIENT INFO				LABORATORY				OTHER INFO				
Facility Name / Job#	Line Creek Operation			Lab Name	Nautilus Environmental			Report Format / Distribution		Excel	PDF	EDD
Project Manager	Tom Jeffery			Lab Contact	Armando Tang			Email 1:	tom.jeffery@teck.com	x	x	
Email	tom.jeffery@teck.com			Email	armando@nautilusenvironmental.com			Email 2:	teckcoal@equisonline.com			x
Address	Box 2003			Address	8664 Commerce Crt			Email 3:	drake.tymstra@teck.com	x	x	
	15km North Hwy 43							Email 4:	shanise.fossen@teck.com	x	x	
								Email 5:	tanya.dick@teck.com	x	x	
City	Sparwood	Province	BC	City	Burnaby	Province	BC	PO number	VPO00741384			
Postal Code	V0B 2G0	Country	Canada	Postal Code	V5A 4N7	Country	Canada					
Phone Number	250-425-6111			Phone Number	604-420-8773							

SAMPLE DETAILS / ANALYSIS REQUESTED

Filtered - F: Field, L: Lab, FL: Field & Lab, N: None

Sample ID	Sample Location	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	7-d C.dubia P/F (290962)	72-hr P. subcapitata P/F (210961)	30-d embryo EA P/F (210963)	28-d Hyalella P/F (210964)								
Filt.								N	N	N	N								
PRESERV.								N	N	N	N								
LC_DCDS_WS_2021-05-18_N	LC_DCDS	WS	No	18-May-21	11:00	G	1	x	x	x	x							4.6 -	4.9
LC_LC3_WS_2021-05-18_N	LC_LC3	WS	No	18-May-21	10:15	G	1	x	x	x	x							4.7 -	5.8
LC_SLC_WS_2021-05-18_N	LC_SLC	WS	No	18-May-21	9:45	G	1	x	x	x	x							4.1 -	5.0
LC_LC5_WS_2021-05-18_N	LC_LC5	WS	No	18-May-21	9:50	G	1	x	x	x	x							5.2 -	5.6
LC_LCDSSLCC_WS_2021-05-18_N	LC_LCDSSLCC	WS	No	18-May-21	11:00	G	1	x	x	x	x							4.3 -	5.4

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
Please provide prelimnary update as results are available	S.Fossen [signature]	5/18/2021	Tyrone Hamilton	May 19/21 @ 11:20
			Nautilus - Burnaby	Q2 - W1

NB OF BOTTLES RETURNED/DESCRIPTION					
Regular (default)	X	Sampler's Name	S.Fossen	Mobile #	O: 250-425-3196 / C: 780-223-8222
Priority (2-3 business days) - 50% surcharge					
Emergency (1 Business Day) - 100% surcharge		Sampler's Signature	[signature]	Date/Time	May 18, 2021
For Emergency <1 Day, ASAP or Weekend - Contact ALS					

Teck

COC ID: 5/25/2021 | TURNAROUND TIME: | RUSH:

PROJECT/CLIENT INFO				LABORATORY				OTHER INFO			
Facility Name / Job#	Fording River Operation			Lab Name	Nautilus Environmental - BC			Report Format / Distribution		Excel	PDF	EDD
Project Manager	Scott Roughead			Lab Contact				Email 1:	david.burroughs@teck.com	X	X	X
Email	scott.roughead@teck.com			Email	BCinfo@nautilusenvironmental.ca			Email 2:	britt.anderson@teck.com	X	X	X
Address				Address	8664 Commerce Court			Email 3:	scott.roughead@teck.com	X	X	X
								Email 4:	teckcoal@equisonline.com			X
City	Elkford	Province	BC	City	Burnaby	Province	BC	Email 5:	carlie.meyer@teck.com	X	X	X
Postal Code		Country	Canada	Postal Code	V5A 4N7	Country	Canada	Email 6:	cait.good@teck.com	X	X	X
Phone Number	1-250-433-6976			Phone Number	604-420-8773							

SAMPLE DETAILS | **ANALYSIS REQUESTED** (Filtered - F: Field, L: Lab, FL: Field & Lab, N: None)

Sample ID	Sample Location (sys loc code)	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	FILT.	PRESERV.	ANALYSIS: 7-d C.dubia P/F	7-d C.dubia P/F (EDTA)	72-hr P. subcapitata P/F	30-d embryo EA P/F	28-d Hyalella P/F	28-d Hyalella P/F (EDTA)					
FR_FR4_WS_2021-05-25_N	FR_FR4	WS	NO	5/25/2021	8:32	G	3						X	X					3.6-4.0	
FR_FRRD_WS_2021-05-25_N	FR_FRRD	WS	NO	5/25/2021	7:51	G	3						X	X					3.3-3.6	
FR_FR2_WS_2021-05-25_N	FR_FR2	WS	NO	5/25/2021	9:24	G	3						X	X					4.2-4.6	
FR_MULTIPLATE_WS_2021-05-25_NP	FR_MULTIPLATE	WS	NO	5/25/2021	10:19	G	3						X	X					2.6-2.8	
													210963	196412						

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
			Tyrone Hamilton	May 26/21 @ 11:00
			Nautilus - Burnaby	Q2-W2

SERVICE REQUEST (rush - subject to availability)

Regular (default)	X
Priority (2-3 business days) - 50% surcharge	
Emergency (1 Business Day) - 100% surcharge	
For Emergency <1 Day, ASAP or Weekend - Contact ALS	

Sampler's Name	Tyler Fortin	Mobile #	
Sampler's Signature		Date/Time	May 25, 2021

Teck

COC ID: 5/25/2021 | TURNAROUND TIME: | RUSH:

PROJECT/CLIENT INFO				LABORATORY				OTHER INFO			
Facility Name / Job#	Fording River Operation			Lab Name	Nautilus Environmental - BC			Report Format / Distribution		Excel	PDF	EDD
Project Manager	Scott Roughead			Lab Contact				Email 1:	david.burroughs@teck.com	X	X	X
Email	scott.roughead@teck.com			Email	BCinfo@nautiluser.vironmental.ca			Email 2:	britt.anderson@teck.com	X	X	X
Address				Address	8664 Commerce Court			Email 3:	scott.roughead@teck.com	X	X	X
								Email 4:	cruz.canlas@teck.com	X	X	X
City	Elkford	Province	BC	City	Burnaby	Province	BC	Email 5:	jamie.walsh@teck.com	X	X	X
Postal Code		Country	Canada	Postal Code	V5A 4N7	Country	Canada	Email 6:	teckcoal@equisonline.com			X
Phone Number	1-250-433-6976			Phone Number	604-420-8773			VPO00741382				

SAMPLE DETAILS								ANALYSIS REQUESTED														
								Filt	NO	NO	NO	NO	NO	NO								
								PRESTAV	NO	NO	NO	NO	NO	NO								
								ANALYSIS	7-d C.dubia P/F	7-d C.dubia P/F (EDTA)	72-hr P. subcapitata P/F	30-d embryo EA P/F	28-d Hyalella P/F	28-d Hyalella P/F (EDTA)								
Sample ID	Sample Location (sys_loc_code)	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.															
FR_FRCP1_WEK_2021-05-24_N	FR_FRCP1	WS	NO	5/25/2021	9:46	G	5					X	X	X							3.1 - 3.8	
FR_FRABCH_WEK_2021-05-24_N	FR_FRABCH	WS	NO	5/25/2021	9:30	G	4					X	X								2.9 - 3.1	
FR_UFR1_WEK_2021-05-24_N	FR_UFR1	WS	NO	5/25/2021	11:26	G	4					X	X								2.1 - 2.6	
												210963	210964	210960								

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
7 COOLERS TOTAL		May 25, 2021	Tyrone Hamilton	May 26/21 @ 11:00
			Nautilus - Burnaby	Q2-W2

SERVICE REQUEST (rush - subject to availability)					
Regular (default)	X	Sampler's Name	Hanna Whiting	Mobile #	(250)425-5999
Priority (2-3 business days) - 50% surcharge		Sampler's Signature	Hanna Whiting	Date/Time	May 25, 2021
Emergency (1 Business Day) - 100% surcharge					
For Emergency <1 Day, ASAP or Weekend - Contact ALS					

Teck

COC ID:	25th of May, Chronic TOX_Naut	TURNAROUND TIME:	regular	RUSH:	

PROJECT/CLIENT INFO				LABORATORY				OTHER INFO				
Facility Name	Greenhills Operations			Lab Name	Nautilus Environmental			EDD delivery:				
Project Manager	Jeremy Enns			Lab Contact	Richard Chea			Email 1:				
Email	jeremy.enns@teck.com			Email				Email 2:				
Address	PO Box 5000			Address	8664 Commerce Court			Email 3:	teckcoal@equisonline.com	x	x	x
								Email 4:				
City	Elkford	Province	BC	City	Burnaby	Province	BC	Email 5:				
Postal Code	V0B 1H0	Country	Canada	Postal Code	V5A 4N7	Country	Can	Email 6:	DL-Equis-GHO-Field@teck.com	x	x	x
Phone Number	250 865 3274			Phone Number	403.253.7121			PO number	610307			

SAMPLE DETAILS								ANALYSIS REQUESTED													
								Please indicate below Filtered, Perserved or both (F, P, F/P)													
								#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		
Sample ID	Sample Location	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	7-d C.dubia P/F	72-hr P. subcapitata P/F	30-d embryo EA P/F 210963	28-d Hyalella P/F 210964										
GH_ER2_WS_2021-05-25_N	GH_ER2	WS		25-May	11:45	G	3			X	X									1.9 - 2.6	
GH_ERC_WS_2021-05-25_N	GH_ERC	WS		25-May	10:45	G	3			X	X									0.0 - 0.0	
GH_FR1_WS_2021-05-25_N	GH_FR1	WS		25-May	10:05	G	3			X	X									0.0 - 0.7	

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	Date	Time	Accepted By/Affiliation	Date	Time
1 container of ER2 arrived leaking				Tyrone Hamilton	May 26/21	@ 11:09
				Nautilus - Burnaby	Q2+W2	

SERVICE REQUEST (rush - subject to availability)					
Regular (default)	X	Sampler's Name	SS/RG	Mobile #	
Priority (2-3 business days) - 50% surcharge					
Emergency (1 Business Day) - 100% surcharge		Sampler's Signature		Date/Time	25th of May,2021
For Emergency <1 Day, ASAP or Weekend - Contact ALS					

Teck

COC ID:	20210525CRN1B	TURNAROUND TIME:		RUSH:	

PROJECT/CLIENT INFO

Facility Name / Job#	Elkview Operations		
Job Description	Q1 Chronic Sampling		
Project Manager	Jennifer Dane		
Email	jennifer.dane@teck.com		
Address	RR#1 HWY# 3		
City	Sparwood	Province	BC
Postal Code	V1C 4C3	Country	Canada
Phone Number	1-250-425-8137		

LABORATORY

Lab Name	Nautilus Environmental		
Lab Contact	Jeslin Wijaya		
Email	[illegible]		
Address	8664 Commerce Court		
	Imperial Square Lake City		
City	Burnaby	Province	BC
Postal Code	V5A 4N7	Country	Canada
Phone Number	604-420-8773		

OTHER INFO

Report Format / Distribution		Excel	PDF	EDD
Email 1:	kennedy.Allen@teck.com	x	x	x
Email 2:	teckcoal@equisonline.com			x
Email 3:	Colby.bracken@teck.com	x	x	x
Email 4:	Chris.emslie@teck.com	x	x	x
Email 5:	Teck.Lab.Results@teck.com	x	x	x
PO number	VPO00678876			

SAMPLE DETAILS

ANALYSIS REQUESTED

Filtered = F: Field, L: Lab, FL: Field & Lab, N: None

Sample ID	Sample Location	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	ANALYSIS	7-d C.dubia P/F	72-hr P. subcapitata P/F	30-d embryo EA P/F	28-d H. azteca P/F					
FILTERED									No	No	No	No					
PRESERVED									No	No	No	No					
EV_HC1_WS_2021_Q2_WK2_N	EV_HC1	WS	N	5/25/2021	9:30	G	3				3						2.0-2.6
EV_MC2_WS_2021_Q2_WK2_N	EV_MC2	WS	N	5/25/2021	12:00	G	3				3						2.3-2.9
											210965	210964					
					Total		6										

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
Toxicity 96-Hr/48-HR = 96 Hr Rainbow Trout pass/fail & 48 Hr Daphnia pass/fail (Daphinia testing to occur at 20 degrees)	C. Bracken/S. Hansen	25-May-21	Tyrone Hamilton Nautilus - Burnaby	May 26/21 @ 11:00 Q2-W2

NB OF BOTTLES RETURNED/DESCRIPTION

Regular (default)	X
Priority (2-3 business days) - 50% surcharge	
Emergency (1 Business Day) - 100% surcharge	
For Emergency <1 Day, ASAP or Weekend - Contact ALS	

Sampler's Name	C. Bracken/S. Hansen	Mobile #	1-250-425-1101
Sampler's Signature	Colby	Date/Time	May 25, 2021

Teck

COC ID:	Q2_CHRONIC_05252021_Burn	TURNAROUND TIME:	Regular	RUSH:	No

PROJECT/CLIENT INFO				LABORATORY				OTHER INFO				
Facility Name / Job#	Coal Mountain Operations			Lab Name	Nautilus Environmental			Report Format / Distribution		Excel	PDF	EDD
Project Manager	Victoria Sharpe			Lab Contact	Armando Tang			Email 1:	Jay.jones@teck.com	X	X	X
Email	Victoria.Sharpe@teck.com			Email	armando@nautilusenvironmental.ca			Email 2:	teckcoal@equisonline.com			X
								Email 3:	Victoria.Sharpe@teck.com	X	X	X
								Email 4	Don.Sacino@teck.com	X	X	X
Address	PO Box 3000			Address	8664 commerce Court			Email 5:	Shelby.Holden@teck.com	X	X	X
City	Sparwood	Province	BC	City	Burnaby	Province	BC	PO number				
Postal Code	V0B 2G0	Country	Canada	Postal Code	V5A 4N7	Country	Canada					
Phone Number	1-250-425-7522			Phone Number	604-420-8773							

SAMPLE DETAILS								ANALYSIS REQUESTED												Filtered - F: Field, L: Lab, FL: Field & Lab, N: None
							Filt.													
							PRESERV.													
							ANALYSIS	7-d C.dubia P/F	7-d C.dubia P/F (EDTA)	72-hr P. subcapitata P/F	30-d embryo EA P/F 210963	28-d Hyalella P/F 210964	28-d Hyalella P/F (EDTA) 210960						
Sample ID	Sample Location	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.													
CM_MC2_WS_2021-05-25_N	CM_MC2	WS	No	5/25/2021	10:29	G	4				X	X	X						6.5-7.0	
CM_MC1_WS_2021-05-25_N	CM_MC1	WS	No	5/25/2021	8:58	G	3				X	X							5.3-5.5	
RG_MIDAG_WS_2021-05-25_N	RG_MIDAG	WS	No	5/25/2021	9:57	G	2					X	X						5.8-5.5	

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
			Tyrone Hamilton	May 26/21 @ 1150
			Nautilus - Burnaby	Q2-W2

NB OF BOTTLES RETURNED/DESCRIPTION	
Regular (default)	X
Priority (2-3 business days) - 50% surcharge	
Emergency (1 Business Day) - 100% surcharge	
For Emergency <1 Day, ASAP or Weekend - Contact ALS	

Sampler's Name	SH/DS	Mobile #	250 425 7522
Sampler's Signature	SDH	Date/Time	May 25, 2021

Teck

COC ID:	20210525 Chronic Tox Burn	TURNAROUND TIME:		RUSH:	

PROJECT/CLIENT INFO				LABORATORY				OTHER INFO				
Facility Name / Job#	Line Creek Operation			Lab Name	Nautilus Environmental			Report Format / Distribution		Excel	PDF	EDD
Project Manager	Tom Jeffery			Lab Contact	Armando Tang			Email 1:	tom.jeffery@teck.com	x	x	
Email	tom.jeffery@teck.com			Email	armando@nautilusenvironmental.com			Email 2:	teckcoal@equisonline.com			x
Address	Box 2003			Address	8664 Commerce Crt			Email 3:	drake.tymstra@teck.com	x	x	
	15km North Hwy 43							Email 4:	shanise.fossen@teck.com	x	x	
								Email 5:	tanya.dick@teck.com	x	x	
City	Sparwood	Province	BC	City	Burnaby	Province	BC	PO number	VPO00741384			
Postal Code	V0B 2G0	Country	Canada	Postal Code	V5A 4N7	Country	Canada					
Phone Number	250-425-6111			Phone Number	604-420-8773							

SAMPLE DETAILS								ANALYSIS REQUESTED											Filtered - F: Field, L: Lab, FL: Field & Lab, N: None
								FIL.	N	N									
								PRESERV.	N	N									
								ANALYSIS	210963 30-d embryo EA P/F	210964 28-d Hyalella P/F									
Sample ID	Sample Location	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.												
LC_DCDS_WS_2021-05-25_N	LC_DCDS	WS	No	25-May-21	11:45	G	3		x	x								1.6	2.1
LC_LC3_WS_2021-05-25_N	LC_LC3	WS	No	25-May-21	12:00	G	3		x	x								0.6	1.4
LC_SLC_WS_2021-05-25_N	LC_SLC	WS	No	25-May-21	11:10	G	3		x	x								0.6	1.0
LC_LC5_WS_2021-05-25_N	LC_LC5	WS	No	25-May-21	13:00	G	3		x	x								0.9	2.0
LC_LCDSSLCC_WS_2021-05-25_N	LC_LCDSSLCC	WS	No	25-May-21	12:30	G	3		x	x								0.0	0.0

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
Please provide prelimnary update as results are available	S.Fossen	2021-05-25	Tyrone Hamilton	May 26/21 @11:00
			Nautilus - Burnaby	Q2-W2

NB OF BOTTLES RETURNED/DESCRIPTION	
Regular (default)	X
Priority (2-3 business days) - 50% surcharge	
Emergency (1 Business Day) - 100% surcharge	
For Emergency <1 Day, ASAP or Weekend - Contact ALS	

Sampler's Name	S.Fossen	Mobile #	O: 250-425-3196 / C: 780-223-8222
Sampler's Signature	S Fossen	Date/Time	May 25, 2021

Teck

COC ID: 6/1/2021 | TURNAROUND TIME: | RUSH:

PROJECT/CLIENT INFO				LABORATORY				OTHER INFO				
Facility Name / Job#	Fording River Operation			Lab Name	Nautilus Environmental - BC			Report Format / Distribution		Excel	PDF	EDD
Project Manager	Scott Roughead			Lab Contact				Email 1:	david.burroughs@teck.com	X	X	X
Email	scott.roughead@teck.com			Email	BCinfo@nautilusenvironmental.ca			Email 2:	britt.anderson@teck.com	X	X	X
Address				Address	8664 Commerce Court			Email 3:	scott.roughead@teck.com	X	X	X
								Email 4:	cruz.canlas@teck.com	X	X	X
City	Elkford	Province	BC	City	Burnaby	Province	BC	Email 5:	jamie.walsh@teck.com	X	X	X
Postal Code		Country	Canada	Postal Code	V5A 4N7	Country	Canada	Email 6:	teckcoal@equisonline.com			X
Phone Number	1-250-433-6976			Phone Number	604-420-8773			VPO00741382				

SAMPLE DETAILS | **ANALYSIS REQUESTED** (Filtered - F: Field, L: Lab, FL: Field & Lab, N: None)

Sample ID	Sample Location (sys_loc_code)	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	FIL	PRESERV.	ANALYSIS: 7-d C.dubia P/F	7-d C.dubia P/F (EDTA)	72-hr P. subcapitata P/F	30-d embryo EA P/F	28-d Hyalella P/F	28-d Hyalella P/F (EDTA)						
								NO	NO				NO	NO	NO						
FR_FRCP1_WEK_2021-05-31_N	FR_FRCP1	WS	NO	6/1/2021		G	5						X	X	X					6.7	6.8
FR_FRABCH_WEK_2021-05-31_N	FR_FRABCH	WS	NO	6/1/2021		G	4						X	X						5.5	5.6
FR_UFR1_WEK_2021-05-31_N	FR_UFR1	WS	NO	6/1/2021		G	4						X	X						4.1	5.9
													21 00 63	21 00 64	21 00 60						

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
7 COOLERS TOTAL	HANNA WHITING	June 1, 2021	Tyrone Hamilton	June 2/21 @ 11:30
			Nautilus - Burnaby	Q2-W3

SERVICE REQUEST (rush - subject to availability)

Regular (default)	X
Priority (2-3 business days) - 50% surcharge	
Emergency (1 Business Day) - 100% surcharge	
For Emergency <1 Day, ASAP or Weekend - Contact ALS	

Sampler's Name	HANNA WHITING	Mobile #	250 4255999
Sampler's Signature	HannaWhiting	Date/Time	June 1, 2021

Teck

COC ID:	20210112-CPX2 TOX	TURNAROUND TIME:	regular	RUSH:	

PROJECT/CLIENT INFO				LABORATORY				OTHER INFO				
Facility Name	Greenhills Operations			Lab Name	Hydroqual Laboratories Ltd			EDD delivery:				
Project Manager	Leigh Stickney			Lab Contact	Jacklyn Pool			Email 1:	Leigh.Stickney@teck.com	x	x	x
Email	leigh.stickney@teck.com			Email				Email 2:	jeremy.enns@teck.com	x	x	x
Address	PO Box 5000			Address	#4, 6125 - 12th Street S.E.			Email 3:	teckcoal@equisonline.com			x
								Email 4:	jaydon.francis@teck.com	x	x	x
City	Elkford	Province	BC	City	Calgary	Province	AB	Email 5:	Heather.Stevenson@teck.com	x	x	x
Postal Code	V0B 1H0	Country	Canada	Postal Code	T2H 2K1	Country	Can	Email 6:	DL-Equis-GHO-Field@teck.com	x	x	x
Phone Number	250 865 3274			Phone Number	403.253.7121			PO number	740426			

SAMPLE DETAILS								ANALYSIS REQUESTED											
								Please indicate below Filtered, Perserved or both (F, P, F/P)											
Sample ID	Sample Location	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	ANALYSIS	7-d C.dubia P/F	72-hr P. subcapitata P/F	30-d embryo EA P/F	28-d Hyalella P/F							
GH_FR1_WS_2021-06-01_N	GH_FR1	WS		6/1/2201	12:15	G	2		1	1	1	1							6.6-6.8
GH_ERC_WS_2021-06-01_N	GH_ERC	WS		6/1/2201	11:25	G	2		1	1	1	1							7.4-8.1
GH_ER2_WS_2021-06-01_N	Gh_ERC	WS		6/1/2201	10:20	G	2		1	1	1	1							7.3-7.4
									210962	210961	210963	210964							
									210965	210966	210967	210968							

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	Date	Time	Accepted By/Affiliation	Date	Time
				Tyrone Hamilton	June 2/21	@ 11:30
				Newterra - Burnaby		02-03

SERVICE REQUEST (rush - subject to availability)					
Regular (default)	X	Sampler's Name	MWILSON	Mobile #	
Priority (2-3 business days) - 50% surcharge					
Emergency (1 Business Day) - 100% surcharge		Sampler's Signature		Date/Time	12-Jan
For Emergency <1 Day, ASAP or Weekend - Contact ALS					

Teck

COC ID:	Q2_CHRONIC_06012021_Burn	TURNAROUND TIME:	Regular	RUSH:	No

PROJECT/CLIENT INFO				LABORATORY				OTHER INFO				
Facility Name / Job#	Coal Mountain Operations			Lab Name	Nautilus Environmental			Report Format / Distribution		Excel	PDF	EDD
Project Manager	Victoria Sharpe			Lab Contact	Armando Tang			Email 1:	Jay.jones@teck.com	X	X	X
Email	Victoria.Sharpe@teck.com			Email	armando@nautilusenvironmental.ca			Email 2:	teckcoal@equisonline.com			X
								Email 3:	Victoria.Sharpe@teck.com	X	X	X
								Email 4	Don.Sacino@teck.com	X	X	X
Address	PO Box 3000			Address	8664 commerce Court			Email 5:	Shelby.Holden@teck.com	X	X	X
City	Sparwood	Province	BC	City	Burnaby	Province	BC	PO number				
Postal Code	V0B 2G0	Country	Canada	Postal Code	V5A 4N7	Country	Canada					
Phone Number	1-250-425-7522			Phone Number	604-420-8773							

SAMPLE DETAILS / **ANALYSIS REQUESTED** (Filtered - F: Field, L: Lab, FL: Field & Lab, N: None)

Sample ID	Sample Location	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	Filt.	PRESERV.	ANALYSIS: 7-d C.dubia P/F	7-d C.dubia P/F (EDTA)	72-hr P. subcapitata P/F	30-d embryo EA P/F	28-d Hyalella P/F	28-d Hyalella P/F (EDTA)						
													210063	210064	210060						
CM_MC2_WS_2021-06-01_N	CM_MC2	WS	No	6/1/2021	9:55	G	4						x	x	x						6.3-8.8
CM_MC1_WS_2021-06-01_N	CM_MC1	WS	No	6/1/2021	8:50	G	3						x	x							4.8-4.9
RG_MIDAG_WS_2021-06-01_N	RG_MIDAG	WS	No	6/1/2021	9:25	G	2							x	x						6.0-6.1

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
			Tyrone Hamilton	June 2/21 @ 11:30
			Nautilus - Burnaby	Q2-W3

NB OF BOTTLES RETURNED/DESCRIPTION	
Regular (default)	X
Priority (2-3 business days) - 50% surcharge	
Emergency (1 Business Day) - 100% surcharge	
For Emergency <1 Day, ASAP or Weekend - Contact ALS	

Sampler's Name	SH/DS	Mobile #	250 425 7522
Sampler's Signature	SDH	Date/Time	June 1, 2021

Teck

COC ID:	20210601CRN2B	TURNAROUND TIME:		RUSH:	

PROJECT/CLIENT INFO				LABORATORY				OTHER INFO				
Facility Name / Job#	Elkview Operations			Lab Name	Nautilus Environmental			Report Format / Distribution		Excel	PDF	EDD
Job Description	Q2 Chronic Sampling			Lab Contact	Jeslin Wijaya			Email 1:	kennedy.Allen@teck.com	X	X	X
Project Manager	Jennifer Dane			Email	[redacted]			Email 2:	teckcoal@equisonline.com			X
Email	jennifer.dane@teck.com			Address	8664 Commerce Court			Email 3:	Colby.bracken@teck.com	X	X	X
Address	RR#1 HWY# 3				Imperial Square Lake City			Email 4:	Chris.emslie@teck.com	X	X	X
								Email 5:	Teck.Lab.Results@teck.com	X	X	X
City	Sparwood	Province	BC	City	Burnaby	Province	BC	PO number	VPO00678876			
Postal Code	V1C 4C3	Country	Canada	Postal Code	V5A 4N7	Country	Canada					
Phone Number	1-250-425-8137			Phone Number	604-420-8773							

SAMPLE DETAILS								ANALYSIS REQUESTED											Filtered - F: Field, L: Lab, FL: Field & Lab, N: None
								FILTERED	No	No	No	No							
								PRESERVED	No	No	No	No							
Sample ID	Sample Location	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	ANALYSIS	7-d C.dubia P/F	72-hr P. subcapitata P/F	30-d embryo EA P/F	28-d Hyalella P/F							
EV_HC1_WS_2021-05_WEEK23_N	EV_HC1	WS	N	2021-06-01	9:13	G	3				3								11.2 - 11.3
EV_MC2_WS_2021-05_WEEK23_N	EV_MC2	WS	N	2021-06-01	10:22	G	3				3								9.9 - 10.1
											21 0063	21 0064							
					Total		6				21	21							

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
Toxicity 96-Hr/48-HR = 96 Hr Rainbow Trout pass/fail & 48 Hr Daphnia pass/fail (Daphinia testing to occur at 20 degrees)	C. Emslie/S. Hansen	1-Jun-21	Tyrone Hamilton Nautilus - Burnaby	June 2/21 @ 11:30 Q2-W3

NB OF BOTTLES RETURNED/DESCRIPTION					
Regular (default)	X	Sampler's Name	C. Emslie/S. Hansen	Mobile #	1-250-425-1101
Priority (2-3 business days) - 50% surcharge					
Emergency (1 Business Day) - 100% surcharge		Sampler's Signature		Date/Time	June 1, 2021
For Emergency <1 Day, ASAP or Weekend - Contact ALS					

Teck

COC ID:	Q2_CHRONIC_06082021_Burn	TURNAROUND TIME:	Regular	RUSH:	No

PROJECT/CLIENT INFO				LABORATORY				OTHER INFO				
Facility Name / Job#	Coal Mountain Operations			Lab Name	Nautilus Environmental			Report Format / Distribution		Excel	PDF	EDD
Project Manager	Victoria Sharpe			Lab Contact	Armando Tang			Email 1:	Jay.Jones@teck.com	X	X	X
Email	Victoria.Sharpe@teck.com			Email	armando@nautilusenvironmental.ca			Email 2:	teckcoal@equisonline.com			X
								Email 3:	Victoria.Sharpe@teck.com	X	X	X
								Email 4	Don.Sacino@teck.com	X	X	X
Address	PO Box 3000			Address	8664 commerce Court			Email 5:	Shelby.Holden@teck.com	X	X	X
City	Sparwood	Province	BC	City	Burnaby	Province	BC	PO number				
Postal Code	V0B 2G0	Country	Canada	Postal Code	V5A 4N7	Country	Canada					
Phone Number	1-250-425-7522			Phone Number	604-420-8773							

SAMPLE DETAILS								ANALYSIS REQUESTED												Filtered - F: Field, L: Lab, FL: Field & Lab, N: None					
								Filt.																	
								PRESERV.						TH		TH		210960							
								ANALYSIS	7-d C.dubia P/F	7-d C.dubia P/F (EDTA)	72-hr P. subcapitata P/F	30-d embryo EA P/F	210963 210963	28-d Hyalella P/F	210964 210964	28-d Hyalella P/F (EDTA)	210960 210960 TH								
Sample ID	Sample Location	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.																		
CM_MC2_WS_2021-06-08_N	CM_MC2	WS	No	6/8/2021	10:23	G	4					x		x		x								6.0-6.1	
CM_MC1_WS_2021-06-08_N	CM_MC1	WS	No	6/8/2021	9:17	G	3					x		x										4.1-4.1	
RG_MIDAG_WS_2021-06-08_N	RG_MIDAG	WS	No	6/8/2021	9:57	G	2							x		x								5.1-5.4	

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
			Tymne Hamilton	June 9/21 @ 11:30
			Nautilus - Burnaby	Q2-W4

NB OF BOTTLES RETURNED/DESCRIPTION	
Regular (default)	X
Priority (2-3 business days) - 50% surcharge	
Emergency (1 Business Day) - 100% surcharge	
For Emergency <1 Day, ASAP or Weekend - Contact ALS	

Sampler's Name	SH/DS	Mobile #	250 425 7522
Sampler's Signature	S.Holden	Date/Time	June 8, 2021

Teck

COC ID: 20210608CRN2B | TURNAROUND TIME: | RUSH:

PROJECT/CLIENT INFO				LABORATORY				OTHER INFO			
Facility Name / Job#	Elkview Operations			Lab Name	Nautilus Environmental			Report Format / Distribution		Excel	PDF	EDD
Job Description	Q2 Chronic Sampling			Lab Contact	Jeslin Wijaya			Email 1:	kennedy.Allen@teck.com	X	X	X
Project Manager	Jennifer Dane			Email	[illegible]			Email 2:	teckcoal@equisonline.com			X
Email	jennifer.dane@teck.com			Address	8664 Commerce Court			Email 3:	Colby.bracken@teck.com	X	X	X
Address	RR#1 HWY# 3				Imperial Square Lake City			Email 4:	Chris.emslie@teck.com	X	X	X
								Email 5:	Teck.Lab.Results@teck.com	X	X	X
City	Sparwood	Province	BC	City	Burnaby	Province	BC	PO number	VPO00678876			
Postal Code	V1C 4C3	Country	Canada	Postal Code	V5A 4N7	Country	Canada					
Phone Number	1-250-425-8137			Phone Number	604-420-8773							

SAMPLE DETAILS | **ANALYSIS REQUESTED** (Filtered - F: Field, L: Lab, FL: Field & Lab, N: None)

Sample ID	Sample Location	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	ANALYSIS	7-d C.dubia P/F	72-hr P. subcapitata P/F	30-d embryo EA P/F	28-d Hyalella P/F						
FILTERED									No	No	No	No						
PRESERVED									No	No	No	No						
EV_HC1_WS_2021-06_MON_N	EV_HC1	WS	N	6/8/2021	9:28	G	3				210963 TM 3	210964 TM						5.6-5.7
EV_MC2_WS_2021_Q2_WK4_N	EV_MC2	WS	N	6/8/2021	10:30	G	3				210963 3	210964						6.4-6.4
											210963	210964						
					Total		6											

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
Toxicity 96-Hr/48-HR = 96 Hr Rainbow Trout pass/fail & 48 Hr Daphnia pass/fail (Daphinia testing to occur at 20 degrees)	C. Emslie/S. Hansen	8-Jun-21	Tyson Hamilton Nautilus - Burnaby	June 9/21 @ 11:30 Q2-W4

NB OF BOTTLES RETURNED/DESCRIPTION					
Regular (default)	X	Sampler's Name	C. Emslie/S. Hansen	Mobile #	1-250-425-1101
Priority (2-3 business days) - 50% surcharge		Sampler's Signature		Date/Time	June 8, 2021
Emergency (1 Business Day) - 100% surcharge					
For Emergency <1 Day, ASAP or Weekend - Contact ALS					

Teck

COC ID: 6/8/2021 | TURNAROUND TIME: | RUSH:

PROJECT/CLIENT INFO				LABORATORY				OTHER INFO			
Facility Name / Job#	Fording River Operation			Lab Name	Nautilus Environmental - BC			Report Format / Distribution		Excel	PDF	EDD
Project Manager	Scott Roughead			Lab Contact				Email 1:	david.burroughs@teck.com	X	X	X
Email	scott.roughead@teck.com			Email	BCinfo@nautilusenvironmental.ca			Email 2:	britt.anderson@teck.com	X	X	X
Address				Address	8664 Commerce Court			Email 3:	scott.roughead@teck.com	X	X	X
								Email 4:	cruz.canlas@teck.com	X	X	X
City	Elkford	Province	BC	City	Burnaby	Province	BC	Email 5:	jamia.walsh@teck.com	X	X	X
Postal Code		Country	Canada	Postal Code	V5A 4N7	Country	Canada	Email 6:	teckcoal@equisonline.com			X
Phone Number	1-250-433-6976			Phone Number	604-420-8773			VPO00741382				

SAMPLE DETAILS / ANALYSIS REQUESTED (Filtered - F: Field, L: Lab, FL: Field & Lab, N: None)

Sample ID	Sample Location (sys_loc_code)	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	FIL	PRESERV.	ANALYSIS: 7-d C.dubia P/F	7-d C.dubia P/F (EDTA)	72-hr P. subcapitata P/F	30-d embryo EA P/F	28-d Hyalella P/F	28-d Hyalella P/F (EDTA)						
								NO	NO	NO	NO	NO	NO								
FR_FRCP1_MON_2021-06-07_N	FR_FRCP1	WS	NO	6/8/2021		G	5						X	X	X					2.1	2.4
FR_FRABCH_MON_2021-06-07_N	FR_FRABCH	WS	NO	6/8/2021		G	4						X	X						2.8	2.4
FR_UFR1_MON_2021-06-07_N	FR_UFR1	WS	NO	6/8/2021		G	4						X	X						2.3	2.8
													21 0963	21 0964	21 0960						

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
7 COOLERS TOTAL	Cruz Canlas	June 8, 2021	Tyrone Hamilton	June 9/21 @ 11:30
			Nautilus - Burnaby	QZ-W4

SERVICE REQUEST (rush - subject to availability)					
Regular (default)	X	Sampler's Name	Cruz Canlas	Mobile #	250 433 6166
Priority (2-3 business days) - 50% surcharge		Sampler's Signature		Date/Time	June 8, 2021
Emergency (1 Business Day) - 100% surcharge					
For Emergency <1 Day, ASAP or Weekend - Contact ALS					

Teck

Page 1 of 1

COC ID: 8 6/8/2021 | TURNAROUND TIME: | RUSH:

PROJECT/CLIENT INFO				LABORATORY				OTHER INFO				
Facility Name / Job#	Fording River Operation			Lab Name	Nautilus Environmental - BC			Report Format / Distribution		Excel	PDF	EDD
Project Manager	Scott Roughead			Lab Contact				Email 1:	david.burroughs@teck.com	X	X	X
Email	scott.roughead@teck.com			Email	BCinfo@nautilusenvironmental.ca			Email 2:	britt.anderson@teck.com	X	X	X
Address				Address	8664 Commerce Court			Email 3:	scott.roughead@teck.com	X	X	X
								Email 4:	teckcoal@equisonline.com			X
City	Elkford	Province	BC	City	Burnaby	Province	BC	Email 5:	carlie.meyer@teck.com	X	X	X
Postal Code		Country	Canada	Postal Code	V5A 4N7	Country	Canada	Email 6:	cait.good@teck.com	X	X	X
Phone Number	1-250-433-6976			Phone Number	604-420-8773							

SAMPLE DETAILS / ANALYSIS REQUESTED (Filtered - F: Field, L: Lab, FL: Field & Lab, N: None)

Sample ID	Sample Location (sys loc code)	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	FIltr.	PRESERV.	ANALYSIS: 7-d C.dubia P/F	7-d C.dubia P/F (EDTA)	72-hr P. subcapitata P/F	30-d embryo EA P/F	28-d Hyalella P/F	28-d Hyalella P/F (EDTA)					
FR_FR4_WS_2021-06-08_N	FR_FR4	WS	NO	6/8/2021	9:17	G	3						X	X						3.3-3.4
FR_FRRD_WS_2021-06-08_N	FR_FRRD	WS	NO	6/8/2021	8:30	G	3						X	X						4.1-4.8
FR_FR2_WS_2021-06-08_N	FR_FR2	WS	NO	6/8/2021	9:55	G	3						X	X						4.1-4.2
FR_MULTIPLATE_WS_2021-06-08_NP	FR_MULTIPLATE	WS	NO	6/8/2021	10:29	G	3						X	X						2.9-3.3
													21 0963	21 0964						

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
			Tyrone Hamilton	June 9/21 @ 11:30
			Nautilus - Burnaby	Q2-W4

SERVICE REQUEST (rush - subject to availability)

Regular (default)	X
Priority (2-3 business days) - 50% surcharge	
Emergency (1 Business Day) - 100% surcharge	
For Emergency <1 Day, ASAP or Weekend - Contact ALS	

Sampler's Name	Tyler Fortin	Mobile #	250-464-5914
Sampler's Signature		Date/Time	June 8 2021

Teck

COC ID:	2021-06-08 CHRONIC TOX	TURNAROUND TIME:	regular	RUSH:	

PROJECT/CLIENT INFO				LABORATORY				OTHER INFO				
Facility Name	Greenhills Operations			Lab Name	Nautilus Environmental			EDD delivery:				
Project Manager	Jeremy Enns			Lab Contact	Armando			Email 1:				
Email	jeremy.enns@teck.com			Email				Email 2:				
Address	PO Box 5000			Address	8664 Commerce Court			Email 3:	teckcoal@equisonline.com	x	x	x
								Email 4:				
City	Elkford	Province	BC	City	Burnaby	Province	BC	Email 5:				
Postal Code	V0B 1H0	Country	Canada	Postal Code	V5A 4N7	Country	Can	Email 6:	DL-Equis-GHO-Field@teck.com	x	x	x
Phone Number	250 865 3274			Phone Number	403.253.7121			PO number	610307			

SAMPLE DETAILS / **ANALYSIS REQUESTED**

Please indicate below Filtered, Perserved or both (F, P, F/P)

Sample ID	Sample Location	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	7-d C.dubia P/F	72-hr P. subcapitata P/F	30-d embryo EA P/F 210963	28-d Hyalella P/F 210964	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
GH_ER2_WS_2021-06-08_N	GH_ER2	WS		8-Jun	10:10	G	3			X	X									7.2 - 7.8	
GH_ERC_WS_2021-06-08_N	GH_ERC	WS		8-Jun	11:05	G	3			X	X									7.2 - 7.5	
GH_FR1_WS_2021-06-08_N	GH_FR1	WS		8-Jun	12:00	G	3			X	X									6.3 - 7.2	

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	Date	Time	Accepted By/Affiliation	Date	Time
				Tyrone Hamilton	June 9/21	@ 11:30
				Nautilus - Burnaby		Q2-W4

SERVICE REQUEST (rush - subject to availability)

Regular (default)	X
Priority (2-3 business days) - 50% surcharge	
Emergency (1 Business Day) - 100% surcharge	
For Emergency <1 Day, ASAP or Weekend - Contact ALS	

Sampler's Name	HS/RG	Mobile #	
Sampler's Signature		Date/Time	JUNE 8 2021

Teck

COC ID: 20210608 Chronic Tox Burn | TURNAROUND TIME: | RUSH:

PROJECT/CLIENT INFO

Facility Name / Job#	Line Creek Operation
Project Manager	Tom Jeffery
Email	tom.jeffery@teck.com
Address	Box 2003
	15km North Hwy 43
City	Sparwood
Province	BC
Postal Code	V0B 2G0
Country	Canada
Phone Number	250-425-6111

LABORATORY

Lab Name	Nautilus Environmental
Lab Contact	Armando Tang
Email	armando@nautilusenvironmental.com
Address	8664 Commerce Crt
City	Burnaby
Province	BC
Postal Code	V5A 4N7
Country	Canada
Phone Number	604-420-8773

OTHER INFO

Report Format / Distribution		Excel	PDF	EDD
Email 1:	tom.jeffery@teck.com	x	x	
Email 2:	teckcoal@equisonline.com			x
Email 3:	drake.tymstra@teck.com	x	x	
Email 4:	shanise.fossen@teck.com	x	x	
Email 5:	tanya.dick@teck.com	x	x	
PO number	VPO00741384			

SAMPLE DETAILS / ANALYSIS REQUESTED

Filtered - F: Field, L: Lab, FL: Field & Lab, N: None

Sample ID	Sample Location	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	FIL.	PRESERV.	ANALYSIS: 210963 30-d embryo EA P/F	ANALYSIS: 210964 28-d Hyalella P/F									
								N	N											
								N	N											
LC_DCDS_WS_2021-06-08_N	LC_DCDS	WS	No	8-Jun-21		G	3			x	x									7.4 - 7.9
LC_LC3_WS_2021-06-08_N	LC_LC3	WS	No	8-Jun-21	10:30	G	3			x	x									6.3 - 7.0
LC_SLC_WS_2021-06-08_N	LC_SLC	WS	No	8-Jun-21	10:10	G	3			x	x									7.9 - 7.9
LC_LC5_WS_2021-06-08_N	LC_LC5	WS	No	8-Jun-21	10:00	G	3			x	x									7.3 - 7.6
LC_LCDSSLCC_WS_2021-06-08_N	LC_LCDSSLCC	WS	No	8-Jun-21	11:00	G	3			x	x									8.4 - 10.0

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
Please provide prelimnary update as results are available	S.Fossen	6/8/2021	Tyrone Hamilton	June 9/21 @ 11:30
			Nautilus - Burnaby	Q2-W4

NB OF BOTTLES RETURNED/DESCRIPTION

Regular (default)	X
Priority (2-3 business days) - 50% surcharge	
Emergency (1 Business Day) - 100% surcharge	
For Emergency <1 Day, ASAP or Weekend - Contact ALS	

Sampler's Name	S.Fossen	Mobile #	O: 250-425-3196 / C: 780-223-8222
Sampler's Signature	S Fossen	Date/Time	June 8, 2021

Teck

COC ID:	Q2_CHRONIC_06152021_Burn	TURNAROUND TIME:	Regular	RUSH:	No

PROJECT/CLIENT INFO				LABORATORY				OTHER INFO				
Facility Name / Job#	Coal Mountain Operations			Lab Name	Nautilus Environmental			Report Format / Distribution		Excel	PDF	EDD
Project Manager	Victoria Sharpe			Lab Contact	Armando Tang			Email 1:	Jay.Jones@teck.com	X	X	X
Email	Victoria.Sharpe@teck.com			Email	armando@nautilusenvironmental.ca			Email 2:	teckcoal@equisonline.com			X
								Email 3:	Victoria.Sharpe@teck.com	X	X	X
								Email 4	Don.Sacino@teck.com	X	X	X
Address	PO Box 3000			Address	8664 commerce Court			Email 5:	Shelby.Holden@teck.com	X	X	X
City	Sparwood	Province	BC	City	Burnaby	Province	BC	PO number				
Postal Code	V0B 2G0	Country	Canada	Postal Code	V5A 4N7	Country	Canada					
Phone Number	1-250-425-7522			Phone Number	604-420-8773							

SAMPLE DETAILS								ANALYSIS REQUESTED												Filtered - F: Field, L: Lab, FL: Field & Lab, N: None
								Filt.												
								PRESERV.						210963						
Sample ID	Sample Location	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	ANALYSIS	7-d C.dubia P/F	7-d C.dubia P/F (EDTA)	72-hr P. subcapitata P/F	30-d embryo EA P/F	28-d Hyalella P/F	28-d Hyalella P/F (EDTA)						
CM_MC2_WS_2021-06-15_N	CM_MC2	WS	No	6/15/2021	10:00	G	1					X								10.8
CM_MC1_WS_2021-06-15_N	CM_MC1	WS	No	6/15/2021	9:25	G	1					X								11.3

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
			Tyrone Nautilus	June 16/21 @ 11:30
			Nautilus - Burnaby	Q2-WS

NB OF BOTTLES RETURNED/DESCRIPTION	
Regular (default)	X
Priority (2-3 business days) - 50% surcharge	
Emergency (1 Business Day) - 100% surcharge	
For Emergency <1 Day, ASAP or Weekend - Contact ALS	

Sampler's Name	SH/DS	Mobile #	250 425 7522
Sampler's Signature	SH	Date/Time	June 15, 2021

Teck

COC ID: 20210615CRN2B | TURNAROUND TIME: | RUSH:

PROJECT/CLIENT INFO

Facility Name / Job#	Elkview Operations
Job Description	Q2 Chronic Sampling
Project Manager	Jennifer Dane
Email	jennifer.dane@teck.com
Address	RR#1 HWY# 3
City	Sparwood
Province	BC
Postal Code	V1C 4C3
Country	Canada
Phone Number	1-250-425-8137

LABORATORY

Lab Name	Nautilus Environmental
Lab Contact	Jeslin Wijaya
Email	
Address	8664 Commerce Court
	Imperial Square Lake City
City	Burnaby
Province	BC
Postal Code	V5A 4N7
Country	Canada
Phone Number	604-420-8773

OTHER INFO

Report Format / Distribution		Excel	PDF	EDD
Email 1:	kennedy.allen@teck.com	X	X	X
Email 2:	teckcoal@equisonline.com			X
Email 3:	chris.emslie@teck.com	X	X	X
Email 4:	Teck.Lab.Results@teck.com	X	X	X
Email 5:	jennifer.dane@teck.com	X	X	X
Email 6:	colby.bracken@teck.com	X	X	X
PO number	VPO00678876			

SAMPLE DETAILS

ANALYSIS REQUESTED (Filtered - F: Field, L: Lab, FL: Field & Lab, N: None)

Sample ID	Sample Location	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	FILTERED	No	No	No	No						
								PRESERVED	No	No	No	No						
								ANALYSIS	7-d C.dubia P/F	72-hr P. subcapitata P/F	30-d embryo EA P/F	28-d Hyalella P/F						
EV_HC1_WS_2021-06_WEK25_N	EV_HC1	WS	N	6/15/2021	8:56	G	1				1							10.6
EV_MC2_WS_2021-06_WEK25_N	EV_MC2	WS	N	6/15/2021	10:57	G	1				1							10.3
											21							
											09							
					Total		2				63							

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS

Toxicity 96-Hr/48-HR = 96 Hr Rainbow Trout pass/fail & 48 Hr Daphnia pass/fail
(Daphinia testing to occur at 20 degrees)

RELINQUISHED BY/AFFILIATION

Jenni Dane/Josh Batstone

DATE/TIME

15-Jun-21

ACCEPTED BY/AFFILIATION

Tyrone Hamilton
Nautilus - Burnaby

DATE/TIME

June 16/21 @11:30
Q2-WS

NB OF BOTTLES RETURNED/DESCRIPTION

Regular (default)	X
Priority (2-3 business days) - 50% surcharge	
Emergency (1 Business Day) - 100% surcharge	
For Emergency <1 Day, ASAP or Weekend - Contact ALS	

Sampler's Name	Jenni Dane/Josh Batstone	Mobile #	1-250-423-0826
Sampler's Signature		Date/Time	June 15, 2021

Teck

COC ID: 6/15/2021 | TURNAROUND TIME: | RUSH:

PROJECT/CLIENT INFO				LABORATORY				OTHER INFO			
Facility Name / Job#	Fording River Operation			Lab Name	Nautilus Environmental - BC			Report Format / Distribution		Excel	PDF	EDD
Project Manager	Scott Roughead			Lab Contact				Email 1:	david.burroughs@teck.com	X	X	X
Email	scott.roughead@teck.com			Email	BCinfo@nautilusenvironmental.ca			Email 2:	britt.anderson@teck.com	X	X	X
Address				Address	8664 Commerce Court			Email 3:	scott.roughead@teck.com	X	X	X
								Email 4:	cruz.canlas@teck.com	X	X	X
City	Elkford	Province	BC	City	Burnaby	Province	BC	Email 5:	jamie.walsh@teck.com	X	X	X
Postal Code		Country	Canada	Postal Code	V5A 4N7	Country	Canada	Email 6:	teckcoal@equisonline.com			X
Phone Number	1-250-433-6976			Phone Number	604-420-8773			VPO00741382				

SAMPLE DETAILS								ANALYSIS REQUESTED (Filtered - F: Field, L: Lab, FL: Field & Lab, N: None)											
								Filt.	NO	NO	NO	NO	NO	NO						
								PRESERV.	NO	NO	NO	NO	NO	NO						
Sample ID	Sample Location (sys_loc_code)	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	ANALYSIS	7-d C.dubia P/F	7-d C.dubia P/F (EDTA)	72-hr P. subcapitata P/F	30-d embryo EA P/F	28-d Hyalella P/F	28-d Hyalella P/F (EDTA)						
FR_FRCP1_WEK_2021-06-14_N	FR_FRCP1	WS	NO	6/15/2021		G	1					x								11.5
FR_FRABCH_WEK_2021-06-14_N	FR_FRABCH	WS	NO	6/15/2021		G	1					x								10.9
FR_UFR1_WEK_2021-06-14_N	FR_UFR1	WS	NO	6/15/2021		G	1					x								8.6
												21 0963								

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
3 COOLERS TOTAL	Jamie Walsh	June 15, 2021	Tyrone Hamilton	June 16/21 @ 16:30
			Nautilus - Burnaby	Q2-W5

SERVICE REQUEST (rush - subject to availability)					
Regular (default)	X	Sampler's Name	Jamie Walsh	Mobile #	250-433-6168
Priority (2-3 business days) - 50% surcharge					
Emergency (1 Business Day) - 100% surcharge		Sampler's Signature		Date/Time	June 15, 2021
For Emergency <1 Day, ASAP or Weekend - Contact ALS					

Teck

COC ID: 6/15/2021

TURNAROUND TIME:

RUSH:

PROJECT/CLIENT INFO

Facility Name / Job#	Fording River Operation
Project Manager	Scott Roughead
Email	scott.roughead@teck.com
Address	
City	Elkford
Province	BC
Postal Code	
Country	Canada
Phone Number	1-250-433-6976

LABORATORY

Lab Name	Nautilus Environmental - BC
Lab Contact	
Email	BCinfo@nautilusenvironmental.ca
Address	8664 Commerce Court
City	Burnaby
Province	BC
Postal Code	V5A 4N7
Country	Canada
Phone Number	604-420-8773

OTHER INFO

Report Format / Distribution		Excel	PDF	EDD
Email 1:	david.burroughs@teck.com	X	X	X
Email 2:	britt.anderson@teck.com	X	X	X
Email 3:	scott.roughead@teck.com	X	X	X
Email 4:	teckcoal@equisonline.com			X
Email 5:	carlie.meyer@teck.com	X	X	X
Email 6:	cait.good@teck.com	X	X	X

SAMPLE DETAILS / ANALYSIS REQUESTED

Filtered - F: Field, L: Lab, FL: Field & Lab, N: None

Sample ID	Sample Location (sys loc code)	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	FILT.	PRESERV.	7-d C.dubia P/F	7-d C.dubia P/F (EDTA)	72-hr P. subcapitata P/F	30-d embryo EA P/F	28-d Hyalella P/F	28-d Hyalella P/F (EDTA)						
FR_FR4_WS_2021-06-15_N	FR_FR4	WS	NO	6/15/2021	1040	G	1						X	X							11.4
FR_FRRD_WS_2021-06-15_N	FR_FRRD	WS	NO	6/15/2021	11:25	G	1						X	X							10.5
FR_FR2_WS_2021-06-15_N	FR_FR2	WS	NO	6/15/2021	9:34	G	1						X	X							11.2
FR_MULTIPLATE_WS_2021-06-15_NP	FR_MULTIPLATE	WS	NO	6/15/2021	9:01	G	1						X	X							11.0
													210963	210964							

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS

Analysis updated by Teck

RELINQUISHED BY/AFFILIATION

DATE/TIME

ACCEPTED BY/AFFILIATION

Tyrone Hamilton
Nautilus - Burnaby

DATE/TIME

June 16/21 @ 11:30
Q2-W5

SERVICE REQUEST (rush - subject to availability)

Regular (default)	X
Priority (2-3 business days) - 50% surcharge	
Emergency (1 Business Day) - 100% surcharge	
For Emergency <1 Day, ASAP or Weekend - Contact ALS	

Sampler's Name	Tyler Fortin	Mobile #	
Sampler's Signature		Date/Time	June 15 2021

Teck

COC ID:	2021-06-15 CHRONIC TOX	TURNAROUND TIME:	regular	RUSH:	

PROJECT/CLIENT INFO				LABORATORY				OTHER INFO				
Facility Name	Greenhills Operations			Lab Name	Nautilus Environmental			EDD delivery:				
Project Manager	Jeremy Enns			Lab Contact	Armando			Email 1:				
Email	jeremy.enns@teck.com			Email				Email 2:				
Address	PO Box 5000			Address	8664 Commerce Court			Email 3:	teckcoal@equisonline.com	x	x	X
								Email 4:				
City	Elkford	Province	BC	City	Burnaby	Province	BC	Email 5:				
Postal Code	V0B 1H0	Country	Canada	Postal Code	V5A 4N7	Country	Can	Email 6:	DL-Equis-GHO-Field@teck.com	X	X	X
Phone Number	250 865 3274			Phone Number	403.253.7121			PO number	610307			

SAMPLE DETAILS								ANALYSIS REQUESTED											
								Please indicate below Filtered, Preserved or both (F, P, F/P)											
								#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
Sample ID	Sample Location	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	ANALYSIS	7-d C.dubia P/F	72-hr P. subcapitata P/F	30-d embryo EA P/F 210963	28-d Hyalella P/F							
GH_ER2_WS_2021-06-15_N	GH_ER2	WS		15-Jun	1020	G	1				X								12.8
GH_ERC_WS_2021-06-15_N	GH_ERC	WS		15-Jun	1315	G	1				X								12.1
GH_FR1_WS_2021-06-15_N	GH_FR1	WS		15-Jun	1345	G	1				X								12.5

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	Date	Time	Accepted By/Affiliation	Date	Time
				Tyrone Nautilus	June 16/21	@ 11:30
				Nautilus - Burnaby	02-W5	

SERVICE REQUEST (rush - subject to availability)					
Regular (default)	X	Sampler's Name	HS/JM	Mobile #	
Priority (2-3 business days) - 50% surcharge					
Emergency (1 Business Day) - 100% surcharge		Sampler's Signature		Date/Time	JUNE 15 2021
For Emergency <1 Day, ASAP or Weekend - Contact ALS					

Teck

COC ID: 20210615 Chronic Tox Burn | TURNAROUND TIME: | RUSH:

PROJECT/CLIENT INFO

Facility Name / Job#	Line Creek Operation
Project Manager	Tom Jeffery
Email	tom.jeffery@teck.com
Address	Box 2003
	15km North Hwy 43
City	Sparwood
Province	BC
Postal Code	V0B 2G0
Country	Canada
Phone Number	250-425-6111

LABORATORY

Lab Name	Nautilus Environmental
Lab Contact	Armando Tang
Email	armando@nautilusenvironmental.com
Address	8664 Commerce Crt
City	Burnaby
Province	BC
Postal Code	V5A 4N7
Country	Canada
Phone Number	604-420-8773

OTHER INFO

Report Format / Distribution		Excel	PDF	EDD
Email 1:	tom.jeffery@teck.com	x	x	
Email 2:	teckcoal@equisonline.com			x
Email 3:	drake.tymstra@teck.com	x	x	
Email 4:	shanise.fossen@teck.com	x	x	
Email 5:	tanya.dick@teck.com	x	x	
PO number	VPO00741384			

SAMPLE DETAILS / ANALYSIS REQUESTED

Filtered - F: Field, L: Lab, FL: Field & Lab, N: None

Sample ID	Sample Location	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	FIL.	N	N										
								PRESRV.	N	N										
								ANALYSIS	30-d embryo EA P/F	210964 28-d Hyalella P/F										
LC_DCDS_WS_2021-06-15_N	LC_DCDS	WS	No	15-Jun-21	11:30	G	1			x										9.6
LC_LC3_WS_2021-06-15_N	LC_LC3	WS	No	15-Jun-21		G	1			x										9.3
LC_SLC_WS_2021-06-15_N	LC_SLC	WS	No	15-Jun-21		G	1			x										9.5
LC_LC5_WS_2021-06-15_N	LC_LC5	WS	No	15-Jun-21	9:40	G	1			x										10.1
LC_LCDSSLCC_WS_2021-06-15_N	LC_LCDSSLCC	WS	No	15-Jun-21		G	1			x										10.6

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS

Please provide prelimnary update as results are available

RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
S.Fossen	6/15/2021	Tyrone Hamilton	Q2 - WS
		June 16/21 @ 11:30	Nautilus - Burnaby

NB OF BOTTLES RETURNED/DESCRIPTION

Regular (default)	X
Priority (2-3 business days) - 50% surcharge	
Emergency (1 Business Day) - 100% surcharge	
For Emergency <1 Day, ASAP or Weekend - Contact ALS	

Sampler's Name	S.Fossen	Mobile #	O: 250-425-3196 / C: 780-223-8222
Sampler's Signature	S Fossen	Date/Time	June 15, 2021

Teck

2021-06-29

COC ID:	[redacted]	TURNAROUND TIME:		RUSH:	

PROJECT/CLIENT INFO				LABORATORY				OTHER INFO				
Facility Name / Job#	Fording River Operation			Lab Name	Nautilus Environmental - BC			Report Format / Distribution		Excel	PDF	EDD
Project Manager	Scott Roughead			Lab Contact				Email 1:	david.burroughs@teck.com	X	X	X
Email	scott.roughead@teck.com			Email	BCinfo@nautilusenvironmental.ca			Email 2:	britt.anderson@teck.com	X	X	X
Address				Address	8664 Commerce Court			Email 3:	scott.roughead@teck.com	X	X	X
								Email 4:	teckcoal@equisonline.com			X
City	Elkford	Province	BC	City	Burnaby	Province	BC	Email 5:		X	X	X
Postal Code		Country	Canada	Postal Code	V5A 4N7	Country	Canada	Email 6:	cait.good@teck.com	X	X	X
Phone Number	1-250-433-6976			Phone Number	604-420-8773							

SAMPLE DETAILS / ANALYSIS REQUESTED

	Sample ID	Sample Location (sys_loc_code)	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	7-d C.dubia P/F	7-d C.dubia P/F (EDTA)	72-hr P. subcapitata P/F	30-d embryo EA P/F	28-d Hyalella P/F	28-d Hyalella P/F (EDTA)						
②	FR_FR4_WS_2021-~~07~~-~~06~~ 29_N	FR_FR4	WS	NO	2021-06-29	11:36	G	1					X							19.5
①	FR_FRRD_WS_2021-~~07~~-~~06~~ 29_N	FR_FRRD	WS	NO	↓	12:03	G	1					X							20.6
①	FR_FR2_WS_2021-~~07~~-~~06~~ 29_N	FR_FR2	WS	NO		11:06	G	1					X							19.6
②	FR_MULTIPLATE_WS_2021-~~07~~-~~06~~ 29_NP	FR_MULTIPLATE	WS	NO		10:34	G	1					X							18.3
②	FR-UFR1_WS-2021-06-29	FR-UFR1	WS	NO	↓	9:49	G	1					X							18.3

21 1262

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
See digital COC for Analysis			Tyrone Hamilton	June 30/21 @ 9:38
All samples 2021-06-29			Nautilus - Burnaby	

SERVICE REQUEST (rush - subject to availability)					
Regular (default)	X	Sampler's Name	Tyler Forbin	Mobile #	
Priority (2-3 business days) - 50% surcharge					
Emergency (1 Business Day) - 100% surcharge		Sampler's Signature	[signature]	Date/Time	2021-06-29
For Emergency <1 Day, ASAP or Weekend - Contact ALS					

① clear odourless liquid, no particulats

② Clear odourless liquid, some particulates

Teck

Page 1 of 1

2021/07/06

COC ID: ~~6/29/2021~~ | TURNAROUND TIME: | RUSH:

PROJECT/CLIENT INFO				LABORATORY				OTHER INFO				
Facility Name / Job#	Fording River Operation			Lab Name	Nautilus Environmental - BC			Report Format / Distribution		Excel	PDF	EDD
Project Manager	Scott Roughead			Lab Contact				Email 1:	david.burroughs@teck.com	X	X	X
Email	scott.roughead@teck.com			Email	BCinfo@nautilusenvironmental.ca			Email 2:	britt.anderson@teck.com	X	X	X
Address				Address	8664 Commerce Court			Email 3:	scott.roughead@teck.com	X	X	X
								Email 4:	teckcoal@equisonline.com			X
City	Elkford	Province	BC	City	Burnaby	Province	BC	Email 5:		X	X	X
Postal Code		Country	Canada	Postal Code	V5A 4N7	Country	Canada	Email 6:	cait.good@teck.com	X	X	X
Phone Number	1-250-433-6976			Phone Number	604-420-8773							

SAMPLE DETAILS								ANALYSIS REQUESTED										
Sample ID	Sample Location (sys loc code)	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	7-d C.dubia P/F	7-d C.dubia P/F (EDTA)	72-hr P. subcapitata P/F	30-d embryo EA P/F	28-d Hyalella P/F	28-d Hyalella P/F (EDTA)					
(2) FR_FR4_WS_2021-~~06-29~~ 07-06_N	FR_FR4	WS	NO	2021/07/06	9:07	G	1					X						17.9
(1) FR_FRRD_WS_2021-~~06-29~~ 07-06_N	FR_FRRD	WS	NO		8:34	G	1					X						18.0
(1) FR_FR2_WS_2021-~~06-29~~ 07-06_N	FR_FR2	WS	NO		13:00	G	1					X						15.0
(3) FR_MULTIPLATE_WS_2021-~~06-29~~ 07-06_N	FR_MULTIPLATE	WS	NO		9:57	G	1					X						17.8
(2) FR-UFR1-WS-2021-07-06-N	FR-UFR1	WS	NO		10:46							X						18.6
												211332						

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
			Tyrone Hamilton	July 8/21 @ 8:40
			Nautilus - Burnaby	

SERVICE REQUEST (rush - subject to availability)					
Regular (default) X	Sampler's Name	Tyler Forth	Mobile #		
Priority (2-3 business days) - 50% surcharge					
Emergency (1 Business Day) - 100% surcharge	Sampler's Signature		Date/Time	2021-07-06	
For Emergency <1 Day, ASAP or Weekend - Contact ALS					

(1) clear odourless liquid, no particulate

(2) clear odourless liquid, some particulate

Teck

COC ID: 7/13/2021 | TURNAROUND TIME: | RUSH:

PROJECT/CLIENT INFO

Facility Name / Job#	Fording River Operation
Project Manager	Scott Roughead
Email	scott.roughead@teck.com
Address	
City	Elkford
Province	BC
Postal Code	
Country	Canada
Phone Number	1-250-433-6976

LABORATORY

Lab Name	Nautilus Environmental - BC
Lab Contact	
Email	BCinfo@nautilusenvironmental.ca
Address	8664 Commerce Court
City	Burnaby
Province	BC
Postal Code	V5A 4N7
Country	Canada
Phone Number	604-420-8773

OTHER INFO

Report Format / Distribution		Excel	PDF	EDD
Email 1:	david.burroughs@teck.com	X	X	X
Email 2:	britt.anderson@teck.com	X	X	X
Email 3:	scott.roughead@teck.com	X	X	X
Email 4:	teckcoal@equisonline.com			X
Email 5:		X	X	X
Email 6:	calt.good@teck.com	X	X	X

SAMPLE DETAILS / ANALYSIS REQUESTED

Filtered: F - Field, L - Lab, B - Field & Lab, N - None

Sample ID	Sample Location (sys loc code)	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	7-d C.dubia P/F	7-d C.dubia P/F (EDTA)	72-hr P. subcapitata P/F	30-d embryo EA P/F	28-d Hyalella P/F	28-d Hyalella P/F (EDTA)					
(2) FR_FR4_WS_2021-07-13_N	FR_FR4	WS	NO	7/13/2021	10:32	G	1					X						14.8
(1) FR_FRRD_WS_2021-07-13_N	FR_FRRD	WS	NO	7/13/2021	8:01	G	1					X						16.3
(1) FR_FR2_WS_2021-07-13_N	FR_FR2	WS	NO	7/13/2021	10:59	G	1					X						16.4
(2) FR_MULTIPLATE_WS_2021-07-13_NP	FR_MULTIPLATE	WS	NO	7/13/2021	9:46	G	1					X						15.7
(2) FR_UFR1_WS_2021-07-13_N	FR_UFR1	WS	NO	7/13/2021	9:10	G	1					X						15.9
												211332						

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
			Tyrone Hamilton Nautilus - Burnaby	July 14/21 @ 10:53

SERVICE REQUEST (rush - subject to availability)

Regular (default)	X
Priority (2-3 business days) - 50% surcharge	
Emergency (1 Business Day) - 100% surcharge	
For Emergency <1 Day, ASAP or Weekend - Contact ALS	

Sampler's Name	Tyler Fortin / Stella Hansen	Mobile #	
Sampler's Signature		Date/Time	2021-07-13 11:15

(1) clear odourless liquid, no particulates
(2) clear odourless liquid, some particulates

Teck

COC ID: 20 7/[illegible]/2021 | TURNAROUND TIME: | RUSH:

PROJECT/CLIENT INFO				LABORATORY				OTHER INFO				
Facility Name / Job#	Fording River Operation			Lab Name	Nautilus Environmental - BC			Report Format / Distribution		Excel	PDF	EDD
Project Manager	Scott Roughead			Lab Contact				Email 1:	david.burroughs@teck.com	X	X	X
Email	scott.roughead@teck.com			Email	BCinfo@nautilusenvironmental.ca			Email 2:	britt.anderson@teck.com	X	X	X
Address				Address	8664 Commerce Court			Email 3:	scott.roughead@teck.com	X	X	X
								Email 4:	teckcoal@equisonline.com			X
City	Elkford	Province	BC	City	Burnaby	Province	BC	Email 5:		X	X	X
Postal Code		Country	Canada	Postal Code	V5A 4N7	Country	Canada	Email 6:	cait.good@teck.com	X	X	X
Phone Number	1-250-433-6976			Phone Number	604-420-8773							

SAMPLE DETAILS | ANALYSIS REQUESTED (Filtered = Field, L: Lab, FL: Field & Lab, N: None)

	Sample ID	Sample Location (sys loc code)	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	7-d C.dubia P/F	7-d C.dubia P/F (EDTA)	72-hr P. subcapitata P/F	30-d embryo EA P/F	21/332 28-d Hyalella P/F	28-d Hyalella P/F (EDTA)					
3	FR_FR4_WS_2021-07-20_N	FR_FR4	WS	NO	7/20/2021	13:38	G	1					X						18.3°C
1	FR_FRRD_WS_2021-07-20_N	FR_FRRD	WS	NO	7/20/2021	9:20	G	1					X						16.3°C
2	FR_FR2_WS_2021-07-20_N	FR_FR2	WS	NO	7/20/2021	12:35	G	1					X						16.7°C
2	FR_MULTIPLATE_WS_2021-07-20_NP	FR_MULTIPLATE	WS	NO	7/20/2021	11:46	G	1					X						17.1°C
3	FR_UFR1_WS_2021-07-20_N	FR_UFR1	WS	NO	7/20/2021	10:50	G	1					X						16.8°C

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
		07/20/2021	rec'd by Stesta Llwyd	July 21/21 @ 11:21

SERVICE REQUEST (rush - subject to availability)

Regular (default)	X
Priority (2-3 business days) - 50% surcharge	
Emergency (1 Business Day) - 100% surcharge	
For Emergency <1 Day, ASAP or Weekend - Contact ALS	

Sampler's Name	Jeff/Shelby	Mobile #	
Sampler's Signature		Date/Time	July 20, 2021

① clear odorless liquid, no particulats

② Clear odorless liquid, Some particulates

END OF REPORT

Toxicity testing on Elk Valley Samples with *Ceriodaphnia dubia*, *Pseudokirchneriella subcapitata*, *Hyalella azteca* and *Pimephales promelas*

Third Quarter 2021

Final Report

December 1, 2021

Submitted to: **Teck Coal Ltd.**
Sparwood, BC

10823 27 Street SE, Calgary, AB T2Z 3V9

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SIGNATURE PAGE

Report By:
Émilie Viczko, M.Sc.
Project Biologist

Reviewed By:
Melanie Gallant, Ph.D.
Environmental Toxicologist

This report has been prepared by Nautilus Environmental Company Inc. based on data and/or samples provided by our client and the results of this study are for their sole benefit. Any reliance on the data by a third party is at the sole and exclusive risk of that party. The results presented here relate only to the samples tested.

1.0 INTRODUCTION

Nautilus Environmental conducted toxicity tests for Teck Coal Ltd. (Teck) on samples collected from various locations in the Elk Valley as part of a quarterly toxicity testing program required under the BC Ministry of Environment and Climate Change Strategy permit number 107517.

Stations sampled in the third quarter of 2021 are shown in Figure 1; stations shown as green symbols align with the integrated chronic toxicity testing program, which was designed to eliminate redundancy between Permit 107517 Section 9.8 (ii) and Permit 106970 toxicity testing programs. The integrated program was approved by BC Ministry of Environment and Climate Change Strategy on March 4, 2019 (BC ENV 2019). Species requiring quarterly testing include a include a cladoceran (*Ceriodaphnia dubia*) and a unicellular green alga (*Pseudokirchneriella subcapitata*). On a semi-annual basis, tests using rainbow trout (*Oncorhynchus mykiss*; Q2 and Q4), an amphipod (*Hyalella azteca*; Q2 and Q4), and fathead minnows (*Pimephales promelas*; Q1 and Q3) are also required. Due to the technical laboratory error from the second quarter, the hyalella test was re-initiated in Q3. Figure 1 stations shown as orange symbols align with the upper Fording River chronic toxicity testing program, which is a supplemental study for 2021 to satisfy Section 4D3.6 of Permit 107517. The upper Fording River program includes the same test species and testing frequency as the regional program, except that green alga is not tested.

Water samples used for testing were transported in 20-L plastic containers in coolers containing ice packs. Samples were received at temperatures ranging from 2.8 to 16.9°C and were stored in the dark at 4 ± 2°C prior to testing. Table 1 summarizes the toxicity tests that were conducted on each sample as well as sample collection dates. Samples were collected weekly on the dates shown in Table 1 for the duration of the *P. promelas* and *H. azteca* tests. The *C. dubia*, *P. subcapitata*, and *H. azteca* tests were conducted at the Nautilus Environmental laboratory in Burnaby, BC. The *P. promelas* test was conducted at the Nautilus Environmental laboratory in Calgary, AB.

This report presents the results of the toxicity tests. Copies of laboratory data sheets and printouts of statistical analyses are provided in Appendices A through D. The chain-of-custody forms are provided in Appendix E. Results of analytical chemistry that was performed on the samples tested in this program are uploaded by Teck to the Environmental Management System database. Analytical chemistry samples were collected by Teck personnel at the same time the samples were collected for toxicity testing.

Figure 1. Chronic toxicity monitoring locations.

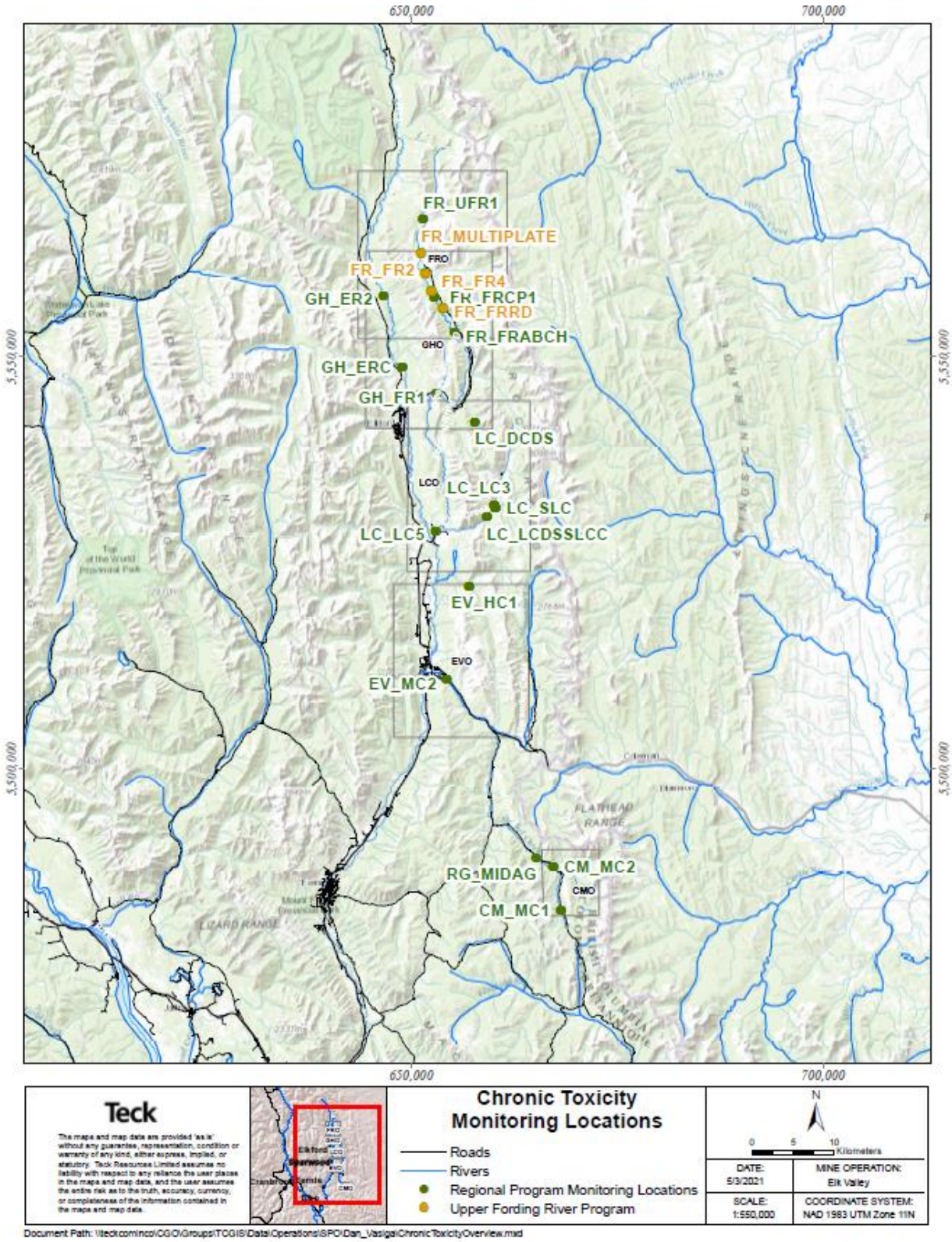

Table 1. Summary of toxicity testing program.

Sample ID	EMS Location ID	Species Tested	Sample Collection Dates‡
FR_UFR1 *	E300071	*C. dubia*, *P. subcapitata*, *P. promelas, and H. azteca*	August 8, 17, 24, 31, and September 7; 2021
GH_ER2 *	E300090	*C. dubia*, *P. subcapitata*, *P. promelas, and H. azteca*	August 8, 17, 24, 31, and September 7; 2021
CM_MC1 *	E258937	*C. dubia*, *P. subcapitata*, *P. promelas, and H. azteca*	August 8, 17, 24, 31, and September 7; 2021
LC_SLC *	E282149	*C. dubia*, *P. subcapitata*, *P. promelas, and H. azteca*	August 8, 17, 24, 31, and September 7; 2021
FR_FRABCH	E223753	*C. dubia*, *P. subcapitata*, *P. promelas, and H. azteca*	August 8, 17, 24, 31, and September 7; 2021
FR_FRCP1	E299272	*C. dubia*, *P. subcapitata*, *P. promelas, and H. azteca*	August 8, 17, 24, 31, and September 7; 2021
GH_FR1	E200028	*C. dubia*, *P. subcapitata*, *P. promelas, and H. azteca*	August 8, 17, 24, 31, and September 7; 2021
GH_ERC	E258175	*C. dubia*, *P. subcapitata*, *P. promelas, and H. azteca*	August 8, 17, 24, 31, and September 7; 2021
CM_MC2	E300091	*C. dubia*, *P. subcapitata*, *P. promelas, and H. azteca*	August 8, 17, 24, 31, and September 7; 2021
RG_MIDAG	--	*C. dubia*, *P. promelas, and H. azteca*	August 8, 17, 24, 31, and September 7; 2021
EV_MC2	E102682	*C. dubia*, *P. subcapitata*, *P. promelas, and H. azteca*	August 8, 17, 24, 31, and September 7; 2021
EV_HC1	E299270	*C. dubia*, *P. subcapitata*, *P. promelas, and H. azteca*	August 8, 17, 24, 31, and September 7; 2021
LC_DCDS	E291569	*C. dubia*, *P. subcapitata*, *P. promelas, and H. azteca*	August 8, 17, 24, 31, and September 7; 2021
LC_LC3	E297110	*C. dubia*, *P. subcapitata*, *P. promelas, and H. azteca*	August 8, 17, 24, 31, and September 7; 2021
LC_LC5	0200389	*C. dubia*, *P. subcapitata*, *P. promelas, and H. azteca*	August 8, 17, 24, 31, and September 7; 2021
LC_LCDSSLCC	E282149	*C. dubia*, *P. subcapitata*, *P. promelas, and H. azteca*	August 8, 17, 24, 31, and September 7; 2021
FR_FR4 #	0200311	*C. dubia*, *P. subcapitata*, *P. promelas, and H. azteca*	August 8, 17, 24, 31, and September 7; 2021
FR_FR2 #	200201	*C. dubia*, *P. promelas, and H. azteca*	August 8, 17, 24, 31, and September 7; 2021
FR_MULTIPLATE #	--	*C. dubia*, *P. promelas, and H. azteca*	August 8, 17, 24, 31, and September 7; 2021
FR_FRRD #	E300097	*C. dubia*, *P. promelas, and H. azteca*	August 8, 17, 24, 31, and September 7; 2021

* Site water controls

Upper Fording River samples from the supplemental study for 2021

‡ Testing with *C. dubia* and *P. subcapitata* was conducted with water collected on August 8th; testing with *H. azteca* was conducted with water collected August 8th – 31st; testing with *P. promelas* was conducted with water collected August 8th – September 7th.

2.0 METHODS

Methods for the toxicity tests using *C. dubia*, *P. subcapitata, P. promelas* and *H. azteca* are summarized in Tables 2-5. Laboratory control water was prepared using deionized water with 20% Perrier for *C. dubia*; deionized water with supplemented nutrients for *P. subcapitata*; dechlorinated City of Calgary municipal tap water with the addition of 4 mg/L potassium chloride (KCl) for *P. promelas*. In accordance with a recipe provided in Environment Canada (2013), water for *H. azteca* was prepared by adding reagent grade salts to dechlorinated Metro Vancouver municipal tap water.

For *C. dubia*, the test protocol specifies that test duration must be 7 ± 1 day, with the test being terminated on the day that at least 60% of control organisms have produced three broods. To provide additional information on reproduction patterns in the samples, and as requested by Teck, the tests were extended to 8 days, regardless of when 60% of controls had produced three broods. The results reported below were calculated based on the specifications of the test method, which in this case was based on the reproduction that had been observed up to Day 7 of exposure. The additional information on reproduction up to Day 8 of exposure is available in Appendix A.

As requested by Teck, site water used in the tests with *P. promelas* were amended with either 10, 15, or 20 µg/L of copper (concentrations provided by Golder depending on the hardness, pH and DOC of each sample) to reduce the potentially confounding effects of microbial growth. Fathead minnows are susceptible to adverse effects of fungi and microbes (Grothe and Johnson, 1996; Kszos et al., 1997; Downey et al., 2000). Results of toxicity tests and Toxicity Identification Evaluation efforts conducted in 2015 indicated that artefactual toxicity (i.e., adverse effects that were not associated with toxicants in the sample) had occurred in fathead minnow tests using ambient water samples from the Elk Valley. Amendment of the samples with a low dose of copper appeared to counteract this effect. Consequently, samples were amended with copper for the *P. promelas* tests in order to reduce the potential adverse effects caused by fungi and microbes.

The fathead minnows were evaluated for potential microbial growth during daily replenishments and test termination (Nautilus, 2020). Microbial growth is noted on the bench sheets at every instance of visual confirmation of a superficial fungus-like growth around the gill region and/or surrounding the surfaces of the test organisms, and high mortality that is not consistent across replicates, as described in Downey et al. (2000).

For the *H. azteca* tests, all site waters were supplemented with 25 mg/L chloride and 0.02 mg/L bromide using NaCl and NaBr, respectively, in accordance with recommendations by the Hyalella Advisory Group (chaired by Chris Ingersoll, USGS; Norberg-King et al., 2014). Insufficient concentrations of these halides are known to impair growth of this species. The laboratory control water contained approximately 75 mg/L chloride and 0.8 mg/L bromide

Statistical analyses were performed using CETIS (Tidepool Scientific Software, 2013), and involved comparison of results to both the laboratory and site water controls.

Table 2. Test conditions: *Ceriodaphnia dubia* survival and reproduction test.

Test species	*Ceriodaphnia dubia*
Organism source	In-house culture
Organism age	<24-hour old neonates, produced within a 12-hour window
Test type	Static-renewal
Test duration	8 days[1]
Test vessel	20-mL glass test tube
Test volume	15 mL
Test solution depth	10 cm
Test concentrations	100% (undiluted) sample, plus laboratory control
Test replicates	10 per treatment
Number of organisms	1 per replicate
Control water	20% Perrier water and 80% deionized water + 5 µg/L Se and 2 µg/L vitamin B12
Test solution renewal	Daily (100% renewal)
Test temperature	25 ± 1°C
Feeding	Daily with *Pseudokirchneriella subcapitata* and TCC[2] (3:1 ratio)
Light intensity	100 to 600 lux at water surface
Photoperiod	16 hours light / 8 hours dark
Aeration	None
Test measurements	Temperature, dissolved oxygen, pH and conductivity measured daily; hardness and alkalinity of undiluted sample measured at test initiation; survival and reproduction checked daily
Test protocol	Environment Canada (2007a), EPS 1/RM/21
Statistical software	CETIS Version 1.9.4
Test endpoints	Survival and reproduction
Test acceptability criteria for controls	≥80% survival; ≥15 young per surviving control producing three broods; ≥60% of controls producing three or more broods; no ephippia present
Reference toxicant	Sodium chloride (NaCl)

[1] Test duration was extended to 8 days to provide additional information on patterns of reproduction. Summarized data and calculated endpoints are based on results from Day 7, according to the standard test procedure; however, all of the data through 8 days are provided in Appendix A.

[2] TCC = Trout Chow + cerophyl

Table 3. Test conditions: *Pseudokirchneriella subcapitata* growth inhibition test.

Test species	*Pseudokirchneriella subcapitata*, strain CPCC# 37
Organism source	In-house axenic culture, obtained from Canadian Phycological Culture Center, and originally isolated from Nivelta River, Norway.
Organism age	3-to 7-day old culture in logarithmic growth phase
Test type	Static
Test duration	72 hours
Test vessel	Microplate
Test volume	220 µL
Test concentrations	Full strength sample diluted to 95.2% (v/v) by addition of nutrients, plus laboratory control
Test replicates	4 per treatment; 8 for laboratory control and site controls
Number of organisms	10,000 cells/mL
Control water	Deionized water supplemented with nutrients
Test solution renewal	None
Test temperature	24 ± 2°C
Feeding	None
Light intensity	3600 to 4400 lux
Photoperiod	24 hours light
Aeration	None
Test measurements	Test area temperature measured daily; temperature and pH measured at test initiation; pH of two control wells measured at test termination
Test protocol	Environment Canada (2007b), EPS 1/RM/25
Statistical software	CETIS Version 1.9.4
Test endpoints	Algal cell growth inhibition
Test acceptability criteria for controls	>16-fold increase in number of algal cells; CV ≤ 20%; no trend when analyzed using Mann-Kendall test
Reference toxicant	Zinc (added as $ZnSO_4$)

Table 4. Test conditions: 32-day fathead minnow *(Pimephales promelas)* survival and growth test.

Test species	*Pimephales promelas*
Organism source	Aquatox Inc., AR
Organism age	<24 hours
Test type	Static-renewal
Test duration	From egg stage until 28 days post hatch
Test vessel	1-L glass jar
Test volume	1 L
Test concentrations	100% (undiluted) sample amended with 10, 15, or 20 µg/L Cu, plus laboratory control and control amended with 10, 15, or 20 µg/L Cu
Test replicates	4 per treatment
Number of organisms	10 per replicate
Control water	Dechlorinated City of Calgary municipal tapwater amended with 4 mg/L KCl.
Test solution renewal	Daily (80% renewal)
Test temperature	25 ± 1°C
Feeding	Twice a day, after hatch, with newly hatched brine shrimp (*Artemia* nauplii)
Light intensity	100 to 500 lux
Photoperiod	16 hours light / 8 hours dark
Aeration	None unless dissolved oxygen fell to less than 60% saturation
Test measurements	Temperature, dissolved oxygen, pH and conductivity measured daily; hardness and alkalinity measured upon arrival; survival and any incidence of fungal growth on the test organisms recorded daily
Test protocol	US EPA (1996) and ASTM (2013)
Statistical software	CETIS Version 1.9.4
Test endpoints	Hatch, survival, length, biomass, normal development (which assesses incidence of deformities)
Test acceptability criteria for controls	>66% hatch, ≥70% post-hatch survival
Reference toxicant	Sodium chloride (NaCl)

Table 5. Test conditions: *Hyalella azteca* survival and growth test.

Test species	*Hyalella azteca*
Organism source	Aquatic Biosystems, CO
Organism age	7- to 8-days old
Test type	Static-renewal
Test duration	28 days
Test vessel	375-mL glass container
Test volume	300 mL
Test concentrations	100% (undiluted) samples amended with 25 mg/L Cl and 0.02 mg/L Br, plus laboratory control
Test replicates	5 per treatment
Number of organisms	10 per replicate
Control water	Reconstituted water containing ~75 mg/L Cl and 0.8 mg/L Br (Environment Canada 2013). Samples were supplemented with 25 mg/L Cl and 0.02 mg/L Br.
Test solution renewal	Twice daily (~80% renewal)
Test temperature	23 ± 1°C
Feeding	1 mL of YCT daily to each container. Tetramin daily, with amounts increasing weekly; Week 1: 0.25 mg, Week 2: 0.5 mg, Week 3: 1 mg, Week 4: 1.5 mg in each test container.
Light intensity	500 to 1000 lux at water surface
Photoperiod	16 hours light / 8 hours dark
Aeration	None
Test measurements	Temperature, dissolved oxygen, pH and conductivity measured daily; hardness and alkalinity measured upon arrival; hardness and alkalinity measured at test termination; total ammonia measured at test initiation and termination
Test protocol	Modified from US EPA (2000), as described in Norberg-King et al. (2014)
Statistical software	CETIS Version 1.9.4
Test endpoints	Survival and dry weight
Test acceptability criteria for controls	Mean control survival of ≥80%, dry weight ≥0.10 mg
Reference toxicant	Sodium chloride (NaCl)

3.0 RESULTS

3.1 *Ceriodaphnia dubia*

Results of the toxicity tests using *C. dubia* are provided in Table 6. The site water control samples from FR_UFR1, GH_ER2, CM_MC1 and LC_SLC performed similarly to the laboratory control, indicating that there were no adverse effects associated with the upstream stations.

There were no adverse effects on survival in any of the samples tested; survival ranged between 80 and 100%. Significantly lower reproduction relative to one or more controls was observed in FR_FRCP1, LC_DCDS and FR_FR4.

3.2 *Pseudokirchneriella subcapitata*

Results of the toxicity tests using *P. subcapitata* are provided in Table 7. The cell yield in site controls FR_UFR1, GH_ER2, CM_MC1 and LC_SLC was 2.9- to 3.0-fold greater than the laboratory control. This finding is not unusual, since the higher ionic strength associated with the site water controls would be expected to stimulate cell growth of this species relative to the very low ionic strength associated with the laboratory control water.

Significantly lower cell yield relative to one or more site controls was observed in FR_FRABCH, GH_ERC, EV_HC1, LC_DCDS and LC_LC3. Growth stimulation was observed in all samples tested compared to the laboratory control. Percent stimulation ranged between 106.9 and 203.3%.

3.3 *Pimephales promelas*

Results of the toxicity tests using *P. promelas* are provided in Table 8. Relative to the laboratory control, there were no adverse effects observed in the copper-amended controls for hatch rate, biomass, or normal development. An adverse effect on survival relative to the laboratory control or one or more copper-amended controls was observed in site control FR_UFR1. Decreased length relative to the laboratory control or one or more copper-amended controls was observed in site controls GH_ER2 and CM_MC1.

There were no adverse effects observed on hatch rate or normal development for any samples tested. Adverse effects on survival in downstream stations relative to one or more controls were observed in samples EV_HC1 and LC_LCDSSLC. Decreased biomass relative to one control was observed in EV_HC1. Decreased length relative to one or more control was observed in FR_FRCP1, GH_FR1, RG_MIDAG, EV_MC2, FR_FR4, FR_FR2, FR_MULTIPLATE and FR_FRRD.

Microbial growth was observed on test organisms in one or more replicates of all samples except EV_MC2 and LC_DCDS suggesting that the copper dose employed in these samples was not sufficient to curtail microbial effects. Instances of microbial growth were observed as early as day 3 of the test and observations persisted as late day 20. Patterns of mortality are consistent with previous observations microbial growth.

3.4 *Hyalella azteca*

Results of the toxicity tests using *H. azteca* are provided in Table 9. Survival among site controls FR_UFR1, GH_ER2, CM_MC1 and LC_SLC was similar to the laboratory control, however, dry weight of FR_UFR1, GH_ER2, and LC_SLC was significantly lower than the laboratory control.

Significantly lower survival, relative to all controls, was observed in CM_MC. All of the samples tested had significantly lower dry weight relative to one or more controls, except of RG_MIDAG and EV_HC1.

Table 6. Results: *Ceriodaphnia dubia* survival and reproduction test.

Sample ID	Survival (%)	Reproduction (Mean ± SD)
Laboratory Control	100	22.2 ± 3.8
FR_UFR1 (Site Control)	100	22.1 ± 3.3
GH_ER2 (Site Control)	90	21.0 ± 7.7
CM_MC1 (Site Control)	100	23.0 ± 4.0
LC_SLC (Site Control)	100	23.0 ± 4.3
FR_FRABCH	100	19.1 ± 3.4
FR_FRCP1	90	12.7 ± 7.4 # † ‡ §
GH_FR1	100	19.1 ± 3.8
GH_ERC	100	21.1 ± 2.1
CM_MC2	90	19.3 ± 4.4
RG_MIDAG	100	22.2 ± 4.4
EV_MC2	100	25.0 ± 5.7
EV_HC1	90	23.2 ± 7.3
LC_DCDS	80	12.7 ± 9.4 ‡
LC_LC3	100	20.2 ± 2.5
LC_LC5	100	21.1 ± 4.3
LC_LCDSSLCC	90	20.3 ± 6.6
FR_FR4	100	15.9 ± 6.8 ‡
FR_FR2	100	19.4 ± 3.9
FR_MULTIPLATE	100	21.0 ± 2.7
FR_FRRD	100	16.9 ± 5.9

SD = Standard Deviation
* Result was significantly lower than the laboratory control
# Result was significantly lower than the FR_UFR1 site control
† Result was significantly lower than the GH_ER2 site control
‡ Result was significantly lower than the CM_MC1 site control
§ Result was significantly lower than the LC_SLC site control

Table 7. Results: *Pseudokirchneriella subcapitata* growth inhibition test.

Sample ID	Cell Yield (x 10^4 cells/mL) (Mean ± SD)	Stimulation relative to laboratory control (%)
Laboratory Control	33.1 ± 3.5	--
FR_UFR1 (Site Control)	95.8 ± 12.4	189.1
GH_ER2 (Site Control)	97.4 ± 8.4	194.0
CM_MC1 (Site Control)	100.4 ± 8.7	203.0
LC_SLC (Site Control)	99.4 ± 9.2	200.0
FR_FRABCH	83.8 ± 7.2 ‡ §	152.8
FR_FRCP1	89.8 ± 11.6	170.9
GH_FR1	87.0 ± 10.8	162.6
GH_ERC	75.0 ± 7.5 # † ‡ §	126.4
CM_MC2	89.0 ± 3.5	168.7
EV_MC2	94.8 ± 8.1	186.0
EV_HC1	74.5 ± 6.2 # † ‡ §	124.9
LC_DCDS	68.5 ± 7.4 # † ‡ §	106.8
LC_LC3	80.8 ± 5.6 # † ‡ §	143.8
LC_LC5	91.2 ± 10.9	175.5
LC_LCDSSLCC	85.8 ± 5.0	158.9

SD = Standard Deviation
* Result was significantly lower than the laboratory control
# Result was significantly lower than the FR_UFR1 site control
† Result was significantly lower than the GH_ER2 site control
‡ Result was significantly lower than the CM_MC1 site control
§ Result was significantly lower than the LC_SLC site control

Table 8. Results: *Pimephales promelas* survival and growth test.

Sample ID	(Mean ± SD)				
	Hatch (%)	Survival (%)	Biomass (mg)	Length (mm)	Normal development (%)
Laboratory Control	98.3 ± 3.3	84.8 ± 8.3	2.63 ± 0.40	11.9 ± 0.5	100.0 ± 0.0
Laboratory Control [M] [+10 µg/L Cu]	98.3 ± 3.3	83.1 ± 3.6	2.77 ± 0.38	12.4 ± 0.5	98.1 ± 3.9
Laboratory Control [+15 µg/L Cu]	96.7 ± 3.9	71.0 ± 21.2	2.44 ± 0.28	12.4 ± 0.9	98.2 ± 3.6
Laboratory Control [+20 µg/L Cu]	95.0 ± 3.3	75.1 ± 17.2	2.61 ± 0.07	13.0 ± 0.2	94.1 ± 6.8
FR_UFR1 (Site Control) [M] [+20 µg/L Cu]	93.3 ± 5.4	55.3 ± 23.6 [a,b,4]	2.16 ± 0.85	11.7 ± 0.5	100.0 ± 0.0
GH_ER2 (Site Control) [M] [+10 µg/L Cu]	95.0 ± 6.4	78.6 ± 12.9	2.48 ± 0.33	11.2 ± 0.2 [d]	97.9 ± 4.2
CM_MC1 (Site Control) [M] [+15 µg/L Cu]	88.3 ± 3.3	62.2 ± 18.9	1.91 ± 0.53	11.0 ±0.6 [b,c,d]	95.0 ± 10.0
LC_SLC (Site Control) [M] [+15 µg/L Cu]	93.3 ± 0.0	85.7 ± 5.8	2.64 ± 0.11	11.9 ± 0.5	97.9 ± 4.2
FR_FRABCH [M] [+20 µg/L Cu]	91.7 ± 6.4	74.4 ± 7.8	2.63 ± 0.26	11.7 ± 0.8	100.0 ± 0.0
FR_FRCP1 [M] [+20 µg/L Cu]	96.7 ± 3.9	79.4 ± 15.2	2.46 ± 0.30	10.8 ± 0.9 [b,c,d]	95.1 ± 5.7
GH_FR1 [M] [+20 µg/L Cu]	96.7 ± 6.7	81.2 ± 2.3	2.51 ± 0.16	11.0 ± 0.4 [b,c,d]	93.8 ± 8.0
GH_ERC [M] [+10 µg/L Cu]	95.0 ± 6.4	65.6 ± 13.5	2.58 ± 0.18	12.7 ± 0.3	97.2 ± 5.6
CM_MC2 [M] [+20 µg/L Cu][M]	98.3 ± 3.3	67.5 ± 24.7	2.27 ± 0.18	12.5 ± 0.9	100.0 ± 0.0
RG_MIDAG [M] [+15 µg/L Cu]	96.7 ± 6.7	79.2 ± 9.6	2.41 ± 0.22	11.1 ± 0.6 [d]	91.2 ± 6.4
EV_MC2 [+20 µg/L Cu]	96.7 ± 3.9	84.4 ± 9.1	2.58 ± 0.21	10.8 ± 1.0 [b,c,d]	92.3 ± 6.3
EV_HC1 [M] [+20 µg/L Cu]	88.3 ± 8.4	57.1 ± 33.3 [a, 4]	2.07 ± 0.27[b]	12.2 ± 1.6	98.3 ± 3.3

SD = Standard Deviation; M = microbial growth
[a] Result was significantly lower than the laboratory control
[b] Result was significantly lower than the 10 µg/L copper-treated laboratory control for fathead minnow
[c] Result was significantly lower than the 15 µg/L copper-treated laboratory control for fathead minnow
[d] Result was significantly lower than the 20 µg/L copper-treated laboratory control for fathead minnow
[1] Result was significantly lower than the FR_UFR1 site control
[2] Result was significantly lower than the GH_ER2 site control
[3] Result was significantly lower than the CM_MC1 site control
[4] Result was significantly lower than the LC_SLC site control

Table 8. Results: 32-day *Pimephales promelas* survival and growth test (continued).

Sample ID	(Mean ± SD)				
	Hatch (%)	Survival (%)	Biomass (mg)	Length (mm)	Normal development (%)
LC_DCDS [+20 µg/L Cu]	100.0 ± 0.0	66.7 ± 21.1	2.46 ± 0.28	12.3 ± 0.6	94.2 ± 7.1
LC_LC3 M [+20 µg/L Cu]	100.0 ± 0.0	68.3 ± 11.4	2.66 ± 0.20	12.2 ± 0.9	95.6 ± 5.0
LC_LC5 M [+20 µg/L Cu]	98.3 ± 3.3	67.6 ± 18.8	2.54 ± 0.22	12.6 ± 1.2	98.1 ± 3.9
LC_LCDSSLCC M [+20 µg/L Cu]	96.7 ± 3.9	57.3 ± 13.7 [a,b,4]	2.28 ± 0.38	12.1 ± 0.4	97.5 ± 5.0
FR_FR4 M [+20 µg/L Cu]	95.0 ± 10.0	71.3 ± 17.7	2.36 ± 0.45	11.2 ± 0.4 [d]	91.5 ± 11.8
FR_FR2 M [+20 µg/L Cu]	96.7 ± 3.9	85.0 ± 17.5	2.75 ± 0.22	11.3 ± 0.5 [d]	98.2 ± 3.6
FR_MULTIPLATE M [+20 µg/L Cu]	88.3 ± 10.0	78.2 ± 19.2	2.23 ± 0.20	11.1 ± 0.9 [d]	97.5 ± 5.0
FR_FRRD M [+20 µg/L Cu]	98.3 ± 3.3	86.6 ± 5.3	2.74 ± 0.13	10.9 ± 0.3 [b,c,d]	97.9 ± 4.2

SD = Standard Deviation; M = microbial growth
[a] Result was significantly lower than the laboratory control
[b] Result was significantly lower than the 10 µg/L copper-treated laboratory control for fathead minnow
[c] Result was significantly lower than the 15 µg/L copper-treated laboratory control for fathead minnow
[d] Result was significantly lower than the 20 µg/L copper-treated laboratory control for fathead minnow
[1] Result was significantly lower than the FR_UFR1 site control
[2] Result was significantly lower than the GH_ER2 site control
[3] Result was significantly lower than the CM_MC1 site control
[4] Result was significantly lower than the LC_SLC site control

Table 9. Results: *Hyalella azteca* survival and growth test.

Sample ID	(Mean ± SD)	
	Survival (%)	Dry weight (mg)
Laboratory Control	96.0 ± 8.9	0.86 ± 0.15
FR_UFR1 (Site Control)	94.0 ± 8.9	0.61 ± 0.12*
GH_ER2 (Site Control)	98.0 ± 4.5	0.53 ± 0.11*‡
CM_MC1 (Site Control)	98.0 ± 4.5	0.77 ± 0.07
LC_SLC (Site Control)	94.0 ± 5.5	0.55 ± 0.05*‡
FR_FRABCH	92.0 ± 11.0	0.47 ± 0.11*‡
FR_FRCP1	98.0 ± 4.5	0.45 ± 0.14*‡
GH_FR1	100.0 ± 0.0	0.49 ± 0.11*‡
GH_ERC	98.0 ± 4.5	0.50 ± 0.07 *‡
CM_MC2	38.0 ± 31.9*#†‡§	0.32 ± 0.10 *#†‡§
RG_MIDAG	94.0 ± 13.4	0.79 ± 0.07
EV_MC2	94.0 ± 8.9	0.61 ± 0.09*
EV_HC1	98.0 ± 4.5	0.75 ± 0.10
LC_DCDS	100.0 ± 0.0	0.58 ± 0.06 *‡
LC_LC3	96.0 ± 5.5	0.51 ± 0.06 *‡
LC_LC5	94.0 ± 5.5	0.48 ± 0.08 *‡
LC_LCDSSLCC	94.0 ± 8.9	0.53 ± 0.07 *‡
FR_FR4	98.0 ± 4.5	0.47 ± 0.25 *‡
FR_FR2	86.0 ± 26.1	0.50 ± 0.12 *‡
FR_MULTIPLATE	98.0 ± 4.5	0.32 ± 0.03 *#†‡§
FR_FRRD	100.0 ± 0.0	0.50 ± 0.13 *‡

SD = Standard Deviation
* Result was significantly lower than the laboratory control
# Result was significantly lower than the FR_UFR1 site control
† Result was significantly lower than the GH_ER2 site control
‡ Result was significantly lower than the CM_MC1 site control
§ Result was significantly lower than the LC_SLC site control

4.0 QA/QC

The health histories of the test organisms used in the exposures were acceptable and met the requirements of the test protocols. Tests met all control acceptability criteria and water quality parameters remained within ranges specified in the protocol throughout the tests. There were no other deviations from the test methodologies, other than the planned modifications to the *C. dubia*, *H. azteca* and *P. promelas* tests, as described in Section 2.0. Uncertainty associated with the test is best described by the standard deviation around the mean.

Results of the reference toxicant tests conducted during the testing program are summarized in Table 10. Results of the *C. dubia*, *P. subcapitata*, *H. azteca* and the *P. promelas* growth endpoint fell within the acceptable range for organism performance of two standard deviations around the mean, based on historical results obtained by the laboratory with these tests. The *P. promelas* survival result of the reference toxicant test fell outside of two standard deviations of the historical mean; this is expected to happen 5% of the time. An investigation occurred and all testing and culturing procedures were followed appropriately. The sensitivity of the organisms used in these tests was appropriate.

Table 10. Reference toxicant test results.

Test species	Endpoint	Historical mean (2 SD Range)	CV (%)	Test date
C. dubia	Survival (LC50): 2.0 g/L NaCl	2.0 (1.8-2.2)	5	August 10, 2021
	Reproduction (IC50): 1.8 g/L NaCl	1.8 (1.4-2.3)	13	
P. subcapitata	Growth (IC50): 28.3 µg/L Zn	32.0 (26.8 – 38.3)	9	August 4, 2021
P. promelas	Survival (LC50): 3.9 g/L NaCl	6.3 (4.1-9.7)	14.1	August 17, 2021
	Biomass (IC25): 2.3 g/L NaCl	3.7 (2.2-6.2)	17.2	
H. azteca	Survival (LC50): 6.9 g/L NaCl	6.2 (3.9-9.8)	23	August 12, 2021

SD = Standard Deviation, CV = Coefficient of Variation, LC = Lethal Concentration, IC = Inhibition Concentration

5.0 REFERENCES

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APPENDIX A – *Ceriodaphnia dubia* Toxicity Test Data

Ceriodaphnia dubia Summary Sheet

Client: TECK
Work Order No.: 211567

Start Date/Time: August. 11/21 @ 1500h
Set up by: SAK/JZL

Sample Information:

Sample ID: Various - see below
Sample Date: ~~Q~~ SM Aug. 10/21
Date Received: Aug. 11/21
Sample Volume: Various

Test Validity Criteria:

1) Mean survival of first generation controls is ≥80 %
2) At least 60% of controls have produced three broods within 8 days
3) An average of ≥15 live young produced per surviving female in the control solutions during the first three broods.
4) Invalid if ephippia observed in any control solution at any time.

WQ Ranges:

T (°C) = 25 ± 1; DO (mg/L) = 3.3 to 8.4 ; pH = 6.0 to 8.5

Test Organism Information:

Broodstock No.: BB080421A ~~+B~~ SM; ~~BB080~~ SM ~~21~~ BB072921A+B
Age of young (Day 0): <24-h (within 12-h)
Avg No. young in first 3 broods of previous 7 d: 30
Mortality (%) in previous 7 d: 6
Individual female # used ≥8 young on test day: #1, 3-10, 12-19; # 3, 5-7, 12, 14-18, 21-23, 26

NaCl Reference Toxicant Results:

Reference Toxicant ID: Cd291
Stock Solution ID: 21Na02
Date Initiated: Aug. 10/21

7-d LC50 (95% CL): 2.0 (1.7 - 2.3) g/L NaCL
7-d IC50 (95% CL): 1.8 (1.4 - 1.9) g/L NaCL

7-d LC50 Reference Toxicant Mean and Historical Range: 2.0 (1.8 - 2.2) g/L NaCL CV (%): 5
7-d IC50 Reference Toxicant Mean and Historical Range: 1.8 (1.4 - 2.3) g/L NaCL CV (%): 13

Test Results:

	Survival (%)	Reproduction (Mean ± SD)
Negative Control	100	22.2 ± 3.8
FR_UFR1	100	22.1 ± 3.3
GH_ER2	90	21.0 ± 7.7
CM_MC1	100	23.0 ± 4.0
LC_SLC	100	23.0 ± 4.3
FR_FRABCH	100	19.1 ± 3.4
FR_FRCP1	90	12.7 ± 7.4 a,b,c,d
GH_FR1	100	19.1 ± 3.8
GH_ERC	100	21.1 ± 2.1

Results that are significantly lower ~~than~~ than -
~~b~~ SM a = FR_UFR1
b = GH_ER2
c = ~~GH_ER2~~ SM CM_MC1
d = ~~CM~~ SM LC_SLC

Reviewed by: JGW

Date reviewed: Nov. 2/21

Ceriodaphnia dubia Summary Sheet

Client: TECK
Work Order No.: 211567

Start Date/Time: August 11/21 @ 1500h
Set up by: SAK/JZL

Sample Information:

Sample ID: Various - see below
Sample Date: 8 & 9 Aug. 10/21
Date Received: Aug. 11/21
Sample Volume: Various

Test Validity Criteria:

1) Mean survival of first generation controls is ≥80 %
2) At least 60% of controls have produced three broods within 8 days
3) An average of ≥15 live young produced per surviving female in the control solutions during the first three broods.
4) Invalid if ephippia observed in any control solution at any time.

WQ Ranges:

T (°C) = 25 ± 1; DO (mg/L) = 3.3 to 8.4 ; pH = 6.0 to 8.5

Test Organism Information:

Broodstock No.: BB080421A+B 8th; ~~BB080521~~ 8th BB072921A+B
Age of young (Day 0): <24-h (within 12-h)
Avg No. young in first 3 broods of previous 7 d: 30
Mortality (%) in previous 7 d: 6
Individual female # used ≥8 young on test day: # 1, 3-10, 12-19*; # 3, 5-7, 12, 14-18, 21-23, 26

NaCl Reference Toxicant Results:

Reference Toxicant ID: Cd291
Stock Solution ID: 21NaCl2
Date Initiated: Aug. 10/21

7-d LC50 (95% CL): 2.0 (1.7 - 2.3) g/L NaCL
7-d IC50 (95% CL): 1.8 (1.4 - 1.9) g/L NaCL

7-d LC50 Reference Toxicant Mean and Historical Range: 2.0 (1.8-2.2) g/L NaCL CV (%): 5
7-d IC50 Reference Toxicant Mean and Historical Range: 1.8 (1.4 - 2.3) g/L NaCL CV (%): 13

Test Results:

	Survival (%)	Reproduction (Mean ± SD)
Negative Control	100	22.2 ± 3.8
CM-MC2	90	19.3 ± 4.4
EV-MC2	100	25.0 ± 5.7
EV-HCl	90	23.2 ± 7.3
LC-DCDS	80	12.7 ± 9.4 c
LC-LC3	100	20.2 ± 2.5
LC-LC5	100	21.1 ± 4.3
LC-LCDSSLCC	90	20.3 ± 6.6
RG-MIDAG	100	22.2 ± 4.4

Results that are significantly lower than =
c = CM-MCl

Reviewed by: JCM
Date reviewed: Nov 2/21

Ceriodaphnia dubia Summary Sheet

Client: TECK
Work Order No.: 211567

Start Date/Time: August 11/21 @ 1500h
Set up by: SAK/JZL

Sample Information:

Sample ID: Various - See below
Sample Date: Aug. 10/21
Date Received: Aug. 11/21
Sample Volume: Various

Test Validity Criteria:

1) Mean survival of first generation controls is ≥80 %
2) At least 60% of controls have produced three broods within 8 days
3) An average of ≥15 live young produced per surviving female in the control solutions during the first three broods.
4) Invalid if ephippia observed in any control solution at any time.

WQ Ranges:

T (°C) = 25 ± 1; DO (mg/L) = 3.3 to 8.4 ; pH = 6.0 to 8.5

Test Organism Information:

Broodstock No.: BB080421A+B; ~~BB080521~~ BB072921A+B
Age of young (Day 0): <24-h (within 12-h)
Avg No. young in first 3 broods of previous 7 d: 30
Mortality (%) in previous 7 d: 6
Individual female # used ≥8 young on test day: #1,3-10,12-19; #3,5-7,12,14-18,21-23,26

NaCl Reference Toxicant Results:

Reference Toxicant ID: Cd291
Stock Solution ID: 21NaCl2
Date Initiated: Aug. 10/21

7-d LC50 (95% CL): 2.0 (1.7 - 2.3) g/L NaCL
7-d IC50 (95% CL): 1.8 (1.4 - 1.9) g/L NaCL

7-d LC50 Reference Toxicant Mean and Historical Range: 2.0 (1.8-2.2) g/L NaCL CV (%): 5
7-d IC50 Reference Toxicant Mean and Historical Range: 1.8 (1.4 - 2.3) g/L NaCL CV (%): 13

Test Results:

	Survival (%)	Reproduction (Mean ± SD)
Negative Control	100	22.2 ± 3.8
FR-FR4	100	15.9 ± 6.8 [c]
FR-FR2	100	19.4 ± 3.9
FR-MULTIPLATE	100	21.0 ± 2.7
FR-FRRD	100	16.9 ± 5.9
		±
		±
		±
		±

Results that are significantly lower than = c = CM-MCI

Reviewed by: JGL
Date reviewed: Nov. 2/21

Chronic Freshwater Toxicity Test
Initial and Final Water Quality Measurements

Client: TECK
Sample ID: Various
Work Order #: 211567

Start Date & Time: August. 11/21 @ 1500h
Stop Date & Time: August. 19/21 @ 1300h
CER #: 4 J
Test Species: *Ceriodaphnia dubia*

Concentration Control	Days																
	0	1		2		3		4		5		6		7		8	
	init.	old	new	old	new	old	new	old	new	old	new	old	new	~~old~~ final	new	final
Temperature (°C)	25.0	24.0	25.0	24.0	25.0	24.0	25.0	24.0	24.5	24.0	25.0	24.0	25.0	24.0	25.0	24.0	
DO (mg/L)	8.1	7.0	8.0	7.1	8.0	7.3	8.0	7.3	7.9	7.1	8.1	7.0	8.0	7.0	8.1	7.0	
pH	7.9	7.5	7.9	7.6	8.0	7.6	7.9	7.6	8.0	~~7.4~~ ① 7.7	8.0	7.6	8.0	7.6	7.9	7.5	
Cond. (µS/cm)	212	214		213		209		211		210		211		/	209	214	
Initials	SAK	JZL		JZL		GJU		CCS		SAK		JZL		SAK	JZL	JZL	

① 7.7

① Concentration FR_UFR1	Days																
	0	1		2		3		4		5		6		7		8	
	init.	old	new	old	new	old	new	old	new	old	new	old	new	~~old~~ final	new	final	
Temperature (°C)	26.0	24.0	24.0	24.0	24.5	24.5	24.0	24.0	24.5	24.0	24.0	24.0	24.0	24.0	24.0	24.0	
DO (mg/L)	7.3	7.1	7.8	7.1	7.7	7.4	7.8	7.3	8.2	7.2	8.2	7.2	7.9	7.0	7.8	7.0	
pH	8.0	7.8	8.1	7.8	8.0	7.7	7.9	7.8	8.1	7.8	8.2	7.8	8.1	7.8	8.0	7.8	
Cond. (µS/cm)	347	344		344		344		346		346		346		/	347	343	
Initials	SAK	JZL		JZL		JZL		CCS		SAK		JZL		SAK	JZL	JZL	

② Concentration GH_ER2	Days																
	0	1		2		3		4		5		6		7		8	
	init.	old	new	old	new	old	new	old	new	old	new	old	new	~~old~~ final	new	final	
Temperature (°C)	26.0	24.0	24.0	24.0	24.0	24.0	24.0	24.5	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	
DO (mg/L)	7.3	7.2	7.9	7.2	7.8	7.3	7.9	7.3	8.2	7.3	8.2	7.2	8.2	7.0	8.0	7.1	
pH	7.9	7.8	8.0	7.8	7.9	7.7	7.8	7.8	8.0	7.8	8.1	7.8	7.9	7.8	7.9	7.8	
Cond. (µS/cm)	276	274		273		274		275		274		275		/	275	274	
Initials	SAK	JZL		JZL		JZL		CCS		SAK		JZL		SAK	JZL	JZL	

③ Concentration CM_MCI	Days																
	0	1		2		3		4		5		6		7		8	
	init.	old	new	old	new	old	new	old	new	old	new	old	new	~~old~~ final	new	final	
Temperature (°C)	26.0	24.0	24.0	24.0	24.0	24.0	24.0	24.5	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	
DO (mg/L)	7.2	7.1	7.9	7.2	7.8	7.4	8.0	7.3	8.1	7.4	8.2	7.3	8.1	7.0	8.0	7.1	
pH	7.9	7.8	8.0	7.8	7.9	7.7	7.8	7.8	8.1	7.9	8.2	7.8	8.0	7.7	7.9	7.8	
Cond. (µS/cm)	286	282		283		284		283		283		284		/	285	281	
Initials	SAK	JZL		JZL		JZL		CCS		SAK		JZL		SAK	JZL	JZL	

Thermometer: CER #4 DO meter/probe: 1 / 1 pH meter/probe: 1 / 1 Conductivity meter/probe: 1 / 1

	Control	FR_UFR1	GH_ER2	CM_MCI
Hardness*	100	180	142	142
Alkalinity*	94	152	140	138

* mg/L as CaCO3

Analysts: SAK, JZL, RES, CCS, GJU
Reviewed by: JCL
Date reviewed: Oct-26/21

Sample Description: refer to COC

Comments: Broodboard Used: BB072921A (# 3.5-7, 12, 14-18, 21, 22, 23, 26)
BB080421A (# 1, 3-10, 12-19)

Chronic Freshwater Toxicity Test
Initial and Final Water Quality Measurements

Client: TECK
Sample ID: various
Work Order #: 211567

Start Date & Time: ~~5th~~ Aug. 11/21 @ 1500h
Stop Date & Time: Aug. 19/21 @ 1300h
CER #: 4
Test Species: *Ceriodaphnia dubia*

④ Concentration LC_SLC

	0	1		2		3		4		5		6		7	8	
	init.	old	new	old	new	old	new	old	new	old	new	old	new	~~old~~ final	new	final
Temperature (°C)	26.0	24.0	24.0	24.0	24.0	24.0	24.0	24.5	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0
DO (mg/L)	7.3	7.0	7.8	7.2	7.8	7.3	7.8	7.3	8.1	7.3	8.2	6.9	7.8	7.0	7.9	7.0
pH	7.9	7.8	8.0	7.8	8.0	7.7	7.9	7.8	8.1	7.9	8.2	7.8	8.0	7.7	7.9	7.8
Cond. (µS/cm)	344	346		345		345		344		346		346		/	346	341
Initials	SAK	JZL		JZL		JZL		CK		SAK		JZL		SAK	JZL	JZL

⑤ Concentration FR_FRABCH

	0	1		2		3		4		5		6		7	8	
	init.	old	new	old	new	old	new	old	new	old	new	old	new	~~old~~ final	new	final
Temperature (°C)	26.0	24.0	24.0	24.0	24.0	24.0	24.0	24.5	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0
DO (mg/L)	7.4	7.0	8.0	7.3	7.9	7.3	8.0	7.3	8.0	7.3	8.1	7.2	8.0	7.0	8.0	7.0
pH	7.8	8.0	8.0	8.0	8.0	8.0	7.9	8.0	8.0	8.0	8.1	8.0	8.0	8.0	7.9	~~7.88~~ 8.0
Cond. (µS/cm)	1097	1101		1093		1101		1101		1098		1103		/	1099	1051
Initials	SAK	JZL		JZL		JZL		CK		SAK		JZL			JZL	JZL

⑥ Concentration FR_FRCPi

	0	1		2		3		4		5		6		7	8	
	init.	old	new	old	new	old	new	old	new	old	new	old	new	~~old~~ final	new	final
Temperature (°C)	26.0	24.0	24.0	24.0	24.0	24.0	24.0	24.5	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0
DO (mg/L)	7.4	7.0	8.0	7.3	7.9	7.3	8.0	7.3	8.2	7.3	8.1	7.2	8.1	6.9	8.0	7.0
pH	7.9	8.0	8.2	8.1	8.1	8.0	8.1	8.1	8.2	8.1	8.3	8.1	8.2	8.0	8.1	8.1
Cond. (µS/cm)	1042	1043		1043		1040		1043		1044		1045		/	1045	1010
Initials	SAK	JZL		JZL		JZL		CK		SAK		JZL		SAK	JZL	JZL

⑦ Concentration GH_FRI

	0	1		2		3		4		5		6		7	8	
	init.	old	new	old	new	old	new	old	new	old	new	old	new	~~old~~ final	new	final
Temperature (°C)	26.0	24.0	24.0	24.0	24.0	24.0	24.0	24.5	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0
DO (mg/L)	7.3	7.1	7.9	7.2	7.8	7.3	8.0	7.3	8.4	7.3	8.2	7.2	7.9	6.9	8.0	7.0
pH	7.9	8.0	8.0	8.0	8.1	8.0	8.0	8.0	8.1	8.1	8.2	8.0	8.1	8.0	8.0	8.0
Cond. (µS/cm)	823	822		821		815		818		824		825		/	824	800
Initials	SAK	JZL		JZL		JZL		CK		SAK		JZL		SAK	JZL	JZL

Thermometer: 1 DO meter/probe: 1 / 1 pH meter/probe: 1 / 1 Conductivity meter/probe: 1 / 1

	~~Control~~ LC_SLC	FR_FRABCH	FR_FRCPi	GH_FRI
Hardness*	176	560	520	360
Alkalinity*	138	180	210	160

* mg/L as CaCO3

Analysts: SAK, JZL, RZS, CCS, GJU
Reviewed by: JCL
Date reviewed: Oct. 26/21

Sample Description: See p. 1

Comments: Broodboard Used: See P. 1

Chronic Freshwater Toxicity Test
Initial and Final Water Quality Measurements

Client: TEK
Sample ID: various
Work Order #: 21567

Start Date & Time: Aug. 11/21 @1500h
Stop Date & Time: Aug. 19/21 @1300h
CER #: 4
Test Species: *Ceriodaphnia dubia*

(8) Concentration GH-ERC

	Days 0	1		2		3		4		5		6		7		8	
	init.	old	new	old	new	old	new	old	new	old	new	old	new	~~old~~ final	new	final
Temperature (°C)	26.0	24.0	24.0	24.0	24.0	24.0	24.0	24.5	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0
DO (mg/L)	7.3	6.9	7.8	7.2	7.8	7.4	7.9	7.3	8.4	7.3	8.2	7.0	8.0	6.9	8.0	6.9
pH	7.9	7.9	8.0	7.9	8.0	7.8	7.9	7.9	8.0	7.9	8.1	8.0	8.0	7.8	7.9	8.0
Cond. (µS/cm)	301	298		299		298		298		299		299		/	299	309
Initials	SAK	JZL		JZL		JZL		CK		SAK		JZL		SAK	JZL	JZL

(9) Concentration CM-MC2

	Days 0	1		2		3		4		5		6		7		8	
	init.	old	new	old	new	old	new	old	new	old	new	old	new	~~old~~ final	new	final
Temperature (°C)	26.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0
DO (mg/L)	7.3	7.2	7.9	7.1	8.0	7.4	8.1	7.3	8.2	7.2	8.2	7.1	8.2	7.0	8.1	7.0
pH	8.1	8.1	8.2	8.1	8.2	8.0	8.1	8.0	8.1	8.1	8.3	8.0	8.1	8.0	8.1	8.0
Cond. (µS/cm)	948	956		951		955		978		951		960		/	962	927
Initials	SAK	JZL		JZL		JZL		CK		SAK		JZL		SAK	JZL	JZL

(10) Concentration EV-MC2

	Days 0	1		2		3		4		5		6		7		8	
	init.	old	new	old	new	old	new	old	new	old	new	old	new	~~old~~ final	new	final
Temperature (°C)	25.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0
DO (mg/L)	7.5	7.1	7.8	7.0	8.0	7.4	8.1	7.4	8.3	7.2	8.1	7.2	8.2	7.0	8.2	7.0
pH	8.0	8.0	8.1	8.0	8.1	7.9	8.0	8.0	8.0	8.0	8.2	8.0	8.1	7.9	8.0	8.0
Cond. (µS/cm)	513	521		520		518		520		521		523		/	521	513
Initials	SAK	JZL		JZL		JZL		CK		SAK		JZL		SAK	JZL	JZL

(11) Concentration EV-HCl

	Days 0	1		2		3		4		5		6		7		8	
	init.	old	new	old	new	old	new	old	new	old	new	old	new	~~old~~ final	new	final
Temperature (°C)	25.0	24.0	24.0	24.0	24.0	24.0	24.0	24.5	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0
DO (mg/L)	7.6	7.1	7.7	7.0	7.9	7.4	8.1	7.4	8.1	7.2	8.1	7.3	8.1	7.1	8.1	7.0
pH	8.0	8.0	8.1	8.0	8.1	7.9	8.0	8.0	8.1	8.0	8.3	8.0	8.1	7.9	8.0	8.0
Cond. (µS/cm)	642	651		652		651		655		651		653		/	655	636
Initials	SAK	JZL		JZL		JZL		CK		SAK		JZL		SAK	JZL	JZL

Thermometer: 1 DO meter/probe: 1 / 1 pH meter/probe: 1 / 1 Conductivity meter/probe: 1 / 1

GH-ERC	~~Control~~	CM-MC2	EV-MC2	EV-HCl
Hardness*	158	460	280	310
Alkalinity*	140	200	180	180

* mg/L as CaCO3

Analysts: SAK, JZL, RZS, CCS, GJU
Reviewed by: JCL
Date reviewed: Oct. 26/21

Sample Description: See pg. 1

Comments: Broodboard Used: See P. 1

Chronic Freshwater Toxicity Test
Initial and Final Water Quality Measurements

Client: TECK
Sample ID: various
Work Order #: 211567

Start Date & Time: Aug. 11/21 @ 1500h
Stop Date & Time: Aug. 19/21 @ 1300h
CER #: 4
Test Species: *Ceriodaphnia dubia*

(12) Concentration LC_DCDS

	Days																
	0	1		2		3		4		5		6		7		8	
	init.	old	new	old	new	old	new	old	new	old	new	old	new	old final	new	final
Temperature (°C)	25.0	24.0	24.0	24.0	24.0	24.0	24.0	24.5	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0
DO (mg/L)	7.6	6.8	7.5	7.0	7.7	7.4	7.8	7.4	8.2	7.2	8.1	7.2	8.2	7.1	8.0	6.9
pH	8.0	7.8	8.1	7.7	8.0	7.7	8.0	7.8	8.0	7.9	8.1	7.8	7.9	7.7	7.8	7.8
Cond. (µS/cm)	860	877		876		880		885		886		880		/	884	852
Initials	SAM	JZL		JZL		JZL		CK		SAM		JZL		SAM	JZL	JZL

(13) Concentration LC_LC3

	Days																
	0	1		2		3		4		5		6		7		8	
	init.	old	new	old	new	old	new	old	new	old	new	old	new	old final	new	final
Temperature (°C)	25.0	24.0	24.0	24.0	24.0	24.0	24.0	25.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0
DO (mg/L)	7.6	6.9	7.7	7.0	7.8	7.4	7.9	7.4	8.3	7.2	8.1	7.3	8.0	7.1	8.1	6.9
pH	7.7	7.9	8.0	8.0	8.0	8.0	8.0	8.1	8.1	8.2	8.2	8.0	8.1	8.0	8.0	8.1
Cond. (µS/cm)	1008	1012		1004		1013		1011		1015		1018		/	1012	977
Initials	SAM	JZL		JZL		JZL		CK		SAM		JZL		SAM	JZL	JZL

(14) Concentration LC_LC5

	Days																
	0	1		2		3		4		5		6		7		8	
	init.	old	new	old	new	old	new	old	new	old	new	old	new	old final	new	final
Temperature (°C)	25.0	24.0	24.0	24.0	24.0	24.0	24.0	24.5	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.5
DO (mg/L)	7.6	7.0	7.7	7.0	7.8	7.4	8.0	7.3	8.4	7.2	~~8.2~~	7.3	8.1	7.1	8.1	6.9
pH	8.0	8.0	8.2	8.0	8.1	8.0	8.1	8.0	8.1	8.1	8.3	8.0	8.2	8.0	8.1	8.0
Cond. (µS/cm)	745	750		749		752		755		757		758		/	754	735
Initials	SAM	JZL		JZL		JZL		CK		SAM		JZL		SAM	JZL	JZL

8.2

(15) Concentration LC_LCDSSLCC

	Days																
	0	1		2		3		4		5		6		7		8	
	init.	old	new	old	new	old	new	old	new	old	new	old	new	old final	new	final
Temperature (°C)	26.0	24.0	24.0	24.0	24.0	24.0	24.0	24.5	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0
DO (mg/L)	7.5	7.1	7.7	7.1	7.9	7.5	8.0	7.1	8.3	7.2	8.2	7.3	8.2	7.1	8.0	7.0
pH	7.9	8.0	8.2	8.0	8.1	8.0	8.1	8.0	8.1	8.2	8.3	8.0	8.1	8.0	8.1	8.0
Cond. (µS/cm)	805	816		815		815		819		815		816		/	817	795
Initials	SAM	JZL		JZL		JZL		CK		SAM		JZL		SAM	JZL	JZL

Thermometer: 1 DO meter/probe: 1 / 1 pH meter/probe: 1 / 1 Conductivity meter/probe: 1 / 1

	~~Control~~ LC_DCDS	LC_LC3	LC_LC5	LC_LCDSSLCC
Hardness*	470	560	360	420
Alkalinity*	140	230	200	190

* mg/L as CaCO3

Analysts: JZL, SAK, RZS, GJU, CCS

Reviewed by: JZL

Date reviewed: Oct. 26/21

Sample Description: See p.1

Comments: Broodboard Used: See P.1

Chronic Freshwater Toxicity Test
Initial and Final Water Quality Measurements

Client: TEAM
Sample ID: Various
Work Order #: 21567

Start Date & Time: Aug. 11/21 @1500h
Stop Date & Time: Aug. 19/21 @ 1300h
CER #: 4
Test Species: *Ceriodaphnia dubia*

(16) Concentration RG_MIDAG

	Days																
	0	1		2		3		4		5		6		7		8	
	init.	old	new	old	new	old	new	old	new	old	new	old	new	old final	new	new	final
Temperature (°C)	26.0	24.0	24.0	24.0	24.0	24.0	24.0	24.5	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.5
DO (mg/L)	7.6	6.9	7.7	7.2	7.8	7.5	7.8	7.2	8.1	7.2	8.2	7.3	8.1	7.2	8.0	7.2	
pH	7.9	7.9	8.1	7.9	8.0	7.8	8.0	7.9	8.0	8.0	8.2	7.9	8.0	7.9	7.9	7.9	
Cond. (µS/cm)	532	541		535		535		537		536		540		/	537	537	
Initials	SAK	JZ		JZ		JZ		CK		SAK		JZ		SAK	JZ	JZ	

(17) Concentration FR_FR4

	Days																
	0	1		2		3		4		5		6		7		8	
	init.	old	new	old	new	old	new	old	new	old	new	old	new	old final	new	new	final
Temperature (°C)	25.0	24.0	24.5	24.0	24.0	24.0	24.0	24.5	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.5
DO (mg/L)	7.5	6.9	7.9	7.2	7.9	7.5	8.0	7.2	8.1	7.2	8.2	7.2	8.3	7.2	8.0	7.2	
pH	8.0	8.0	8.2	8.1	8.2	8.0	8.1	8.1	8.2	8.1	8.3	8.1	8.2	8.0	8.1	8.1	
Cond. (µS/cm)	1056	1067		1077		1072		1066		1069		1069		/	1075	1031	
Initials	SAK	JZ		JZ		JZ		CK		SAK		JZ		SAK	JZ	JZ	

(18) Concentration FR_FR2

	Days																
	0	1		2		3		4		5		6		7		8	
	init.	old	new	old	new	old	new	old	new	old	new	old	new	old final	new	new	final
Temperature (°C)	26.0	24.0	24.0	24.0	24.0	24.0	24.0	24.5	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.5
DO (mg/L)	7.6	7.1	7.8	7.1	7.9	7.5	8.0	7.1	8.2	7.3	8.2	7.3	8.2	7.0	8.1	7.2	
pH	8.0	8.0	8.1	7.9	8.0	8.0	8.0	8.0	8.1	8.1	8.2	8.0	8.1	7.9	8.1	8.1	
Cond. (µS/cm)	808	814		811		813		812		813		817		/	817	792	
Initials	SAK	JZ		JZ		JZ		CK		SAK		JZ		SAK	JZ	JZ	

(19) Concentration FR_MULTIPLATE

	Days																
	0	1		2		3		4		5		6		7		8	
	init.	old	new	old	new	old	new	old	new	old	new	old	new	old final	new	new	final
Temperature (°C)	26.0	24.0	24.0	24.0	24.0	24.0	24.0	25.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.5
DO (mg/L)	7.6	7.1	7.8	7.1	7.9	7.5	7.8	7.2	8.1	7.3	8.2	7.4	8.2	7.0	8.1	7.1	
pH	7.9	8.0	8.1	7.9	8.0	7.9	8.0	8.0	8.1	8.0	8.2	8.0	8.1	7.9	8.0	8.0	
Cond. (µS/cm)	748	753		755		759		756		759		756		/	757	735	
Initials	SAK	JZ		JZ		JZ		CK		SAK		JZ		SAK	JZ	JZ	

Thermometer: CER# 4 DO meter/probe: 1 / 1 pH meter/probe: 1 / 1 Conductivity meter/probe: 1 / 1

	Control RG_MIDAG	FR_FR4	FR_FR2	FR_MULTIPLATE
Hardness*	260	560	370	370
Alkalinity*	180	190	~~180~~ 170	180

* mg/L as CaCO3

Analysts: SAK, JZ, RES, CCS, GJU
Reviewed by: JZ
Date reviewed: Nov-2/21

Sample Description: See p.1

Comments: Broodboard Used: See P.1

Chronic Freshwater Toxicity Test
Initial and Final Water Quality Measurements

Client: TEIL
Sample ID: various
Work Order #: 211567

Start Date & Time: Aug. 11/21 @ 1500h
Stop Date & Time: Aug. 19/21 @ 1300h
CER #: 4
Test Species: *Ceriodaphnia dubia*

(20) Concentration FR_FRRD	Days																
	0	1		2		3		4		5		6		7		8	
	init.	old	new	old	new	old	new	old	new	old	new	old	new	~~old~~ final	new	final	
Temperature (°C)	25.0	24.0	24.0	24.0	24.0	24.0	24.0	25.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	25.0	
DO (mg/L)	7.6	7.2	7.6	7.1	7.9	7.5	7.9	7.1	8.3	7.3	8.2	7.4	8.2	7.0	8.1	7.1	
pH	7.7	8.0	8.0	8.0	7.9	8.0	7.9	8.1	7.9	8.2	8.0	8.1	8.0	8.0	7.9	8.0	
Cond. (µS/cm)	1158	1166		1165		1156		1156		1146		1154		/	1158	1099	
Initials	SAK	JZL		JZL		JZL		CK		SAK		JZL		JZL	JZL	JZL	

Concentration	Days																
	0	1		2		3		4		5		6		7		8	
	init.	old	new	old	new	old	new	old	new	old	new	old	new	~~old~~ final	new	final	
Temperature (°C)																	
DO (mg/L)																	
pH																	
Cond. (µS/cm)																	
Initials																	

Concentration	Days																
	0	1		2		3		4		5		6		7		8	
	init.	old	new	old	new	old	new	old	new	old	new	old	new	~~old~~ final	new	final	
Temperature (°C)																	
DO (mg/L)																	
pH																	
Cond. (µS/cm)																	
Initials																	

Concentration	Days																
	0	1		2		3		4		5		6		7		8	
	init.	old	new	old	new	old	new	old	new	old	new	old	new	~~old~~ final	new	final	
Temperature (°C)																	
DO (mg/L)																	
pH																	
Cond. (µS/cm)																	
Initials																	

Thermometer: CER #4 DO meter/probe: 1 / 1 pH meter/probe: 1 / 1 Conductivity meter/probe: 1 / 1

	Control	FR-FRRD		
Hardness*	100	530 ~~340~~		
Alkalinity*	94	190		

* mg/L as CaCO3

Analysts: SAK, JZL, RZS, CCS, GJO
Reviewed by: JCH
Date reviewed: Oct-26/21

Sample Description: See p. 1

Comments: Broodboard Used: See p. 1

Chronic Freshwater Toxicity Test
C. dubia Reproduction Data

Client: Teck
Sample ID: Various
Work Order: 211567

Start Date & Time: Aug 11 /21 @1500h
Stop Date & Time: Aug. 19/21 @1300h
Set up by: SAK / JTL

Concentration: Control

Days	A	B	C	D	E	F	G	H	I	J	Init
1	/	/	/	/	/	/	/	/	/	/	JTL
2	/	/	/	/	/	/	/	/	/	/	JTL
3	/	/	/	/	/	/	/	/	/	/	GM
4	4	4	7	7	4	5	4	4	5	3	RZS
5	5	8	7	12	9	7	8	8	4	8	SAK
6	/	/	/	/	8	/	10	/	/	/	SAK
7	10	14	13	10	/	8	/	9	9	8	SAK
8	11	11	9	12	8	10	5	12	11	11	JTL
Total	19	26	27	29	21	20	22	21	18	19	SAK

Concentration: ① FR_UFR1

Days	A	B	C	D	E	F	G	H	I	J	Init
1	/	/	/	/	/	/	/	/	/	/	JTL
2	/	/	/	/	/	/	/	/	/	/	JTL
3	/	/	/	/	/	/	/	/	/	/	GM
4	3	4	2	2	2	6	7	5	5	3	RZS
5	8	8	8	8	10	7	11	7	7	10	SAK
6	12	/	12	/	3	/	/	/	/	/	SAK
7	/	10	/	12	8	8	11	10	10	10	SAK
8	8	11	8	8	8	7	8	14	11	9	JTL
Total	23	22	22	22	15	21	29	22	22	23	SAK

Concentration: ② GH-ER2

Days	A	B	C	D	E	F	G	H	I	J	Init
1	/	/	/	/	/	/	/	/	/	/	JTL
2	/	/	/	/	/	/	/	/	/	/	JTL
3	/	/	/	/	/	/	/	/	/	/	GM
4	4	4	4	2	6	4	5	X	6	5	RZS
5	8	5	12	7	7	7	2	↓	9	9	SAK
6	/	/	10	/	/	/	/		8	/	SAK
7	13	9	/	13	12	13	10		10	8	SAK
8	11	6	7	11	11	12	14	↓	6	12	JTL
Total	25	18	26	22	25	24	24	0X	24	22	SAK

Concentration: ③ CM_MC1

Days	A	B	C	D	E	F	G	H	I	J	Init
1	/	/	/	/	/	/	/	/	/	/	JTL
2	/	/	/	/	/	/	/	/	/	/	JTL
3	/	/	/	/	/	/	/	/	/	/	GM
4	3	3	3	4	4	3	3	7	4	3	RZS
5	6	7	9	8	8	9	6	11	9	7	SAK
6	9	/	12	/	/	10	/	/	/	/	SAK
7	/	10	/	12	12	/	9	13	14	12	SAK
8	6	6	8	7	5	9	6	/	10	7	JTL
Total	18	20	24	24	24	22	18	31	27	22	SAK

Concentration: ④ LC-SLC

Days	A	B	C	D	E	F	G	H	I	J	Init
1	/	/	/	/	/	/	/	/	/	/	JTL
2	/	/	/	/	/	/	/	/	/	/	JTL
3	/	/	/	/	/	/	/	/	/	/	GM
4	/	4	5	6	/	3	7	4	4	3	RZS
5	/	10	10	9	8	10	9	7	8	10	SAK
6	4	11	/	/	/	9	/	/	/	12	SAK
7	10	/	11	10	10	/	13	13	10	/	SAK
8	/	10	/	10	8	9	9	11	10	8	JTL
Total	14	25	26	25	18	22	29	24	22	25	SAK

Concentration: ⑤ FR-FRABCH

Days	A	B	C	D	E	F	G	H	I	J	Init
1	/	/	/	/	/	/	/	/	/	/	JTL
2	/	/	/	/	/	/	/	/	/	/	JTL
3	/	/	/	/	/	/	/	/	/	/	GM
4	3	4	2	2	/	3	4	/	4	4	RZS
5	9	10	8	8	5	7	9	9	8	7	SAK
6	/	/	/	/	8	8	/	7	/	/	SAK
7	11	8	8	11	/	/	20	/	9	5	SAK
8	8	/	6	3	10	7	/	4	/	8	JTL
Total	23	22	18	21	13	18	23	16	21	16	SAK

Concentration: ⑥ FR-FRCP1

Days	A	B	C	D	E	F	G	H	I	J	Init
1	/	/	/	/	/	/	/	/	/	/	JTL
2	/	/	/	/	/	/	/	/	/	/	JTL
3	/	/	/	/	/	/	/	/	/	/	GM
4	/	/	2	2	4	/	/	/	4	/	RZS
5	7	7	8	6	9	5	/	X	/	5	SAK
6	/	8	/	4	/	6	8	↓	7	/	SAK
7	/	/	10	/	9	/	/	↓	11	8	SAK
8	/	6	6	/	/	/	/	↓	/	6	JTL
Total	4	15	20	12	22	11	8	0X	22	13	SAK

Concentration: ⑦ GH-FR1

Days	A	B	C	D	E	F	G	H	I	J	Init
1	/	/	/	/	/	/	/	/	/	/	JTL
2	/	/	/	/	/	/	/	/	/	/	JTL
3	/	/	/	/	/	/	/	/	/	/	GM
4	2	/	4	/	/	4	2	/	3	/	RZS
5	5	7	7	7	6	10	6	7	9	9	SAK
6	/	/	6	/	11	/	7	/	/	/	SAK
7	9	9	3	12	7	12	10	11	12	8	SAK
8	6	9	7	/	12	/	8	/	/	7	JTL
Total	16	16	17	19	17	26	15	18	24	23	SAK

Concentration: ⑧ GH-ERC

Days	A	B	C	D	E	F	G	H	I	J	Init
1	/	/	/	/	/	/	/	/	/	/	JTL
2	/	/	/	/	/	/	/	/	/	/	JTL
3	/	/	/	/	/	/	5	4	3	4	GM
4	3	3	5	5	3	2	/	/	/	/	RZS
5	9	11	6	7	9	9	9	7	9	8	SAK
6	/	8	/	/	/	6	10	8	8	8	SAK
7	10	/	11	11	10	2	3	/	2	/	SAK
8	6	8	8	10	7	7	9	9	10	6	JTL
Total	22	22	22	23	22	17	24	19	20	20	SAK

Notes: X = mortality.

Comments: 1. Total # Young only based on the first 3 Broods. Fourth and subsequent broods not included in total count.

2. Ephippia present in Controls (Y), (N)?

Reviewed by: JTL

Date reviewed: Oct-26/21

Chronic Freshwater Toxicity Test
C. dubia Reproduction Data

Client: TECK
Sample ID: Various
Work Order: 211567

Start Date & Time: Aug 11/21 @ 1500h
Stop Date & Time: Aug 19/21 @ 1300h
Set up by: SAK / JH

(9) CM-MC2

Days	Concentration: A	B	C	D	E	F	G	H	I	J	Init
1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	JH
2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	SM
3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	JH
4	2	4	5	4	✓	4	4	3	4	4	CK
5	6	8	6	6	7	8	7	10	5	6	SM
6	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	JH
7	9	10	7	9	13	12	9	13	8	X	JH
8	5	6	✓	4	✓	5	6	✓	7	↓	JH
Total	17	22	18	19	20	24	20	26	17	10X	SM

(10) EV-MC2

Days	Concentration: A	B	C	D	E	F	G	H	I	J	Init
1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	JH
2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	SM
3	4	✓	✓	✓	✓	✓	✓	✓	✓	✓	JH
4	✓	5	5	3	3	5	2	6	6	6	CK
5	11	4	8	10	8	12	8	7	8	8	SM
6	16	✓	✓	✓	✓	✓	13	✓	✓	✓	JH
7	10	5	10	15	10	16	✓	12	16	8	JH
8	✓	5	10	11	11	5	7	8	10	9	JH
Total	31	14	23	28	21	33	23	25	30	22	JH

(11) EV-HC1

Days	Concentration: A	B	C	D	E	F	G	H	I	J	Init
1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	JH
2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	SM
3	✓	2	✓	✓	✓	✓	✓	✓	✓	3	JH
4	3X	✓	2	4	4	4	5	2	3	✓	CK
5	↓	9	10	10	8	10	8	10	6	8	SM
6		13	12	✓	✓	✓	✓	✓	14	13	JH
7		✓	✓	13	15	11	14	16	✓	✓	JH
8		8	8	10	8	5	8	12	9	6	JH
Total	3X	24	24	27	27	25	27	28	23	24	JH

(12) LC-DCDS

Days	Concentration: A	B	C	D	E	F	G	H	I	J	Init
1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	JH
2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	SM
3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	JH
4	3	✓	4	X	5	2	4	5	2	5	CK
5	6	✓	10	↓	10	4	8	5	✓	10	SM
6	✓	X	✓		✓	✓	✓	12	✓	✓	JH
7	10	↓	✓		2	5	15	✓	✓	✓	JH
8	3	↓	✓	↓	6	✓	✓	✓	8	✓	JH
Total	19	0X	14	0X	17	11	27	22	10	15	JH

(13) LC-LC3

Days	Concentration: A	B	C	D	E	F	G	H	I	J	Init
1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	JH
2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	SM
3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	JH
4	3	✓	5	5	3	3	5	3	3	3	CK
5	9	8	6	8	10	8	8	9	8	10	SM
6	✓	6	✓	✓	✓	11	✓	✓	8	8	JH
7	7	✓	10	10	9	✓	8	8	✓	✓	JH
8	✓	6	✓	✓	5	6	✓	5	4	5	JH
Total	19	14	21	23	22	22	21	20	19	21	JH

(14) LC-LCS

Days	Concentration: A	B	C	D	E	F	G	H	I	J	Init
1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	JH
2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	SM
3	✓	✓	✓	✓	✓	✓	✓	✓	✓	3	JH
4	4	5	2	2	3	✓	4	5	2	✓	CK
5	7	8	8	2	7	8	9	7	6	7	SM
6	✓	✓	13	✓	✓	12	✓	✓	10	14	JH
7	8	13	✓	7	13	✓	10	12	✓	✓	JH
8	7	8	9	✓	7	6	8	8	10	10	JH
Total	19	26	23	11	23	20	23	24	18	24	JH

(15) LC-LCDSSLCC

Days	Concentration: A	B	C	D	E	F	G	H	I	J	Init
1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	JH
2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	SM
3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	JH
4	4	3X	4	4	4	3	4	2	4	4	CK
5	10	↓	6	8	6	8	8	7	8	8	SM
6	12		✓	9	✓	✓	✓	10	✓	11	JH
7	✓	↓	8	2	13	13	13	✓	9	✓	JH
8	6	↓	6	7	2	4	✓	5	✓	✓	JH
Total	26	3X	18	21	23	24	25	19	21	23	JH

(16) RG-MIDAG

Days	Concentration: A	B	C	D	E	F	G	H	I	J	Init
1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	JH
2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	SM
3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	JH
4	✓	3	5	✓	3	6	5	6	5	4	JH
5	6	8	6	4	4	10	8	7	7	8	SM
6	13	✓	✓	✓	✓	✓	✓	✓	✓	12	JH
7	✓	11	9	11	11	14	10	12	14	✓	JH
8	4	5	6	7	6	6	6	X	6	5	JH
Total	22	22	20	22	18	30	23	25X	26	24	JH

(17) FR-FR4

Days	Concentration: A	B	C	D	E	F	G	H	I	J	Init
1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	JH
2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	SM
3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	JH
4	✓	4	5	6	✓	4	✓	4	2	2	CK
5	9	6	✓	10	4	6	6	8	4	4	SM
6	12	✓	✓	10	✓	✓	✓	11	✓	✓	JH
7	✓	8	✓	10	✓	5	11	8	✓	10	JH
8	5	5	3	✓	7	✓	4	5	7	4	JH
Total	25	18	8	26	11	15	21	20	17	16	JH

Notes: X = mortality.

Comments: 1. Total # Young only based on the first 3 Broods. Fourth and subsequent broods not included in total count.

2. Ephippia present in Controls (Y), (N)?

Reviewed by: JH

Date reviewed: Oct. 26/21

Chronic Freshwater Toxicity Test
C. dubia Reproduction Data

Client: Teck
Sample ID: Various
Work Order: 211567

Start Date & Time: Aug 11/21 @ 1500h
Stop Date & Time: Aug 19/21 @ 1300h
Set up by: SAK/JH

(18) FR-FR2

Days	Concentration: A	B	C	D	E	F	G	H	I	J	Init
1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	JH
2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	JH
3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	GM
4	✓	3	✓	2	✓	2	6	4	✓	4	RZ
5	3	6	8	8	8	9	✓	10	9	7	RZ
6	11	✓	✓	✓	✓	✓	7	✓	5	✓	SAK
7	✓	11	10	6	12	11	10	12	✓	10	JH
8	4	6	6	4	6	✓	✓	4	6	6	JH
Total	18GM 14	20	18GM 18	16	18GM 20	22	23	26	20GM 14	21	JH

(19) FR-MULTIPLATE

Days	Concentration: A	B	C	D	E	F	G	H	I	J	Init
1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	JH
2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	JH
3	✓	✓	✓	✓	✓	✓	✓	4	✓	✓	GM
4	4	4	6	3	2	3/4	4	✓	✓	5	RZ
5	8	9	11	7	7	9	8	3	9	6	RZ
6	✓	5	✓	10	✓	8	✓	10	11	✓	SAK
7	9	✓	10	✓	12	✓	10	✓	✓	12	JH
8	4	5	8	4	5	7	4	6	6	6	JH
Total	21	18	27	20	21	21	22	17	26GM 20	23	JH

(20) FR-FRRD

Days	Concentration: A	B	C	D	E	F	G	H	I	J	Init
1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	JH
2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	JH
3	✓	✓	✓	2	✓	✓	✓	✓	✓	4	GM
4	4	4	✓	✓	3	4	4	4	5	✓	RZ
5	7	9	✓	7	9	7	PSK 7	8	10	6	RZ
6	✓	✓	✓	7	7	✓	✓	8	✓	8	SAK
7	5	8	2	✓	✓	8	9	✓	8	✓	JH
8	✓	5	✓	6	✓	6	8	4	6	5	JH
Total	16	21	2	16	14	19	20	20	23	18GM	JH

Days	Concentration: A	B	C	D	E	F	G	H	I	J	Init
1											
2											
3											
4											
5											
6											
7											
8											
Total											

Concentration:

Days	A	B	C	D	E	F	G	H	I	J	Init
1											
2											
3											
4											
5											
6											
7											
8											
Total											

Concentration:

Days	A	B	C	D	E	F	G	H	I	J	Init
1											
2											
3											
4											
5											
6											
7											
8											
Total											

Notes: X = mortality.

Comments: 1. Total # Young only based on the first 3 Broods. Fourth and subsequent broods not included in total count.

2. Ephippia present in Controls (Y) (N)?

Reviewed by: JOL

Date reviewed: Oct. 26/21

Chronic Freshwater Toxicity Test
Initial and Final Water Quality Measurements

Client: TECH
Sample ID: Various
Work Order #: 211564

Start Date & Time: Aug. 11/21 @ 1500h
Stop Date & Time: Aug. 19/21 @ 1300h
CER #: 4
Test Species: *Ceriodaphnia dubia*

(21) Concentration: EDTA Control

	Days 0	1		2		3		4		5		6		7		8	
	init.	old	new	old	new	old	new	old	new	old	new	old	new	old ~~final~~	new	final
Temperature (°C)	26.0	24.0	24.5	24.0	24.5	24.0	25.0	25.0	24.0	24.0	24.0	24.0	24.5	24.0	24.0	24.0
DO (mg/L)	7.5	7.0	7.5	7.0	7.5	7.3	7.6	7.0	7.5	7.1	7.7	7.2	7.7	6.7	7.5	6.7
pH	7.9	7.9	7.9	7.6	7.9	7.6	8.0	7.5	7.9	7.6	8.1	7.7	8.0	7.6	7.9	7.8
Cond. (µS/cm)	215	212		214		212		212		211		214		/	216	231
Initials	SAH	JZL		JZL		JZL		CK		SAH		JZL		SAH	JZL	JZL

(22) Concentration: FR_FRCP1 + EDTA

	Days 0	1		2		3		4		5		6		7		8	
	init.	old	new	old	new	old	new	old	new	old	new	old	new	old ~~final~~	new	final
Temperature (°C)	26.0	24.0	24.5	24.0	24.5	24.5	25.0	25.0	24.0	24.0	24.0	24.0	24.5	24.0	24.5	24.0
DO (mg/L)	7.5	7.1	7.6	7.1	7.6	7.3	7.7	7.0	7.6	7.1	7.7	7.3	7.7	6.8	7.6	6.7
pH	7.9	8.0	8.1	8.1	8.2	8.0	8.2	8.0	8.2	8.1	8.4	8.1	8.3	8.0	8.2	8.0
Cond. (µS/cm)	1033	1047		1051		1045		1042		~~1052~~ @1043		1044		/	1047	1009
Initials	SAH	JZL		JZL		JZL		CK		SAH		JZL		SAH	JZL	JZL

(23) Concentration: CM_MC2 + EDTA

	Days 0	1		2		3		4		5		6		7		8	
	init.	old	new	old	new	old	new	old	new	old	new	old	new	old ~~final~~	new	final
Temperature (°C)	26.0	24.0	24.5	24.0	24.0	24.5	24.5	25.0	24.0	24.0	24.0	24.0	24.0	24.0	24.5	24.0
DO (mg/L)	7.5	7.0	7.7	7.2	7.6	7.3	7.7	7.1	7.6	7.1	7.7	7.3	7.7	6.8	7.7	6.9
pH	7.9	8.0	8.2	8.1	8.1	8.0	8.0	7.9	8.1	8.0	8.2	8.0	8.1	7.8	8.0	7.9
Cond. (µS/cm)	953	956		962		950		948		934		928		/	927	893
Initials	SAH	JZL		JZL		JZL		CK		SAH		JZL		SAH	JZL	JZL

(24) Concentration: RG_MIDAG + EDTA

	Days 0	1		2		3		4		5		6		7		8	
	init.	old	new	old	new	old	new	old	new	old	new	old	new	old ~~final~~	new	final
Temperature (°C)	26.0	24.0	24.5	24.0	24.0	24.5	24.5	24.5	24.0	24.0	24.0	24.0	24.0	24.0	24.5	24.0
DO (mg/L)	7.6	7.1	7.7	7.2	7.6	7.3	7.7	7.0	7.6	7.1	7.1	7.3	7.7	6.4	7.7	7.0
pH	7.8	7.9	8.0	7.9	8.1	7.8	8.1	7.9	8.1	8.0	8.3	7.9	8.1	7.8	8.0	7.9
Cond. (µS/cm)	539	542		544		541		540		543		554		/	555	540
Initials	SAH	JZL		JZL		JZL		CK		SAH		JZL		SAH	JZL	JZL

Thermometer: CER# 4 DO meter/probe: 1 / 1 pH meter/probe: 1 / 1 Conductivity meter/probe: 1 / 1

	Control			
Hardness*	100			
Alkalinity*	94			

* mg/L as CaCO3

Analysts: SAH, JZL
Reviewed by: JCL
Date reviewed: Oct. 26/21

Sample Description: refer to COC

Comments: Broodboard Used: See P.1

Chronic Freshwater Toxicity Test
C. dubia Reproduction Data

Client: TECK
Sample ID: Various
Work Order: 211564

Start Date & Time: Aug. 11/21 @ 1500h
Stop Date & Time: Aug 19/21 @ 1300h
Set up by: SAH / JZL

Concentration: (21) EDTA Control

Days	A	B	C	D	E	F	G	H	I	J	Init
1	/	/	/	/	/	/	/	/	/	/	JZL
2	/	/	/	/	/	/	/	/	/	/	SAH
3	/	/	4	/	/	/	/	/	/	/	GM
4	2	3	/	2	4	2X	4X	5	3	/	CA
5	/	4	9	9	9	↓	↓	13	7	2	SAH
6	4	9	12	/	14			/	/	/	SAH
7	10	/	/	11	/			11	11	6	SAH
8	6	8	10	14	10			10	8	/	JZL
Total	16	16	25	22	27	2X	4X	29	21	8	JZL

Concentration: (22) FR_FRCP1 + EDTA

Days	A	B	C	D	E	F	G	H	I	J	Init
1	/	/	/	/	/	/	/	/	/	/	JZL
2	/	/	/	/	/	/	/	/	/	/	SAH
3	/	/	/	/	/	/	/	/	/	/	GM
4	3	6	5	6	/	2	6	2	/	2	CA
5	7	7	4	/	8	5	4	5	3	6	SAH
6	/	/	/	6	12	7	/	10	10	/	SAH
7	8	9	11	12	/	/	10	/	/	11	SAH
8	/	/	7	/	10	10	11	10	8	/	JZL
Total	18	22	20	24	30 (20)	14	20	17	21 (13)	19	JZL

Concentration: (23) CM_MC2 + EDTA

Days	A	B	C	D	E	F	G	H	I	J	Init
1	/	/	/	/	/	/	/	/	/	/	JZL
2	/	/	/	/	/	/	/	/	/	/	SAH
3	/	/	/	/	/	/	/	/	/	/	GM
4	2	/	2	/	/	2	4	/	/	2	CA
5	6	6	4	7	3	8	7	2	7	4	SAH
6	/	8	/	7	/	/	/	6	/	/	SAH
7	12	/	10	14	8	7	13	14	12	12	SAH
8	/	11	12	12	5	5	7	2	4	2	JZL
Total	20	25 (14)	16	33 (21)	16 (11)	17	24	22	23 (19)	18	JZL

Concentration: (24) RG-MIDAG + EDTA

Days	A	B	C	D	E	F	G	H	I	J	Init
1	/	/	/	/	/	/	/	/	/	/	JZL
2	/	/	/	/	/	/	/	/	/	/	SAH
3	/	/	/	/	/	/	/	/	/	/	GM
4	2	3	5	3	3	5	5	2	3	4	CA
5	6	9	10	6	9	7	/	/	10	8	SAH
6	/	/	/	9	/	8	10	5	/	/	SAH
7	8	10	12	9	9	/	9	10	8	6	SAH
8	5	8	4	7	4	9	/	/	7	5	JZL
Total	16	22	27	18	21	20	24	17	21	18	JZL

Concentration:

Days	A	B	C	D	E	F	G	H	I	J	Init
1											
2											
3											
4											
5											
6											
7											
8											
Total											

Concentration:

Days	A	B	C	D	E	F	G	H	I	J	Init
1											
2											
3											
4											
5											
6											
7											
8											
Total											

Notes: X = mortality.

Comments: 1. Total # Young only based on the first 3 Broods. Fourth and subsequent broods not included in total count.

2. Ephippia present in Controls (Y) (N) ?

Reviewed by: JZL

Date reviewed: Nov. 2/21

Ceriodaphnia 7-d Survival and Reproduction Test

Nautilus Environmental

Batch ID:	09-9771-6958	**Test Type:**	Reproduction-Survival (7d)	**Analyst:**	Sierra Klueppel
Start Date:	11 Aug-21 15:00	**Protocol:**	EC/EPS 1/RM/21	**Diluent:**	20% Perrier Water
Ending Date:	19 Aug-21 13:00	**Species:**	Ceriodaphnia dubia	**Brine:**	
Test Length:	7d 22h	**Taxon:**	Branchiopoda	**Source:**	In-House Culture **Age:** <24

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
Lab Control	06-8799-3466	11 Aug-21	11 Aug-21	15h	Teck Coal	
FR_UFR1	01-9312-3340	10 Aug-21 08:54	11 Aug-21 11:15	30h (12.8 °C)		
GH_ER2	03-3301-7818	10 Aug-21 10:45	11 Aug-21 11:15	28h (15.8 °C)		
CM_MC1	20-0000-6898	10 Aug-21 11:04	11 Aug-21 11:15	28h (14 °C)		
LC_SLC	07-8534-5756	10 Aug-21 09:09	11 Aug-21 11:15	30h (11.2 °C)		
FR_FRABCH	12-3746-7337	10 Aug-21 09:35	11 Aug-21 11:15	29h (13.6 °C)		
FR_FRCP1	02-0987-3329	10 Aug-21 09:55	11 Aug-21 11:15	29h (12.1 °C)		
GH_FR1	00-2216-4794	10 Aug-21 09:30	11 Aug-21 11:15	29h (15.3 °C)		
GH_ERC	02-8768-9833	10 Aug-21 11:45	11 Aug-21 11:15	27h (16.4 °C)		
CM_MC2	08-6405-5477	10 Aug-21 12:07	11 Aug-21 11:15	27h (14.9 °C)		
EV_MC2	09-5920-8643	10 Aug-21 10:44	11 Aug-21 11:15	28h (12.8 °C)		
EV_HC1	05-3700-4202	10 Aug-21 09:46	11 Aug-21 11:15	29h (13 °C)		
LC_DCDS	10-8734-0222	10 Aug-21 10:10	11 Aug-21 11:15	29h (10.8 °C)		
LC_LC3	07-4841-6068	10 Aug-21 09:30	11 Aug-21 11:15	29h (9.8 °C)		
LC_LC5	18-0478-8867	10 Aug-21 12:00	11 Aug-21 11:15	27h (11.8 °C)		
LC_LCDSSLCC	17-9964-8023	10 Aug-21 10:40	11 Aug-21 11:15	28h (12.1 °C)		
RG_MIDAG	04-6323-4167	10 Aug-21 11:30	11 Aug-21 11:15	28h (14.3 °C)		
FR_FR4	04-5681-6105	10 Aug-21 10:00	11 Aug-21 11:15	29h (15.6 °C)		
FR_FR2	16-7096-5741	10 Aug-21 10:54	11 Aug-21 11:15	28h (15.9 °C)		
FR_MULTIPLATE	08-7549-1660	10 Aug-21 11:51	11 Aug-21 11:15	27h (16.9 °C)		
FR_FRRD	03-6145-5105	10 Aug-21 08:25	11 Aug-21 11:15	31h (16.8 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
Lab Control	Water Sample	Teck Coal	Lab Control	
FR_UFR1	Water Sample	Teck Coal	FR_UFR1_MON_2021-08-0	
GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-08-10_	
CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-08-10	
LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-08-10_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_MON_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_MON_2021-08	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-08-10_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-08-10	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-08-10	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2021_Q3_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2021_Q3_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-08-10	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-08-10_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-08-10_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	
RG_MIDAG	Water Sample	Teck Coal	RG_MIDAG_WS_2021-08-	
FR_FR4	Water Sample	Teck Coal	FR_FR4_WS_2021-08-10_	
FR_FR2	Water Sample	Teck Coal	FR_FR2_WS_2021-08-10_	
FR_MULTIPLATE	Water Sample	Teck Coal	FR_MULTIPLATE_WS_202	
FR_FRRD	Water Sample	Teck Coal	FR_FRRD_WS_2021-08-10	

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Lab Control passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed 7d survival rate	1

SIngle Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	RG_MIDAG passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Lab Control passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	RG_MIDAG passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	RG_MIDAG passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed 7d survival rate	1

Ceriodaphnia 7-d Survival and Reproduction Test **Nautilus Environmental**

SIngle Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Lab Control passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	RG_MIDAG passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Lab Control passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Lab Control passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	RG_MIDAG passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Lab Control passed 7d survival rate	1

SIngle Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	RG_MIDAG passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Lab Control passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	RG_MIDAG passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Lab Control passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed 7d survival rate	1

Ceriodaphnia 7-d Survival and Reproduction Test **Nautilus Environmental**

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	RG_MIDAG passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	RG_MIDAG passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Lab Control passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	RG_MIDAG passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Lab Control passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed 7d survival rate	1

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	RG_MIDAG passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Lab Control passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Lab Control passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	RG_MIDAG passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	RG_MIDAG passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Lab Control passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed 7d survival rate	1

Ceriodaphnia 7-d Survival and Reproduction Test **Nautilus Environmental**

SIngle Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	RG_MIDAG passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Lab Control passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	RG_MIDAG passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Lab Control passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	RG_MIDAG passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed 7d survival rate	1

Ceriodaphnia 7-d Survival and Reproduction Test **Nautilus Environmental**

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Lab Control passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Lab Control passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	RG_MIDAG passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	RG_MIDAG passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Lab Control passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed 7d survival rate	1

Ceriodaphnia 7-d Survival and Reproduction Test **Nautilus Environmental**

SIngle Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Lab Control passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	RG_MIDAG passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Lab Control passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	RG_MIDAG passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed 7d survival rate	1
04-6959-8216	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed 7d survival rate	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9969	CM_MC1 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9969	LC_LC3 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9969	RG_MIDAG passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9969	FR_UFR1 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9969	LC_DCDS passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9969	FR_MULTIPLATE passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9969	GH_ER2 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9969	LC_LC5 passed reproduction	1

SIngle Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9969	FR_FR2 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9969	EV_MC2 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9969	Lab Control passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9969	GH_ERC passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9969	LC_SLC passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9969	GH_FR1 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9969	FR_FRRD passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9969	FR_FRCP1 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9969	FR_FRABCH passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9969	FR_FR4 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9969	CM_MC2 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9969	LC_LCDSSLCC passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9969	EV_HC1 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9878	CM_MC2 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9878	FR_MULTIPLATE passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9878	FR_FR2 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9878	CM_MC1 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9878	LC_LC5 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9878	FR_FR4 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9878	LC_SLC passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9878	GH_ERC passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9878	EV_MC2 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9878	FR_UFR1 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9878	GH_ER2 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9878	Lab Control passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9878	LC_DCDS passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9878	FR_FRCP1 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9878	GH_FR1 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9878	LC_LCDSSLCC passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9878	RG_MIDAG passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9878	EV_HC1 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9878	LC_LC3 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9878	FR_FRABCH passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9878	FR_FRRD passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9906	FR_FRABCH passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9906	GH_ER2 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9906	Lab Control passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9906	FR_FRRD passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9906	FR_FR2 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9906	LC_LCDSSLCC passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9906	GH_FR1 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9906	CM_MC1 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9906	LC_SLC passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9906	FR_FR4 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9906	GH_ERC passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9906	FR_FRCP1 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9906	LC_LC5 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9906	FR_MULTIPLATE passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9906	FR_UFR1 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9906	CM_MC2 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9906	LC_DCDS passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9906	RG_MIDAG passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9906	LC_LC3 passed reproduction	1

Ceriodaphnia 7-d Survival and Reproduction Test — Nautilus Environmental

SIngle Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9906	EV_HC1 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9906	EV_MC2 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9937	LC_LC5 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9937	FR_UFR1 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9937	GH_FR1 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9937	EV_MC2 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9937	GH_ER2 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9937	LC_DCDS passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9937	LC_SLC passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9937	FR_FR4 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9937	RG_MIDAG passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9937	CM_MC1 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9937	FR_MULTIPLATE passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9937	FR_FRCP1 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9937	CM_MC2 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9937	LC_LCDSSLCC passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9937	FR_FRRD passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9937	Lab Control passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9937	LC_LC3 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9937	FR_FR2 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9937	GH_ERC passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9937	FR_FRABCH passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9937	EV_HC1 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.4578	LC_DCDS passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.4578	LC_SLC passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.4578	EV_HC1 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.4578	FR_FRCP1 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.4578	LC_LC3 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.4578	FR_FRRD passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.4578	LC_LCDSSLCC passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.4578	RG_MIDAG passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.4578	GH_ER2 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.4578	FR_UFR1 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.4578	CM_MC2 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.4578	CM_MC1 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.4578	Lab Control passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.4578	LC_LC5 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.4578	FR_MULTIPLATE passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.4578	FR_FR4 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.4578	EV_MC2 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.4578	FR_FRABCH passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.4578	GH_ERC passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.4578	FR_FR2 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.4578	GH_FR1 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.0658	EV_HC1 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.0658	FR_FR2 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.0658	EV_MC2 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.0658	LC_LC5 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.0658	FR_FRCP1 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.0658	FR_MULTIPLATE passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.0658	FR_FR4 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.0658	LC_LCDSSLCC passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.0658	GH_FR1 passed reproduction	1

Ceriodaphnia 7-d Survival and Reproduction Test **Nautilus Environmental**

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.0658	LC_LC3 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.0658	FR_FRRD passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.0658	Lab Control passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.0658	RG_MIDAG passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.0658	GH_ERC passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.0658	LC_DCDS passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.0658	GH_ER2 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.0658	CM_MC2 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.0658	FR_UFR1 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.0658	LC_SLC passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.0658	CM_MC1 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.0658	FR_FRABCH passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.2084	GH_ERC passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.2084	GH_ER2 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.2084	FR_FR4 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.2084	FR_MULTIPLATE passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.2084	LC_LC5 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.2084	FR_FR2 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.2084	GH_FR1 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.2084	CM_MC2 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.2084	LC_DCDS passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.2084	FR_FRABCH passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.2084	LC_LC3 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.2084	LC_SLC passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.2084	FR_FRCP1 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.2084	Lab Control passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.2084	EV_HC1 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.2084	FR_FRRD passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.2084	FR_UFR1 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.2084	RG_MIDAG passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.2084	EV_MC2 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.2084	LC_LCDSSLCC passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.2084	CM_MC1 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9420	FR_FRRD passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9420	FR_FRABCH passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9420	CM_MC2 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9420	LC_SLC passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9420	EV_MC2 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9420	FR_MULTIPLATE passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9420	CM_MC1 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9420	GH_ERC passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9420	LC_LC3 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9420	FR_FR2 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9420	LC_DCDS passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9420	FR_UFR1 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9420	RG_MIDAG passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9420	LC_LCDSSLCC passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9420	GH_FR1 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9420	LC_LC5 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9420	GH_ER2 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9420	EV_HC1 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9420	FR_FR4 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9420	Lab Control passed reproduction	1

Ceriodaphnia 7-d Survival and Reproduction Test **Nautilus Environmental**

SIngle Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9420	FR_FRCP1 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.4205	LC_SLC passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.4205	Lab Control passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.4205	RG_MIDAG passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.4205	LC_LCDSSLCC passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.4205	EV_HC1 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.4205	EV_MC2 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.4205	FR_FR4 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.4205	LC_LC5 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.4205	FR_UFR1 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.4205	LC_LC3 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.4205	CM_MC2 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.4205	GH_ER2 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.4205	FR_MULTIPLATE passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.4205	LC_DCDS passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.4205	CM_MC1 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.4205	GH_FR1 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.4205	GH_ERC passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.4205	FR_FR2 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.4205	FR_FRCP1 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.4205	FR_FRABCH passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.4205	FR_FRRD passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9999	GH_ER2 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9999	EV_MC2 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9999	FR_MULTIPLATE passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9999	LC_LC3 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9999	CM_MC1 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9999	FR_FRRD passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9999	CM_MC2 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9999	LC_DCDS passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9999	FR_FR4 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9999	GH_ERC passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9999	RG_MIDAG passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9999	GH_FR1 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9999	FR_FR2 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9999	LC_LCDSSLCC passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9999	Lab Control passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9999	EV_HC1 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9999	FR_UFR1 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9999	FR_FRCP1 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9999	FR_FRABCH passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9999	LC_SLC passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9999	LC_LC5 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9998	FR_MULTIPLATE passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9998	FR_FR4 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9998	FR_FR2 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9998	RG_MIDAG passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9998	LC_LC5 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9998	GH_ER2 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9998	LC_DCDS passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9998	LC_LC3 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9998	GH_FR1 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9998	LC_LCDSSLCC passed reproduction	1

SIngle Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9998	CM_MC2 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9998	FR_FRABCH passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9998	FR_UFR1 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9998	LC_SLC passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9998	GH_ERC passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9998	Lab Control passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9998	FR_FRCP1 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9998	CM_MC1 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9998	FR_FRRD passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9998	EV_MC2 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9998	EV_HC1 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.0719	LC_LCDSSLCC passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.0719	LC_SLC passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.0719	GH_FR1 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.0719	FR_FRRD passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.0719	CM_MC2 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.0719	LC_DCDS passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.0719	EV_MC2 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.0719	FR_FRCP1 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.0719	LC_LC3 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.0719	CM_MC1 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.0719	FR_FRABCH passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.0719	FR_UFR1 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.0719	FR_FR2 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.0719	Lab Control passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.0719	EV_HC1 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.0719	GH_ER2 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.0719	FR_FR4 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.0719	RG_MIDAG passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.0719	LC_LC5 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.0719	FR_MULTIPLATE passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.0719	GH_ERC passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.8274	LC_SLC passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.8274	FR_MULTIPLATE passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.8274	EV_HC1 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.8274	FR_UFR1 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.8274	CM_MC1 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.8274	FR_FRABCH passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.8274	LC_LC3 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.8274	RG_MIDAG passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.8274	FR_FR4 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.8274	GH_FR1 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.8274	FR_FRCP1 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.8274	LC_DCDS passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.8274	Lab Control passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.8274	LC_LCDSSLCC passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.8274	CM_MC2 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.8274	LC_LC5 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.8274	EV_MC2 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.8274	GH_ER2 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.8274	FR_FR2 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.8274	GH_ERC passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.8274	FR_FRRD passed reproduction	1

Ceriodaphnia 7-d Survival and Reproduction Test **Nautilus Environmental**

SIngle Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9361	LC_LC5 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9361	FR_FRABCH passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9361	RG_MIDAG passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9361	Lab Control passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9361	LC_SLC passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9361	FR_FRRD passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9361	FR_FR2 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9361	FR_MULTIPLATE passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9361	FR_FR4 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9361	FR_FRCP1 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9361	LC_LCDSSLCC passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9361	GH_ER2 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9361	EV_MC2 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9361	EV_HC1 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9361	CM_MC1 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9361	LC_DCDS passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9361	GH_ERC passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9361	GH_FR1 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9361	CM_MC2 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9361	LC_LC3 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9361	FR_UFR1 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9299	LC_LCDSSLCC passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9299	FR_FRCP1 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9299	FR_FRRD passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9299	LC_DCDS passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9299	Lab Control passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9299	LC_SLC passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9299	CM_MC1 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9299	GH_ERC passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9299	FR_FR4 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9299	FR_FR2 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9299	EV_MC2 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9299	GH_ER2 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9299	EV_HC1 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9299	GH_FR1 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9299	LC_LC3 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9299	CM_MC2 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9299	FR_UFR1 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9299	FR_FRABCH passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9299	LC_LC5 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9299	RG_MIDAG passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9299	FR_MULTIPLATE passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9612	FR_FRRD passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9612	RG_MIDAG passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9612	FR_FR4 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9612	FR_FR2 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9612	CM_MC2 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9612	LC_LC5 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9612	LC_LC3 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9612	FR_FRCP1 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9612	LC_DCDS passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9612	LC_SLC passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9612	GH_ERC passed reproduction	1

Ceriodaphnia 7-d Survival and Reproduction Test **Nautilus Environmental**

SIngle Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9612	GH_FR1 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9612	CM_MC1 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9612	FR_FRABCH passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9612	Lab Control passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9612	GH_ER2 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9612	FR_UFR1 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9612	LC_LCDSSLCC passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9612	FR_MULTIPLATE passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9612	EV_MC2 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.9612	EV_HC1 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.0658	Lab Control passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.0658	FR_FRRD passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.0658	EV_MC2 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.0658	GH_ERC passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.0658	FR_FRCP1 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.0658	FR_FR4 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.0658	LC_SLC passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.0658	GH_FR1 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.0658	FR_FR2 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.0658	CM_MC1 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.0658	GH_ER2 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.0658	FR_UFR1 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.0658	CM_MC2 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.0658	EV_HC1 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.0658	FR_FRABCH passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.0658	LC_LC5 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.0658	LC_LC3 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.0658	RG_MIDAG passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.0658	LC_DCDS passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.0658	LC_LCDSSLCC passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.0658	FR_MULTIPLATE passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.5334	LC_DCDS passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.5334	LC_SLC passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.5334	FR_FRABCH passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.5334	RG_MIDAG passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.5334	FR_FR2 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.5334	FR_FR4 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.5334	FR_FRCP1 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.5334	CM_MC1 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.5334	LC_LC5 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.5334	FR_FRRD passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.5334	GH_FR1 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.5334	LC_LCDSSLCC passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.5334	EV_MC2 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.5334	FR_UFR1 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.5334	Lab Control passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.5334	EV_HC1 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.5334	FR_MULTIPLATE passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.5334	GH_ERC passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.5334	LC_LC3 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.5334	CM_MC2 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.5334	GH_ER2 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.8722	CM_MC2 passed reproduction	1

Ceriodaphnia 7-d Survival and Reproduction Test **Nautilus Environmental**

SIngle Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.8722	RG_MIDAG passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.8722	CM_MC1 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.8722	LC_LCDSSLCC passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.8722	GH_ER2 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.8722	LC_LC5 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.8722	EV_HC1 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.8722	FR_UFR1 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.8722	FR_FR2 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.8722	FR_FRRD passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.8722	FR_FR4 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.8722	Lab Control passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.8722	GH_ERC passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.8722	FR_MULTIPLATE passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.8722	GH_FR1 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.8722	LC_SLC passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.8722	LC_DCDS passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.8722	FR_FRCP1 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.8722	FR_FRABCH passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.8722	LC_LC3 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.8722	EV_MC2 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.1480	FR_FR4 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.1480	EV_MC2 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.1480	Lab Control passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.1480	CM_MC2 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.1480	RG_MIDAG passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.1480	GH_ERC passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.1480	EV_HC1 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.1480	LC_LCDSSLCC passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.1480	FR_MULTIPLATE passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.1480	CM_MC1 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.1480	GH_FR1 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.1480	FR_UFR1 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.1480	LC_SLC passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.1480	FR_FRABCH passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.1480	LC_DCDS passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.1480	FR_FRRD passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.1480	GH_ER2 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.1480	LC_LC3 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.1480	FR_FR2 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.1480	FR_FRCP1 passed reproduction	1
17-6804-3727	Reproduction	Steel Many-One Rank Sum Test	0.1480	LC_LC5 passed reproduction	1

Ceriodaphnia 7-d Survival and Reproduction Test **Nautilus Environmental**

7d Survival Rate Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
Lab Control	N	10	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
FR_UFR1		10	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
GH_ER2		10	0.9000	0.6738	1.0000	0.0000	1.0000	0.1000	0.3162	35.14%	10.00%
CM_MC1		10	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
LC_SLC		10	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
FR_FRABCH		10	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
FR_FRCP1		10	0.9000	0.6738	1.0000	0.0000	1.0000	0.1000	0.3162	35.14%	10.00%
GH_FR1		10	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
GH_ERC		10	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
CM_MC2		10	0.9000	0.6738	1.0000	0.0000	1.0000	0.1000	0.3162	35.14%	10.00%
EV_MC2		10	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
EV_HC1		10	0.9000	0.6738	1.0000	0.0000	1.0000	0.1000	0.3162	35.14%	10.00%
LC_DCDS		10	0.8000	0.4984	1.0000	0.0000	1.0000	0.1333	0.4216	52.70%	20.00%
LC_LC3		10	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
LC_LC5		10	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
LC_LCDSSLCC		10	0.9000	0.6738	1.0000	0.0000	1.0000	0.1000	0.3162	35.14%	10.00%
RG_MIDAG		10	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
FR_FR4		10	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
FR_FR2		10	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
FR_MULTIPLATE		10	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
FR_FRRD		10	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%

Reproduction Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
Lab Control	N	10	22.2	19.49	24.91	18	29	1.2	3.795	17.09%	0.00%
FR_UFR1		10	22.1	19.7	24.5	15	29	1.059	3.348	15.15%	0.45%
GH_ER2		10	21	15.48	26.52	0	26	2.44	7.717	36.75%	5.41%
CM_MC1		10	23	20.14	25.86	18	31	1.265	4	17.39%	-3.60%
LC_SLC		10	23	19.93	26.07	14	29	1.358	4.295	18.67%	-3.60%
FR_FRABCH		10	19.1	16.66	21.54	13	23	1.08	3.414	17.87%	13.96%
FR_FRCP1		10	12.7	7.4	18	0	22	2.343	7.409	58.34%	42.79%
GH_FR1		10	19.1	16.35	21.85	15	26	1.215	3.843	20.12%	13.96%
GH_ERC		10	21.1	19.61	22.59	17	24	0.6574	2.079	9.85%	4.95%
CM_MC2		10	19.3	16.15	22.45	10	26	1.391	4.398	22.79%	13.06%
EV_MC2		10	25	20.95	29.05	14	33	1.789	5.657	22.63%	-12.61%
EV_HC1		10	23.2	17.98	28.42	3	28	2.308	7.3	31.47%	-4.50%
LC_DCDS		10	12.7	5.972	19.43	0	27	2.974	9.405	74.06%	42.79%
LC_LC3		10	20.2	18.39	22.01	14	23	0.8	2.53	12.52%	9.01%
LC_LC5		10	21.1	18	24.2	11	26	1.37	4.332	20.53%	4.95%
LC_LCDSSLCC		10	20.3	15.59	25.01	3	26	2.082	6.584	32.43%	8.56%
RG_MIDAG		10	22.2	19.08	25.32	15	30	1.381	4.367	19.67%	0.00%
FR_FR4		10	15.9	11.05	20.75	4	26	2.142	6.773	42.60%	28.38%
FR_FR2		10	19.4	16.59	22.21	14	26	1.24	3.921	20.21%	12.61%
FR_MULTIPLATE		10	21	19.03	22.97	17	27	0.8692	2.749	13.09%	5.41%
FR_FRRD		10	16.9	12.7	21.1	2	23	1.859	5.877	34.78%	23.87%

Ceriodaphnia 7-d Survival and Reproduction Test **Nautilus Environmental**

7d Survival Rate Binomials

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
Lab Control	N	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
FR_UFR1		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
GH_ER2		1/1	1/1	1/1	1/1	1/1	1/1	1/1	0/1	1/1	1/1
CM_MC1		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
LC_SLC		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
FR_FRABCH		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
FR_FRCP1		1/1	1/1	1/1	1/1	1/1	1/1	1/1	0/1	1/1	1/1
GH_FR1		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
GH_ERC		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
CM_MC2		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	0/1
EV_MC2		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
EV_HC1		0/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
LC_DCDS		1/1	0/1	1/1	0/1	1/1	1/1	1/1	1/1	1/1	1/1
LC_LC3		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
LC_LC5		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
LC_LCDSSLCC		1/1	0/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
RG_MIDAG		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
FR_FR4		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
FR_FR2		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
FR_MULTIPLATE		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
FR_FRRD		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1

Ceriodaphnia 7-d Survival and Reproduction Test **Nautilus Environmental**

7d Survival Rate Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
Lab Control	N	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
FR_UFR1		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
GH_ER2		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	1.0000	1.0000
CM_MC1		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
LC_SLC		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
FR_FRABCH		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
FR_FRCP1		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	1.0000	1.0000
GH_FR1		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
GH_ERC		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
CM_MC2		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000
EV_MC2		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
EV_HC1		0.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
LC_DCDS		1.0000	0.0000	1.0000	0.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
LC_LC3		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
LC_LC5		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
LC_LCDSSLCC		1.0000	0.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
RG_MIDAG		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
FR_FR4		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
FR_FR2		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
FR_MULTIPLATE		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
FR_FRRD		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

Reproduction Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
Lab Control	N	19	26	27	29	21	20	22	21	18	19
FR_UFR1		23	22	22	22	15	21	29	22	22	23
GH_ER2		25	18	26	22	25	24	24	0	24	22
CM_MC1		18	20	24	24	24	22	18	31	27	22
LC_SLC		14	25	26	25	18	22	29	24	22	25
FR_FRABCH		23	22	18	21	13	18	23	16	21	16
FR_FRCP1		4	15	20	12	22	11	8	0	22	13
GH_FR1		16	16	17	19	17	26	15	18	24	23
GH_ERC		22	22	22	23	22	17	24	19	20	20
CM_MC2		17	22	18	19	20	24	20	26	17	10
EV_MC2		31	14	23	28	21	33	23	25	30	22
EV_HC1		3	24	24	27	27	25	27	28	23	24
LC_DCDS		19	0	14	0	17	11	27	22	2	15
LC_LC3		19	14	21	23	22	22	21	20	19	21
LC_LC5		19	26	23	11	23	20	23	24	18	24
LC_LCDSSLCC		26	3	18	21	23	24	25	19	21	23
RG_MIDAG		19	22	20	15	18	30	23	25	26	24
FR_FR4		21	18	5	26	4	15	17	20	17	16
FR_FR2		14	20	18	16	20	22	23	26	14	21
FR_MULTIPLATE		21	18	27	20	21	21	22	17	20	23
FR_FRRD		16	21	2	16	14	19	20	20	23	18

Ceriodaphnia 7-d Survival and Reproduction Test

Nautilus Environmental

Analysis ID:	04-6959-8216	**Endpoint:**	7d Survival Rate	**CETIS Version:**	CETISv1.9.4
Analyzed:	15 Oct-21 15:24	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1
Batch ID:	09-9771-6958	**Test Type:**	Reproduction-Survival (7d)	**Analyst:**	Sierra Klueppel
Start Date:	11 Aug-21 15:00	**Protocol:**	EC/EPS 1/RM/21	**Diluent:**	20% Perrier Water
Ending Date:	19 Aug-21 13:00	**Species:**	Ceriodaphnia dubia	**Brine:**	
Test Length:	7d 22h	**Taxon:**	Branchiopoda	**Source:**	In-House Culture **Age:** <24

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
Lab Control	06-8799-3466	11 Aug-21	11 Aug-21	15h	Teck Coal	
FR_UFR1	01-9312-3340	10 Aug-21 08:54	11 Aug-21 11:15	30h (12.8 °C)		
GH_ER2	03-3301-7818	10 Aug-21 10:45	11 Aug-21 11:15	28h (15.8 °C)		
CM_MC1	20-0000-6898	10 Aug-21 11:04	11 Aug-21 11:15	28h (14 °C)		
LC_SLC	07-8534-5756	10 Aug-21 09:09	11 Aug-21 11:15	30h (11.2 °C)		
FR_FRABCH	12-3746-7337	10 Aug-21 09:35	11 Aug-21 11:15	29h (13.6 °C)		
FR_FRCP1	02-0987-3329	10 Aug-21 09:55	11 Aug-21 11:15	29h (12.1 °C)		
GH_FR1	00-2216-4794	10 Aug-21 09:30	11 Aug-21 11:15	29h (15.3 °C)		
GH_ERC	02-8768-9833	10 Aug-21 11:45	11 Aug-21 11:15	27h (16.4 °C)		
CM_MC2	08-6405-5477	10 Aug-21 12:07	11 Aug-21 11:15	27h (14.9 °C)		
EV_MC2	09-5920-8643	10 Aug-21 10:44	11 Aug-21 11:15	28h (12.8 °C)		
EV_HC1	05-3700-4202	10 Aug-21 09:46	11 Aug-21 11:15	29h (13 °C)		
LC_DCDS	10-8734-0222	10 Aug-21 10:10	11 Aug-21 11:15	29h (10.8 °C)		
LC_LC3	07-4841-6068	10 Aug-21 09:30	11 Aug-21 11:15	29h (9.8 °C)		
LC_LC5	18-0478-8867	10 Aug-21 12:00	11 Aug-21 11:15	27h (11.8 °C)		
LC_LCDSSLCC	17-9964-8023	10 Aug-21 10:40	11 Aug-21 11:15	28h (12.1 °C)		
RG_MIDAG	04-6323-4167	10 Aug-21 11:30	11 Aug-21 11:15	28h (14.3 °C)		
FR_FR4	04-5681-6105	10 Aug-21 10:00	11 Aug-21 11:15	29h (15.6 °C)		
FR_FR2	16-7096-5741	10 Aug-21 10:54	11 Aug-21 11:15	28h (15.9 °C)		
FR_MULTIPLATE	08-7549-1660	10 Aug-21 11:51	11 Aug-21 11:15	27h (16.9 °C)		
FR_FRRD	03-6145-5105	10 Aug-21 08:25	11 Aug-21 11:15	31h (16.8 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
Lab Control	Water Sample	Teck Coal	Lab Control	
FR_UFR1	Water Sample	Teck Coal	FR_UFR1_MON_2021-08-0	
GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-08-10_	
CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-08-10	
LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-08-10_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_MON_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_MON_2021-08	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-08-10_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-08-10	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-08-10	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2021_Q3_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2021_Q3_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-08-10	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-08-10_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-08-10_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	
RG_MIDAG	Water Sample	Teck Coal	RG_MIDAG_WS_2021-08-	
FR_FR4	Water Sample	Teck Coal	FR_FR4_WS_2021-08-10_	
FR_FR2	Water Sample	Teck Coal	FR_FR2_WS_2021-08-10_	
FR_MULTIPLATE	Water Sample	Teck Coal	FR_MULTIPLATE_WS_202	
FR_FRRD	Water Sample	Teck Coal	FR_FRRD_WS_2021-08-10	

Fisher Exact/Bonferroni-Holm Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
Negative Control		FR_UFR1	1.0000	Exact	1.0000	Non-Significant Effect
		GH_ER2	0.5000	Exact	1.0000	Non-Significant Effect

Ceriodaphnia 7-d Survival and Reproduction Test — **Nautilus Environmental**

Analysis ID: 04-6959-8216 **Endpoint:** 7d Survival Rate **CETIS Version:** CETISv1.9.4
Analyzed: 15 Oct-21 15:24 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Fisher Exact/Bonferroni-Holm Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
		CM_MC1	1.0000	Exact	1.0000	Non-Significant Effect
		LC_SLC	1.0000	Exact	1.0000	Non-Significant Effect
		FR_FRABCH	1.0000	Exact	1.0000	Non-Significant Effect
		FR_FRCP1	0.5000	Exact	1.0000	Non-Significant Effect
		GH_FR1	1.0000	Exact	1.0000	Non-Significant Effect
		GH_ERC	1.0000	Exact	1.0000	Non-Significant Effect
		CM_MC2	0.5000	Exact	1.0000	Non-Significant Effect
		EV_MC2	1.0000	Exact	1.0000	Non-Significant Effect
		EV_HC1	0.5000	Exact	1.0000	Non-Significant Effect
		LC_DCDS	0.2368	Exact	1.0000	Non-Significant Effect
		LC_LC3	1.0000	Exact	1.0000	Non-Significant Effect
		LC_LC5	1.0000	Exact	1.0000	Non-Significant Effect
		LC_LCDSSLCC	0.5000	Exact	1.0000	Non-Significant Effect
		RG_MIDAG	1.0000	Exact	1.0000	Non-Significant Effect
		FR_FR4	1.0000	Exact	1.0000	Non-Significant Effect
		FR_FR2	1.0000	Exact	1.0000	Non-Significant Effect
		FR_MULTIPLATE	1.0000	Exact	1.0000	Non-Significant Effect
		FR_FRRD	1.0000	Exact	1.0000	Non-Significant Effect

Data Summary

Sample	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
Lab Control	N	10	0	10	1	0	0.0%
FR_UFR1		10	0	10	1	0	0.0%
GH_ER2		9	1	10	0.9	0.1	10.0%
CM_MC1		10	0	10	1	0	0.0%
LC_SLC		10	0	10	1	0	0.0%
FR_FRABCH		10	0	10	1	0	0.0%
FR_FRCP1		9	1	10	0.9	0.1	10.0%
GH_FR1		10	0	10	1	0	0.0%
GH_ERC		10	0	10	1	0	0.0%
CM_MC2		9	1	10	0.9	0.1	10.0%
EV_MC2		10	0	10	1	0	0.0%
EV_HC1		9	1	10	0.9	0.1	10.0%
LC_DCDS		8	2	10	0.8	0.2	20.0%
LC_LC3		10	0	10	1	0	0.0%
LC_LC5		10	0	10	1	0	0.0%
LC_LCDSSLCC		9	1	10	0.9	0.1	10.0%
RG_MIDAG		10	0	10	1	0	0.0%
FR_FR4		10	0	10	1	0	0.0%
FR_FR2		10	0	10	1	0	0.0%
FR_MULTIPLATE		10	0	10	1	0	0.0%
FR_FRRD		10	0	10	1	0	0.0%

Ceriodaphnia 7-d Survival and Reproduction Test — **Nautilus Environmental**

Analysis ID: 04-6959-8216 **Endpoint:** 7d Survival Rate **CETIS Version:** CETISv1.9.4
Analyzed: 15 Oct-21 15:24 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

7d Survival Rate Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
Lab Control	N	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
FR_UFR1		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
GH_ER2		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	1.0000	1.0000
CM_MC1		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
LC_SLC		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
FR_FRABCH		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
FR_FRCP1		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	1.0000	1.0000
GH_FR1		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
GH_ERC		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
CM_MC2		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000
EV_MC2		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
EV_HC1		0.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
LC_DCDS		1.0000	0.0000	1.0000	0.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
LC_LC3		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
LC_LC5		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
LC_LCDSSLCC		1.0000	0.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
RG_MIDAG		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
FR_FR4		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
FR_FR2		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
FR_MULTIPLATE		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
FR_FRRD		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

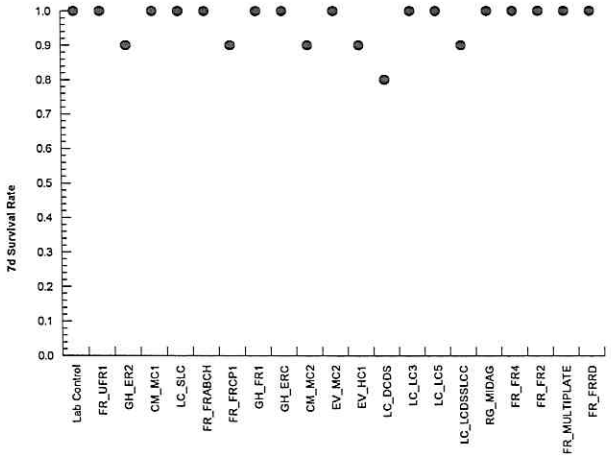
7d Survival Rate Binomials

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
Lab Control	N	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
FR_UFR1		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
GH_ER2		1/1	1/1	1/1	1/1	1/1	1/1	1/1	0/1	1/1	1/1
CM_MC1		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
LC_SLC		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
FR_FRABCH		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
FR_FRCP1		1/1	1/1	1/1	1/1	1/1	1/1	1/1	0/1	1/1	1/1
GH_FR1		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
GH_ERC		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
CM_MC2		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	0/1
EV_MC2		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
EV_HC1		0/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
LC_DCDS		1/1	0/1	1/1	0/1	1/1	1/1	1/1	1/1	1/1	1/1
LC_LC3		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
LC_LC5		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
LC_LCDSSLCC		1/1	0/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
RG_MIDAG		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
FR_FR4		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
FR_FR2		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
FR_MULTIPLATE		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
FR_FRRD		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1

Ceriodaphnia 7-d Survival and Reproduction Test — **Nautilus Environmental**

Analysis ID:	04-6959-8216	**Endpoint:**	7d Survival Rate	**CETIS Version:**	CETISv1.9.4
Analyzed:	15 Oct-21 15:24	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1

Graphics



Analyst: sam QA: Oct. 27/21

Ceriodaphnia 7-d Survival and Reproduction Test

Nautilus Environmental

Analysis ID:	17-6804-3727	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.9.4
Analyzed:	15 Oct-21 15:27	**Analysis:**	Nonparametric-Control vs Treatments	**Status Level:**	1
Batch ID:	09-9771-6958	**Test Type:**	Reproduction-Survival (7d)	**Analyst:**	Sierra Klueppel
Start Date:	11 Aug-21 15:00	**Protocol:**	EC/EPS 1/RM/21	**Diluent:**	20% Perrier Water
Ending Date:	19 Aug-21 13:00	**Species:**	Ceriodaphnia dubia	**Brine:**	
Test Length:	7d 22h	**Taxon:**	Branchiopoda	**Source:**	In-House Culture **Age:** <24

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
Lab Control	06-8799-3466	11 Aug-21	11 Aug-21	15h	Teck Coal	
FR_UFR1	01-9312-3340	10 Aug-21 08:54	11 Aug-21 11:15	30h (12.8 °C)		
GH_ER2	03-3301-7818	10 Aug-21 10:45	11 Aug-21 11:15	28h (15.8 °C)		
CM_MC1	20-0000-6898	10 Aug-21 11:04	11 Aug-21 11:15	28h (14 °C)		
LC_SLC	07-8534-5756	10 Aug-21 09:09	11 Aug-21 11:15	30h (11.2 °C)		
FR_FRABCH	12-3746-7337	10 Aug-21 09:35	11 Aug-21 11:15	29h (13.6 °C)		
FR_FRCP1	02-0987-3329	10 Aug-21 09:55	11 Aug-21 11:15	29h (12.1 °C)		
GH_FR1	00-2216-4794	10 Aug-21 09:30	11 Aug-21 11:15	29h (15.3 °C)		
GH_ERC	02-8768-9833	10 Aug-21 11:45	11 Aug-21 11:15	27h (16.4 °C)		
CM_MC2	08-6405-5477	10 Aug-21 12:07	11 Aug-21 11:15	27h (14.9 °C)		
EV_MC2	09-5920-8643	10 Aug-21 10:44	11 Aug-21 11:15	28h (12.8 °C)		
EV_HC1	05-3700-4202	10 Aug-21 09:46	11 Aug-21 11:15	29h (13 °C)		
LC_DCDS	10-8734-0222	10 Aug-21 10:10	11 Aug-21 11:15	29h (10.8 °C)		
LC_LC3	07-4841-6068	10 Aug-21 09:30	11 Aug-21 11:15	29h (9.8 °C)		
LC_LC5	18-0478-8867	10 Aug-21 12:00	11 Aug-21 11:15	27h (11.8 °C)		
LC_LCDSSLCC	17-9964-8023	10 Aug-21 10:40	11 Aug-21 11:15	28h (12.1 °C)		
RG_MIDAG	04-6323-4167	10 Aug-21 11:30	11 Aug-21 11:15	28h (14.3 °C)		
FR_FR4	04-5681-6105	10 Aug-21 10:00	11 Aug-21 11:15	29h (15.6 °C)		
FR_FR2	16-7096-5741	10 Aug-21 10:54	11 Aug-21 11:15	28h (15.9 °C)		
FR_MULTIPLATE	08-7549-1660	10 Aug-21 11:51	11 Aug-21 11:15	27h (16.9 °C)		
FR_FRRD	03-6145-5105	10 Aug-21 08:25	11 Aug-21 11:15	31h (16.8 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
Lab Control	Water Sample	Teck Coal	Lab Control	
FR_UFR1	Water Sample	Teck Coal	FR_UFR1_MON_2021-08-0	
GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-08-10_	
CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-08-10	
LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-08-10_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_MON_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_MON_2021-08	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-08-10_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-08-10	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-08-10	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2021_Q3_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2021_Q3_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-08-10	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-08-10_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-08-10_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	
RG_MIDAG	Water Sample	Teck Coal	RG_MIDAG_WS_2021-08-	
FR_FR4	Water Sample	Teck Coal	FR_FR4_WS_2021-08-10_	
FR_FR2	Water Sample	Teck Coal	FR_FR2_WS_2021-08-10_	
FR_MULTIPLATE	Water Sample	Teck Coal	FR_MULTIPLATE_WS_202	
FR_FRRD	Water Sample	Teck Coal	FR_FRRD_WS_2021-08-10	

Ceriodaphnia 7-d Survival and Reproduction Test **Nautilus Environmental**

Analysis ID: 17-6804-3727 **Endpoint:** Reproduction **CETIS Version:** CETISv1.9.4
Analyzed: 15 Oct-21 15:27 **Analysis:** Nonparametric-Control vs Treatments **Status Level:** 1

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	FR_FRCP1 passed reproduction	28.46%
		GH_FR1 passed reproduction	28.46%
		GH_ERC passed reproduction	28.46%
		CM_MC2 passed reproduction	28.46%
		EV_MC2 passed reproduction	28.46%
		EV_HC1 passed reproduction	28.46%
		LC_DCDS passed reproduction	28.46%
		LC_LC3 passed reproduction	28.46%
		LC_LC5 passed reproduction	28.46%
		LC_LCDSSLCC passed reproduction	28.46%
		RG_MIDAG passed reproduction	28.46%
		FR_FR4 passed reproduction	28.46%
		FR_FR2 passed reproduction	28.46%
		FR_MULTIPLATE passed reproduction	28.46%
		FR_FRRD passed reproduction	28.46%
		FR_UFR1 passed reproduction	28.46%
		GH_ER2 passed reproduction	28.46%
		CM_MC1 passed reproduction	28.46%
		LC_SLC passed reproduction	28.46%
		FR_FRABCH passed reproduction	28.46%

Steel Many-One Rank Sum Test

Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)
Negative Control		FR_UFR1	116	70	3	18	CDF	0.9969	Non-Significant Effect
		GH_ER2	111	70	3	18	CDF	0.9878	Non-Significant Effect
		CM_MC1	112	70	4	18	CDF	0.9906	Non-Significant Effect
		LC_SLC	113.5	70	4	18	CDF	0.9937	Non-Significant Effect
		FR_FRABCH	86.5	70	3	18	CDF	0.4578	Non-Significant Effect
		FR_FRCP1	71.5	70	2	18	CDF	0.0658	Non-Significant Effect
		GH_FR1	79	70	3	18	CDF	0.2084	Non-Significant Effect
		GH_ERC	104	70	3	18	CDF	0.9420	Non-Significant Effect
		CM_MC2	85.5	70	5	18	CDF	0.4205	Non-Significant Effect
		EV_MC2	126.5	70	2	18	CDF	0.9999	Non-Significant Effect
		EV_HC1	124.5	70	1	18	CDF	0.9998	Non-Significant Effect
		LC_DCDS	72	70	3	18	CDF	0.0719	Non-Significant Effect
		LC_LC3	97.5	70	4	18	CDF	0.8274	Non-Significant Effect
		LC_LC5	103.5	70	4	18	CDF	0.9361	Non-Significant Effect
		LC_LCDSSLCC	103	70	4	18	CDF	0.9299	Non-Significant Effect
		RG_MIDAG	106	70	5	18	CDF	0.9612	Non-Significant Effect
		FR_FR4	71.5	70	4	18	CDF	0.0658	Non-Significant Effect
		FR_FR2	88.5	70	5	18	CDF	0.5334	Non-Significant Effect
		FR_MULTIPLATE	99.5	70	5	18	CDF	0.8722	Non-Significant Effect
		FR_FRRD	76.5	70	4	18	CDF	0.1480	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	4.169	3.62	0.0044	Outlier Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	2073.38	103.669	20	3.694	1.1E-06	Significant Effect
Error	5303.5	28.0608	189			
Total	7376.88		209			

Distributional Tests

Ceriodaphnia 7-d Survival and Reproduction Test — **Nautilus Environmental**

Analysis ID: 17-6804-3727 **Endpoint:** Reproduction **CETIS Version:** CETISv1.9.4
Analyzed: 15 Oct-21 15:27 **Analysis:** Nonparametric-Control vs Treatments **Status Level:** 1

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance Test	52.25	37.57	1.0E-04	Unequal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9245	0.9824	6.7E-09	Non-Normal Distribution

Reproduction Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
Lab Control	N	10	22.2	19.49	24.91	21	18	29	1.2	17.09%	0.00%
FR_UFR1		10	22.1	19.7	24.5	22	15	29	1.059	15.15%	0.45%
GH_ER2		10	21	15.48	26.52	24	0	26	2.44	36.75%	5.41%
CM_MC1		10	23	20.14	25.86	23	18	31	1.265	17.39%	-3.60%
LC_SLC		10	23	19.93	26.07	24.5	14	29	1.358	18.67%	-3.60%
FR_FRABCH		10	19.1	16.66	21.54	19.5	13	23	1.08	17.87%	13.96%
FR_FRCP1		10	12.7	7.4	18	12.5	0	22	2.343	58.34%	42.79%
GH_FR1		10	19.1	16.35	21.85	17.5	15	26	1.215	20.12%	13.96%
GH_ERC		10	21.1	19.61	22.59	22	17	24	0.6574	9.85%	4.95%
CM_MC2		10	19.3	16.15	22.45	19.5	10	26	1.391	22.79%	13.06%
EV_MC2		10	25	20.95	29.05	24	14	33	1.789	22.63%	-12.61%
EV_HC1		10	23.2	17.98	28.42	24.5	3	28	2.308	31.47%	-4.50%
LC_DCDS		10	12.7	5.972	19.43	14.5	0	27	2.974	74.06%	42.79%
LC_LC3		10	20.2	18.39	22.01	21	14	23	0.8	12.52%	9.01%
LC_LC5		10	21.1	18	24.2	23	11	26	1.37	20.53%	4.95%
LC_LCDSSLCC		10	20.3	15.59	25.01	22	3	26	2.082	32.43%	8.56%
RG_MIDAG		10	22.2	19.08	25.32	22.5	15	30	1.381	19.67%	0.00%
FR_FR4		10	15.9	11.05	20.75	17	4	26	2.142	42.60%	28.38%
FR_FR2		10	19.4	16.59	22.21	20	14	26	1.24	20.21%	12.61%
FR_MULTIPLATE		10	21	19.03	22.97	21	17	27	0.8692	13.09%	5.41%
FR_FRRD		10	16.9	12.7	21.1	18.5	2	23	1.859	34.78%	23.87%

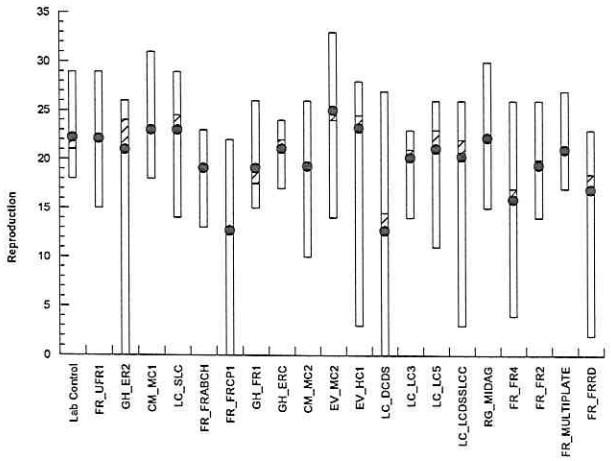
Reproduction Detail

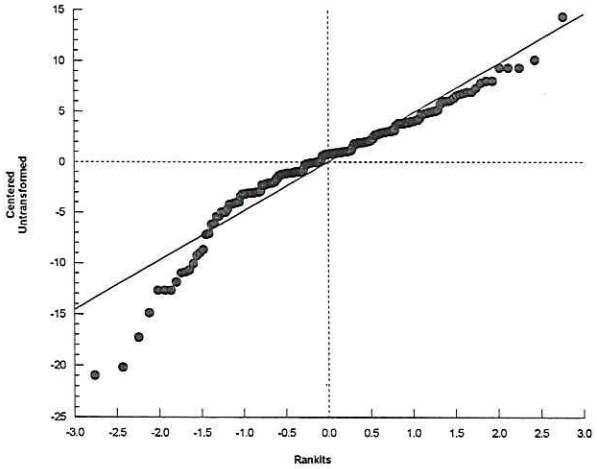
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
Lab Control	N	19	26	27	29	21	20	22	21	18	19
FR_UFR1		23	22	22	22	15	21	29	22	22	23
GH_ER2		25	18	26	22	25	24	24	0	24	22
CM_MC1		18	20	24	24	24	22	18	31	27	22
LC_SLC		14	25	26	25	18	22	29	24	22	25
FR_FRABCH		23	22	18	21	13	18	23	16	21	16
FR_FRCP1		4	15	20	12	22	11	8	0	22	13
GH_FR1		16	16	17	19	17	26	15	18	24	23
GH_ERC		22	22	22	23	22	17	24	19	20	20
CM_MC2		17	22	18	19	20	24	20	26	17	10
EV_MC2		31	14	23	28	21	33	23	25	30	22
EV_HC1		3	24	24	27	27	25	27	28	23	24
LC_DCDS		19	0	14	0	17	11	27	22	2	15
LC_LC3		19	14	21	23	22	22	21	20	19	21
LC_LC5		19	26	23	11	23	20	23	24	18	24
LC_LCDSSLCC		26	3	18	21	23	24	25	19	21	23
RG_MIDAG		19	22	20	15	18	30	23	25	26	24
FR_FR4		21	18	5	26	4	15	17	20	17	16
FR_FR2		14	20	18	16	20	22	23	26	14	21
FR_MULTIPLATE		21	18	27	20	21	21	22	17	20	23
FR_FRRD		16	21	2	16	14	19	20	20	23	18

Ceriodaphnia 7-d Survival and Reproduction Test **Nautilus Environmental**

Analysis ID:	17-6804-3727	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.9.4
Analyzed:	15 Oct-21 15:27	**Analysis:**	Nonparametric-Control vs Treatments	**Status Level:**	1

Graphics





Ceriodaphnia 7-d Survival and Reproduction Test

Nautilus Environmental

Analysis ID:	17-1827-2576	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.9.4
Analyzed:	15 Oct-21 15:27	**Analysis:**	Nonparametric-Control vs Treatments	**Status Level:**	1
Batch ID:	09-9771-6958	**Test Type:**	Reproduction-Survival (7d)	**Analyst:**	Sierra Klueppel
Start Date:	11 Aug-21 15:00	**Protocol:**	EC/EPS 1/RM/21	**Diluent:**	20% Perrier Water
Ending Date:	19 Aug-21 13:00	**Species:**	Ceriodaphnia dubia	**Brine:**	
Test Length:	7d 22h	**Taxon:**	Branchiopoda	**Source:**	In-House Culture **Age:** <24

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
Lab Control	06-8799-3466	11 Aug-21	11 Aug-21	15h	Teck Coal	
FR_UFR1	01-9312-3340	10 Aug-21 08:54	11 Aug-21 11:15	30h (12.8 °C)		
GH_ER2	03-3301-7818	10 Aug-21 10:45	11 Aug-21 11:15	28h (15.8 °C)		
CM_MC1	20-0000-6898	10 Aug-21 11:04	11 Aug-21 11:15	28h (14 °C)		
LC_SLC	07-8534-5756	10 Aug-21 09:09	11 Aug-21 11:15	30h (11.2 °C)		
FR_FRABCH	12-3746-7337	10 Aug-21 09:35	11 Aug-21 11:15	29h (13.6 °C)		
FR_FRCP1	02-0987-3329	10 Aug-21 09:55	11 Aug-21 11:15	29h (12.1 °C)		
GH_FR1	00-2216-4794	10 Aug-21 09:30	11 Aug-21 11:15	29h (15.3 °C)		
GH_ERC	02-8768-9833	10 Aug-21 11:45	11 Aug-21 11:15	27h (16.4 °C)		
CM_MC2	08-6405-5477	10 Aug-21 12:07	11 Aug-21 11:15	27h (14.9 °C)		
EV_MC2	09-5920-8643	10 Aug-21 10:44	11 Aug-21 11:15	28h (12.8 °C)		
EV_HC1	05-3700-4202	10 Aug-21 09:46	11 Aug-21 11:15	29h (13 °C)		
LC_DCDS	10-8734-0222	10 Aug-21 10:10	11 Aug-21 11:15	29h (10.8 °C)		
LC_LC3	07-4841-6068	10 Aug-21 09:30	11 Aug-21 11:15	29h (9.8 °C)		
LC_LC5	18-0478-8867	10 Aug-21 12:00	11 Aug-21 11:15	27h (11.8 °C)		
LC_LCDSSLCC	17-9964-8023	10 Aug-21 10:40	11 Aug-21 11:15	28h (12.1 °C)		
RG_MIDAG	04-6323-4167	10 Aug-21 11:30	11 Aug-21 11:15	28h (14.3 °C)		
FR_FR4	04-5681-6105	10 Aug-21 10:00	11 Aug-21 11:15	29h (15.6 °C)		
FR_FR2	16-7096-5741	10 Aug-21 10:54	11 Aug-21 11:15	28h (15.9 °C)		
FR_MULTIPLATE	08-7549-1660	10 Aug-21 11:51	11 Aug-21 11:15	27h (16.9 °C)		
FR_FRRD	03-6145-5105	10 Aug-21 08:25	11 Aug-21 11:15	31h (16.8 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
Lab Control	Water Sample	Teck Coal	Lab Control	
FR_UFR1	Water Sample	Teck Coal	FR_UFR1_MON_2021-08-0	
GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-08-10_	
CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-08-10	
LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-08-10_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_MON_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_MON_2021-08	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-08-10_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-08-10	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-08-10	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2021_Q3_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2021_Q3_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-08-10	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-08-10_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-08-10_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	
RG_MIDAG	Water Sample	Teck Coal	RG_MIDAG_WS_2021-08-	
FR_FR4	Water Sample	Teck Coal	FR_FR4_WS_2021-08-10_	
FR_FR2	Water Sample	Teck Coal	FR_FR2_WS_2021-08-10_	
FR_MULTIPLATE	Water Sample	Teck Coal	FR_MULTIPLATE_WS_202	
FR_FRRD	Water Sample	Teck Coal	FR_FRRD_WS_2021-08-10	

Ceriodaphnia 7-d Survival and Reproduction Test **Nautilus Environmental**

Analysis ID: 17-1827-2576 **Endpoint:** Reproduction **CETIS Version:** CETISv1.9.4
Analyzed: 15 Oct-21 15:27 **Analysis:** Nonparametric-Control vs Treatments **Status Level:** 1

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C < T	FR_UFR1 passed reproduction	28.46%
		GH_ER2 passed reproduction	28.46%
		CM_MC1 passed reproduction	28.46%
		LC_SLC passed reproduction	28.46%
		FR_FRABCH passed reproduction	28.46%
		FR_FRCP1 passed reproduction	28.46%
		GH_FR1 passed reproduction	28.46%
		GH_ERC passed reproduction	28.46%
		CM_MC2 passed reproduction	28.46%
		EV_MC2 passed reproduction	28.46%
		EV_HC1 passed reproduction	28.46%
		LC_DCDS passed reproduction	28.46%
		LC_LC3 passed reproduction	28.46%
		LC_LC5 passed reproduction	28.46%
		LC_LCDSSLCC passed reproduction	28.46%
		RG_MIDAG passed reproduction	28.46%
		FR_FR4 passed reproduction	28.46%
		FR_FR2 passed reproduction	28.46%
		FR_MULTIPLATE passed reproduction	28.46%
		FR_FRRD passed reproduction	28.46%

Steel Many-One Rank Sum Test

Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)
Negative Control		FR_UFR1	94	70	3	18	CDF	0.7285	Non-Significant Effect
		GH_ER2	99	70	3	18	CDF	0.8618	Non-Significant Effect
		CM_MC1	98	70	4	18	CDF	0.8395	Non-Significant Effect
		LC_SLC	96.5	70	4	18	CDF	0.8018	Non-Significant Effect
		FR_FRABCH	123.5	70	3	18	CDF	0.9997	Non-Significant Effect
		FR_FRCP1	138.5	70	2	18	CDF	1.0000	Non-Significant Effect
		GH_FR1	131	70	3	18	CDF	1.0000	Non-Significant Effect
		GH_ERC	106	70	3	18	CDF	0.9612	Non-Significant Effect
		CM_MC2	124.5	70	5	18	CDF	0.9998	Non-Significant Effect
		EV_MC2	83.5	70	2	18	CDF	0.3485	Non-Significant Effect
		EV_HC1	85.5	70	1	18	CDF	0.4205	Non-Significant Effect
		LC_DCDS	138	70	3	18	CDF	1.0000	Non-Significant Effect
		LC_LC3	112.5	70	4	18	CDF	0.9918	Non-Significant Effect
		LC_LC5	106.5	70	4	18	CDF	0.9652	Non-Significant Effect
		LC_LCDSSLCC	107	70	4	18	CDF	0.9687	Non-Significant Effect
		RG_MIDAG	104	70	5	18	CDF	0.9420	Non-Significant Effect
		FR_FR4	138.5	70	4	18	CDF	1.0000	Non-Significant Effect
		FR_FR2	121.5	70	5	18	CDF	0.9995	Non-Significant Effect
		FR_MULTIPLATE	110.5	70	5	18	CDF	0.9862	Non-Significant Effect
		FR_FRRD	133.5	70	4	18	CDF	1.0000	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	4.169	3.62	0.0044	Outlier Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	2073.38	103.669	20	3.694	1.1E-06	Significant Effect
Error	5303.5	28.0608	189			
Total	7376.88		209			

Distributional Tests

Ceriodaphnia 7-d Survival and Reproduction Test **Nautilus Environmental**

Analysis ID: 17-1827-2576 **Endpoint:** Reproduction **CETIS Version:** CETISv1.9.4
Analyzed: 15 Oct-21 15:27 **Analysis:** Nonparametric-Control vs Treatments **Status Level:** 1

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance Test	52.25	37.57	1.0E-04	Unequal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9245	0.9824	6.7E-09	Non-Normal Distribution

Reproduction Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
Lab Control	N	10	22.2	19.49	24.91	21	18	29	1.2	17.09%	0.00%
FR_UFR1		10	22.1	19.7	24.5	22	15	29	1.059	15.15%	0.45%
GH_ER2		10	21	15.48	26.52	24	0	26	2.44	36.75%	5.41%
CM_MC1		10	23	20.14	25.86	23	18	31	1.265	17.39%	-3.60%
LC_SLC		10	23	19.93	26.07	24.5	14	29	1.358	18.67%	-3.60%
FR_FRABCH		10	19.1	16.66	21.54	19.5	13	23	1.08	17.87%	13.96%
FR_FRCP1		10	12.7	7.4	18	12.5	0	22	2.343	58.34%	42.79%
GH_FR1		10	19.1	16.35	21.85	17.5	15	26	1.215	20.12%	13.96%
GH_ERC		10	21.1	19.61	22.59	22	17	24	0.6574	9.85%	4.95%
CM_MC2		10	19.3	16.15	22.45	19.5	10	26	1.391	22.79%	13.06%
EV_MC2		10	25	20.95	29.05	24	14	33	1.789	22.63%	-12.61%
EV_HC1		10	23.2	17.98	28.42	24.5	3	28	2.308	31.47%	-4.50%
LC_DCDS		10	12.7	5.972	19.43	14.5	0	27	2.974	74.06%	42.79%
LC_LC3		10	20.2	18.39	22.01	21	14	23	0.8	12.52%	9.01%
LC_LC5		10	21.1	18	24.2	23	11	26	1.37	20.53%	4.95%
LC_LCDSSLCC		10	20.3	15.59	25.01	22	3	26	2.082	32.43%	8.56%
RG_MIDAG		10	22.2	19.08	25.32	22.5	15	30	1.381	19.67%	0.00%
FR_FR4		10	15.9	11.05	20.75	17	4	26	2.142	42.60%	28.38%
FR_FR2		10	19.4	16.59	22.21	20	14	26	1.24	20.21%	12.61%
FR_MULTIPLATE		10	21	19.03	22.97	21	17	27	0.8692	13.09%	5.41%
FR_FRRD		10	16.9	12.7	21.1	18.5	2	23	1.859	34.78%	23.87%

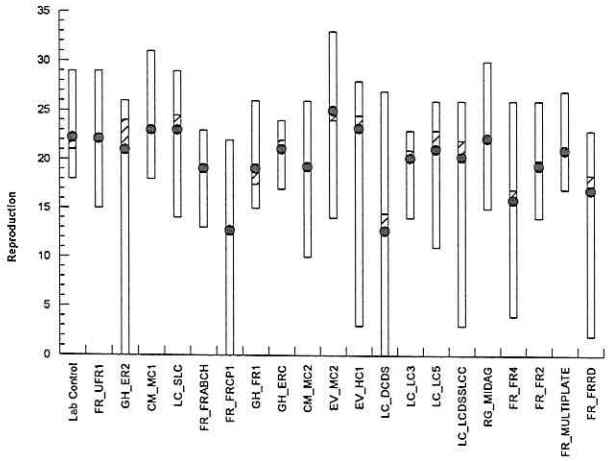
Reproduction Detail

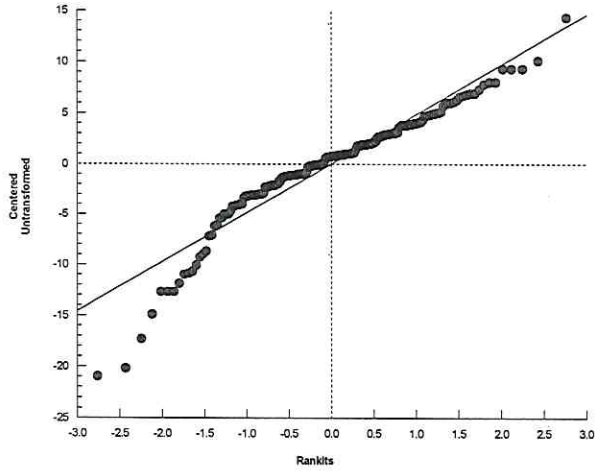
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
Lab Control	N	19	26	27	29	21	20	22	21	18	19
FR_UFR1		23	22	22	22	15	21	29	22	22	23
GH_ER2		25	18	26	22	25	24	24	0	24	22
CM_MC1		18	20	24	24	24	22	18	31	27	22
LC_SLC		14	25	26	25	18	22	29	24	22	25
FR_FRABCH		23	22	18	21	13	18	23	16	21	16
FR_FRCP1		4	15	20	12	22	11	8	0	22	13
GH_FR1		16	16	17	19	17	26	15	18	24	23
GH_ERC		22	22	22	23	22	17	24	19	20	20
CM_MC2		17	22	18	19	20	24	20	26	17	10
EV_MC2		31	14	23	28	21	33	23	25	30	22
EV_HC1		3	24	24	27	27	25	27	28	23	24
LC_DCDS		19	0	14	0	17	11	27	22	2	15
LC_LC3		19	14	21	23	22	22	21	20	19	21
LC_LC5		19	26	23	11	23	20	23	24	18	24
LC_LCDSSLCC		26	3	18	21	23	24	25	19	21	23
RG_MIDAG		19	22	20	15	18	30	23	25	26	24
FR_FR4		21	18	5	26	4	15	17	20	17	16
FR_FR2		14	20	18	16	20	22	23	26	14	21
FR_MULTIPLATE		21	18	27	20	21	21	22	17	20	23
FR_FRRD		16	21	2	16	14	19	20	20	23	18

Ceriodaphnia 7-d Survival and Reproduction Test **Nautilus Environmental**

Analysis ID:	17-1827-2576	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.9.4
Analyzed:	15 Oct-21 15:27	**Analysis:**	Nonparametric-Control vs Treatments	**Status Level:**	1

Graphics





Ceriodaphnia 7-d Survival and Reproduction Test

Nautilus Environmental

Analysis ID:	11-6508-3879	**Endpoint:**	7d Survival Rate	**CETIS Version:**	CETISv1.9.4
Analyzed:	15 Oct-21 15:29	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1
Batch ID:	09-9771-6958	**Test Type:**	Reproduction-Survival (7d)	**Analyst:**	Sierra Klueppel
Start Date:	11 Aug-21 15:00	**Protocol:**	EC/EPS 1/RM/21	**Diluent:**	20% Perrier Water
Ending Date:	19 Aug-21 13:00	**Species:**	Ceriodaphnia dubia	**Brine:**	
Test Length:	7d 22h	**Taxon:**	Branchiopoda	**Source:**	In-House Culture **Age:** <24

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
FR_UFR1	01-9312-3340	10 Aug-21 08:54	11 Aug-21 11:15	30h (12.8 °C)	Teck Coal	
GH_ER2	03-3301-7818	10 Aug-21 10:45	11 Aug-21 11:15	28h (15.8 °C)		
CM_MC1	20-0000-6898	10 Aug-21 11:04	11 Aug-21 11:15	28h (14 °C)		
LC_SLC	07-8534-5756	10 Aug-21 09:09	11 Aug-21 11:15	30h (11.2 °C)		
FR_FRABCH	12-3746-7337	10 Aug-21 09:35	11 Aug-21 11:15	29h (13.6 °C)		
FR_FRCP1	02-0987-3329	10 Aug-21 09:55	11 Aug-21 11:15	29h (12.1 °C)		
GH_FR1	00-2216-4794	10 Aug-21 09:30	11 Aug-21 11:15	29h (15.3 °C)		
GH_ERC	02-8768-9833	10 Aug-21 11:45	11 Aug-21 11:15	27h (16.4 °C)		
CM_MC2	08-6405-5477	10 Aug-21 12:07	11 Aug-21 11:15	27h (14.9 °C)		
EV_MC2	09-5920-8643	10 Aug-21 10:44	11 Aug-21 11:15	28h (12.8 °C)		
EV_HC1	05-3700-4202	10 Aug-21 09:46	11 Aug-21 11:15	29h (13 °C)		
LC_DCDS	10-8734-0222	10 Aug-21 10:10	11 Aug-21 11:15	29h (10.8 °C)		
LC_LC3	07-4841-6068	10 Aug-21 09:30	11 Aug-21 11:15	29h (9.8 °C)		
LC_LC5	18-0478-8867	10 Aug-21 12:00	11 Aug-21 11:15	27h (11.8 °C)		
LC_LCDSSLCC	17-9964-8023	10 Aug-21 10:40	11 Aug-21 11:15	28h (12.1 °C)		
RG_MIDAG	04-6323-4167	10 Aug-21 11:30	11 Aug-21 11:15	28h (14.3 °C)		
FR_FR4	04-5681-6105	10 Aug-21 10:00	11 Aug-21 11:15	29h (15.6 °C)		
FR_FR2	16-7096-5741	10 Aug-21 10:54	11 Aug-21 11:15	28h (15.9 °C)		
FR_MULTIPLATE	08-7549-1660	10 Aug-21 11:51	11 Aug-21 11:15	27h (16.9 °C)		
FR_FRRD	03-6145-5105	10 Aug-21 08:25	11 Aug-21 11:15	31h (16.8 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_UFR1	Water Sample	Teck Coal	FR_UFR1_MON_2021-08-0	
GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-08-10_	
CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-08-10	
LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-08-10_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_MON_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_MON_2021-08	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-08-10_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-08-10	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-08-10	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2021_Q3_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2021_Q3_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-08-10	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-08-10_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-08-10_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	
RG_MIDAG	Water Sample	Teck Coal	RG_MIDAG_WS_2021-08-	
FR_FR4	Water Sample	Teck Coal	FR_FR4_WS_2021-08-10_	
FR_FR2	Water Sample	Teck Coal	FR_FR2_WS_2021-08-10_	
FR_MULTIPLATE	Water Sample	Teck Coal	FR_MULTIPLATE_WS_202	
FR_FRRD	Water Sample	Teck Coal	FR_FRRD_WS_2021-08-10	

Fisher Exact/Bonferroni-Holm Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
Site Control (FR_UFR1)		GH_ER2	0.5000	Exact	1.0000	Non-Significant Effect
		CM_MC1	1.0000	Exact	1.0000	Non-Significant Effect
		LC_SLC	1.0000	Exact	1.0000	Non-Significant Effect
		FR_FRABCH	1.0000	Exact	1.0000	Non-Significant Effect

Ceriodaphnia 7-d Survival and Reproduction Test **Nautilus Environmental**

Analysis ID: 11-6508-3879 **Endpoint:** 7d Survival Rate **CETIS Version:** CETISv1.9.4
Analyzed: 15 Oct-21 15:29 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Fisher Exact/Bonferroni-Holm Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
		FR_FRCP1	0.5000	Exact	1.0000	Non-Significant Effect
		GH_FR1	1.0000	Exact	1.0000	Non-Significant Effect
		GH_ERC	1.0000	Exact	1.0000	Non-Significant Effect
		CM_MC2	0.5000	Exact	1.0000	Non-Significant Effect
		EV_MC2	1.0000	Exact	1.0000	Non-Significant Effect
		EV_HC1	0.5000	Exact	1.0000	Non-Significant Effect
		LC_DCDS	0.2368	Exact	1.0000	Non-Significant Effect
		LC_LC3	1.0000	Exact	1.0000	Non-Significant Effect
		LC_LC5	1.0000	Exact	1.0000	Non-Significant Effect
		LC_LCDSSLCC	0.5000	Exact	1.0000	Non-Significant Effect
		RG_MIDAG	1.0000	Exact	1.0000	Non-Significant Effect
		FR_FR4	1.0000	Exact	1.0000	Non-Significant Effect
		FR_FR2	1.0000	Exact	1.0000	Non-Significant Effect
		FR_MULTIPLATE	1.0000	Exact	1.0000	Non-Significant Effect
		FR_FRRD	1.0000	Exact	1.0000	Non-Significant Effect

Data Summary

Sample	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
FR_UFR1	XC	10	0	10	1	0	0.0%
GH_ER2		9	1	10	0.9	0.1	10.0%
CM_MC1		10	0	10	1	0	0.0%
LC_SLC		10	0	10	1	0	0.0%
FR_FRABCH		10	0	10	1	0	0.0%
FR_FRCP1		9	1	10	0.9	0.1	10.0%
GH_FR1		10	0	10	1	0	0.0%
GH_ERC		10	0	10	1	0	0.0%
CM_MC2		9	1	10	0.9	0.1	10.0%
EV_MC2		10	0	10	1	0	0.0%
EV_HC1		9	1	10	0.9	0.1	10.0%
LC_DCDS		8	2	10	0.8	0.2	20.0%
LC_LC3		10	0	10	1	0	0.0%
LC_LC5		10	0	10	1	0	0.0%
LC_LCDSSLCC		9	1	10	0.9	0.1	10.0%
RG_MIDAG		10	0	10	1	0	0.0%
FR_FR4		10	0	10	1	0	0.0%
FR_FR2		10	0	10	1	0	0.0%
FR_MULTIPLATE		10	0	10	1	0	0.0%
FR_FRRD		10	0	10	1	0	0.0%

Ceriodaphnia 7-d Survival and Reproduction Test — **Nautilus Environmental**

Analysis ID: 11-6508-3879 **Endpoint:** 7d Survival Rate **CETIS Version:** CETISv1.9.4
Analyzed: 15 Oct-21 15:29 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

7d Survival Rate Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
FR_UFR1	XC	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
GH_ER2		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	1.0000	1.0000
CM_MC1		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
LC_SLC		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
FR_FRABCH		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
FR_FRCP1		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	1.0000	1.0000
GH_FR1		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
GH_ERC		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
CM_MC2		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000
EV_MC2		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
EV_HC1		0.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
LC_DCDS		1.0000	0.0000	1.0000	0.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
LC_LC3		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
LC_LC5		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
LC_LCDSSLCC		1.0000	0.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
RG_MIDAG		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
FR_FR4		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
FR_FR2		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
FR_MULTIPLATE		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
FR_FRRD		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

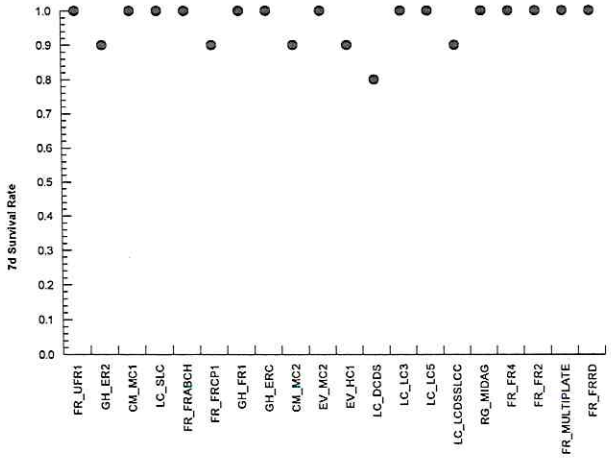
7d Survival Rate Binomials

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
GH_ER2		1/1	1/1	1/1	1/1	1/1	1/1	1/1	0/1	1/1	1/1
CM_MC1		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
LC_SLC		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
FR_FRABCH		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
FR_FRCP1		1/1	1/1	1/1	1/1	1/1	1/1	1/1	0/1	1/1	1/1
GH_FR1		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
GH_ERC		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
CM_MC2		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	0/1
EV_MC2		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
EV_HC1		0/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
LC_DCDS		1/1	0/1	1/1	0/1	1/1	1/1	1/1	1/1	1/1	1/1
LC_LC3		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
LC_LC5		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
LC_LCDSSLCC		1/1	0/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
RG_MIDAG		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
FR_FR4		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
FR_FR2		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
FR_MULTIPLATE		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
FR_FRRD		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1

Ceriodaphnia 7-d Survival and Reproduction Test — **Nautilus Environmental**

Analysis ID:	11-6508-3879	**Endpoint:**	7d Survival Rate	**CETIS Version:**	CETISv1.9.4
Analyzed:	15 Oct-21 15:29	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1

Graphics



Ceriodaphnia 7-d Survival and Reproduction Test

Nautilus Environmental

Analysis ID:	17-3115-4739	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.9.4
Analyzed:	15 Oct-21 15:29	**Analysis:**	Nonparametric-Control vs Treatments	**Status Level:**	1
Batch ID:	09-9771-6958	**Test Type:**	Reproduction-Survival (7d)	**Analyst:**	Sierra Klueppel
Start Date:	11 Aug-21 15:00	**Protocol:**	EC/EPS 1/RM/21	**Diluent:**	20% Perrier Water
Ending Date:	19 Aug-21 13:00	**Species:**	Ceriodaphnia dubia	**Brine:**	
Test Length:	7d 22h	**Taxon:**	Branchiopoda	**Source:**	In-House Culture **Age:** <24

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
FR_UFR1	01-9312-3340	10 Aug-21 08:54	11 Aug-21 11:15	30h (12.8 °C)	Teck Coal	
GH_ER2	03-3301-7818	10 Aug-21 10:45	11 Aug-21 11:15	28h (15.8 °C)		
CM_MC1	20-0000-6898	10 Aug-21 11:04	11 Aug-21 11:15	28h (14 °C)		
LC_SLC	07-8534-5756	10 Aug-21 09:09	11 Aug-21 11:15	30h (11.2 °C)		
FR_FRABCH	12-3746-7337	10 Aug-21 09:35	11 Aug-21 11:15	29h (13.6 °C)		
FR_FRCP1	02-0987-3329	10 Aug-21 09:55	11 Aug-21 11:15	29h (12.1 °C)		
GH_FR1	00-2216-4794	10 Aug-21 09:30	11 Aug-21 11:15	29h (15.3 °C)		
GH_ERC	02-8768-9833	10 Aug-21 11:45	11 Aug-21 11:15	27h (16.4 °C)		
CM_MC2	08-6405-5477	10 Aug-21 12:07	11 Aug-21 11:15	27h (14.9 °C)		
EV_MC2	09-5920-8643	10 Aug-21 10:44	11 Aug-21 11:15	28h (12.8 °C)		
EV_HC1	05-3700-4202	10 Aug-21 09:46	11 Aug-21 11:15	29h (13 °C)		
LC_DCDS	10-8734-0222	10 Aug-21 10:10	11 Aug-21 11:15	29h (10.8 °C)		
LC_LC3	07-4841-6068	10 Aug-21 09:30	11 Aug-21 11:15	29h (9.8 °C)		
LC_LC5	18-0478-8867	10 Aug-21 12:00	11 Aug-21 11:15	27h (11.8 °C)		
LC_LCDSSLCC	17-9964-8023	10 Aug-21 10:40	11 Aug-21 11:15	28h (12.1 °C)		
RG_MIDAG	04-6323-4167	10 Aug-21 11:30	11 Aug-21 11:15	28h (14.3 °C)		
FR_FR4	04-5681-6105	10 Aug-21 10:00	11 Aug-21 11:15	29h (15.6 °C)		
FR_FR2	16-7096-5741	10 Aug-21 10:54	11 Aug-21 11:15	28h (15.9 °C)		
FR_MULTIPLATE	08-7549-1660	10 Aug-21 11:51	11 Aug-21 11:15	27h (16.9 °C)		
FR_FRRD	03-6145-5105	10 Aug-21 08:25	11 Aug-21 11:15	31h (16.8 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_UFR1	Water Sample	Teck Coal	FR_UFR1_MON_2021-08-0	
GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-08-10_	
CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-08-10	
LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-08-10_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_MON_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_MON_2021-08	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-08-10_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-08-10	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-08-10	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2021_Q3_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2021_Q3_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-08-10	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-08-10_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-08-10_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	
RG_MIDAG	Water Sample	Teck Coal	RG_MIDAG_WS_2021-08-	
FR_FR4	Water Sample	Teck Coal	FR_FR4_WS_2021-08-10_	
FR_FR2	Water Sample	Teck Coal	FR_FR2_WS_2021-08-10_	
FR_MULTIPLATE	Water Sample	Teck Coal	FR_MULTIPLATE_WS_202	
FR_FRRD	Water Sample	Teck Coal	FR_FRRD_WS_2021-08-10	

Ceriodaphnia 7-d Survival and Reproduction Test — **Nautilus Environmental**

Analysis ID:	17-3115-4739	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.9.4
Analyzed:	15 Oct-21 15:29	**Analysis:**	Nonparametric-Control vs Treatments	**Status Level:**	1

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	GH_ER2 passed reproduction	28.80%
		CM_MC1 passed reproduction	28.80%
		LC_SLC passed reproduction	28.80%
		FR_FRABCH passed reproduction	28.80%
		FR_FRCP1 failed reproduction	28.80%
		GH_FR1 passed reproduction	28.80%
		GH_ERC passed reproduction	28.80%
		CM_MC2 passed reproduction	28.80%
		EV_MC2 passed reproduction	28.80%
		EV_HC1 passed reproduction	28.80%
		LC_DCDS passed reproduction	28.80%
		LC_LC3 passed reproduction	28.80%
		LC_LC5 passed reproduction	28.80%
		LC_LCDSSLCC passed reproduction	28.80%
		RG_MIDAG passed reproduction	28.80%
		FR_FR4 passed reproduction	28.80%
		FR_FR2 passed reproduction	28.80%
		FR_MULTIPLATE passed reproduction	28.80%
		FR_FRRD passed reproduction	28.80%

Steel Many-One Rank Sum Test

Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)
Site Control (FR_UFR1)		GH_ER2	119	70	1	18	CDF	0.9987	Non-Significant Effect
		CM_MC1	113	70	1	18	CDF	0.9923	Non-Significant Effect
		LC_SLC	119.5	70	2	18	CDF	0.9989	Non-Significant Effect
		FR_FRABCH	82.5	70	3	18	CDF	0.3075	Non-Significant Effect
		FR_FRCP1*	65.5	70	2	18	CDF	0.0191	Significant Effect
		GH_FR1	87.5	70	2	18	CDF	0.4874	Non-Significant Effect
		GH_ERC	94	70	2	18	CDF	0.7213	Non-Significant Effect
		CM_MC2	83.5	70	1	18	CDF	0.3412	Non-Significant Effect
		EV_MC2	125	70	3	18	CDF	0.9998	Non-Significant Effect
		EV_HC1	135	70	1	18	CDF	1.0000	Non-Significant Effect
		LC_DCDS	71	70	2	18	CDF	0.0581	Non-Significant Effect
		LC_LC3	79.5	70	3	18	CDF	0.2165	Non-Significant Effect
		LC_LC5	109	70	1	18	CDF	0.9790	Non-Significant Effect
		LC_LCDSSLCC	103	70	2	18	CDF	0.9267	Non-Significant Effect
		RG_MIDAG	108	70	3	18	CDF	0.9735	Non-Significant Effect
		FR_FR4	71	70	2	18	CDF	0.0581	Non-Significant Effect
		FR_FR2	82	70	3	18	CDF	0.2912	Non-Significant Effect
		FR_MULTIPLATE	85	70	3	18	CDF	0.3944	Non-Significant Effect
		FR_FRRD	70.5	70	2	18	CDF	0.0529	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	4.118	3.606	0.0052	Outlier Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	2023.66	106.508	19	3.705	1.8E-06	Significant Effect
Error	5173.9	28.7439	180			
Total	7197.55		199			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance Test	50.63	36.19	1.1E-04	Unequal Variances

Ceriodaphnia 7-d Survival and Reproduction Test **Nautilus Environmental**

Analysis ID: 17-3115-4739 **Endpoint:** Reproduction **CETIS Version:** CETISv1.9.4
Analyzed: 15 Oct-21 15:29 **Analysis:** Nonparametric-Control vs Treatments **Status Level:** 1

Distribution					
Shapiro-Wilk W Normality Test	0.9202	0.9816	6.0E-09	Non-Normal Distribution	

Reproduction Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
FR_UFR1	XC	10	22.1	19.7	24.5	22	15	29	1.059	15.15%	0.00%
GH_ER2		10	21	15.48	26.52	24	0	26	2.44	36.75%	4.98%
CM_MC1		10	23	20.14	25.86	23	18	31	1.265	17.39%	-4.07%
LC_SLC		10	23	19.93	26.07	24.5	14	29	1.358	18.67%	-4.07%
FR_FRABCH		10	19.1	16.66	21.54	19.5	13	23	1.08	17.87%	13.57%
FR_FRCP1		10	12.7	7.4	18	12.5	0	22	2.343	58.34%	42.53%
GH_FR1		10	19.1	16.35	21.85	17.5	15	26	1.215	20.12%	13.57%
GH_ERC		10	21.1	19.61	22.59	22	17	24	0.6574	9.85%	4.52%
CM_MC2		10	19.3	16.15	22.45	19.5	10	26	1.391	22.79%	12.67%
EV_MC2		10	25	20.95	29.05	24	14	33	1.789	22.63%	-13.12%
EV_HC1		10	23.2	17.98	28.42	24.5	3	28	2.308	31.47%	-4.98%
LC_DCDS		10	12.7	5.972	19.43	14.5	0	27	2.974	74.06%	42.53%
LC_LC3		10	20.2	18.39	22.01	21	14	23	0.8	12.52%	8.60%
LC_LC5		10	21.1	18	24.2	23	11	26	1.37	20.53%	4.52%
LC_LCDSSLCC		10	20.3	15.59	25.01	22	3	26	2.082	32.43%	8.14%
RG_MIDAG		10	22.2	19.08	25.32	22.5	15	30	1.381	19.67%	-0.45%
FR_FR4		10	15.9	11.05	20.75	17	4	26	2.142	42.60%	28.05%
FR_FR2		10	19.4	16.59	22.21	20	14	26	1.24	20.21%	12.22%
FR_MULTIPLATE		10	21	19.03	22.97	21	17	27	0.8692	13.09%	4.98%
FR_FRRD		10	16.9	12.7	21.1	18.5	2	23	1.859	34.78%	23.53%

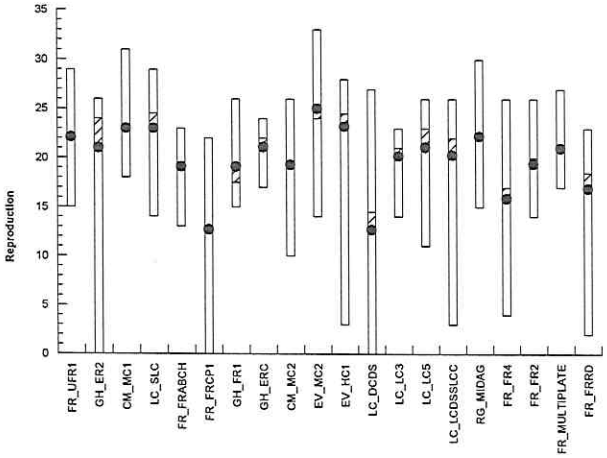
Reproduction Detail

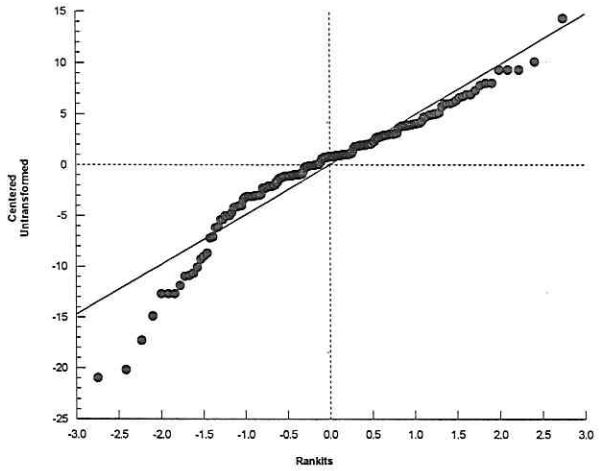
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
FR_UFR1	XC	23	22	22	22	15	21	29	22	22	23
GH_ER2		25	18	26	22	25	24	24	0	24	22
CM_MC1		18	20	24	24	24	22	18	31	27	22
LC_SLC		14	25	26	25	18	22	29	24	22	25
FR_FRABCH		23	22	18	21	13	18	23	16	21	16
FR_FRCP1		4	15	20	12	22	11	8	0	22	13
GH_FR1		16	16	17	19	17	26	15	18	24	23
GH_ERC		22	22	22	23	22	17	24	19	20	20
CM_MC2		17	22	18	19	20	24	20	26	17	10
EV_MC2		31	14	23	28	21	33	23	25	30	22
EV_HC1		3	24	24	27	27	25	27	28	23	24
LC_DCDS		19	0	14	0	17	11	27	22	2	15
LC_LC3		19	14	21	23	22	22	21	20	19	21
LC_LC5		19	26	23	11	23	20	23	24	18	24
LC_LCDSSLCC		26	3	18	21	23	24	25	19	21	23
RG_MIDAG		19	22	20	15	18	30	23	25	26	24
FR_FR4		21	18	5	26	4	15	17	20	17	16
FR_FR2		14	20	18	16	20	22	23	26	14	21
FR_MULTIPLATE		21	18	27	20	21	21	22	17	20	23
FR_FRRD		16	21	2	16	14	19	20	20	23	18

Ceriodaphnia 7-d Survival and Reproduction Test — **Nautilus Environmental**

Analysis ID:	17-3115-4739	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.9.4
Analyzed:	15 Oct-21 15:29	**Analysis:**	Nonparametric-Control vs Treatments	**Status Level:**	1

Graphics





Ceriodaphnia 7-d Survival and Reproduction Test — **Nautilus Environmental**

Analysis ID:	20-0595-7965	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.9.4
Analyzed:	15 Oct-21 15:29	**Analysis:**	Nonparametric-Control vs Treatments	**Status Level:**	1
Batch ID:	09-9771-6958	**Test Type:**	Reproduction-Survival (7d)	**Analyst:**	Sierra Klueppel
Start Date:	11 Aug-21 15:00	**Protocol:**	EC/EPS 1/RM/21	**Diluent:**	20% Perrier Water
Ending Date:	19 Aug-21 13:00	**Species:**	Ceriodaphnia dubia	**Brine:**	
Test Length:	7d 22h	**Taxon:**	Branchiopoda	**Source:**	In-House Culture **Age:** <24

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
FR_UFR1	01-9312-3340	10 Aug-21 08:54	11 Aug-21 11:15	30h (12.8 °C)	Teck Coal	
GH_ER2	03-3301-7818	10 Aug-21 10:45	11 Aug-21 11:15	28h (15.8 °C)		
CM_MC1	20-0000-6898	10 Aug-21 11:04	11 Aug-21 11:15	28h (14 °C)		
LC_SLC	07-8534-5756	10 Aug-21 09:09	11 Aug-21 11:15	30h (11.2 °C)		
FR_FRABCH	12-3746-7337	10 Aug-21 09:35	11 Aug-21 11:15	29h (13.6 °C)		
FR_FRCP1	02-0987-3329	10 Aug-21 09:55	11 Aug-21 11:15	29h (12.1 °C)		
GH_FR1	00-2216-4794	10 Aug-21 09:30	11 Aug-21 11:15	29h (15.3 °C)		
GH_ERC	02-8768-9833	10 Aug-21 11:45	11 Aug-21 11:15	27h (16.4 °C)		
CM_MC2	08-6405-5477	10 Aug-21 12:07	11 Aug-21 11:15	27h (14.9 °C)		
EV_MC2	09-5920-8643	10 Aug-21 10:44	11 Aug-21 11:15	28h (12.8 °C)		
EV_HC1	05-3700-4202	10 Aug-21 09:46	11 Aug-21 11:15	29h (13 °C)		
LC_DCDS	10-8734-0222	10 Aug-21 10:10	11 Aug-21 11:15	29h (10.8 °C)		
LC_LC3	07-4841-6068	10 Aug-21 09:30	11 Aug-21 11:15	29h (9.8 °C)		
LC_LC5	18-0478-8867	10 Aug-21 12:00	11 Aug-21 11:15	27h (11.8 °C)		
LC_LCDSSLCC	17-9964-8023	10 Aug-21 10:40	11 Aug-21 11:15	28h (12.1 °C)		
RG_MIDAG	04-6323-4167	10 Aug-21 11:30	11 Aug-21 11:15	28h (14.3 °C)		
FR_FR4	04-5681-6105	10 Aug-21 10:00	11 Aug-21 11:15	29h (15.6 °C)		
FR_FR2	16-7096-5741	10 Aug-21 10:54	11 Aug-21 11:15	28h (15.9 °C)		
FR_MULTIPLATE	08-7549-1660	10 Aug-21 11:51	11 Aug-21 11:15	27h (16.9 °C)		
FR_FRRD	03-6145-5105	10 Aug-21 08:25	11 Aug-21 11:15	31h (16.8 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_UFR1	Water Sample	Teck Coal	FR_UFR1_MON_2021-08-0	
GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-08-10_	
CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-08-10	
LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-08-10_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_MON_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_MON_2021-08	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-08-10_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-08-10	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-08-10	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2021_Q3_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2021_Q3_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-08-10	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-08-10_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-08-10_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	
RG_MIDAG	Water Sample	Teck Coal	RG_MIDAG_WS_2021-08-	
FR_FR4	Water Sample	Teck Coal	FR_FR4_WS_2021-08-10_	
FR_FR2	Water Sample	Teck Coal	FR_FR2_WS_2021-08-10_	
FR_MULTIPLATE	Water Sample	Teck Coal	FR_MULTIPLATE_WS_202	
FR_FRRD	Water Sample	Teck Coal	FR_FRRD_WS_2021-08-10	

Ceriodaphnia 7-d Survival and Reproduction Test — **Nautilus Environmental**

Analysis ID: 20-0595-7965 **Endpoint:** Reproduction **CETIS Version:** CETISv1.9.4
Analyzed: 15 Oct-21 15:29 **Analysis:** Nonparametric-Control vs Treatments **Status Level:** 1

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C < T	GH_ER2 passed reproduction	28.80%
		CM_MC1 passed reproduction	28.80%
		LC_SLC passed reproduction	28.80%
		FR_FRABCH passed reproduction	28.80%
		FR_FRCP1 passed reproduction	28.80%
		GH_FR1 passed reproduction	28.80%
		GH_ERC passed reproduction	28.80%
		CM_MC2 passed reproduction	28.80%
		EV_MC2 passed reproduction	28.80%
		EV_HC1 passed reproduction	28.80%
		LC_DCDS passed reproduction	28.80%
		LC_LC3 passed reproduction	28.80%
		LC_LC5 passed reproduction	28.80%
		LC_LCDSSLCC passed reproduction	28.80%
		RG_MIDAG passed reproduction	28.80%
		FR_FR4 passed reproduction	28.80%
		FR_FR2 passed reproduction	28.80%
		FR_MULTIPLATE passed reproduction	28.80%
		FR_FRRD passed reproduction	28.80%

Steel Many-One Rank Sum Test

Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)
Site Control		GH_ER2	91	70	1	18	CDF	0.6181	Non-Significant Effect
(FR_UFR1		CM_MC1	97	70	1	18	CDF	0.8089	Non-Significant Effect
		LC_SLC	90.5	70	2	18	CDF	0.5999	Non-Significant Effect
		FR_FRABCH	127.5	70	3	18	CDF	0.9999	Non-Significant Effect
		FR_FRCP1	144.5	70	2	18	CDF	1.0000	Non-Significant Effect
		GH_FR1	122.5	70	2	18	CDF	0.9996	Non-Significant Effect
		GH_ERC	116	70	2	18	CDF	0.9967	Non-Significant Effect
		CM_MC2	126.5	70	1	18	CDF	0.9999	Non-Significant Effect
		EV_MC2	85	70	3	18	CDF	0.3944	Non-Significant Effect
		EV_HC1	75	70	1	18	CDF	0.1146	Non-Significant Effect
		LC_DCDS	139	70	2	18	CDF	1.0000	Non-Significant Effect
		LC_LC3	130.5	70	3	18	CDF	1.0000	Non-Significant Effect
		LC_LC5	101	70	1	18	CDF	0.8959	Non-Significant Effect
		LC_LCDSSLCC	107	70	2	18	CDF	0.9670	Non-Significant Effect
		RG_MIDAG	102	70	3	18	CDF	0.9123	Non-Significant Effect
		FR_FR4	139	70	2	18	CDF	1.0000	Non-Significant Effect
		FR_FR2	128	70	3	18	CDF	0.9999	Non-Significant Effect
		FR_MULTIPLATE	125	70	3	18	CDF	0.9998	Non-Significant Effect
		FR_FRRD	139.5	70	2	18	CDF	1.0000	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	4.118	3.606	0.0052	Outlier Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	2023.66	106.508	19	3.705	1.8E-06	Significant Effect
Error	5173.9	28.7439	180			
Total	7197.55		199			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance Test	50.63	36.19	1.1E-04	Unequal Variances

Ceriodaphnia 7-d Survival and Reproduction Test **Nautilus Environmental**

Analysis ID: 20-0595-7965 **Endpoint:** Reproduction **CETIS Version:** CETISv1.9.4
Analyzed: 15 Oct-21 15:29 **Analysis:** Nonparametric-Control vs Treatments **Status Level:** 1

Distribution					
Shapiro-Wilk W Normality Test	0.9202	0.9816	6.0E-09	Non-Normal Distribution	

Reproduction Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
FR_UFR1	XC	10	22.1	19.7	24.5	22	15	29	1.059	15.15%	0.00%
GH_ER2		10	21	15.48	26.52	24	0	26	2.44	36.75%	4.98%
CM_MC1		10	23	20.14	25.86	23	18	31	1.265	17.39%	-4.07%
LC_SLC		10	23	19.93	26.07	24.5	14	29	1.358	18.67%	-4.07%
FR_FRABCH		10	19.1	16.66	21.54	19.5	13	23	1.08	17.87%	13.57%
FR_FRCP1		10	12.7	7.4	18	12.5	0	22	2.343	58.34%	42.53%
GH_FR1		10	19.1	16.35	21.85	17.5	15	26	1.215	20.12%	13.57%
GH_ERC		10	21.1	19.61	22.59	22	17	24	0.6574	9.85%	4.52%
CM_MC2		10	19.3	16.15	22.45	19.5	10	26	1.391	22.79%	12.67%
EV_MC2		10	25	20.95	29.05	24	14	33	1.789	22.63%	-13.12%
EV_HC1		10	23.2	17.98	28.42	24.5	3	28	2.308	31.47%	-4.98%
LC_DCDS		10	12.7	5.972	19.43	14.5	0	27	2.974	74.06%	42.53%
LC_LC3		10	20.2	18.39	22.01	21	14	23	0.8	12.52%	8.60%
LC_LC5		10	21.1	18	24.2	23	11	26	1.37	20.53%	4.52%
LC_LCDSSLCC		10	20.3	15.59	25.01	22	3	26	2.082	32.43%	8.14%
RG_MIDAG		10	22.2	19.08	25.32	22.5	15	30	1.381	19.67%	-0.45%
FR_FR4		10	15.9	11.05	20.75	17	4	26	2.142	42.60%	28.05%
FR_FR2		10	19.4	16.59	22.21	20	14	26	1.24	20.21%	12.22%
FR_MULTIPLATE		10	21	19.03	22.97	21	17	27	0.8692	13.09%	4.98%
FR_FRRD		10	16.9	12.7	21.1	18.5	2	23	1.859	34.78%	23.53%

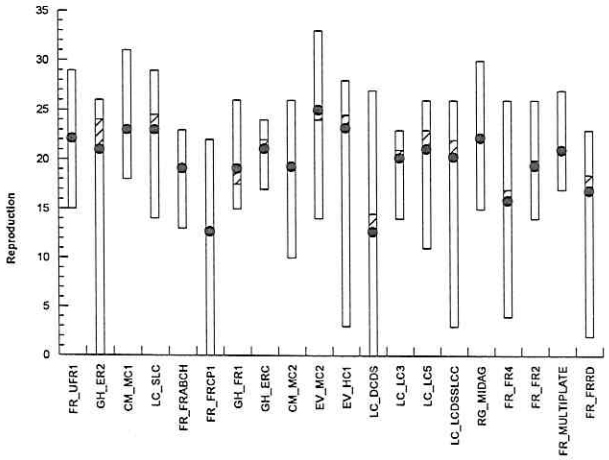
Reproduction Detail

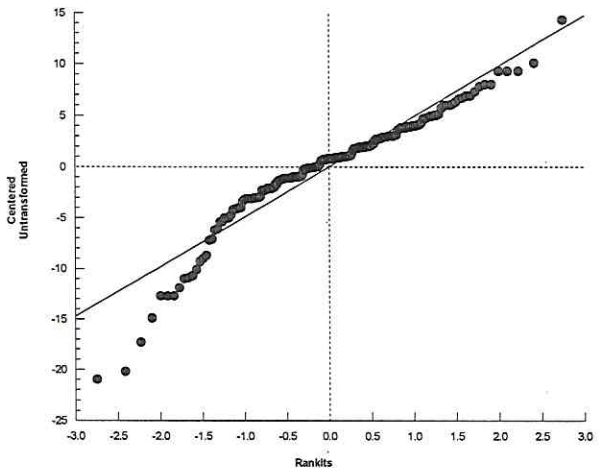
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
FR_UFR1	XC	23	22	22	22	15	21	29	22	22	23
GH_ER2		25	18	26	22	25	24	24	0	24	22
CM_MC1		18	20	24	24	24	22	18	31	27	22
LC_SLC		14	25	26	25	18	22	29	24	22	25
FR_FRABCH		23	22	18	21	13	18	23	16	21	16
FR_FRCP1		4	15	20	12	22	11	8	0	22	13
GH_FR1		16	16	17	19	17	26	15	18	24	23
GH_ERC		22	22	22	23	22	17	24	19	20	20
CM_MC2		17	22	18	19	20	24	20	26	17	10
EV_MC2		31	14	23	28	21	33	23	25	30	22
EV_HC1		3	24	24	27	27	25	27	28	23	24
LC_DCDS		19	0	14	0	17	11	27	22	2	15
LC_LC3		19	14	21	23	22	22	21	20	19	21
LC_LC5		19	26	23	11	23	20	23	24	18	24
LC_LCDSSLCC		26	3	18	21	23	24	25	19	21	23
RG_MIDAG		19	22	20	15	18	30	23	25	26	24
FR_FR4		21	18	5	26	4	15	17	20	17	16
FR_FR2		14	20	18	16	20	22	23	26	14	21
FR_MULTIPLATE		21	18	27	20	21	21	22	17	20	23
FR_FRRD		16	21	2	16	14	19	20	20	23	18

Ceriodaphnia 7-d Survival and Reproduction Test **Nautilus Environmental**

Analysis ID:	20-0595-7965	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.9.4
Analyzed:	15 Oct-21 15:29	**Analysis:**	Nonparametric-Control vs Treatments	**Status Level:**	1

Graphics





Ceriodaphnia 7-d Survival and Reproduction Test

Nautilus Environmental

Analysis ID:	12-8811-3620	**Endpoint:**	7d Survival Rate	**CETIS Version:**	CETISv1.9.4
Analyzed:	15 Oct-21 15:30	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1
Batch ID:	09-9771-6958	**Test Type:**	Reproduction-Survival (7d)	**Analyst:**	Sierra Klueppel
Start Date:	11 Aug-21 15:00	**Protocol:**	EC/EPS 1/RM/21	**Diluent:**	20% Perrier Water
Ending Date:	19 Aug-21 13:00	**Species:**	Ceriodaphnia dubia	**Brine:**	
Test Length:	7d 22h	**Taxon:**	Branchiopoda	**Source:**	In-House Culture **Age:** <24

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
FR_UFR1	01-9312-3340	10 Aug-21 08:54	11 Aug-21 11:15	30h (12.8 °C)	Teck Coal	
GH_ER2	03-3301-7818	10 Aug-21 10:45	11 Aug-21 11:15	28h (15.8 °C)		
CM_MC1	20-0000-6898	10 Aug-21 11:04	11 Aug-21 11:15	28h (14 °C)		
LC_SLC	07-8534-5756	10 Aug-21 09:09	11 Aug-21 11:15	30h (11.2 °C)		
FR_FRABCH	12-3746-7337	10 Aug-21 09:35	11 Aug-21 11:15	29h (13.6 °C)		
FR_FRCP1	02-0987-3329	10 Aug-21 09:55	11 Aug-21 11:15	29h (12.1 °C)		
GH_FR1	00-2216-4794	10 Aug-21 09:30	11 Aug-21 11:15	29h (15.3 °C)		
GH_ERC	02-8768-9833	10 Aug-21 11:45	11 Aug-21 11:15	27h (16.4 °C)		
CM_MC2	08-6405-5477	10 Aug-21 12:07	11 Aug-21 11:15	27h (14.9 °C)		
EV_MC2	09-5920-8643	10 Aug-21 10:44	11 Aug-21 11:15	28h (12.8 °C)		
EV_HC1	05-3700-4202	10 Aug-21 09:46	11 Aug-21 11:15	29h (13 °C)		
LC_DCDS	10-8734-0222	10 Aug-21 10:10	11 Aug-21 11:15	29h (10.8 °C)		
LC_LC3	07-4841-6068	10 Aug-21 09:30	11 Aug-21 11:15	29h (9.8 °C)		
LC_LC5	18-0478-8867	10 Aug-21 12:00	11 Aug-21 11:15	27h (11.8 °C)		
LC_LCDSSLCC	17-9964-8023	10 Aug-21 10:40	11 Aug-21 11:15	28h (12.1 °C)		
RG_MIDAG	04-6323-4167	10 Aug-21 11:30	11 Aug-21 11:15	28h (14.3 °C)		
FR_FR4	04-5681-6105	10 Aug-21 10:00	11 Aug-21 11:15	29h (15.6 °C)		
FR_FR2	16-7096-5741	10 Aug-21 10:54	11 Aug-21 11:15	28h (15.9 °C)		
FR_MULTIPLATE	08-7549-1660	10 Aug-21 11:51	11 Aug-21 11:15	27h (16.9 °C)		
FR_FRRD	03-6145-5105	10 Aug-21 08:25	11 Aug-21 11:15	31h (16.8 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_UFR1	Water Sample	Teck Coal	FR_UFR1_MON_2021-08-0	
GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-08-10_	
CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-08-10	
LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-08-10_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_MON_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_MON_2021-08	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-08-10_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-08-10	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-08-10	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2021_Q3_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2021_Q3_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-08-10	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-08-10_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-08-10_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	
RG_MIDAG	Water Sample	Teck Coal	RG_MIDAG_WS_2021-08-	
FR_FR4	Water Sample	Teck Coal	FR_FR4_WS_2021-08-10_	
FR_FR2	Water Sample	Teck Coal	FR_FR2_WS_2021-08-10_	
FR_MULTIPLATE	Water Sample	Teck Coal	FR_MULTIPLATE_WS_202	
FR_FRRD	Water Sample	Teck Coal	FR_FRRD_WS_2021-08-10	

Fisher Exact/Bonferroni-Holm Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
Site Control (GH_ER2)		FR_UFR1	1.0000	Exact	1.0000	Non-Significant Effect
		CM_MC1	1.0000	Exact	1.0000	Non-Significant Effect
		LC_SLC	1.0000	Exact	1.0000	Non-Significant Effect
		FR_FRABCH	1.0000	Exact	1.0000	Non-Significant Effect

Ceriodaphnia 7-d Survival and Reproduction Test — **Nautilus Environmental**

Analysis ID: 12-8811-3620 **Endpoint:** 7d Survival Rate **CETIS Version:** CETISv1.9.4
Analyzed: 15 Oct-21 15:30 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Fisher Exact/Bonferroni-Holm Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
		FR_FRCP1	0.7632	Exact	1.0000	Non-Significant Effect
		GH_FR1	1.0000	Exact	1.0000	Non-Significant Effect
		GH_ERC	1.0000	Exact	1.0000	Non-Significant Effect
		CM_MC2	0.7632	Exact	1.0000	Non-Significant Effect
		EV_MC2	1.0000	Exact	1.0000	Non-Significant Effect
		EV_HC1	0.7632	Exact	1.0000	Non-Significant Effect
		LC_DCDS	0.5000	Exact	1.0000	Non-Significant Effect
		LC_LC3	1.0000	Exact	1.0000	Non-Significant Effect
		LC_LC5	1.0000	Exact	1.0000	Non-Significant Effect
		LC_LCDSSLCC	0.7632	Exact	1.0000	Non-Significant Effect
		RG_MIDAG	1.0000	Exact	1.0000	Non-Significant Effect
		FR_FR4	1.0000	Exact	1.0000	Non-Significant Effect
		FR_FR2	1.0000	Exact	1.0000	Non-Significant Effect
		FR_MULTIPLATE	1.0000	Exact	1.0000	Non-Significant Effect
		FR_FRRD	1.0000	Exact	1.0000	Non-Significant Effect

Data Summary

Sample	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
FR_UFR1		10	0	10	1	0	0.0%
GH_ER2	XC	9	1	10	0.9	0.1	10.0%
CM_MC1		10	0	10	1	0	0.0%
LC_SLC		10	0	10	1	0	0.0%
FR_FRABCH		10	0	10	1	0	0.0%
FR_FRCP1		9	1	10	0.9	0.1	10.0%
GH_FR1		10	0	10	1	0	0.0%
GH_ERC		10	0	10	1	0	0.0%
CM_MC2		9	1	10	0.9	0.1	10.0%
EV_MC2		10	0	10	1	0	0.0%
EV_HC1		9	1	10	0.9	0.1	10.0%
LC_DCDS		8	2	10	0.8	0.2	20.0%
LC_LC3		10	0	10	1	0	0.0%
LC_LC5		10	0	10	1	0	0.0%
LC_LCDSSLCC		9	1	10	0.9	0.1	10.0%
RG_MIDAG		10	0	10	1	0	0.0%
FR_FR4		10	0	10	1	0	0.0%
FR_FR2		10	0	10	1	0	0.0%
FR_MULTIPLATE		10	0	10	1	0	0.0%
FR_FRRD		10	0	10	1	0	0.0%

Ceriodaphnia 7-d Survival and Reproduction Test — **Nautilus Environmental**

Analysis ID: 12-8811-3620 **Endpoint:** 7d Survival Rate **CETIS Version:** CETISv1.9.4
Analyzed: 15 Oct-21 15:30 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

7d Survival Rate Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
FR_UFR1		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
GH_ER2	XC	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	1.0000	1.0000
CM_MC1		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
LC_SLC		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
FR_FRABCH		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
FR_FRCP1		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	1.0000	1.0000
GH_FR1		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
GH_ERC		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
CM_MC2		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000
EV_MC2		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
EV_HC1		0.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
LC_DCDS		1.0000	0.0000	1.0000	0.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
LC_LC3		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
LC_LC5		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
LC_LCDSSLCC		1.0000	0.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
RG_MIDAG		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
FR_FR4		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
FR_FR2		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
FR_MULTIPLATE		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
FR_FRRD		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

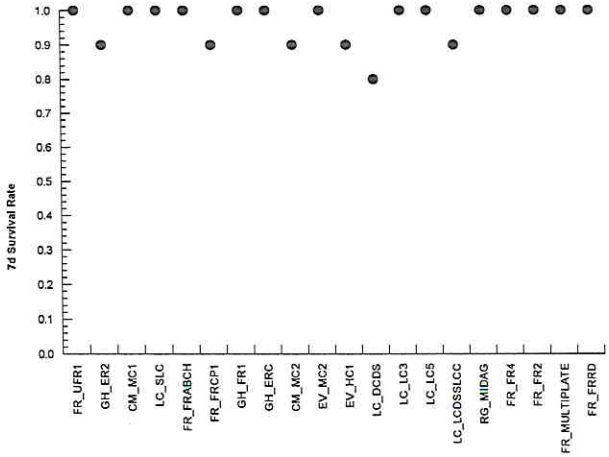
7d Survival Rate Binomials

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
FR_UFR1		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
CM_MC1		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
LC_SLC		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
FR_FRABCH		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
FR_FRCP1		1/1	1/1	1/1	1/1	1/1	1/1	1/1	0/1	1/1	1/1
GH_FR1		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
GH_ERC		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
CM_MC2		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	0/1
EV_MC2		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
EV_HC1		0/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
LC_DCDS		1/1	0/1	1/1	0/1	1/1	1/1	1/1	1/1	1/1	1/1
LC_LC3		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
LC_LC5		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
LC_LCDSSLCC		1/1	0/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
RG_MIDAG		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
FR_FR4		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
FR_FR2		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
FR_MULTIPLATE		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
FR_FRRD		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1

Ceriodaphnia 7-d Survival and Reproduction Test — **Nautilus Environmental**

Analysis ID:	12-8811-3620	**Endpoint:**	7d Survival Rate	**CETIS Version:**	CETISv1.9.4
Analyzed:	15 Oct-21 15:30	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1

Graphics



Ceriodaphnia 7-d Survival and Reproduction Test

Nautilus Environmental

Analysis ID:	14-5134-2431	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.9.4
Analyzed:	15 Oct-21 15:30	**Analysis:**	Nonparametric-Control vs Treatments	**Status Level:**	1
Batch ID:	09-9771-6958	**Test Type:**	Reproduction-Survival (7d)	**Analyst:**	Sierra Klueppel
Start Date:	11 Aug-21 15:00	**Protocol:**	EC/EPS 1/RM/21	**Diluent:**	20% Perrier Water
Ending Date:	19 Aug-21 13:00	**Species:**	Ceriodaphnia dubia	**Brine:**	
Test Length:	7d 22h	**Taxon:**	Branchiopoda	**Source:**	In-House Culture **Age:** <24

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
FR_UFR1	01-9312-3340	10 Aug-21 08:54	11 Aug-21 11:15	30h (12.8 °C)	Teck Coal	
GH_ER2	03-3301-7818	10 Aug-21 10:45	11 Aug-21 11:15	28h (15.8 °C)		
CM_MC1	20-0000-6898	10 Aug-21 11:04	11 Aug-21 11:15	28h (14 °C)		
LC_SLC	07-8534-5756	10 Aug-21 09:09	11 Aug-21 11:15	30h (11.2 °C)		
FR_FRABCH	12-3746-7337	10 Aug-21 09:35	11 Aug-21 11:15	29h (13.6 °C)		
FR_FRCP1	02-0987-3329	10 Aug-21 09:55	11 Aug-21 11:15	29h (12.1 °C)		
GH_FR1	00-2216-4794	10 Aug-21 09:30	11 Aug-21 11:15	29h (15.3 °C)		
GH_ERC	02-8768-9833	10 Aug-21 11:45	11 Aug-21 11:15	27h (16.4 °C)		
CM_MC2	08-6405-5477	10 Aug-21 12:07	11 Aug-21 11:15	27h (14.9 °C)		
EV_MC2	09-5920-8643	10 Aug-21 10:44	11 Aug-21 11:15	28h (12.8 °C)		
EV_HC1	05-3700-4202	10 Aug-21 09:46	11 Aug-21 11:15	29h (13 °C)		
LC_DCDS	10-8734-0222	10 Aug-21 10:10	11 Aug-21 11:15	29h (10.8 °C)		
LC_LC3	07-4841-6068	10 Aug-21 09:30	11 Aug-21 11:15	29h (9.8 °C)		
LC_LC5	18-0478-8867	10 Aug-21 12:00	11 Aug-21 11:15	27h (11.8 °C)		
LC_LCDSSLCC	17-9964-8023	10 Aug-21 10:40	11 Aug-21 11:15	28h (12.1 °C)		
RG_MIDAG	04-6323-4167	10 Aug-21 11:30	11 Aug-21 11:15	28h (14.3 °C)		
FR_FR4	04-5681-6105	10 Aug-21 10:00	11 Aug-21 11:15	29h (15.6 °C)		
FR_FR2	16-7096-5741	10 Aug-21 10:54	11 Aug-21 11:15	28h (15.9 °C)		
FR_MULTIPLATE	08-7549-1660	10 Aug-21 11:51	11 Aug-21 11:15	27h (16.9 °C)		
FR_FRRD	03-6145-5105	10 Aug-21 08:25	11 Aug-21 11:15	31h (16.8 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_UFR1	Water Sample	Teck Coal	FR_UFR1_MON_2021-08-0	
GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-08-10_	
CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-08-10	
LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-08-10_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_MON_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_MON_2021-08	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-08-10_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-08-10	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-08-10	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2021_Q3_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2021_Q3_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-08-10	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-08-10_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-08-10_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	
RG_MIDAG	Water Sample	Teck Coal	RG_MIDAG_WS_2021-08-	
FR_FR4	Water Sample	Teck Coal	FR_FR4_WS_2021-08-10_	
FR_FR2	Water Sample	Teck Coal	FR_FR2_WS_2021-08-10_	
FR_MULTIPLATE	Water Sample	Teck Coal	FR_MULTIPLATE_WS_202	
FR_FRRD	Water Sample	Teck Coal	FR_FRRD_WS_2021-08-10	

JGW Oct-27/21

Ceriodaphnia 7-d Survival and Reproduction Test — **Nautilus Environmental**

Analysis ID: 14-5134-2431 **Endpoint:** Reproduction **CETIS Version:** CETISv1.9.4
Analyzed: 15 Oct-21 15:30 **Analysis:** Nonparametric-Control vs Treatments **Status Level:** 1

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	FR_UFR1 passed reproduction	30.30%
		CM_MC1 passed reproduction	30.30%
		LC_SLC passed reproduction	30.30%
		FR_FRABCH passed reproduction	30.30%
		FR_FRCP1 failed reproduction	30.30%
		GH_FR1 passed reproduction	30.30%
		GH_ERC passed reproduction	30.30%
		CM_MC2 passed reproduction	30.30%
		EV_MC2 passed reproduction	30.30%
		EV_HC1 passed reproduction	30.30%
		LC_DCDS passed reproduction	30.30%
		LC_LC3 passed reproduction	30.30%
		LC_LC5 passed reproduction	30.30%
		LC_LCDSSLCC passed reproduction	30.30%
		RG_MIDAG passed reproduction	30.30%
		FR_FR4 passed reproduction	30.30%
		FR_FR2 passed reproduction	30.30%
		FR_MULTIPLATE passed reproduction	30.30%
		FR_FRRD passed reproduction	30.30%

Steel Many-One Rank Sum Test

Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)
Site Control		FR_UFR1	91	70	1	18	CDF	0.6181	Non-Significant Effect
(GH-ERC)		CM_MC1	102.5	70	3	18	CDF	0.9197	Non-Significant Effect
		LC_SLC	112.5	70	5	18	CDF	0.9912	Non-Significant Effect
		FR_FRABCH	76	70	2	18	CDF	0.1336	Non-Significant Effect
		FR_FRCP1*	69.5	70	2	18	CDF	0.0438	Significant Effect
		GH_FR1	82.5	70	3	18	CDF	0.3075	Non-Significant Effect
		GH_ERC	83.5	70	2	18	CDF	0.3412	Non-Significant Effect
		CM_MC2	83.5	70	4	18	CDF	0.3412	Non-Significant Effect
		EV_MC2	117	70	2	18	CDF	0.9975	Non-Significant Effect
		EV_HC1	124.5	70	2	18	CDF	0.9998	Non-Significant Effect
		LC_DCDS	76	70	2	18	CDF	0.1336	Non-Significant Effect
		LC_LC3	78	70	1	18	CDF	0.1778	Non-Significant Effect
		LC_LC5	94	70	3	18	CDF	0.7213	Non-Significant Effect
		LC_LCDSSLCC	94.5	70	4	18	CDF	0.7371	Non-Significant Effect
		RG_MIDAG	101.5	70	5	18	CDF	0.9043	Non-Significant Effect
		FR_FR4	76	70	2	18	CDF	0.1336	Non-Significant Effect
		FR_FR2	82	70	3	18	CDF	0.2912	Non-Significant Effect
		FR_MULTIPLATE	84.5	70	2	18	CDF	0.3764	Non-Significant Effect
		FR_FRRD	72.5	70	1	18	CDF	0.0759	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	4.118	3.606	0.0052	Outlier Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	2023.66	106.508	19	3.705	1.8E-06	Significant Effect
Error	5173.9	28.7439	180			
Total	7197.55		199			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance Test	50.63	36.19	1.1E-04	Unequal Variances

Ceriodaphnia 7-d Survival and Reproduction Test **Nautilus Environmental**

Analysis ID: 14-5134-2431 **Endpoint:** Reproduction **CETIS Version:** CETISv1.9.4
Analyzed: 15 Oct-21 15:30 **Analysis:** Nonparametric-Control vs Treatments **Status Level:** 1

Distribution	Shapiro-Wilk W Normality Test	0.9202	0.9816	6.0E-09	Non-Normal Distribution

Reproduction Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
FR_UFR1		10	22.1	19.7	24.5	22	15	29	1.059	15.15%	0.00%
GH_ER2	XC	10	21	15.48	26.52	24	0	26	2.44	36.75%	4.98%
CM_MC1		10	23	20.14	25.86	23	18	31	1.265	17.39%	-4.07%
LC_SLC		10	23	19.93	26.07	24.5	14	29	1.358	18.67%	-4.07%
FR_FRABCH		10	19.1	16.66	21.54	19.5	13	23	1.08	17.87%	13.57%
FR_FRCP1		10	12.7	7.4	18	12.5	0	22	2.343	58.34%	42.53%
GH_FR1		10	19.1	16.35	21.85	17.5	15	26	1.215	20.12%	13.57%
GH_ERC		10	21.1	19.61	22.59	22	17	24	0.6574	9.85%	4.52%
CM_MC2		10	19.3	16.15	22.45	19.5	10	26	1.391	22.79%	12.67%
EV_MC2		10	25	20.95	29.05	24	14	33	1.789	22.63%	-13.12%
EV_HC1		10	23.2	17.98	28.42	24.5	3	28	2.308	31.47%	-4.98%
LC_DCDS		10	12.7	5.972	19.43	14.5	0	27	2.974	74.06%	42.53%
LC_LC3		10	20.2	18.39	22.01	21	14	23	0.8	12.52%	8.60%
LC_LC5		10	21.1	18	24.2	23	11	26	1.37	20.53%	4.52%
LC_LCDSSLCC		10	20.3	15.59	25.01	22	3	26	2.082	32.43%	8.14%
RG_MIDAG		10	22.2	19.08	25.32	22.5	15	30	1.381	19.67%	-0.45%
FR_FR4		10	15.9	11.05	20.75	17	4	26	2.142	42.60%	28.05%
FR_FR2		10	19.4	16.59	22.21	20	14	26	1.24	20.21%	12.22%
FR_MULTIPLATE		10	21	19.03	22.97	21	17	27	0.8692	13.09%	4.98%
FR_FRRD		10	16.9	12.7	21.1	18.5	2	23	1.859	34.78%	23.53%

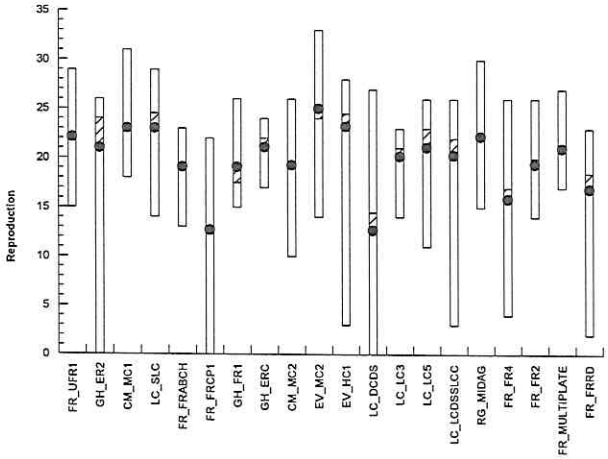
Reproduction Detail

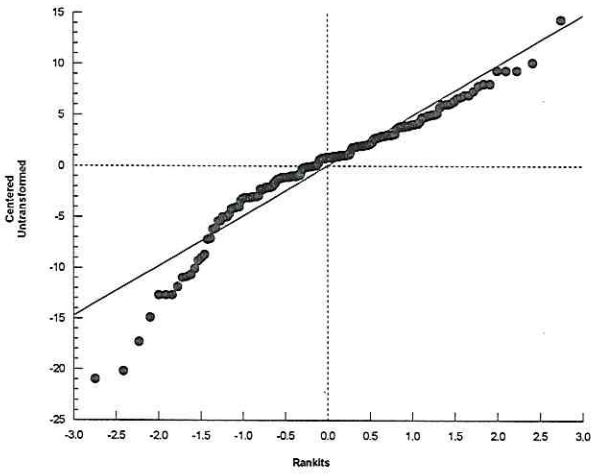
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
FR_UFR1		23	22	22	22	15	21	29	22	22	23
GH_ER2	XC	25	18	26	22	25	24	24	0	24	22
CM_MC1		18	20	24	24	24	22	18	31	27	22
LC_SLC		14	25	26	25	18	22	29	24	22	25
FR_FRABCH		23	22	18	21	13	18	23	16	21	16
FR_FRCP1		4	15	20	12	22	11	8	0	22	13
GH_FR1		16	16	17	19	17	26	15	18	24	23
GH_ERC		22	22	22	23	22	17	24	19	20	20
CM_MC2		17	22	18	19	20	24	20	26	17	10
EV_MC2		31	14	23	28	21	33	23	25	30	22
EV_HC1		3	24	24	27	27	25	27	28	23	24
LC_DCDS		19	0	14	0	17	11	27	22	2	15
LC_LC3		19	14	21	23	22	22	21	20	19	21
LC_LC5		19	26	23	11	23	20	23	24	18	24
LC_LCDSSLCC		26	3	18	21	23	24	25	19	21	23
RG_MIDAG		19	22	20	15	18	30	23	25	26	24
FR_FR4		21	18	5	26	4	15	17	20	17	16
FR_FR2		14	20	18	16	20	22	23	26	14	21
FR_MULTIPLATE		21	18	27	20	21	21	22	17	20	23
FR_FRRD		16	21	2	16	14	19	20	20	23	18

Ceriodaphnia 7-d Survival and Reproduction Test **Nautilus Environmental**

Analysis ID:	14-5134-2431	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.9.4
Analyzed:	15 Oct-21 15:30	**Analysis:**	Nonparametric-Control vs Treatments	**Status Level:**	1

Graphics





Ceriodaphnia 7-d Survival and Reproduction Test

Nautilus Environmental

Analysis ID:	00-5801-4613	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.9.4
Analyzed:	15 Oct-21 15:31	**Analysis:**	Nonparametric-Control vs Treatments	**Status Level:**	1
Batch ID:	09-9771-6958	**Test Type:**	Reproduction-Survival (7d)	**Analyst:**	Sierra Klueppel
Start Date:	11 Aug-21 15:00	**Protocol:**	EC/EPS 1/RM/21	**Diluent:**	20% Perrier Water
Ending Date:	19 Aug-21 13:00	**Species:**	Ceriodaphnia dubia	**Brine:**	
Test Length:	7d 22h	**Taxon:**	Branchiopoda	**Source:**	In-House Culture **Age:** <24

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
FR_UFR1	01-9312-3340	10 Aug-21 08:54	11 Aug-21 11:15	30h (12.8 °C)	Teck Coal	
GH_ER2	03-3301-7818	10 Aug-21 10:45	11 Aug-21 11:15	28h (15.8 °C)		
CM_MC1	20-0000-6898	10 Aug-21 11:04	11 Aug-21 11:15	28h (14 °C)		
LC_SLC	07-8534-5756	10 Aug-21 09:09	11 Aug-21 11:15	30h (11.2 °C)		
FR_FRABCH	12-3746-7337	10 Aug-21 09:35	11 Aug-21 11:15	29h (13.6 °C)		
FR_FRCP1	02-0987-3329	10 Aug-21 09:55	11 Aug-21 11:15	29h (12.1 °C)		
GH_FR1	00-2216-4794	10 Aug-21 09:30	11 Aug-21 11:15	29h (15.3 °C)		
GH_ERC	02-8768-9833	10 Aug-21 11:45	11 Aug-21 11:15	27h (16.4 °C)		
CM_MC2	08-6405-5477	10 Aug-21 12:07	11 Aug-21 11:15	27h (14.9 °C)		
EV_MC2	09-5920-8643	10 Aug-21 10:44	11 Aug-21 11:15	28h (12.8 °C)		
EV_HC1	05-3700-4202	10 Aug-21 09:46	11 Aug-21 11:15	29h (13 °C)		
LC_DCDS	10-8734-0222	10 Aug-21 10:10	11 Aug-21 11:15	29h (10.8 °C)		
LC_LC3	07-4841-6068	10 Aug-21 09:30	11 Aug-21 11:15	29h (9.8 °C)		
LC_LC5	18-0478-8867	10 Aug-21 12:00	11 Aug-21 11:15	27h (11.8 °C)		
LC_LCDSSLCC	17-9964-8023	10 Aug-21 10:40	11 Aug-21 11:15	28h (12.1 °C)		
RG_MIDAG	04-6323-4167	10 Aug-21 11:30	11 Aug-21 11:15	28h (14.3 °C)		
FR_FR4	04-5681-6105	10 Aug-21 10:00	11 Aug-21 11:15	29h (15.6 °C)		
FR_FR2	16-7096-5741	10 Aug-21 10:54	11 Aug-21 11:15	28h (15.9 °C)		
FR_MULTIPLATE	08-7549-1660	10 Aug-21 11:51	11 Aug-21 11:15	27h (16.9 °C)		
FR_FRRD	03-6145-5105	10 Aug-21 08:25	11 Aug-21 11:15	31h (16.8 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_UFR1	Water Sample	Teck Coal	FR_UFR1_MON_2021-08-0	
GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-08-10_	
CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-08-10	
LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-08-10_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_MON_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_MON_2021-08	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-08-10_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-08-10	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-08-10	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2021_Q3_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2021_Q3_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-08-10	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-08-10_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-08-10_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	
RG_MIDAG	Water Sample	Teck Coal	RG_MIDAG_WS_2021-08-	
FR_FR4	Water Sample	Teck Coal	FR_FR4_WS_2021-08-10_	
FR_FR2	Water Sample	Teck Coal	FR_FR2_WS_2021-08-10_	
FR_MULTIPLATE	Water Sample	Teck Coal	FR_MULTIPLATE_WS_202	
FR_FRRD	Water Sample	Teck Coal	FR_FRRD_WS_2021-08-10	

Ceriodaphnia 7-d Survival and Reproduction Test — **Nautilus Environmental**

Analysis ID: 00-5801-4613 **Endpoint:** Reproduction **CETIS Version:** CETISv1.9.4
Analyzed: 15 Oct-21 15:31 **Analysis:** Nonparametric-Control vs Treatments **Status Level:** 1

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C < T	FR_UFR1 passed reproduction	30.30%
		CM_MC1 passed reproduction	30.30%
		LC_SLC passed reproduction	30.30%
		FR_FRABCH passed reproduction	30.30%
		FR_FRCP1 passed reproduction	30.30%
		GH_FR1 passed reproduction	30.30%
		GH_ERC passed reproduction	30.30%
		CM_MC2 passed reproduction	30.30%
		EV_MC2 passed reproduction	30.30%
		EV_HC1 passed reproduction	30.30%
		LC_DCDS passed reproduction	30.30%
		LC_LC3 passed reproduction	30.30%
		LC_LC5 passed reproduction	30.30%
		LC_LCDSSLCC passed reproduction	30.30%
		RG_MIDAG passed reproduction	30.30%
		FR_FR4 passed reproduction	30.30%
		FR_FR2 passed reproduction	30.30%
		FR_MULTIPLATE passed reproduction	30.30%
		FR_FRRD passed reproduction	30.30%

Steel Many-One Rank Sum Test

Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)
Site Control (GH_ERC)		FR_UFR1	119	70	1	18	CDF	0.9987	Non-Significant Effect
		CM_MC1	107.5	70	3	18	CDF	0.9704	Non-Significant Effect
		LC_SLC	97.5	70	5	18	CDF	0.8217	Non-Significant Effect
		FR_FRABCH	134	70	2	18	CDF	1.0000	Non-Significant Effect
		FR_FRCP1	140.5	70	2	18	CDF	1.0000	Non-Significant Effect
		GH_FR1	127.5	70	3	18	CDF	0.9999	Non-Significant Effect
		GH_ERC	126.5	70	2	18	CDF	0.9999	Non-Significant Effect
		CM_MC2	126.5	70	4	18	CDF	0.9999	Non-Significant Effect
		EV_MC2	93	70	2	18	CDF	0.6884	Non-Significant Effect
		EV_HC1	85.5	70	2	18	CDF	0.4127	Non-Significant Effect
		LC_DCDS	134	70	2	18	CDF	1.0000	Non-Significant Effect
		LC_LC3	132	70	1	18	CDF	1.0000	Non-Significant Effect
		LC_LC5	116	70	3	18	CDF	0.9967	Non-Significant Effect
		LC_LCDSSLCC	115.5	70	4	18	CDF	0.9962	Non-Significant Effect
		RG_MIDAG	108.5	70	5	18	CDF	0.9764	Non-Significant Effect
		FR_FR4	134	70	2	18	CDF	1.0000	Non-Significant Effect
		FR_FR2	128	70	3	18	CDF	0.9999	Non-Significant Effect
		FR_MULTIPLATE	125.5	70	2	18	CDF	0.9999	Non-Significant Effect
		FR_FRRD	137.5	70	1	18	CDF	1.0000	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	4.118	3.606	0.0052	Outlier Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	2023.66	106.508	19	3.705	1.8E-06	Significant Effect
Error	5173.9	28.7439	180			
Total	7197.55		199			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance Test	50.63	36.19	1.1E-04	Unequal Variances

Ceriodaphnia 7-d Survival and Reproduction Test **Nautilus Environmental**

Analysis ID: 00-5801-4613 **Endpoint:** Reproduction **CETIS Version:** CETISv1.9.4
Analyzed: 15 Oct-21 15:31 **Analysis:** Nonparametric-Control vs Treatments **Status Level:** 1

Distribution					
Shapiro-Wilk W Normality Test	0.9202	0.9816	6.0E-09	Non-Normal Distribution	

Reproduction Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
FR_UFR1		10	22.1	19.7	24.5	22	15	29	1.059	15.15%	0.00%
GH_ER2	XC	10	21	15.48	26.52	24	0	26	2.44	36.75%	4.98%
CM_MC1		10	23	20.14	25.86	23	18	31	1.265	17.39%	-4.07%
LC_SLC		10	23	19.93	26.07	24.5	14	29	1.358	18.67%	-4.07%
FR_FRABCH		10	19.1	16.66	21.54	19.5	13	23	1.08	17.87%	13.57%
FR_FRCP1		10	12.7	7.4	18	12.5	0	22	2.343	58.34%	42.53%
GH_FR1		10	19.1	16.35	21.85	17.5	15	26	1.215	20.12%	13.57%
GH_ERC		10	21.1	19.61	22.59	22	17	24	0.6574	9.85%	4.52%
CM_MC2		10	19.3	16.15	22.45	19.5	10	26	1.391	22.79%	12.67%
EV_MC2		10	25	20.95	29.05	24	14	33	1.789	22.63%	-13.12%
EV_HC1		10	23.2	17.98	28.42	24.5	3	28	2.308	31.47%	-4.98%
LC_DCDS		10	12.7	5.972	19.43	14.5	0	27	2.974	74.06%	42.53%
LC_LC3		10	20.2	18.39	22.01	21	14	23	0.8	12.52%	8.60%
LC_LC5		10	21.1	18	24.2	23	11	26	1.37	20.53%	4.52%
LC_LCDSSLCC		10	20.3	15.59	25.01	22	3	26	2.082	32.43%	8.14%
RG_MIDAG		10	22.2	19.08	25.32	22.5	15	30	1.381	19.67%	-0.45%
FR_FR4		10	15.9	11.05	20.75	17	4	26	2.142	42.60%	28.05%
FR_FR2		10	19.4	16.59	22.21	20	14	26	1.24	20.21%	12.22%
FR_MULTIPLATE		10	21	19.03	22.97	21	17	27	0.8692	13.09%	4.98%
FR_FRRD		10	16.9	12.7	21.1	18.5	2	23	1.859	34.78%	23.53%

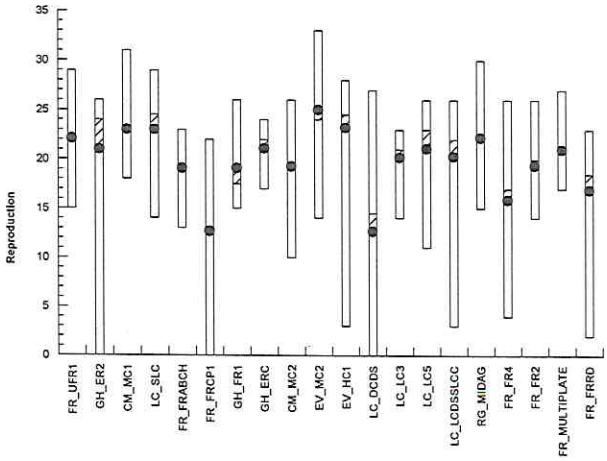
Reproduction Detail

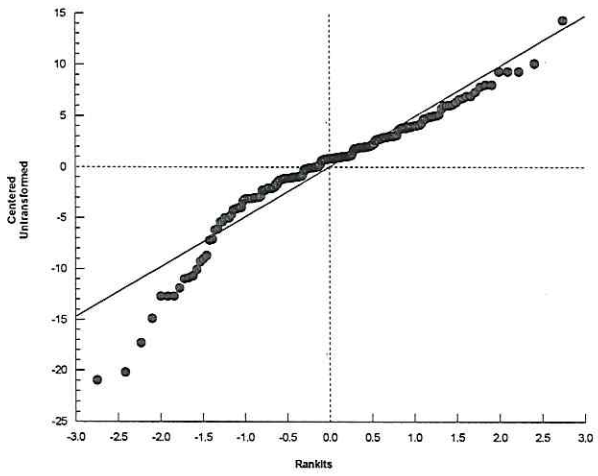
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
FR_UFR1		23	22	22	22	15	21	29	22	22	23
GH_ER2	XC	25	18	26	22	25	24	24	0	24	22
CM_MC1		18	20	24	24	24	22	18	31	27	22
LC_SLC		14	25	26	25	18	22	29	24	22	25
FR_FRABCH		23	22	18	21	13	18	23	16	21	16
FR_FRCP1		4	15	20	12	22	11	8	0	22	13
GH_FR1		16	16	17	19	17	26	15	18	24	23
GH_ERC		22	22	22	23	22	17	24	19	20	20
CM_MC2		17	22	18	19	20	24	20	26	17	10
EV_MC2		31	14	23	28	21	33	23	25	30	22
EV_HC1		3	24	24	27	27	25	27	28	23	24
LC_DCDS		19	0	14	0	17	11	27	22	2	15
LC_LC3		19	14	21	23	22	22	21	20	19	21
LC_LC5		19	26	23	11	23	20	23	24	18	24
LC_LCDSSLCC		26	3	18	21	23	24	25	19	21	23
RG_MIDAG		19	22	20	15	18	30	23	25	26	24
FR_FR4		21	18	5	26	4	15	17	20	17	16
FR_FR2		14	20	18	16	20	22	23	26	14	21
FR_MULTIPLATE		21	18	27	20	21	21	22	17	20	23
FR_FRRD		16	21	2	16	14	19	20	20	23	18

Ceriodaphnia 7-d Survival and Reproduction Test **Nautilus Environmental**

Analysis ID:	00-5801-4613	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.9.4
Analyzed:	15 Oct-21 15:31	**Analysis:**	Nonparametric-Control vs Treatments	**Status Level:**	1

Graphics





Analyst: SW QA: Oct. 27/21

Ceriodaphnia 7-d Survival and Reproduction Test

Nautilus Environmental

Analysis ID:	08-5216-5293	**Endpoint:**	7d Survival Rate	**CETIS Version:**	CETISv1.9.4
Analyzed:	15 Oct-21 15:33	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1
Batch ID:	09-9771-6958	**Test Type:**	Reproduction-Survival (7d)	**Analyst:**	Sierra Klueppel
Start Date:	11 Aug-21 15:00	**Protocol:**	EC/EPS 1/RM/21	**Diluent:**	20% Perrier Water
Ending Date:	19 Aug-21 13:00	**Species:**	Ceriodaphnia dubia	**Brine:**	
Test Length:	7d 22h	**Taxon:**	Branchiopoda	**Source:**	In-House Culture **Age:** <24

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
FR_UFR1	01-9312-3340	10 Aug-21 08:54	11 Aug-21 11:15	30h (12.8 °C)	Teck Coal	
GH_ER2	03-3301-7818	10 Aug-21 10:45	11 Aug-21 11:15	28h (15.8 °C)		
CM_MC1	20-0000-6898	10 Aug-21 11:04	11 Aug-21 11:15	28h (14 °C)		
LC_SLC	07-8534-5756	10 Aug-21 09:09	11 Aug-21 11:15	30h (11.2 °C)		
FR_FRABCH	12-3746-7337	10 Aug-21 09:35	11 Aug-21 11:15	29h (13.6 °C)		
FR_FRCP1	02-0987-3329	10 Aug-21 09:55	11 Aug-21 11:15	29h (12.1 °C)		
GH_FR1	00-2216-4794	10 Aug-21 09:30	11 Aug-21 11:15	29h (15.3 °C)		
GH_ERC	02-8768-9833	10 Aug-21 11:45	11 Aug-21 11:15	27h (16.4 °C)		
CM_MC2	08-6405-5477	10 Aug-21 12:07	11 Aug-21 11:15	27h (14.9 °C)		
EV_MC2	09-5920-8643	10 Aug-21 10:44	11 Aug-21 11:15	28h (12.8 °C)		
EV_HC1	05-3700-4202	10 Aug-21 09:46	11 Aug-21 11:15	29h (13 °C)		
LC_DCDS	10-8734-0222	10 Aug-21 10:10	11 Aug-21 11:15	29h (10.8 °C)		
LC_LC3	07-4841-6068	10 Aug-21 09:30	11 Aug-21 11:15	29h (9.8 °C)		
LC_LC5	18-0478-8867	10 Aug-21 12:00	11 Aug-21 11:15	27h (11.8 °C)		
LC_LCDSSLCC	17-9964-8023	10 Aug-21 10:40	11 Aug-21 11:15	28h (12.1 °C)		
RG_MIDAG	04-6323-4167	10 Aug-21 11:30	11 Aug-21 11:15	28h (14.3 °C)		
FR_FR4	04-5681-6105	10 Aug-21 10:00	11 Aug-21 11:15	29h (15.6 °C)		
FR_FR2	16-7096-5741	10 Aug-21 10:54	11 Aug-21 11:15	28h (15.9 °C)		
FR_MULTIPLATE	08-7549-1660	10 Aug-21 11:51	11 Aug-21 11:15	27h (16.9 °C)		
FR_FRRD	03-6145-5105	10 Aug-21 08:25	11 Aug-21 11:15	31h (16.8 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_UFR1	Water Sample	Teck Coal	FR_UFR1_MON_2021-08-0	
GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-08-10_	
CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-08-10	
LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-08-10_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_MON_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_MON_2021-08	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-08-10_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-08-10	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-08-10	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2021_Q3_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2021_Q3_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-08-10	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-08-10_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-08-10_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	
RG_MIDAG	Water Sample	Teck Coal	RG_MIDAG_WS_2021-08-	
FR_FR4	Water Sample	Teck Coal	FR_FR4_WS_2021-08-10_	
FR_FR2	Water Sample	Teck Coal	FR_FR2_WS_2021-08-10_	
FR_MULTIPLATE	Water Sample	Teck Coal	FR_MULTIPLATE_WS_202	
FR_FRRD	Water Sample	Teck Coal	FR_FRRD_WS_2021-08-10	

Fisher Exact/Bonferroni-Holm Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
Site Control (CM-MC1)		FR_UFR1	1.0000	Exact	1.0000	Non-Significant Effect
		GH_ER2	0.5000	Exact	1.0000	Non-Significant Effect
		LC_SLC	1.0000	Exact	1.0000	Non-Significant Effect
		FR_FRABCH	1.0000	Exact	1.0000	Non-Significant Effect

Ceriodaphnia 7-d Survival and Reproduction Test — **Nautilus Environmental**

Analysis ID: 08-5216-5293 **Endpoint:** 7d Survival Rate **CETIS Version:** CETISv1.9.4
Analyzed: 15 Oct-21 15:33 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Fisher Exact/Bonferroni-Holm Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
		FR_FRCP1	0.5000	Exact	1.0000	Non-Significant Effect
		GH_FR1	1.0000	Exact	1.0000	Non-Significant Effect
		GH_ERC	1.0000	Exact	1.0000	Non-Significant Effect
		CM_MC2	0.5000	Exact	1.0000	Non-Significant Effect
		EV_MC2	1.0000	Exact	1.0000	Non-Significant Effect
		EV_HC1	0.5000	Exact	1.0000	Non-Significant Effect
		LC_DCDS	0.2368	Exact	1.0000	Non-Significant Effect
		LC_LC3	1.0000	Exact	1.0000	Non-Significant Effect
		LC_LC5	1.0000	Exact	1.0000	Non-Significant Effect
		LC_LCDSSLCC	0.5000	Exact	1.0000	Non-Significant Effect
		RG_MIDAG	1.0000	Exact	1.0000	Non-Significant Effect
		FR_FR4	1.0000	Exact	1.0000	Non-Significant Effect
		FR_FR2	1.0000	Exact	1.0000	Non-Significant Effect
		FR_MULTIPLATE	1.0000	Exact	1.0000	Non-Significant Effect
		FR_FRRD	1.0000	Exact	1.0000	Non-Significant Effect

Data Summary

Sample	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
FR_UFR1		10	0	10	1	0	0.0%
GH_ER2		9	1	10	0.9	0.1	10.0%
CM_MC1	XC	10	0	10	1	0	0.0%
LC_SLC		10	0	10	1	0	0.0%
FR_FRABCH		10	0	10	1	0	0.0%
FR_FRCP1		9	1	10	0.9	0.1	10.0%
GH_FR1		10	0	10	1	0	0.0%
GH_ERC		10	0	10	1	0	0.0%
CM_MC2		9	1	10	0.9	0.1	10.0%
EV_MC2		10	0	10	1	0	0.0%
EV_HC1		9	1	10	0.9	0.1	10.0%
LC_DCDS		8	2	10	0.8	0.2	20.0%
LC_LC3		10	0	10	1	0	0.0%
LC_LC5		10	0	10	1	0	0.0%
LC_LCDSSLCC		9	1	10	0.9	0.1	10.0%
RG_MIDAG		10	0	10	1	0	0.0%
FR_FR4		10	0	10	1	0	0.0%
FR_FR2		10	0	10	1	0	0.0%
FR_MULTIPLATE		10	0	10	1	0	0.0%
FR_FRRD		10	0	10	1	0	0.0%

Ceriodaphnia 7-d Survival and Reproduction Test — **Nautilus Environmental**

Analysis ID: 08-5216-5293 **Endpoint:** 7d Survival Rate **CETIS Version:** CETISv1.9.4
Analyzed: 15 Oct-21 15:33 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

7d Survival Rate Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
FR_UFR1		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
GH_ER2		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	1.0000	1.0000
CM_MC1	XC	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
LC_SLC		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
FR_FRABCH		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
FR_FRCP1		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	1.0000	1.0000
GH_FR1		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
GH_ERC		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
CM_MC2		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000
EV_MC2		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
EV_HC1		0.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
LC_DCDS		1.0000	0.0000	1.0000	0.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
LC_LC3		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
LC_LC5		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
LC_LCDSSLCC		1.0000	0.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
RG_MIDAG		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
FR_FR4		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
FR_FR2		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
FR_MULTIPLATE		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
FR_FRRD		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

7d Survival Rate Binomials

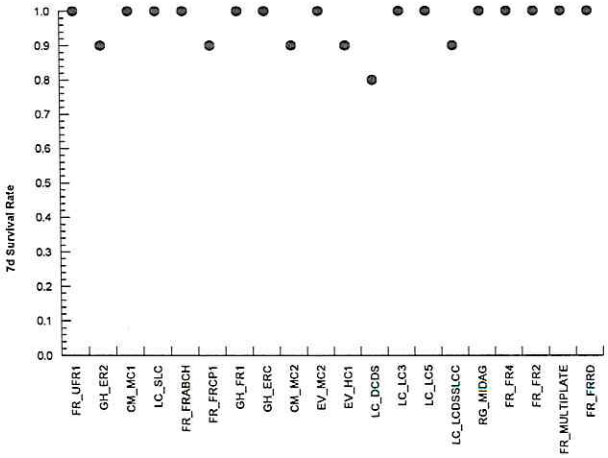
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
FR_UFR1		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
GH_ER2		1/1	1/1	1/1	1/1	1/1	1/1	1/1	0/1	1/1	1/1
LC_SLC		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
FR_FRABCH		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
FR_FRCP1		1/1	1/1	1/1	1/1	1/1	1/1	1/1	0/1	1/1	1/1
GH_FR1		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
GH_ERC		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
CM_MC2		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	0/1
EV_MC2		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
EV_HC1		0/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
LC_DCDS		1/1	0/1	1/1	0/1	1/1	1/1	1/1	1/1	1/1	1/1
LC_LC3		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
LC_LC5		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
LC_LCDSSLCC		1/1	0/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
RG_MIDAG		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
FR_FR4		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
FR_FR2		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
FR_MULTIPLATE		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
FR_FRRD		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1

Analyst: SM QA: Oct. 27/21

Ceriodaphnia 7-d Survival and Reproduction Test — **Nautilus Environmental**

Analysis ID:	08-5216-5293	**Endpoint:**	7d Survival Rate	**CETIS Version:**	CETISv1.9.4
Analyzed:	15 Oct-21 15:33	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1

Graphics



Ceriodaphnia 7-d Survival and Reproduction Test

Nautilus Environmental

Analysis ID:	20-5922-7386	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.9.4
Analyzed:	15 Oct-21 15:33	**Analysis:**	Nonparametric-Control vs Treatments	**Status Level:**	1
Batch ID:	09-9771-6958	**Test Type:**	Reproduction-Survival (7d)	**Analyst:**	Sierra Klueppel
Start Date:	11 Aug-21 15:00	**Protocol:**	EC/EPS 1/RM/21	**Diluent:**	20% Perrier Water
Ending Date:	19 Aug-21 13:00	**Species:**	Ceriodaphnia dubia	**Brine:**	
Test Length:	7d 22h	**Taxon:**	Branchiopoda	**Source:**	In-House Culture **Age:** <24

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
FR_UFR1	01-9312-3340	10 Aug-21 08:54	11 Aug-21 11:15	30h (12.8 °C)	Teck Coal	
GH_ER2	03-3301-7818	10 Aug-21 10:45	11 Aug-21 11:15	28h (15.8 °C)		
CM_MC1	20-0000-6898	10 Aug-21 11:04	11 Aug-21 11:15	28h (14 °C)		
LC_SLC	07-8534-5756	10 Aug-21 09:09	11 Aug-21 11:15	30h (11.2 °C)		
FR_FRABCH	12-3746-7337	10 Aug-21 09:35	11 Aug-21 11:15	29h (13.6 °C)		
FR_FRCP1	02-0987-3329	10 Aug-21 09:55	11 Aug-21 11:15	29h (12.1 °C)		
GH_FR1	00-2216-4794	10 Aug-21 09:30	11 Aug-21 11:15	29h (15.3 °C)		
GH_ERC	02-8768-9833	10 Aug-21 11:45	11 Aug-21 11:15	27h (16.4 °C)		
CM_MC2	08-6405-5477	10 Aug-21 12:07	11 Aug-21 11:15	27h (14.9 °C)		
EV_MC2	09-5920-8643	10 Aug-21 10:44	11 Aug-21 11:15	28h (12.8 °C)		
EV_HC1	05-3700-4202	10 Aug-21 09:46	11 Aug-21 11:15	29h (13 °C)		
LC_DCDS	10-8734-0222	10 Aug-21 10:10	11 Aug-21 11:15	29h (10.8 °C)		
LC_LC3	07-4841-6068	10 Aug-21 09:30	11 Aug-21 11:15	29h (9.8 °C)		
LC_LC5	18-0478-8867	10 Aug-21 12:00	11 Aug-21 11:15	27h (11.8 °C)		
LC_LCDSSLCC	17-9964-8023	10 Aug-21 10:40	11 Aug-21 11:15	28h (12.1 °C)		
RG_MIDAG	04-6323-4167	10 Aug-21 11:30	11 Aug-21 11:15	28h (14.3 °C)		
FR_FR4	04-5681-6105	10 Aug-21 10:00	11 Aug-21 11:15	29h (15.6 °C)		
FR_FR2	16-7096-5741	10 Aug-21 10:54	11 Aug-21 11:15	28h (15.9 °C)		
FR_MULTIPLATE	08-7549-1660	10 Aug-21 11:51	11 Aug-21 11:15	27h (16.9 °C)		
FR_FRRD	03-6145-5105	10 Aug-21 08:25	11 Aug-21 11:15	31h (16.8 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_UFR1	Water Sample	Teck Coal	FR_UFR1_MON_2021-08-0	
GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-08-10_	
CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-08-10	
LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-08-10_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_MON_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_MON_2021-08	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-08-10_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-08-10	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-08-10	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2021_Q3_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2021_Q3_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-08-10	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-08-10_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-08-10_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	
RG_MIDAG	Water Sample	Teck Coal	RG_MIDAG_WS_2021-08-	
FR_FR4	Water Sample	Teck Coal	FR_FR4_WS_2021-08-10_	
FR_FR2	Water Sample	Teck Coal	FR_FR2_WS_2021-08-10_	
FR_MULTIPLATE	Water Sample	Teck Coal	FR_MULTIPLATE_WS_202	
FR_FRRD	Water Sample	Teck Coal	FR_FRRD_WS_2021-08-10	

Ceriodaphnia 7-d Survival and Reproduction Test — **Nautilus Environmental**

Analysis ID: 20-5922-7386 **Endpoint:** Reproduction **CETIS Version:** CETISv1.9.4
Analyzed: 15 Oct-21 15:33 **Analysis:** Nonparametric-Control vs Treatments **Status Level:** 1

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	FR_UFR1 passed reproduction	27.67%
		GH_ER2 passed reproduction	27.67%
		LC_SLC passed reproduction	27.67%
		FR_FRABCH passed reproduction	27.67%
		FR_FRCP1 failed reproduction	27.67%
		GH_FR1 passed reproduction	27.67%
		GH_ERC passed reproduction	27.67%
		CM_MC2 passed reproduction	27.67%
		EV_MC2 passed reproduction	27.67%
		EV_HC1 passed reproduction	27.67%
		LC_DCDS failed reproduction	27.67%
		LC_LC3 passed reproduction	27.67%
		LC_LC5 passed reproduction	27.67%
		LC_LCDSSLCC passed reproduction	27.67%
		RG_MIDAG passed reproduction	27.67%
		FR_FR4 failed reproduction	27.67%
		FR_FR2 passed reproduction	27.67%
		FR_MULTIPLATE passed reproduction	27.67%
		FR_FRRD passed reproduction	27.67%

Steel Many-One Rank Sum Test

Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)
Site Control		FR_UFR1	97	70	1	18	CDF	0.8089	Non-Significant Effect
(CM_MC)		GH_ER2	107.5	70	3	18	CDF	0.9704	Non-Significant Effect
		LC_SLC	111.5	70	3	18	CDF	0.9886	Non-Significant Effect
		FR_FRABCH	77	70	2	18	CDF	0.1546	Non-Significant Effect
		FR_FRCP1*	65.5	70	2	18	CDF	0.0191	Significant Effect
		GH_FR1	77.5	70	2	18	CDF	0.1659	Non-Significant Effect
		GH_ERC	89.5	70	3	18	CDF	0.5628	Non-Significant Effect
		CM_MC2	81.5	70	4	18	CDF	0.2753	Non-Significant Effect
		EV_MC2	117.5	70	2	18	CDF	0.9979	Non-Significant Effect
		EV_HC1	122	70	2	18	CDF	0.9995	Non-Significant Effect
		LC_DCDS*	69.5	70	2	18	CDF	0.0438	Significant Effect
		LC_LC3	83.5	70	2	18	CDF	0.3412	Non-Significant Effect
		LC_LC5	96.5	70	3	18	CDF	0.7956	Non-Significant Effect
		LC_LCDSSLCC	96.5	70	2	18	CDF	0.7956	Non-Significant Effect
		RG_MIDAG	101	70	4	18	CDF	0.8959	Non-Significant Effect
		FR_FR4*	69.5	70	2	18	CDF	0.0438	Significant Effect
		FR_FR2	81	70	3	18	CDF	0.2599	Non-Significant Effect
		FR_MULTIPLATE	87.5	70	4	18	CDF	0.4874	Non-Significant Effect
		FR_FRRD	71	70	2	18	CDF	0.0581	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	4.118	3.606	0.0052	Outlier Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	2023.66	106.508	19	3.705	1.8E-06	Significant Effect
Error	5173.9	28.7439	180			
Total	7197.55		199			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance Test	50.63	36.19	1.1E-04	Unequal Variances

Ceriodaphnia 7-d Survival and Reproduction Test **Nautilus Environmental**

Analysis ID: 20-5922-7386 **Endpoint:** Reproduction **CETIS Version:** CETISv1.9.4
Analyzed: 15 Oct-21 15:33 **Analysis:** Nonparametric-Control vs Treatments **Status Level:** 1

Distribution	Shapiro-Wilk W Normality Test	0.9202	0.9816	6.0E-09	Non-Normal Distribution

Reproduction Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
FR_UFR1		10	22.1	19.7	24.5	22	15	29	1.059	15.15%	0.00%
GH_ER2		10	21	15.48	26.52	24	0	26	2.44	36.75%	4.98%
CM_MC1	XC	10	23	20.14	25.86	23	18	31	1.265	17.39%	-4.07%
LC_SLC		10	23	19.93	26.07	24.5	14	29	1.358	18.67%	-4.07%
FR_FRABCH		10	19.1	16.66	21.54	19.5	13	23	1.08	17.87%	13.57%
FR_FRCP1		10	12.7	7.4	18	12.5	0	22	2.343	58.34%	42.53%
GH_FR1		10	19.1	16.35	21.85	17.5	15	26	1.215	20.12%	13.57%
GH_ERC		10	21.1	19.61	22.59	22	17	24	0.6574	9.85%	4.52%
CM_MC2		10	19.3	16.15	22.45	19.5	10	26	1.391	22.79%	12.67%
EV_MC2		10	25	20.95	29.05	24	14	33	1.789	22.63%	-13.12%
EV_HC1		10	23.2	17.98	28.42	24.5	3	28	2.308	31.47%	-4.98%
LC_DCDS		10	12.7	5.972	19.43	14.5	0	27	2.974	74.06%	42.53%
LC_LC3		10	20.2	18.39	22.01	21	14	23	0.8	12.52%	8.60%
LC_LC5		10	21.1	18	24.2	23	11	26	1.37	20.53%	4.52%
LC_LCDSSLCC		10	20.3	15.59	25.01	22	3	26	2.082	32.43%	8.14%
RG_MIDAG		10	22.2	19.08	25.32	22.5	15	30	1.381	19.67%	-0.45%
FR_FR4		10	15.9	11.05	20.75	17	4	26	2.142	42.60%	28.05%
FR_FR2		10	19.4	16.59	22.21	20	14	26	1.24	20.21%	12.22%
FR_MULTIPLATE		10	21	19.03	22.97	21	17	27	0.8692	13.09%	4.98%
FR_FRRD		10	16.9	12.7	21.1	18.5	2	23	1.859	34.78%	23.53%

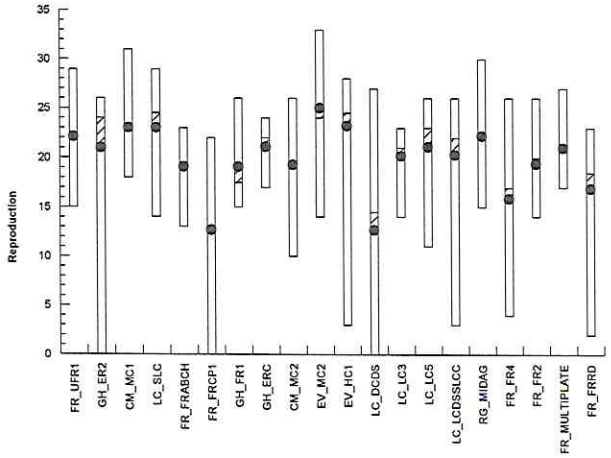
Reproduction Detail

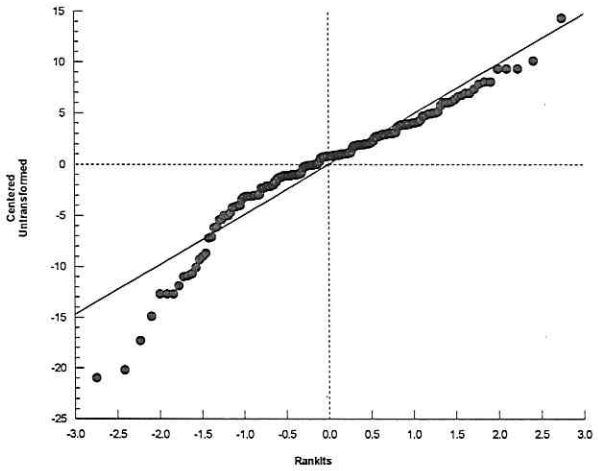
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
FR_UFR1		23	22	22	22	15	21	29	22	22	23
GH_ER2		25	18	26	22	25	24	24	0	24	22
CM_MC1	XC	18	20	24	24	24	22	18	31	27	22
LC_SLC		14	25	26	25	18	22	29	24	22	25
FR_FRABCH		23	22	18	21	13	18	23	16	21	16
FR_FRCP1		4	15	20	12	22	11	8	0	22	13
GH_FR1		16	16	17	19	17	26	15	18	24	23
GH_ERC		22	22	22	23	22	17	24	19	20	20
CM_MC2		17	22	18	19	20	24	20	26	17	10
EV_MC2		31	14	23	28	21	33	23	25	30	22
EV_HC1		3	24	24	27	27	25	27	28	23	24
LC_DCDS		19	0	14	0	17	11	27	22	2	15
LC_LC3		19	14	21	23	22	22	21	20	19	21
LC_LC5		19	26	23	11	23	20	23	24	18	24
LC_LCDSSLCC		26	3	18	21	23	24	25	19	21	23
RG_MIDAG		19	22	20	15	18	30	23	25	26	24
FR_FR4		21	18	5	26	4	15	17	20	17	16
FR_FR2		14	20	18	16	20	22	23	26	14	21
FR_MULTIPLATE		21	18	27	20	21	21	22	17	20	23
FR_FRRD		16	21	2	16	14	19	20	20	23	18

Ceriodaphnia 7-d Survival and Reproduction Test **Nautilus Environmental**

Analysis ID:	20-5922-7386	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.9.4
Analyzed:	15 Oct-21 15:33	**Analysis:**	Nonparametric-Control vs Treatments	**Status Level:**	1

Graphics





Ceriodaphnia 7-d Survival and Reproduction Test

Nautilus Environmental

Analysis ID:	07-9874-5562	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.9.4
Analyzed:	15 Oct-21 15:33	**Analysis:**	Nonparametric-Control vs Treatments	**Status Level:**	1
Batch ID:	09-9771-6958	**Test Type:**	Reproduction-Survival (7d)	**Analyst:**	Sierra Klueppel
Start Date:	11 Aug-21 15:00	**Protocol:**	EC/EPS 1/RM/21	**Diluent:**	20% Perrier Water
Ending Date:	19 Aug-21 13:00	**Species:**	Ceriodaphnia dubia	**Brine:**	
Test Length:	7d 22h	**Taxon:**	Branchiopoda	**Source:**	In-House Culture **Age:** <24

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
FR_UFR1	01-9312-3340	10 Aug-21 08:54	11 Aug-21 11:15	30h (12.8 °C)	Teck Coal	
GH_ER2	03-3301-7818	10 Aug-21 10:45	11 Aug-21 11:15	28h (15.8 °C)		
CM_MC1	20-0000-6898	10 Aug-21 11:04	11 Aug-21 11:15	28h (14 °C)		
LC_SLC	07-8534-5756	10 Aug-21 09:09	11 Aug-21 11:15	30h (11.2 °C)		
FR_FRABCH	12-3746-7337	10 Aug-21 09:35	11 Aug-21 11:15	29h (13.6 °C)		
FR_FRCP1	02-0987-3329	10 Aug-21 09:55	11 Aug-21 11:15	29h (12.1 °C)		
GH_FR1	00-2216-4794	10 Aug-21 09:30	11 Aug-21 11:15	29h (15.3 °C)		
GH_ERC	02-8768-9833	10 Aug-21 11:45	11 Aug-21 11:15	27h (16.4 °C)		
CM_MC2	08-6405-5477	10 Aug-21 12:07	11 Aug-21 11:15	27h (14.9 °C)		
EV_MC2	09-5920-8643	10 Aug-21 10:44	11 Aug-21 11:15	28h (12.8 °C)		
EV_HC1	05-3700-4202	10 Aug-21 09:46	11 Aug-21 11:15	29h (13 °C)		
LC_DCDS	10-8734-0222	10 Aug-21 10:10	11 Aug-21 11:15	29h (10.8 °C)		
LC_LC3	07-4841-6068	10 Aug-21 09:30	11 Aug-21 11:15	29h (9.8 °C)		
LC_LC5	18-0478-8867	10 Aug-21 12:00	11 Aug-21 11:15	27h (11.8 °C)		
LC_LCDSSLCC	17-9964-8023	10 Aug-21 10:40	11 Aug-21 11:15	28h (12.1 °C)		
RG_MIDAG	04-6323-4167	10 Aug-21 11:30	11 Aug-21 11:15	28h (14.3 °C)		
FR_FR4	04-5681-6105	10 Aug-21 10:00	11 Aug-21 11:15	29h (15.6 °C)		
FR_FR2	16-7096-5741	10 Aug-21 10:54	11 Aug-21 11:15	28h (15.9 °C)		
FR_MULTIPLATE	08-7549-1660	10 Aug-21 11:51	11 Aug-21 11:15	27h (16.9 °C)		
FR_FRRD	03-6145-5105	10 Aug-21 08:25	11 Aug-21 11:15	31h (16.8 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_UFR1	Water Sample	Teck Coal	FR_UFR1_MON_2021-08-0	
GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-08-10_	
CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-08-10	
LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-08-10_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_MON_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_MON_2021-08	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-08-10_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-08-10	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-08-10	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2021_Q3_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2021_Q3_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-08-10	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-08-10_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-08-10_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	
RG_MIDAG	Water Sample	Teck Coal	RG_MIDAG_WS_2021-08-	
FR_FR4	Water Sample	Teck Coal	FR_FR4_WS_2021-08-10_	
FR_FR2	Water Sample	Teck Coal	FR_FR2_WS_2021-08-10_	
FR_MULTIPLATE	Water Sample	Teck Coal	FR_MULTIPLATE_WS_202	
FR_FRRD	Water Sample	Teck Coal	FR_FRRD_WS_2021-08-10	

Ceriodaphnia 7-d Survival and Reproduction Test — **Nautilus Environmental**

Analysis ID:	07-9874-5562	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.9.4
Analyzed:	15 Oct-21 15:33	**Analysis:**	Nonparametric-Control vs Treatments	**Status Level:**	1

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C < T	FR_UFR1 passed reproduction	27.67%
		GH_ER2 passed reproduction	27.67%
		LC_SLC passed reproduction	27.67%
		FR_FRABCH passed reproduction	27.67%
		FR_FRCP1 passed reproduction	27.67%
		GH_FR1 passed reproduction	27.67%
		GH_ERC passed reproduction	27.67%
		CM_MC2 passed reproduction	27.67%
		EV_MC2 passed reproduction	27.67%
		EV_HC1 passed reproduction	27.67%
		LC_DCDS passed reproduction	27.67%
		LC_LC3 passed reproduction	27.67%
		LC_LC5 passed reproduction	27.67%
		LC_LCDSSLCC passed reproduction	27.67%
		RG_MIDAG passed reproduction	27.67%
		FR_FR4 passed reproduction	27.67%
		FR_FR2 passed reproduction	27.67%
		FR_MULTIPLATE passed reproduction	27.67%
		FR_FRRD passed reproduction	27.67%

Steel Many-One Rank Sum Test

Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)
Site Control (CM-MC1)		FR_UFR1	113	70	1	18	CDF	0.9923	Non-Significant Effect
		GH_ER2	102.5	70	3	18	CDF	0.9197	Non-Significant Effect
		LC_SLC	98.5	70	3	18	CDF	0.8456	Non-Significant Effect
		FR_FRABCH	133	70	2	18	CDF	1.0000	Non-Significant Effect
		FR_FRCP1	144.5	70	2	18	CDF	1.0000	Non-Significant Effect
		GH_FR1	132.5	70	2	18	CDF	1.0000	Non-Significant Effect
		GH_ERC	120.5	70	3	18	CDF	0.9992	Non-Significant Effect
		CM_MC2	128.5	70	4	18	CDF	1.0000	Non-Significant Effect
		EV_MC2	92.5	70	2	18	CDF	0.6713	Non-Significant Effect
		EV_HC1	88	70	2	18	CDF	0.5063	Non-Significant Effect
		LC_DCDS	140.5	70	2	18	CDF	1.0000	Non-Significant Effect
		LC_LC3	126.5	70	2	18	CDF	0.9999	Non-Significant Effect
		LC_LC5	113.5	70	3	18	CDF	0.9933	Non-Significant Effect
		LC_LCDSSLCC	113.5	70	2	18	CDF	0.9933	Non-Significant Effect
		RG_MIDAG	109	70	4	18	CDF	0.9790	Non-Significant Effect
		FR_FR4	140.5	70	2	18	CDF	1.0000	Non-Significant Effect
		FR_FR2	129	70	3	18	CDF	1.0000	Non-Significant Effect
		FR_MULTIPLATE	122.5	70	4	18	CDF	0.9996	Non-Significant Effect
		FR_FRRD	139	70	2	18	CDF	1.0000	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	4.118	3.606	0.0052	Outlier Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	2023.66	106.508	19	3.705	1.8E-06	Significant Effect
Error	5173.9	28.7439	180			
Total	7197.55		199			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance Test	50.63	36.19	1.1E-04	Unequal Variances

Ceriodaphnia 7-d Survival and Reproduction Test — **Nautilus Environmental**

Analysis ID: 07-9874-5562 **Endpoint:** Reproduction **CETIS Version:** CETISv1.9.4
Analyzed: 15 Oct-21 15:33 **Analysis:** Nonparametric-Control vs Treatments **Status Level:** 1

Distribution					
Shapiro-Wilk W Normality Test	0.9202	0.9816	6.0E-09	Non-Normal Distribution	

Reproduction Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
FR_UFR1		10	22.1	19.7	24.5	22	15	29	1.059	15.15%	0.00%
GH_ER2		10	21	15.48	26.52	24	0	26	2.44	36.75%	4.98%
CM_MC1	XC	10	23	20.14	25.86	23	18	31	1.265	17.39%	-4.07%
LC_SLC		10	23	19.93	26.07	24.5	14	29	1.358	18.67%	-4.07%
FR_FRABCH		10	19.1	16.66	21.54	19.5	13	23	1.08	17.87%	13.57%
FR_FRCP1		10	12.7	7.4	18	12.5	0	22	2.343	58.34%	42.53%
GH_FR1		10	19.1	16.35	21.85	17.5	15	26	1.215	20.12%	13.57%
GH_ERC		10	21.1	19.61	22.59	22	17	24	0.6574	9.85%	4.52%
CM_MC2		10	19.3	16.15	22.45	19.5	10	26	1.391	22.79%	12.67%
EV_MC2		10	25	20.95	29.05	24	14	33	1.789	22.63%	-13.12%
EV_HC1		10	23.2	17.98	28.42	24.5	3	28	2.308	31.47%	-4.98%
LC_DCDS		10	12.7	5.972	19.43	14.5	0	27	2.974	74.06%	42.53%
LC_LC3		10	20.2	18.39	22.01	21	14	23	0.8	12.52%	8.60%
LC_LC5		10	21.1	18	24.2	23	11	26	1.37	20.53%	4.52%
LC_LCDSSLCC		10	20.3	15.59	25.01	22	3	26	2.082	32.43%	8.14%
RG_MIDAG		10	22.2	19.08	25.32	22.5	15	30	1.381	19.67%	-0.45%
FR_FR4		10	15.9	11.05	20.75	17	4	26	2.142	42.60%	28.05%
FR_FR2		10	19.4	16.59	22.21	20	14	26	1.24	20.21%	12.22%
FR_MULTIPLATE		10	21	19.03	22.97	21	17	27	0.8692	13.09%	4.98%
FR_FRRD		10	16.9	12.7	21.1	18.5	2	23	1.859	34.78%	23.53%

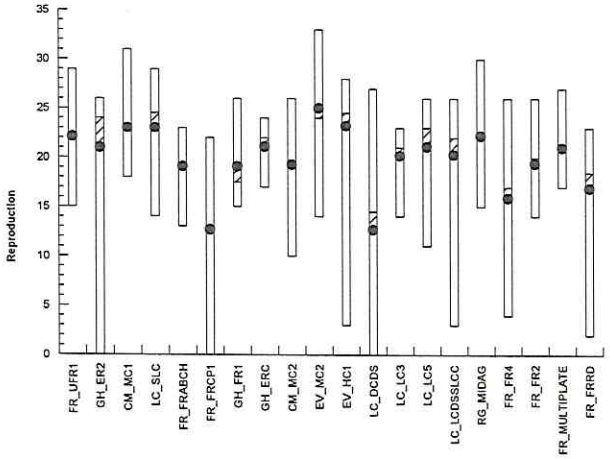
Reproduction Detail

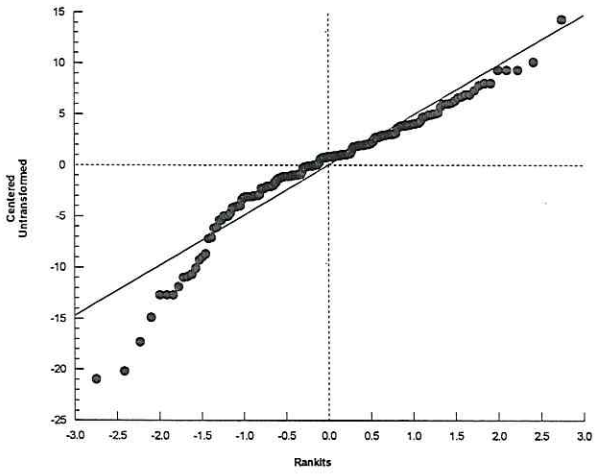
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
FR_UFR1		23	22	22	22	15	21	29	22	22	23
GH_ER2		25	18	26	22	25	24	24	0	24	22
CM_MC1	XC	18	20	24	24	24	22	18	31	27	22
LC_SLC		14	25	26	25	18	22	29	24	22	25
FR_FRABCH		23	22	18	21	13	18	23	16	21	16
FR_FRCP1		4	15	20	12	22	11	8	0	22	13
GH_FR1		16	16	17	19	17	26	15	18	24	23
GH_ERC		22	22	22	23	22	17	24	19	20	20
CM_MC2		17	22	18	19	20	24	20	26	17	10
EV_MC2		31	14	23	28	21	33	23	25	30	22
EV_HC1		3	24	24	27	27	25	27	28	23	24
LC_DCDS		19	0	14	0	17	11	27	22	2	15
LC_LC3		19	14	21	23	22	22	21	20	19	21
LC_LC5		19	26	23	11	23	20	23	24	18	24
LC_LCDSSLCC		26	3	18	21	23	24	25	19	21	23
RG_MIDAG		19	22	20	15	18	30	23	25	26	24
FR_FR4		21	18	5	26	4	15	17	20	17	16
FR_FR2		14	20	18	16	20	22	23	26	14	21
FR_MULTIPLATE		21	18	27	20	21	21	22	17	20	23
FR_FRRD		16	21	2	16	14	19	20	20	23	18

Ceriodaphnia 7-d Survival and Reproduction Test **Nautilus Environmental**

Analysis ID:	07-9874-5562	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.9.4
Analyzed:	15 Oct-21 15:33	**Analysis:**	Nonparametric-Control vs Treatments	**Status Level:**	1

Graphics





Ceriodaphnia 7-d Survival and Reproduction Test

Nautilus Environmental

Analysis ID:	19-1711-6782	**Endpoint:**	7d Survival Rate	**CETIS Version:**	CETISv1.9.4
Analyzed:	15 Oct-21 15:36	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1
Batch ID:	09-9771-6958	**Test Type:**	Reproduction-Survival (7d)	**Analyst:**	Sierra Klueppel
Start Date:	11 Aug-21 15:00	**Protocol:**	EC/EPS 1/RM/21	**Diluent:**	20% Perrier Water
Ending Date:	19 Aug-21 13:00	**Species:**	Ceriodaphnia dubia	**Brine:**	
Test Length:	7d 22h	**Taxon:**	Branchiopoda	**Source:**	In-House Culture **Age:** <24

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
FR_UFR1	01-9312-3340	10 Aug-21 08:54	11 Aug-21 11:15	30h (12.8 °C)	Teck Coal	
GH_ER2	03-3301-7818	10 Aug-21 10:45	11 Aug-21 11:15	28h (15.8 °C)		
CM_MC1	20-0000-6898	10 Aug-21 11:04	11 Aug-21 11:15	28h (14 °C)		
LC_SLC	07-8534-5756	10 Aug-21 09:09	11 Aug-21 11:15	30h (11.2 °C)		
FR_FRABCH	12-3746-7337	10 Aug-21 09:35	11 Aug-21 11:15	29h (13.6 °C)		
FR_FRCP1	02-0987-3329	10 Aug-21 09:55	11 Aug-21 11:15	29h (12.1 °C)		
GH_FR1	00-2216-4794	10 Aug-21 09:30	11 Aug-21 11:15	29h (15.3 °C)		
GH_ERC	02-8768-9833	10 Aug-21 11:45	11 Aug-21 11:15	27h (16.4 °C)		
CM_MC2	08-6405-5477	10 Aug-21 12:07	11 Aug-21 11:15	27h (14.9 °C)		
EV_MC2	09-5920-8643	10 Aug-21 10:44	11 Aug-21 11:15	28h (12.8 °C)		
EV_HC1	05-3700-4202	10 Aug-21 09:46	11 Aug-21 11:15	29h (13 °C)		
LC_DCDS	10-8734-0222	10 Aug-21 10:10	11 Aug-21 11:15	29h (10.8 °C)		
LC_LC3	07-4841-6068	10 Aug-21 09:30	11 Aug-21 11:15	29h (9.8 °C)		
LC_LC5	18-0478-8867	10 Aug-21 12:00	11 Aug-21 11:15	27h (11.8 °C)		
LC_LCDSSLCC	17-9964-8023	10 Aug-21 10:40	11 Aug-21 11:15	28h (12.1 °C)		
RG_MIDAG	04-6323-4167	10 Aug-21 11:30	11 Aug-21 11:15	28h (14.3 °C)		
FR_FR4	04-5681-6105	10 Aug-21 10:00	11 Aug-21 11:15	29h (15.6 °C)		
FR_FR2	16-7096-5741	10 Aug-21 10:54	11 Aug-21 11:15	28h (15.9 °C)		
FR_MULTIPLATE	08-7549-1660	10 Aug-21 11:51	11 Aug-21 11:15	27h (16.9 °C)		
FR_FRRD	03-6145-5105	10 Aug-21 08:25	11 Aug-21 11:15	31h (16.8 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_UFR1	Water Sample	Teck Coal	FR_UFR1_MON_2021-08-0	
GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-08-10_	
CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-08-10	
LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-08-10_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_MON_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_MON_2021-08	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-08-10_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-08-10	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-08-10	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2021_Q3_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2021_Q3_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-08-10	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-08-10_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-08-10_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	
RG_MIDAG	Water Sample	Teck Coal	RG_MIDAG_WS_2021-08-	
FR_FR4	Water Sample	Teck Coal	FR_FR4_WS_2021-08-10_	
FR_FR2	Water Sample	Teck Coal	FR_FR2_WS_2021-08-10_	
FR_MULTIPLATE	Water Sample	Teck Coal	FR_MULTIPLATE_WS_202	
FR_FRRD	Water Sample	Teck Coal	FR_FRRD_WS_2021-08-10	

Fisher Exact/Bonferroni-Holm Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
Site Control		FR_UFR1	1.0000	Exact	1.0000	Non-Significant Effect
(LC-SLC)		GH_ER2	0.5000	Exact	1.0000	Non-Significant Effect
		CM_MC1	1.0000	Exact	1.0000	Non-Significant Effect
		FR_FRABCH	1.0000	Exact	1.0000	Non-Significant Effect

Ceriodaphnia 7-d Survival and Reproduction Test — **Nautilus Environmental**

Analysis ID: 19-1711-6782 **Endpoint:** 7d Survival Rate **CETIS Version:** CETISv1.9.4
Analyzed: 15 Oct-21 15:36 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Fisher Exact/Bonferroni-Holm Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
		FR_FRCP1	0.5000	Exact	1.0000	Non-Significant Effect
		GH_FR1	1.0000	Exact	1.0000	Non-Significant Effect
		GH_ERC	1.0000	Exact	1.0000	Non-Significant Effect
		CM_MC2	0.5000	Exact	1.0000	Non-Significant Effect
		EV_MC2	1.0000	Exact	1.0000	Non-Significant Effect
		EV_HC1	0.5000	Exact	1.0000	Non-Significant Effect
		LC_DCDS	0.2368	Exact	1.0000	Non-Significant Effect
		LC_LC3	1.0000	Exact	1.0000	Non-Significant Effect
		LC_LC5	1.0000	Exact	1.0000	Non-Significant Effect
		LC_LCDSSLCC	0.5000	Exact	1.0000	Non-Significant Effect
		RG_MIDAG	1.0000	Exact	1.0000	Non-Significant Effect
		FR_FR4	1.0000	Exact	1.0000	Non-Significant Effect
		FR_FR2	1.0000	Exact	1.0000	Non-Significant Effect
		FR_MULTIPLATE	1.0000	Exact	1.0000	Non-Significant Effect
		FR_FRRD	1.0000	Exact	1.0000	Non-Significant Effect

Data Summary

Sample	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
FR_UFR1		10	0	10	1	0	0.0%
GH_ER2		9	1	10	0.9	0.1	10.0%
CM_MC1		10	0	10	1	0	0.0%
LC_SLC	XC	10	0	10	1	0	0.0%
FR_FRABCH		10	0	10	1	0	0.0%
FR_FRCP1		9	1	10	0.9	0.1	10.0%
GH_FR1		10	0	10	1	0	0.0%
GH_ERC		10	0	10	1	0	0.0%
CM_MC2		9	1	10	0.9	0.1	10.0%
EV_MC2		10	0	10	1	0	0.0%
EV_HC1		9	1	10	0.9	0.1	10.0%
LC_DCDS		8	2	10	0.8	0.2	20.0%
LC_LC3		10	0	10	1	0	0.0%
LC_LC5		10	0	10	1	0	0.0%
LC_LCDSSLCC		9	1	10	0.9	0.1	10.0%
RG_MIDAG		10	0	10	1	0	0.0%
FR_FR4		10	0	10	1	0	0.0%
FR_FR2		10	0	10	1	0	0.0%
FR_MULTIPLATE		10	0	10	1	0	0.0%
FR_FRRD		10	0	10	1	0	0.0%

JGU

Ceriodaphnia 7-d Survival and Reproduction Test — **Nautilus Environmental**

Analysis ID: 19-1711-6782 **Endpoint:** 7d Survival Rate **CETIS Version:** CETISv1.9.4
Analyzed: 15 Oct-21 15:36 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

7d Survival Rate Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
FR_UFR1		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
GH_ER2		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	1.0000	1.0000
CM_MC1		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
LC_SLC	XC	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
FR_FRABCH		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
FR_FRCP1		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	1.0000	1.0000
GH_FR1		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
GH_ERC		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
CM_MC2		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000
EV_MC2		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
EV_HC1		0.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
LC_DCDS		1.0000	0.0000	1.0000	0.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
LC_LC3		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
LC_LC5		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
LC_LCDSSLCC		1.0000	0.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
RG_MIDAG		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
FR_FR4		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
FR_FR2		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
FR_MULTIPLATE		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
FR_FRRD		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

7d Survival Rate Binomials

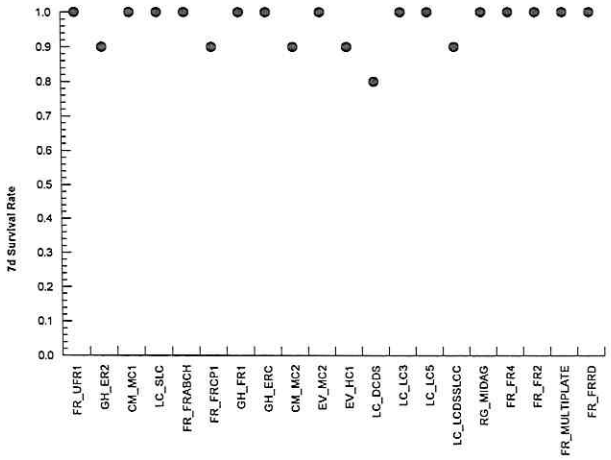
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
FR_UFR1		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
GH_ER2		1/1	1/1	1/1	1/1	1/1	1/1	1/1	0/1	1/1	1/1
CM_MC1		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
FR_FRABCH		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
FR_FRCP1		1/1	1/1	1/1	1/1	1/1	1/1	1/1	0/1	1/1	1/1
GH_FR1		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
GH_ERC		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
CM_MC2		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	0/1
EV_MC2		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
EV_HC1		0/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
LC_DCDS		1/1	0/1	1/1	0/1	1/1	1/1	1/1	1/1	1/1	1/1
LC_LC3		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
LC_LC5		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
LC_LCDSSLCC		1/1	0/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
RG_MIDAG		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
FR_FR4		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
FR_FR2		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
FR_MULTIPLATE		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
FR_FRRD		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1

Analyst: SAR QA: Oct-27/21

Ceriodaphnia 7-d Survival and Reproduction Test **Nautilus Environmental**

Analysis ID:	19-1711-6782	**Endpoint:**	7d Survival Rate	**CETIS Version:**	CETISv1.9.4
Analyzed:	15 Oct-21 15:36	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1

Graphics



 Analyst: SAH QA: Oct-27/21

Ceriodaphnia 7-d Survival and Reproduction Test

Nautilus Environmental

Analysis ID:	06-2483-2368	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.9.4
Analyzed:	15 Oct-21 15:36	**Analysis:**	Nonparametric-Control vs Treatments	**Status Level:**	1
Batch ID:	09-9771-6958	**Test Type:**	Reproduction-Survival (7d)	**Analyst:**	Sierra Klueppel
Start Date:	11 Aug-21 15:00	**Protocol:**	EC/EPS 1/RM/21	**Diluent:**	20% Perrier Water
Ending Date:	19 Aug-21 13:00	**Species:**	Ceriodaphnia dubia	**Brine:**	
Test Length:	7d 22h	**Taxon:**	Branchiopoda	**Source:**	In-House Culture **Age:** <24

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
FR_UFR1	01-9312-3340	10 Aug-21 08:54	11 Aug-21 11:15	30h (12.8 °C)	Teck Coal	
GH_ER2	03-3301-7818	10 Aug-21 10:45	11 Aug-21 11:15	28h (15.8 °C)		
CM_MC1	20-0000-6898	10 Aug-21 11:04	11 Aug-21 11:15	28h (14 °C)		
LC_SLC	07-8534-5756	10 Aug-21 09:09	11 Aug-21 11:15	30h (11.2 °C)		
FR_FRABCH	12-3746-7337	10 Aug-21 09:35	11 Aug-21 11:15	29h (13.6 °C)		
FR_FRCP1	02-0987-3329	10 Aug-21 09:55	11 Aug-21 11:15	29h (12.1 °C)		
GH_FR1	00-2216-4794	10 Aug-21 09:30	11 Aug-21 11:15	29h (15.3 °C)		
GH_ERC	02-8768-9833	10 Aug-21 11:45	11 Aug-21 11:15	27h (16.4 °C)		
CM_MC2	08-6405-5477	10 Aug-21 12:07	11 Aug-21 11:15	27h (14.9 °C)		
EV_MC2	09-5920-8643	10 Aug-21 10:44	11 Aug-21 11:15	28h (12.8 °C)		
EV_HC1	05-3700-4202	10 Aug-21 09:46	11 Aug-21 11:15	29h (13 °C)		
LC_DCDS	10-8734-0222	10 Aug-21 10:10	11 Aug-21 11:15	29h (10.8 °C)		
LC_LC3	07-4841-6068	10 Aug-21 09:30	11 Aug-21 11:15	29h (9.8 °C)		
LC_LC5	18-0478-8867	10 Aug-21 12:00	11 Aug-21 11:15	27h (11.8 °C)		
LC_LCDSSLCC	17-9964-8023	10 Aug-21 10:40	11 Aug-21 11:15	28h (12.1 °C)		
RG_MIDAG	04-6323-4167	10 Aug-21 11:30	11 Aug-21 11:15	28h (14.3 °C)		
FR_FR4	04-5681-6105	10 Aug-21 10:00	11 Aug-21 11:15	29h (15.6 °C)		
FR_FR2	16-7096-5741	10 Aug-21 10:54	11 Aug-21 11:15	28h (15.9 °C)		
FR_MULTIPLATE	08-7549-1660	10 Aug-21 11:51	11 Aug-21 11:15	27h (16.9 °C)		
FR_FRRD	03-6145-5105	10 Aug-21 08:25	11 Aug-21 11:15	31h (16.8 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_UFR1	Water Sample	Teck Coal	FR_UFR1_MON_2021-08-0	
GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-08-10_	
CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-08-10	
LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-08-10_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_MON_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_MON_2021-08	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-08-10_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-08-10	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-08-10	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2021_Q3_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2021_Q3_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-08-10	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-08-10_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-08-10_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	
RG_MIDAG	Water Sample	Teck Coal	RG_MIDAG_WS_2021-08-	
FR_FR4	Water Sample	Teck Coal	FR_FR4_WS_2021-08-10_	
FR_FR2	Water Sample	Teck Coal	FR_FR2_WS_2021-08-10_	
FR_MULTIPLATE	Water Sample	Teck Coal	FR_MULTIPLATE_WS_202	
FR_FRRD	Water Sample	Teck Coal	FR_FRRD_WS_2021-08-10	

Ceriodaphnia 7-d Survival and Reproduction Test — **Nautilus Environmental**

Analysis ID: 06-2483-2368 **Endpoint:** Reproduction **CETIS Version:** CETISv1.9.4
Analyzed: 15 Oct-21 15:36 **Analysis:** Nonparametric-Control vs Treatments **Status Level:** 1

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	FR_UFR1 passed reproduction	27.67%
		GH_ER2 passed reproduction	27.67%
		CM_MC1 passed reproduction	27.67%
		FR_FRABCH passed reproduction	27.67%
		FR_FRCP1 failed reproduction	27.67%
		GH_FR1 passed reproduction	27.67%
		GH_ERC passed reproduction	27.67%
		CM_MC2 passed reproduction	27.67%
		EV_MC2 passed reproduction	27.67%
		EV_HC1 passed reproduction	27.67%
		LC_DCDS passed reproduction	27.67%
		LC_LC3 passed reproduction	27.67%
		LC_LC5 passed reproduction	27.67%
		LC_LCDSSLCC passed reproduction	27.67%
		RG_MIDAG passed reproduction	27.67%
		FR_FR4 passed reproduction	27.67%
		FR_FR2 passed reproduction	27.67%
		FR_MULTIPLATE passed reproduction	27.67%
		FR_FRRD passed reproduction	27.67%

Steel Many-One Rank Sum Test

Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)
Site Control (LC_SLC)		FR_UFR1	90.5	70	2	18	CDF	0.5999	Non-Significant Effect
		GH_ER2	97.5	70	5	18	CDF	0.8217	Non-Significant Effect
		CM_MC1	98.5	70	3	18	CDF	0.8456	Non-Significant Effect
		FR_FRABCH	75	70	2	18	CDF	0.1146	Non-Significant Effect
		FR_FRCP1*	64	70	1	18	CDF	0.0136	Significant Effect
		GH_FR1	80.5	70	3	18	CDF	0.2449	Non-Significant Effect
		GH_ERC	82.5	70	2	18	CDF	0.3075	Non-Significant Effect
		CM_MC2	80.5	70	4	18	CDF	0.2449	Non-Significant Effect
		EV_MC2	114	70	3	18	CDF	0.9941	Non-Significant Effect
		EV_HC1	115	70	2	18	CDF	0.9956	Non-Significant Effect
		LC_DCDS	71.5	70	2	18	CDF	0.0636	Non-Significant Effect
		LC_LC3	77.5	70	2	18	CDF	0.1659	Non-Significant Effect
		LC_LC5	90	70	3	18	CDF	0.5814	Non-Significant Effect
		LC_LCDSSLCC	90	70	4	18	CDF	0.5814	Non-Significant Effect
		RG_MIDAG	98	70	5	18	CDF	0.8340	Non-Significant Effect
		FR_FR4	73	70	2	18	CDF	0.0827	Non-Significant Effect
		FR_FR2	80	70	4	18	CDF	0.2305	Non-Significant Effect
		FR_MULTIPLATE	83.5	70	2	18	CDF	0.3412	Non-Significant Effect
		FR_FRRD	71	70	2	18	CDF	0.0581	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	4.118	3.606	0.0052	Outlier Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	2023.66	106.508	19	3.705	1.8E-06	Significant Effect
Error	5173.9	28.7439	180			
Total	7197.55		199			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance Test	50.63	36.19	1.1E-04	Unequal Variances

Ceriodaphnia 7-d Survival and Reproduction Test **Nautilus Environmental**

Analysis ID: 06-2483-2368 **Endpoint:** Reproduction **CETIS Version:** CETISv1.9.4
Analyzed: 15 Oct-21 15:36 **Analysis:** Nonparametric-Control vs Treatments **Status Level:** 1

Distribution	Shapiro-Wilk W Normality Test	0.9202	0.9816	6.0E-09	Non-Normal Distribution

Reproduction Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
FR_UFR1		10	22.1	19.7	24.5	22	15	29	1.059	15.15%	0.00%
GH_ER2		10	21	15.48	26.52	24	0	26	2.44	36.75%	4.98%
CM_MC1		10	23	20.14	25.86	23	18	31	1.265	17.39%	-4.07%
LC_SLC	XC	10	23	19.93	26.07	24.5	14	29	1.358	18.67%	-4.07%
FR_FRABCH		10	19.1	16.66	21.54	19.5	13	23	1.08	17.87%	13.57%
FR_FRCP1		10	12.7	7.4	18	12.5	0	22	2.343	58.34%	42.53%
GH_FR1		10	19.1	16.35	21.85	17.5	15	26	1.215	20.12%	13.57%
GH_ERC		10	21.1	19.61	22.59	22	17	24	0.6574	9.85%	4.52%
CM_MC2		10	19.3	16.15	22.45	19.5	10	26	1.391	22.79%	12.67%
EV_MC2		10	25	20.95	29.05	24	14	33	1.789	22.63%	-13.12%
EV_HC1		10	23.2	17.98	28.42	24.5	3	28	2.308	31.47%	-4.98%
LC_DCDS		10	12.7	5.972	19.43	14.5	0	27	2.974	74.06%	42.53%
LC_LC3		10	20.2	18.39	22.01	21	14	23	0.8	12.52%	8.60%
LC_LC5		10	21.1	18	24.2	23	11	26	1.37	20.53%	4.52%
LC_LCDSSLCC		10	20.3	15.59	25.01	22	3	26	2.082	32.43%	8.14%
RG_MIDAG		10	22.2	19.08	25.32	22.5	15	30	1.381	19.67%	-0.45%
FR_FR4		10	15.9	11.05	20.75	17	4	26	2.142	42.60%	28.05%
FR_FR2		10	19.4	16.59	22.21	20	14	26	1.24	20.21%	12.22%
FR_MULTIPLATE		10	21	19.03	22.97	21	17	27	0.8692	13.09%	4.98%
FR_FRRD		10	16.9	12.7	21.1	18.5	2	23	1.859	34.78%	23.53%

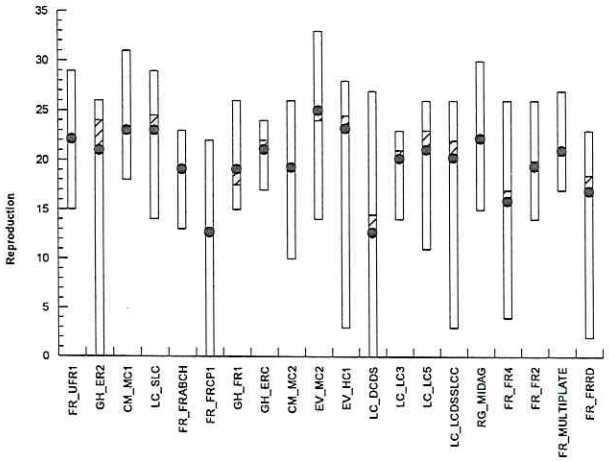
Reproduction Detail

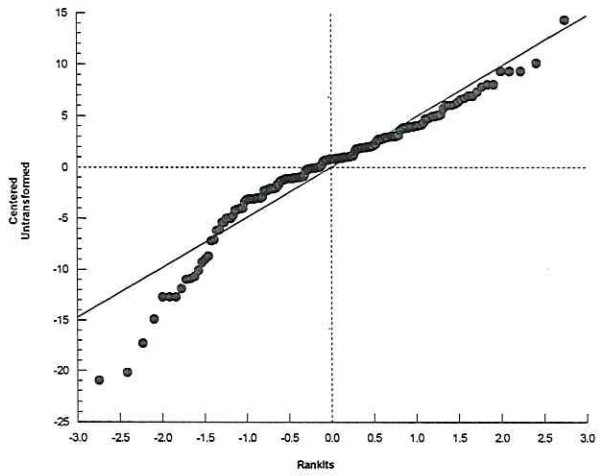
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
FR_UFR1		23	22	22	22	15	21	29	22	22	23
GH_ER2		25	18	26	22	25	24	24	0	24	22
CM_MC1		18	20	24	24	24	22	18	31	27	22
LC_SLC	XC	14	25	26	25	18	22	29	24	22	25
FR_FRABCH		23	22	18	21	13	18	23	16	21	16
FR_FRCP1		4	15	20	12	22	11	8	0	22	13
GH_FR1		16	16	17	19	17	26	15	18	24	23
GH_ERC		22	22	22	23	22	17	24	19	20	20
CM_MC2		17	22	18	19	20	24	20	26	17	10
EV_MC2		31	14	23	28	21	33	23	25	30	22
EV_HC1		3	24	24	27	27	25	27	28	23	24
LC_DCDS		19	0	14	0	17	11	27	22	2	15
LC_LC3		19	14	21	23	22	22	21	20	19	21
LC_LC5		19	26	23	11	23	20	23	24	18	24
LC_LCDSSLCC		26	3	18	21	23	24	25	19	21	23
RG_MIDAG		19	22	20	15	18	30	23	25	26	24
FR_FR4		21	18	5	26	4	15	17	20	17	16
FR_FR2		14	20	18	16	20	22	23	26	14	21
FR_MULTIPLATE		21	18	27	20	21	21	22	17	20	23
FR_FRRD		16	21	2	16	14	19	20	20	23	18

Ceriodaphnia 7-d Survival and Reproduction Test **Nautilus Environmental**

Analysis ID:	06-2483-2368	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.9.4
Analyzed:	15 Oct-21 15:36	**Analysis:**	Nonparametric-Control vs Treatments	**Status Level:**	1

Graphics





Ceriodaphnia 7-d Survival and Reproduction Test

Nautilus Environmental

Analysis ID:	13-4132-6153	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.9.4
Analyzed:	15 Oct-21 15:36	**Analysis:**	Nonparametric-Control vs Treatments	**Status Level:**	1
Batch ID:	09-9771-6958	**Test Type:**	Reproduction-Survival (7d)	**Analyst:**	Sierra Klueppel
Start Date:	11 Aug-21 15:00	**Protocol:**	EC/EPS 1/RM/21	**Diluent:**	20% Perrier Water
Ending Date:	19 Aug-21 13:00	**Species:**	Ceriodaphnia dubia	**Brine:**	
Test Length:	7d 22h	**Taxon:**	Branchiopoda	**Source:**	In-House Culture **Age:** <24

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
FR_UFR1	01-9312-3340	10 Aug-21 08:54	11 Aug-21 11:15	30h (12.8 °C)	Teck Coal	
GH_ER2	03-3301-7818	10 Aug-21 10:45	11 Aug-21 11:15	28h (15.8 °C)		
CM_MC1	20-0000-6898	10 Aug-21 11:04	11 Aug-21 11:15	28h (14 °C)		
LC_SLC	07-8534-5756	10 Aug-21 09:09	11 Aug-21 11:15	30h (11.2 °C)		
FR_FRABCH	12-3746-7337	10 Aug-21 09:35	11 Aug-21 11:15	29h (13.6 °C)		
FR_FRCP1	02-0987-3329	10 Aug-21 09:55	11 Aug-21 11:15	29h (12.1 °C)		
GH_FR1	00-2216-4794	10 Aug-21 09:30	11 Aug-21 11:15	29h (15.3 °C)		
GH_ERC	02-8768-9833	10 Aug-21 11:45	11 Aug-21 11:15	27h (16.4 °C)		
CM_MC2	08-6405-5477	10 Aug-21 12:07	11 Aug-21 11:15	27h (14.9 °C)		
EV_MC2	09-5920-8643	10 Aug-21 10:44	11 Aug-21 11:15	28h (12.8 °C)		
EV_HC1	05-3700-4202	10 Aug-21 09:46	11 Aug-21 11:15	29h (13 °C)		
LC_DCDS	10-8734-0222	10 Aug-21 10:10	11 Aug-21 11:15	29h (10.8 °C)		
LC_LC3	07-4841-6068	10 Aug-21 09:30	11 Aug-21 11:15	29h (9.8 °C)		
LC_LC5	18-0478-8867	10 Aug-21 12:00	11 Aug-21 11:15	27h (11.8 °C)		
LC_LCDSSLCC	17-9964-8023	10 Aug-21 10:40	11 Aug-21 11:15	28h (12.1 °C)		
RG_MIDAG	04-6323-4167	10 Aug-21 11:30	11 Aug-21 11:15	28h (14.3 °C)		
FR_FR4	04-5681-6105	10 Aug-21 10:00	11 Aug-21 11:15	29h (15.6 °C)		
FR_FR2	16-7096-5741	10 Aug-21 10:54	11 Aug-21 11:15	28h (15.9 °C)		
FR_MULTIPLATE	08-7549-1660	10 Aug-21 11:51	11 Aug-21 11:15	27h (16.9 °C)		
FR_FRRD	03-6145-5105	10 Aug-21 08:25	11 Aug-21 11:15	31h (16.8 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_UFR1	Water Sample	Teck Coal	FR_UFR1_MON_2021-08-0	
GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-08-10_	
CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-08-10	
LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-08-10_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_MON_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_MON_2021-08	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-08-10_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-08-10	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-08-10	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2021_Q3_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2021_Q3_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-08-10	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-08-10_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-08-10_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	
RG_MIDAG	Water Sample	Teck Coal	RG_MIDAG_WS_2021-08-	
FR_FR4	Water Sample	Teck Coal	FR_FR4_WS_2021-08-10_	
FR_FR2	Water Sample	Teck Coal	FR_FR2_WS_2021-08-10_	
FR_MULTIPLATE	Water Sample	Teck Coal	FR_MULTIPLATE_WS_202	
FR_FRRD	Water Sample	Teck Coal	FR_FRRD_WS_2021-08-10	

Ceriodaphnia 7-d Survival and Reproduction Test — **Nautilus Environmental**

Analysis ID: 13-4132-6153 **Endpoint:** Reproduction **CETIS Version:** CETISv1.9.4
Analyzed: 15 Oct-21 15:36 **Analysis:** Nonparametric-Control vs Treatments **Status Level:** 1

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C < T	FR_UFR1 passed reproduction	27.67%
		GH_ER2 passed reproduction	27.67%
		CM_MC1 passed reproduction	27.67%
		FR_FRABCH passed reproduction	27.67%
		FR_FRCP1 passed reproduction	27.67%
		GH_FR1 passed reproduction	27.67%
		GH_ERC passed reproduction	27.67%
		CM_MC2 passed reproduction	27.67%
		EV_MC2 passed reproduction	27.67%
		EV_HC1 passed reproduction	27.67%
		LC_DCDS passed reproduction	27.67%
		LC_LC3 passed reproduction	27.67%
		LC_LC5 passed reproduction	27.67%
		LC_LCDSSLCC passed reproduction	27.67%
		RG_MIDAG passed reproduction	27.67%
		FR_FR4 passed reproduction	27.67%
		FR_FR2 passed reproduction	27.67%
		FR_MULTIPLATE passed reproduction	27.67%
		FR_FRRD passed reproduction	27.67%

Steel Many-One Rank Sum Test

Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)
Site Control (LC_SLC)		FR_UFR1	119.5	70	2	18	CDF	0.9989	Non-Significant Effect
		GH_ER2	112.5	70	5	18	CDF	0.9912	Non-Significant Effect
		CM_MC1	111.5	70	3	18	CDF	0.9886	Non-Significant Effect
		FR_FRABCH	135	70	2	18	CDF	1.0000	Non-Significant Effect
		FR_FRCP1	146	70	1	18	CDF	1.0000	Non-Significant Effect
		GH_FR1	129.5	70	3	18	CDF	1.0000	Non-Significant Effect
		GH_ERC	127.5	70	2	18	CDF	0.9999	Non-Significant Effect
		CM_MC2	129.5	70	4	18	CDF	1.0000	Non-Significant Effect
		EV_MC2	96	70	3	18	CDF	0.7817	Non-Significant Effect
		EV_HC1	95	70	2	18	CDF	0.7525	Non-Significant Effect
		LC_DCDS	138.5	70	2	18	CDF	1.0000	Non-Significant Effect
		LC_LC3	132.5	70	2	18	CDF	1.0000	Non-Significant Effect
		LC_LC5	120	70	3	18	CDF	0.9991	Non-Significant Effect
		LC_LCDSSLCC	120	70	4	18	CDF	0.9991	Non-Significant Effect
		RG_MIDAG	112	70	5	18	CDF	0.9900	Non-Significant Effect
		FR_FR4	137	70	2	18	CDF	1.0000	Non-Significant Effect
		FR_FR2	130	70	4	18	CDF	1.0000	Non-Significant Effect
		FR_MULTIPLATE	126.5	70	2	18	CDF	0.9999	Non-Significant Effect
		FR_FRRD	139	70	2	18	CDF	1.0000	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	4.118	3.606	0.0052	Outlier Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	2023.66	106.508	19	3.705	1.8E-06	Significant Effect
Error	5173.9	28.7439	180			
Total	7197.55		199			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance Test	50.63	36.19	1.1E-04	Unequal Variances

Ceriodaphnia 7-d Survival and Reproduction Test **Nautilus Environmental**

Analysis ID: 13-4132-6153 **Endpoint:** Reproduction **CETIS Version:** CETISv1.9.4
Analyzed: 15 Oct-21 15:36 **Analysis:** Nonparametric-Control vs Treatments **Status Level:** 1

Distribution					
Shapiro-Wilk W Normality Test	0.9202	0.9816	6.0E-09	Non-Normal Distribution	

Reproduction Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
FR_UFR1		10	22.1	19.7	24.5	22	15	29	1.059	15.15%	0.00%
GH_ER2		10	21	15.48	26.52	24	0	26	2.44	36.75%	4.98%
CM_MC1		10	23	20.14	25.86	23	18	31	1.265	17.39%	-4.07%
LC_SLC	XC	10	23	19.93	26.07	24.5	14	29	1.358	18.67%	-4.07%
FR_FRABCH		10	19.1	16.66	21.54	19.5	13	23	1.08	17.87%	13.57%
FR_FRCP1		10	12.7	7.4	18	12.5	0	22	2.343	58.34%	42.53%
GH_FR1		10	19.1	16.35	21.85	17.5	15	26	1.215	20.12%	13.57%
GH_ERC		10	21.1	19.61	22.59	22	17	24	0.6574	9.85%	4.52%
CM_MC2		10	19.3	16.15	22.45	19.5	10	26	1.391	22.79%	12.67%
EV_MC2		10	25	20.95	29.05	24	14	33	1.789	22.63%	-13.12%
EV_HC1		10	23.2	17.98	28.42	24.5	3	28	2.308	31.47%	-4.98%
LC_DCDS		10	12.7	5.972	19.43	14.5	0	27	2.974	74.06%	42.53%
LC_LC3		10	20.2	18.39	22.01	21	14	23	0.8	12.52%	8.60%
LC_LC5		10	21.1	18	24.2	23	11	26	1.37	20.53%	4.52%
LC_LCDSSLCC		10	20.3	15.59	25.01	22	3	26	2.082	32.43%	8.14%
RG_MIDAG		10	22.2	19.08	25.32	22.5	15	30	1.381	19.67%	-0.45%
FR_FR4		10	15.9	11.05	20.75	17	4	26	2.142	42.60%	28.05%
FR_FR2		10	19.4	16.59	22.21	20	14	26	1.24	20.21%	12.22%
FR_MULTIPLATE		10	21	19.03	22.97	21	17	27	0.8692	13.09%	4.98%
FR_FRRD		10	16.9	12.7	21.1	18.5	2	23	1.859	34.78%	23.53%

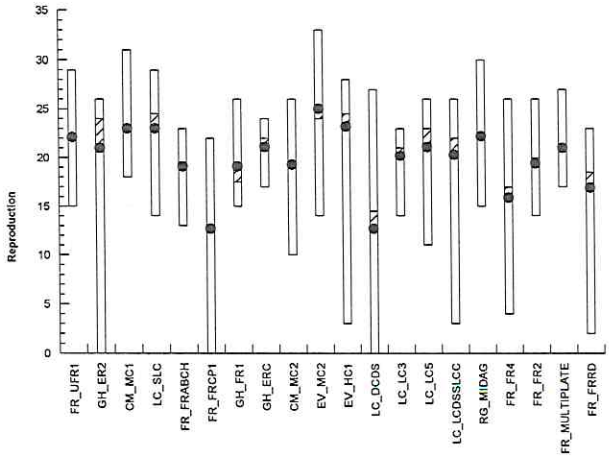
Reproduction Detail

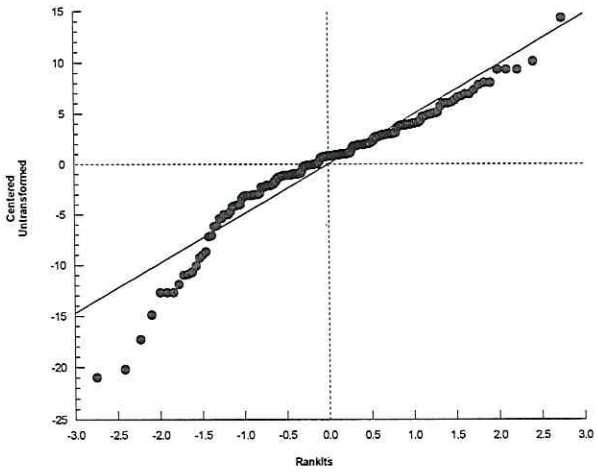
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
FR_UFR1		23	22	22	22	15	21	29	22	22	23
GH_ER2		25	18	26	22	25	24	24	0	24	22
CM_MC1		18	20	24	24	24	22	18	31	27	22
LC_SLC	XC	14	25	26	25	18	22	29	24	22	25
FR_FRABCH		23	22	18	21	13	18	23	16	21	16
FR_FRCP1		4	15	20	12	22	11	8	0	22	13
GH_FR1		16	16	17	19	17	26	15	18	24	23
GH_ERC		22	22	22	23	22	17	24	19	20	20
CM_MC2		17	22	18	19	20	24	20	26	17	10
EV_MC2		31	14	23	28	21	33	23	25	30	22
EV_HC1		3	24	24	27	27	25	27	28	23	24
LC_DCDS		19	0	14	0	17	11	27	22	2	15
LC_LC3		19	14	21	23	22	22	21	20	19	21
LC_LC5		19	26	23	11	23	20	23	24	18	24
LC_LCDSSLCC		26	3	18	21	23	24	25	19	21	23
RG_MIDAG		19	22	20	15	18	30	23	25	26	24
FR_FR4		21	18	5	26	4	15	17	20	17	16
FR_FR2		14	20	18	16	20	22	23	26	14	21
FR_MULTIPLATE		21	18	27	20	21	21	22	17	20	23
FR_FRRD		16	21	2	16	14	19	20	20	23	18

Ceriodaphnia 7-d Survival and Reproduction Test — **Nautilus Environmental**

Analysis ID:	13-4132-6153	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.9.4
Analyzed:	15 Oct-21 15:36	**Analysis:**	Nonparametric-Control vs Treatments	**Status Level:**	1

Graphics





APPENDIX B – *Pseudokirchneriella subcapitata* Toxicity Test Data

Pseudokirchneriella subcapitata Summary Sheet

Client: TECK
Work Order No.: 211566

Start Date: Aug. 12/21 @1500h
Set up by: SAK

Sample Information:

Sample ID: various - see below
Sample Date: August. 10/21
Date Received: August. 11/21
Sample Volume: various

Test Organism Information:

Culture Date: August. 6/21
Age of culture (Day 0): 6d

Zinc Reference Toxicant Results:

Reference Toxicant ID: SC218
Stock Solution ID: 21Zn01
Date Initiated: Aug. 4/21

72-h IC50 (95% CL): 28.3 (24.7 - 32.2) µg/L Zn

72-h IC50 Reference Toxicant Mean and Range: 32.0 (26.8 - 38.3) µg/L Zn CV (%): 9

Test Results:

	Cell Yield (Mean± SD)
Negative Control	33.1 ± 3.5
FR-UFR1	95.8 ± 12.4
GH-ER2	97.4 ± 8.4
CM-MC1	100.4 ± 8.7
LC-SLC	99.4 ± 9.2
FR-FRABCH	83.8 ± 7.2 c,d
FR-FRCP1	89.8 ± 11.6
GH-FR1	87.0 ± 10.8
GH-ERC	75.0 ± 7.5 a,b,c,d

All samples are significantly greater than the lab control.
Results that are significantly lower than

a = FR-UFR1
b = GH-ER2
c = CM-MC1
d = LC-SLC

Reviewed by: JGL

Date reviewed: Oct. 26/21

Pseudokirchneriella subcapitata Summary Sheet

Client: TECK
Work Order No.: 211566

Start Date: Aug. 12/21 @1500h
Set up by: SAK

Sample Information:

Sample ID: various - see below
Sample Date: August. 10/21
Date Received: August. 11/21
Sample Volume: various

Test Organism Information:

Culture Date: August. 6/21
Age of culture (Day 0): 6d

Zinc Reference Toxicant Results:

Reference Toxicant ID: SC218
Stock Solution ID: 21Zn01
Date Initiated: Aug. 4/21

72-h IC50 (95% CL): 28.3 (24.7 – 32.2) µg/L Zn

72-h IC50 Reference Toxicant Mean and Range: 32.0 (26.8 – 38.3) µg/L Zn CV (%): 9

Test Results:

All samples are significantly greater than the lab control.
Results that are significantly lower than
a = FR-UFR1
b = GH-ERZ
c = CM-MC1
d = LC-SLC

	Cell Yield (Mean ± SD)
Negative Control	33.1 ± 3.5
CM-MC2	89.0 ± 6.7
EV-MC2	94.8 ± 8.1
EV-HC1	74.5 ± 6.2 a,b,c,d
LC-DCDS	68.5 ± 7.4 a,b,c,d
LC-LC3	80.8 ± 5.6 a,b,c,d
LC-LC5	91.2 ± 10.9
LC-LCDSSLCC	85.8 ± 5.0
	±

Reviewed by: _____ Date reviewed: _____

72-h Algal Growth Inhibition Toxicity Test
Water Quality Measurements

Client : TECK
Setup by: SAK
Sample ID: Various
Test Date/Time: Aug. 12/21 @ 1500h
Work Order No.: 21566
CER #: 4
Test Species: *Pseudokirchneriella subcapitata*

Culture Date: August 6/21
Age of Culture: 6 d
Culture Health: Good
Culture Count: 1 295 2 275
Average: 285
Culture Cell Density (c1): 285×10^4 cells/mL

v1 = 220,000 cells/ml x 60 ml / (c1) 285×10^4 cells/ml = 4.6 mL

Time Zero Counts: 1 21 2 23
Average: 22
No. of Cells/mL: 22×10^4 cells/mL
Initial Density: # cells/mL ÷ 220 µL x 10 µL = ~~10682~~ 100000 cells/mL

Concentration %(v/v)	Water Quality		Incubator Temperature (°C)				Microplates rotated 2X per day?			
	pH	Temp (°C)								
	0 h	0 h	0 h	24 h	48 h	72 h	0 h	24 h	48 h	72 h
Control	6.9	24.0	25.0	25.0	25.0	25.0	✓	✓	✓	✓
FR-UFR1	8.0	↓	↓	↓	↓	↓	↓	↓	↓	↓
GH-ERZ	8.0	↓	↓	↓	↓	↓	↓	↓	↓	↓
CM-MC1	8.0	↓	↓	↓	↓	↓	↓	↓	↓	↓
LC-SLC	8.0	↓	↓	↓	↓	↓	↓	↓	↓	↓
FR-FRBLH	8.1	↓	↓	↓	↓	↓	↓	↓	↓	↓
FR-FRCP1	8.2	↓	↓	↓	↓	↓	↓	↓	↓	↓
GH-FR1	8.1	23.0	↓	↓	↓	↓	↓	↓	↓	↓
GH-ERC	8.0	24.0	↓	↓	↓	↓	↓	↓	↓	↓
CM-MC2	8.2	24.0	↓	↓	↓	↓	↓	↓	↓	↓
Initials	SAK	SAK	SAK	SAK	JCL	RZS	SAK	SAK	JCL	RZS

Initial control pH: Well 1: 6.9 Well 2: 6.9
Final control pH: Well 1: 7.0 Well 2: 7.0
Light intensity (lux): 4030 Date measured: Aug. 12/21
Thermometer: 1 Light meter: 1 pH meter/probe: 1 / 1
Sample Description: refer to COC
Comments:
Reviewed: JCL Date reviewed: Oct. 26/21

72-h Algal Growth Inhibition Toxicity Test
Water Quality Measurements

Client : TECK

Setup by: SAM

Sample ID: Various

Test Date/Time: Aug. 12/21 @ 1500 h

Work Order No.: 211566

CER #: 4

Test Species: *Pseudokirchneriella subcapitata*

Culture Date: Aug. 6/21

Age of Culture: 6 d

Culture Health: Good

Culture Count: 1 2955 2 2775

Average: 285

Culture Cell Density (c1): 285×10^4 cells/mL

v1 = $\frac{220{,}000 \text{ cells/ml} \times 60 \text{ ml}}{(c1) \quad 285 \times 10^4 \quad \text{cells/ml}}$ = 4.6 mL

Time Zero Counts: 1 21 2 23

Average: 22

No. of Cells/mL: 22×10^4 cells/mL

Initial Density: # cells/mL ÷ 220 µL x 10 µL = 10000 cells/mL

Concentration %(v/v)	Water Quality		Incubator Temperature (°C)				Microplates rotated 2X per day?			
	pH	Temp (°C)								
	0 h	0 h	0 h	24 h	48 h	72 h	0 h	24 h	48 h	72 h
Control	6.9	24.0	25.0	25.0	25.0	25.0	✓	✓	✓	✓
EV-MC2	8.1	↓	↓	↓	↓	↓	↓	↓	↓	↓
EV-HCl	8.1									
LC-DCDS	8.2									
LC-LC3	7.9									
LC-LC5	8.2									
LC-LCDSS LCC	8.1	↓	↓	↓	↓	↓	↓	↓	↓	↓
Initials	SAM	SAM	SAM	SAM	JGL	RZS	SAM	SAM	JGL	RZS

Initial control pH: Well 1: 6.9 Well 2: 6.9

Final control pH: Well 1: 7.0 Well 2: 7.0

Light intensity (lux): 4030 Date measured: Aug. 12/21

Thermometer: 1 Light meter: 1 pH meter/probe: 1 / 1

Sample Description: refer to COC

Comments:

Reviewed: JGL Date reviewed: Oct. 26/21

Pseudokirchneriella subcapitata Toxicity Test Data Sheet
72-h Algal Cell Counts

Client: TECK
Work Order #: Z11566
Sample ID: various
%(v/v)

Start Date/Time: Aug. 12/21 @1500h
Termination Date: Aug. 15/21 @1500h
Test set up by: SAH

Concentration	Rep	Count 1	Count 2	Count 3	Count 4	Comments	Initials
Control	A	34					SAH
	B	33					
	C	39					
	D	34					
	E	29					
	F	38					
	G	30					
	H	36					
FR_UFR1	A	114					
	B	91					
	C	93					
	D	80					
	E A	103					
	F B	87					
	G C	92					
	H D	114					
GH_ER2	A	99					
	B	112					
	C	92					
	D	89					
	E A	94					
	F B	97					
	G C	94					
	H D	110					
CM_MCI	A	102					
	B	100					
	C	97					
	D	120					
	E A	93					
	F B	98					
	G C	94					
	H D	107					
	A						
	B						
	C						
	D						

Comments:

Reviewed by: JGH

Date Reviewed: Oct. 26/21

Pseudokirchneriella subcapitata Toxicity Test Data Sheet
72-h Algal Cell Counts

Client: TECC
Work Order #: 211566
Sample ID: various
%(v/v)

Start Date/Time: Aug. 12/21 @ 1500h
Termination Date: Aug. 15/21 @ 1500h
Test set up by: SAH

Concentration	Rep	Count 1	Count 2	Count 3	Count 4	Comments	Initials
~~Control~~ LC-SLC	A	92					SAH
	B	106					
	C	91					
	D	105					
	E	104					
	F	96					
	G	92					
	H	117					
FR-FRABCH	A	82					
	B	92					
	C	76					
	D	89					
FR-FRCPI	A	89					
	B	76					
	C	94					
	D	104					
GH-FRI	A	76					
	B	99					
	C	82					
	D	95					
GH-ERL	A	65					
	B	78					
	C	82					
	D	79					
CM-MC2	A	89					
	B	81					
	C	96					
	D	94					
EV-MC2	A	85					
	B	94					
	C	101					
	D	103					
EV-HCI	A	74					
	B	84					
	C	75					
	D	69					

Comments:

Reviewed by: JCh Date Reviewed: Oct. 26/21

Pseudokirchneriella subcapitata Toxicity Test Data Sheet
72-h Algal Cell Counts

Client: TEAM
Work Order #: 211566
Sample ID: various
%(v/v)

Start Date/Time: Aug. 12/21 @ 1500h
Termination Date: Aug. 15/21 @ 1500h
Test set up by: SAH

Concentration	Rep	Count 1	Count 2	Count 3	Count 4	Comments	Initials
Control	A						
	B						
	C						
	D						
	E						
	F						
	G						
	H						
LC-DCDS	A	66					SAH
	B	69					
	C	80					
	D	63					
LC-LC3	A	85					
	B	77					
	C	77					
	D	88					
LC-LC5	A	84					
	B	83					
	C	106					
	D	96					
LC-LCDSLCC	A	82					
	B	72					
	C	90					
	D	83					
	A						
	B						
	C						
	D						
	A						
	B						
	C						
	D						
	A						
	B						
	C						
	D						

Comments:

Reviewed by: JCh Date Reviewed: Oct. 26/21

Pseudokirchneriella subcapitata Algal Counts

Client: TECK
WO#: 211566
Sample ID: various

Start Date/Time: 12-Aug-21 @1500h
Termination Date/Time: 15-Aug-21 @1500h

Initial Cell Density: 10000 cell/mL

220000
0.22
0.01
10000

Concentration %(v/v)	Rep	Count 1 (x 10^4)	Count 2 (x 10^4)	Count 3 (x 10^4)	Count 4 (x 10^4)	Mean (x 10^4)	Cell Yield (x 10^4) cell/mL		
Control	A	34				34	33.0	mean	33.1
	B	33				33	32.0	SD	3.522884
	C	39				39	38.0	CV	10.63512
	D	34				34	33.0		
	E	29				29	28.0		
	F	38				38	37.0		
	G	30				30	29.0		
	H	36				36	35.0		
FR_UFR1	A	114				114	113.0		
	B	91				91	90.0		
	C	93				93	92.0		
	D	80				80	79.0		
	E	103				103	102.0		
	F	87				87	86.0		
	G	92				92	91.0		
	H	114				114	113.0		
GH_ER2	A	99				99	98.0		
	B	112				112	111.0		
	C	92				92	91.0		
	D	89				89	88.0		
	E	94				94	93.0		
	F	97				97	96.0		
	G	94				94	93.0		
	H	110				110	109.0		
CM_MC1	A	102				102	101.0		
	B	100				100	99.0		
	C	97				97	96.0		
	D	120				120	119.0		
	E	93				93	92.0		
	F	98				98	97.0		
	G	94				94	93.0		
	H	107				107	106.0		
	A					#DIV/0!	#DIV/0!		
	B					#DIV/0!	#DIV/0!		
	C					#DIV/0!	#DIV/0!		
	D					#DIV/0!	#DIV/0!		

Reviewed by: JGL

Date reviewed: Oct. 26/21

Pseudokirchneriella subcapitata Algal Counts

Client: TECK
WO#: 211566
Sample ID: various

Start Date/Time: 12-Aug-21 @1500h
Termination Date/Time: 15-Aug-21 @1500h

Initial Cell Density: 10000 cell/mL

									220000
									0.22
									0.01
Concentration	Rep	Count 1 ($\times 10^4$)	Count 2 ($\times 10^4$)	Count 3 ($\times 10^4$)	Count 4 ($\times 10^4$)	Mean ($\times 10^4$)	Cell Yield ($\times 10^4$) cell/mL		10000
LC_SLC	A	92				92	91.0	mean	99.4
	B	106				106	105.0	SD	9.179753
	C	91				91	90.0	CV	9.237487
	D	105				105	104.0		
	E	104				104	103.0		
	F	96				96	95.0		
	G	92				92	91.0		
	H	117				117	116.0		
FR_FRABCH	A	82				82	81.0		
	B	92				92	91.0		
	C	76				76	75.0		
	D	89				89	88.0		
FR_FRCP1	A	89				89	88.0		
	B	76				76	75.0		
	C	94				94	93.0		
	D	104				104	103.0		
GH-FR1	A	76				76	75.0		
	B	99				99	98.0		
	C	82				82	81.0		
	D	95				95	94.0		
GH_ERC	A	65				65	64.0		
	B	78				78	77.0		
	C	82				82	81.0		
	D	79				79	78.0		
CM_MC2	A	89				89	88.0		
	B	81				81	80.0		
	C	96				96	95.0		
	D	94				94	93.0		
EV_MC2	A	85				85	84.0		
	B	94				94	93.0		
	C	101				101	100.0		
	D	103				103	102.0		
EV__HC1	A	74				74	73.0		
	B	84				84	83.0		
	C	75				75	74.0		
	D	69				69	68.0		

Reviewed by: JCu

Date reviewed: Oct. 26/21

Pseudokirchneriella subcapitata Algal Counts

Client: TECK
WO#: 211566
Sample ID: various

Start Date/Time: 12-Aug-21 @1500h
Termination Date/Time: 15-Aug-21 @1500h

Initial Cell Density: 10000 cell/mL

									220000
									0.22
									0.01
Concentration	Rep	Count 1 ($x 10^4$)	Count 2 ($x 10^4$)	Count 3 ($x 10^4$)	Count 4 ($x 10^4$)	Mean ($x 10^4$)	Cell Yield ($x 10^4$) cell/mL		10000
	A					#DIV/0!	#DIV/0!	mean	#DIV/0!
	B					#DIV/0!	#DIV/0!	SD	#DIV/0!
	C					#DIV/0!	#DIV/0!	CV	#DIV/0!
	D					#DIV/0!	#DIV/0!		
	E					#DIV/0!	#DIV/0!		
	F					#DIV/0!	#DIV/0!		
	G					#DIV/0!	#DIV/0!		
	H					#DIV/0!	#DIV/0!		
LC_DCDS	A	66				66	65.0		
	B	69				69	68.0		
	C	80				80	79.0		
	D	63				63	62.0		
LC_LC3	A	85				85	84.0		
	B	77				77	76.0		
	C	77				77	76.0		
	D	88				88	87.0		
LC_LC5	A	84				84	83.0		
	B	83				83	82.0		
	C	106				106	105.0		
	D	96				96	95.0		
LC_LCDSSLC	A	82				82	81.0		
	B	92				92	91.0		
	C	90				90	89.0		
	D	83				83	82.0		
	A					#DIV/0!	#DIV/0!		
	B					#DIV/0!	#DIV/0!		
	C					#DIV/0!	#DIV/0!		
	D					#DIV/0!	#DIV/0!		
	A					#DIV/0!	#DIV/0!		
	B					#DIV/0!	#DIV/0!		
	C					#DIV/0!	#DIV/0!		
	D					#DIV/0!	#DIV/0!		
	A					#DIV/0!	#DIV/0!		
	B					#DIV/0!	#DIV/0!		
	C					#DIV/0!	#DIV/0!		
	D					#DIV/0!	#DIV/0!		

Reviewed by: OGu

Date reviewed: Oct - 26/21

CETIS Summary Report

EC Alga Growth Inhibition Test — **Nautilus Environmental**

Batch ID:	20-0248-6050	**Test Type:**	Cell Growth	**Analyst:**	Sierra Klueppel
Start Date:	12 Aug-21 15:00	**Protocol:**	EC/EPS 1/RM/25	**Diluent:**	Deionized Water + nutrients
Ending Date:	15 Aug-21 15:00	**Species:**	Pseudokirchneriella subcapitata	**Brine:**	
Test Length:	72h	**Taxon:**	Chlorophyta	**Source:**	In-House Culture **Age:** 6d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
Lab Control	00-3568-3085	12 Aug-21	12 Aug-21	15h	Teck Coal	
FR_UFR1	01-9312-3340	10 Aug-21 08:54 ✓	11 Aug-21 11:15 ✓	54h (12.8 °C) ✓		
GH_ER2	03-3301-7818	10 Aug-21 10:45 ✓	11 Aug-21 11:15	52h (15.8 °C) ✓		
CM_MC1	20-0000-6898	10 Aug-21 11:04 ✓	11 Aug-21 11:15	52h (14 °C) ✓		
LC_SLC	07-8534-5756	10 Aug-21 09:09 ✓	11 Aug-21 11:15	54h (11.2 °C) ✓		
FR_FRABCH	12-3746-7337	10 Aug-21 09:35 ✓	11 Aug-21 11:15	53h (13.6 °C) ✓		
FR_FRCP1	02-0987-3329	10 Aug-21 09:55 ✓	11 Aug-21 11:15	53h (12.1 °C) ✓		
GH_FR1	00-2216-4794	10 Aug-21 09:30 ✓	11 Aug-21 11:15	53h (15.3 °C) ✓		
GH_ERC	02-8768-9833	10 Aug-21 11:45 ✓	11 Aug-21 11:15	51h (16.4 °C) ✓		
CM_MC2	08-6405-5477	10 Aug-21 12:07 ✓	11 Aug-21 11:15	51h (14.9 °C) ✓		
EV_MC2	09-5920-8643	10 Aug-21 10:44 ✓	11 Aug-21 11:15	52h (12.8 °C) ✓		
EV_HC1	05-3700-4202	10 Aug-21 09:46 ✓	11 Aug-21 11:15	53h (13 °C) ✓		
LC_DCDS	10-8734-0222	10 Aug-21 10:10 ✓	11 Aug-21 11:15	53h (10.8 °C) ✓		
LC_LC3	07-4841-6068	10 Aug-21 09:30 ✓	11 Aug-21 11:15	53h (9.8 °C) ✓		
LC_LC5	18-0478-8867	10 Aug-21 12:00 ✓	11 Aug-21 11:15	51h (11.8 °C) ✓		
LC_LCDSSLCC	17-9964-8023	10 Aug-21 10:40 ✓	11 Aug-21 11:15	52h (12.1 °C) ✓		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
Lab Control	Water Sample	Teck Coal	Lab Control	
FR_UFR1	Water Sample	Teck Coal	FR_UFR1_MON_2021-08-0	
GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-08-10_	
CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-08-10	
LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-08-10_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_MON_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_MON_2021-08	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-08-10_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-08-10	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-08-10	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2021_Q3_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2021_Q3_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-08-10	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-08-10_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-08-10_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	

SIngle Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	CM_MC2 passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	CM_MC1 passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	LC_SLC passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	FR_FRABCH passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	Lab Control passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	GH_FR1 passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	GH_ERC passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	GH_ER2 passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	FR_UFR1 passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	LC_LCDSSLCC passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	EV_MC2 passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	EV_HC1 passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	LC_DCDS passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	LC_LC3 passed cell yield	1

EC Alga Growth Inhibition Test **Nautilus Environmental**

SIngle Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	LC_LC5 passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	FR_FRCP1 passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	LC_LC3 passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	FR_FRCP1 passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	CM_MC2 passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	CM_MC1 passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	GH_ERC passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	LC_DCDS passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	FR_UFR1 passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	FR_FRABCH passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	LC_SLC passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	EV_HC1 passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	GH_ER2 passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	LC_LC5 passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	EV_MC2 passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	LC_LCDSSLCC passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	GH_FR1 passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	Lab Control passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	LC_LC3 passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	FR_FRCP1 passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	EV_HC1 passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	GH_FR1 passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	LC_DCDS passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	CM_MC2 passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	LC_SLC passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	Lab Control passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	FR_FRABCH passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	EV_MC2 passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	LC_LCDSSLCC passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	CM_MC1 passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	GH_ER2 passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	GH_ERC passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	LC_LC5 passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	FR_UFR1 passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	GH_FR1 passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	LC_LC3 passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	LC_LC5 passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	LC_SLC passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	EV_HC1 passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	FR_FRCP1 passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	GH_ER2 passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	Lab Control passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	GH_ERC passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	EV_MC2 passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	LC_LCDSSLCC passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	FR_UFR1 passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	LC_DCDS passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	CM_MC2 passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	CM_MC1 passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	FR_FRABCH passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	LC_SLC passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	LC_LC3 passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	Lab Control passed cell yield	1

EC Alga Growth Inhibition Test **Nautilus Environmental**

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	GH_FR1 passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	GH_ER2 passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	FR_FRCP1 passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	FR_FRABCH passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	EV_MC2 passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	GH_ERC passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	EV_HC1 passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	FR_UFR1 passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	LC_LCDSSLCC passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	LC_LC5 passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	LC_DCDS passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	CM_MC2 passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	CM_MC1 passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	FR_UFR1 passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	Lab Control passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	LC_LCDSSLCC passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	FR_FRCP1 passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	GH_FR1 passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	CM_MC2 passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	LC_LC3 passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	EV_MC2 passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	LC_SLC passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	CM_MC1 passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	EV_HC1 passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	LC_DCDS passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	GH_ERC passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	LC_LC5 passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	GH_ER2 passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	FR_FRABCH passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	LC_LC3 passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	CM_MC1 passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	GH_FR1 passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	GH_ERC passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	LC_LC5 passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	FR_FRCP1 passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	GH_ER2 passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	FR_FRABCH passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	LC_DCDS passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	LC_SLC passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	CM_MC2 passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	EV_MC2 passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	LC_LCDSSLCC passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	FR_UFR1 passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	EV_HC1 passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	Lab Control passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	FR_UFR1 passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	FR_FRABCH passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	CM_MC1 passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	Lab Control passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	GH_FR1 passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	LC_SLC passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	GH_ER2 passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	LC_DCDS passed cell yield	1

EC Alga Growth Inhibition Test — Nautilus Environmental

SIngle Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	LC_LC5 passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	CM_MC2 passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	FR_FRCP1 passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	LC_LC3 passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	GH_ERC passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	LC_LCDSSLCC passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	EV_HC1 passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	EV_MC2 passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	CM_MC1 passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	CM_MC2 passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	GH_ERC passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	LC_SLC passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	GH_ER2 passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	EV_MC2 passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	LC_LC3 passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	FR_UFR1 passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	FR_FRABCH passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	Lab Control passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	LC_LC5 passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	GH_FR1 passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	LC_LCDSSLCC passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	LC_DCDS passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	EV_HC1 passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	FR_FRCP1 passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	FR_UFR1 passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	CM_MC1 passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	EV_HC1 passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	FR_FRABCH passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	EV_MC2 passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	LC_SLC passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	Lab Control passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	LC_LC3 passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	GH_ERC passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	GH_ER2 passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	FR_FRCP1 passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	CM_MC2 passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	LC_LC5 passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	GH_FR1 passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	LC_DCDS passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	LC_LCDSSLCC passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	LC_SLC passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	LC_DCDS passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	CM_MC1 passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	GH_ER2 passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	LC_LC5 passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	GH_FR1 passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	LC_LCDSSLCC passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	CM_MC2 passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	LC_LC3 passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	Lab Control passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	EV_HC1 passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	EV_MC2 passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	FR_FRCP1 passed cell yield	1

EC Alga Growth Inhibition Test **Nautilus Environmental**

SIngle Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	FR_UFR1 passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	FR_FRABCH passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	GH_ERC passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	LC_LC3 passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	LC_DCDS passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	LC_LC5 passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	CM_MC1 passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	GH_ER2 passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	GH_ERC passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	Lab Control passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	FR_FRCP1 passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	FR_UFR1 passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	EV_MC2 passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	FR_FRABCH passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	EV_HC1 passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	LC_LCDSSLCC passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	LC_SLC passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	GH_FR1 passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	CM_MC2 passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	LC_LCDSSLCC passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	GH_ERC passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	CM_MC2 passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	LC_LC3 passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	Lab Control passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	GH_FR1 passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	LC_LC5 passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	GH_ER2 passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	FR_UFR1 passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	EV_MC2 passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	FR_FRABCH passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	LC_DCDS passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	LC_SLC passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	EV_HC1 passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	FR_FRCP1 passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	CM_MC1 passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	GH_ERC passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	FR_UFR1 passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	Lab Control passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	EV_HC1 passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	LC_DCDS passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	LC_LCDSSLCC passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	GH_FR1 passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	EV_MC2 passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	LC_LC3 passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	CM_MC2 passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	FR_FRABCH passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	LC_LC5 passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	LC_SLC passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	CM_MC1 passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	FR_FRCP1 passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	GH_ER2 passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	LC_LC5 passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	LC_DCDS passed cell yield	1

EC Alga Growth Inhibition Test
Nautilus Environmental

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	EV_HC1 passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	EV_MC2 passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	LC_LC3 passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	CM_MC2 passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	GH_FR1 passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	LC_LCDSSLCC passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	FR_UFR1 passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	FR_FRCP1 passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	Lab Control passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	FR_FRABCH passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	LC_SLC passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	CM_MC1 passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	GH_ER2 passed cell yield	1
16-4911-9152	Cell Yield	Dunnett Multiple Comparison Test	1.0000	GH_ERC passed cell yield	1

Cell Yield Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
Lab Control	N	8	33.12	30.18	36.07	28	38	1.246	3.523	10.64%	0.00%
FR_UFR1		8	95.75	85.37	106.1	79	113	4.391	12.42	12.97%	-189.06%
GH_ER2		8	97.38	90.38	104.4	88	111	2.958	8.366	8.59%	-193.96%
CM_MC1		8	100.4	93.06	107.7	92	119	3.093	8.749	8.72%	-203.02%
LC_SLC		8	99.38	91.7	107	90	116	3.246	9.18	9.24%	-200.00%
FR_FRABCH		4	83.75	72.32	95.18	75	91	3.591	7.182	8.58%	-152.83%
FR_FRCP1		4	89.75	71.22	108.3	75	103	5.822	11.64	12.97%	-170.94%
GH_FR1		4	87	69.81	104.2	75	98	5.401	10.8	12.42%	-162.64%
GH_ERC		4	75	63.02	86.98	64	81	3.764	7.528	10.04%	-126.42%
CM_MC2		4	89	78.37	99.63	80	95	3.342	6.683	7.51%	-168.68%
EV_MC2		4	94.75	81.8	107.7	84	102	4.07	8.139	8.59%	-186.04%
EV_HC1		4	74.5	64.56	84.44	68	83	3.122	6.245	8.38%	-124.91%
LC_DCDS		4	68.5	56.7	80.3	62	79	3.708	7.416	10.83%	-106.79%
LC_LC3		4	80.75	71.81	89.69	76	87	2.81	5.62	6.96%	-143.77%
LC_LC5		4	91.25	73.9	108.6	82	105	5.452	10.9	11.95%	-175.47%
LC_LCDSSLCC		4	85.75	77.81	93.69	81	91	2.496	4.992	5.82%	-158.87%

Cell Yield Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
Lab Control	N	33	32	38	33	28	37	29	35
FR_UFR1		113	90	92	79	102	86	91	113
GH_ER2		98	111	91	88	93	96	93	109
CM_MC1		101	99	96	119	92	97	93	106
LC_SLC		91	105	90	104	103	95	91	116
FR_FRABCH		81	91	75	88				
FR_FRCP1		88	75	93	103				
GH_FR1		75	98	81	94				
GH_ERC		64	77	81	78				
CM_MC2		88	80	95	93				
EV_MC2		84	93	100	102				
EV_HC1		73	83	74	68				
LC_DCDS		65	68	79	62				
LC_LC3		84	76	76	87				
LC_LC5		83	82	105	95				
LC_LCDSSLCC		81	91	89	82				

Analyst: SM QA: Jon Oct 26/21

CETIS Analytical Report

Report Date: 15 Oct-21 16:04 (p 1 of 30)
Test Code/ID: 211566 / 14-4817-6977

EC Alga Growth Inhibition Test — **Nautilus Environmental**

Analysis ID:	16-4911-9152	**Endpoint:**	Cell Yield	**CETIS Version:**	CETISv1.9.4
Analyzed:	07 Oct-21 17:30	**Analysis:**	Parametric-Control vs Treatments	**Status Level:**	1

Batch ID:	20-0248-6050	**Test Type:**	Cell Growth	**Analyst:**	Sierra Klueppel	
Start Date:	12 Aug-21 15:00	**Protocol:**	EC/EPS 1/RM/25	**Diluent:**	Deionized Water + nutrients	
Ending Date:	15 Aug-21 15:00	**Species:**	Pseudokirchneriella subcapitata	**Brine:**		
Test Length:	72h	**Taxon:**	Chlorophyta	**Source:**	In-House Culture	**Age:** 6d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
Lab Control	00-3568-3085	12 Aug-21	12 Aug-21	15h	Teck Coal	
FR_UFR1	01-9312-3340	10 Aug-21 08:54	11 Aug-21 11:15	54h (12.8 °C)		
GH_ER2	03-3301-7818	10 Aug-21 10:45	11 Aug-21 11:15	52h (15.8 °C)		
CM_MC1	20-0000-6898	10 Aug-21 11:04	11 Aug-21 11:15	52h (14 °C)		
LC_SLC	07-8534-5756	10 Aug-21 09:09	11 Aug-21 11:15	54h (11.2 °C)		
FR_FRABCH	12-3746-7337	10 Aug-21 09:35	11 Aug-21 11:15	53h (13.6 °C)		
FR_FRCP1	02-0987-3329	10 Aug-21 09:55	11 Aug-21 11:15	53h (12.1 °C)		
GH_FR1	00-2216-4794	10 Aug-21 09:30	11 Aug-21 11:15	53h (15.3 °C)		
GH_ERC	02-8768-9833	10 Aug-21 11:45	11 Aug-21 11:15	51h (16.4 °C)		
CM_MC2	08-6405-5477	10 Aug-21 12:07	11 Aug-21 11:15	51h (14.9 °C)		
EV_MC2	09-5920-8643	10 Aug-21 10:44	11 Aug-21 11:15	52h (12.8 °C)		
EV_HC1	05-3700-4202	10 Aug-21 09:46	11 Aug-21 11:15	53h (13 °C)		
LC_DCDS	10-8734-0222	10 Aug-21 10:10	11 Aug-21 11:15	53h (10.8 °C)		
LC_LC3	07-4841-6068	10 Aug-21 09:30	11 Aug-21 11:15	53h (9.8 °C)		
LC_LC5	18-0478-8867	10 Aug-21 12:00	11 Aug-21 11:15	51h (11.8 °C)		
LC_LCDSSLCC	17-9964-8023	10 Aug-21 10:40	11 Aug-21 11:15	52h (12.1 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
Lab Control	Water Sample	Teck Coal	Lab Control	
FR_UFR1	Water Sample	Teck Coal	FR_UFR1_MON_2021-08-0	
GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-08-10_	
CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-08-10	
LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-08-10_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_MON_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_MON_2021-08	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-08-10_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-08-10	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-08-10	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2021_Q3_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2021_Q3_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-08-10	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-08-10_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-08-10_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	

EC Alga Growth Inhibition Test — **Nautilus Environmental**

Analysis ID: 16-4911-9152 **Endpoint:** Cell Yield **CETIS Version:** CETISv1.9.4
Analyzed: 07 Oct-21 17:30 **Analysis:** Parametric-Control vs Treatments **Status Level:** 1

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	FR_UFR1 passed cell yield	42.63%
		GH_ER2 passed cell yield	42.63%
		CM_MC1 passed cell yield	42.63%
		LC_SLC passed cell yield	42.63%
		FR_FRABCH passed cell yield	42.63%
		FR_FRCP1 passed cell yield	42.63%
		GH_FR1 passed cell yield	42.63%
		GH_ERC passed cell yield	42.63%
		CM_MC2 passed cell yield	42.63%
		EV_MC2 passed cell yield	42.63%
		EV_HC1 passed cell yield	42.63%
		LC_DCDS passed cell yield	42.63%
		LC_LC3 passed cell yield	42.63%
		LC_LC5 passed cell yield	42.63%
		LC_LCDSSLCC passed cell yield	42.63%

Dunnett Multiple Comparison Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Negative Control		FR_UFR1	-14.6	2.688	11.53	14	CDF	1.0000	Non-Significant Effect
		GH_ER2	-14.98	2.688	11.53	14	CDF	1.0000	Non-Significant Effect
		CM_MC1	-15.68	2.688	11.53	14	CDF	1.0000	Non-Significant Effect
		LC_SLC	-15.45	2.688	11.53	14	CDF	1.0000	Non-Significant Effect
		FR_FRABCH	-9.637	2.688	14.12	10	CDF	1.0000	Non-Significant Effect
		FR_FRCP1	-10.78	2.688	14.12	10	CDF	1.0000	Non-Significant Effect
		GH_FR1	-10.26	2.688	14.12	10	CDF	1.0000	Non-Significant Effect
		GH_ERC	-7.971	2.688	14.12	10	CDF	1.0000	Non-Significant Effect
		CM_MC2	-10.64	2.688	14.12	10	CDF	1.0000	Non-Significant Effect
		EV_MC2	-11.73	2.688	14.12	10	CDF	1.0000	Non-Significant Effect
		EV_HC1	-7.876	2.688	14.12	10	CDF	1.0000	Non-Significant Effect
		LC_DCDS	-6.734	2.688	14.12	10	CDF	1.0000	Non-Significant Effect
		LC_LC3	-9.066	2.688	14.12	10	CDF	1.0000	Non-Significant Effect
		LC_LC5	-11.06	2.688	14.12	10	CDF	1.0000	Non-Significant Effect
		LC_LCDSSLCC	-10.02	2.688	14.12	10	CDF	1.0000	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	2.399	3.323	1.0000	No Outliers Detected
Control Trend	Mann-Kendall Trend Test	2.399		0.9049	Non-Significant Trend in Controls

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	29907.3	1993.82	15	27.09	<1.0E-37	Significant Effect
Error	5004.5	73.5956	68			
Total	34911.8		83			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance Test	12.75	30.58	0.6217	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9771	0.9596	0.1396	Normal Distribution

EC Alga Growth Inhibition Test — **Nautilus Environmental**

Analysis ID: 16-4911-9152 **Endpoint:** Cell Yield **CETIS Version:** CETISv1.9.4
Analyzed: 07 Oct-21 17:30 **Analysis:** Parametric-Control vs Treatments **Status Level:** 1

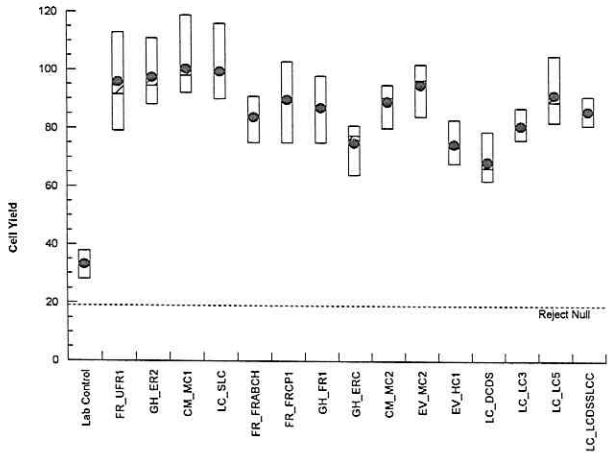
Cell Yield Summary

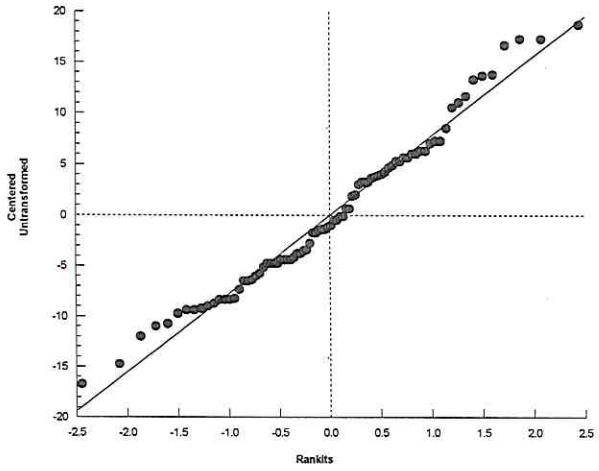
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
Lab Control	N	8	33.12	30.18	36.07	33	28	38	1.246	10.64%	0.00%
FR_UFR1		8	95.75	85.37	106.1	91.5	79	113	4.391	12.97%	-189.06%
GH_ER2		8	97.38	90.38	104.4	94.5	88	111	2.958	8.59%	-193.96%
CM_MC1		8	100.4	93.06	107.7	98	92	119	3.093	8.72%	-203.02%
LC_SLC		8	99.38	91.7	107	99	90	116	3.246	9.24%	-200.00%
FR_FRABCH		4	83.75	72.32	95.18	84.5	75	91	3.591	8.58%	-152.83%
FR_FRCP1		4	89.75	71.22	108.3	90.5	75	103	5.822	12.97%	-170.94%
GH_FR1		4	87	69.81	104.2	87.5	75	98	5.401	12.42%	-162.64%
GH_ERC		4	75	63.02	86.98	77.5	64	81	3.764	10.04%	-126.42%
CM_MC2		4	89	78.37	99.63	90.5	80	95	3.342	7.51%	-168.68%
EV_MC2		4	94.75	81.8	107.7	96.5	84	102	4.07	8.59%	-186.04%
EV_HC1		4	74.5	64.56	84.44	73.5	68	83	3.122	8.38%	-124.91%
LC_DCDS		4	68.5	56.7	80.3	66.5	62	79	3.708	10.83%	-106.79%
LC_LC3		4	80.75	71.81	89.69	80	76	87	2.81	6.96%	-143.77%
LC_LC5		4	91.25	73.9	108.6	89	82	105	5.452	11.95%	-175.47%
LC_LCDSSLCC		4	85.75	77.81	93.69	85.5	81	91	2.496	5.82%	-158.87%

Cell Yield Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
Lab Control	N	33	32	38	33	28	37	29	35
FR_UFR1		113	90	92	79	102	86	91	113
GH_ER2		98	111	91	88	93	96	93	109
CM_MC1		101	99	96	119	92	97	93	106
LC_SLC		91	105	90	104	103	95	91	116
FR_FRABCH		81	91	75	88				
FR_FRCP1		88	75	93	103				
GH_FR1		75	98	81	94				
GH_ERC		64	77	81	78				
CM_MC2		88	80	95	93				
EV_MC2		84	93	100	102				
EV_HC1		73	83	74	68				
LC_DCDS		65	68	79	62				
LC_LC3		84	76	76	87				
LC_LC5		83	82	105	95				
LC_LCDSSLCC		81	91	89	82				

Graphics





EC Alga Growth Inhibition Test — **Nautilus Environmental**

Analysis ID:	13-1436-3738	**Endpoint:**	Cell Yield	**CETIS Version:**	CETISv1.9.4
Analyzed:	07 Oct-21 17:30	**Analysis:**	Parametric-Control vs Treatments	**Status Level:**	1
Batch ID:	20-0248-6050	**Test Type:**	Cell Growth	**Analyst:**	Sierra Klueppel
Start Date:	12 Aug-21 15:00	**Protocol:**	EC/EPS 1/RM/25	**Diluent:**	Deionized Water + nutrients
Ending Date:	15 Aug-21 15:00	**Species:**	Pseudokirchneriella subcapitata	**Brine:**	
Test Length:	72h	**Taxon:**	Chlorophyta	**Source:**	In-House Culture **Age:** 6d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
Lab Control	00-3568-3085	12 Aug-21	12 Aug-21	15h	Teck Coal	
FR_UFR1	01-9312-3340	10 Aug-21 08:54	11 Aug-21 11:15	54h (12.8 °C)		
GH_ER2	03-3301-7818	10 Aug-21 10:45	11 Aug-21 11:15	52h (15.8 °C)		
CM_MC1	20-0000-6898	10 Aug-21 11:04	11 Aug-21 11:15	52h (14 °C)		
LC_SLC	07-8534-5756	10 Aug-21 09:09	11 Aug-21 11:15	54h (11.2 °C)		
FR_FRABCH	12-3746-7337	10 Aug-21 09:35	11 Aug-21 11:15	53h (13.6 °C)		
FR_FRCP1	02-0987-3329	10 Aug-21 09:55	11 Aug-21 11:15	53h (12.1 °C)		
GH_FR1	00-2216-4794	10 Aug-21 09:30	11 Aug-21 11:15	53h (15.3 °C)		
GH_ERC	02-8768-9833	10 Aug-21 11:45	11 Aug-21 11:15	51h (16.4 °C)		
CM_MC2	08-6405-5477	10 Aug-21 12:07	11 Aug-21 11:15	51h (14.9 °C)		
EV_MC2	09-5920-8643	10 Aug-21 10:44	11 Aug-21 11:15	52h (12.8 °C)		
EV_HC1	05-3700-4202	10 Aug-21 09:46	11 Aug-21 11:15	53h (13 °C)		
LC_DCDS	10-8734-0222	10 Aug-21 10:10	11 Aug-21 11:15	53h (10.8 °C)		
LC_LC3	07-4841-6068	10 Aug-21 09:30	11 Aug-21 11:15	53h (9.8 °C)		
LC_LC5	18-0478-8867	10 Aug-21 12:00	11 Aug-21 11:15	51h (11.8 °C)		
LC_LCDSSLCC	17-9964-8023	10 Aug-21 10:40	11 Aug-21 11:15	52h (12.1 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
Lab Control	Water Sample	Teck Coal	Lab Control	
FR_UFR1	Water Sample	Teck Coal	FR_UFR1_MON_2021-08-0	
GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-08-10_	
CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-08-10	
LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-08-10_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_MON_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_MON_2021-08	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-08-10_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-08-10	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-08-10	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2021_Q3_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2021_Q3_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-08-10	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-08-10_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-08-10_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	

EC Alga Growth Inhibition Test — **Nautilus Environmental**

Analysis ID: 13-1436-3738 **Endpoint:** Cell Yield **CETIS Version:** CETISv1.9.4
Analyzed: 07 Oct-21 17:30 **Analysis:** Parametric-Control vs Treatments **Status Level:** 1

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C < T	FR_UFR1 failed cell yield	42.63%
		GH_ER2 failed cell yield	42.63%
		CM_MC1 failed cell yield	42.63%
		LC_SLC failed cell yield	42.63%
		FR_FRABCH failed cell yield	42.63%
		FR_FRCP1 failed cell yield	42.63%
		GH_FR1 failed cell yield	42.63%
		GH_ERC failed cell yield	42.63%
		CM_MC2 failed cell yield	42.63%
		EV_MC2 failed cell yield	42.63%
		EV_HC1 failed cell yield	42.63%
		LC_DCDS failed cell yield	42.63%
		LC_LC3 failed cell yield	42.63%
		LC_LC5 failed cell yield	42.63%
		LC_LCDSSLCC failed cell yield	42.63%

Dunnett Multiple Comparison Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Negative Control		FR_UFR1*	14.6	2.688	11.53	14	CDF	6.2E-07	Significant Effect
		GH_ER2*	14.98	2.688	11.53	14	CDF	6.2E-07	Significant Effect
		CM_MC1*	15.68	2.688	11.53	14	CDF	6.2E-07	Significant Effect
		LC_SLC*	15.45	2.688	11.53	14	CDF	6.2E-07	Significant Effect
		FR_FRABCH*	9.637	2.688	14.12	10	CDF	6.2E-07	Significant Effect
		FR_FRCP1*	10.78	2.688	14.12	10	CDF	6.2E-07	Significant Effect
		GH_FR1*	10.26	2.688	14.12	10	CDF	6.2E-07	Significant Effect
		GH_ERC*	7.971	2.688	14.12	10	CDF	6.2E-07	Significant Effect
		CM_MC2*	10.64	2.688	14.12	10	CDF	6.2E-07	Significant Effect
		EV_MC2*	11.73	2.688	14.12	10	CDF	6.2E-07	Significant Effect
		EV_HC1*	7.876	2.688	14.12	10	CDF	6.2E-07	Significant Effect
		LC_DCDS*	6.734	2.688	14.12	10	CDF	6.5E-07	Significant Effect
		LC_LC3*	9.066	2.688	14.12	10	CDF	6.2E-07	Significant Effect
		LC_LC5*	11.06	2.688	14.12	10	CDF	6.2E-07	Significant Effect
		LC_LCDSSLCC*	10.02	2.688	14.12	10	CDF	6.2E-07	Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	2.399	3.323	1.0000	No Outliers Detected
Control Trend	Mann-Kendall Trend Test	2.399		0.9049	Non-Significant Trend in Controls

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	29907.3	1993.82	15	27.09	<1.0E-37	Significant Effect
Error	5004.5	73.5956	68			
Total	34911.8		83			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance Test	12.75	30.58	0.6217	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9771	0.9596	0.1396	Normal Distribution

EC Alga Growth Inhibition Test — **Nautilus Environmental**

Analysis ID: 13-1436-3738 **Endpoint:** Cell Yield **CETIS Version:** CETISv1.9.4
Analyzed: 07 Oct-21 17:30 **Analysis:** Parametric-Control vs Treatments **Status Level:** 1

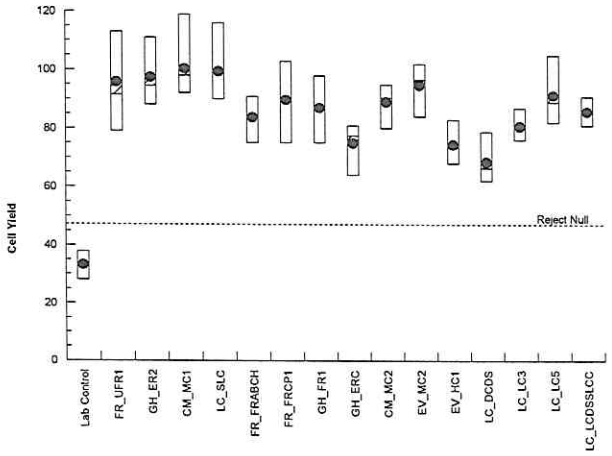
Cell Yield Summary

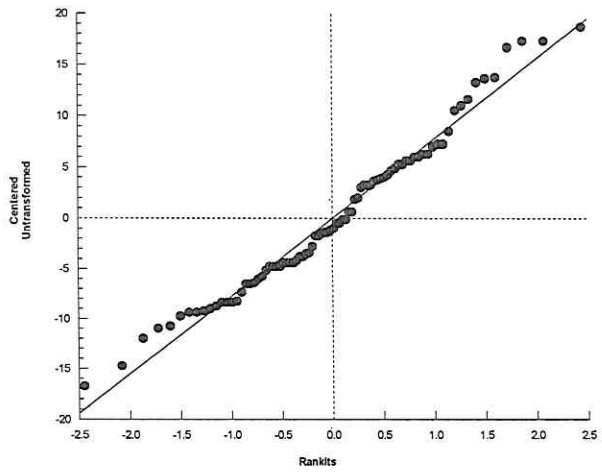
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
Lab Control	N	8	33.12	30.18	36.07	33	28	38	1.246	10.64%	0.00%
FR_UFR1		8	95.75	85.37	106.1	91.5	79	113	4.391	12.97%	-189.06%
GH_ER2		8	97.38	90.38	104.4	94.5	88	111	2.958	8.59%	-193.96%
CM_MC1		8	100.4	93.06	107.7	98	92	119	3.093	8.72%	-203.02%
LC_SLC		8	99.38	91.7	107	99	90	116	3.246	9.24%	-200.00%
FR_FRABCH		4	83.75	72.32	95.18	84.5	75	91	3.591	8.58%	-152.83%
FR_FRCP1		4	89.75	71.22	108.3	90.5	75	103	5.822	12.97%	-170.94%
GH_FR1		4	87	69.81	104.2	87.5	75	98	5.401	12.42%	-162.64%
GH_ERC		4	75	63.02	86.98	77.5	64	81	3.764	10.04%	-126.42%
CM_MC2		4	89	78.37	99.63	90.5	80	95	3.342	7.51%	-168.68%
EV_MC2		4	94.75	81.8	107.7	96.5	84	102	4.07	8.59%	-186.04%
EV_HC1		4	74.5	64.56	84.44	73.5	68	83	3.122	8.38%	-124.91%
LC_DCDS		4	68.5	56.7	80.3	66.5	62	79	3.708	10.83%	-106.79%
LC_LC3		4	80.75	71.81	89.69	80	76	87	2.81	6.96%	-143.77%
LC_LC5		4	91.25	73.9	108.6	89	82	105	5.452	11.95%	-175.47%
LC_LCDSSLCC		4	85.75	77.81	93.69	85.5	81	91	2.496	5.82%	-158.87%

Cell Yield Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
Lab Control	N	33	32	38	33	28	37	29	35
FR_UFR1		113	90	92	79	102	86	91	113
GH_ER2		98	111	91	88	93	96	93	109
CM_MC1		101	99	96	119	92	97	93	106
LC_SLC		91	105	90	104	103	95	91	116
FR_FRABCH		81	91	75	88				
FR_FRCP1		88	75	93	103				
GH_FR1		75	98	81	94				
GH_ERC		64	77	81	78				
CM_MC2		88	80	95	93				
EV_MC2		84	93	100	102				
EV_HC1		73	83	74	68				
LC_DCDS		65	68	79	62				
LC_LC3		84	76	76	87				
LC_LC5		83	82	105	95				
LC_LCDSSLCC		81	91	89	82				

Graphics





EC Alga Growth Inhibition Test

Nautilus Environmental

Analysis ID:	02-0911-2636	**Endpoint:**	Cell Yield	**CETIS Version:**	CETISv1.9.4
Analyzed:	07 Oct-21 17:30	**Analysis:**	Parametric-Control vs Treatments	**Status Level:**	1
Batch ID:	20-0248-6050	**Test Type:**	Cell Growth	**Analyst:**	Sierra Klueppel
Start Date:	12 Aug-21 15:00	**Protocol:**	EC/EPS 1/RM/25	**Diluent:**	Deionized Water + nutrients
Ending Date:	15 Aug-21 15:00	**Species:**	Pseudokirchneriella subcapitata	**Brine:**	
Test Length:	72h	**Taxon:**	Chlorophyta	**Source:**	In-House Culture **Age:** 6d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
FR_UFR1	01-9312-3340	10 Aug-21 08:54	11 Aug-21 11:15	54h (12.8 °C)	Teck Coal	
GH_ER2	03-3301-7818	10 Aug-21 10:45	11 Aug-21 11:15	52h (15.8 °C)		
CM_MC1	20-0000-6898	10 Aug-21 11:04	11 Aug-21 11:15	52h (14 °C)		
LC_SLC	07-8534-5756	10 Aug-21 09:09	11 Aug-21 11:15	54h (11.2 °C)		
FR_FRABCH	12-3746-7337	10 Aug-21 09:35	11 Aug-21 11:15	53h (13.6 °C)		
FR_FRCP1	02-0987-3329	10 Aug-21 09:55	11 Aug-21 11:15	53h (12.1 °C)		
GH_FR1	00-2216-4794	10 Aug-21 09:30	11 Aug-21 11:15	53h (15.3 °C)		
GH_ERC	02-8768-9833	10 Aug-21 11:45	11 Aug-21 11:15	51h (16.4 °C)		
CM_MC2	08-6405-5477	10 Aug-21 12:07	11 Aug-21 11:15	51h (14.9 °C)		
EV_MC2	09-5920-8643	10 Aug-21 10:44	11 Aug-21 11:15	52h (12.8 °C)		
EV_HC1	05-3700-4202	10 Aug-21 09:46	11 Aug-21 11:15	53h (13 °C)		
LC_DCDS	10-8734-0222	10 Aug-21 10:10	11 Aug-21 11:15	53h (10.8 °C)		
LC_LC3	07-4841-6068	10 Aug-21 09:30	11 Aug-21 11:15	53h (9.8 °C)		
LC_LC5	18-0478-8867	10 Aug-21 12:00	11 Aug-21 11:15	51h (11.8 °C)		
LC_LCDSSLCC	17-9964-8023	10 Aug-21 10:40	11 Aug-21 11:15	52h (12.1 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_UFR1	Water Sample	Teck Coal	FR_UFR1_MON_2021-08-0	
GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-08-10_	
CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-08-10	
LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-08-10_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_MON_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_MON_2021-08	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-08-10_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-08-10	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-08-10	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2021_Q3_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2021_Q3_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-08-10	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-08-10_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-08-10_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	

EC Alga Growth Inhibition Test — **Nautilus Environmental**

Analysis ID: 02-0911-2636 **Endpoint:** Cell Yield **CETIS Version:** CETISv1.9.4
Analyzed: 07 Oct-21 17:30 **Analysis:** Parametric-Control vs Treatments **Status Level:** 1

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	GH_ER2 passed cell yield	15.37%
		CM_MC1 passed cell yield	15.37%
		LC_SLC passed cell yield	15.37%
		FR_FRABCH passed cell yield	15.37%
		FR_FRCP1 passed cell yield	15.37%
		GH_FR1 passed cell yield	15.37%
		GH_ERC failed cell yield	15.37%
		CM_MC2 passed cell yield	15.37%
		EV_MC2 passed cell yield	15.37%
		EV_HC1 failed cell yield	15.37%
		LC_DCDS failed cell yield	15.37%
		LC_LC3 failed cell yield	15.37%
		LC_LC5 passed cell yield	15.37%
		LC_LCDSSLCC passed cell yield	15.37%

Dunnett Multiple Comparison Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Site Control		GH_ER2	-0.362	2.677	12.02	14	CDF	0.9910	Non-Significant Effect
FR-UFR1		CM_MC1	-1.03	2.677	12.02	14	CDF	0.9995	Non-Significant Effect
		LC_SLC	-0.8075	2.677	12.02	14	CDF	0.9986	Non-Significant Effect
		FR_FRABCH	2.182	2.677	14.72	10	CDF	0.1451	Non-Significant Effect
		FR_FRCP1	1.091	2.677	14.72	10	CDF	0.6361	Non-Significant Effect
		GH_FR1	1.591	2.677	14.72	10	CDF	0.3770	Non-Significant Effect
		GH_ERC*	3.774	2.677	14.72	10	CDF	0.0023	Significant Effect
		CM_MC2	1.228	2.677	14.72	10	CDF	0.5656	Non-Significant Effect
		EV_MC2	0.1819	2.677	14.72	10	CDF	0.9456	Non-Significant Effect
		EV_HC1*	3.865	2.677	14.72	10	CDF	0.0018	Significant Effect
		LC_DCDS*	4.956	2.677	14.72	10	CDF	4.1E-05	Significant Effect
		LC_LC3*	2.728	2.677	14.72	10	CDF	0.0443	Significant Effect
		LC_LC5	0.8184	2.677	14.72	10	CDF	0.7639	Non-Significant Effect
		LC_LCDSSLCC	1.819	2.677	14.72	10	CDF	0.2726	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	2.3	3.288	1.0000	No Outliers Detected
Control Trend	Mann-Kendall Trend Test	2.3		1.0000	Non-Significant Trend in Controls

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	6677.57	476.969	14	5.917	3.9E-07	Significant Effect
Error	4917.62	80.6168	61			
Total	11595.2		75			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance Test	6.437	29.14	0.9543	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9728	0.9559	0.1011	Normal Distribution

EC Alga Growth Inhibition Test — **Nautilus Environmental**

Analysis ID: 02-0911-2636 **Endpoint:** Cell Yield **CETIS Version:** CETISv1.9.4
Analyzed: 07 Oct-21 17:30 **Analysis:** Parametric-Control vs Treatments **Status Level:** 1

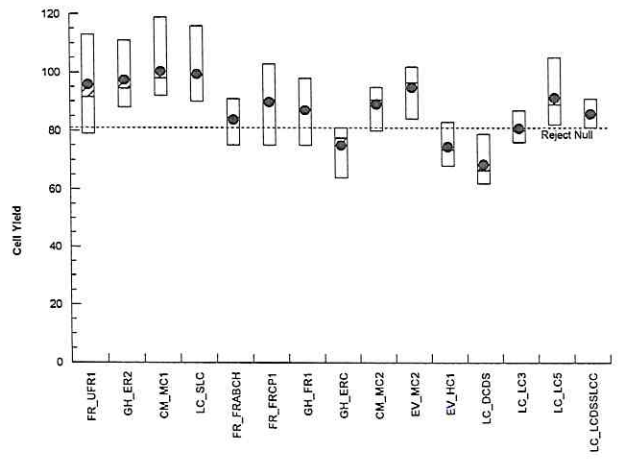
Cell Yield Summary

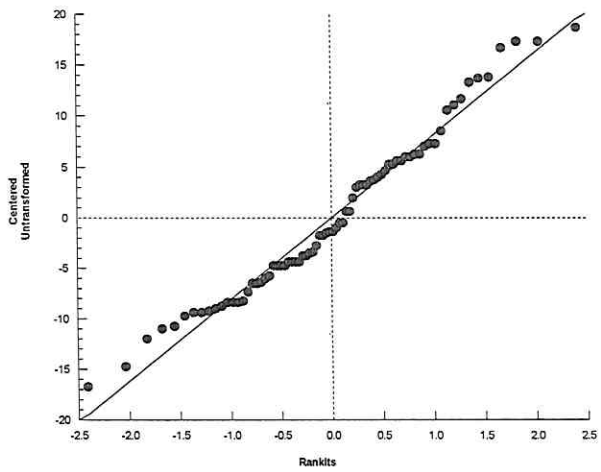
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
FR_UFR1	XC	8	95.75	85.37	106.1	91.5	79	113	4.391	12.97%	0.00%
GH_ER2		8	97.38	90.38	104.4	94.5	88	111	2.958	8.59%	-1.70%
CM_MC1		8	100.4	93.06	107.7	98	92	119	3.093	8.72%	-4.83%
LC_SLC		8	99.38	91.7	107	99	90	116	3.246	9.24%	-3.79%
FR_FRABCH		4	83.75	72.32	95.18	84.5	75	91	3.591	8.58%	12.53%
FR_FRCP1		4	89.75	71.22	108.3	90.5	75	103	5.822	12.97%	6.27%
GH_FR1		4	87	69.81	104.2	87.5	75	98	5.401	12.42%	9.14%
GH_ERC		4	75	63.02	86.98	77.5	64	81	3.764	10.04%	21.67%
CM_MC2		4	89	78.37	99.63	90.5	80	95	3.342	7.51%	7.05%
EV_MC2		4	94.75	81.8	107.7	96.5	84	102	4.07	8.59%	1.04%
EV_HC1		4	74.5	64.56	84.44	73.5	68	83	3.122	8.38%	22.19%
LC_DCDS		4	68.5	56.7	80.3	66.5	62	79	3.708	10.83%	28.46%
LC_LC3		4	80.75	71.81	89.69	80	76	87	2.81	6.96%	15.67%
LC_LC5		4	91.25	73.9	108.6	89	82	105	5.452	11.95%	4.70%
LC_LCDSSLCC		4	85.75	77.81	93.69	85.5	81	91	2.496	5.82%	10.44%

Cell Yield Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
FR_UFR1	XC	113	90	92	79	102	86	91	113
GH_ER2		98	111	91	88	93	96	93	109
CM_MC1		101	99	96	119	92	97	93	106
LC_SLC		91	105	90	104	103	95	91	116
FR_FRABCH		81	91	75	88				
FR_FRCP1		88	75	93	103				
GH_FR1		75	98	81	94				
GH_ERC		64	77	81	78				
CM_MC2		88	80	95	93				
EV_MC2		84	93	100	102				
EV_HC1		73	83	74	68				
LC_DCDS		65	68	79	62				
LC_LC3		84	76	76	87				
LC_LC5		83	82	105	95				
LC_LCDSSLCC		81	91	89	82				

Graphics





EC Alga Growth Inhibition Test — **Nautilus Environmental**

Analysis ID:	06-1736-6478	**Endpoint:**	Cell Yield	**CETIS Version:**	CETISv1.9.4
Analyzed:	07 Oct-21 17:30	**Analysis:**	Parametric-Control vs Treatments	**Status Level:**	1
Batch ID:	20-0248-6050	**Test Type:**	Cell Growth	**Analyst:**	Sierra Klueppel
Start Date:	12 Aug-21 15:00	**Protocol:**	EC/EPS 1/RM/25	**Diluent:**	Deionized Water + nutrients
Ending Date:	15 Aug-21 15:00	**Species:**	Pseudokirchneriella subcapitata	**Brine:**	
Test Length:	72h	**Taxon:**	Chlorophyta	**Source:**	In-House Culture **Age:** 6d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
FR_UFR1	01-9312-3340	10 Aug-21 08:54	11 Aug-21 11:15	54h (12.8 °C)	Teck Coal	
GH_ER2	03-3301-7818	10 Aug-21 10:45	11 Aug-21 11:15	52h (15.8 °C)		
CM_MC1	20-0000-6898	10 Aug-21 11:04	11 Aug-21 11:15	52h (14 °C)		
LC_SLC	07-8534-5756	10 Aug-21 09:09	11 Aug-21 11:15	54h (11.2 °C)		
FR_FRABCH	12-3746-7337	10 Aug-21 09:35	11 Aug-21 11:15	53h (13.6 °C)		
FR_FRCP1	02-0987-3329	10 Aug-21 09:55	11 Aug-21 11:15	53h (12.1 °C)		
GH_FR1	00-2216-4794	10 Aug-21 09:30	11 Aug-21 11:15	53h (15.3 °C)		
GH_ERC	02-8768-9833	10 Aug-21 11:45	11 Aug-21 11:15	51h (16.4 °C)		
CM_MC2	08-6405-5477	10 Aug-21 12:07	11 Aug-21 11:15	51h (14.9 °C)		
EV_MC2	09-5920-8643	10 Aug-21 10:44	11 Aug-21 11:15	52h (12.8 °C)		
EV_HC1	05-3700-4202	10 Aug-21 09:46	11 Aug-21 11:15	53h (13 °C)		
LC_DCDS	10-8734-0222	10 Aug-21 10:10	11 Aug-21 11:15	53h (10.8 °C)		
LC_LC3	07-4841-6068	10 Aug-21 09:30	11 Aug-21 11:15	53h (9.8 °C)		
LC_LC5	18-0478-8867	10 Aug-21 12:00	11 Aug-21 11:15	51h (11.8 °C)		
LC_LCDSSLCC	17-9964-8023	10 Aug-21 10:40	11 Aug-21 11:15	52h (12.1 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_UFR1	Water Sample	Teck Coal	FR_UFR1_MON_2021-08-0	
GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-08-10_	
CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-08-10	
LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-08-10_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_MON_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_MON_2021-08	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-08-10_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-08-10	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-08-10	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2021_Q3_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2021_Q3_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-08-10	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-08-10_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-08-10_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	

JCU

EC Alga Growth Inhibition Test — **Nautilus Environmental**

Analysis ID:	06-1736-6478	**Endpoint:**	Cell Yield	**CETIS Version:**	CETISv1.9.4
Analyzed:	07 Oct-21 17:30	**Analysis:**	Parametric-Control vs Treatments	**Status Level:**	1

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C < T	GH_ER2 passed cell yield	15.37%
		CM_MC1 passed cell yield	15.37%
		LC_SLC passed cell yield	15.37%
		FR_FRABCH passed cell yield	15.37%
		FR_FRCP1 passed cell yield	15.37%
		GH_FR1 passed cell yield	15.37%
		GH_ERC passed cell yield	15.37%
		CM_MC2 passed cell yield	15.37%
		EV_MC2 passed cell yield	15.37%
		EV_HC1 passed cell yield	15.37%
		LC_DCDS passed cell yield	15.37%
		LC_LC3 passed cell yield	15.37%
		LC_LC5 passed cell yield	15.37%
		LC_LCDSSLCC passed cell yield	15.37%

Dunnett Multiple Comparison Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Site Control		GH_ER2	0.362	2.677	12.02	14	CDF	0.9117	Non-Significant Effect
FR_UFR1		CM_MC1	1.03	2.677	12.02	14	CDF	0.6666	Non-Significant Effect
		LC_SLC	0.8075	2.677	12.02	14	CDF	0.7685	Non-Significant Effect
		FR_FRABCH	-2.182	2.677	14.72	10	CDF	1.0000	Non-Significant Effect
		FR_FRCP1	-1.091	2.677	14.72	10	CDF	0.9996	Non-Significant Effect
		GH_FR1	-1.591	2.677	14.72	10	CDF	1.0000	Non-Significant Effect
		GH_ERC	-3.774	2.677	14.72	10	CDF	1.0000	Non-Significant Effect
		CM_MC2	-1.228	2.677	14.72	10	CDF	0.9998	Non-Significant Effect
		EV_MC2	-0.1819	2.677	14.72	10	CDF	0.9827	Non-Significant Effect
		EV_HC1	-3.865	2.677	14.72	10	CDF	1.0000	Non-Significant Effect
		LC_DCDS	-4.956	2.677	14.72	10	CDF	1.0000	Non-Significant Effect
		LC_LC3	-2.728	2.677	14.72	10	CDF	1.0000	Non-Significant Effect
		LC_LC5	-0.8184	2.677	14.72	10	CDF	0.9987	Non-Significant Effect
		LC_LCDSSLCC	-1.819	2.677	14.72	10	CDF	1.0000	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	2.3	3.288	1.0000	No Outliers Detected
Control Trend	Mann-Kendall Trend Test	2.3		1.0000	Non-Significant Trend in Controls

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	6677.57	476.969	14	5.917	3.9E-07	Significant Effect
Error	4917.62	80.6168	61			
Total	11595.2		75			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance Test	6.437	29.14	0.9543	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9728	0.9559	0.1011	Normal Distribution

EC Alga Growth Inhibition Test — **Nautilus Environmental**

Analysis ID: 06-1736-6478 **Endpoint:** Cell Yield **CETIS Version:** CETISv1.9.4
Analyzed: 07 Oct-21 17:30 **Analysis:** Parametric-Control vs Treatments **Status Level:** 1

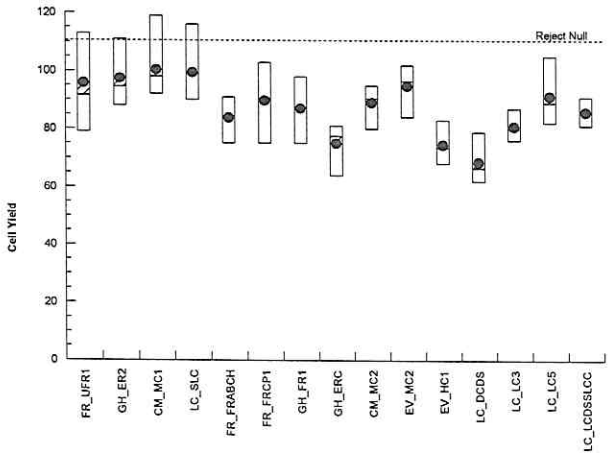
Cell Yield Summary

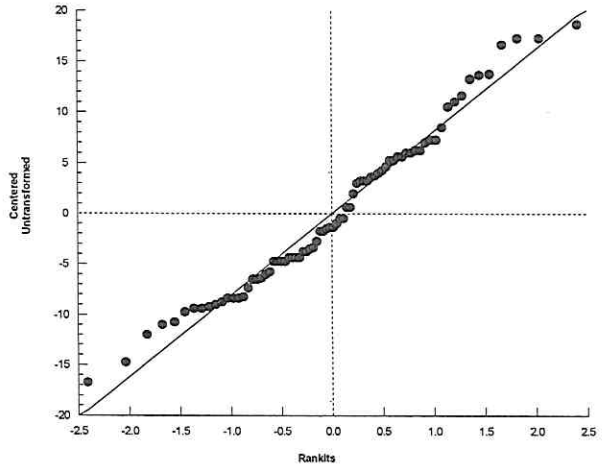
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
FR_UFR1	XC	8	95.75	85.37	106.1	91.5	79	113	4.391	12.97%	0.00%
GH_ER2		8	97.38	90.38	104.4	94.5	88	111	2.958	8.59%	-1.70%
CM_MC1		8	100.4	93.06	107.7	98	92	119	3.093	8.72%	-4.83%
LC_SLC		8	99.38	91.7	107	99	90	116	3.246	9.24%	-3.79%
FR_FRABCH		4	83.75	72.32	95.18	84.5	75	91	3.591	8.58%	12.53%
FR_FRCP1		4	89.75	71.22	108.3	90.5	75	103	5.822	12.97%	6.27%
GH_FR1		4	87	69.81	104.2	87.5	75	98	5.401	12.42%	9.14%
GH_ERC		4	75	63.02	86.98	77.5	64	81	3.764	10.04%	21.67%
CM_MC2		4	89	78.37	99.63	90.5	80	95	3.342	7.51%	7.05%
EV_MC2		4	94.75	81.8	107.7	96.5	84	102	4.07	8.59%	1.04%
EV_HC1		4	74.5	64.56	84.44	73.5	68	83	3.122	8.38%	22.19%
LC_DCDS		4	68.5	56.7	80.3	66.5	62	79	3.708	10.83%	28.46%
LC_LC3		4	80.75	71.81	89.69	80	76	87	2.81	6.96%	15.67%
LC_LC5		4	91.25	73.9	108.6	89	82	105	5.452	11.95%	4.70%
LC_LCDSSLCC		4	85.75	77.81	93.69	85.5	81	91	2.496	5.82%	10.44%

Cell Yield Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
FR_UFR1	XC	113	90	92	79	102	86	91	113
GH_ER2		98	111	91	88	93	96	93	109
CM_MC1		101	99	96	119	92	97	93	106
LC_SLC		91	105	90	104	103	95	91	116
FR_FRABCH		81	91	75	88				
FR_FRCP1		88	75	93	103				
GH_FR1		75	98	81	94				
GH_ERC		64	77	81	78				
CM_MC2		88	80	95	93				
EV_MC2		84	93	100	102				
EV_HC1		73	83	74	68				
LC_DCDS		65	68	79	62				
LC_LC3		84	76	76	87				
LC_LC5		83	82	105	95				
LC_LCDSSLCC		81	91	89	82				

Graphics





EC Alga Growth Inhibition Test — **Nautilus Environmental**

Analysis ID:	01-2995-6539	**Endpoint:**	Cell Yield	**CETIS Version:**	CETISv1.9.4
Analyzed:	07 Oct-21 17:31	**Analysis:**	Parametric-Control vs Treatments	**Status Level:**	1
Batch ID:	20-0248-6050	**Test Type:**	Cell Growth	**Analyst:**	Sierra Klueppel
Start Date:	12 Aug-21 15:00	**Protocol:**	EC/EPS 1/RM/25	**Diluent:**	Deionized Water + nutrients
Ending Date:	15 Aug-21 15:00	**Species:**	Pseudokirchneriella subcapitata	**Brine:**	
Test Length:	72h	**Taxon:**	Chlorophyta	**Source:**	In-House Culture **Age:** 6d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
FR_UFR1	01-9312-3340	10 Aug-21 08:54	11 Aug-21 11:15	54h (12.8 °C)	Teck Coal	
GH_ER2	03-3301-7818	10 Aug-21 10:45	11 Aug-21 11:15	52h (15.8 °C)		
CM_MC1	20-0000-6898	10 Aug-21 11:04	11 Aug-21 11:15	52h (14 °C)		
LC_SLC	07-8534-5756	10 Aug-21 09:09	11 Aug-21 11:15	54h (11.2 °C)		
FR_FRABCH	12-3746-7337	10 Aug-21 09:35	11 Aug-21 11:15	53h (13.6 °C)		
FR_FRCP1	02-0987-3329	10 Aug-21 09:55	11 Aug-21 11:15	53h (12.1 °C)		
GH_FR1	00-2216-4794	10 Aug-21 09:30	11 Aug-21 11:15	53h (15.3 °C)		
GH_ERC	02-8768-9833	10 Aug-21 11:45	11 Aug-21 11:15	51h (16.4 °C)		
CM_MC2	08-6405-5477	10 Aug-21 12:07	11 Aug-21 11:15	51h (14.9 °C)		
EV_MC2	09-5920-8643	10 Aug-21 10:44	11 Aug-21 11:15	52h (12.8 °C)		
EV_HC1	05-3700-4202	10 Aug-21 09:46	11 Aug-21 11:15	53h (13 °C)		
LC_DCDS	10-8734-0222	10 Aug-21 10:10	11 Aug-21 11:15	53h (10.8 °C)		
LC_LC3	07-4841-6068	10 Aug-21 09:30	11 Aug-21 11:15	53h (9.8 °C)		
LC_LC5	18-0478-8867	10 Aug-21 12:00	11 Aug-21 11:15	51h (11.8 °C)		
LC_LCDSSLCC	17-9964-8023	10 Aug-21 10:40	11 Aug-21 11:15	52h (12.1 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_UFR1	Water Sample	Teck Coal	FR_UFR1_MON_2021-08-0	
GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-08-10_	
CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-08-10	
LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-08-10_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_MON_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_MON_2021-08	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-08-10_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-08-10	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-08-10	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2021_Q3_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2021_Q3_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-08-10	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-08-10_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-08-10_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	

EC Alga Growth Inhibition Test **Nautilus Environmental**

Analysis ID: 01-2995-6539 **Endpoint:** Cell Yield **CETIS Version:** CETISv1.9.4
Analyzed: 07 Oct-21 17:31 **Analysis:** Parametric-Control vs Treatments **Status Level:** 1

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	FR_UFR1 passed cell yield	15.12%
		CM_MC1 passed cell yield	15.12%
		LC_SLC passed cell yield	15.12%
		FR_FRABCH passed cell yield	15.12%
		FR_FRCP1 passed cell yield	15.12%
		GH_FR1 passed cell yield	15.12%
		GH_ERC failed cell yield	15.12%
		CM_MC2 passed cell yield	15.12%
		EV_MC2 passed cell yield	15.12%
		EV_HC1 failed cell yield	15.12%
		LC_DCDS failed cell yield	15.12%
		LC_LC3 failed cell yield	15.12%
		LC_LC5 passed cell yield	15.12%
		LC_LCDSSLCC passed cell yield	15.12%

Dunnett Multiple Comparison Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Site Control		FR_UFR1	0.362	2.677	12.02	14	CDF	0.9117	Non-Significant Effect
GH-ERC		CM_MC1	-0.6682	2.677	12.02	14	CDF	0.9974	Non-Significant Effect
		LC_SLC	-0.4455	2.677	12.02	14	CDF	0.9935	Non-Significant Effect
		FR_FRABCH	2.478	2.677	14.72	10	CDF	0.0789	Non-Significant Effect
		FR_FRCP1	1.387	2.677	14.72	10	CDF	0.4816	Non-Significant Effect
		GH_FR1	1.887	2.677	14.72	10	CDF	0.2448	Non-Significant Effect
		GH_ERC*	4.069	2.677	14.72	10	CDF	9.0E-04	Significant Effect
		CM_MC2	1.523	2.677	14.72	10	CDF	0.4111	Non-Significant Effect
		EV_MC2	0.4774	2.677	14.72	10	CDF	0.8830	Non-Significant Effect
		EV_HC1*	4.16	2.677	14.72	10	CDF	6.7E-04	Significant Effect
		LC_DCDS*	5.252	2.677	14.72	10	CDF	1.4E-05	Significant Effect
		LC_LC3*	3.024	2.677	14.72	10	CDF	0.0209	Significant Effect
		LC_LC5	1.114	2.677	14.72	10	CDF	0.6245	Non-Significant Effect
		LC_LCDSSLCC	2.114	2.677	14.72	10	CDF	0.1651	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	2.3	3.288	1.0000	No Outliers Detected
Control Trend	Mann-Kendall Trend Test	2.3		1.0000	Non-Significant Trend in Controls

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	6677.57	476.969	14	5.917	3.9E-07	Significant Effect
Error	4917.62	80.6168	61			
Total	11595.2		75			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance Test	6.437	29.14	0.9543	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9728	0.9559	0.1011	Normal Distribution

EC Alga Growth Inhibition Test — **Nautilus Environmental**

Analysis ID: 01-2995-6539 **Endpoint:** Cell Yield **CETIS Version:** CETISv1.9.4
Analyzed: 07 Oct-21 17:31 **Analysis:** Parametric-Control vs Treatments **Status Level:** 1

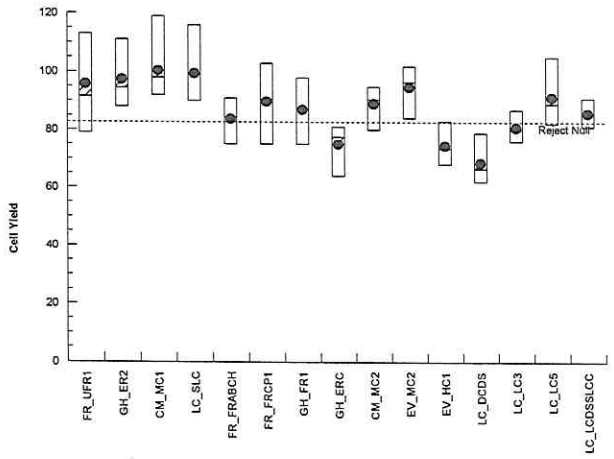
Cell Yield Summary

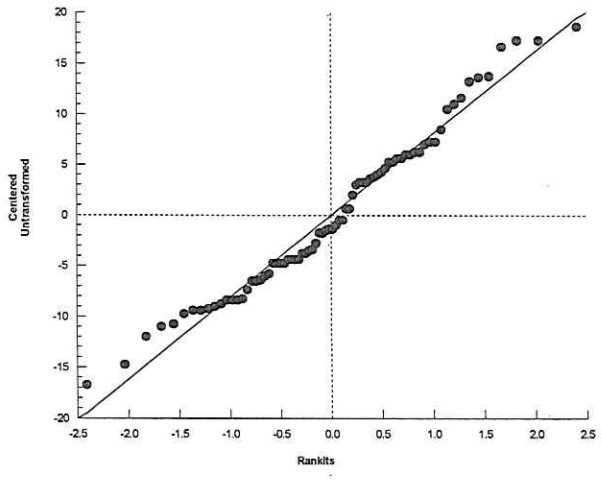
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
FR_UFR1		8	95.75	85.37	106.1	91.5	79	113	4.391	12.97%	0.00%
GH_ER2	XC	8	97.38	90.38	104.4	94.5	88	111	2.958	8.59%	-1.70%
CM_MC1		8	100.4	93.06	107.7	98	92	119	3.093	8.72%	-4.83%
LC_SLC		8	99.38	91.7	107	99	90	116	3.246	9.24%	-3.79%
FR_FRABCH		4	83.75	72.32	95.18	84.5	75	91	3.591	8.58%	12.53%
FR_FRCP1		4	89.75	71.22	108.3	90.5	75	103	5.822	12.97%	6.27%
GH_FR1		4	87	69.81	104.2	87.5	75	98	5.401	12.42%	9.14%
GH_ERC		4	75	63.02	86.98	77.5	64	81	3.764	10.04%	21.67%
CM_MC2		4	89	78.37	99.63	90.5	80	95	3.342	7.51%	7.05%
EV_MC2		4	94.75	81.8	107.7	96.5	84	102	4.07	8.59%	1.04%
EV_HC1		4	74.5	64.56	84.44	73.5	68	83	3.122	8.38%	22.19%
LC_DCDS		4	68.5	56.7	80.3	66.5	62	79	3.708	10.83%	28.46%
LC_LC3		4	80.75	71.81	89.69	80	76	87	2.81	6.96%	15.67%
LC_LC5		4	91.25	73.9	108.6	89	82	105	5.452	11.95%	4.70%
LC_LCDSSLCC		4	85.75	77.81	93.69	85.5	81	91	2.496	5.82%	10.44%

Cell Yield Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
FR_UFR1		113	90	92	79	102	86	91	113
GH_ER2	XC	98	111	91	88	93	96	93	109
CM_MC1		101	99	96	119	92	97	93	106
LC_SLC		91	105	90	104	103	95	91	116
FR_FRABCH		81	91	75	88				
FR_FRCP1		88	75	93	103				
GH_FR1		75	98	81	94				
GH_ERC		64	77	81	78				
CM_MC2		88	80	95	93				
EV_MC2		84	93	100	102				
EV_HC1		73	83	74	68				
LC_DCDS		65	68	79	62				
LC_LC3		84	76	76	87				
LC_LC5		83	82	105	95				
LC_LCDSSLCC		81	91	89	82				

Graphics





EC Alga Growth Inhibition Test **Nautilus Environmental**

Analysis ID:	17-8139-2190	**Endpoint:**	Cell Yield	**CETIS Version:**	CETISv1.9.4
Analyzed:	07 Oct-21 17:31	**Analysis:**	Parametric-Control vs Treatments	**Status Level:**	1
Batch ID:	20-0248-6050	**Test Type:**	Cell Growth	**Analyst:**	Sierra Klueppel
Start Date:	12 Aug-21 15:00	**Protocol:**	EC/EPS 1/RM/25	**Diluent:**	Deionized Water + nutrients
Ending Date:	15 Aug-21 15:00	**Species:**	Pseudokirchneriella subcapitata	**Brine:**	
Test Length:	72h	**Taxon:**	Chlorophyta	**Source:**	In-House Culture **Age:** 6d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
FR_UFR1	01-9312-3340	10 Aug-21 08:54	11 Aug-21 11:15	54h (12.8 °C)	Teck Coal	
GH_ER2	03-3301-7818	10 Aug-21 10:45	11 Aug-21 11:15	52h (15.8 °C)		
CM_MC1	20-0000-6898	10 Aug-21 11:04	11 Aug-21 11:15	52h (14 °C)		
LC_SLC	07-8534-5756	10 Aug-21 09:09	11 Aug-21 11:15	54h (11.2 °C)		
FR_FRABCH	12-3746-7337	10 Aug-21 09:35	11 Aug-21 11:15	53h (13.6 °C)		
FR_FRCP1	02-0987-3329	10 Aug-21 09:55	11 Aug-21 11:15	53h (12.1 °C)		
GH_FR1	00-2216-4794	10 Aug-21 09:30	11 Aug-21 11:15	53h (15.3 °C)		
GH_ERC	02-8768-9833	10 Aug-21 11:45	11 Aug-21 11:15	51h (16.4 °C)		
CM_MC2	08-6405-5477	10 Aug-21 12:07	11 Aug-21 11:15	51h (14.9 °C)		
EV_MC2	09-5920-8643	10 Aug-21 10:44	11 Aug-21 11:15	52h (12.8 °C)		
EV_HC1	05-3700-4202	10 Aug-21 09:46	11 Aug-21 11:15	53h (13 °C)		
LC_DCDS	10-8734-0222	10 Aug-21 10:10	11 Aug-21 11:15	53h (10.8 °C)		
LC_LC3	07-4841-6068	10 Aug-21 09:30	11 Aug-21 11:15	53h (9.8 °C)		
LC_LC5	18-0478-8867	10 Aug-21 12:00	11 Aug-21 11:15	51h (11.8 °C)		
LC_LCDSSLCC	17-9964-8023	10 Aug-21 10:40	11 Aug-21 11:15	52h (12.1 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_UFR1	Water Sample	Teck Coal	FR_UFR1_MON_2021-08-0	
GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-08-10_	
CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-08-10	
LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-08-10_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_MON_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_MON_2021-08	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-08-10_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-08-10	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-08-10	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2021_Q3_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2021_Q3_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-08-10	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-08-10_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-08-10_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	

EC Alga Growth Inhibition Test — **Nautilus Environmental**

Analysis ID: 17-8139-2190 **Endpoint:** Cell Yield **CETIS Version:** CETISv1.9.4
Analyzed: 07 Oct-21 17:31 **Analysis:** Parametric-Control vs Treatments **Status Level:** 1

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C < T	FR_UFR1 passed cell yield	15.12%
		CM_MC1 passed cell yield	15.12%
		LC_SLC passed cell yield	15.12%
		FR_FRABCH passed cell yield	15.12%
		FR_FRCP1 passed cell yield	15.12%
		GH_FR1 passed cell yield	15.12%
		GH_ERC passed cell yield	15.12%
		CM_MC2 passed cell yield	15.12%
		EV_MC2 passed cell yield	15.12%
		EV_HC1 passed cell yield	15.12%
		LC_DCDS passed cell yield	15.12%
		LC_LC3 passed cell yield	15.12%
		LC_LC5 passed cell yield	15.12%
		LC_LCDSSLCC passed cell yield	15.12%

Dunnett Multiple Comparison Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Site Control		FR_UFR1	-0.362	2.677	12.02	14	CDF	0.9910	Non-Significant Effect
GH-FR2		CM_MC1	0.6682	2.677	12.02	14	CDF	0.8227	Non-Significant Effect
		LC_SLC	0.4455	2.677	12.02	14	CDF	0.8915	Non-Significant Effect
		FR_FRABCH	-2.478	2.677	14.72	10	CDF	1.0000	Non-Significant Effect
		FR_FRCP1	-1.387	2.677	14.72	10	CDF	0.9999	Non-Significant Effect
		GH_FR1	-1.887	2.677	14.72	10	CDF	1.0000	Non-Significant Effect
		GH_ERC	-4.069	2.677	14.72	10	CDF	1.0000	Non-Significant Effect
		CM_MC2	-1.523	2.677	14.72	10	CDF	1.0000	Non-Significant Effect
		EV_MC2	-0.4774	2.677	14.72	10	CDF	0.9943	Non-Significant Effect
		EV_HC1	-4.16	2.677	14.72	10	CDF	1.0000	Non-Significant Effect
		LC_DCDS	-5.252	2.677	14.72	10	CDF	1.0000	Non-Significant Effect
		LC_LC3	-3.024	2.677	14.72	10	CDF	1.0000	Non-Significant Effect
		LC_LC5	-1.114	2.677	14.72	10	CDF	0.9997	Non-Significant Effect
		LC_LCDSSLCC	-2.114	2.677	14.72	10	CDF	1.0000	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	2.3	3.288	1.0000	No Outliers Detected
Control Trend	Mann-Kendall Trend Test	2.3		1.0000	Non-Significant Trend in Controls

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	6677.57	476.969	14	5.917	3.9E-07	Significant Effect
Error	4917.62	80.6168	61			
Total	11595.2		75			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance Test	6.437	29.14	0.9543	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9728	0.9559	0.1011	Normal Distribution

EC Alga Growth Inhibition Test — **Nautilus Environmental**

Analysis ID: 17-8139-2190 **Endpoint:** Cell Yield **CETIS Version:** CETISv1.9.4
Analyzed: 07 Oct-21 17:31 **Analysis:** Parametric-Control vs Treatments **Status Level:** 1

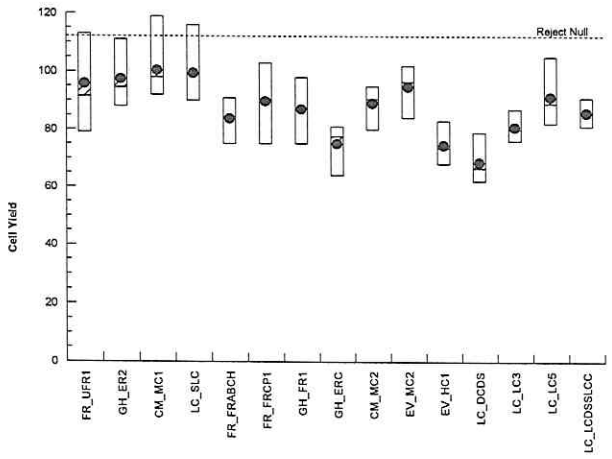
Cell Yield Summary

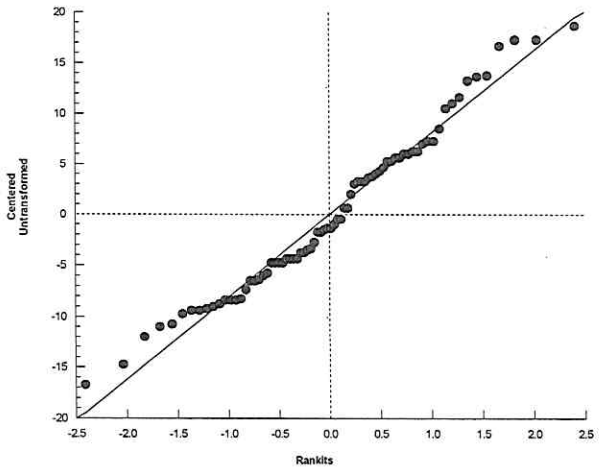
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
FR_UFR1		8	95.75	85.37	106.1	91.5	79	113	4.391	12.97%	0.00%
GH_ER2	XC	8	97.38	90.38	104.4	94.5	88	111	2.958	8.59%	-1.70%
CM_MC1		8	100.4	93.06	107.7	98	92	119	3.093	8.72%	-4.83%
LC_SLC		8	99.38	91.7	107	99	90	116	3.246	9.24%	-3.79%
FR_FRABCH		4	83.75	72.32	95.18	84.5	75	91	3.591	8.58%	12.53%
FR_FRCP1		4	89.75	71.22	108.3	90.5	75	103	5.822	12.97%	6.27%
GH_FR1		4	87	69.81	104.2	87.5	75	98	5.401	12.42%	9.14%
GH_ERC		4	75	63.02	86.98	77.5	64	81	3.764	10.04%	21.67%
CM_MC2		4	89	78.37	99.63	90.5	80	95	3.342	7.51%	7.05%
EV_MC2		4	94.75	81.8	107.7	96.5	84	102	4.07	8.59%	1.04%
EV_HC1		4	74.5	64.56	84.44	73.5	68	83	3.122	8.38%	22.19%
LC_DCDS		4	68.5	56.7	80.3	66.5	62	79	3.708	10.83%	28.46%
LC_LC3		4	80.75	71.81	89.69	80	76	87	2.81	6.96%	15.67%
LC_LC5		4	91.25	73.9	108.6	89	82	105	5.452	11.95%	4.70%
LC_LCDSSLCC		4	85.75	77.81	93.69	85.5	81	91	2.496	5.82%	10.44%

Cell Yield Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
FR_UFR1		113	90	92	79	102	86	91	113
GH_ER2	XC	98	111	91	88	93	96	93	109
CM_MC1		101	99	96	119	92	97	93	106
LC_SLC		91	105	90	104	103	95	91	116
FR_FRABCH		81	91	75	88				
FR_FRCP1		88	75	93	103				
GH_FR1		75	98	81	94				
GH_ERC		64	77	81	78				
CM_MC2		88	80	95	93				
EV_MC2		84	93	100	102				
EV_HC1		73	83	74	68				
LC_DCDS		65	68	79	62				
LC_LC3		84	76	76	87				
LC_LC5		83	82	105	95				
LC_LCDSSLCC		81	91	89	82				

Graphics





EC Alga Growth Inhibition Test — **Nautilus Environmental**

Analysis ID:	06-5596-7601	**Endpoint:**	Cell Yield	**CETIS Version:**	CETISv1.9.4
Analyzed:	07 Oct-21 17:32	**Analysis:**	Parametric-Control vs Treatments	**Status Level:**	1
Batch ID:	20-0248-6050	**Test Type:**	Cell Growth	**Analyst:**	Sierra Klueppel
Start Date:	12 Aug-21 15:00	**Protocol:**	EC/EPS 1/RM/25	**Diluent:**	Deionized Water + nutrients
Ending Date:	15 Aug-21 15:00	**Species:**	Pseudokirchneriella subcapitata	**Brine:**	
Test Length:	72h	**Taxon:**	Chlorophyta	**Source:**	In-House Culture **Age:** 6d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
FR_UFR1	01-9312-3340	10 Aug-21 08:54	11 Aug-21 11:15	54h (12.8 °C)	Teck Coal	
GH_ER2	03-3301-7818	10 Aug-21 10:45	11 Aug-21 11:15	52h (15.8 °C)		
CM_MC1	20-0000-6898	10 Aug-21 11:04	11 Aug-21 11:15	52h (14 °C)		
LC_SLC	07-8534-5756	10 Aug-21 09:09	11 Aug-21 11:15	54h (11.2 °C)		
FR_FRABCH	12-3746-7337	10 Aug-21 09:35	11 Aug-21 11:15	53h (13.6 °C)		
FR_FRCP1	02-0987-3329	10 Aug-21 09:55	11 Aug-21 11:15	53h (12.1 °C)		
GH_FR1	00-2216-4794	10 Aug-21 09:30	11 Aug-21 11:15	53h (15.3 °C)		
GH_ERC	02-8768-9833	10 Aug-21 11:45	11 Aug-21 11:15	51h (16.4 °C)		
CM_MC2	08-6405-5477	10 Aug-21 12:07	11 Aug-21 11:15	51h (14.9 °C)		
EV_MC2	09-5920-8643	10 Aug-21 10:44	11 Aug-21 11:15	52h (12.8 °C)		
EV_HC1	05-3700-4202	10 Aug-21 09:46	11 Aug-21 11:15	53h (13 °C)		
LC_DCDS	10-8734-0222	10 Aug-21 10:10	11 Aug-21 11:15	53h (10.8 °C)		
LC_LC3	07-4841-6068	10 Aug-21 09:30	11 Aug-21 11:15	53h (9.8 °C)		
LC_LC5	18-0478-8867	10 Aug-21 12:00	11 Aug-21 11:15	51h (11.8 °C)		
LC_LCDSSLCC	17-9964-8023	10 Aug-21 10:40	11 Aug-21 11:15	52h (12.1 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_UFR1	Water Sample	Teck Coal	FR_UFR1_MON_2021-08-0	
GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-08-10_	
CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-08-10	
LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-08-10_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_MON_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_MON_2021-08	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-08-10_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-08-10	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-08-10	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2021_Q3_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2021_Q3_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-08-10	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-08-10_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-08-10_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	

EC Alga Growth Inhibition Test — **Nautilus Environmental**

Analysis ID: 06-5596-7601 **Endpoint:** Cell Yield **CETIS Version:** CETISv1.9.4
Analyzed: 07 Oct-21 17:32 **Analysis:** Parametric-Control vs Treatments **Status Level:** 1

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	FR_UFR1 passed cell yield	14.67%
		GH_ER2 passed cell yield	14.67%
		LC_SLC passed cell yield	14.67%
		FR_FRABCH failed cell yield	14.67%
		FR_FRCP1 passed cell yield	14.67%
		GH_FR1 passed cell yield	14.67%
		GH_ERC failed cell yield	14.67%
		CM_MC2 passed cell yield	14.67%
		EV_MC2 passed cell yield	14.67%
		EV_HC1 failed cell yield	14.67%
		LC_DCDS failed cell yield	14.67%
		LC_LC3 failed cell yield	14.67%
		LC_LC5 passed cell yield	14.67%
		LC_LCDSSLCC passed cell yield	14.67%

Dunnett Multiple Comparison Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Site Control		FR_UFR1	1.03	2.677	12.02	14	CDF	0.6666	Non-Significant Effect
CM-MC1		GH_ER2	0.6682	2.677	12.02	14	CDF	0.8227	Non-Significant Effect
		LC_SLC	0.2227	2.677	12.02	14	CDF	0.9389	Non-Significant Effect
		FR_FRABCH*	3.024	2.677	14.72	10	CDF	0.0209	Significant Effect
		FR_FRCP1	1.932	2.677	14.72	10	CDF	0.2272	Non-Significant Effect
		GH_FR1	2.433	2.677	14.72	10	CDF	0.0872	Non-Significant Effect
		GH_ERC*	4.615	2.677	14.72	10	CDF	1.4E-04	Significant Effect
		CM_MC2	2.069	2.677	14.72	10	CDF	0.1793	Non-Significant Effect
		EV_MC2	1.023	2.677	14.72	10	CDF	0.6701	Non-Significant Effect
		EV_HC1*	4.706	2.677	14.72	10	CDF	1.0E-04	Significant Effect
		LC_DCDS*	5.797	2.677	14.72	10	CDF	1.9E-06	Significant Effect
		LC_LC3*	3.569	2.677	14.72	10	CDF	0.0044	Significant Effect
		LC_LC5	1.66	2.677	14.72	10	CDF	0.3440	Non-Significant Effect
		LC_LCDSSLCC	2.66	2.677	14.72	10	CDF	0.0521	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	2.3	3.288	1.0000	No Outliers Detected
Control Trend	Mann-Kendall Trend Test	2.3		0.7195	Non-Significant Trend in Controls

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	6677.57	476.969	14	5.917	3.9E-07	Significant Effect
Error	4917.62	80.6168	61			
Total	11595.2		75			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance Test	6.437	29.14	0.9543	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9728	0.9559	0.1011	Normal Distribution

EC Alga Growth Inhibition Test — **Nautilus Environmental**

Analysis ID:	06-5596-7601	**Endpoint:**	Cell Yield	**CETIS Version:**	CETISv1.9.4
Analyzed:	07 Oct-21 17:32	**Analysis:**	Parametric-Control vs Treatments	**Status Level:**	1

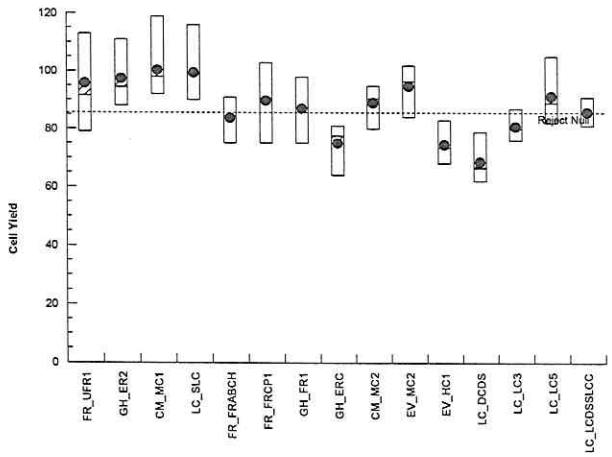
Cell Yield Summary

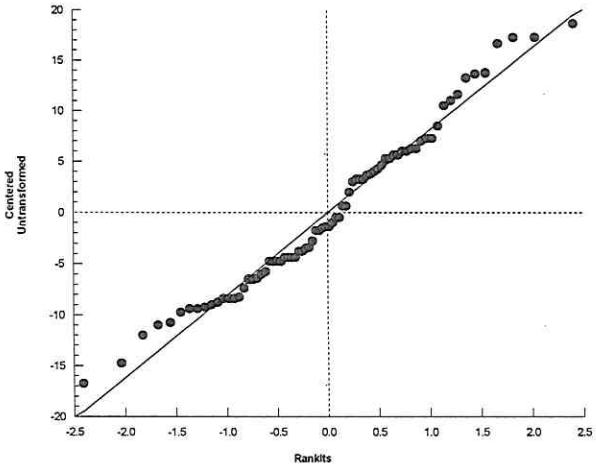
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
FR_UFR1		8	95.75	85.37	106.1	91.5	79	113	4.391	12.97%	0.00%
GH_ER2		8	97.38	90.38	104.4	94.5	88	111	2.958	8.59%	-1.70%
CM_MC1	XC	8	100.4	93.06	107.7	98	92	119	3.093	8.72%	-4.83%
LC_SLC		8	99.38	91.7	107	99	90	116	3.246	9.24%	-3.79%
FR_FRABCH		4	83.75	72.32	95.18	84.5	75	91	3.591	8.58%	12.53%
FR_FRCP1		4	89.75	71.22	108.3	90.5	75	103	5.822	12.97%	6.27%
GH_FR1		4	87	69.81	104.2	87.5	75	98	5.401	12.42%	9.14%
GH_ERC		4	75	63.02	86.98	77.5	64	81	3.764	10.04%	21.67%
CM_MC2		4	89	78.37	99.63	90.5	80	95	3.342	7.51%	7.05%
EV_MC2		4	94.75	81.8	107.7	96.5	84	102	4.07	8.59%	1.04%
EV_HC1		4	74.5	64.56	84.44	73.5	68	83	3.122	8.38%	22.19%
LC_DCDS		4	68.5	56.7	80.3	66.5	62	79	3.708	10.83%	28.46%
LC_LC3		4	80.75	71.81	89.69	80	76	87	2.81	6.96%	15.67%
LC_LC5		4	91.25	73.9	108.6	89	82	105	5.452	11.95%	4.70%
LC_LCDSSLCC		4	85.75	77.81	93.69	85.5	81	91	2.496	5.82%	10.44%

Cell Yield Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
FR_UFR1		113	90	92	79	102	86	91	113
GH_ER2		98	111	91	88	93	96	93	109
CM_MC1	XC	101	99	96	119	92	97	93	106
LC_SLC		91	105	90	104	103	95	91	116
FR_FRABCH		81	91	75	88				
FR_FRCP1		88	75	93	103				
GH_FR1		75	98	81	94				
GH_ERC		64	77	81	78				
CM_MC2		88	80	95	93				
EV_MC2		84	93	100	102				
EV_HC1		73	83	74	68				
LC_DCDS		65	68	79	62				
LC_LC3		84	76	76	87				
LC_LC5		83	82	105	95				
LC_LCDSSLCC		81	91	89	82				

Graphics





EC Alga Growth Inhibition Test — **Nautilus Environmental**

Analysis ID:	12-5198-5160	**Endpoint:**	Cell Yield	**CETIS Version:**	CETISv1.9.4
Analyzed:	07 Oct-21 17:33	**Analysis:**	Parametric-Control vs Treatments	**Status Level:**	1
Batch ID:	20-0248-6050	**Test Type:**	Cell Growth	**Analyst:**	Sierra Klueppel
Start Date:	12 Aug-21 15:00	**Protocol:**	EC/EPS 1/RM/25	**Diluent:**	Deionized Water + nutrients
Ending Date:	15 Aug-21 15:00	**Species:**	Pseudokirchneriella subcapitata	**Brine:**	
Test Length:	72h	**Taxon:**	Chlorophyta	**Source:**	In-House Culture **Age:** 6d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
FR_UFR1	01-9312-3340	10 Aug-21 08:54	11 Aug-21 11:15	54h (12.8 °C)	Teck Coal	
GH_ER2	03-3301-7818	10 Aug-21 10:45	11 Aug-21 11:15	52h (15.8 °C)		
CM_MC1	20-0000-6898	10 Aug-21 11:04	11 Aug-21 11:15	52h (14 °C)		
LC_SLC	07-8534-5756	10 Aug-21 09:09	11 Aug-21 11:15	54h (11.2 °C)		
FR_FRABCH	12-3746-7337	10 Aug-21 09:35	11 Aug-21 11:15	53h (13.6 °C)		
FR_FRCP1	02-0987-3329	10 Aug-21 09:55	11 Aug-21 11:15	53h (12.1 °C)		
GH_FR1	00-2216-4794	10 Aug-21 09:30	11 Aug-21 11:15	53h (15.3 °C)		
GH_ERC	02-8768-9833	10 Aug-21 11:45	11 Aug-21 11:15	51h (16.4 °C)		
CM_MC2	08-6405-5477	10 Aug-21 12:07	11 Aug-21 11:15	51h (14.9 °C)		
EV_MC2	09-5920-8643	10 Aug-21 10:44	11 Aug-21 11:15	52h (12.8 °C)		
EV_HC1	05-3700-4202	10 Aug-21 09:46	11 Aug-21 11:15	53h (13 °C)		
LC_DCDS	10-8734-0222	10 Aug-21 10:10	11 Aug-21 11:15	53h (10.8 °C)		
LC_LC3	07-4841-6068	10 Aug-21 09:30	11 Aug-21 11:15	53h (9.8 °C)		
LC_LC5	18-0478-8867	10 Aug-21 12:00	11 Aug-21 11:15	51h (11.8 °C)		
LC_LCDSSLCC	17-9964-8023	10 Aug-21 10:40	11 Aug-21 11:15	52h (12.1 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_UFR1	Water Sample	Teck Coal	FR_UFR1_MON_2021-08-0	
GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-08-10_	
CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-08-10	
LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-08-10_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_MON_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_MON_2021-08	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-08-10_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-08-10	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-08-10	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2021_Q3_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2021_Q3_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-08-10	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-08-10_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-08-10_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	

EC Alga Growth Inhibition Test — **Nautilus Environmental**

Analysis ID: 12-5198-5160 **Endpoint:** Cell Yield **CETIS Version:** CETISv1.9.4
Analyzed: 07 Oct-21 17:33 **Analysis:** Parametric-Control vs Treatments **Status Level:** 1

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C < T	FR_UFR1 passed cell yield	14.67%
		GH_ER2 passed cell yield	14.67%
		LC_SLC passed cell yield	14.67%
		FR_FRABCH passed cell yield	14.67%
		FR_FRCP1 passed cell yield	14.67%
		GH_FR1 passed cell yield	14.67%
		GH_ERC passed cell yield	14.67%
		CM_MC2 passed cell yield	14.67%
		EV_MC2 passed cell yield	14.67%
		EV_HC1 passed cell yield	14.67%
		LC_DCDS passed cell yield	14.67%
		LC_LC3 passed cell yield	14.67%
		LC_LC5 passed cell yield	14.67%
		LC_LCDSSLCC passed cell yield	14.67%

Dunnett Multiple Comparison Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Site Control		FR_UFR1	-1.03	2.677	12.02	14	CDF	0.9995	Non-Significant Effect
CM-MC1		GH_ER2	-0.6682	2.677	12.02	14	CDF	0.9974	Non-Significant Effect
		LC_SLC	-0.2227	2.677	12.02	14	CDF	0.9851	Non-Significant Effect
		FR_FRABCH	-3.024	2.677	14.72	10	CDF	1.0000	Non-Significant Effect
		FR_FRCP1	-1.932	2.677	14.72	10	CDF	1.0000	Non-Significant Effect
		GH_FR1	-2.433	2.677	14.72	10	CDF	1.0000	Non-Significant Effect
		GH_ERC	-4.615	2.677	14.72	10	CDF	1.0000	Non-Significant Effect
		CM_MC2	-2.069	2.677	14.72	10	CDF	1.0000	Non-Significant Effect
		EV_MC2	-1.023	2.677	14.72	10	CDF	0.9995	Non-Significant Effect
		EV_HC1	-4.706	2.677	14.72	10	CDF	1.0000	Non-Significant Effect
		LC_DCDS	-5.797	2.677	14.72	10	CDF	1.0000	Non-Significant Effect
		LC_LC3	-3.569	2.677	14.72	10	CDF	1.0000	Non-Significant Effect
		LC_LC5	-1.66	2.677	14.72	10	CDF	1.0000	Non-Significant Effect
		LC_LCDSSLCC	-2.66	2.677	14.72	10	CDF	1.0000	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	2.3	3.288	1.0000	No Outliers Detected
Control Trend	Mann-Kendall Trend Test	2.3		0.7195	Non-Significant Trend in Controls

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	6677.57	476.969	14	5.917	3.9E-07	Significant Effect
Error	4917.62	80.6168	61			
Total	11595.2		75			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance Test	6.437	29.14	0.9543	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9728	0.9559	0.1011	Normal Distribution

EC Alga Growth Inhibition Test — **Nautilus Environmental**

Analysis ID:	12-5198-5160	**Endpoint:**	Cell Yield	**CETIS Version:**	CETISv1.9.4
Analyzed:	07 Oct-21 17:33	**Analysis:**	Parametric-Control vs Treatments	**Status Level:**	1

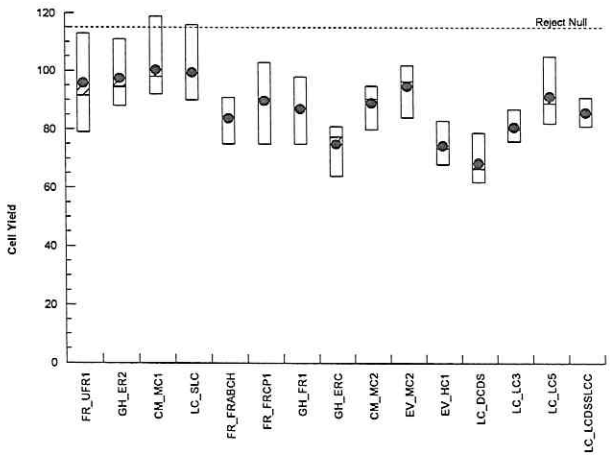
Cell Yield Summary

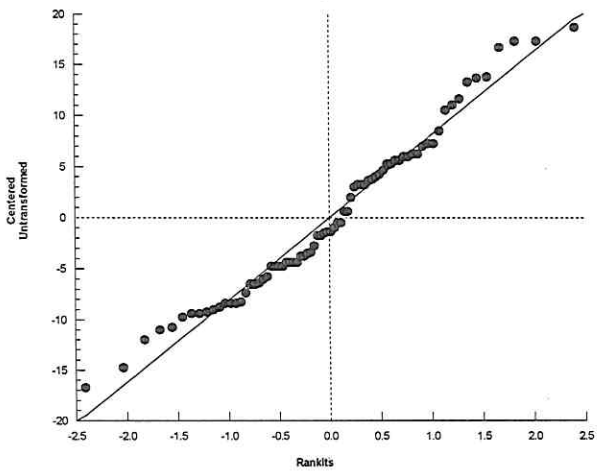
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
FR_UFR1		8	95.75	85.37	106.1	91.5	79	113	4.391	12.97%	0.00%
GH_ER2		8	97.38	90.38	104.4	94.5	88	111	2.958	8.59%	-1.70%
CM_MC1	XC	8	100.4	93.06	107.7	98	92	119	3.093	8.72%	-4.83%
LC_SLC		8	99.38	91.7	107	99	90	116	3.246	9.24%	-3.79%
FR_FRABCH		4	83.75	72.32	95.18	84.5	75	91	3.591	8.58%	12.53%
FR_FRCP1		4	89.75	71.22	108.3	90.5	75	103	5.822	12.97%	6.27%
GH_FR1		4	87	69.81	104.2	87.5	75	98	5.401	12.42%	9.14%
GH_ERC		4	75	63.02	86.98	77.5	64	81	3.764	10.04%	21.67%
CM_MC2		4	89	78.37	99.63	90.5	80	95	3.342	7.51%	7.05%
EV_MC2		4	94.75	81.8	107.7	96.5	84	102	4.07	8.59%	1.04%
EV_HC1		4	74.5	64.56	84.44	73.5	68	83	3.122	8.38%	22.19%
LC_DCDS		4	68.5	56.7	80.3	66.5	62	79	3.708	10.83%	28.46%
LC_LC3		4	80.75	71.81	89.69	80	76	87	2.81	6.96%	15.67%
LC_LC5		4	91.25	73.9	108.6	89	82	105	5.452	11.95%	4.70%
LC_LCDSSLCC		4	85.75	77.81	93.69	85.5	81	91	2.496	5.82%	10.44%

Cell Yield Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
FR_UFR1		113	90	92	79	102	86	91	113
GH_ER2		98	111	91	88	93	96	93	109
CM_MC1	XC	101	99	96	119	92	97	93	106
LC_SLC		91	105	90	104	103	95	91	116
FR_FRABCH		81	91	75	88				
FR_FRCP1		88	75	93	103				
GH_FR1		75	98	81	94				
GH_ERC		64	77	81	78				
CM_MC2		88	80	95	93				
EV_MC2		84	93	100	102				
EV_HC1		73	83	74	68				
LC_DCDS		65	68	79	62				
LC_LC3		84	76	76	87				
LC_LC5		83	82	105	95				
LC_LCDSSLCC		81	91	89	82				

Graphics





EC Alga Growth Inhibition Test — **Nautilus Environmental**

Analysis ID:	17-3314-5592	**Endpoint:**	Cell Yield	**CETIS Version:**	CETISv1.9.4
Analyzed:	07 Oct-21 17:34	**Analysis:**	Parametric-Control vs Treatments	**Status Level:**	1

Batch ID:	20-0248-6050	**Test Type:**	Cell Growth	**Analyst:**	Sierra Klueppel
Start Date:	12 Aug-21 15:00	**Protocol:**	EC/EPS 1/RM/25	**Diluent:**	Deionized Water + nutrients
Ending Date:	15 Aug-21 15:00	**Species:**	Pseudokirchneriella subcapitata	**Brine:**	
Test Length:	72h	**Taxon:**	Chlorophyta	**Source:**	In-House Culture **Age:** 6d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
FR_UFR1	01-9312-3340	10 Aug-21 08:54	11 Aug-21 11:15	54h (12.8 °C)	Teck Coal	
GH_ER2	03-3301-7818	10 Aug-21 10:45	11 Aug-21 11:15	52h (15.8 °C)		
CM_MC1	20-0000-6898	10 Aug-21 11:04	11 Aug-21 11:15	52h (14 °C)		
LC_SLC	07-8534-5756	10 Aug-21 09:09	11 Aug-21 11:15	54h (11.2 °C)		
FR_FRABCH	12-3746-7337	10 Aug-21 09:35	11 Aug-21 11:15	53h (13.6 °C)		
FR_FRCP1	02-0987-3329	10 Aug-21 09:55	11 Aug-21 11:15	53h (12.1 °C)		
GH_FR1	00-2216-4794	10 Aug-21 09:30	11 Aug-21 11:15	53h (15.3 °C)		
GH_ERC	02-8768-9833	10 Aug-21 11:45	11 Aug-21 11:15	51h (16.4 °C)		
CM_MC2	08-6405-5477	10 Aug-21 12:07	11 Aug-21 11:15	51h (14.9 °C)		
EV_MC2	09-5920-8643	10 Aug-21 10:44	11 Aug-21 11:15	52h (12.8 °C)		
EV_HC1	05-3700-4202	10 Aug-21 09:46	11 Aug-21 11:15	53h (13 °C)		
LC_DCDS	10-8734-0222	10 Aug-21 10:10	11 Aug-21 11:15	53h (10.8 °C)		
LC_LC3	07-4841-6068	10 Aug-21 09:30	11 Aug-21 11:15	53h (9.8 °C)		
LC_LC5	18-0478-8867	10 Aug-21 12:00	11 Aug-21 11:15	51h (11.8 °C)		
LC_LCDSSLCC	17-9964-8023	10 Aug-21 10:40	11 Aug-21 11:15	52h (12.1 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_UFR1	Water Sample	Teck Coal	FR_UFR1_MON_2021-08-0	
GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-08-10_	
CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-08-10	
LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-08-10_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_MON_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_MON_2021-08	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-08-10_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-08-10	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-08-10	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2021_Q3_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2021_Q3_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-08-10	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-08-10_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-08-10_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	

EC Alga Growth Inhibition Test **Nautilus Environmental**

Analysis ID: 17-3314-5592 **Endpoint:** Cell Yield **CETIS Version:** CETISv1.9.4
Analyzed: 07 Oct-21 17:34 **Analysis:** Parametric-Control vs Treatments **Status Level:** 1

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	FR_UFR1 passed cell yield	14.81%
		GH_ER2 passed cell yield	14.81%
		CM_MC1 passed cell yield	14.81%
		FR_FRABCH failed cell yield	14.81%
		FR_FRCP1 passed cell yield	14.81%
		GH_FR1 passed cell yield	14.81%
		GH_ERC failed cell yield	14.81%
		CM_MC2 passed cell yield	14.81%
		EV_MC2 passed cell yield	14.81%
		EV_HC1 failed cell yield	14.81%
		LC_DCDS failed cell yield	14.81%
		LC_LC3 failed cell yield	14.81%
		LC_LC5 passed cell yield	14.81%
		LC_LCDSSLCC passed cell yield	14.81%

Dunnett Multiple Comparison Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Site Control		FR_UFR1	0.8075	2.677	12.02	14	CDF	0.7685	Non-Significant Effect
LC-SLC		GH_ER2	0.4455	2.677	12.02	14	CDF	0.8915	Non-Significant Effect
		CM_MC1	-0.2227	2.677	12.02	14	CDF	0.9851	Non-Significant Effect
		FR_FRABCH*	2.842	2.677	14.72	10	CDF	0.0334	Significant Effect
		FR_FRCP1	1.751	2.677	14.72	10	CDF	0.3022	Non-Significant Effect
		GH_FR1	2.251	2.677	14.72	10	CDF	0.1271	Non-Significant Effect
		GH_ERC*	4.433	2.677	14.72	10	CDF	2.6E-04	Significant Effect
		CM_MC2	1.887	2.677	14.72	10	CDF	0.2448	Non-Significant Effect
		EV_MC2	0.8412	2.677	14.72	10	CDF	0.7542	Non-Significant Effect
		EV_HC1*	4.524	2.677	14.72	10	CDF	1.9E-04	Significant Effect
		LC_DCDS*	5.615	2.677	14.72	10	CDF	3.7E-06	Significant Effect
		LC_LC3*	3.387	2.677	14.72	10	CDF	0.0076	Significant Effect
		LC_LC5	1.478	2.677	14.72	10	CDF	0.4343	Non-Significant Effect
		LC_LCDSSLCC	2.478	2.677	14.72	10	CDF	0.0789	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	2.3	3.288	1.0000	No Outliers Detected
Control Trend	Mann-Kendall Trend Test	2.3		0.9049	Non-Significant Trend in Controls

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	6677.57	476.969	14	5.917	3.9E-07	Significant Effect
Error	4917.62	80.6168	61			
Total	11595.2		75			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance Test	6.437	29.14	0.9543	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9728	0.9559	0.1011	Normal Distribution

EC Alga Growth Inhibition Test — **Nautilus Environmental**

Analysis ID: 17-3314-5592 **Endpoint:** Cell Yield **CETIS Version:** CETISv1.9.4
Analyzed: 07 Oct-21 17:34 **Analysis:** Parametric-Control vs Treatments **Status Level:** 1

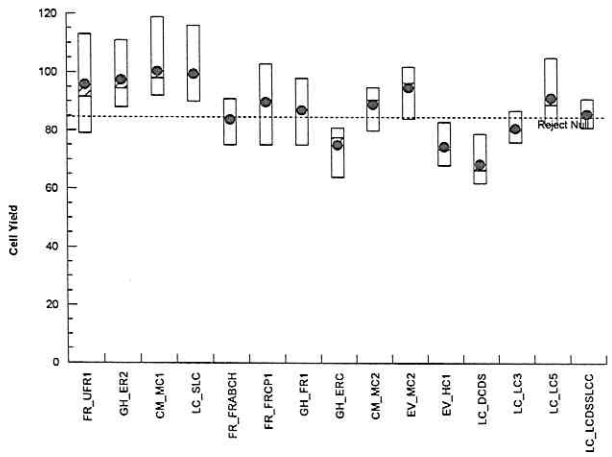
Cell Yield Summary

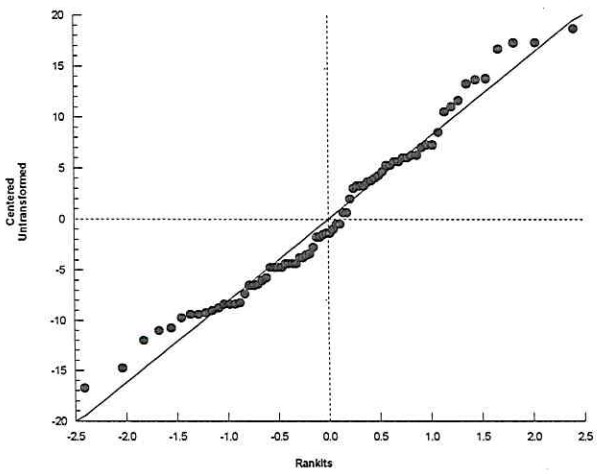
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
FR_UFR1		8	95.75	85.37	106.1	91.5	79	113	4.391	12.97%	0.00%
GH_ER2		8	97.38	90.38	104.4	94.5	88	111	2.958	8.59%	-1.70%
CM_MC1		8	100.4	93.06	107.7	98	92	119	3.093	8.72%	-4.83%
LC_SLC	XC	8	99.38	91.7	107	99	90	116	3.246	9.24%	-3.79%
FR_FRABCH		4	83.75	72.32	95.18	84.5	75	91	3.591	8.58%	12.53%
FR_FRCP1		4	89.75	71.22	108.3	90.5	75	103	5.822	12.97%	6.27%
GH_FR1		4	87	69.81	104.2	87.5	75	98	5.401	12.42%	9.14%
GH_ERC		4	75	63.02	86.98	77.5	64	81	3.764	10.04%	21.67%
CM_MC2		4	89	78.37	99.63	90.5	80	95	3.342	7.51%	7.05%
EV_MC2		4	94.75	81.8	107.7	96.5	84	102	4.07	8.59%	1.04%
EV_HC1		4	74.5	64.56	84.44	73.5	68	83	3.122	8.38%	22.19%
LC_DCDS		4	68.5	56.7	80.3	66.5	62	79	3.708	10.83%	28.46%
LC_LC3		4	80.75	71.81	89.69	80	76	87	2.81	6.96%	15.67%
LC_LC5		4	91.25	73.9	108.6	89	82	105	5.452	11.95%	4.70%
LC_LCDSSLCC		4	85.75	77.81	93.69	85.5	81	91	2.496	5.82%	10.44%

Cell Yield Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
FR_UFR1		113	90	92	79	102	86	91	113
GH_ER2		98	111	91	88	93	96	93	109
CM_MC1		101	99	96	119	92	97	93	106
LC_SLC	XC	91	105	90	104	103	95	91	116
FR_FRABCH		81	91	75	88				
FR_FRCP1		88	75	93	103				
GH_FR1		75	98	81	94				
GH_ERC		64	77	81	78				
CM_MC2		88	80	95	93				
EV_MC2		84	93	100	102				
EV_HC1		73	83	74	68				
LC_DCDS		65	68	79	62				
LC_LC3		84	76	76	87				
LC_LC5		83	82	105	95				
LC_LCDSSLCC		81	91	89	82				

Graphics





EC Alga Growth Inhibition Test

Nautilus Environmental

Analysis ID:	03-4665-2358	**Endpoint:**	Cell Yield	**CETIS Version:**	CETISv1.9.4
Analyzed:	07 Oct-21 17:34	**Analysis:**	Parametric-Control vs Treatments	**Status Level:**	1
Batch ID:	20-0248-6050	**Test Type:**	Cell Growth	**Analyst:**	Sierra Klueppel
Start Date:	12 Aug-21 15:00	**Protocol:**	EC/EPS 1/RM/25	**Diluent:**	Deionized Water + nutrients
Ending Date:	15 Aug-21 15:00	**Species:**	Pseudokirchneriella subcapitata	**Brine:**	
Test Length:	72h	**Taxon:**	Chlorophyta	**Source:**	In-House Culture **Age:** 6d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
FR_UFR1	01-9312-3340	10 Aug-21 08:54	11 Aug-21 11:15	54h (12.8 °C)	Teck Coal	
GH_ER2	03-3301-7818	10 Aug-21 10:45	11 Aug-21 11:15	52h (15.8 °C)		
CM_MC1	20-0000-6898	10 Aug-21 11:04	11 Aug-21 11:15	52h (14 °C)		
LC_SLC	07-8534-5756	10 Aug-21 09:09	11 Aug-21 11:15	54h (11.2 °C)		
FR_FRABCH	12-3746-7337	10 Aug-21 09:35	11 Aug-21 11:15	53h (13.6 °C)		
FR_FRCP1	02-0987-3329	10 Aug-21 09:55	11 Aug-21 11:15	53h (12.1 °C)		
GH_FR1	00-2216-4794	10 Aug-21 09:30	11 Aug-21 11:15	53h (15.3 °C)		
GH_ERC	02-8768-9833	10 Aug-21 11:45	11 Aug-21 11:15	51h (16.4 °C)		
CM_MC2	08-6405-5477	10 Aug-21 12:07	11 Aug-21 11:15	51h (14.9 °C)		
EV_MC2	09-5920-8643	10 Aug-21 10:44	11 Aug-21 11:15	52h (12.8 °C)		
EV_HC1	05-3700-4202	10 Aug-21 09:46	11 Aug-21 11:15	53h (13 °C)		
LC_DCDS	10-8734-0222	10 Aug-21 10:10	11 Aug-21 11:15	53h (10.8 °C)		
LC_LC3	07-4841-6068	10 Aug-21 09:30	11 Aug-21 11:15	53h (9.8 °C)		
LC_LC5	18-0478-8867	10 Aug-21 12:00	11 Aug-21 11:15	51h (11.8 °C)		
LC_LCDSSLCC	17-9964-8023	10 Aug-21 10:40	11 Aug-21 11:15	52h (12.1 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_UFR1	Water Sample	Teck Coal	FR_UFR1_MON_2021-08-0	
GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-08-10_	
CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-08-10	
LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-08-10_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_MON_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_MON_2021-08	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-08-10_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-08-10	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-08-10	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2021_Q3_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2021_Q3_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-08-10	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-08-10_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-08-10_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	

EC Alga Growth Inhibition Test — **Nautilus Environmental**

Analysis ID: 03-4665-2358 **Endpoint:** Cell Yield **CETIS Version:** CETISv1.9.4
Analyzed: 07 Oct-21 17:34 **Analysis:** Parametric-Control vs Treatments **Status Level:** 1

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C < T	FR_UFR1 passed cell yield	14.81%
		GH_ER2 passed cell yield	14.81%
		CM_MC1 passed cell yield	14.81%
		FR_FRABCH passed cell yield	14.81%
		FR_FRCP1 passed cell yield	14.81%
		GH_FR1 passed cell yield	14.81%
		GH_ERC passed cell yield	14.81%
		CM_MC2 passed cell yield	14.81%
		EV_MC2 passed cell yield	14.81%
		EV_HC1 passed cell yield	14.81%
		LC_DCDS passed cell yield	14.81%
		LC_LC3 passed cell yield	14.81%
		LC_LC5 passed cell yield	14.81%
		LC_LCDSSLCC passed cell yield	14.81%

Dunnett Multiple Comparison Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Site Control		FR_UFR1	-0.8075	2.677	12.02	14	CDF	0.9986	Non-Significant Effect
LC SLC		GH_ER2	-0.4455	2.677	12.02	14	CDF	0.9935	Non-Significant Effect
		CM_MC1	0.2227	2.677	12.02	14	CDF	0.9389	Non-Significant Effect
		FR_FRABCH	-2.842	2.677	14.72	10	CDF	1.0000	Non-Significant Effect
		FR_FRCP1	-1.751	2.677	14.72	10	CDF	1.0000	Non-Significant Effect
		GH_FR1	-2.251	2.677	14.72	10	CDF	1.0000	Non-Significant Effect
		GH_ERC	-4.433	2.677	14.72	10	CDF	1.0000	Non-Significant Effect
		CM_MC2	-1.887	2.677	14.72	10	CDF	1.0000	Non-Significant Effect
		EV_MC2	-0.8412	2.677	14.72	10	CDF	0.9988	Non-Significant Effect
		EV_HC1	-4.524	2.677	14.72	10	CDF	1.0000	Non-Significant Effect
		LC_DCDS	-5.615	2.677	14.72	10	CDF	1.0000	Non-Significant Effect
		LC_LC3	-3.387	2.677	14.72	10	CDF	1.0000	Non-Significant Effect
		LC_LC5	-1.478	2.677	14.72	10	CDF	1.0000	Non-Significant Effect
		LC_LCDSSLCC	-2.478	2.677	14.72	10	CDF	1.0000	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	2.3	3.288	1.0000	No Outliers Detected
Control Trend	Mann-Kendall Trend Test	2.3		0.9049	Non-Significant Trend in Controls

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	6677.57	476.969	14	5.917	3.9E-07	Significant Effect
Error	4917.62	80.6168	61			
Total	11595.2		75			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance Test	6.437	29.14	0.9543	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9728	0.9559	0.1011	Normal Distribution

EC Alga Growth Inhibition Test — **Nautilus Environmental**

Analysis ID:	03-4665-2358	**Endpoint:**	Cell Yield	**CETIS Version:**	CETISv1.9.4
Analyzed:	07 Oct-21 17:34	**Analysis:**	Parametric-Control vs Treatments	**Status Level:**	1

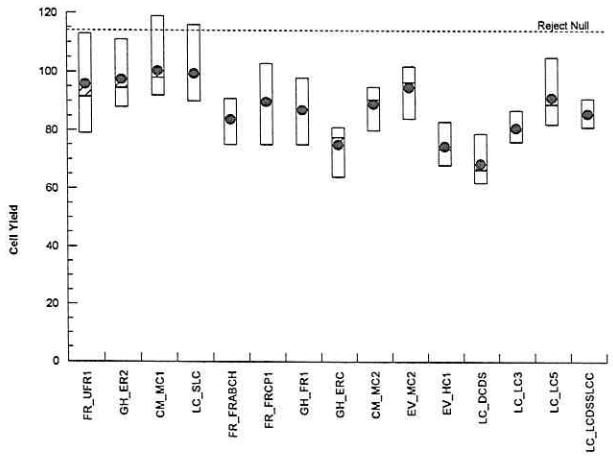
Cell Yield Summary

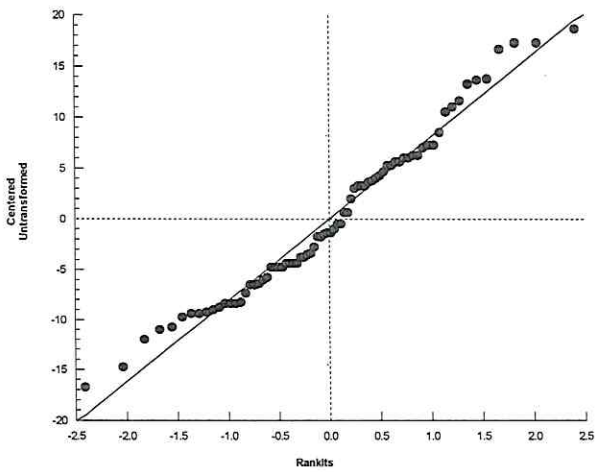
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
FR_UFR1		8	95.75	85.37	106.1	91.5	79	113	4.391	12.97%	0.00%
GH_ER2		8	97.38	90.38	104.4	94.5	88	111	2.958	8.59%	-1.70%
CM_MC1		8	100.4	93.06	107.7	98	92	119	3.093	8.72%	-4.83%
LC_SLC	XC	8	99.38	91.7	107	99	90	116	3.246	9.24%	-3.79%
FR_FRABCH		4	83.75	72.32	95.18	84.5	75	91	3.591	8.58%	12.53%
FR_FRCP1		4	89.75	71.22	108.3	90.5	75	103	5.822	12.97%	6.27%
GH_FR1		4	87	69.81	104.2	87.5	75	98	5.401	12.42%	9.14%
GH_ERC		4	75	63.02	86.98	77.5	64	81	3.764	10.04%	21.67%
CM_MC2		4	89	78.37	99.63	90.5	80	95	3.342	7.51%	7.05%
EV_MC2		4	94.75	81.8	107.7	96.5	84	102	4.07	8.59%	1.04%
EV_HC1		4	74.5	64.56	84.44	73.5	68	83	3.122	8.38%	22.19%
LC_DCDS		4	68.5	56.7	80.3	66.5	62	79	3.708	10.83%	28.46%
LC_LC3		4	80.75	71.81	89.69	80	76	87	2.81	6.96%	15.67%
LC_LC5		4	91.25	73.9	108.6	89	82	105	5.452	11.95%	4.70%
LC_LCDSSLCC		4	85.75	77.81	93.69	85.5	81	91	2.496	5.82%	10.44%

Cell Yield Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
FR_UFR1		113	90	92	79	102	86	91	113
GH_ER2		98	111	91	88	93	96	93	109
CM_MC1		101	99	96	119	92	97	93	106
LC_SLC	XC	91	105	90	104	103	95	91	116
FR_FRABCH		81	91	75	88				
FR_FRCP1		88	75	93	103				
GH_FR1		75	98	81	94				
GH_ERC		64	77	81	78				
CM_MC2		88	80	95	93				
EV_MC2		84	93	100	102				
EV_HC1		73	83	74	68				
LC_DCDS		65	68	79	62				
LC_LC3		84	76	76	87				
LC_LC5		83	82	105	95				
LC_LCDSSLCC		81	91	89	82				

Graphics





APPENDIX C – *Pimephales promelas* Toxicity Test Data

32-d Fathead Minnow Survival and Growth Test

Client: Teck
Work Order No.: NA
Test Date: 13-Aug-21
Test Species: *Pimephales promelas*

Sample Information:

Sample ID: Various - see table below
Sample Date: Tuesday, August 10th
Date Received: Wednesday, August 11th

Dilution Water:

Type: Dechlorinated Tap Water (amended with 4 mg/L KCl)
Temperature (°C): 24°C
pH: 8
Conductivity: 367
Dissolved Oxygen (mg/L): 7.5
Hardness (mg/L CaCO3): 162
Alkalinity (mg/L CaCO3): 141

Test Organism Information:

Batch No: 20210813FM-ELS
Source: Aquatox
Age: <24 hours post fertilization
Receipt temperature: 28°C
Acclimation Rate: N/A
Swim bladder inflated at test initiation? (Y/N): N/A
Breeding stock mortality during the week prior to test initiation (%): N/A
Breeding stock mortality on weekly basis: N/A
Incidence of disease: No

NaCl Reference Toxicant Results:

Reference Toxicant ID: QA177
Stock Solution ID: NA
Date Initiated: August 17, 2021
7-d LC50 (95% CL): 3.9 (3.3 - 4.5) g/L NaCl
7-d IC25 (95% CL): 2.3 (1.7 - 3.2) g/L NaCl

Survival

Reference Toxicant Mean and Range: 6.3 (4.1 - 9.7) g/L NaCl (14.1% CV)

Biomass

Reference Toxicant Mean and Range: 3.7 (2.2 - 6.2) g/L NaCl (17.2% CV)

Test Results:

Sample ID	Hatch (%) (Mean ± SD)	Biomass (mg) (Mean ± SD)	Length (mm) (Mean ± SD)	Normality (%) (Mean ± SD)	32 day survival (%) (Mean ± SD)
Lab Control	98.3 ± 3.3	2.63 ± 0.40	11.9 ± 0.5	100.0 ± 0.0	84.8 ± 8.3
10 Cu Control	98.3 ± 3.3	2.77 ± 0.38	12.4 ± 0.5	98.1 ± 3.9	83.1 ± 3.6
15 Cu Control	96.7 ± 3.9	2.44 ± 0.28	12.4 ± 0.9	98.2 ± 3.6	71.0 ± 21.2
20 Cu Control	95.0 ± 3.3	2.61 ± 0.07	13.0 ± 0.2	94.1 ± 6.8	75.1 ± 17.2
FR_UFR1 20 Cu	93.3 ± 5.4	2.16 ± 0.85	11.7 ± 0.5	100.0 ± 0.0	55.3 ± 23.6 [a, b, 4]
GH_ER2 10 Cu	95.0 ± 6.4	2.48 ± 0.33	11.2 ± 0.2 [d]	97.9 ± 4.2	78.6 ± 12.9
CM_MC1 15 Cu	88.3 ± 3.3	1.91 ± 0.53	11.0 ± 0.6 [b,c,d]	95.0 ± 10.0	62.2 ± 18.9
LC_SLC 15 Cu	93.3 ± 0.0	2.64 ± 0.11	11.9 ± 0.5	97.9 ± 4.2	85.7 ± 5.8
FR_FRABCH 20 Cu	91.7 ± 6.4	2.63 ± 0.26	11.7 ± 0.8	100.0 ± 0.0	74.4 ± 7.8
FR_FRCP1 20 Cu	96.7 ± 3.9	2.46 ± 0.30	10.8 ± 0.9 [b,c,d]	95.1 ± 5.7	79.4 ± 15.2

[a] indicates results significantly lower relative to the laboratory control
[b] indicates results significantly lowr relative to the 10 ug/L copper-treated laboratory control
[c] indicates results significantly lower relative to the 15 ug/L copper-treated laboratory control
[d] indicates results significantly lower relative to the 20 ug/L copper-treated laboratory control
[1] indicates results significantly lower relative to the 20 ug/L copper-treated FR_UFR1 site control
[2] indicates results significantly lower relative to the 10 ug/L copper-treated GH_ER2 site control
[3] indicates results significantly lower relative to the 15 ug/L copper-treated CM_MC1 site control
[4] indicates results significanlty lower relative to the 15 ug/L copper-treated LC_SLC site control

Reviewed by: MG
Date reviewed: 2021/11/19

32-d Fathead Minnow Survival and Growth Test

Test Results:

Sample ID	Hatch (%) (Mean ± SD)	Biomass (mg) (Mean ± SD)	Length (mm) (Mean ± SD)	Normality (%) (Mean ± SD)	32 day survival (%) (Mean ± SD)
GH_FR1 20 Cu	96.7 ± 6.7	2.51 ± 0.16	11.0 ± 0.4 [b,c,d]	93.8 ± 8.0	81.2 ± 2.3
GH_ERC 10 Cu	95.0 ± 6.4	2.58 ± 0.18	12.7 ± 0.3	97.2 ± 5.6	65.6 ± 13.5
CM_MC2 20 Cu	98.3 ± 3.3	2.27 ± 0.18	12.5 ± 0.9	100.0 ± 0.0	67.5 ± 24.7
RG_MIDAG 15 Cu	96.7 ± 6.7	2.41 ± 0.22	11.1 ± 0.6 [d]	91.2 ± 6.4	79.2 ± 9.6
EV_MC2 20 Cu	96.7 ± 3.9	2.58 ± 0.21	10.8 ± 1.0 [b,c,d]	92.3 ± 6.3	84.4 ± 9.1
EV_HC1 20 Cu	88.3 ± 8.4	2.07 ± 0.27 [b]	12.2 ± 1.6	98.3 ± 3.3	57.1 ± 33.3 [a, 4]
LC_DCDS 20 Cu	100.0 ± 0.0	2.46 ± 0.28	12.3 ± 0.6	94.2 ± 7.1	66.7 ± 21.1
LC_LC3 20 Cu	100.0 ± 0.0	2.66 ± 0.20	12.2 ± 0.9	95.6 ± 5.0	68.3 ± 11.4
LC_LC5 20 Cu	98.3 ± 3.3	2.54 ± 0.22	12.6 ± 1.2	98.1 ± 3.9	67.6 ± 18.8
LC_LCDSSLCC 20 Cu	96.7 ± 3.9	2.28 ± 0.38	12.1 ± 0.4	97.5 ± 5.0	57.3 ± 13.7 [a, b, 4]
FR_FR4 20 Cu	95.0 ± 10.0	2.36 ± 0.45	11.2 ± 0.4 [d]	91.5 ± 11.8	71.3 ± 17.7
FR_FR2 20 Cu	96.7 ± 3.9	2.75 ± 0.22	11.3 ± 0.5 [d]	98.2 ± 3.6	85.0 ± 17.5
FR_MULTIPLATE 20 Cu	88.3 ± 10.0	2.23 ± 0.20	11.1 ± 0.9 [d]	97.5 ± 5.0	78.2 ± 19.2
FR_FRRD 20Cu	98.3 ± 3.3	2.74 ± 0.13	10.9 ± 0.3 [b,c,d]	97.9 ± 4.2	86.6 ± 5.3

[a] indicates results e significantly lower relative to the laboratory control

[b] indicates results significantly lowr relative to the 10 ug/L copper-treated laboratory control

[c] indicates results significantly lower relative to the 15 ug/L copper-treated laboratory control

[d] indicates results significantly lower relative to the 20 ug/L copper-treated laboratory control

[1] indicates results significantly lower relative to the 20 ug/L copper-treated FR_UFR1 site control

[2] indicates results significantly lower relative to the 10 ug/L copper-treated GH_ER2 site control

[3] indicates results significantly lower relative to the 15 ug/L copper-treated CM_MC1 site control

[4] indicates results significanlty lower relative to the 15 ug/L copper-treated LC_SLC site control

Reviewed by: MH Date reviewed: 2021/11/19

Fathead Minnow Bench Sheet

FMD 32 Day ELS Client NAU104 Sample: 2021-1872, 2021-1874, 2021-1876, 2021-1877, 2021-1879, 2021-1882, 2021-1883 (20 ug/L Cu)

Test Information

Source: Aquatox Batch: 20210813FM-ELS Egg Stage: 16 Somite Organisms Received in Good Condition (Yes) or No

Test Log

Date	Day	Time	Technicians	Chem Cart Used	Fed AM	Fed PM	Sample Pre-Aeration Time	Bench Sheet Review First
2021/08/13	0	1500	CB/ML/EV	2	-	-	60 min	—
2021/08/14	1	0935	CB	2	-	-	60 mins	MF
2021/08/15	2	1015	ST	2	-	-	60 mins	DW
2021/08/16	3	1155	ST	2	-	-	60 mins	KL
2021/08/17	4	1100	MF/KL	2	-	-	60 mins	ST
2021/08/18	5	1000	CB	2	✓	✓	60 mins	—
2021/08/19	6	1130	SC/ST	2	✓	✓	60 mins	KL
2021/08/20	7	1140	SC/MF	2	✓	✓	60 mins	DW
2021/08/21	8	1350	SC/MF	2	✓	✓	60 mins	DW
2021/08/22	9	1237	CB	2	✓	✓	60 mins	KL
2021/08/23	10	1130	KL	2	✓	✓	60 mins	ST
2021/08/24	11	1050	KL	2	✓	✓	60 mins	ST
2021/08/25	12	1035	AW	2	✓	✓	60 mins	EV
2021/08/26	13	1100	ST/MF	2	✓	✓	60 mins	KL
2021/08/27	14	1100	SC/AW	2	✓	✓	60 mins	DW
2021/08/28	15	1500	SC	2	✓	✓	60 mins	ST
2021/08/29	16	1030	KL	2	✓	✓	60 mins	AL
2021/08/30	17	1130	ST	2	✓	✓	60 mins	KL
2021/08/31	18	1215	KL	2	✓	✓	60 mins	MAF
2021/09/01	19	1135	ST	2	✓	✓	60 mins	DW
2021/09/02	20	1140	SC	2	✓	✓	60 mins	DW
2021/09/03	21	1130	SC	2	✓	✓	60 mins	AW
2021/09/04	22	1020	MF/SC	2	✓	✓	60 mins	DW
2021/09/05	23	1025	AW	2	✓	✓	60 mins	KL
2021/09/06	24	1015	AW	2	✓	✓	60 mins	KL
2021/09/07	25	1000	AW	2	✓	✓	60 mins	EV
2021/09/08	26	0900	SC	2	✓	✓	60 mins	AW
2021/09/09	27	1030	SC	2	✓	✓	60 mins	DW
2021/09/10	28	1100	SC	2	✓	✓	60 mins	MAF
2021/09/11	29	0935	ST	2	✓	✓	60 mins	MAF
2021/09/12	30	1015	AW	2	✓	✓	60 mins	KL
2021/09/13	31	1000	AW	2	✓	✓	60 mins	EV
2021/09/14	32	1155	ST	2	-	-	60 mins - ST	KL

Reviewed By: MG Date Reviewed: 2021/10/28

NAUTILUS ENVIRONMENTAL

Fathead Minnow Bench

Method FMD 32 Day ELS Client NAU104 Sample: 2021-1872, 2021-1874, 2021-1876, 2021-1877, 2021-1879, 2021-1882, 2021-1883 (20 ug/L Cu)

Control hatching success must be >66% (≥10 per replicate). Post hatch survival must be >70%.

Number of Alive Embryos and Hatched Organisms

replicate	2021-1872 Day 1 Alive Embryos	2021-1872 Day 1 Dead Embryos	2021-1874 Day 1 Alive Embryos	2021-1874 Day 1 Dead Embryos	2021-1876 Day 1 Alive Embryos	2021-1876 Day 1 Dead Embryos	2021-1877 Day 1 Alive Embryos	2021-1877 Day 1 Dead Embryos	2021-1879 Day 1 Alive Embryos	2021-1879 Day 1 Dead Embryos	2021-1882 Day 1 Alive Embryos	2021-1882 Day 1 Dead Embryos	2021-1883 Day 1 Alive Embryos	2021-1883 Day 1 Dead Embryos
a	15	0	14	1	14	1	15	0	15	0	14	1	14	1
b	14	1	14	1	15	0	15	0	14	1	14	1	15	0
c	15	0	15	0	14	1	15	0	13	2	15	0	15	0
d	15	0	14	1	14	1	15	0	15	0	15	0	14	1
e	29	1	29	1	27	3	30	0	27	3	28	2	29	1
f	28	2	29	1	30	0	26	4	30	0	29	1	28	2

Comments/Observations:

Number of Alive Embryos and Hatched Organisms

replicate	2021-1872 Day 2 Alive Embryos	2021-1872 Day 2 Dead Embryos	2021-1872 Cull to 15	2021-1874 Day 2 Alive Embryos	2021-1874 Day 2 Dead Embryos	2021-1874 Cull to 15	2021-1876 Day 2 Alive Embryos	2021-1876 Day 2 Dead Embryos	2021-1876 Cull to 15	2021-1877 Day 2 Alive Embryos	2021-1877 Day 2 Dead Embryos	2021-1877 Cull to 15
a	13	2	✓	15	0	✓	11	3	✓	15	0	✓
b	14	0	✓	13	1	✓	14	0	✓	14	1	✓
c	15	0	✓	15	0	✓	15	0	✓	15	0	✓
d	15	0	✓	14	0	✓	14	0	✓	15	0	✓
e	29	2		28	1		27	0		28	2	
f	26	2		28	1		30	0		26	0	

replicate	2021-1879 Day 2 Alive Embryos	2021-1879 Day 2 Dead Embryos	2021-1879 Cull to 15	2021-1882 Day 2 Alive Embryos	2021-1882 Day 2 Dead Embryos	2021-1882 Cull to 15	2021-1883 Day 2 Alive Embryos	2021-1883 Day 2 Dead Embryos	2021-1883 Cull to 15
a	15	0	✓	14	0	✓	14	0	✓
b	14	0	✓	14	0	✓	15	0	✓
c	12	1	✓	15	0	✓	15	0	✓
d	15	0	✓	15	0	✓	14	0	✓
e	26	1		28	0		28	1	
f	30	0		29	0		28	0	

Day 2 - Poor looking and dead embryos in replicates a, b, c and d are replaced with healthy embryos from replicates e and f. Replicates e and f are discarded after day 2

Comments/Observations:

Reviewed By: ML Date Reviewed: 2021/10/28

NAUTILUS ENVIRONMENTAL

Fathead Minnow Bench Sheet

Method FMD 32 Day ELS Client NAU104 Sample: 2021-1872, 2021-1874, 2021-1876, 2021-1877, 2021-1879, 2021-1882, 2021-1883 (20 ug/L Cu)

Control hatching success must be >66% (≥10 per replicate). Post hatch survival must be >70%.

2021-1872

	Day 3			
	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	10	0	5	0
b	12	0	3	0
c	15	0	0	0
d	12	0	2	1

2021-1874

	Day 3			
	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	12	0	3	0
b	10	0	5	0
c	14	0	1	0
d	13	0	2	0

2021-1876

	Day 3			
	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	5	0	10	0
b	10	0	5	0
c	11	0	4	0
d	11	0	4	0

2021-1877

	Day 3			
	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	12	0	3	0
b	12	2	1	0
c	7	0	8	0
d	10	0	5	6

2021-1879

	Day 3			
	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	12	0	3	0
b	11	0	4	0
c	11	0	4	0
d	13	0	2	0

2021-1882

	Day 3			
	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	9	0	6	0
b	11	1	3	0
c	11	1	3	0
d	10	0	5	0

2021-1883

	Day 3			
	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	6	0	9	0
b	13	0	2	0
c	11	1	3	0
d	13	0	2	0

[redacted]

2021-1872

	Day 4			
	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	0	0	15	0
b	1	1	13	0
c	3	0	11	1
d	4	0	10	0

2021-1874

	Day 4			
	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	6	0	8	1
b	4	0	7	0
c	7	0	7	1
d	4	1	10	0

2021-1876

	Day 4			
	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	2	0	13	0
b	2	0	13	0
c	2	0	13	0
d	7	0	8	0

2021-1877

	Day 4			
	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	2	3	10	0
b	6	0	6	1
c	0	0	15	0
d	2	1	12	0

2021-1879

	Day 4			
	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	4	0	11	0
b	5	0	10	0
c	2	0	13	0
d	3	0	10	1

11

2021-1882

	Day 4			
	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	2	0	12	1
b	1	2	11	0
c	1	1	12	0
d	0	0	15	0

2021-1883

	Day 4			
	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	0	0	14	1
b	4	0	11	0
c	2	0	12	0
d	2	1	12	0

Comments/Observations

Reviewed By: MG Date Reviewed: 2021/10/28

NAUTILUS ENVIRONMENTAL

Fathead Minnow Bench Sheet

Method FMD 32 Day ELS Client NAU104 Sample: 2021-1872, 2021-1874, 2021-1876, 2021-1877, 2021-1879, 2021-1882, 2021-1883 (20 ug/L Cu)

Control hatching success must be >66% (≥10 per replicate). Post hatch survival must be >70%.

2021-1872

Day 5

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	0	0	15	0
b	0	0	14	0
c	1	0	13	0
d	0	0	14	0

2021-1874

Day 5

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	0	2	12	0
b	0	2	13	0
c	0	0	14	0
d	0	0	14	0

2021-1876

Day 5

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	0	1	14	0
b	0	0	15	0
c	0	0	12	3
d	0	1	14	0

2021-1877

Day 5

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	0	0	14	0
b	0	1	15	0
c	0	0	15	0
d	0	0	13	1

2021-1879

Day 5

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	0	0	14	1
b	0	0	14	1
c	0	0	15	0
d	0	2	12	0

2021-1882

Day 5

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	0	2	12	0
b	0	0	12	0
c	0	0	13	0
d	0	0	15	0

2021-1883

Day 5

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	0	0	14	0
b	0	0	15(1)	0
c	0	0	13	1
d	0	0	12	2

[redacted]

2021-1872

Day 6

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	0	0	14	1
b	0	0	14	0
c	0	1	13	0
d	0	0	14*	0

2021-1874

Day 6

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	0	0	11	1
b	0	0	13	0
c	0	0	14(2)	0
d	0	0	14*	0

2021-1876

Day 6

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	0	0	14	0
b	0	0	15(2)	0
c	0	0	12	0
d	0	0	14	0

2021-1877

Day 6

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	0	0	12	0
b	0	0	10	0
c	0	0	15	0
d	0	0	13	0

2021-1879

Day 6

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	0	0	14	0
b	0	0	14	0
c	0	0	[illegible]	
d	0	0	12	0

2021-1882

Day 6

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	0	0	12(1)	0
b	0	0	12(1)	0
c	0	0	13	0
d	0	0	15	0

2021-1883

Day 6

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	0	0	14	0
b	0	0	15(1)	0
c	0	0	13	0
d	0	0	12	0

Comments/Observations

*microbial DAY 6
1872 d mJAK
1874 d

Reviewed By: ML Date Reviewed: 2021/10/28

NAUTILUS ENVIRONMENTAL

Fathead Minnow Bench Sheet

Method FMD 32 Day ELS Client NAU104 Sample: 2021-1872, 2021-1874, 2021-1876, 2021-1877, 2021-1879, 2021-1882, 2021-1883 (20 ug/L Cu)

Number of Alive Embryos and Hatched Organisms

replicate	2021-1872 Day 7 Alive Hatched	2021-1874 Day 7 Alive Hatched	2021-1876 Day 7 Alive Hatched	2021-1877 Day 7 Alive Hatched	2021-1879 Day 7 Alive Hatched	2021-1882 Day 7 Alive Hatched	2021-1883 Day 7 Alive Hatched
a	14	11	14	12	13(1)	12(1)	14
b	14	12	13	9*	14	12(2)	~~13~~ 15
c	13	13(1)*	12(1)	15*	~~13~~ 14	13	13
d	13(1)	14	14	13*	11	15	12 ~~11~~(1)

Comments/Observations: *microbial 1874 c *microbial death 1877 c 1882 1883
sc in JAR A:1AS A:1AS
~~*MG~~ 1877 c,d B:2AS D:1AS

replicate	2021-1872 Day 8 Alive Hatched	2021-1874 Day 8 Alive Hatched	2021-1876 Day 8 Alive Hatched	2021-1877 Day 8 Alive Hatched	2021-1879 Day 8 Alive Hatched	2021-1882 Day 8 Alive Hatched	2021-1883 Day 8 Alive Hatched
a	13*	11 ~~10~~*	14	12	12	11*	14
b	14	10*	13	9*	14	12(2)*	~~13~~ 15
c	13	12*	11	15*	~~13~~ 14	13*	13
d	12	14 ~~13~~*	14	13	11	15	~~11~~ 12

Comments/Observations: *microbial in JAR 1872 a, 1874 a, b, c, d, 1877 b, c, 1882 a, b, c

replicate	2021-1872 Day 9 Alive Hatched	2021-1874 Day 9 Alive Hatched	2021-1876 Day 9 Alive Hatched	2021-1877 Day 9 Alive Hatched	2021-1879 Day 9 Alive Hatched	2021-1882 Day 9 Alive Hatched	2021-1883 Day 9 Alive Hatched
a	13*	11 ~~10~~(1)*	14	12(1)*	12*	5Δ	14
b	14	10*	13	9*	14(1)*	12(2)	15
c	13(2)	12*	11	14	14*	5Δ	13
d	11	14*	14	13	11*	15	12

Comments/Observations: * Microbial in Jar Δ microbial on dead organism

replicate	2021-1872 Day 10 Alive Hatched	2021-1874 Day 10 Alive Hatched	2021-1876 Day 10 Alive Hatched	2021-1877 Day 10 Alive Hatched	2021-1879 Day 10 Alive Hatched	2021-1882 Day 10 Alive Hatched	2021-1883 Day 10 Alive Hatched
a	13*	11	14*	12(2)*	12*	4	14
b	14	10*	13	9	14(1)*	12(2)	15
c	13(2)*	12*	11*	14	14*	4	13
d	11	14(1)	14*	13	11*	15	12

Comments/Observations: * Microbial in Jar

Reviewed By: MG Date Reviewed: 2021/10/28

NAUTILUS ENVIRONMENTAL

Fathead Minnow Bench Sheet

Method FMD 32 Day ELS Client NAU104 Sample: 2021-1872, 2021-1874, 2021-1876, 2021-1877, 2021-1879, 2021-1882, 2021-1883 (20 ug/L Cu)

Number of Alive Embryos and Hatched Organisms

	2021-1872	2021-1874	2021-1876	2021-1877	2021-1879	2021-1882	2021-1883
	Day 11	Day 11	Day 11	Day 11	Day 11	Day 11	Day 11
replicate	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched
a	13 *	10	14 *	10 *Δ	12	4	14
b	14(1)	10 *	13(2)*	7 *Δ	14(1)	11(1)	13(1)
c	13(4) *	12 *	11	14 **	14	4	13
d	11 *	13 *	14 *	13 *	11	15	12(1)

Comments/Observations:
* Microbial growth in jar
Δ Microbial on dead organism

	2021-1872	2021-1874	2021-1876	2021-1877	2021-1879	2021-1882	2021-1883
	Day 12	Day 12	Day 12	Day 12	Day 12	Day 12	Day 12
replicate	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched
a	13	9	14	10	12	4	14
b	14(1)	9 *	13(2)	7	14(1)	9(1) *	13(1)
c	13(4)	12(1)	11	14	14(1)	4	13
d	11	13	14	13	11	15	12(1)

Comments/Observations: * Microbial growth

	2021-1872	2021-1874	2021-1876	2021-1877	2021-1879	2021-1882	2021-1883
	Day 13	Day 13	Day 13	Day 13	Day 13	Day 13	Day 13
replicate	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched
a	13(1)	9 *	14	10 *	12	4 *	14
b	14	9 *	11	7 *	14(1)	9(1)	13(1)
c	13(4)	11	11	14	13	4 *	13
d	11	13	14	13 *	11	15	14

Comments/Observations: * Microbial growth

	2021-1872	2021-1874	2021-1876	2021-1877	2021-1879	2021-1882	2021-1883
	Day 14	Day 14	Day 14	Day 14	Day 14	Day 14	Day 14
replicate	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched
a	13	9	14	10 *	12	9	14
b	14	9	11	6 **	14(1)	8	13(1)
c	13(4)	11 *	11	14	13	4	13
d	11	13	14	13	11	15	11

Comments/Observations: * microbial ** microbial death 1877-6

Reviewed By: MG Date Reviewed: 2021/10/28

NAUTILUS ENVIRONMENTAL

Fathead Minnow Bench Sheet

Method FMD 32 Day ELS Client NAU104 Sample: 2021-1872, 2021-1874, 2021-1876, 2021-1877, 2021-1879, 2021-1882, 2021-1883 (20 ug/L Cu)

Number of Alive Embryos and Hatched Organisms

replicate	2021-1872 Day 15 Alive Hatched	2021-1874 Day 15 Alive Hatched	2021-1876 Day 15 Alive Hatched	2021-1877 Day 15 Alive Hatched	2021-1879 Day 15 Alive Hatched	2021-1882 Day 15 Alive Hatched	2021-1883 Day 15 Alive Hatched
a	13(1)	9	14	10	12	4	14
b	14	9*	11(2)	6	14(1)	8	13
c	12(2)	11*	11	14	13	4	13
d	11	13	14	13	11	15	11

Comments/Observations: * Microbial

replicate	2021-1872 Day 16 Alive Hatched	2021-1874 Day 16 Alive Hatched	2021-1876 Day 16 Alive Hatched	2021-1877 Day 16 Alive Hatched	2021-1879 Day 16 Alive Hatched	2021-1882 Day 16 Alive Hatched	2021-1883 Day 16 Alive Hatched
a	13(1)	9	14	10	12	4	14
b	14	9*	11(1)	6	14(1)	8	13
c	12(1)	11*	11	14	13	4	13
d	11	12*	14	13	11	15	11

Comments/Observations: * Microbial growth in jar

replicate	2021-1872 Day 17 Alive Hatched	2021-1874 Day 17 Alive Hatched	2021-1876 Day 17 Alive Hatched	2021-1877 Day 17 Alive Hatched	2021-1879 Day 17 Alive Hatched	2021-1882 Day 17 Alive Hatched	2021-1883 Day 17 Alive Hatched
a	13(1)	9	14	10	12	4	14
b	14	9	11(1)	6	14	8	13
c	12(1)	11*	11	14	13	4	13
d	11	12*	14	13	11	15	11

Comments/Observations: * Microbial growth in jar
12468-1AJ

replicate	2021-1872 Day 18 Alive Hatched	2021-1874 Day 18 Alive Hatched	2021-1876 Day 18 Alive Hatched	2021-1877 Day 18 Alive Hatched	2021-1879 Day 18 Alive Hatched	2021-1882 Day 18 Alive Hatched	2021-1883 Day 18 Alive Hatched
a	13(1)	9	14	10	12	4	14
b	14	9	11(1)	6	13	8	13
c	12(2)	11*	11	14	13	4	13
d	11	12*	14	13	11	15	11

Comments/Observations: * Microbial growth in jar

MG 2021/10/28

NAUTILUS ENVIRONMENTAL

Fathead Minnow Bench Sheet

Method FMD 32 Day ELS Client NAU104 Sample: 2021-1872, 2021-1874, 2021-1876, 2021-1877, 2021-1879, 2021-1882, 2021-1883 (20 ug/L Cu)

Number of Alive Embryos and Hatched Organisms

replicate	2021-1872 Day 19 Alive Hatched	2021-1874 Day 19 Alive Hatched	2021-1876 Day 19 Alive Hatched	2021-1877 Day 19 Alive Hatched	2021-1879 Day 19 Alive Hatched	2021-1882 Day 19 Alive Hatched	2021-1883 Day 19 Alive Hatched
a	13(1)	9	14	10	12	4	14
b	14	9 *	11(1)	6	13	8	13
c	12(1)	11(1) *	11	14	13	4	13
d	11	12 *	14	13	11	15	11

Comments/Observations: 1872-1AS 1874C-1AS * Microbial in jar

replicate	2021-1872 Day 20 Alive Hatched	2021-1874 Day 20 Alive Hatched	2021-1876 Day 20 Alive Hatched	2021-1877 Day 20 Alive Hatched	2021-1879 Day 20 Alive Hatched	2021-1882 Day 20 Alive Hatched	2021-1883 Day 20 Alive Hatched
a	13(1)	9	14	10	12	4	14
b	14	9	11(1)	6	13	8	13
c	12(1)	11 *	11	14	13	4	13
d	11	12 *	14	13	11	15	11

Comments/Observations: *microbial 1876b-1AS

replicate	2021-1872 Day 21 Alive Hatched	2021-1874 Day 21 Alive Hatched	2021-1876 Day 21 Alive Hatched	2021-1877 Day 21 Alive Hatched	2021-1879 Day 21 Alive Hatched	2021-1882 Day 21 Alive Hatched	2021-1883 Day 21 Alive Hatched
a	13	9	14	10	12	4	13
b	14	9	11(1)	6	13	8	13
c	12	11	11	14	13	4	13
d	11	12	14	13	11	15	11

Comments/Observations:

replicate	2021-1872 Day 22 Alive Hatched	2021-1874 Day 22 Alive Hatched	2021-1876 Day 22 Alive Hatched	2021-1877 Day 22 Alive Hatched	2021-1879 Day 22 Alive Hatched	2021-1882 Day 22 Alive Hatched	2021-1883 Day 22 Alive Hatched
a	13	9	14	10	12	4	13
b	14	9	11(1)	6	13	S1 ~~7~~ 8	13
c	11	11	11	14	13	4	13
d	11	12	14	13	11	15	11

Comments/Observations:

MG 2021/10/28

NAUTILUS ENVIRONMENTAL

Fathead Minnow Bench Sheet

Method FMD 32 Day ELS Client NAU104 Sample: 2021-1872, 2021-1874, 2021-1876, 2021-1877, 2021-1879, 2021-1882, 2021-1883 (20 ug/L Cu)

Number of Alive Embryos and Hatched Organisms

	2021-1872	2021-1874	2021-1876	2021-1877	2021-1879	2021-1882	2021-1883
	Day 23	Day 23	Day 23	Day 23	Day 23	Day 23	Day 23
replicate	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched
a	12	9	14	10	12	4	13
b	14	9	11(1)	6	13	8	13
c	10(1)	11	11	14	13(1)	4	13
d	11	12	14	13	11	15	11

Comments/Observations:

	2021-1872	2021-1874	2021-1876	2021-1877	2021-1879	2021-1882	2021-1883
	Day 24	Day 24	Day 24	Day 24	Day 24	Day 24	Day 24
replicate	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched
a	12	9	14	10	12	4	13
b	14	9	11(1)	6	13	8	13
c	9(1)	11	11	14	13(1)	4	13
d	11	12	14	13	11	15	11

Comments/Observations:

	2021-1872	2021-1874	2021-1876	2021-1877	2021-1879	2021-1882	2021-1883
	Day 25	Day 25	Day 25	Day 25	Day 25	Day 25	Day 25
replicate	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched
a	12	9	14	10	12	4	13
b	14	9	11(1)	6	13	8	13
c	9(1)	11	11	14	13(1)	4	13
d	11	12	14	13	11	15	11

Comments/Observations:

	2021-1872	2021-1874	2021-1876	2021-1877	2021-1879	2021-1882	2021-1883
	Day 26	Day 26	Day 26	Day 26	Day 26	Day 26	Day 26
replicate	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched
a	12	9	14	10	12	4	13
b	14	9	10	6	13	8	13
c	9	11	11	14	13	4	13
d	11	12	14	13	11	15	11

Comments/Observations:

AS 1883A

MG 2021/10/28

NAUTILUS ENVIRONMENTAL

Fathead Minnow Bench Sheet

Method FMD 32 Day ELS Client NAU104 Sample: 2021-1872, 2021-1874, 2021-1876, 2021-1877, 2021-1879, 2021-1882, 2021-1883 (20 ug/L Cu)

Number of Alive Embryos and Hatched Organisms

replicate	2021-1872 Day 27 Alive Hatched	2021-1874 Day 27 Alive Hatched	2021-1876 Day 27 Alive Hatched	2021-1877 Day 27 Alive Hatched	2021-1879 Day 27 Alive Hatched	2021-1882 Day 27 Alive Hatched	2021-1883 Day 27 Alive Hatched
a	12	9	14	10	12	4	13
b	14	9	10	6	13	8	13
c	9	11	11	14	13	4	13
d	11	12	14	13	11	15	10

Comments/Observations: A-1883 IAS

replicate	2021-1872 Day 28 Alive Hatched	2021-1874 Day 28 Alive Hatched	2021-1876 Day 28 Alive Hatched	2021-1877 Day 28 Alive Hatched	2021-1879 Day 28 Alive Hatched	2021-1882 Day 28 Alive Hatched	2021-1883 Day 28 Alive Hatched
a	12	9	14	10	12	4	13
b	14	9	10	6	13	8	13
c	9	11	11	14	13	4	13
d	11	12	14	13	11	15	10

Comments/Observations:

replicate	2021-1872 Day 29 Alive Hatched	2021-1874 Day 29 Alive Hatched	2021-1876 Day 29 Alive Hatched	2021-1877 Day 29 Alive Hatched	2021-1879 Day 29 Alive Hatched	2021-1882 Day 29 Alive Hatched	2021-1883 Day 29 Alive Hatched
a	12	9	14	10	12	4	13
b	14	9	10	6	12	8	13
c	9(1)	11	11	14	13	4	13
d	11	12	14	13	11	15	10

Comments/Observations: 1879-C-1AS 1883A-1AS 1883C-1AS

replicate	2021-1872 Day 30 Alive Hatched	2021-1874 Day 30 Alive Hatched	2021-1876 Day 30 Alive Hatched	2021-1877 Day 30 Alive Hatched	2021-1879 Day 30 Alive Hatched	2021-1882 Day 30 Alive Hatched	2021-1883 Day 30 Alive Hatched
a	12	9	14	10	12	4	13
b	14	9	10	6	12	8	13
c	9(1)	11	11	14	13	4	13
d	11	12	14	13	11	15	10

Comments/Observations:

MG 2021/10/25

NAUTILUS ENVIRONMENTAL

Fathead Minnow Bench Sheet

Method FMD 32 Day ELS Client NAU104 Sample: 2021-1872, 2021-1874, 2021-1876, 2021-1877, 2021-1879, 2021-1882, 2021-1883 (20 ug/L Cu)

Number of Alive Embryos and Hatched Organisms

	2021-1872	2021-1874	2021-1876	2021-1877	2021-1879	2021-1882	2021-1883
	Day 31	Day 31	Day 31	Day 31	Day 31	Day 31	Day 31
replicate	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched
a	12	9	14	10	12	4	13
b	14	9	10	6	12	8	13
c	9(1)	11	11	13	13	4	13
d	11	12	14	13	11	15	10

Comments/Observations:

	2021-1872	2021-1874	2021-1876	2021-1877	2021-1879	2021-1882	2021-1883
	Day 32	Day 32	Day 32	Day 32	Day 32	Day 32	Day 32
replicate	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched
a	12	9	14	10	12	4	13
b	14	9	10	6	12	8	13
c	9(1)	11	11	13	12	4	13
d	11	12	14	13	11	15	10

Comments/Observations:

Reviewed By: MG Date Reviewed: 2021/10/28

NAUTILUS ENVIRONMENTAL

Fathead Minnow Bench Sheet

Method: FMD 32 Day ELS Client: NAU104

Sample: 2021-1872, 2021-1874, 2021-1876, 2021-1877, 2021-1879, 2021-1882, 2021-1883 (20 ug/L Cu)

New Solutions

Conc. (%) / Day	2021-1872	2021-1874	2021-1876	2021-1877	2021-1879	2021-1882	2021-1883
pH (units)							
0	8.3	8.2	8.1	8.2	8.23	8.2	8.2
1	8.1	8.1	8.2	8.1	8.2	8.2	8.2
2	8.2	8.1	8.3	8.2	8.2	8.2	8.2
3	8.2	8.1	8.2	8.2	8.2	8.2	8.2
4	8.3	8.0	8.2	8.3	8.2	8.2	8.2
5	8.1	8.0	8.1	8.1	8.0	8.1	8.1
6	8.2	8.1	8.3	8.3	8.2	8.2	8.2
7	8.2	8.3	8.2	8.2	8.3	8.1	8.2
8	8.3	8.1	8.3	8.3	8.3	8.2	8.3
Conductance (µS/cm)							
0	968	994	779	708	769	614	478
1	959	1042	779	720	792	625	501
2	967	1020	752	751	751	605	496
3	941	977	739	686	732	585	461
4	944	987	725	679	716	583	472
5	1076	1129	830	782	845	673	542
6	1072	1086	831	791	851	645	520
7	1046	1067	838	791	871	648	519
8	1031	1074	749	714	852	647	512
Dissolved Oxygen (mg/L) (60-100% saturation)							
0	7.3	7.3	7.3	7.3	7.3	7.3	7.3
1	7.3	7.3	7.3	7.3	7.3	7.3	7.3
2	7.3	7.3	7.3	7.3	7.3	7.3	7.3
3	7.3	7.3	7.3	7.3	7.3	7.3	7.3
4	7.3	7.3	7.3	7.3	7.3	7.3	7.3
5	7.3	7.3	7.3	7.3	7.3	7.3	7.3
6	7.3	7.3	7.3	7.3	7.3	7.3	7.3
7	7.3	7.3	7.3	7.3	7.3	7.3	7.3
8	7.3	7.3	7.3	7.3	7.3	7.3	7.3
Temperature (°C)							
0	24	24	24	24	24	24	24
1	24	24	24	24	24	24	24
2	24	24	24	24	24	24	24
3	24	24	24	24	24	24	24
4	24	24	24	24	24	24	24
5	24	24	24	24	24	24	24
6	24	24	24	24	24	24	24
7	24	24	24	24	24	24	24
8	24	24	24	24	24	24	24

Old Solutions

Conc. (%) / Day	2021-1872	2021-1874	2021-1876	2021-1877	2021-1879	2021-1882	2021-1883
pH (units)							
0							
1	8.3	8.3	8.3	8.2	8.3	8.3	8.3
2	8.3	8.1	8.1	8.2	8.3	8.3	8.3
3	8.2	7.9	8.0	8.1	8.1	8.2	8.2
4	8.3	8.0	8.1	8.2	8.2	8.3	8.3
5	8.3	8.0	8.1	8.2	8.1	8.2	8.3
6	8.2	7.9	8.0	8.1	8.0	8.2	8.2
7	8.3	8.0	8.1	8.2	8.2	8.2	8.3
8	8.3	8.2	8.1	8.2	8.2	8.2	8.2
Conductance (µS/cm)							
0							
1	963	9103	808	746	787	6046	525
2	983	1037	814	746	794	649	534
3	924	979	766	707	751	613	501
4	958	944	757	713	758	623	501
5	1046	1100	845	790	836	689	553
6	1063	1102	836	775	832	682	545
7	1091	1085	840	790	864	673	542
8	1082	1080	853	790	874	669	543
Dissolved Oxygen (mg/L) (60-100% saturation)							
0							
1	7.1	7.1	7.0	7.0	7.0	7.0	7.0
2	7.2	7.2	7.2	7.3	7.2	7.2	7.2
3	7.3	7.3	7.3	7.2	7.2	7.2	7.2
4	7.3	7.3	7.3	7.3	7.2	7.2	7.2
5	7.3	7.3	7.3	7.3	7.3	7.3	7.3
6	7.1	7.1	6.9	7.4	6.9	6.9	7.8
7	7.3	7.2	7.2	7.2	7.1	7.0	7.8
8	7.2	7.1	7.1	7.0	7.0	6.9	6.8
Temperature (°C)							
0							
1	24	24	24	24	24	24	24
2	24	24	24	24	24	24	24
3	24	24	24	24	24	24	24
4	24	24	24	24	24	24	24
5	24	24	24	24	24	24	24
6	24	24	24	24	24	24	24
7	24	24	24	24	24	24	24
8	24	24	24	24	24	24	24

DO Levels (60-100% saturation) -
4.4 to 7.3 mg/L at 24°C
4.3 to 7.2 mg/L at 25°C
4.2 to 7.0 mg/L at 26°C

Comments:

Reviewed By: MG Date Reviewed: 2021/10/28

NAUTILUS ENVIRONMENTAL

Fathead Minnow Bench Sheet

Method: FMD 32 Day ELS Client: NAU104 Sample: 2021-1872, 2021-1874, 2021-1876, 2021-1877, 2021-1879, 2021-1882, 2021-1883 (20 ug/L Cu)

New Solutions

Conc. (%) / Day	2021-1872	2021-1874	2021-1876	2021-1877	2021-1879	2021-1882	2021-1883
pH (units)							
9	8.2	8.1	8.2	8.2	8.2	8.2	8.2
10	8.2	8.0	8.1	8.2	8.2	8.3	8.2
11	8.2	8.0	8.2	8.2	8.2	8.3	8.2
12	8.3	8.3	8.3	8.2	8.3	8.4	8.3
13	8.4	8.3	8.3	8.3	8.2	8.4	8.3
14	8.3	8.3	8.3	8.3	8.3	8.4	8.4
15	8.2	8.2	8.2	8.3	8.2	8.3	8.3
16	8.2	8.3	8.2	8.4	8.2	8.3	8.2
17	8.2	8.2	8.2	8.4	8.4	8.4	8.2
Conductance (µS/cm)							
9	1067	1087	817	711	867	522	522
10	1047	1064	845	694	854	617	496
11	1050	1073	835	714	830	612	520
12	1025	1062	814	681	848	637	509
13	869	1010	700	695	767	607	496
14	861	1017	721	637	766	603	495
15	869	1017	721	640	772	693	494
16	854	998	719	632	747	672	487
17	837	975	689	620	747	670	482
Dissolved Oxygen (mg/L) (60-100% saturation)							
9	7.3	7.3	7.3	7.3	7.3	7.3	7.3
10	7.3	7.3	7.3	7.3	7.3	7.3	7.3
11	7.3	7.3	7.3	7.3	7.3	7.3	7.3
12	7.3	7.3	7.3	7.3	7.3	7.3	7.3
13	7.3	7.3	7.3	7.3	7.3	7.3	7.3
14	7.3	7.3	7.3	7.3	7.3	7.3	7.3
15	7.3	7.3	7.3	7.3	7.3	7.3	7.3
16	7.3	7.3	7.3	7.3	7.3	7.3	7.3
17	7.3	7.3	7.3	7.0	7.3	7.3	7.3
Temperature (°C)							
9	24	24	24	24	24	24	24
10	24	24	24	24	24	24	24
11	24	24	24	24	24	24	24
12	24	24	24	24	24	24	24
13	24	24	24	24	24	24	24
14	24	24	24	24	24	24	24
15	24	24	24	24	24	24	24
16	24	24	24	24	24	24	24
17	24	24	24	24	24	24	24

Old Solutions

Conc. (%) / Day	2021-1872	2021-1874	2021-1876	2021-1877	2021-1879	2021-1882	2021-1883
pH (units)							
9	8.2	8.0	8.0	8.1	8.1	8.2	8.1
10	8.1	8.0	7.9	8.1	8.1	8.1	8.0
11	8.2	8.0	8.0	8.1	8.2	8.2	8.2
12	8.3	8.0	8.1	8.2	8.3	8.3	8.2
13	8.3	8.1	8.1	8.1	8.2	8.3	8.2
14	8.2	8.1	8.0	8.1	8.1	8.2	8.2
15	8.0	8.0	8.0	8.1	8.1	8.2	8.2
16	8.3	8.1	8.1	8.2	8.2	8.4	8.2
17	8.1	7.9	7.9	8.1	8.1	8.2	8.0
Conductance (µS/cm)							
9	1063	1084	850	735	871	1075	537
10	1043	1062	841	726	867	659	523
11	1078	1080	851	735	870	662	534
12	1083	1076	847	740	870	663	544
13	1094	1081	851	743	875	668	538
14	905	1007	738	662	769	698	513
15	915	1009	737	664	768	697	508
16	875	996	735	655	779	698	513
17	864	968	726	633	755	675	493
Dissolved Oxygen (mg/L) (60-100% saturation)							
9	7.0	6.7	6.8	6.7	6.6	6.7	6.9
10	5.8	5.8	5.8	5.7	6.0	6.1	6.2
11	6.7	6.7	6.7	6.7	6.7	6.8	6.7
12	6.9	6.9	6.9	6.8	6.7	6.7	6.7
13	6.3	6.3	6.3	6.2	6.1	6.2	6.8
14	6.7	6.6	6.2	6.2	6.1	6.0	6.2
15	6.6	6.6	6.6	6.6	6.5	6.5	6.6
16	6.2	6.2	6.2	6.2	5.6	6.0	6.3
17	6.1	6.0	6.0	5.9	5.9	6.0	6.1
Temperature (°C)							
9	24	24	24	24	24	24	24
10	24	24	24	24	24	24	24
11	24	24	24	24	24	24	24
12	24	24	24	24	24	24	24
13	24	24	24	24	24	24	24
14	24	24	24	24	24	24	24
15	24	24	24	24	24	24	24
16	24	24	24	24	24	24	24
17	24	24	24	24	24	24	24

DO Levels (60-100% saturation) -
4.4 to 7.3 mg/L at 24°C
4.3 to 7.2 mg/L at 25°C
4.2 to 7.0 mg/L at 26°C

Comments:

Reviewed By: MG Date Reviewed: 10/11/2021

NAUTILUS ENVIRONMENTAL

Fathead Minnow Bench Sheet

Method: FMD 32 Day ELS Client: NAU104

Sample: 2021-1872, 2021-1874, 2021-1876, 2021-1877, 2021-1879, 2021-1882, 2021-1883 (20 ug/L Cu)

pH (units)

Conc. (%)	New Solutions							Old Solutions						
Day	2021-1872	2021-1874	2021-1876	2021-1877	2021-1879	2021-1882	2021-1883	2021-1872	2021-1874	2021-1876	2021-1877	2021-1879	2021-1882	2021-1883
18	8.3	8.2	8.2	8.3	8.3	8.3	8.2	8.1	8.0	7.9	8.0	8.1	8.1	8.1
19	8.3	8.3	8.3	8.3	8.4	8.3	8.3	8.1	7.9	7.9	8.0	8.0	8.2	8.0
20	8.1	8.1	8.0	8.2	8.0	8.2	8.2	8.1	8.0	8.1	8.0	8.0	8.1	8.0
21	8.2	8.2	8.1	8.3	8.3	8.4	8.3	8.2	8.1	8.0	8.1	8.1	8.2	8.2
22	8.2	8.2	8.1	8.3	8.3	8.3	8.3	8.1	8.0	7.9	7.9	8.1	8.1	8.1
23	8.1	8.2	8.1	8.3	8.3	8.3	8.3	8.1	8.1	7.9	8.0	8.1	8.2	8.1
24	8.2	8.2	8.1	8.3	8.3	8.3	8.3	8.1	8.1	8.0	8.1	8.1	8.2	8.2
25	8.2	8.1	8.1	8.3	8.3	8.3	8.3	8.1	8.2	7.9	8.0	8.1	8.2	8.1
26	8.3	8.2	8.1	8.3	8.3	8.3	8.3	8.1	7.9	7.9	8.0	8.0	8.0	8.0

Conductance (µS/cm)

Day														
18	833	902	700	621	[illegible]	670	457	846	978	778	633	754	512	663
19	827	961	629	[illegible]	737	661	485	853	975	731	643	757	679	509
20	1014	1074	826	751	855	666	551	858	976	731	643	759	682	505
21	953	1028	772	727	779	664	530	991	1035	823	730	801	692	565
22	959	1015	805	720	811	660	541	1000	1030	824	752	805	575	502
23	978	1033	816	736	798	679	554	999	1033	827	750	807	679	563
24	980	1036	815	733	798	678	553	1003	1032	827	748	802	683	566
25	986	1041	806	733	794	677	552	998	1037	819	752	800	684	567
26	981	1021	794	723	785	664	542	993	1035	824	754	805	690	572

Dissolved Oxygen (mg/L) (60-100% saturation)

Day														
18	7.3	7.3	7.3	7.3	7.3	7.3	7.3	6.0	6.0	5.8	5.6	5.6	5.6	5.7
19	7.3	7.3	7.3	7.3	7.3	7.3	7.3	5.7	5.5	5.4	5.5	5.3	5.5	5.4
20	7.3	7.3	7.3	7.3	7.3	7.3	7.3	6.2	6.0	6.3	5.7	5.7	5.9	5.7
21	7.3	7.3	7.3	7.3	7.3	7.3	7.3	6.5	6.7	6.6	6.6	6.4	6.5	6.6
22	7.3	7.3	7.3	7.3	7.3	7.3	7.3	6.4	6.0	5.8	5.5	5.5	5.5	5.8
23	7.3	7.3	7.3	7.3	7.3	7.3	7.3	6.3	6.2	6.0	5.8	5.7	5.8	5.9
24	7.3	7.3	7.3	7.3	7.3	7.3	7.3	6.4	6.3	6.2	6.1	6.1	6.2	6.2
25	7.3	7.3	7.3	7.3	7.3	7.3	7.3	6.2	6.2	6.0	6.0	6.0	5.9	6.0
26	7.3	7.3	7.3	7.3	7.3	7.3	7.3	6.8	6.4	6.3	6.3	6.5	5.8	5.6

Temperature (°C)

Day														
18	24	24	24	24	24	24	24	24	24	24	24	24	24	24
19	24	24	24	24	24	24	24	24	24	24	24	24	24	24
20	24	24	24	24	24	24	24	24	24	24	24	24	24	24
21	24	24	24	24	24	24	24	24	24	24	24	24	24	24
22	24	24	24	24	24	24	24	24	24	24	24	24	24	24
23	24	24	24	24	24	24	24	24	24	24	24	24	24	24
24	24	24	24	24	24	24	24	24	24	24	24	24	24	24
25	24	24	24	24	24	24	24	24	24	24	24	24	24	24
26	24	24	24	24	24	24	24	24	24	24	24	24	24	24

DO Levels (60-100% saturation) -
4.4 to 7.3 mg/L at 24°C
4.3 to 7.2 mg/L at 25°C
4.2 to 7.0 mg/L at 26°C

Comments:

Reviewed By: MG Date Reviewed: 2021/10/28

NAUTILUS ENVIRONMENTAL

Fathead Minnow Bench Sheet

Method: FMD 32 Day ELS Client: NAU104 Sample: 2021-1872, 2021-1874, 2021-1876, 2021-1877, 2021-1879, 2021-1882, 2021-1883 (20 ug/L Cu)

New Solutions

Conc. (%) / Day	2021-1872	2021-1874	2021-1876	2021-1877	2021-1879	2021-1882	2021-1883
pH (units)							
27	8.2	7.9	8.0	8.1	8.1	8.3	8.2
28	8.4	8.2	8.2	8.3	8.3	8.4	8.4
29	8.2	8.0	8.0	8.1	8.1	8.3	8.3
30	8.1	8.1	8.1	8.2	8.2	8.3	8.2
31	8.3	8.2	8.2	8.2	8.3	8.3	8.4
32							
Conductance (µS/cm)							
27	1029	1084	861	801	824	635	554
28	1058	1094	858	793	831	674	565
29	1062	1078	842	801	846	678	574
30	1060	1077	868	792	820	677	572
31	1063	1066	866	8180	819	689	580
32							
Dissolved Oxygen (mg/L) (60-100% saturation)							
27	7.3	7.3	7.3	7.3	7.3	7.3	7.3
28	7.3	7.3	7.3	7.3	7.3	7.3	7.3
29	7.3	7.3	7.3	7.3	7.3	7.3	7.3
30	7.3	7.3	7.3	7.3	7.3	7.3	7.3
31	7.3	7.3	7.3	7.3	7.3	7.3	7.3
32							
Temperature (°C)							
27	24	24	24	24	24	24	24
28	24	24	24	24	24	24	24
29	24	24	24	24	24	24	24
30	24	24	24	24	24	24	24
31	24	24	24	24	24	24	24
32							

Old Solutions

Conc. (%) / Day	2021-1872	2021-1874	2021-1876	2021-1877	2021-1879	2021-1882	2021-1883
pH (units)							
27	8.1	8.0	7.9	8.0	8.0	8.1	8.0
28	8.2	8.0	8.1	8.1	8.1	8.1	8.0
29	8.1	8.0	7.9	8.0	8.0	8.1	8.1
30	8.1	7.9	7.9	8.0	8.0	8.1	8.0
31	7.9	8.0	7.9	7.9	7.9	7.9	8.0
32	8.1	8.1	8.1	8.1	8.1	8.0	8.0
Conductance (µS/cm)							
27	997	1035	815	765	804	691	570
28	1004	1035	802	800	815	1081	1003
29	1049	1077	860	814	833	696	588
30	1040	1074	833	814	832	695	586
31	1083	1077	841	822	839	703	601
32	1102	1044	1033	811	810	712	1004
Dissolved Oxygen (mg/L) (60-100% saturation)							
27	6.4	6.4	5.8	5.6	5.7	5.8	5.6
28	5.10	5.5	5.5	5.5	5.3	5.2	5.1
29	6.0	5.16	5.3	5.4	5.5	5.5	5.4
30	6.0	6.1	6.0	5.9	5.9	5.5	5.9
31	5.7	5.6	5.7	5.6	5.7	5.4	5.4
32	10.6	10.5	10.6	10.4	10.4	10.2	10.4
Temperature (°C)							
27	24	24	24	24	24	24	24
28	24	24	24	24	24	24	24
29	24	24	24	24	24	24	24
30	24	24	24	24	24	24	24
31	24	24	24	24	24	24	24
32	24	24	24	24	24	24	24

DO Levels (60-100% saturation) -
4.4 to 7.3 mg/L at 24°C
4.3 to 7.2 mg/L at 25°C
4.2 to 7.0 mg/L at 26°C

Comments:

Reviewed By: MG Date Reviewed: 2021/10/28

NAUTILUS ENVIRONMENTAL

Fathead Minnow Bench Sheet

Method FMD 32 Day ELS Client NAU104 Sample: 2021-1872, 2021-1874, 2021-1876, 2021-1877, 2021-1879, 2021-1882, 2021-1883 (20 ug/L Cu)

Test Termination

For normal/abnormal column, use the following notation:

N=Normal, A= Abnormal And note location: H=head, O=oral, E=eyes, G=gills, F=fins, S=spine

Conc.

2021-1872

Fish	Replicate # A Length (mm)	Normal/ Abnormal	Replicate # B Length (mm)	Normal/ Abnormal	Replicate # C Length (mm)	Normal/ Abnormal	Replicate # D Length (mm)	Normal/ Abnormal
1	10	AS	10	N	3	N	11	N
2	12	N	10		12		10	
3	13		11		8		12	
4	13		10		11	A-S	9	
5	11		13		12	N	14	
6	11		9		12		13	
7	10		12		7		11	
8	13		9		12		13	
9	13		13		8		12	
10	11		10				10	
11	9		10				13	
12	9		13					
13	–	–	11					
14	–	–	12					
15	–	–	–					

Comments

2021-1874

Fish	Replicate # A Length (mm)	Normal/ Abnormal	Replicate # B Length (mm)	Normal/ Abnormal	Replicate # C Length (mm)	Normal/ Abnormal	Replicate # D Length (mm)	Normal/ Abnormal
1	14	N	12	N	12	N	11	N
2	8		14		14		11	
3	12		12		11		14	
4	15		13		13		13	
5	14		12		12		10	
6	13		11		11		13	
7	13		11		9		9	
8	12		12		10		10	
9	13		11		12		8	
10					8		12	
11					9		11	
12							14	
13								
14								
15								

Comments

Reviewed By: MG Date Reviewed: 2021/10/28

NAUTILUS ENVIRONMENTAL

Fathead Minnow Bench Sheet

Method FMD 32 Day ELS Client NAU104 Sample: 2021-1872, 2021-1874, 2021-1876, 2021-1877, 2021-1879, 2021-1882, 2021-1883 (20 ug/L Cu)

Test Termination

For normal/abnormal column, use the following notation:

N=Normal, A= Abnormal And note location: H=head, O=oral, E=eyes, G=gills, F=fins, S=spine

Conc. **2021-1876**

Replicate # A			Replicate # B			Replicate # C			Replicate # D		
Fish	Length (mm)	Normal/ Abnormal	Fish	Length (mm)	Normal/ Abnormal	Fish	Length (mm)	Normal/ Abnormal	Fish	Length (mm)	Normal/ Abnormal
1	13	N	1	13	N	1	11	N	1	13	N
2	13		2	14		2	10		2	13	
3	12		3	11		3	12		3	10	
4	9		4	10		4	12		4	+012	
5	11		5	10		5	12		5	11	
6	10		6	13		6	12		6	9	
7	10		7	14		7	12		7	6	
8	10		8	9		8	10		8	11	
9	12		9	13		9	12		9	11	NA-S
10	12		10	12		10	11		10	12	N
11	12		11			11	11		11	12	
12	11		12			12			12	13	
13	10		13			13			13	9	
14	9		14			14			14	10	
15	–	–	15			15			15	–	–

Comments

Conc. **2021-1877**

Replicate # A			Replicate # B			Replicate # C			Replicate # D		
Fish	Length (mm)	Normal/ Abnormal	Fish	Length (mm)	Normal/ Abnormal	Fish	Length (mm)	Normal/ Abnormal	Fish	Length (mm)	Normal/ Abnormal
1	13	N	1	12	N	1	9	N	1	10	N
2	13		2	12		2	12		2	11	
3	10		3	13		3	9		3	10	
4	10		4	13		4	10		4	12	
5	10	AS	5	12		5	11		5	12	
6	13	N	6	12		6	8		6	12	
7	12		7			7	13		7	13	
8	12		8			8	9		8	11	
9	9		9			9	9		9	12	
10	9		10			10	10		10	9	
11			11			11	10		11	8	
12			12			12	11		12	10	
13			13			13	12		13	11	
14			14			14			14		
15			15			15			15		

Comments

Reviewed By: MG Date Reviewed: 2021/10/28

NAUTILUS ENVIRONMENTAL

Fathead Minnow Bench Sheet

Method FMD 32 Day ELS Client NAU104 Sample: 2021-1872, 2021-1874, 2021-1876, 2021-1877, 2021-1879, 2021-1882, 2021-1883 (20 ug/L Cu)

Test Termination

For normal/abnormal column, use the following notation:

N=Normal, A= Abnormal And note location: H=head, O=oral, E=eyes, G=gills, F=fins, S=spine

Conc.

2021-1879

Fish	Rep A Length (mm)	Rep A Normal/ Abnormal	Rep B Length (mm)	Rep B Normal/ Abnormal	Rep C Length (mm)	Rep C Normal/ Abnormal	Rep D Length (mm)	Rep D Normal/ Abnormal
1	10	N	10	N	10	N	10	N
2	12		10		9	A-S	11	
3	9		11		12	N	13	
4	9		13		12		13	
5	13		11		12		11	
6	12		11		12		11	
7	11		9		11		11	
8	11		10	A-S	10	A-S	9	
9	10		11	N	11	N	13	
10	13		9		11		10	
11	14		9		10		13	
12	9		12		10			
13								
14								
15								

Comments

2021-1882

Fish	Rep A Length (mm)	Rep A Normal/ Abnormal	Rep B Length (mm)	Rep B Normal/ Abnormal	Rep C Length (mm)	Rep C Normal/ Abnormal	Rep D Length (mm)	Rep D Normal/ Abnormal
1	14	N	11	N	13	N	10	N
2	14		11		14		7	
3	12		11		11		11	
4	14		11		14		12	
5			13				10	
6			12				10	
7			12				12	
8			12				12	
9							9	
10							9	
11							8	
12							12	
13							10	
14							11	
15							8	A-S

Comments

Reviewed By: MG Date Reviewed: 2021/10/28

NAUTILUS ENVIRONMENTAL

Fathead Minnow Bench Sheet

Method FMD 32 Day ELS Client NAU104 Sample: 2021-1872, 2021-1874, 2021-1876, 2021-1877, 2021-1879, 2021-1882, 2021-1883 (20 ug/L Cu)

Test Termination

For normal/abnormal column, use the following notation:

N=Normal, A= Abnormal And note location: H=head, O=oral, E=eyes, G=gills, F=fins, S=spine

Conc. 2021-1883

Replicate # A			Replicate # B			Replicate # C			Replicate # D		
Fish	Length (mm)	Normal/ Abnormal	Fish	Length (mm)	Normal/ Abnormal	Fish	Length (mm)	Normal/ Abnormal	Fish	Length (mm)	Normal/ Abnormal
1	9	N	1	7	N	1	11	N	1	11	N
2	9	A-S	2	9		2	9		2	13	
3	8	A-S	3	10		3	14		3	13	
4	13	N	4	13		4	12		4	12	
5	14		5	7		5	12		5	14	
6	7		6	8		6	8		6	12	
7	12		7	12		7	10		7	11	
8	10		8	10	A-S	8	11		8	10	
9	12		9	10	N	9	13		9	12	
10	6		10	10		10	8	A-S	10	13	"
11	9		11	13		11	13	N	11		
12	12		12	14		12	12		12		
13	8		13	9		13	10		13		
14			14			14			14		
15			15			15			15		

Comments

Reviewed By: MG Date Reviewed: 2021/10/28

NAUTILUS ENVIRONMENTAL

Fathead Minnow Bench Sheet

Method FMD 32 Day ELS Client NAU104 Sample: 2021-1873, 2021-1875, 2021-1878, 2021-1881, ,2021-1885, 2021-1886, 2021-1887 (15 ug/L Cu)

Organism Information

Source: Aqualox Batch: 20210813FM-ELS Egg Stage: 16 somite Organisms Received in Good Condition: Yes or No

Test Log

Date	Day	Time	Technicians	Chem Cart Used	Fed AM	Fed PM	Sample Pre-Aeration Time	Bench Sheet Review First
2021/08/13	0	1500	CB/MG/EV/SS	2	–	–	60 min	–
2021/08/14	1	1044	CB	2	–	–	60 min	MF
2021/08/15	2	1045	ST	2	–	– ST	60 mins	DW
2021/08/16	3	1515	ST	2	–	– ST	60 mins	KL
2021/08/17	4	1100	MF	2	–	–	60 mins	ST
2021/08/18	5	1030	CB	2	✓	✓	60 mins	–
2021/08/19	6	1100	SC/ST	2	✓	✓	60 mins.	KL
2021/08/20	7	1030	MF/SC	2	✓	✓	60 mins	DW
2021/08/21	8	1440	SC/MF	2	✓	✓	60 mins	DW
2021/08/22	9	1300	CB	2	✓	✓	60 mins	KL
2021/08/23	10	1130	KL	2	✓	✓	60 mins	ST
2021/08/24	11	1145	CB	2	✓	✓	60 mins	ST
2021/08/25	12	1020	AW	2	✓	✓	60 min	EV
2021/08/26	13	1025	MF/ST	2	✓	✓	60 mins	KL
2021/08/27	14	1200	SC/AW	2	✓	✓	60 mins.	DW
2021/08/28	15	1500	SC	2	✓	✓	60 mins	ST
2021/08/29	16	1050	KL	2	✓	✓	60 mins	
2021/08/30	17	1050	ST	2	✓	✓	60 mins	KL
2021/08/31	18	1145	KL	2	✓	✓	60 mins	MAF
2021/09/01	19	1115	ST	2	✓	✓	60 mins	DW
2021/09/02	20	1115	SC	2	✓	✓	60 mins	DW
2021/09/03	21	1150	SC	2	✓	✓	60 mins	AW
2021/09/04	22	1000	SC	2	✓	✓	60 mins	DW
2021/09/05	23	1100	AW	2	✓	✓	60 mins	KL
2021/09/06	24	1030	AW	2	✓	✓	60 mins	KL.
2021/09/07	25	1020	AW	2	✓	✓	60 mins	EV
2021/09/08	26	0945	SC	2	✓	✓	60 mins	AW
2021/09/09	27	1045	SC	2	✓	✓	60 mins	DW
2021/09/10	28	1040	SC	2	✓	✓	60 mins	MAF
2021/09/11	29	0935	ST	2	✓	✓	60 mins	MAF
2021/09/12	30	1030	AW	2	✓	✓	60 mins	KL
2021/09/13	31	1015	AW	2	✓	✓	60 mins	EV
2021/09/14	32	1425	ST	2	–	–	–	KL

Reviewed By: MG Date Reviewed: 2021/10/28

NAUTILUS ENVIRONMENTAL

Fathead Minnow Bench Sheet

Method FMD 32 Day ELS Client NAU104 Sample: 2021-1873, 2021-1875, 2021-1878, 2021-1881, ,2021-1885, 2021-1886, 2021-1887 (15 ug/L Cu)

Control hatching success must be >66% (≥10 per replicate). Post hatch survival must be >70%.

Number of Alive Embryos and Hatched Organisms

replicate	2021-1873 Day 1 Alive Embryos	2021-1873 Day 1 Dead Embryos	2021-1875 Day 1 Alive Embryos	2021-1875 Day 1 Dead Embryos	2021-1878 Day 1 Alive Embryos	2021-1878 Day 1 Dead Embryos	2021-1881 Day 1 Alive Embryos	2021-1881 Day 1 Dead Embryos	2021-1885 Day 1 Alive Embryos	2021-1885 Day 1 Dead Embryos	2021-1886 Day 1 Alive Embryos	2021-1886 Day 1 Dead Embryos	2021-1887 Day 1 Alive Embryos	2021-1887 Day 1 Dead Embryos
a	14	1	14	1	13	2	13	2	15	0	12	3	15	0
b	12	3	15	0	15	0	15	0	15	0	15	0	15	0
c	15	0	13	2	12	3	14	1	14	1	14	1	14	1
d	12	3	15	0	15	0	14	1	15	0	15	0	13	2
e	27	3	29	1	27	3	30	0	28	2	30	0	28	2
f	29	1	26	4	28	2	30	0	26	4	29	1	-	-

*

Comments/Observations:

Number of Alive Embryos and Hatched Organisms

replicate	2021-1873 Day 2 Alive Embryos	2021-1873 Day 2 Dead Embryos	2021-1873 Day 2 Cull to 15	2021-1875 Day 2 Alive Embryos	2021-1875 Day 2 Dead Embryos	2021-1875 Day 2 Cull to 15	2021-1878 Day 2 Alive Embryos	2021-1878 Day 2 Dead Embryos	2021-1878 Day 2 Cull to 15	2021-1881 Day 2 Alive Embryos	2021-1881 Day 2 Dead Embryos	2021-1881 Day 2 Cull to 15
a	14	0	✓	14	0	✓	13	0	✓	13	0	✓
b	12	0	✓	13	2	✓	14	1	✓	15	0	✓
c	15	0	✓	13	0	✓	12	0	✓	14	0	✓
d	11	1	✓	15	0	✓	14	1	✓	14	0	✓
e	27	0		29	0		27	0		30	0	
f	28	1		26	0		28	0		30	0	

replicate	2021-1885 Day 2 Alive Embryos	2021-1885 Day 2 Dead Embryos	2021-1885 Day 2 Cull to 15	2021-1886 Day 2 Alive Embryos	2021-1886 Day 2 Dead Embryos	2021-1886 Day 2 Cull to 15	2021-1887 Day 2 Alive Embryos	2021-1887 Day 2 Dead Embryos	2021-1887 Day 2 Cull to 15
a	15	0	✓	12	0	✓	15	0	✓
b	15	0	✓	15	0	✓	14	1	✓
c	14	0	✓	13	1	✓	14	0	✓
d	14	1	✓	14	1	✓	13	0	✓
e	28	0		29	1		28	0	
f	26	0		26	3		-	-	

*

Day 2 - Poor looking and dead embryos in replicates a, b, c and d are replaced with healthy embryos from replicates e and f. Replicates e and f are discarded after day 2.

Comments/Observations:

* Jar spilled.-

Reviewed By: MG Date Reviewed: 2021/10/28

NAUTILUS ENVIRONMENTAL

Fathead Minnow Bench Sheet

Method FMD 32 Day ELS Client NAU104 Sample: 2021-1873, 2021-1875, 2021-1878, 2021-1881, ,2021-1885, 2021-1886, 2021-1887 (15 ug/L Cu)

Control hatching success must be >66% (≥10 per replicate). Post hatch survival must be >70%.

2021-1873

Day 3

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	14	1	1	0
b	14	0	1	0
c	13	0	2	0
d	10	0	5	0

2021-1875

Day 3

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	11	0	2	2
b	12	0	2	1
c	11	0	4	0
d	14	0	1	0

2021-1878

Day 3

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	10	0	5	0
b	11	0	4	0
c	10	0	5	0
d	13	0	2	0

2021-1881

Day 3

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	11	0	4	0
b	12	1	2	0
c	13	1	1	0
d	13	0	2	0

2021-1885

Day 3

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	14	0	1	0
b	9	0	6	0
c	13	0	2	0
d	12	0	3	0

2021-1886

Day 3

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	9	0	6	0
b	10	0	4	1
c	10	0	5	0
d	13	0	1	1*

*Microbial on fish

2021-1887

Day 3

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	9	0	6	0
b	11	0	3	1
c	12	0	3	0
d	15	0	0	0

[redacted]

2021-1873

Day 4

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	4	0	10	0
b	5	0	9	1
c	2	1	11 (1)	1
d	1	2	12	0

2021-1875

Day 4

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	3	0	10	0
b	2	0	12	0
c	4	0	11	0
d	4	1	10	0

2021-1878

Day 4

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	2	0	13	0
b	3	0	12 (1)	0
c	2	0	12 (1)	0
d	2	0	12	1

2021-1881

Day 4

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	0	0	15	0
b	2	0	12	0
c	3	1	10	0
d	6	0	9	0

2021-1885

Day 4

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	12	1	12	0
b	4	0	10	0
c	8	0	7	0
d	4	2	9	0

2021-1886

Day 4

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	0	0	14	1
b	3	0	11 (1)	0
c	1	0	13	1
d	1	1	12 (1)	0

2021-1887

Day 4

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	1	1	13 (2)	0
b	1	0	13	0
c	1	0	14 (2)	0
d	0	1	14	0

Comments/Observations

Reviewed By: MG Date Reviewed: 2021/10/28

NAUTILUS ENVIRONMENTAL

Fathead Minnow Bench Sheet

Method FMD 32 Day ELS Client NAU104 Sample: 2021-1873, 2021-1875, 2021-1878, 2021-1881, ,2021-1885, 2021-1886, 2021-1887 (15 ug/L Cu)

Control hatching success must be >66% (≥10 per replicate). Post hatch survival must be >70%.

2021-1873

Day 5

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	0	0	10	4
b	0	0	12	2
c	0	0	12	1
d	0	0	12	1

2021-1875

Day 5

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	0	0	13	0
b	1	0	13	0
c	0	0	15	0
d	0	2	12	0

2021-1878

Day 5

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	1	0	14	0
b	0	0	15	0
c	0	0	15	0
d	0	1	13	0

2021-1881

Day 5

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	0	0	15	0
b	0	0	13	1
c	0	0	12	1
d	0	0	14	1

2021-1885

Day 5

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	0	1	13	0
b	0	1	13	0
c	0	2	13	0
d	0	0	13	0

2021-1886

Day 5

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	0	0	14	0
b	0	0	14	0
c	0	0	14	0
d	1	1	10	1

2021-1887

Day 5

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	0	0	14	0
b	0	0	13	1
c	0	0	15	0
d	0	0	14	0

[redacted]

2021-1873

Day 6

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	0	0	9 10 10	1 0 0
b	0	0	11	1
c	0	0	11	1
d	0	0	12*	0

2021-1875

Day 6

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	0	0	13	0
b	0	0	13	0 1
c	0	0	15	0
d	0	0	12	0

2021-1878

Day 6

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	0	0	14	1
b	0	0	15	0
c	0	0	15	0
d	0	0	13	0

2021-1881

Day 6

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	0	0	15	0
b	0	0	13	0
c	0	0	11	1
d	0	0	13	1

2021-1885

Day 6

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	0	0	13	0
b	0	0	13	0
c	0	0	13	0
d	0	0	13	0

2021-1886

Day 6

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	0	0	14	0
b	0	0	14(2)	0
c	0	0	14	0
d	0	0	11	0

2021-1887

Day 6

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	0	0	14	0
b	0	0	13	0
c	0	0	14(0)	1
d	0	0	14	0

Comments/Observations

microbial 1873 d-0A46
1878 d

Reviewed By: MG Date Reviewed: 2021/10/28

NAUTILUS ENVIRONMENTAL

Fathead Minnow Bench Sheet

Method FMD 32 Day ELS Client NAU104 Sample: 2021-1873, 2021-1875, 2021-1878, 2021-1881, ,2021-1885, 2021-1886, 2021-1887 (15 ug/L Cu)

Number of Alive Embryos and Hatched Organisms

replicate	2021-1873 Day 7 Alive Hatched	2021-1875 Day 7 Alive Hatched	2021-1878 Day 7 Alive Hatched	2021-1881 Day 7 Alive Hatched	2021-1885 Day 7 Alive Hatched	2021-1886 Day 7 Alive Hatched	2021-1887 Day 7 Alive Hatched
a	10 *	13(1)	14 *	15	13	14	12 *
b	11	13	13	13	13	14(1)	13
c	11 *	14	14	10	13 *	14	14(1)
d	11 *	11 *	13	13	13	11	13

Comments/Observations: * Microbial (in jar) 1873 a,c,d , 1875 d , 1878 a, 1885 c, 1887 a

replicate	2021-1873 Day 8 Alive Hatched	2021-1875 Day 8 Alive Hatched	2021-1878 Day 8 Alive Hatched	2021-1881 Day 8 Alive Hatched	2021-1885 Day 8 Alive Hatched	2021-1886 Day 8 Alive Hatched	2021-1887 Day 8 Alive Hatched
a	10	12	14 *	13	13	14	12 *
b	11	12	12	13	13	14(2)	13
c	11	14(1)	14 *	10	13	14(1) *	14(1)
d	9	11	13 *	13 *	13	10	12(1)

Comments/Observations: 1875 C:1A3 Microbial in jar 1878 a,c,d , 1881 d 1885 C:1A3 1886 C, 1887 a

replicate	2021-1873 Day 9 Alive Hatched	2021-1875 Day 9 Alive Hatched	2021-1878 Day 9 Alive Hatched	2021-1881 Day 9 Alive Hatched	2021-1885 Day 9 Alive Hatched	2021-1886 Day 9 Alive Hatched	2021-1887 Day 9 Alive Hatched
a	10	11 *	14 *	13	13 *	14	12(3)
b	11	12 *	12(1) *	13	13 *	12(1)	13(1) *
c	11	11 Δ *	13 *	10(2) *	13(1) *	14(1)	13 14(1) *
d	9	11	13 *	13 *	13 *	10	12(1) *

Comments/Observations: * Microbial in jar Δ Microbial on dead organism

replicate	2021-1873 Day 10 Alive Hatched	2021-1875 Day 10 Alive Hatched	2021-1878 Day 10 Alive Hatched	2021-1881 Day 10 Alive Hatched	2021-1885 Day 10 Alive Hatched	2021-1886 Day 10 Alive Hatched	2021-1887 Day 10 Alive Hatched
a	10 *	11	14 *	13 *	13 *	14	10 *
b	11 *	12	12(1) *	13	13 *	12(1)	(3)1 *
c	11 *	10	13 *	10(2) *	13(1) *	14(1)	14(1) *
d	9 *	11	13 *	13 *	13 *	10	11 *

Comments/Observations: * Microbial in jar

Reviewed By: ML Date Reviewed: 2021/10/28

NAUTILUS ENVIRONMENTAL

Fathead Minnow Bench Sheet

Method FMD 32 Day ELS Client NAU104 Sample: 2021-1873, 2021-1875, 2021-1878, 2021-1881, ,2021-1885, 2021-1886, 2021-1887 (15 ug/L Cu)

Number of Alive Embryos and Hatched Organisms

replicate	2021-1873 Day 11 Alive Hatched	2021-1875 Day 11 Alive Hatched	2021-1878 Day 11 Alive Hatched	2021-1881 Day 11 Alive Hatched	2021-1885 Day 11 Alive Hatched	2021-1886 Day 11 Alive Hatched	2021-1887 Day 11 Alive Hatched
a	10 *	11	14 *	12 *	13	14	10 *
b	11 *	12	12(1) *	13 *	13	12(1)	13(1)
c	11 *	9(1) A	13 *	10(1) *	12(1)	14(1)	14
d	9 *	11	13 *	13(1) *	13	10	11

Comments/Observations: * Microbial in jar A microbial on dead organism

replicate	2021-1873 Day 12 Alive Hatched	2021-1875 Day 12 Alive Hatched	2021-1878 Day 12 Alive Hatched	2021-1881 Day 12 Alive Hatched	2021-1885 Day 12 Alive Hatched	2021-1886 Day 12 Alive Hatched	2021-1887 Day 12 Alive Hatched
a	10(1)	11	14	12	13	14	10
b	11	12	12(1)	13	13	12(1)	13(1)
c	11	9(1)	13	9 * A	11	14(1)	14(1)
d	9(1)	11	13	13(1)	13(1)	10	11

Comments/Observations: * Microbial growth A microbial on dead organism

replicate	2021-1873 Day 13 Alive Hatched	2021-1875 Day 13 Alive Hatched	2021-1878 Day 13 Alive Hatched	2021-1881 Day 13 Alive Hatched	2021-1885 Day 13 Alive Hatched	2021-1886 Day 13 Alive Hatched	2021-1887 Day 13 Alive Hatched
a	10(1) *	11	14 *	12	13(1)	14	10
b	11	12	12(1) *	13	13	12(1)	13(1)
c	11	8	13	9 *	11	14(1)	13
d	9	11	13 *	13(1)	13(1)	10 *	11

Comments/Observations: * Microbial growth 1881-C-1AS 1886-1AS 1887B-1AS

replicate	2021-1873 Day 14 Alive Hatched	2021-1875 Day 14 Alive Hatched	2021-1878 Day 14 Alive Hatched	2021-1881 Day 14 Alive Hatched	2021-1885 Day 14 Alive Hatched	2021-1886 Day 14 Alive Hatched	2021-1887 Day 14 Alive Hatched
a	10(1)	11	14 *	12	13(1)	14	10
b	11	12	12	13	13	12	13(1)
c	11	8	13	9	11	14(1)	13
d	9	11	13	12	13	10	11

Comments/Observations: * Microbial growth 1881-C-1AS 1886-C-1AS

Reviewed By: MG Date Reviewed: 2021/10/28

NAUTILUS ENVIRONMENTAL

Fathead Minnow Bench Sheet

Method FMD 32 Day ELS Client NAU104 Sample: 2021-1873, 2021-1875, 2021-1878, 2021-1881, ,2021-1885, 2021-1886, 2021-1887 (15 ug/L Cu)

Number of Alive Embryos and Hatched Organisms

replicate	2021-1873 Day 15 Alive Hatched	2021-1875 Day 15 Alive Hatched	2021-1878 Day 15 Alive Hatched	2021-1881 Day 15 Alive Hatched	2021-1885 Day 15 Alive Hatched	2021-1886 Day 15 Alive Hatched	2021-1887 Day 15 Alive Hatched
a	10(1)	11	14	12	13(1)	13	10
b	11	12	12	13	13	12	13(1)
c	~~9~~ 11	8	13	~~9~~ 9	11	14(1)	13
d	9	11	13	12	13	10	11

Comments/Observations:

replicate	2021-1873 Day 16 Alive Hatched	2021-1875 Day 16 Alive Hatched	2021-1878 Day 16 Alive Hatched	2021-1881 Day 16 Alive Hatched	2021-1885 Day 16 Alive Hatched	2021-1886 Day 16 Alive Hatched	2021-1887 Day 16 Alive Hatched
a	10(1)	11	14	12	13(1)	13	10
b	11	12	12	13	13	12	13(1)
c	11	8	13	9 *	11	14	13
d	9	11	13	12	13	10	11

Comments/Observations: * Microbial in jar

replicate	2021-1873 Day 17 Alive Hatched	2021-1875 Day 17 Alive Hatched	2021-1878 Day 17 Alive Hatched	2021-1881 Day 17 Alive Hatched	2021-1885 Day 17 Alive Hatched	2021-1886 Day 17 Alive Hatched	2021-1887 Day 17 Alive Hatched
a	10(1)	11	14	12	13 12	13	10
b	11	12	12	13	13	12	13
c	11	8	13	9 *	11	14	13
d	9	11	13	12	12	16	11

Comments/Observations: * 1881C-1A5 1887B-1A5

replicate	2021-1873 Day 18 Alive Hatched	2021-1875 Day 18 Alive Hatched	2021-1878 Day 18 Alive Hatched	2021-1881 Day 18 Alive Hatched	2021-1885 Day 18 Alive Hatched	2021-1886 Day 18 Alive Hatched	2021-1887 Day 18 Alive Hatched
a	10(1)	11	14	12	12	13	10
b	11	12	12	13	13	12	13(1)
c	11	8	13	9	11	14	13
d	9	11	13	12	10(1)	10	11

Comments/Observations:

MG 2021/10/28

NAUTILUS ENVIRONMENTAL

Fathead Minnow Bench Sheet

Method FMD 32 Day ELS Client NAU104 Sample: 2021-1873, 2021-1875, 2021-1878, 2021-1881, ,2021-1885, 2021-1886, 2021-1887 (15 ug/L Cu)

Number of Alive Embryos and Hatched Organisms

	2021-1873	2021-1875	2021-1878	2021-1881	2021-1885	2021-1886	2021-1887
	Day 19	Day 19	Day 19	Day 19	Day 19	Day 19	Day 19
replicate	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched
a	10(1)	10	13	12	12	13	10
b	11	12	12	13	13	12	13(2)
c	11	8	13	9	11	14	~~12~~ 13 ST
d	9	11	13	12	10(1)	10	11

Comments/Observations: 1873A:1AS 1885D:1AS 1887B:1AS

	2021-1873	2021-1875	2021-1878	2021-1881	2021-1885	2021-1886	2021-1887
	Day 20	Day 20	Day 20	Day 20	Day 20	Day 20	Day 20
replicate	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched
a	10(1)	10	13	12	12	13	10
b	11	12	12	13	13	12	12(1)
c	11	8	13	9	11	14	13
d	9	11	13	12	9	10	10

Comments/Observations: 1887: 1AS

	2021-1873	2021-1875	2021-1878	2021-1881	2021-1885	2021-1886	2021-1887
	Day 21	Day 21	Day 21	Day 21	Day 21	Day 21	Day 21
replicate	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched
a	10(1)	10	13	12	12	13	10
b	11	12	12	13	12	11	12(1)
c	9	8	13	9	11	14	13
d	9	11	13	12	9	10	10

Comments/Observations:

	2021-1873	2021-1875	2021-1878	2021-1881	2021-1885	2021-1886	2021-1887
	Day 22	Day 22	Day 22	Day 22	Day 22	Day 22	Day 22
replicate	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched
a	10(1)	10	13	12	12	13	10
b	11	12	12	13	12	11	12(1)
c	9	8	13	9	11	14	11
d	9	11	13	12	9	10	10

Comments/Observations:

MG 2021/10/28

NAUTILUS ENVIRONMENTAL

Fathead Minnow Bench Sheet

Method FMD 32 Day ELS Client NAU104 Sample: 2021-1873, 2021-1875, 2021-1878, 2021-1881, ,2021-1885, 2021-1886, 2021-1887 (15 ug/L Cu)

Number of Alive Embryos and Hatched Organisms

replicate	2021-1873 Day 23 Alive Hatched	2021-1875 Day 23 Alive Hatched	2021-1878 Day 23 Alive Hatched	2021-1881 Day 23 Alive Hatched	2021-1885 Day 23 Alive Hatched	2021-1886 Day 23 Alive Hatched	2021-1887 Day 23 Alive Hatched
a	10(1)	10(1)	13	12	10	13	10
b	11	12	12	13	12	11	12(1)
c	9	8	13	9	11	14	11
d	9	11	13	12	8(1)	10	10

Comments/Observations:

replicate	2021-1873 Day 24 Alive Hatched	2021-1875 Day 24 Alive Hatched	2021-1878 Day 24 Alive Hatched	2021-1881 Day 24 Alive Hatched	2021-1885 Day 24 Alive Hatched	2021-1886 Day 24 Alive Hatched	2021-1887 Day 24 Alive Hatched
a	10(1)	10(1)	13	12	10	13	10
b	11	12	12	13	11	10	10
c	5	8	13	9	11	14	9
d	9	11	13	12	6	10	10

Comments/Observations:

replicate	2021-1873 Day 25 Alive Hatched	2021-1875 Day 25 Alive Hatched	2021-1878 Day 25 Alive Hatched	2021-1881 Day 25 Alive Hatched	2021-1885 Day 25 Alive Hatched	2021-1886 Day 25 Alive Hatched	2021-1887 Day 25 Alive Hatched
a	10(1)	10(1)	13	12	10	13	10(1)
b	11	12	12	13	10	10	10
c	5	8	13	9	11	14	9(1)
d	9	11	13	12	6	10	10

Comments/Observations:

replicate	2021-1873 Day 26 Alive Hatched	2021-1875 Day 26 Alive Hatched	2021-1878 Day 26 Alive Hatched	2021-1881 Day 26 Alive Hatched	2021-1885 Day 26 Alive Hatched	2021-1886 Day 26 Alive Hatched	2021-1887 Day 26 Alive Hatched
a	10(1)	10(1)	13	12	8	12	10
b	11	12	12	13	10	10(1)	10
c	5	8	13	9	11	14	9
d	9	11	13	12	5	10	10

Comments/Observations:

MG 2021/10/28

NAUTILUS ENVIRONMENTAL

Fathead Minnow Bench Sheet

Method FMD 32 Day ELS Client NAU104 Sample: 2021-1873, 2021-1875, 2021-1878, 2021-1881, ,2021-1885, 2021-1886, 2021-1887 (15 ug/L Cu)

Number of Alive Embryos and Hatched Organisms

replicate	2021-1873 Day 27 Alive Hatched	2021-1875 Day 27 Alive Hatched	2021-1878 Day 27 Alive Hatched	2021-1881 Day 27 Alive Hatched	2021-1885 Day 27 Alive Hatched	2021-1886 Day 27 Alive Hatched	2021-1887 Day 27 Alive Hatched
a	10(1)	10(1)	13	12	8	13	10
b	11	12	12	13	10	10	10
c	5	8	13	9	11	14	8
d	9	11 ~~12~~ 5	13	12	5	10	10

Comments/Observations:

replicate	2021-1873 Day 28 Alive Hatched	2021-1875 Day 28 Alive Hatched	2021-1878 Day 28 Alive Hatched	2021-1881 Day 28 Alive Hatched	2021-1885 Day 28 Alive Hatched	2021-1886 Day 28 Alive Hatched	2021-1887 Day 28 Alive Hatched
a	9(1)	10(1)	13	12	8	13	10
b	11	12	12	13	9	10	8
c	5	8	13	9	11	14	8
d	9	11	13	12	5	10	10

Comments/Observations:

replicate	2021-1873 Day 29 Alive Hatched	2021-1875 Day 29 Alive Hatched	2021-1878 Day 29 Alive Hatched	2021-1881 Day 29 Alive Hatched	2021-1885 Day 29 Alive Hatched	2021-1886 Day 29 Alive Hatched	2021-1887 Day 29 Alive Hatched
a	8	9	13	12	8	13	10
b	11	12	12	13	9	10	6
c	5	8	13	9	11	14	8
d	9	11	13	12	5	10	10

Comments/Observations: 1881A-1AS 1887A-1AS

replicate	2021-1873 Day 30 Alive Hatched	2021-1875 Day 30 Alive Hatched	2021-1878 Day 30 Alive Hatched	2021-1881 Day 30 Alive Hatched	2021-1885 Day 30 Alive Hatched	2021-1886 Day 30 Alive Hatched	2021-1887 Day 30 Alive Hatched
a	8	9	13	12	8	13	9
b	11	12	12	13	9	10	6
c	4	8	13	9	11	14	8
d	9	11	13	12	5	10	10

Comments/Observations:

MG 2021/10/28

NAUTILUS ENVIRONMENTAL

Fathead Minnow Bench Sheet

Method FMD 32 Day ELS Client NAU104 Sample: 2021-1873, 2021-1875, 2021-1878, 2021-1881, ,2021-1885, 2021-1886, 2021-1887 (15 ug/L Cu)

Number of Alive Embryos and Hatched Organisms

	2021-1873	2021-1875	2021-1878	2021-1881	2021-1885	2021-1886	2021-1887
	Day 31	Day 31	Day 31	Day 31	Day 31	Day 31	Day 31
replicate	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched
a	8	9	13	12	8	13	9
b	11	12	12	13	9	10	6
c	4	8	13	9	11	13	8
d	9	11	13	12	5	10	10

Comments/Observations:

	2021-1873	2021-1875	2021-1878	2021-1881	2021-1885	2021-1886	2021-1887
	Day 32	Day 32	Day 32	Day 32	Day 32	Day 32	Day 32
replicate	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched
a	8	9	13	12	8	13	9
b	11	12	12	13	9	10(1)	6
c	3	8	13	8	11	13	8
d	9	11	13	12	5	10	10

Comments/Observations:

Reviewed By: MG Date Reviewed: 2021/10/28

NAUTILUS ENVIRONMENTAL

Fathead Minnow Bench Sheet

Method FMD 32 Day ELS Client NAU104 Sample 2021-1873, 2021-1875, 2021-1878, 2021-1881, ,2021-1885, 2021-1886, 2021-1887 (15 ug/L Cu)

New Solutions

Conc. (%)	2021-1873	2021-1875	2021-1878	2021-1881	2021-1885	2021-1886	2021-1887
Day							
pH (units)							
0	8.3	8.3	8.0	8.2	8.2	8.2	8.2
1	8.2	8.2	8.0	8.1	8.1	8.2	8.1
2	8.3	8.3	8.0	8.2	8.1	8.2	8.2
3	8.2	8.3	8.1	8.2	8.1	8.2	8.2
4	8.3	8.3	8.0	8.2	8.2	8.2	8.3
5	8.1	8.2	7.9	8.1	8.0	8.1	8.0
6	8.3	8.2	8.1	8.2	8.1	8	8.2
7	8.2	8.3	8.1	8.1	8.2	8.2	8.2
8	8.3	8.3	8.0	8.1	8.1	8.2	8.1
Conductance (µS/cm)							
0	342	1018	1101	258	291	502	748
1	355	942	1103	275	279	505	771
2	330	995	1124	301	272	500	774
3	316	928	1164	249	257	471	720
4	329	962	1089	256	240	463	744
5	365	1096	1193	322	299	551	828
6	350	1048	1104	323	284	611	761
7	379	1079	1157	309	286	630	776
8	334	1040	1147	309	283	538	748
Dissolved Oxygen (mg/L) (60-100% saturation)							
0	7.3	7.3	7.3	7.3	7.3	7.3	7.3
1	7.3	7.3	7.3	7.3	7.3	7.3	7.3
2	7.3	7.3	7.3	7.3	7.3	7.3	7.3
3	7.3	7.3	7.3	7.3	7.3	7.3	7.3
4	7.3	7.3	7.3	7.3	7.3	7.3	7.3
5	7.3	7.3	7.3	7.3	7.3	7.3	7.3
6	7.3	7.3	7.3	7.3	7.3	7.3	7.3
7	7.3	7.3	7.3	7.3	7.3	7.3	7.3
8	7.3	7.3	7.3	7.3	7.3	7.3	7.3
Temperature (°C)							
0	24	24	24	24	24	24	24
1	24	24	24	24	24	24	24
2	24	24	24	24	24	24	24
3	24	24	24	24	24	24	24
4	24	24	24	24	24	24	24
5	24	24	24	24	24	24	24
6	24	24	24	24	24	24	24
7	24	24	24	24	24	24	24
8	24	24	24	24	24	24	24

Old Solutions

	2021-1873	2021-1875	2021-1878	2021-1881	2021-1885	2021-1886	2021-1887
pH (units)							
0							
1	8.3	8.3	8.2	8.2	8.2	8.2	8.2
2	8.3	8.3	8.3	8.1	8.2	8.3	8.3
3	8.2	8.2	7.9	8.1	8.1	8.2	8.2
4	8.3	8.3	7.9	8.2	8.2	8.2	8.2
5	8.3	8.2	8.1	8.0	8.2	8.2	8.2
6	8.2	8.2	7.9	8.2	8.2	8.2	8.2
7	8.3	8.3	8.1	8.3	8.2	8.2	8.2
8	8.2	8.2	8.0	8.1	8.1	8.1	8.2
Conductance (µS/cm)							
0							
1	357	988	1083	284	278	502	759
2	359	981	1088	310	284	504	764
3	319	932	1037	328	282	492	736
4	344	957	1082	325	282	495	748
5	387	1016	1130	342	317	546	816
6	378	1047	1145	361	310	543	817
7	364	1049	1105	340	310	611	769
8	359	1045	1119	361	299	618	809
Dissolved Oxygen (mg/L) (60-100% saturation)							
0							
1	7.0	6.9	7.0	7.0	7.0	7.0	7.0
2	7.2	7.2	7.2	7.2	7.2	7.2	7.3
3	7.2	7.2	7.2	7.2	7.2	7.2	7.2
4	7.2	7.2	7.2	7.2	7.2	7.2	7.2
5	7.3	7.3	7.3	7.3	7.3	7.3	7.3
6	7.3	7.3	7.2	7.2	7.2	7.2	7.2
7	7.2	7.3	7.3	7.3	7.3	7.3	7.3
8	7.2	6.7	6.6	6.9	7.3	6.9	6.9
Temperature (°C)							
0							
1	24	24	24	24	24	24	24
2	24	24	24	24	24	24	24
3	24	24	24	24	24	24	24
4	24	24	24	24	24	24	24
5	24	24	24	24	24	24	24
6	24	24	24	24	24	24	24
7	24	24	24	24	24	24	24
8	24	24	24	24	24	24	24

DO Levels (60-100% saturation) -
4.4 to 7.3 mg/L at 24°C
4.3 to 7.2 mg/L at 25°C
4.2 to 7.0 mg/L at 26°C

Comments:

Reviewed By: MG Date Reviewed: 2021/10/28

NAUTILUS ENVIRONMENTAL

Fathead Minnow Bench Sheet

Method: FMD 32 Day ELS Client: NAU104 Sample: 2021-1873, 2021-1875, 2021-1878, 2021-1881, ,2021-1885, 2021-1886, 2021-1887 (15 ug/L Cu)

pH (units)

Conc. (%)	New Solutions							Old Solutions						
Day	2021-1873	2021-1875	2021-1878	2021-1881	2021-1885	2021-1886	2021-1887	2021-1873	2021-1875	2021-1878	2021-1881	2021-1885	2021-1886	2021-1887
9	8.2	8.2	7.9	8.1	8.2	8.2	8.1	8.1	8.1	8.0	8.0	8.0	8.0	8.1
10	8.1	8.2	7.9	8.0	8.1	8.0	8.0	8.1	8.1	8.0	7.9	8.0	8.0	8.0
11	8.3	8.2	8.0	8.2	8.2	8.1	8.1	8.2	8.1	8.0	8.0	8.0	8.0	8.1
12	8.4	8.3	8.1	8.2	8.3	8.3	8.2	8.2	8.3	8.1	8.2	8.1	8.2	8.2
13	8.3	8.4	8.1	8.3	8.3	8.2	8.2	8.1	8.2	8.0	8.1	8.1	8.1	8.2
14	8.4	8.4	8.2	8.3	8.3	8.3	8.3	8.2	8.2	8.0	8.1	8.1	8.1	8.1
15	8.4	8.3	8.1	8.2	8.3	8.2	8.2	7.9	8.0	7.9	7.9	8.0	8.1	8.1
16	8.4	8.3	8.3	8.3	8.2	8.1	8.2	8.2	8.2	7.9	8.1	8.1	8.1	8.1
17	8.3	8.3	8.2	8.3	8.3	8.2	8.2	8.0	8.0	7.8	9.0	8.0	7.9	8.0

Conductance (µS/cm)

Day														
9	339	1080	1153	313	289	620	776	363	1051	1126	357	304	569	766
10	325	1051	1112	290	281	597	754	361	1046	1125	356	303	606	771
11	345	1067	1113	300	275	612	745	359	1041	1110	354	308	617	775
12	336	1059	1141	320	283	604	760	362	1052	1116	380	319	642	760
13	337	840	1091	316	293	454	609	341	1048	1115	302	321	618	764
14	345	846	1086	323	299	462	704	353	957	1039	332	309	621	707
15	346	848	1094	317	297	461	717	361	865	1045	325	311	495	725
16	352	836	1052	302	294	462	703	372	847	1052	340	311	501	714
17	335	820	1023	310	289	453	690	357	833	1017	306	301	462	690

Dissolved Oxygen (mg/L) (60-100% saturation)

Day														
9	7.3	7.3	7.3	7.3	7.3	7.3	7.3	6.6	6.6	6.4	6.4	6.4	6.6	6.6
10	7.3	7.3	7.3	7.3	7.3	7.3	7.3	6.7	6.3	6.4	6.4	6.3	6.2	6.7
11	7.3	7.3	7.3	7.3	7.3	7.3	7.3	6.8	6.8	6.9	6.9	6.8	6.7	6.8
12	7.3	7.3	7.3	7.3	7.3	7.3	7.3	6.7	6.7	6.8	6.8	6.7	6.8	6.8
13	7.3	7.3	7.3	7.3	7.3	7.3	7.3	6.5	6.4	6.2	6.2	6.3	6.2	5.9
14	7.3	7.3	7.3	7.3	7.3	7.3	7.3	6.7	6.6	6.6	6.3	6.3	6.2	6.0
15	7.3	7.3	7.3	7.3	7.3	7.3	7.3	6.6	6.6	6.6	6.4	6.2	6.6	6.5
16	7.2	7.3	7.3	7.3	7.3	7.3	7.3	6.3	6.2	6.2	6.3	6.3	6.2	6.3
17	7.3	7.3	7.3	7.3	7.3	7.3	7.3	6.1	6.1	6.2	6.0	6.1	6.3	6.2

Temperature (°C)

Day														
9	24	24	24	24	24	24	24	24	24	24	24	24	24	24
10	24	24	24	24	24	24	24	24	24	24	24	24	24	24
11	24	24	24	24	24	24	24	24	24	24	24	24	24	24
12	24	24	24	24	24	24	24	24	24	24	24	24	24	24
13	24	24	24	24	24	24	24	24	24	24	24	24	24	24
14	24	24	24	24	24	24	24	24	24	24	24	24	24	24
15	24	24	24	24	24	24	24	24	24	24	24	24	24	24
16	24	24	24	24	24	24	24	24	24	24	24	24	24	24
17	24	24	24	24	24	24	24	24	24	24	24	24	24	24

DO Levels (60-100% saturation) -
4.4 to 7.3 mg/L at 24°C
4.3 to 7.2 mg/L at 25°C
4.2 to 7.0 mg/L at 26°C

Comments:

Reviewed By: MCh Date Reviewed: 2021/10/28

NAUTILUS ENVIRONMENTAL

Fathead Minnow Bench Sheet

Method FMD 32 Day ELS Client NAU104 Sample 2021-1873, 2021-1875, 2021-1878, 2021-1881, ,2021-1885, 2021-1886, 2021-1887 (15 ug/L Cu)

New Solutions

Conc. (%) / Day	2021-1873	2021-1875	2021-1878	2021-1881	2021-1885	2021-1886	2021-1887
pH (units)							
18	8.3	8.3	8.2	8.3	8.3	8.2	8.2
19	8.3	8.2	8.2	8.4	8.3	8.2	8.2
20	8.2	8.1	8.0	8.2	8.2	8.1	8.0
21	8.4	8.3	8.2	8.4	8.3	8.2	8.2
22	8.2	8.3	8.2	8.3	8.2	8.2	8.1
23	8.1	8.2	8.1	8.3	8.2	8.1	8.1
24	8.1	8.2	8.1	8.2	8.2	8.1	8.1
25	8.0	8.1	8.2	8.2	8.2	8.1	8.1
26	8.2	8.2	8.1	8.3	8.2	8.1	8.1
Conductance (µS/cm)							
18	344	829	1038	315	292	453	667
19	351	828	1046	290	289	453	683
20	379	1016	1100	297	701	624	773
21	348	945	1056	316	294	591	748
22	339	918	1087	308	290	590	753
23	343	996	1087	325	298	590	750
24	336	976	1061	358	301	590	748
25	336	998	1074	329	296	587	748
26	343	983	1073	307	294	588	744
Dissolved Oxygen (mg/L) (60-100% saturation)							
18	7.3	7.3	7.5	7.3	7.3	7.3	7.3
19	7.3	7.3	7.3	7.3	7.3	7.3	7.3
20	7.3	7.3	7.3	7.3	7.3	7.3	7.3
21	7.3	7.3	7.3	7.3	7.3	7.3	7.3
22	7.3	7.3	7.3	7.3	7.3	7.3	7.3
23	7.3	7.3	7.3	7.3	7.3	7.3	7.3
24	7.3	7.3	7.3	7.3	7.3	7.3	7.3
25	7.3	7.3	7.3	7.3	7.3	7.3	7.3
26	7.3	7.3	7.3	7.3	7.3	7.3	7.3
Temperature (°C)							
18	24	24	24	24	24	24	24
19	24	24	24	24	24	24	24
20	24	24	24	24	24	24	24
21	24	24	24	24	24	24	24
22	24	24	24	24	24	24	24
23	24	24	24	24	24	24	24
24	24	24	24	24	24	24	24
25	24	24	24	24	24	24	24
26	24	24	24	24	24	24	24

Old Solutions

Conc. (%) / Day	2021-1873	2021-1875	2021-1878	2021-1881	2021-1885	2021-1886	2021-1887
pH (units)							
18	8.0	8.0	7.8	7.9	8.0	8.0	8.0
19	8.1	8.0	7.8	8.0	8.0	7.9	7.9
20	8.0	8.1	8.0	8.0	8.1	8.0	8.0
21	8.1	8.1	8.1	8.0	8.0	8.0	8.0
22	8.1	8.1	7.9	8.0	8.0	8.0	8.0
23	8.0	8.0	7.8	8.0	8.0	8.0	8.0
24	8.1	8.1	8.0	8.0	8.0	8.0	8.0
25	8.1	8.0	7.8	7.9	8.0	8.0	8.0
26	8.0	8.0	7.8	7.9	7.9	7.9	7.9
Conductance (µS/cm)							
18	365	825	1001	323	305	459	694
19	383	833	1016	350	317	467	705
20	396	860	1048	334	309	459	715
21	385	854	1057	316	310	577	746
22	385	905	1070	359	316	601	761
23	402	1005	1031	345	335	623	759
24	360	963	1056	367	314	597	758
25	365	966	1054	343	314	591	753
26	375	975	1047	341	314	601	769
Dissolved Oxygen (mg/L) (60-100% saturation)							
18	6.1	6.0	5.8	5.7	5.8	5.9	6.1
19	5.8	5.7	5.8	5.7	5.7	5.7	5.7
20	6.2	6.0	5.9	5.9	6.4	6.7	6.3
21	6.5	6.5	6.7	6.4	6.3	6.2	6.5
22	6.9	6.9	6.9	6.7	6.7	6.3	6.2
23	5.8	5.7	5.6	5.8	5.8	5.7	5.7
24	6.4	6.4	6.2	6.1	6.0	6.0	6.0
25	6.1	6.1	5.9	5.8	5.9	6.0	6.1
26	6.6	6.5	6.1	5.9	6.0	6.1	6.3
Temperature (°C)							
18	24	24	24	24	24	24	24
19	24	24	24	24	24	24	24
20	24	24	24	24	24	24	24
21	24	24	24	24	24	24	24
22	24	24	24	24	24	24	24
23	24	24	24	24	24	24	24
24	24	24	24	24	24	24	24
25	24	24	24	24	24	24	24
26	24	24	24	24	24	24	24

DO Levels (60-100% saturation) -
4.4 to 7.3 mg/L at 24°C
4.3 to 7.2 mg/L at 25°C
4.2 to 7.0 mg/L at 26°C

Comments:

Reviewed By: MG Date Reviewed: 2021/10/28

NAUTILUS ENVIRONMENTAL

Fathead Minnow Bench Sheet

Method FMD 32 Day ELS Client NAU104 Sample 2021-1873, 2021-1875, 2021-1878, 2021-1881, ,2021-1885, 2021-1886, 2021-1887 (15 ug/L Cu)

New Solutions

pH (units)

Conc. (%)	2021-1873	2021-1875	2021-1878	2021-1881	2021-1885	2021-1886	2021-1887
Day							
27	8.2	8.2	7.9	8.2	8.2	8.2	8.3
28	8.4	8.3	8.1	8.4	8.3	8.3	8.3
29	8.2	8.2	8.0	8.2	8.3	8.1	8.2
30	8.2	8.2	8.0	8.2	8.1	8.2	8.3
31	8.3	8.2	8.2	8.3	8.2	8.2	8.2
32							

Conductance (µS/cm)

Day	2021-1873	2021-1875	2021-1878	2021-1881	2021-1885	2021-1886	2021-1887
27	343	1065	1108	319	597	785	285
28	350	1074	1101	321	292	503	779
29	360	1085	1114	334	301	605	791
30	347	1083	1091	331	302	610	790
31	357	1075	1102	343	304	601	782
32							

Dissolved Oxygen (mg/L) (60-100% saturation)

Day	2021-1873	2021-1875	2021-1878	2021-1881	2021-1885	2021-1886	2021-1887
27	7.3	7.3	7.3	7.3	7.3	7.3	7.3
28	7.3	7.3	7.3	7.3	7.3	7.3	7.3
29	7.3	7.3	7.3	7.3	7.3	7.3	7.3
30	7.3	7.3	7.3	7.3	7.3	7.3	7.3
31	7.3	7.3	7.3	7.3	7.3	7.3	7.3
32							

Temperature (°C)

Day	2021-1873	2021-1875	2021-1878	2021-1881	2021-1885	2021-1886	2021-1887
27	24	24	24	24	24	24	24
28	24	24	24	24	24	24	24
29	24	24	24	24	24	24	24
30	24	24	24	24	24	24	24
31	24	24	24	24	24	24	24
32							

Old Solutions

pH (units)

Day	2021-1873	2021-1875	2021-1878	2021-1881	2021-1885	2021-1886	2021-1887
27	8.0	8.0	7.9	8.0	8.0	8.0	7.9
28	8.1	8.2	8.0	8.1	8.1	8.1	8.1
29	8.0	8.0	7.9	8.0	7.9	7.9	8.1
30	8.0	8.0	7.8	8.0	7.8	7.9	8.1
31	7.9	7.9	7.9	7.9	7.8	7.9	~~7.8~~ 8.0
32	8.1	8.0	7.9	8.0	8.0	8.0	8.1

Conductance (µS/cm)

Day	2021-1873	2021-1875	2021-1878	2021-1881	2021-1885	2021-1886	2021-1887
27	367	408	1064	343	317	595	758
28	361	1080	1108	349	328	610	793
29	375	1071	1107	340	310	623	811
30	360	1061	1109	328	315	608	793
31	375	1062	1103	363	315	~~595~~ 609	~~797~~ 797
32	373	1040	1080	345	310	611	795

Dissolved Oxygen (mg/L) (60-100% saturation)

Day	2021-1873	2021-1875	2021-1878	2021-1881	2021-1885	2021-1886	2021-1887
27	6.0	6.0	6.3	5.9	5.8	5.8	5.6
28	6.5	6.1	6.2	6.4	5.9	6.0	6.1
29	6.0	6.0	6.0	6.0	6.0	6.2	6.1
30	6.0	6.0	5.9	6.6	5.9	5.8	5.8
31	6.5	6.3	5.9	5.9	5.8	5.8	5.9
32	6.6	6.5	6.3	6.3	6.3	6.2	6.2

Temperature (°C)

Day	2021-1873	2021-1875	2021-1878	2021-1881	2021-1885	2021-1886	2021-1887
27	24	24	24	24	24	24	24
28	24	24	24	24	24	24	24
29	24	24	24	24	24	24	24
30	24	24	24	24	24	24	24
31	24	24	24	24	24	24	24
32	24	24	24	24	24	24	24

DO Levels (60-100% saturation) -
4.4 to 7.3 mg/L at 24°C
4.3 to 7.2 mg/L at 25°C
4.2 to 7.0 mg/L at 26°C

Comments:

Reviewed By: MG Date Reviewed: 2024/10/28

NAUTILUS ENVIRONMENTAL

Fathead Minnow Bench Sheet

Method FMD 32 Day ELS Client NAU104 Sample: 2021-1873, 2021-1875, 2021-1878, 2021-1881, ,2021-1885, 2021-1886, 2021-1887 (15 ug/L Cu)

Test Termination

For normal/abnormal column, use the following notation:

N=Normal, A= Abnormal And note location: H=head, O=oral, E=eyes, G=gills, F=fins, S=spine

Conc. **2021-1873**

Fish	Replicate # A Length (mm)	Normal/ Abnormal	Replicate # B Length (mm)	Normal/ Abnormal	Replicate # C Length (mm)	Normal/ Abnormal	Replicate # D Length (mm)	Normal/ Abnormal
1	10	N	12	N	10	N	8	N
2	11		14		13		13	
3	11		13		13		11	
4	12		10				11	
5	12		12				13	
6	13		10				13	
7	13		~~10~~				14	
8	13		8				12	
9			10				13	
10			11					
11			12					
12			~~8~~					
13								
14								
15								

Comments

2021-1875

Fish	Replicate # A Length (mm)	Normal/ Abnormal	Replicate # B Length (mm)	Normal/ Abnormal	Replicate # C Length (mm)	Normal/ Abnormal	Replicate # D Length (mm)	Normal/ Abnormal
1	14	N	11	N	13	N	8	A-S
2	12		12		11		10	N
3	10		11		12		11	
4	12		11		12		13	
5	11		12		10		13	
6	9		10		10		13	
7	12		11	A-S	11		13	
8	11		13	N	10		12	
9	11		9	A-S			14	
10			10	N			12	
11			11	N			10	
12			8	A-S				
13								
14								
15								

Comments

Reviewed By: MG Date Reviewed: 2021/10/28

NAUTILUS ENVIRONMENTAL

Fathead Minnow Bench Sheet

Method FMD 32 Day ELS Client NAU104 Sample: 2021-1873, 2021-1875, 2021-1878, 2021-1881, ,2021-1885, 2021-1886, 2021-1887 (15 ug/L Cu)

Test Termination

For normal/abnormal column, use the following notation:

N=Normal, A= Abnormal And note location: H=head, O=oral, E=eyes, G=gills, F=fins, S=spine

Conc. **2021-1878**

Fish	Replicate # A Length (mm)	Normal/ Abnormal	Replicate # B Length (mm)	Normal/ Abnormal	Replicate # C Length (mm)	Normal/ Abnormal	Replicate # D Length (mm)	Normal/ Abnormal
1	11	N	7	N	12	N	9	N
2	9		11		9		11	
3	12		13		10		11	
4	11		12		13		11	
5	11		13		11		9	
6	11		12		12		11	
7	10		11		13		11	
8	8		11		9		11	
9	13		11		12		11	
10	12		8		11		12	
11	8		11	A-S	12		12	
12	12		12	N	11		13	
13	9				8		12	
14								
15								

Comments

Conc. **2021-1881**

Fish	Replicate # A Length (mm)	Normal/ Abnormal	Replicate # B Length (mm)	Normal/ Abnormal	Replicate # C Length (mm)	Normal/ Abnormal	Replicate # D Length (mm)	Normal/ Abnormal
1	11	N	12	N	11	N	11	N
2	10	N	13		11		14	
3	11	A-S	12		13		12	
4	10	N	11		11		14	
5	11		13		13		8	
6	11		13		11		12	
7	14		9		10		9	
8	13		13		8		10	
9	11		11				9	
10	11		10				13	
11	12		12				8	
12	10		10				10	
13			8					
14								
15								

Comments

Reviewed By: MK Date Reviewed: 2021/10/28

NAUTILUS ENVIRONMENTAL

Fathead Minnow Bench Sheet

Method FMD 32 Day ELS Client NAU104 Sample: 2021-1873, 2021-1875, 2021-1878, 2021-1881, ,2021-1885, 2021-1886, 2021-1887 (15 ug/L Cu)

Test Termination

For normal/abnormal column, use the following notation:

N=Normal, A= Abnormal And note location: H=head, O=oral, E=eyes, G=gills, F=fins, S=spine

Conc.

2021-1885

Replicate # A			Replicate # B			Replicate # C			Replicate # D		
Fish	Length (mm)	Normal/ Abnormal	Fish	Length (mm)	Normal/ Abnormal	Fish	Length (mm)	Normal/ Abnormal	Fish	Length (mm)	Normal/ Abnormal
1	12	N	1	12	N	1	10	N	1	9	N
2	10	↓	2	9	↓	2	12	↓	2	13	↓
3	12		3	12		3	8		3	10	
4	13		4	11		4	13		4	12	
5	12		5	13		5	1		5	7	A-S
6	9		6	9		6	11		6		
7	11		7	14		7	14		7		
8	13		8	9		8	9		8		
9			9	9		9	11		9		
10			10			10	12		10		
11			11			11	12		11		
12			12			12			12		
13			13			13			13		
14			14			14			14		
15			15			15			15		

Comments

2021-1886

Replicate # A			Replicate # B			Replicate # C			Replicate # D		
Fish	Length (mm)	Normal/ Abnormal	Fish	Length (mm)	Normal/ Abnormal	Fish	Length (mm)	Normal/ Abnormal	Fish	Length (mm)	Normal/ Abnormal
1	10	A-S	1	9	N	1	11	N	1	13	N
2	11	N	2	12	↓	2	10	↓	2	12	↓
3	10	↓	3	10	A-S	3	12		3	9	
4	9	↓	4	10	N	4	12		4	14	
5	9	A-S	5	12	↓	5	11		5	13	
6	14	N	6	13		6	13		6	10	↓
7	8	N	7	7		7	12		7	12	A-S
8	10	↓	8	11		8	12		8	15	N
9	12		9	9		9	11		9	11	↓
10	10		10	13	↓	10	13		10	10	
11	11		11			11	10		11		
12	11		12			12	11		12		
13	13	↓	13			13	7	↓	13		
14			14			14			14		
15			15			15			15		

Comments

Reviewed By: ML Date Reviewed: 2021/10/28

NAUTILUS ENVIRONMENTAL

Fathead Minnow Bench Sheet

Method FMD 32 Day ELS Client NAU104 Sample: 2021-1873, 2021-1875, 2021-1878, 2021-1881, ,2021-1885, 2021-1886, 2021-1887 (15 ug/L Cu)

Test Termination

For normal/abnormal column, use the following notation:

N=Normal, A= Abnormal And note location: H=head, O=oral, E=eyes, G=gills, F=fins, S=spine

Conc. 2021-1887

Replicate # A		
Fish	Length (mm)	Normal/ Abnormal
1	14	N
2	12	
3	13	
4	10	
5	14	
6	11	
7	11	
8	12	
9	13	
10		
11		
12		
13		
14		
15		

Replicate # B		
Fish	Length (mm)	Normal/ Abnormal
1	11	N
2	12	
3	14	
4	14	
5	9	
6	12	
7		
8		
9		
10		
11		
12		
13		
14		
15		

Replicate # C		
Fish	Length (mm)	Normal/ Abnormal
1	12	N
2	12	N
3	9	A-S
4	11	N
5	13	
6	11	
7	13	
8	12	
9	[illegible]	
10		
11		
12		
13		
14		
15		

Replicate # D		
Fish	Length (mm)	Normal/ Abnormal
1	13	N
2	13	
3	13	
4	12	
5	15	
6	12	
7	10	A-S
8	13	N
9	12	
10	12	
11		
12		
13		
14		
15		

Comments

Reviewed By: UG Date Reviewed: 2021/10/28

NAUTILUS ENVIRONMENTAL

Fathead Minnow Bench Sheet

Method FMD 32 Day ELS Client NAU104 Sample: 2021-1880, 2021-1889 (10 ug/L Cu), 2021-1888, 2021-1891 (15 ug/L Cu), 2021-1884, 2021-1890 (20 ug/L Cu)

Organism Information

Source: Aquatox Batch: 20210813FM-ELS Egg Stage: 16 somite Organisms Received in Good Condition: (Yes) or No

Test Log

Date	Day	Time	Technicians	Chem Cart Used	Fed AM	Fed PM	Sample Pre-Aeration Time	Bench Sheet Review First
2021/08/13	0	1500	CB/MG/SS/EV	2	–	–	60 min	–
2021/08/14	1	1135	CB	2	–	–	60 mins	MF
2021/08/15	2	1100	KL	2	–	–	60 mins	AW
2021/08/16	3	1140	AW	2	–	–	60 mins	KL
2021/08/17	4	1100	MF/KL	2	–	–	60 mins	ST
2021/08/18	5	0952	CB	2	✓	✓	60 mins	AW
2021/08/19	6	1130	ST	2	✓	✓	60 mins	KL
2021/08/20	7	1150	MF/SC	2	✓	✓	60 mins	AW
2021/08/21	8	1400	MF/SC	2	✓	✓	60 mins	AW
2021/08/22	9	1150	CB	2	✓	✓	60 mins	KL
2021/08/23	10	1035	CB	2	✓	✓	60 mins	ST
2021/08/24	11	1126	CB	2	✓	✓	60 mins	ST
2021/08/25	12	1040	ST	2	✓	✓	60 mins	EV
2021/08/26	13	1030	MF/ST	2	✓	✓	60 mins	KL
2021/08/27	14	1010	AW	2	✓	✓	60 mins	AW
2021/08/28	15	1420	SC	2	✓	✓	60 mins	ST
2021/08/29	16	1055	ST	2	✓	✓	60 mins	KL
2021/08/30	17	1130	AW/ST	2	✓	✓	60 mins	KL
2021/08/31	18	1145	AW	2	✓	✓	60 mins	MF
2021/09/01	19	1115	AW	2	✓	✓	60 mins	AW
2021/09/02	20	1135	KL	2	✓	✓	60 mins	AW
2021/09/03	21	1130	MF	2	✓	✓	60 mins	AW
2021/09/04	22	1015	MF	2	✓	✓	60 mins	AW
2021/09/05	23	1000	AW	2	✓	✓	60 mins	KL
2021/09/06	24	1100	AW	2	✓	✓	60 mins	KL
2021/09/07	25	0950	AW	2	✓	✓	60 mins	EV
2021/09/08	26	0945	MF	2	✓	✓	60 mins	AW
2021/09/08	27	1030	ST	2	✓	✓	60 mins	AW
2021/09/10	28	1100	MF	2	✓	✓	60 mins	MF
2021/09/11	29	1000	SC	2	✓	✓	60 mins	MF
2021/09/12	30	1000	AW	2	✓	✓	60 mins	KL
2021/09/13	31	0940	AW	2	✓	✓	60 mins	EV
2021/09/14	32	1145	MF	2	–	–	–	KL

Reviewed By: MG Date Reviewed: 2021/10/28

NAUTILUS ENVIRONMENTAL

Fathead Minnow Bench Sheet

Method FMD 32 Day ELS Client NAU104 Sample: 2021-1880, 2021-1889 (10 ug/L Cu), 2021-1888, 2021-1891 (15 ug/L Cu), 2021-1884, 2021-1890 (20 ug/L Cu)

Control hatching success must be >66% (≥10 per replicate). Post hatch survival must be >70%.

Number of Alive Embryos and Hatched Organisms

replicate	2021-1880 Day 1 Alive Embryos	2021-1880 Day 1 Dead Embryos	2021-1889 Day 1 Alive Embryos	2021-1889 Day 1 Dead Embryos	2021-1888 Day 1 Alive Embryos	2021-1888 Day 1 Dead Embryos	2021-1891 Day 1 Alive Embryos	2021-1891 Day 1 Dead Embryos	2021-1884 Day 1 Alive Embryos	2021-1884 Day 1 Dead Embryos	2021-1890 Day 1 Alive Embryos	2021-1890 Day 1 Dead Embryos	Day 1 Alive Embryos	Day 1 Dead Embryos
a	14	1	14	1	14	1	15	0	15	0	14	1		
b	15	0	13	2	15	0	15	0	15	0	15	0		
c	14	1	15	0	15	0	12	3	15	0	12	3		
d	15	0	14	1	15	0	15	0	14	1	15	0		
e	30	0	28	2	30	0	30	0	30	0	27	3		
f	30	0	30	0	30	0	28	2	30	0	28	2		

Comments/Observations:

Number of Alive Embryos and Hatched Organisms

replicate	2021-1880 Day 2 Alive Embryos	2021-1880 Day 2 Dead Embryos	2021-1880 Cull to 15	2021-1889 Day 2 Alive Embryos	2021-1889 Day 2 Dead Embryos	2021-1889 Cull to 15	2021-1888 Day 2 Alive Embryos	2021-1888 Day 2 Dead Embryos	2021-1888 Cull to 15	2021-1891 Day 2 Alive Embryos	2021-1891 Day 2 Dead Embryos	2021-1891 Cull to 15
a	13	1	15	14	0	15	9	5	15	15	0	15
b	15	0	15	13	0	15	15	0	15	15	0	15
c	14	0	15	15	0	15	14	1	15	12	0	15
d	15	0	15	14	0	15	15	0	15	15	0	15
e	29	1		28	0		29	1		30	0	
f	30	0		29	1		30	0		28	0	

replicate	2021-1884 Day 2 Alive Embryos	2021-1884 Day 2 Dead Embryos	2021-1884 Cull to 15	2021-1890 Day 2 Alive Embryos	2021-1890 Day 2 Dead Embryos	2021-1890 Cull to 15	Day 2 Alive Embryos	Day 2 Dead Embryos	Day 2 Cull to 15
a	14	0	15	14	0	15			
b	15	0	15	15	0	15			
c	15	0	15	11	1	15			
d	13	1	15	11	0	15			
e	30	0		27	0				
f	30	0		28	0				

Day 2 - Poor looking and dead embryos in replicates a, b, c and d are replaced with healthy embryos from replicates e and f. Replicates e and f are discarded after day 2

Comments/Observations:

Reviewed By: MG Date Reviewed: 2021/10/28

NAUTILUS ENVIRONMENTAL

Fathead Minnow Bench Sheet

Method FMD 32 Day ELS Client NAU104 Sample: 2021-1880, 2021-1889 (10 ug/L Cu), 2021-1888, 2021-1891 (15 ug/L Cu), 2021-1884, 2021-1890 (20 ug/L Cu)

Control hatching success must be >66% (≥10 per replicate). Post hatch survival must be >70%.

2021-1880

	Day 3 Alive Embryos	Day 3 Dead Embryos	Day 3 Alive Hatched	Day 3 Dead Hatched
a	15	0	0	0
b	12	0	3	0
c	13	0	2	0
d	14	0	1	0

2021-1889

	Day 3 Alive Embryos	Day 3 Dead Embryos	Day 3 Alive Hatched	Day 3 Dead Hatched
a	11	0	4	0
b	13	0	2	0
c	11	0	4	0
d	15	0	0	0

2021-1888

	Day 3 Alive Embryos	Day 3 Dead Embryos	Day 3 Alive Hatched	Day 3 Dead Hatched
a	13	0	2	0
b	12	0	2	1
c	14	0	1	0
d	13	0	2	0

2021-1891

	Day 3 Alive Embryos	Day 3 Dead Embryos	Day 3 Alive Hatched	Day 3 Dead Hatched
a	13	0	2	0
b	13	0	2	0
c	10	0	5	0
d	13	0	2(1)	0

2021-1884

	Day 3 Alive Embryos	Day 3 Dead Embryos	Day 3 Alive Hatched	Day 3 Dead Hatched
a	12	0	3	0
b	11	0	4	0
c	12	0	3	0
d	10	0	5	0

2021-1890

	Day 3 Alive Embryos	Day 3 Dead Embryos	Day 3 Alive Hatched	Day 3 Dead Hatched
a	6	0	9	0
b	12	0	3	0
c	11	0	4	0
d	8	0	7	0

0%

	Day 3 Alive Embryos	Day 3 Dead Embryos	Day 3 Alive Hatched	Day 3 Dead Hatched
a				
b				
c				
d				

[redacted]

2021-1880

	Day 4 Alive Embryos	Day 4 Dead Embryos	Day 4 Alive Hatched	Day 4 Dead Hatched
a	7 MF	0	8	0
b	~~15~~	0	9	1
c	9	0	6	0
d	4	0	10	1

2021-1889

	Day 4 Alive Embryos	Day 4 Dead Embryos	Day 4 Alive Hatched	Day 4 Dead Hatched
a	1	0	13	1
b	3	0	11	1
c	4	0	10	1
d	5	0	10	0

2021-1888

	Day 4 Alive Embryos	Day 4 Dead Embryos	Day 4 Alive Hatched	Day 4 Dead Hatched
a	1	0	13	1
b	6	0	4	2
c	2	0	13	0
d	4	0	11	0

2021-1891

	Day 4 Alive Embryos	Day 4 Dead Embryos	Day 4 Alive Hatched	Day 4 Dead Hatched
a	1	0	13	1
b	2	0	10	23 MF
c	1	0	14	0
d	4	1	9	01 MF

2021-1884

	Day 4 Alive Embryos	Day 4 Dead Embryos	Day 4 Alive Hatched	Day 4 Dead Hatched
a	1	0	11	23 MF
b	1	0	14	0
c	1	0	11	3
d	5	0	10	0

2021-1890

	Day 4 Alive Embryos	Day 4 Dead Embryos	Day 4 Alive Hatched	Day 4 Dead Hatched
a	2	0	13(2)	0
b	3	0	10	2 MF
c	3	0	11	1
d	1	0	4(1)	0

	Day 4 Alive Embryos	Day 4 Dead Embryos	Day 4 Alive Hatched	Day 4 Dead Hatched
a				
b				
c				
d				

Comments/Observations

Reviewed By: MG Date Reviewed: 2021/10/28

NAUTILUS ENVIRONMENTAL

Fathead Minnow Bench Sheet

Method FMD 32 Day ELS Client NAU104 Sample: 2021-1880, 2021-1889 (10 ug/L Cu), 2021-1888, 2021-1891 (15 ug/L Cu), 2021-1884, 2021-1890 (20 ug/L Cu)

Control hatching success must be >66% (≥10 per replicate). Post hatch survival must be >70%.

2021-1880

	Day 5			
	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	0	1	12	2
b	0	0	11	3
c	1	0	14	0
d	1	0	12	1

2021-1889

	Day 5			
	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	1	0	13	0
b	0	1	13	0
c	0	1	12	1
d	1	0	~~13~~ MG 14	0

2021-1888

	Day 5			
	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	0	0	14	0
b	0	0	12	0
c	0	0	15	0
d	0	0	14	1

2021-1891

	Day 5			
	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	0	0	14	0
b	0	0	11	1
c	0	0	15	0
d	0	0	12	1

2021-1884

	Day 5			
	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	1	0	11	0
b	0	0	15	0
c	0	0	12	0
d	0	0	15	0

2021-1890

	Day 5			
	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	0	0	15	0
b	0	0	13	0
c	0	0	14	0
d	0	0	15	0

0%

	Day 5			
	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a				
b				
c				
d				

2021-1880

	Day 6			
	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	0	0	12(2)	0
b	0	0	11(1)	1
c	0	~~2~~ 1 MG	13(3)*	0
d	0	1	12(3)	0

2021-1889

	Day 6			
	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	0	1	~~12~~ MG 13	0
b	0	0	13	0
c	0	0	12	0
d	0	1	~~13~~* MG 14	0

2021-1888

	Day 6			
	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	0	0	14(1)	0
b	0	0	11(1)	1
c	0	0	15	0
d	0	0	14	0

2021-1891

	Day 6			
	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	0	0 ~~0~~ ~~1~~ ST	~~12(2)~~ ST	0 *14
b	0	0	~~13~~ 10 ST	~~0~~ 1 ST
c	0	0	~~12~~ 15 ST	0
d	0	0	12(2)	0

2021-1884

	Day 6			
	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	0	*~~1~~ MG 2	10	~~0~~ MG 1
b	0	0	15	0
c	0	0	12	0
d	0	0	15(2)	0

2021-1890

	Day 6			
	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	0	0	15*	0
b	0	0	13*	0
c	0	0	13	~~0~~ MG 1
d	0	0	15	0

	Day 6			
	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a				
b				
c				
d				

Comments/Observations

* 1880C - 1AS
1889D - 2AS
1890A - 1AS

Reviewed By: MG Date Reviewed: 2021/10/28

NAUTILUS ENVIRONMENTAL

Fathead Minnow Bench Sheet

Method FMD 32 Day ELS Client NAU104 Sample: 2021-1880, 2021-1889 (10 ug/L Cu), 2021-1888, 2021-1891 (15 ug/L Cu), 2021-1884, 2021-1890 (20 ug/L Cu)

Number of Alive Embryos and Hatched Organisms

replicate	2021-1880 Day 7 Alive Hatched	2021-1889 Day 7 Alive Hatched	2021-1888 Day 7 Alive Hatched	2021-1891 Day 7 Alive Hatched	2021-1884 Day 7 Alive Hatched	2021-1890 Day 7 Alive Hatched	Day 7 Alive Hatched
a	12 MF	12 MG 13	13(2)	13	9	15	
b	10(1)	13	10	10	15	13(2)	
c	11(1)	12	15	15	12	13	
d	10(1)	13 MG 14	13	11(1)	14(1)	15	

Comments/Observations: 1880 d:1AS; 1889 d:1AS; 1891 A:1AS; 1884 D:1AS; 1890 C:1AS

replicate	2021-1880 Day 8 Alive Hatched	2021-1889 Day 8 Alive Hatched	2021-1888 Day 8 Alive Hatched	2021-1891 Day 8 Alive Hatched	2021-1884 Day 8 Alive Hatched	2021-1890 Day 8 Alive Hatched	Day 8 Alive Hatched
a	11(1)	12 MG 13	12 MG 11(1)	13	8 MG 9	15	
b	10(1)	13	10	10	15	13(1)	
c	11(1)	12	15	15	12 MG	13	
d	10(1)	14 12 13(1) MG	13	11(1)	14 13(1)	15(1)	

Comments/Observations: 1880 D:1AS; 1889 D:1AS; 1891 A:1AS; 1884 B:1AS D:1AS; 1890 A:2AS C:1AS

replicate	2021-1880 Day 9 Alive Hatched	2021-1889 Day 9 Alive Hatched	2021-1888 Day 9 Alive Hatched	2021-1891 Day 9 Alive Hatched	2021-1884 Day 9 Alive Hatched	2021-1890 Day 9 Alive Hatched	Day 9 Alive Hatched
a	11(1)	13	12	13(1)	9	13(3)	
b	10	13	10	10	15	13(1)	
c	11	12	15	14	12	13	
d	9(2)	13(1) 14(1) B	12	10(1)	9	15	

Comments/Observations:

replicate	2021-1880 Day 10 Alive Hatched	2021-1889 Day 10 Alive Hatched	2021-1888 Day 10 Alive Hatched	2021-1891 Day 10 Alive Hatched	2021-1884 Day 10 Alive Hatched	2021-1890 Day 10 Alive Hatched	Day 10 Alive Hatched
a	11(1) *	13 *	12 *	13(1) *	9 *	15 14(2)	
b	10 *	13 *	10 *	10 *	15 *	13	
c	11 *	12 *	15 *	14 *	12 *	13	
d	9(2) *	14(1) *	12(1) *	10(1) *	8	15	

Comments/Observations: * Microbial in dar

Reviewed By: MG Date Reviewed: 2021/10/28

NAUTILUS ENVIRONMENTAL

Fathead Minnow Bench Sheet

Method FMD 32 Day ELS Client NAU104 Sample: 2021-1880, 2021-1889 (10 ug/L Cu), 2021-1888, 2021-1891 (15 ug/L Cu), 2021-1884, 2021-1890 (20 ug/L Cu)

Number of Alive Embryos and Hatched Organisms

replicate	2021-1880 Day 11 Alive Hatched	2021-1889 Day 11 Alive Hatched	2021-1888 Day 11 Alive Hatched	2021-1891 Day 11 Alive Hatched	2021-1884 Day 11 Alive Hatched	2021-1890 Day 11 Alive Hatched	Day 11 Alive Hatched
a	10 *	13	10	13(1)	9	15(3)	
b	10 *	13 *	10 *	10	15	13	
c	11	12(1) *	15	13	12	13	
d	9(1) *	14(1)	12(1)	10(1)	8 *	15	

Comments/Observations:
* Microbial in jar

replicate	2021-1880 Day 12 Alive Hatched	2021-1889 Day 12 Alive Hatched	2021-1888 Day 12 Alive Hatched	2021-1891 Day 12 Alive Hatched	2021-1884 Day 12 Alive Hatched	2021-1890 Day 12 Alive Hatched	Day 12 Alive Hatched
a	10 *	13 *	10 *	13(1) *	9 *	15(3)	
b	10 *	13 *	10 *	9 *Δ	15	13(1)	
c	11	12 *	15 *	13 *	11	13(1)	
d	8(1) *	14(1) *	12(1) *	10(1) *	8	14	

Comments/Observations: * Microbial in jar Δ microbial on dead fish 1890 (1-AS)

replicate	2021-1880 Day 13 Alive Hatched	2021-1889 Day 13 Alive Hatched	2021-1888 Day 13 Alive Hatched	2021-1891 Day 13 Alive Hatched	2021-1884 Day 13 Alive Hatched	2021-1890 Day 13 Alive Hatched	Day 13 Alive Hatched
a	10	13	10(1)	13(1) MF	8	15(3)	
b	10	13	9 *	39 *	15	13(2)	
c	11	12	15	13 *	11 MF	13(1)	
d	8(1) *	14(1)	11 *	10(1) *	78 *	14	

Comments/Observations: * microbial in jar
1880 D: 1AS
1889 D 1AS
1888 D:1AS
1891 A:1AS
1890 A: 3AS C: 1AS

replicate	2021-1880 Day 14 Alive Hatched	2021-1889 Day 14 Alive Hatched	2021-1888 Day 14 Alive Hatched	2021-1891 Day 14 Alive Hatched	2021-1884 Day 14 Alive Hatched	2021-1890 Day 14 Alive Hatched	Day 14 Alive Hatched
a	10	13	10(1)	13(1)	7	14(2)	
b	10	13	9 *	8	15	13(2)	
c	11 *	12	15	13(1) *	11	13(1)	
d	8(1) *	14(1)	11	9 *	7 *	14	

Comments/Observations:
* microbial in jar

Reviewed By: ML Date Reviewed: 2021/10/28

NAUTILUS ENVIRONMENTAL

Fathead Minnow Bench Sheet

Method FMD 32 Day ELS Client NAU104 Sample: 2021-1880, 2021-1889 (10 ug/L Cu), 2021-1888, 2021-1891 (15 ug/L Cu), 2021-1884, 2021-1890 (20 ug/L Cu)

Number of Alive Embryos and Hatched Organisms

replicate	2021-1880 Day 15 Alive Hatched	2021-1889 Day 15 Alive Hatched	2021-1888 Day 15 Alive Hatched	2021-1891 Day 15 Alive Hatched	2021-1884 Day 15 Alive Hatched	2021-1890 Day 15 Alive Hatched	Day 15 Alive Hatched
a	10	13	10	13	7	14(2)	
b	10	13	9	7*	15	13(2)	
c	11	12	15	12*	11	17(1)	
d	8	(4)(1)	11	9	7	14	

Comments/Observations: *microbial death 1891 b,c

1880
A: 3AS
C: 1AS

replicate	2021-1880 Day 16 Alive Hatched	2021-1889 Day 16 Alive Hatched	2021-1888 Day 16 Alive Hatched	2021-1891 Day 16 Alive Hatched	2021-1884 Day 16 Alive Hatched	2021-1890 Day 16 Alive Hatched	Day 16 Alive Hatched
a	10	13	10(1)	13	7	14(1)	
b	10	13	9	7*	15	13	
c	11	12	15(1)	12	11	13(2)	
d	8	14(1)	11(2)	9(1)	7*	14	

Comments/Observations: 1889A-1AS D-1AS * Microbial growth 1890A-3AS B-1AS C-1AS

replicate	2021-1880 Day 17 Alive Hatched	2021-1889 Day 17 Alive Hatched	2021-1888 Day 17 Alive Hatched	2021-1891 Day 17 Alive Hatched	2021-1884 Day 17 Alive Hatched	2021-1890 Day 17 Alive Hatched	Day 17 Alive Hatched
a	10(1)	13(1)	10(1)	13(1)	7	14(3)	
b	10	13	9	7	15	13(1)	
c	11	12	15(1)	12	11	13(2)	
d	8	13	11(2)	9(1)	7	14	

Comments/Observations:

replicate	2021-1880 Day 18 Alive Hatched	2021-1889 Day 18 Alive Hatched	2021-1888 Day 18 Alive Hatched	2021-1891 Day 18 Alive Hatched	2021-1884 Day 18 Alive Hatched	2021-1890 Day 18 Alive Hatched	Day 18 Alive Hatched
a	10(1)	13(1)	10(1)	13(1)	7	14(3)	
b	10	13	9	7	15	13(1)	
c	11	12	15(1)	12	11	13(2)	
d	8	13	11(2)	9(1)	7	14	

Comments/Observations:

MG 2021/10/28

NAUTILUS ENVIRONMENTAL

Fathead Minnow Bench Sheet

Method FMD 32 Day ELS Client NAU104 Sample: 2021-1880, 2021-1889 (10 ug/L Cu), 2021-1888, 2021-1891 (15 ug/L Cu), 2021-1884, 2021-1890 (20 ug/L Cu)

Number of Alive Embryos and Hatched Organisms

replicate	2021-1880 Day 19 Alive Hatched	2021-1889 Day 19 Alive Hatched	2021-1888 Day 19 Alive Hatched	2021-1891 Day 19 Alive Hatched	2021-1884 Day 19 Alive Hatched	2021-1890 Day 19 Alive Hatched	Day 19 Alive Hatched
a	10(1)	13(1)	10	13(1)	7	13(2)	
b	10	13	9	7	15	13(1)	
c	11	12	15(1)	12	11	13(2)	
d	8	13	11(2)	9(1)	7	14	

Comments/Observations:

replicate	2021-1880 Day 20 Alive Hatched	2021-1889 Day 20 Alive Hatched	2021-1888 Day 20 Alive Hatched	2021-1891 Day 20 Alive Hatched	2021-1884 Day 20 Alive Hatched	2021-1890 Day 20 Alive Hatched	Day 20 Alive Hatched
a	10(1)	13(1)	10	13	7	13(2)	
b	10	13	9	7	15	13	
c	11	12	15(1)	12	11	13(1)	
d	8	13	11(1)	9(1)	7	14	

Comments/Observations:

replicate	2021-1880 Day 21 Alive Hatched	2021-1889 Day 21 Alive Hatched	2021-1888 Day 21 Alive Hatched	2021-1891 Day 21 Alive Hatched	2021-1884 Day 21 Alive Hatched	2021-1890 Day 21 Alive Hatched	Day 21 Alive Hatched
a	10(1)	13(1)	10	13	7	13(2)	
b	10	13	9	7	15	10	
c	11	12	15	12	11	13(1)	
d	8	13	11(1)	9(1)	7	14	

Comments/Observations:

replicate	2021-1880 Day 22 Alive Hatched	2021-1889 Day 22 Alive Hatched	2021-1888 Day 22 Alive Hatched	2021-1891 Day 22 Alive Hatched	2021-1884 Day 22 Alive Hatched	2021-1890 Day 22 Alive Hatched	Day 22 Alive Hatched
a	10(1)	13(1)	10	13	7	12(1)	
b	10(1)	13	9	7	15	10	
c	11	12	15	12	11	12(1)	
d	8	13	11(1)	8	7	14	

Comments/Observations:

MG 2021/10/28

NAUTILUS ENVIRONMENTAL

Fathead Minnow Bench Sheet

Method FMD 32 Day ELS Client NAU104 Sample: 2021-1880, 2021-1889 (10 ug/L Cu), 2021-1888, 2021-1891 (15 ug/L Cu), 2021-1884, 2021-1890 (20 ug/L Cu)

Number of Alive Embryos and Hatched Organisms

replicate	2021-1880 Day 23 Alive Hatched	2021-1889 Day 23 Alive Hatched	2021-1888 Day 23 Alive Hatched	2021-1891 Day 23 Alive Hatched	2021-1884 Day 23 Alive Hatched	2021-1890 Day 23 Alive Hatched	Day 23 Alive Hatched
a	10(1)	13(1)	10	13	7	11	
b	10(1)	13	9	7	15	10	
c	11	12	15	12	11	12(1)	
d	8	13	11(1)	8	7	14	

Comments/Observations:

replicate	2021-1880 Day 24 Alive Hatched	2021-1889 Day 24 Alive Hatched	2021-1888 Day 24 Alive Hatched	2021-1891 Day 24 Alive Hatched	2021-1884 Day 24 Alive Hatched	2021-1890 Day 24 Alive Hatched	Day 24 Alive Hatched
a	10(1)	13(1)	10	13	7	11	
b	9	13	9	7	15	9	
c	11	12	15(1)	12	11	12(1)	
d	8	13	11(1)	8	7	14	

Comments/Observations:

replicate	2021-1880 Day 25 Alive Hatched	2021-1889 Day 25 Alive Hatched	2021-1888 Day 25 Alive Hatched	2021-1891 Day 25 Alive Hatched	2021-1884 Day 25 Alive Hatched	2021-1890 Day 25 Alive Hatched	Day 25 Alive Hatched
a	9	13(1)	10	13	7	11	
b	9	12	9(1)	7	15	8	
c	11	12	14	12	11	11	
d	8	13	11(1)	8	7	14	

Comments/Observations:

replicate	2021-1880 Day 26 Alive Hatched	2021-1889 Day 26 Alive Hatched	2021-1888 Day 26 Alive Hatched	2021-1891 Day 26 Alive Hatched	2021-1884 Day 26 Alive Hatched	2021-1890 Day 26 Alive Hatched	Day 26 Alive Hatched
a	9	12	10	13	7	11	
b	9	12	9(1)	7	15	8	
c	11	12	14	12	11	11	
d	8	13	11	8	7	14	

Comments/Observations:

MG 2021/10/28

NAUTILUS ENVIRONMENTAL

Fathead Minnow Bench Sheet

Method FMD 32 Day ELS Client NAU104 Sample: 2021-1880, 2021-1889 (10 ug/L Cu), 2021-1888, 2021-1891 (15 ug/L Cu), 2021-1884, 2021-1890 (20 ug/L Cu)

Number of Alive Embryos and Hatched Organisms

	2021-1880	2021-1889	2021-1888	2021-1891	2021-1884	2021-1890	
	Day 27	Day 27	Day 27	Day 27	Day 27	Day 27	Day 27
replicate	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched
a	9	12	10	13	7	11	
b	9	12	9	7	15	8	
c	11	12	14	12	11	11	
d	8	13	11	8	7	14	

Comments/Observations: 1889A-1AS 1888-D-1AS 1891A-1AS

	2021-1880	2021-1889	2021-1888	2021-1891	2021-1884	2021-1890	
	Day 28	Day 28	Day 28	Day 28	Day 28	Day 28	Day 28
replicate	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched
a	9	12	10	13	7	9	
b	9	12	9	7	15	8	
c	11	12	14	12	11	11	
d	8	13	11	8	7	14	

Comments/Observations:

	2021-1880	2021-1889	2021-1888	2021-1891	2021-1884	2021-1890	
	Day 29	Day 29	Day 29	Day 29	Day 29	Day 29	Day 29
replicate	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched
a	9	12(1)	10	13	7	9	
b	9	12	9(1)	7	15	8	
c	11	12	14	12	11	11	
d	8	13	11	8	7	14	

Comments/Observations:

	2021-1880	2021-1889	2021-1888	2021-1891	2021-1884	2021-1890	
	Day 30	Day 30	Day 30	Day 30	Day 30	Day 30	Day 30
replicate	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched
a	9	12(1)	10	13	7	7	
b	9	12	8	7	15	8	
c	11	12	14	12	11	11	
d	8	13	11	8	7	14	

Comments/Observations:

MG 2021/10/28

NAUTILUS ENVIRONMENTAL

Fathead Minnow Bench Sheet

Method FMD 32 Day ELS Client NAU104 Sample: 2021-1880, 2021-1889 (10 ug/L Cu), 2021-1888, 2021-1891 (15 ug/L Cu), 2021-1884, 2021-1890 (20 ug/L Cu)

Number of Alive Embryos and Hatched Organisms

	2021-1880	2021-1889	2021-1888	2021-1891	2021-1884	2021-1890	
	Day 31	Day 31	Day 31	Day 31	Day 31	Day 31	Day 31
replicate	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched
a	9	12(1)	10	13	7	7	
b	9	11	8	7	15	8	
c	11	12	14	12	11	11	
d	8	13	11	8	7	14	

Comments/Observations:

	2021-1880	2021-1889	2021-1888	2021-1891	2021-1884	2021-1890	
	Day 32	Day 32	Day 32	Day 32	Day 32	Day 32	Day 32
replicate	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched
a	9	12	10	13	7	7	
b	9	11	8	7	15	8	
c	11	12	12	12	11	11	
d	8	13	11	8	7	14	

Comments/Observations:

Reviewed By: M.G Date Reviewed: 2021/10/28

NAUTILUS ENVIRONMENTAL

Fathead Minnow Bench Sheet

Method: FMD 32 Day ELS Client: NAU104

Sample: 2021-1880, 2021-1889 (10 ug/L Cu), 2021-1888, 2021-1891 (15 ug/L Cu), 2021-1884, 2021-1890 (20 ug/L Cu)

New Solutions

Conc. (%)	2021-1880	2021-1889	2021-1888	2021-1891	2021-1884	2021-1890
Day						
pH (units)						
0	8.2	8.2	8.1	8.3	8.2	8.3
1	8.1	8.1	8.1	8.3	8.2	8.2
2	8.2	8.1	8.2	8.3	8.2	8.2
3	8.1	8.1	8.3	8.2	8.2	8.2
4	8.2	8.3	8.3	8.2	8.2	8.2
5	7.9	7.8	8.1	8.0	8.0	8.0
6	8.2	8.2	8.2	8.2	8.1	8.2
7	8.2	8.2	8.2	8.3	8.3	8.2
8	8.1	8.0	8.2	8.2	8.1	8.2
Conductance (µS/cm)						
0	284	258	940	808	885	898
1	287	337	911	756	897	842
2	272	324	930	728	892	838
3	272	316	899	691	852	790
4	275	315	894	660	843	773
5	307	356	1023	778	975	899
6	287	334	1006	681	1021	949
7	298	341	1026	691	1036	1005
8	291	334	971	613	1005	988
Dissolved Oxygen (mg/L) (60-100% saturation)						
0	7.3	7.3	7.3	7.3	7.3	7.3
1	7.3	7.3	7.3	7.3	7.3	7.3
2	7.3	7.3	7.3	7.3	7.3	7.3
3	7.3	7.3	7.3	7.3	7.3	7.3
4	7.3	7.3	7.3	7.3	7.3	7.3
5	7.3	7.3	7.3	7.3	7.3	7.3
6	7.3	7.3	7.3	7.3	7.3	7.3
7	7.3	7.3	7.3	7.3	7.3	7.3
8	7.3	7.3	7.3	7.3	7.3	7.3
Temperature (°C)						
0	24	24	24	24	24	24
1	24	24	24	24	24	24
2	24	24	24	24	24	24
3	24	24	24	24	24	24
4	24	24	24	24	24	24
5	24	24	24	24	24	24
6	24	24	24	24	24	24
7	24	24	24	24	24	24
8	24	24	24	24	24	24

Old Solutions

	2021-1880	2021-1889	2021-1888	2021-1891	2021-1884	2021-1890
pH (units)						
0						
1	8.3	8.2	8.2	8.2	8.3	8.1
2	8.3	8.2	8.2	8.2	8.2	8.2
3	8.1	8.1	8.2	8.1	8.1	8.1
4	8.3	8.2	8.3	8.2	8.1	8.1
5	8.2	8.2	8.2	8.2	8.2	8.1
6	8.2	8.2	8.1	8.1	8.1	8.0
7	8.2	8.2	8.1	8.2	8.1	8.1
8	8.2	8.1	8.2	8.2	8.1	8.1
Conductance (µS/cm)						
0						
1	302	337	907	728	899	842
2	331	345	932	728	899	886
3	278	322	885	699	855	814
4	314	333	909	713	883	837
5	348	367	1002	771	959	922
6	348	366	999	780	957	920
7	333	354	1007	776	1012	1005
8	359	353	1002	767	1020	1013
Dissolved Oxygen (mg/L) (60-100% saturation)						
0						
1	6.9	6.9	6.9	6.9	6.9	6.9
2	7.2	7.2	7.2	7.2	7.2	7.3
3	7.3	7.3	7.2	7.2	7.1	7.2
4	7.2	7.2	7.2	7.2	7.2	7.2
5	7.3	7.3	7.3	7.3	7.3	7.3
6	7.1	7.2	7.2	7.2	7.2	7.2
7	7.2	7.2	7.1	7.1	7.2	7.0
8	6.7	6.8	6.8	6.9	6.8	6.8
Temperature (°C)						
0						
1	24	24	24	24	24	24
2	24	24	24	24	24	24
3	24	24	24	24	24	24
4	24	24	24	24	24	24
5	24	24	24	24	24	24
6	24	24	24	24	24	24
7	24	24	24	24	24	24
8	24	24	24	24	24	24

DO Levels (60-100% saturation) -
4.4 to 7.3 mg/L at 24°C
4.3 to 7.2 mg/L at 25°C
4.2 to 7.0 mg/L at 26°C

Comments:

Reviewed By: MG Date Reviewed: 2021/10/28

NAUTILUS ENVIRONMENTAL

Fathead Minnow Bench Sheet

Method: FMD 32 Day ELS Client: NAU104

Sample: 2021-1880, 2021-1889 (10 ug/L Cu), 2021-1888, 2021-1891 (15 ug/L Cu), 2021-1884, 2021-1890 (20 ug/L Cu)

New Solutions

pH (units)

Conc. (%) / Day	2021-1880	2021-1889	2021-1888	2021-1891	2021-1884	2021-1890
9	8.1	8.3	8.1	8.1	8.1	8.2
10	8.1	8.2	8.0	8.1	8.0	8.1
11	8.1	8.2	8.1	8.2	8.1	8.1
12	8.1	8.3	8.3	8.2	8.1	8.2
13	8.3	8.3	8.3	8.2	8.1	8.2
14	8.3	8.3	8.4	8.3	8.2	8.3
15	8.1	8.3	8.2	8.2	8.1	8.2
16	8.1	8.2	8.1	8.1	8.1	8.1
17	8.0	8.2	8.2	8.2	8.0	8.1

Conductance (µS/cm)

Day	2021-1880	2021-1889	2021-1888	2021-1891	2021-1884	2021-1890
9	299	331	1022	647	1033	1002
10	283	320	1023	670	1007	964
11	286	329	1004	655	1005	977
12	295	331	958	689	1007	988
13	300	318	882	715	1006	964
14	307	321	872	725	1068	982
15	309	317	901	717	1069	972
16	299	315	870	713	1055	973
17	294	316	855	706	1038	941

Dissolved Oxygen (mg/L) (60-100% saturation)

Day	2021-1880	2021-1889	2021-1888	2021-1891	2021-1884	2021-1890
9	7.3	7.3	7.3	7.3	7.3	7.3
10	7.3	7.3	7.3	7.3	7.3	7.3
11	7.3	7.3	7.3	7.3	7.3	7.3
12	7.3	7.3	7.3	7.3	7.3	7.3
13	7.3	7.3	7.3	7.3	7.3	7.3
14	7.3	7.3	7.3	7.3	7.3	7.3
15	7.3	7.3	7.3	7.3	7.3	7.3
16	7.3	7.3	7.3	7.3	7.3	7.3
17	7.3	7.3	7.3	7.3	7.3	7.3

Temperature (°C)

Day	2021-1880	2021-1889	2021-1888	2021-1891	2021-1884	2021-1890
9	24	24	24	24	24	24
10	24	24	24	24	24	24
11	24	24	24	24	24	24
12	24	24	24	24	24	24
13	24	24	24	24	24	24
14	24	24	24	24	24	24
15	24	24	24	24	24	24
16	24	24	24	24	24	24
17	24	24	24	24	24	24

Old Solutions

pH (units)

Day	2021-1880	2021-1889	2021-1888	2021-1891	2021-1884	2021-1890
9	8.1	8.0	8.1	8.2	8.0	8.1
10	8.0	8.0	8.0	8.1	8.0	8.0
11	8.1	8.0	8.1	8.1	8.0	8.0
12	8.1	8.1	8.1	8.2	8.2	8.1
13	8.0	8.1	8.2	8.2	8.1	8.1
14	8.1	8.1	8.1	8.2	8.1	8.0
15	8.1	8.1	8.1	8.2	8.0	8.0
16	8.1	8.0	8.1	8.2	8.1	8.1
17	7.8	7.8	8.0	8.0	7.9	7.9

Conductance (µS/cm)

Day	2021-1880	2021-1889	2021-1888	2021-1891	2021-1884	2021-1890
9	341	355	1006	707	1028	1015
10	335	350	1006	707	1032	1011
11	345	350	1012	710	1027	1011
12	368	351	1006	712	1031	1013
13	296	345	997	707	1023	1023
14	313	328	878	729	1052	995
15	326	329	878	718	1041	1005
16	326	331	864	730	1074	977
17	294	319	844	714	1045	971

Dissolved Oxygen (mg/L) (60-100% saturation)

Day	2021-1880	2021-1889	2021-1888	2021-1891	2021-1884	2021-1890
9	6.7	6.8	6.8	6.9	7.0	7.0
10	6.7	6.7	6.7	6.7	6.7	6.7
11	6.8	6.8	6.7	6.6	6.7	6.7
12	7.0	6.9	6.7	6.8	6.8	6.8
13	6.9	6.6	6.5	6.5	6.4	6.3
14	6.8	6.6	6.5	6.4	6.3	6.2
15	6.8	6.6	6.6	6.6	6.8	6.6
16	6.2	6.2	6.1	6.2	6.1	6.3
17	6.5	6.4	6.2	6.2	6.3	6.3

Temperature (°C)

Day	2021-1880	2021-1889	2021-1888	2021-1891	2021-1884	2021-1890
9	24	24	24	24	24	24
10	24	24	24	24	24	24
11	24	24	24	24	24	24
12	24	24	24	24	24	24
13	24	24	24	24	24	24
14	24	24	24	24	24	24
15	24	24	24	24	24	24
16	24	24	24	24	24	24
17	24	24	24	24	24	24

DO Levels (60-100% saturation) -
4.4 to 7.3 mg/L at 24°C
4.3 to 7.2 mg/L at 25°C
4.2 to 7.0 mg/L at 26°C

Comments:

Reviewed By: MG Date Reviewed: 2021/10/28

NAUTILUS ENVIRONMENTAL

Fathead Minnow Bench Sheet

Method FMD 32 Day ELS Client NAU104

Sample 2021-1880, 2021-1889 (10 ug/L Cu), 2021-1888, 2021-1891 (15 ug/L Cu), 2021-1884, 2021-1890 (20 ug/L Cu)

New Solutions

Conc. (%) / Day	2021-1880	2021-1889	2021-1888	2021-1891	2021-1884	2021-1890	
pH (units)							
18	8.0	8.2	8.1	8.1	8.0	8.1	
19	8.1	8.2	8.2	8.2	8.1	8.2	
20	8.2	8.2	8.1	8.2	7.9	8.0	
21	8.1	8.2	8.2	8.2	8.0	8.2	
22	8.3	8.2	8.2	8.2	8.0	8.2	
23	8.3	8.3	8.2	8.2	8.2	8.2	
24	8.3	8.3	8.3	8.2	8.1	8.2	
25	8.3	8.3	8.2	8.2	8.1	8.2	
26	8.3	8.3	8.2	8.2	8.0	8.2	
Conductance (µS/cm)							
18	297	312	852	702	982	917	
19	292	313	857	707	1039	955	
20	342	378	953	764	1133	995	
21	308	334	916	733	1091	991	
22	315	331	912	729	1103	989	
23	326	336	899	737	1131	1015	
24	333	335	895	738	1140	986	
25	318	336	914	737	1132	1003	
26	312	329	903	735	1125	985	
Dissolved Oxygen (mg/L) (60-100% saturation)							
18	7.3	7.3	7.3	7.3	7.3	7.3	7.5
19	7.3	7.3	7.3	7.3	7.3	7.3	
20	7.3	7.3	7.3	7.3	7.3	7.3	
21	7.3	7.3	7.3	7.3	7.3	7.3	
22	7.3	7.3	7.3	7.3	7.3	7.3	
23	7.3	7.3	7.3	7.3	7.3	7.3	
24	7.3	7.3	7.3	7.3	7.3	7.3	
25	7.3	7.3	7.3	7.3	7.3	7.3	
26	7.3	7.3	7.3	7.3	7.3	7.3	
Temperature (°C)							
18	24	24	24	24	24	24	24
19	24	24	24	24	24	24	24
20	24	24	24	24	24	24	
21	24	24	24	24	24	24	
22	24	24	24	24	24	24	
23	24	24	24	24	24	24	
24	24	24	24	24	24	24	
25	24	24	24	24	24	24	
26	24	24	24	24	24	24	

Old Solutions

Conc. (%) / Day	2021-1880	2021-1889	2021-1888	2021-1891	2021-1884	2021-1890	
pH (units)							
18	7.9	7.9	8.0	8.0	8.0	7.9	
19	7.8	7.9	8.0	8.1	8.0	7.9	
20	8.0	7.9	8.1	8.1	8.1	7.9	
21	8.1	8.0	8.1	8.1	8.1	7.9	
22	8.0	8.0	8.0	8.1	7.9	7.9	
23	8.0	8.0	8.0	8.1	8.0	7.9	
24	8.0	8.0	8.1	8.1	8.0	8.0	
25	8.0	7.9	8.0	8.1	7.8	7.9	
26	7.8	7.8	7.9	7.9	7.8	7.9	
Conductance (µS/cm)							
18	306	323	869	714	1034	972	
19	300	314	848	713	1043	970	
20	315	328	850	717	1051	975	
21	323	345	911	749	1130	1022	
22	332	349	904	746	1109	1021	
23	320	345	926	750	1137	1009	
24	325	342	896	748	1123	1017	
25	322	343	895	738	1122	1016	
26	310	344	904	744	1120	1015	
Dissolved Oxygen (mg/L) (60-100% saturation)							
18	6.5	6.2	6.0	6.1	6.0	6.0	
19	5.8	5.8	5.8	6.0	6.1	5.8	
20	6.6	6.3	6.0	6.2	6.2	6.0	
21	6.9	6.6	6.6	6.7	6.7	6.5	
22	6.9	6.6	6.6	6.5	6.5	6.4	
23	6.7	6.6	6.4	6.4	6.3	6.2	
24	7.0	6.9	6.8	6.6	6.5	6.5	
25	6.5	6.4	6.3	6.2	6.2	6.3	
26	6.8	6.7	6.2	6.1	5.9	5.8	
Temperature (°C)							
18	24	24	24	24	24	24	
19	24	24	24	24	24	24	
20	24	24	24	24	24	24	
21	24	24	24	24	24	24	
22	24	24	24	24	24	24	
23	24	24	24	24	24	24	
24	24	24	24	24	24	24	
25	24	24	24	24	24	24	
26	24	24	24	24	24	24	

DO Levels (60-100% saturation) -
4.4 to 7.3 mg/L at 24°C
4.3 to 7.2 mg/L at 25°C
4.2 to 7.0 mg/L at 26°C

Comments:

Reviewed By: MG Date Reviewed: 2021/10/28

NAUTILUS ENVIRONMENTAL

Fathead Minnow Bench Sheet

Method FMD 32 Day ELS Client NAU104 Sample 2021-1880, 2021-1889 (10 ug/L Cu), 2021-1888, 2021-1891 (15 ug/L Cu), 2021-1884, 2021-1890 (20 ug/L Cu)

New Solutions

Conc. (%) / Day	2021-1880	2021-1889	2021-1888	2021-1891	2021-1884	2021-1890
pH (units)						
27	8.0	8.1	8.2	8.2	8.0	8.2
28	8.2	8.3	8.1	8.3	8.2	8.3
29	8.0	8.2	8.1	8.2	8.0	8.2
30	8.0	8.0	7.9	8.0		
31	8.1	8.2	8.2	8.2	8.1	8.2
32	8.3	8.3	8.3	8.1	8.2	8.2
Conductance (µS/cm)						
27	314	345	968	746	1071	1032
28	318	347	971	747	1081	1039
29	316	348	980	758	1091	1051
30	328	358	987	767		
31	313	341	962	754	1072	1014
32	329	304	967	730	1090	1022
Dissolved Oxygen (mg/L) (60-100% saturation)						
27	7.3	7.3	7.3	7.3	7.3	7.3
28	7.3	7.3	7.3	7.3	7.3	7.3
29	7.3	7.3	7.3	7.3	7.3	7.3
30	7.3	7.3	7.3	7.3	7.3	7.3
31	7.3	7.3	7.3	7.3	7.3	7.3
32						
Temperature (°C)						
27	24	24	24	24	24	24
28	24	24	24	24	24	24
29	24	24	24	24	24	24
30	24	24	24	24	24	24
31	24	24	24	24	24	24
32						

Old Solutions

Conc. (%) / Day	2021-1880	2021-1889	2021-1888	2021-1891	2021-1884	2021-1890
pH (units)						
27	8.0	7.9	8.0	8.0	7.9	7.9
28	8.0	8.0	8.0	8.2	8.1	8.1
29	8.0	8.0	7.9	8.0	7.9	7.9
30	7.9	7.9	8.0	8.0	7.9	7.9
31	7.8	7.8	7.8	7.9	7.9	7.9
32	8.1	8.0	8.1	8.0	8.0	7.9
Conductance (µS/cm)						
27	324	347	984	760	1138	1018
28	317	355	991	763	1091	1050
29	324	358	985	761	1089	1049
30	326	358	966	771	1085	1040
31	319	359	971	772	1093	1053
32	335	304	983	777	1092	1054
Dissolved Oxygen (mg/L) (60-100% saturation)						
27	6.0	6.0	5.9	6.0	6.1	6.2
28	5.9	5.8	5.7	5.7	5.9	5.8
29	6.0	6.0	6.0	6.0	6.1	6.1
30	6.0	6.3	6.1	6.1	6.4	6.2
31	6.2	6.2	6.6	6.0	5.8	5.7
32	6.6	6.5	6.5	6.4	6.2	5.8
Temperature (°C)						
27	24	24	24	24	24	24
28	24	24	24	24	24	24
29	24	24	24	24	24	24
30	24	24	24	24	24	24
31	24	24	24	24	24	24
32	24	24	24	24	24	24

DO Levels (60-100% saturation) -
4.4 to 7.3 mg/L at 24°C
4.3 to 7.2 mg/L at 25°C
4.2 to 7.0 mg/L at 26°C

Comments:

Reviewed By: MG Date Reviewed: 2021/10/28

NAUTILUS ENVIRONMENTAL

Fathead Minnow Bench Sheet

Method FMD 32 Day ELS Client NAU104 Sample: 2021-1880, 2021-1889 (10 ug/L Cu), 2021-1888, 2021-1891 (15 ug/L Cu), 2021-1884, 2021-1890 (20 ug/L Cu)

Test Termination

For normal/abnormal column, use the following notation:

N=Normal, A= Abnormal And note location: H=head, O=oral, E=eyes, G=gills, F=fins, S=spine

Conc.

2021-1880

Fish	Rep A Length (mm)	Rep A Normal/ Abnormal	Rep B Length (mm)	Rep B Normal/ Abnormal	Rep C Length (mm)	Rep C Normal/ Abnormal	Rep D Length (mm)	Rep D Normal/ Abnormal
1	15	N	13	N	12	N	16	N
2	16		14		14		12	
3	14		16		14		13	
4	12		12		14		15	
5	14		13		16		11	
6	11		13		13		15	
7	10		12		12		11	
8	13		14	AS	12		11	
9	12		13	N	10			
10					10			
11					9			
12								
13								
14								
15								

Comments

2021-1889

Fish	Rep A Length (mm)	Rep A Normal/ Abnormal	Rep B Length (mm)	Rep B Normal/ Abnormal	Rep C Length (mm)	Rep C Normal/ Abnormal	Rep D Length (mm)	Rep D Normal/ Abnormal
1	9	N	10	N	13	N	13	N
2	9		13		11		13	
3	13		13		12		13	
4	13		13		10		12	
5	12		13		13		12	
6	9	AS	13		14		15	
7	12	N	14		14		9	
8	14		13		14		11	
9	14		13		9		13	
10	12		12		11		9	
11	10		11		14		8	
12	11				13		12	
13							10	
14								
15								

Comments

Reviewed By: MG Date Reviewed: 2021/10/28

NAUTILUS ENVIRONMENTAL

Fathead Minnow Bench Sheet

Method FMD 32 Day ELS Client NAU104 Sample: 2021-1880, 2021-1889 (10 ug/L Cu), 2021-1888, 2021-1891 (15 ug/L Cu), 2021-1884, 2021-1890 (20 ug/L Cu)

Test Termination

For normal/abnormal column, use the following notation:

N=Normal, A= Abnormal And note location: H=head, O=oral, E=eyes, G=gills, F=fins, S=spine

Conc. **2021-1888**

Fish	Replicate # A Length (mm)	Normal/ Abnormal	Replicate # B Length (mm)	Normal/ Abnormal	Replicate # C Length (mm)	Normal/ Abnormal	Replicate # D Length (mm)	Normal/ Abnormal
1	12	N	13	N	13	N	13	N
2	13	↓	12	↓	12	↓	11	↓
3	12		12		11		11	AS
4	13		12		12		6	N
5	12		15		10		9	↓
6	12		14		12		10	
7	13		14		12		10	
8	14		13	↓	12		15	
9	13				15	↓	13	
10	13	↓			10	AS	14 MF	↓ MF
11					9	N	11 MF	N
12					11	↓	10	↓
13								
14								
15								

Comments

2021-1891

Fish	Replicate # A Length (mm)	Normal/ Abnormal	Replicate # B Length (mm)	Normal/ Abnormal	Replicate # C Length (mm)	Normal/ Abnormal	Replicate # D Length (mm)	Normal/ Abnormal
1	9	N	14	N	12	N	13	N
2	8	↓	13	↓	13	↓	13	↓
3	14		13		14		12	
4	12		12		11		13	
5	12		11		10		13	
6	10		15		12		16	
7	11		15	↓	12		14	
8	15				13		14	↓
9	15				12			
10	12				12			
11	12	↓			14	↓		
12	8	AS			11			
13	12	N						
14								
15								

Comments

Reviewed By: ML Date Reviewed: 2021/10/28

NAUTILUS ENVIRONMENTAL

Fathead Minnow Bench Sheet

Method FMD 32 Day ELS Client NAU104 Sample: 2021-1880, 2021-1889 (10 ug/L Cu), 2021-1888, 2021-1891 (15 ug/L Cu), 2021-1884, 2021-1890 (20 ug/L Cu)

Test Termination

For normal/abnormal column, use the following notation:

N=Normal, A= Abnormal And note location: H=head, O=oral, E=eyes, G=gills, F=fins, S=spine

Conc.

2021-1884

Fish	Rep A Length (mm)	Rep A Normal/ Abnormal	Rep B Length (mm)	Rep B Normal/ Abnormal	Rep C Length (mm)	Rep C Normal/ Abnormal	Rep D Length (mm)	Rep D Normal/ Abnormal
1	11	N	11	N	R	N	R	N
2	15		R		R		R	
3	11		9		13		10	
4	14		11		R		14	
5	13		11		11		14	
6	14		10		13		15	
7			R		14			
8			13		10			
9			11		13			
10			9		13			
11			13		13			
12			13					
13			13					
14			13					
15			R					

Comments

2021-1890

Fish	Rep A Length (mm)	Rep A Normal/ Abnormal	Rep B Length (mm)	Rep B Normal/ Abnormal	Rep C Length (mm)	Rep C Normal/ Abnormal	Rep D Length (mm)	Rep D Normal/ Abnormal
1	R	N	R	N	13	N	13	N
2	10	AS	11		11		R	
3	R	N	13		R		13	
4	R		14		11		R	
5	14		13		15		R	
6	15		13		R		10	
7	14		13		14		R	
8			14		R		R	
9					13		13	
10					13		11	
11					8	AS	11	
12							13	
13							8	
14							R	
15							—	—

Comments

Reviewed By: MG Date Reviewed: 2021/10/28

ITILUS
NMENTAL

Fathead Minnow Bench Sheet

Method FMD 32 Day ELS Client NAU104 Sample: Lab Control, 10 ug/L Cu Control, 15 ug/L Cu Control, 20 ug/L Cu Control

Organism Information

Source: Aquatox Batch: 20210813FM-ELS Egg Stage: 16 somite Organisms Received in Good Condition? Yes or No

Test Log

Date	Day	Time	Technicians	Chem Cart Used	Fed AM	Fed PM	Sample Pre-Aeration Time	Bench Sheet Review First
2021/08/13	0	1500	CB/EV/SS/MF	2	–	–	60 min	–
2021/08/14	1	0930	CB	2	–	–	60 mins	MF
2021/08/15	2	1040	KL	2	–	–	60 mins	DW
2021/08/16	3	1100	AW	2	–	–	60 mins	KL
2021/08/17	4	1130	MF	2	–	–	60 mins	ST
2021/08/18	5	0930	CB	2	✓	✓	60 mins	DW
2021/08/19	6	1100	ST	2	✓	✓	60 mins	KL
2021/08/20	7	1145	SC/MF	2	✓	✓	60 mins	DW
2021/08/21	8	1330	MF/SC	2	✓	✓	60 mins	DW
2021/08/22	9	1130	CB	2	✓	✓	60 mins	KL
2021/08/23	10	1037	CB	2	✓	✓	60 mins	ST
2021/08/24	11	1108	CB	2	✓	✓	60 mins	ST
2021/08/25	12	1028	ST	2	✓	✓	60 mins	EV
2021/08/26	13	1055	MF/ST	2	✓	✓	60 mins	KL
2021/08/27	14	1000	AW	2	✓	✓	60 mins	DW
2021/08/28	15	1400	KL	2	✓	✓	60 mins	ST
2021/08/29	16	1035	ST	2	✓	✓	60 mins	KL
2021/08/30	17	1100	AW/ST	2	✓	✓	60 mins	KL
2021/08/31	18	1130	AW	2	✓	✓	60 mins	MF
2021/09/01	19	1100	AW	2	✓	✓	60 mins	DW
2021/09/02	20	1130	KL	2	✓	✓	60 mins	AW
2021/09/03	21	1110	MF	2	✓	✓	60 mins	AW
2021/09/04	22	0945	MF	2	✓	✓	60 mins	DW
2021/09/05	23	0945	AW	2	✓	✓	60 mins	KL
2021/09/06	24	[illegible]	AW	2	✓	✓	60 mins	KL
2021/09/07	25	0930	AW	2	✓	✓	60 mins	EV
2021/09/08	26	0920	MF	2	✓	✓	60 mins	AW
2021/09/09	27	1000	ST	2	✓	✓	60 mins	DW
2021/09/10	28	1045	MF	2	✓	✓	60 mins	MF
2021/09/11	29	0945	SC	2	✓	✓	60 mins	MF
2021/09/12	30	0950	AW	2	✓	✓	60 mins	KL
2021/09/13	31	0930	AW	2	✓	✓	60 mins	EV
2021/09/14	32	1200	MF	2	–	–	–	KL

Reviewed By: MG Date Reviewed: 2021/10/28

NAUTILUS ENVIRONMENTAL

Fathead Minnow Bench Sheet

Method FMD 32 Day ELS Client NAU104 Sample: Lab Control, 10 ug/L Cu Control, 15 ug/L Cu Control, 20 ug/L Cu Control

Control hatching success must be >66% (≥10 per replicate). Post hatch survival must be >70%.

Number of Alive Embryos and Hatched Organisms

replicate	CTL Day 1 Alive Embryos	CTL Day 1 Dead Embryos	CTL 10 Day 1 Alive Embryos	CTL 10 Day 1 Dead Embryos	CTL 15 Day 1 Alive Embryos	CTL 15 Day 1 Dead Embryos	CTL 20 Day 1 Alive Embryos	CTL 20 Day 1 Dead Embryos	Day 1 Alive Embryos	Day 1 Dead Embryos	Day 1 Alive Embryos	Day 1 Dead Embryos	Day 1 Alive Embryos	Day 1 Dead Embryos
a	14	1	14	1	14	1	12	3						
b	13	2	15	0	15	0	14	1						
c	~~15~~ 14	~~0~~ 1	~~13~~ 14	~~2~~ 1	15	0	14	1						
d	15	0	13	2	12	3	15	0						
e	28	2	26	4	30	0	27	3						
f	29	1	28	2	28	2	28	2						

Comments/Observations:

Number of Alive Embryos and Hatched Organisms

replicate	CTL Day 2 Alive Embryos	CTL Day 2 Dead Embryos	CTL Day 2 Cull to 15	CTL 10 Day 2 Alive Embryos	CTL 10 Day 2 Dead Embryos	CTL 10 Day 2 Cull to 15	CTL 15 Day 2 Alive Embryos	CTL 15 Day 2 Dead Embryos	CTL 15 Day 2 Cull to 15	CTL 20 Day 2 Alive Embryos	CTL 20 Day 2 Dead Embryos	CTL 20 Day 2 Cull to 15
a	12	2	15	12	2	15	13	1	15	5	7	15
b	12	1	15	14	1	15	14	1	15	12	2	15
c	14	1	15	15	0	15	14	1	15	12	2	15
d	12	3	15	13	0	15	8	4	15	15	0	15
e	28	0		25	1		30	0		25	2	
f	29	0		27	1		27	1		27	1	

replicate	Day 2 Alive Embryos	Day 2 Dead Embryos	Day 2 Cull to 15	Day 2 Alive Embryos	Day 2 Dead Embryos	Day 2 Cull to 15	Day 2 Alive Embryos	Day 2 Dead Embryos	Day 2 Cull to 15
a									
b									
c									
d									
e									
f									

Day 2 - Poor looking and dead embryos in replicates a, b, c and d are replaced with healthy embryos from replicates e and f. Replicates e and f are discarded after day 2

Comments/Observations:

Reviewed By: MG Date Reviewed: 2021/10/28

NAUTILUS ENVIRONMENTAL

Fathead Minnow Bench Sheet

Method FMD 32 Day ELS Client NAU104 Sample: Lab Control, 10 ug/L Cu Control, 15 ug/L Cu Control, 20 ug/L Cu Control

Control hatching success must be >66% (≥10 per replicate). Post hatch survival must be >70%.

CTL

Day 3

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	15	0	0	0
b	13	0	2	0
c	11	0	~~3~~ 4	~~1~~ 0
d	12	0	3	0

CTL 10

Day 3

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	13	0	2	0
b	14	0	1	0
c	12	1	2	0
d	14	0	1	0

CTL 15

Day 3

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	12	0	3	0
b	11	1	3	0
c	14	0	1	0
d	14	0	1	0

CTL 20

Day 3

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	10	1	4	0
b	13	0	2	0
c	14	0	1	0
d	15	0	0	0

Day 3

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a				
b				
c				
d				

Day 3

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a				
b				
c				
d				

Day 3

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a				
b				
c				
d				

[redacted]

CTL

Day 4

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	2	0	12	1
b	1	0	14	0
c	0	0	13	~~12~~ MF
d	0	0	15	0

CTL 10

Day 4

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	1	0	~~12~~ 13 MF	1
b	0	0	13	2
c	5	0	9	0
d	2	0	13	0

CTL 15

Day 4

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	0	0	13	~~12~~ MF
b	0	0	12	2
c	1	0	11	3
d	2	0	13	0

CTL 20

Day 4

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	2	0	12	0
b	4	0	11	0
c	~~5~~ MF	0	10	0
d	~~6~~	0	8	1

Day 4

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a				
b				
c				
d				

Day 4

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a				
b				
c				
d				

Day 4

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a				
b				
c				
d				

Comments/Observations

Reviewed By: ML Date Reviewed: 2021/10/28

NAUTILUS ENVIRONMENTAL

Fathead Minnow Bench Sheet

Method: FMD 32 Day ELS Client: NAU104 Sample: Lab Control, 10 ug/L Cu Control, 15 ug/L Cu Control, 20 ug/L Cu Control

Control hatching success must be >66% (≥10 per replicate). Post hatch survival must be >70%.

CTL

Day 5

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	0	1	13	1 (MG)
b	0	0	15	0
c	0	0	13	0
d	0	0	15	0

CTL 10

Day 5

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	0	0	14	0
b	0	0	13	0
c	0	0	14	0
d	0	0	15	0

CTL 15

Day 5

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	0	0	13	0
b	0	0	12	0
c	0	0	12	0
d	10 (13)	1	14	0

CTL 20

Day 5

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	0	0	14	0
b	0	1	14	0
c	0	0	15	0
d	1	1	12 (13)	1 (11)

Day 5

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	0	0	1 st	
b				
c				
d				

Day 5

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a				
b				
c				
d				

Day 5

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a				
b				
c				
d				

[redacted]

CTL

Day 6

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	0	0	13	0
b	0	0	15	0
c	0	0	13	0
d	0	0	14	1 *

CTL 10

Day 6

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	0	0	12	2
b	0	0	13 *	0
c	0	0	14 (2)	0
d	0	0	15 (2)	0

CTL 15

Day 6

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	0	0	13	0
b	0	0	12 (1)	0
c	0	0	12 (0) *	0
d	0	0	14 (1)	0

CTL 20

Day 6

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a	0	0	14 (1)	0
b	0	0	13 (2)	1
c	0	0	15	0
d	0	0	11 (3)	1

Day 6

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a				
b				
c				
d				

Day 6

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a				
b				
c				
d				

Day 6

	Alive Embryos	Dead Embryos	Alive Hatched	Dead Hatched
a				
b				
c				
d				

Comments/Observations

* CTL 10 b - 1 curved spine
CTL 15 c - 1 AS

Reviewed By: MG Date Reviewed: 2021/10/28

NAUTILUS ENVIRONMENTAL

Fathead Minnow Bench Sheet

Method FMD 32 Day ELS Client NAU104 Sample: Lab Control, 10 ug/L Cu Control, 15 ug/L Cu Control, 20 ug/L Cu Control

Number of Alive Embryos and Hatched Organisms

replicate	CTL Day 7 Alive Hatched	CTL 10 Day 7 Alive Hatched	CTL 15 Day 7 Alive Hatched	CTL 20 Day 7 Alive Hatched	Day 7 Alive Hatched	Day 7 Alive Hatched	Day 7 Alive Hatched
a	13	12	13	13			
b	15	12	12(1)	12(2)*			
c	13	13(1)	11(1)*	15(1)			
d	14	13(2)	14(1)	10(2)*			

Comments/Observations: * curved spine

replicate	CTL Day 8 Alive Hatched	CTL 10 Day 8 Alive Hatched	CTL 15 Day 8 Alive Hatched	CTL 20 Day 8 Alive Hatched	Day 8 Alive Hatched	Day 8 Alive Hatched	Day 8 Alive Hatched
a	13	12	13	12			
b	15	12	11 MF	11(1)			
c	~~12~~ 13	13(1)	11(1)*	15(1)			
d	14	13(1)	14(1)	10(2)			

Comments/Observations: CTL 15 C: 1 AS D: 1 AS CTL 20 B: 1 AS D: 2 AS

replicate	CTL Day 9 Alive Hatched	CTL 10 Day 9 Alive Hatched	CTL 15 Day 9 Alive Hatched	CTL 20 Day 9 Alive Hatched	Day 9 Alive Hatched	Day 9 Alive Hatched	Day 9 Alive Hatched
a	13	12	13	12			
b	15	12	11	11(1)			
c	~~12~~ 13	13	10(1)	15			
d	14	13	14	10(2)			

Comments/Observations:

replicate	CTL Day 10 Alive Hatched	CTL 10 Day 10 Alive Hatched	CTL 15 Day 10 Alive Hatched	CTL 20 Day 10 Alive Hatched	Day 10 Alive Hatched	Day 10 Alive Hatched	Day 10 Alive Hatched
a	13(1) ~~12~~	12	12	12			
b	15	12	11	11(2)			
c	13	13	9	15			
d	14	13	14	9(1)			

Comments/Observations:

Reviewed By: MG Date Reviewed: 2021/10/28

NAUTILUS ENVIRONMENTAL

Fathead Minnow Bench Sheet

Method: FMD 32 Day ELS Client: NAU104 Sample: Lab Control, 10 ug/L Cu Control, 15 ug/L Cu Control, 20 ug/L Cu Control

Number of Alive Embryos and Hatched Organisms

replicate	CTL Day 11 Alive Hatched	CTL 10 Day 11 Alive Hatched	CTL 15 Day 11 Alive Hatched	CTL 20 Day 11 Alive Hatched	Day 11 Alive Hatched	Day 11 Alive Hatched	Day 11 Alive Hatched
a	13(1)	12	12(1)	12			
b	15	12	11	11(2)			
c	13	13	9	15			
d	14	13	14	9(1)			

Comments/Observations:

replicate	CTL Day 12 Alive Hatched	CTL 10 Day 12 Alive Hatched	CTL 15 Day 12 Alive Hatched	CTL 20 Day 12 Alive Hatched	Day 12 Alive Hatched	Day 12 Alive Hatched	Day 12 Alive Hatched
a	12	12	12(1)	12			
b	15	12	11(1)	11(2)*			
c	13	13	9	15			
d	14	13(1)	14	9(1)			

Comments/Observations: CTL 20 B - 2AS
D - 1AS

replicate	CTL Day 13 Alive Hatched	CTL 10 Day 13 Alive Hatched	CTL 15 Day 13 Alive Hatched	CTL 20 Day 13 Alive Hatched	Day 13 Alive Hatched	Day 13 Alive Hatched	Day 13 Alive Hatched
a	12	12	12(1)	12			
b	15	12	11(1)	11(2)			
c	13	13	9	15			
d	14	13(1)	14	9(1)			

Comments/Observations: CTL 15
B: 1AS

CTL 20
B: 2AS
D: 1AS

replicate	CTL Day 14 Alive Hatched	CTL 10 Day 14 Alive Hatched	CTL 15 Day 14 Alive Hatched	CTL 20 Day 14 Alive Hatched	Day 14 Alive Hatched	Day 14 Alive Hatched	Day 14 Alive Hatched
a	12	12	11	12			
b	15	12	11(2)	10(1)			
c	13	13	9	15(1)			
d	14	13(1)*	14	9(1)			

Comments/Observations: * microbial growth present

Reviewed By: MG Date Reviewed: 2021/10/28

NAUTILUS ENVIRONMENTAL

Fathead Minnow Bench Sheet

Method FMD 32 Day ELS Client NAU104 Sample: Lab Control, 10 ug/L Cu Control, 15 ug/L Cu Control, 20 ug/L Cu Control

Number of Alive Embryos and Hatched Organisms

	CTL	CTL 10	CTL 15	CTL 20			
	Day 15	Day 15	Day 15	Day 15	Day 15	Day 15	Day 15
replicate	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched
a	12	12	11	12			
b	15	12	11(2)	10(1)			
c	13	13	9	15(1)			
d	14	13	14	9			

Comments/Observations:

	CTL	CTL 10	CTL 15	CTL 20			
	Day 16	Day 16	Day 16	Day 16	Day 16	Day 16	Day 16
replicate	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched
a	12	12	11	12			
b	15	12	(1 (1)	10(1)			
c	13	13	9	14			
d	14	13	14	9			

Comments/Observations: CTL 5 B-2 AS CTL 20 B-1 AS CTL 20 D-1 AS

	CTL	CTL 10	CTL 15	CTL 20			
	Day 17	Day 17	Day 17	Day 17	Day 17	Day 17	Day 17
replicate	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched
a	12	12	11	12			
b	15(1)	12	11(1)	10(1)			
c	13	13	9	14			
d	14	13	14	9(1)			

Comments/Observations:

	CTL	CTL 10	CTL 15	CTL 20			
	Day 18	Day 18	Day 18	Day 18	Day 18	Day 18	Day 18
replicate	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched	Alive Hatched
a	12	12	11	12			
b	14	12	11(2)	0			
c	13	13	9	14			
d	14	13	14	9(1)			

Comments/Observations:

MG 2021/10/28

NAUTILUS ENVIRONMENTAL

Fathead Minnow Bench Sheet

Method FMD 32 Day ELS Client NAU104 Sample: Lab Control, 10 ug/L Cu Control, 15 ug/L Cu Control, 20 ug/L Cu Control

Number of Alive Embryos and Hatched Organisms

replicate	CTL Day 19 Alive Hatched	CTL 10 Day 19 Alive Hatched	CTL 15 Day 19 Alive Hatched	CTL 20 Day 19 Alive Hatched	Day 19 Alive Hatched	Day 19 Alive Hatched	Day 19 Alive Hatched
a	12	12	11	12			
b	14	12	11(2)	8			
c	13	13	9	14			
d	14	13	14	9(1)			

Comments/Observations:

replicate	CTL Day 20 Alive Hatched	CTL 10 Day 20 Alive Hatched	CTL 15 Day 20 Alive Hatched	CTL 20 Day 20 Alive Hatched	Day 20 Alive Hatched	Day 20 Alive Hatched	Day 20 Alive Hatched
a	12	12	11	12			
b	14	12	11(1)	8			
c	13	13(1)	9	14			
d	14	13	14	9(1)			

Comments/Observations:

replicate	CTL Day 21 Alive Hatched	CTL 10 Day 21 Alive Hatched	CTL 15 Day 21 Alive Hatched	CTL 20 Day 21 Alive Hatched	Day 21 Alive Hatched	Day 21 Alive Hatched	Day 21 Alive Hatched
a	12	12	11	12			
b	14	12	10	8			
c	13	13(1)	9	14			
d	14	13	14	9(1)			

Comments/Observations:

replicate	CTL Day 22 Alive Hatched	CTL 10 Day 22 Alive Hatched	CTL 15 Day 22 Alive Hatched	CTL 20 Day 22 Alive Hatched	Day 22 Alive Hatched	Day 22 Alive Hatched	Day 22 Alive Hatched
a	12	12	11	12			
b	14	12	9(1)	8			
c	13	13(1)	9	14			
d	14	13	14	9(1)			

Comments/Observations:

MG 2021/10/28

NAUTILUS ENVIRONMENTAL

Fathead Minnow Bench Sheet

Method FMD 32 Day ELS Client NAU104 Sample: Lab Control, 10 ug/L Cu Control, 15 ug/L Cu Control, 20 ug/L Cu Control

Number of Alive Embryos and Hatched Organisms

replicate	CTL Day 23 Alive Hatched	CTL 10 Day 23 Alive Hatched	CTL 15 Day 23 Alive Hatched	CTL 20 Day 23 Alive Hatched	Day 23 Alive Hatched	Day 23 Alive Hatched	Day 23 Alive Hatched
a	12	12	11	12			
b	14	12	9(1)	8			
c	13	13(1)	9	14			
d	14	13	14	9(1)			

Comments/Observations:

replicate	CTL Day 24 Alive Hatched	CTL 10 Day 24 Alive Hatched	CTL 15 Day 24 Alive Hatched	CTL 20 Day 24 Alive Hatched	Day 24 Alive Hatched	Day 24 Alive Hatched	Day 24 Alive Hatched
a	12	12	11	12			
b	14	12	9(1)	8			
c	13(1)	13(1)	9	14			
d	14	13	14	9(1)			

Comments/Observations:

replicate	CTL Day 25 Alive Hatched	CTL 10 Day 25 Alive Hatched	CTL 15 Day 25 Alive Hatched	CTL 20 Day 25 Alive Hatched	Day 25 Alive Hatched	Day 25 Alive Hatched	Day 25 Alive Hatched
a	12	12	11	12			
b	14	12	9(1)	8			
c	12	13(1)	9	14			
d	14	13	14	9(1)			

Comments/Observations:

replicate	CTL Day 26 Alive Hatched	CTL 10 Day 26 Alive Hatched	CTL 15 Day 26 Alive Hatched	CTL 20 Day 26 Alive Hatched	Day 26 Alive Hatched	Day 26 Alive Hatched	Day 26 Alive Hatched
a	12	12	11	12			
b	14	12	9(1)	8			
c	12	13(1)	9	14			
d	14	13	14	9(1)			

Comments/Observations:

MG 2021/10/28

NAUTILUS ENVIRONMENTAL

Fathead Minnow Bench Sheet

Method FMD 32 Day ELS Client NAU104 Sample: Lab Control, 10 ug/L Cu Control, 15 ug/L Cu Control, 20 ug/L Cu Control

Number of Alive Embryos and Hatched Organisms

replicate	CTL Day 27 Alive Hatched	CTL 10 Day 27 Alive Hatched	CTL 15 Day 27 Alive Hatched	CTL 20 Day 27 Alive Hatched	Day 27 Alive Hatched	Day 27 Alive Hatched	Day 27 Alive Hatched
a	12	12	11	12			
b	14	12	9	8			
c	12	13(1)	9	14			
d	14	13(1)	14	9			

Comments/Observations: CTL10C-1AS CTL15B-1AS CTL20D-1AS

replicate	CTL Day 28 Alive Hatched	CTL 10 Day 28 Alive Hatched	CTL 15 Day 28 Alive Hatched	CTL 20 Day 28 Alive Hatched	Day 28 Alive Hatched	Day 28 Alive Hatched	Day 28 Alive Hatched
a	12	12	11	12			
b	14	12	9	8			
c	11	13(1)	9	14			
d	14	13(1)	14	9			

Comments/Observations: CTL B15-1AS CTL20AS D

replicate	CTL Day 29 Alive Hatched	CTL 10 Day 29 Alive Hatched	CTL 15 Day 29 Alive Hatched	CTL 20 Day 29 Alive Hatched	Day 29 Alive Hatched	Day 29 Alive Hatched	Day 29 Alive Hatched
a	12	12	11	12			
b	14	12	9	8			
c	11	13(1)	9	14			
d	14	13	14	9			

Comments/Observations:

replicate	CTL Day 30 Alive Hatched	CTL 10 Day 30 Alive Hatched	CTL 15 Day 30 Alive Hatched	CTL 20 Day 30 Alive Hatched	Day 30 Alive Hatched	Day 30 Alive Hatched	Day 30 Alive Hatched
a	12	12	11	12			
b	14	12	9	8			
c	11	13(1)	9	14			
d	14	13	14	9			

Comments/Observations:

MG 2021/10/28

NAUTILUS ENVIRONMENTAL

Fathead Minnow Bench Sheet

Method FMD 32 Day ELS Client NAU104 Sample: Lab Control, 10 ug/L Cu Control, 15 ug/L Cu Control, 20 ug/L Cu Control

Number of Alive Embryos and Hatched Organisms

replicate	CTL Day 31 Alive Hatched	CTL 10 Day 31 Alive Hatched	CTL 15 Day 31 Alive Hatched	CTL 20 Day 31 Alive Hatched	Day 31 Alive Hatched	Day 31 Alive Hatched	Day 31 Alive Hatched
a	12	12	11	12			
b	14	12	9	8			
c	11	13(1)	9	14			
d	13	13	14	9			

Comments/Observations:

replicate	CTL Day 32 Alive Hatched	CTL 10 Day 32 Alive Hatched	CTL 15 Day 32 Alive Hatched	CTL 20 Day 32 Alive Hatched	Day 32 Alive Hatched	Day 32 Alive Hatched	Day 32 Alive Hatched
a	12	12	11	12			
b	14	12	8 9 MG	8			
c	11	12	8 9 MG	14			
d	13	13	14	9			

Comments/Observations:

Reviewed By: MG Date Reviewed: 2021/10/28

NAUTILUS ENVIRONMENTAL

Fathead Minnow Bench Sheet

Method: FMD 32 Day ELS Client: NAU104 Sample: Lab Control, 10 ug/L Cu Control, 15 ug/L Cu Control, 20 ug/L Cu Control

New Solutions

pH (units)

Day	CTL	CTL 10	CTL 15	CTL 20			
0	8.0	8.2	8.3	8.3			
1	8.2	8.3	8.3	8.3			
2	8.3	8.3	8.3	7.8			
3	8.3	8.3	8.2	8.3			
4	8.3	8.3	8.3	8.2			
5	8.2	8.2	8.2	8.3			
6	8.1	8.2	8.2	8.2			
7	8.2	8.3	8.3	8.2			
8	8.4	8.3	8.3	8.3			

Conductance (µS/cm)

Day	CTL	CTL 10	CTL 15	CTL 20			
0	347	368	373	374			
1	347	377	378	3810			
2	348	374	378	359			
3	353	366	366	365			
4	357	375	372	373			
5	367	402	409	410			
6	379	409	413	415			
7	370	411	412	410			
8	394	414	415	422			

Dissolved Oxygen (mg/L) (60-100% saturation)

Day	CTL	CTL 10	CTL 15	CTL 20			
0	7.3	7.3	7.3	7.3			
1	7.3	7.3	7.3	7.3			
2	7.3	7.3	7.3	7.3			
3	7.3	7.3	7.3	7.3			
4	7.3	7.3	7.3	7.2			
5	7.3	7.3	7.3	7.3			
6	7.2	7.2	7.0	7.0			
7	7.1	7.1	7.1	7.1			
8	7.3	7.3	7.3	7.3			

Temperature (°C)

Day	CTL	CTL 10	CTL 15	CTL 20			
0	24	24	24	24			
1	24	24	24	24			
2	24	24	24	24			
3	24	24	24	24			
4	24	24	24	24			
5	24	24	24	24			
6	24	24	24	24			
7	24	24	24	24			
8	24	24	24	24			

Old Solutions

pH (units)

Day	CTL	CTL 10	CTL 15	CTL 20			
0							
1	8.2	8.2	8.2	8.2			
2	8.3	8.3	8.3	8.3			
3	8.2	8.2	8.2	8.2			
4	8.2	8.2	8.3	8.3			
5	8.2	8.2	8.2	8.2			
6	8.3	8.3	8.3	8.3			
7	8.2	8.2	8.2	8.2			
8	8.2	8.1	8.2	8.2			

Conductance (µS/cm)

Day	CTL	CTL 10	CTL 15	CTL 20			
0							
1	368	379	376	382			
2	351	383	384	390			
3	334	365	362	373			
4	364	376	377	378			
5	389	416	418	417			
6	366	406	408	412			
7	387	416	416	420			
8	373	419	420	424			

Dissolved Oxygen (mg/L) (60-100% saturation)

Day	CTL	CTL 10	CTL 15	CTL 20			
0							
1	7.2	7.0	7.1	7.1			
2	7.2	7.2	7.2	7.1			
3	7.2	7.2	7.2	7.1			
4	7.3	7.2	7.2	7.2			
5	7.3	7.3	7.3	7.3			
6	7.2	7.2	7.2	7.3			
7	6.9	6.9	6.8	6.8			
8	7.2	7.0	7.0	7.0			

Temperature (°C)

Day	CTL	CTL 10	CTL 15	CTL 20			
0							
1	24	24	24	24			
2	24	24	24	24			
3	24	24	24	24			
4	24	24	24	24			
5	24	24	24	24			
6	24	24	24	24			
7	24	24	24	24			
8	24	24	24	24			

DO Levels (60-100% saturation) -
4.4 to 7.3 mg/L at 24°C
4.3 to 7.2 mg/L at 25°C
4.2 to 7.0 mg/L at 26°C

Comments:

Reviewed By: MG Date Reviewed: 2021/10/28

NAUTILUS ENVIRONMENTAL

Fathead Minnow Bench Sheet

Method: FMD 32 Day ELS Client: NAU104 Sample: Lab Control, 10 ug/L Cu Control, 15 ug/L Cu Control, 20 ug/L Cu Control

New Solutions

Conc. (%)	CTL	CTL 10	CTL 15	CTL 20			
Day							
pH (units)							
9	8.3	8.3	8.3	8.3			
10	8.3	8.3	8.3	8.3			
11	8.3	8.3	8.3	8.3			
12	8.4	8.3	8.3	8.3			
13	8.5	8.3	8.4	8.4			
14	8.3	8.3	8.3	8.3			
15	8.3	8.3	8.3	8.3			
16	8.0	8.3	8.4	8.4			
17	7.9	8.2	8.2	8.3			
Conductance (µS/cm)							
9	381	418	424	433			
10	379	416	425	411			
11	359	409	417	406			
12	423	412	418	402			
13	404	411	421	399			
14	400	413	423	395			
15	440	420	424	410			
16	364	397	425	417			
17	342	386	404	407			
Dissolved Oxygen (mg/L) (60-100% saturation)							
9	7.3	7.3	7.3	7.3			
10	7.3	7.3	7.2	7.2			
11	7.3	7.3	7.2	7.2			
12	7.3	7.3	7.3	7.2			
13	7.3	7.1	7.1	7.1			
14	7.5	7.3	7.3	7.3			
15	7.3	7.3	7.3	7.3			
16	7.3	7.2	7.2	7.3			
17	7.3	7.3	7.3	7.3			
Temperature (°C)							
9	24	24	24	24			
10	24	24	24	24			
11	24	24	24	24			
12	24	24	24	24			
13	24	24	24	24			
14	24	24	24	24			
15	24	24	24	24			
16	24	24	24	24			
17	24	24	24	24			

Old Solutions

	CTL	CTL 10	CTL 15	CTL 20			
pH (units)							
9	8.2	8.1	8.1	8.2			
10	8.0	8.0	7.9	7.9			
11	8.1	8.0	8.0	8.1			
12	8.1	8.1	8.1	8.1			
13	8.2	8.1	8.2	8.1			
14	8.2	8.2	8.1	8.1			
15	8.0	8.0	8.0	8.1			
16	8.2	8.1	8.1	8.0			
17	7.9	7.9	7.9	8.0			
Conductance (µS/cm)							
9	370	422	425	429			
10	390	424	420	434			
11	384	425	429	422			
12	367	422	425	412			
13	410	421	423	410			
14	421	419	429	405			
15	427	426	426	409			
16	405	417	431	399			
17	367	401	421	411			
Dissolved Oxygen (mg/L) (60-100% saturation)							
9	7.1	7.1	7.0	7.0			
10	6.2	6.2	6.1	6.0			
11	6.8	6.8	6.6	6.5			
12	7.0	6.8	6.8	6.6			
13	6.7	6.6	6.5	6.4			
14	6.8	6.6	6.6	6.4			
15	6.9	6.9	6.7	6.7			
16	6.2	6.2	6.2	6.0			
17	6.6	6.5	6.0	5.9			
Temperature (°C)							
9	24	24	24	24			
10	24	24	24	24			
11	24	24	24	24			
12	24	24	24	24			
13	24	24	24	24			
14	24	24	24	24			
15	24	24	24	24			
16	24	24	24	24			
17	24	24	24	24			

DO Levels (60-100% saturation) -
4.4 to 7.3 mg/L at 24°C
4.3 to 7.2 mg/L at 25°C
4.2 to 7.0 mg/L at 26°C

Comments:

Reviewed By: MG Date Reviewed: 2021/10/28

NAUTILUS ENVIRONMENTAL

Fathead Minnow Bench Sheet

Method: FMD 32 Day ELS Client: NAU104 Sample: Lab Control, 10 ug/L Cu Control, 15 ug/L Cu Control, 20 ug/L Cu Control

New Solutions

Conc. (%) / Day	CTL	CTL 10	CTL 15	CTL 20			
pH (units)							
18	8.2	8.2	8.2	8.3			
19	8.4	8.2	8.3	8.3			
20	~~8.4~~	~~8.3~~	~~8.3~~	~~8.3~~			
21	8.3	8.3	8.3	8.3			
22	8.3	8.2	8.3	8.3			
23	8.2	8.3	8.3	8.3			
24	8.2	8.2	8.3	8.3			
25	8.2	8.0	8.2	8.2			
26	8.3	8.2	8.2	8.2			
20:	8.3	8.3	8.2	8.3			
Conductance (µS/cm)							
18	330	408	401	407			
19	393	410	408	409			
20	~~407~~	~~415~~	~~410~~	~~407~~			
21	390	409	409	412			
22	385	396	403	405			
23	387	397	407	399			
24	381	379	400	394			
25	384	376	390	377			
26	350	377	384	376			
20:	401	412	408	407			
Dissolved Oxygen (mg/L) (60-100% saturation)							
18	7.3	7.3	7.3	7.3			
19	7.3	7.3	7.3	7.3			
20	~~6.9~~ 7.1	~~7.1~~	~~7.2~~	~~7.3~~			
21	7.3	7.3	7.3	7.3			
22	7.3	7.3	7.3	7.3			
23	7.3	7.3	7.3	7.3			
24	7.3	7.3	7.3	7.3			
25	7.3	7.3	7.3	7.3			
26	7.3	7.3	7.3	7.3			
20:	7.3	7.3	7.3	7.3			
Temperature (°C)							
18	24	24	24	24	24	24	24
19	24	24	24	24			
20	~~24~~	~~24~~	~~24~~	~~24~~			
21	24	24	24	24			
22	24	24	24	24			
23	24	24	24	24			
24	24	24	24	24			
25	24	24	24	24			
26	24	24	24	24			
20:	24	24	24	24			

Old Solutions

Conc. (%) / Day	CTL	CTL 10	CTL 15	CTL 20			
pH (units)							
18	7.9	7.8	7.9	7.9			
19	7.9	7.8	7.9	7.9			
20	~~8.0~~	~~8.0~~	~~7.9~~	~~7.9~~			
21	8.1	8.0	8.0	8.0			
22	8.1	8.0	8.0	8.0			
23	8.1	8.0	8.0	8.0			
24	8.1	8.0	8.0	8.0			
25	7.8	7.8	7.8	7.8			
26	8.0	7.9	7.9	7.9			
20:	7.8	7.8	7.9	7.9			
Conductance (µS/cm)							
18	357	395	415	416			
19	354	412	414	416			
20	~~416~~	~~416~~	~~414~~	~~417~~			
21	417	415	407	414			
22	409	418	419	417			
23	401	414	415	415			
24	372	403	411	405			
25	363	391	405	394			
26	358	390	397	388			
20:	392	410	410	410			
Dissolved Oxygen (mg/L) (60-100% saturation)							
18	6.4	6.1	5.9	5.8			
19	6.3	6.3	5.8	5.7			
20	~~6.9~~	~~6.1~~	~~5.7~~	~~5.9~~			
21	7.1	6.8	6.7	6.6			
22	6.9	6.8	6.5	6.4			
23	7.0	6.7	6.5	6.6			
24	6.9	6.8	6.8	6.7			
25	6.5	6.4	6.2	6.2			
26	7.0	6.7	6.5	6.4			
20:	5.7	5.7	5.6	5.7			
Temperature (°C)							
18	24	24	24	24			
19	24	24	24	24			
20	~~24~~	~~24~~	~~24~~	~~24~~			
21	24	24	24	24			
22	24	24	24	24			
23	24	24	24	24			
24	24	24	24	24			
25	24	24	24	24			
26	24	24	24	24			
20:	24	24	24	24			

DO Levels (60-100% saturation) -
4.4 to 7.3 mg/L at 24°C
4.3 to 7.2 mg/L at 25°C
4.2 to 7.0 mg/L at 26°C

Comments:

Reviewed By: MG Date Reviewed: 2021/10/28

NAUTILUS ENVIRONMENTAL

Fathead Minnow Bench Sheet

Method: FMD 32 Day ELS Client: NAU104 Sample: Lab Control, 10 ug/L Cu Control, 15 ug/L Cu Control, 20 ug/L Cu Control

pH (units)

Conc. (%) / Day	New Solutions CTL	New Solutions CTL 10	New Solutions CTL 15	New Solutions CTL 20	Old Solutions CTL	Old Solutions CTL 10	Old Solutions CTL 15	Old Solutions CTL 20
27	8.3	8.2	8.2	8.2	7.8	7.8	7.8	7.8
28	8.4	8.3	8.3	8.3	8.0	8.0	7.9	7.9
29	8.3	8.3	8.3	8.3	8.2	8.1	8.1	8.0
30	8.3	8.1	8.2	8.2	7.9	7.9	8.0	8.0
31	8.1 7.8	8.2	8.2	8.2	7.8	7.8	7.7	7.8
32					7.8	7.9	7.9	7.9

Conductance (µS/cm)

Day	New Solutions CTL	New Solutions CTL 10	New Solutions CTL 15	New Solutions CTL 20	Old Solutions CTL	Old Solutions CTL 10	Old Solutions CTL 15	Old Solutions CTL 20
27	376	383	382	363	360	388	394	384
28	374	394	385	382	398	397	391	390
29	379	394	364	367	351	399	368	367
30	391	400	367	364	380	406	379	369
31	411	391	370	366	410	407	378	371
32					389	400	380	379

Dissolved Oxygen (mg/L) (60-100% saturation)

Day	New Solutions CTL	New Solutions CTL 10	New Solutions CTL 15	New Solutions CTL 20	Old Solutions CTL	Old Solutions CTL 10	Old Solutions CTL 15	Old Solutions CTL 20
27	7.3	7.2	7.2	7.2	6.7	6.2	6.0	6.1
28	7.3	7.3	7.3	7.3	6.10	6.2	6.0	5.9
29	7.3	7.3	7.3	7.3	6.7	6.0	6.0	6.0
30	7.3	7.3	7.3	7.3	6.2	6.1	6.0	6.1
31	7.3	7.3	7.3	7.3	6.5	6.3	6.3	6.2
32					10.5	10.5	10.6	10.5

Temperature (°C)

Day	New Solutions CTL	New Solutions CTL 10	New Solutions CTL 15	New Solutions CTL 20	Old Solutions CTL	Old Solutions CTL 10	Old Solutions CTL 15	Old Solutions CTL 20
27	24	24	24	24	24	24	24	24
28	24	24	24	24	24	24	24	24
29	24	24	24	24	24	24	24	24
30	24	24	24	24	24	24	24	24
31	24	24	24	24	24	24	24	24
32					24	24	24	24

DO Levels (60-100% saturation) -
4.4 to 7.3 mg/L at 24°C
4.3 to 7.2 mg/L at 25°C
4.2 to 7.0 mg/L at 26°C

Comments:

Reviewed By: MG Date Reviewed: 2021/10/28

NAUTILUS ENVIRONMENTAL

Fathead Minnow Bench Sheet

Method FMD 32 Day ELS Client NAU104 Sample: Lab Control, 10 ug/L Cu Control, 15 ug/L Cu Control, 20 ug/L Cu Control

Test Termination

For normal/abnormal column, use the following notation:

N=Normal, A= Abnormal And note location: H=head, O=oral, E=eyes, G=gills, F=fins, S=spine

Conc. **CTL**

Fish	Rep A Length (mm)	Rep A Normal/ Abnormal	Rep B Length (mm)	Rep B Normal/ Abnormal	Rep C Length (mm)	Rep C Normal/ Abnormal	Rep D Length (mm)	Rep D Normal/ Abnormal
1	12	MN	11	N	13	N	11	N
2	13		11		13		13	
3	14		10		14		13	
4	14		7		9		10	
5	11		12		14		12	
6	12		11		11		10	
7	12		12		11		13	
8	12		10		12		11	
9	13		11		12		11	
10	14		9		11		14	
11	12		14		13		12	
12	10		13				11	
13	/	/	11		/	/	12	/
14	/	/	12	-	/	/	/	/
15	/	/	-		/	/	/	/

Comments

CTL 10

Fish	Rep A Length (mm)	Rep A Normal/ Abnormal	Rep B Length (mm)	Rep B Normal/ Abnormal	Rep C Length (mm)	Rep C Normal/ Abnormal	Rep D Length (mm)	Rep D Normal/ Abnormal
1	14	N	13	N	13	N	12	N
2	10		14		13		7	AS
3	13		12		12		14	N
4	11		11		15		13	
5	12		13		12		13	
6	10		13		12		13	
7	12		12		15		13	
8	12		10		12		14	
9	13		11		14		14	
10	12		12		11		15	
11	11		13		11		12	
12	12		11		13		15	
13	/	/	/	/	/	/	12	
14	/	/	/	/	/	/	/	/
15	/	/	/	/	/	/	/	/

Comments

Reviewed By: ML Date Reviewed: 2021/10/28

NAUTILUS ENVIRONMENTAL

Fathead Minnow Bench Sheet

Method FMD 32 Day ELS Client NAU104 Sample: Lab Control, 10 ug/L Cu Control, 15 ug/L Cu Control, 20 ug/L Cu Control

Test Termination

For normal/abnormal column, use the following notation:

N=Normal, A= Abnormal And note location: H=head, O=oral, E=eyes, G=gills, F=fins, S=spine

Conc. **CTL 15**

Fish	Rep A Length (mm)	Rep A Normal/ Abnormal	Rep B Length (mm)	Rep B Normal/ Abnormal	Rep C Length (mm)	Rep C Normal/ Abnormal	Rep D Length (mm)	Rep D Normal/ Abnormal
1	14	N	12	N	12	N	11	N
2	12		13		13		11	
3	14		11		15		12	
4	14		8		13		9	
5	12		15		13		10	AS
6	13		11		13		11	N
7	14		10		13		11	
8	11		14		15		14	
9	12						11	
10	14						11	
11	12						12	
12							13	
13							14	
14							15	
15								

Comments

Conc. **CTL 20**

Fish	Rep A Length (mm)	Rep A Normal/ Abnormal	Rep B Length (mm)	Rep B Normal/ Abnormal	Rep C Length (mm)	Rep C Normal/ Abnormal	Rep D Length (mm)	Rep D Normal/ Abnormal
1	14	N	12	N	14	N	13	N
2	12		11		12		14	
3	16		14		13		15	
4	12		15		14		10	AS
5	13		12		12		9	N
6	12		13		14		13	
7	13		12		12		15	
8	13		14	AS	9		14	
9	14				13		15	
10	15				15			
11	12				13			
12	13				11			
13					12			
14								
15								

Comments

Reviewed By: MG Date Reviewed: 2021/10/28

NAUTILUS ENVIRONMENTAL

Organism Weights Bench Sheet

Client TEC 164 Sample 32d TEST Organism FM Batch

1880 – 1891

	Item Weighed	Date	Initials	Balance*
Initial Weight (mg):	dried pan	2021/09/12	AC	mettler 1
Final Weight (mg):	dried pan + organisms	2021/09/17	NA	mettler 1

* same balance must be used for initial and final weights
* for FM/HA/CT, must use scale with 0.01 mg accuracy

Concentration

Replicate	1880 Initial	1880 Final	1881 Initial	1881 Final	1882 Initial	1882 Final	1883 Initial	1883 Final	1884 Initial	1884 Final	1885 Initial	1885 Final
a	1008.65	1048.90	1016.98	1056.06	1007.58	1035.79	1009.81	1045.10	997.84	1028.06	1001.97	1028.51
b	1006.12	1041.58	998.66	1037.48	996.67	1028.05	1004.49	1041.14	997.28	1031.90	1001.62	1030.44
c	1007.56	1049.12	1001.50	1031.48	1001.83	1029.60	1009.20	1050.75	1000.84	1036.82	1004.22	1043.44
d	1008.40	1045.95	1004.98	1045.84	1009.53	1046.09	1008.34	1049.50	1000.10	1035.69	1001.06	1021.03
e												

997.84

Concentration

Replicate	1886 Initial	1886 Final	1887 Initial	1887 Final	1888 Initial	1888 Final	1889 Initial	1889 Final	1890 Initial	1890 Final	1891 Initial	1891 Final
a	999.00	1035.29	1006.97	1045.10	1005.68	1044.54	1011.46	1048.61	998.91	1031.06	1002.88	1043.21
b	1003.22	1037.53	1005.30	1033.74	1011.86	1053.86	993.46	1033.58	993.27	1028.35	992.36	1025.58
c	1018.33	1051.42	999.72	1030.07	1010.03	1046.21	1001.02	1041.67	1006.89	1049.01	993.76	1032.18
d	1011.71	1052.40	1015.23	1055.28	1009.09	1051.80	995.85	1036.27	998.07	1036.13	1001.20	1041.51
e												

Balance Calibration Check:

	Initial	Final
first pan weighed:	1880 A	1882 C
weight of first pan:	1008.65	1029.60
first pan after all other pans weighed:	1008.67	1029.62
% difference <5%:	Yes/No	Yes/No

% difference = $\frac{\text{(initial weight - reweight)}}{\text{(initial weight + reweight) / 2)}} \times 100\%$

Test Validity Met: Yes/No/NA

Results are Logical:** Yes/No

** no negative numbers, consistent values across replicates

If "no" is circled for any parameter, notify Lab Supervisor/ QA Group to determine appropriate action

Reviewed By: MG Date Reviewed: 2021/10/28

NAUTILUS ENVIRONMENTAL

Organism Weights Bench Sheet

Client TEC 164 Sample 320 test 1872-1879 + CTLs Organism FM Batch

	Item Weighed	Date	Initials	Balance*
Initial Weight (mg):	dried pan	2021/09/12	AC	Mettler 1
Final Weight (mg):	dried pan + organisms	2021/09/17	TP/NA	Mettler 1

* same balance must be used for initial and final weights
* for FM/HA/CT, must use scale with 0.01 mg accuracy

~~Concentration~~ Sample ID

Replicate	CTL		CTL10		CTL15		CTL20		1872		1873	
	Initial	Final	Initial	Final	Initial	Final	Initial	Final	Initial	Final	Initial	Final
a	1017.03	1055.78	1001.33	1035.50	1001.38	1039.18	1003.66	1043.58	992.05	1031.21	1001.82	1035.57
b	999.40	1034.39	1007.54	1047.94	1007.51	1037.90	1013.01	1050.57	1011.24	1046.84	1001.06	1036.54
c	1001.59	1037.49	999.29	1043.79	1001.17	1040.77	1010.01	1049.82	998.05	1029.23	1001.92	1016.93
d	988.12	1036.11	999.83	1046.92	1001.33	1039.90	998.92	1033.31	1001.40	1042.92	999.67	1045.21
e												

~~Concentration~~ Sample ID

Replicate	1874		1875		1876		1877		1878		1879	
	Initial	Final	Initial	Final	Initial	Final	Initial	Final	Initial	Final	Initial	Final
a	1001.62	1038.13	991.71	1025.57	1004.07	1045.25	1004.90	1039.31	999.63	1037.96	1003.76	1043.73
b	1009.14	1049.91	995.36	1029.79	995.84	1037.75	1011.46	1042.08	998.56	1041.21	1001.17	1035.35
c	1007.42	1043.73	996.15	1029.67	1008.63	1045.61	1008.83	1040.57	1000.98	1042.01	997.80	1036.05
d	1007.70	1052.17	995.97	1040.54	1005.41	1050.23	1011.23	1048.46	1006.22	1050.31	999.11	1037.37
e												

Balance Calibration Check:

	Initial	Final
first pan weighed:	CTL A	CTL A
weight of first pan:	1017.03	1055.78
first pan after all other pans weighed:	1017.06	1055.79
% difference <5%:	(Yes)/No	(Yes)/No

$$\% \text{ difference} = \frac{(\text{initial weight} - \text{reweight})}{(\text{initial weight} + \text{reweight}) / 2} \times 100\%$$

Test Validity Met: (Yes)/No/NA

Results are Logical:** (Yes)/No

** no negative numbers, consistent values across replicates

If "no" is circled for any parameter, notify Lab Supervisor/ QA Group to determine appropriate action

Reviewed By: MG Date Reviewed: 2021/10/28

Fathead minnow 32-d (Pimephales promelas) survival and growth test **Nautilus Environmental Calgary**

Batch ID:	19-0275-1751	**Test Type:**	32 Day Fathead Minnow Test	**Analyst:**	Kayla Knol
Start Date:	13 Aug-21	**Protocol:**	ASTM E1241-05 (2013)	**Diluent:**	Dechlorinated Tap Water
Ending Date:	13 Sep-21	**Species:**	Pimephales promelas	**Brine:**	
Test Length:	31d 0h	**Taxon:**	Actinopterygii	**Source:**	Aquatox, AR **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
Lab Control FM	11-5032-4817	10 Aug-21	11 Aug-21	72h	Teck Coal Ltd	
10Cu Control	04-3348-8996	10 Aug-21	11 Aug-21	72h		
15 Cu Control	05-5139-9319	10 Aug-21	11 Aug-21	72h		
20 Cu Control	18-8853-3252	10 Aug-21	11 Aug-21	72h		
FR_UFR1+15Cu	13-9616-5903	10 Aug-21	11 Aug-21	72h (14.7 °C)		
GH_ER2+15Cu	19-5052-7846	10 Aug-21	11 Aug-21	72h (12.1 °C)		
CM_MC1+15Cu	15-1448-1664	10 Aug-21	11 Aug-21	72h (12.3 °C)		
LC_SLC+10Cu	10-0118-5065	10 Aug-21	11 Aug-21	72h (11.8 °C)		
FR_FRABCH+20Cu	12-2763-5905	10 Aug-21	11 Aug-21	72h (14.6 °C)		
FR_FRCP1+20Cu	05-5162-7629	10 Aug-21	11 Aug-21	72h (13.8 °C)		
GH_FR1+20Cu	18-3989-2491	10 Aug-21	11 Aug-21	72h (12 °C)		
GH_ERC+10Cu	14-6940-9296	10 Aug-21	11 Aug-21	72h (15.4 °C)		
CM_MC2+20Cu	17-0166-2336	10 Aug-21	11 Aug-21	72h (13.1 °C)		
RG_MIDAG+15Cu	18-0148-8949	10 Aug-21	11 Aug-21	72h (12.4 °C)		
EV_MC2+20Cu	08-5423-9441	10 Aug-21	11 Aug-21	72h (13.1 °C)		
EV_HC1+20Cu	19-8320-0922	10 Aug-21	11 Aug-21	72h (12.1 °C)		
LC_DCDS+20Cu	12-7443-1043	10 Aug-21	11 Aug-21	72h (12.3 °C)		
LC_LC3+15Cu	06-5017-0795	10 Aug-21	11 Aug-21	72h (12.4 °C)		
LC_LC5+15Cu	10-4683-7945	10 Aug-21	11 Aug-21	72h (15.1 °C)		
LC_LCDSSLCC	11-9856-2953	10 Aug-21	11 Aug-21	72h (10.8 °C)		
FR_FR4+15Cu	16-1388-5677	10 Aug-21	11 Aug-21	72h (14.1 °C)		
FR_FRRD+15Cu	18-8883-2370	10 Aug-21	11 Aug-21	72h (14.7 °C)		
FR_FR2+20Cu	20-1752-8591	10 Aug-21	11 Aug-21	72h (15.3 °C)		
FR_MULTIPLATE	15-0654-9876	10 Aug-21	11 Aug-21	72h (13.6 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
Lab Control FM	Ambient Sample	Teck Coal Ltd	Lab Control FM	
10Cu Control	Ambient Sample	Teck Coal Ltd	10 Cu Control	
15 Cu Control	Ambient Sample	Teck Coal Ltd	15 Cu Control	
20 Cu Control	Ambient Sample	Teck Coal Ltd	20 Cu Control	
FR_UFR1+15Cu	Ambient Sample	Teck Coal Ltd	FR_UFR1_MON_2021-08-0	
GH_ER2+15Cu	Ambient Sample	Teck Coal Ltd	GH_ER2_WS_2021-08-10_	
CM_MC1+15Cu	Ambient Sample	Teck Coal Ltd	CM_MC1_WS_2021-08-10	
LC_SLC+10Cu	Ambient Sample	Teck Coal Ltd	LC_SLC_WS_2021-08-10_	
FR_FRABCH+20Cu	Ambient Sample	Teck Coal Ltd	FR_FRABCH_MON_2021-	
FR_FRCP1+20Cu	Ambient Sample	Teck Coal Ltd	FR_FRCP1_MON_2021-08	
GH_FR1+20Cu	Ambient Sample	Teck Coal Ltd	GH_FR1_WS_2021-08-10_	
GH_ERC+10Cu	Ambient Sample	Teck Coal Ltd	GH_ERC_WS_2021-08-10	
CM_MC2+20Cu	Ambient Sample	Teck Coal Ltd	CM_MC2_WS_2021-08-10	
RG_MIDAG+15Cu	Ambient Sample	Teck Coal Ltd	RG_MIDAG_WS_2021-08-	
EV_MC2+20Cu	Ambient Sample	Teck Coal Ltd	EV_MC2_WS_2021_Q3_W	
EV_HC1+20Cu	Ambient Sample	Teck Coal Ltd	EV_HC1_WS_2021_Q3_W	
LC_DCDS+20Cu	Ambient Sample	Teck Coal Ltd	LC_DCDS_WS_2021-08-1	
LC_LC3+15Cu	Ambient Sample	Teck Coal Ltd	LC_LC3_WS_2021-08-10_	
LC_LC5+15Cu	Ambient Sample	Teck Coal Ltd	LC_LC5_WS_2021-08-10_	
LC_LCDSSLCC	Ambient Sample	Teck Coal Ltd	LC_LCDSSLCC_WS_2021-	
FR_FR4+15Cu	Ambient Sample	Teck Coal Ltd	FR_FR4_WS_2021-08-10_	
FR_FRRD+15Cu	Ambient Sample	Teck Coal Ltd	FR_FRRD_WS_2021-08-1	
FR_FR2+20Cu	Ambient Sample	Teck Coal Ltd	FR_FR2_WS_2021-08-10_	
FR_MULTIPLATE	Ambient Sample	Teck Coal Ltd	FR_MULTIPLATE_WS_20	

Fathead minnow 32-d (Pimephales promelas) survival and growth test **Nautilus Environmental Calgary**

SIngle Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	GH_FR1+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ERC+10Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	10Cu Control passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC3+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	15 Cu Control passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_MULTIPLATE passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC5+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC2+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR2+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_SLC+10Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	Lab Control FM passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	RG_MIDAG+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ER2+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC1+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	EV_HC1+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_UFR1+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRABCH+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR4+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	EV_MC2+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_DCDS+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRCP1+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRRD+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	20 Cu Control passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LCDSSLCC passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	GH_FR1+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	15 Cu Control passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_SLC+10Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC5+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRRD+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LCDSSLCC passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ERC+10Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR4+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR2+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ER2+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_UFR1+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	EV_MC2+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	EV_HC1+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	20 Cu Control passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC1+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	RG_MIDAG+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_DCDS+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRCP1+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRABCH+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC3+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_MULTIPLATE passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	10Cu Control passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC2+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	Lab Control FM passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ERC+10Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR4+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	EV_MC2+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	20 Cu Control passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	EV_HC1+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRCP1+20Cu passed hatch rate	1

Fathead minnow 32-d (Pimephales promelas) survival and growth test **Nautilus Environmental Calgary**

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	RG_MIDAG+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	15 Cu Control passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC3+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	10Cu Control passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_DCDS+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	GH_FR1+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC5+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC2+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LCDSSLCC passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	Lab Control FM passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_SLC+10Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC1+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRRD+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ER2+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_MULTIPLATE passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRABCH+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR2+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_UFR1+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR2+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC5+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRCP1+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC3+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	Lab Control FM passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	GH_FR1+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ERC+10Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC2+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC1+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_DCDS+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ER2+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	10Cu Control passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	RG_MIDAG+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	EV_HC1+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	20 Cu Control passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_UFR1+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	EV_MC2+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_MULTIPLATE passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRRD+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	15 Cu Control passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LCDSSLCC passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR4+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRABCH+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_SLC+10Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	EV_HC1+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_DCDS+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ER2+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC2+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ERC+10Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	15 Cu Control passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	10Cu Control passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	RG_MIDAG+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	EV_MC2+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	Lab Control FM passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRCP1+20Cu passed hatch rate	1

Fathead minnow 32-d (Pimephales promelas) survival and growth test

Nautilus Environmental Calgary

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LCDSSLCC passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC3+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRRD+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_MULTIPLATE passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC1+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	GH_FR1+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_UFR1+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC5+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	20 Cu Control passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR4+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR2+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRABCH+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_SLC+10Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	0.7043	FR_UFR1+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	0.7043	EV_HC1+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	0.7043	10Cu Control passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	0.7043	GH_ER2+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	0.7043	FR_FR4+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	0.7043	20 Cu Control passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	0.7043	RG_MIDAG+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	0.7043	FR_FRABCH+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	0.7043	15 Cu Control passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	0.7043	FR_FRCP1+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	0.7043	FR_FRRD+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	0.7043	Lab Control FM passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	0.7043	GH_FR1+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	0.7043	LC_SLC+10Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	0.7043	LC_LC3+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	0.7043	FR_FR2+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	0.7043	LC_LCDSSLCC passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	0.7043	GH_ERC+10Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	0.7043	LC_DCDS+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	0.7043	CM_MC2+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	0.7043	FR_MULTIPLATE passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	0.7043	EV_MC2+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	0.7043	LC_LC5+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	0.7043	CM_MC1+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	15 Cu Control passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC5+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	EV_HC1+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRRD+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC3+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_MULTIPLATE passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	20 Cu Control passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR2+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR4+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LCDSSLCC passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_DCDS+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	EV_MC2+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC1+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_UFR1+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	Lab Control FM passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRCP1+20Cu passed hatch rate	1

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ERC+10Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_SLC+10Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	10Cu Control passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ER2+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	GH_FR1+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRABCH+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC2+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	RG_MIDAG+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	Lab Control FM passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR2+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR4+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC2+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_DCDS+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ER2+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC3+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_SLC+10Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRRD+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC1+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC5+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	GH_FR1+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_UFR1+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	15 Cu Control passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	EV_HC1+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_MULTIPLATE passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRABCH+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	RG_MIDAG+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRCP1+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ERC+10Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LCDSSLCC passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	20 Cu Control passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	10Cu Control passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	EV_MC2+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC3+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_SLC+10Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	GH_FR1+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC5+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRABCH+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	Lab Control FM passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR4+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ER2+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	EV_MC2+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_UFR1+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	20 Cu Control passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	10Cu Control passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	RG_MIDAG+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_MULTIPLATE passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	EV_HC1+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ERC+10Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR2+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_DCDS+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRRD+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRCP1+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC1+15Cu passed hatch rate	1

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LCDSSLCC passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC2+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	15 Cu Control passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_MULTIPLATE passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRRD+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	Lab Control FM passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_UFR1+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LCDSSLCC passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ER2+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	20 Cu Control passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC1+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_SLC+10Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR4+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	15 Cu Control passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR2+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRABCH+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	10Cu Control passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_DCDS+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	RG_MIDAG+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	GH_FR1+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC3+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC5+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ERC+10Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	EV_HC1+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC2+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	EV_MC2+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRCP1+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRRD+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR2+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	10Cu Control passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC2+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR4+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	15 Cu Control passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC3+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_SLC+10Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ER2+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LCDSSLCC passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_DCDS+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ERC+10Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_UFR1+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRCP1+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	Lab Control FM passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_MULTIPLATE passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	GH_FR1+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	EV_MC2+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRABCH+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC1+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC5+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	EV_HC1+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	20 Cu Control passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	RG_MIDAG+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ERC+10Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	RG_MIDAG+15Cu passed hatch rate	1

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

SIngle Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	EV_MC2+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	20 Cu Control passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_UFR1+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ER2+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	15 Cu Control passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_MULTIPLATE passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	EV_HC1+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC2+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR2+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC5+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRABCH+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR4+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	GH_FR1+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC3+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	Lab Control FM passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_DCDS+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_SLC+10Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	10Cu Control passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRRD+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC1+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRCP1+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LCDSSLCC passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	Lab Control FM passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	15 Cu Control passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_MULTIPLATE passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	20 Cu Control passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LCDSSLCC passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	EV_MC2+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC5+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRCP1+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	RG_MIDAG+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRABCH+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC1+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ERC+10Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ER2+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_DCDS+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRRD+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	10Cu Control passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC3+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR2+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	GH_FR1+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	EV_HC1+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_SLC+10Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR4+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_UFR1+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC2+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	10Cu Control passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	Lab Control FM passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC5+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC2+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	RG_MIDAG+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	GH_FR1+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	20 Cu Control passed hatch rate	1

Fathead minnow 32-d (Pimephales promelas) survival and growth test

Nautilus Environmental Calgary

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	15 Cu Control passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	EV_HC1+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_DCDS+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRCP1+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC3+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ERC+10Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRABCH+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	EV_MC2+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR2+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_UFR1+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ER2+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_MULTIPLATE passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC1+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRRD+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR4+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_SLC+10Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LCDSSLCC passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	0.7043	CM_MC1+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	0.7043	LC_SLC+10Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	0.7043	FR_FRABCH+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	0.7043	FR_FRCP1+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	0.7043	FR_UFR1+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	0.7043	Lab Control FM passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	0.7043	GH_FR1+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	0.7043	GH_ER2+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	0.7043	LC_LC5+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	0.7043	20 Cu Control passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	0.7043	15 Cu Control passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	0.7043	FR_MULTIPLATE passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	0.7043	FR_FR2+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	0.7043	FR_FRRD+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	0.7043	RG_MIDAG+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	0.7043	LC_LCDSSLCC passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	0.7043	GH_ERC+10Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	0.7043	LC_LC3+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	0.7043	10Cu Control passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	0.7043	LC_DCDS+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	0.7043	EV_MC2+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	0.7043	EV_HC1+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	0.7043	CM_MC2+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	0.7043	FR_FR4+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	RG_MIDAG+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	GH_FR1+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR2+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC5+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ERC+10Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	20 Cu Control passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC2+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRCP1+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC3+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ER2+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LCDSSLCC passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	15 Cu Control passed hatch rate	1

Analyst: [illegible] QA: MG 2021/11/15

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC1+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_MULTIPLATE passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	EV_MC2+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	10Cu Control passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR4+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRABCH+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_UFR1+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_DCDS+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	EV_HC1+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_SLC+10Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRRD+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	Lab Control FM passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC3+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	EV_HC1+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ERC+10Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC5+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_MULTIPLATE passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	20 Cu Control passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	10Cu Control passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC1+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_UFR1+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	EV_MC2+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_DCDS+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	Lab Control FM passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR2+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	RG_MIDAG+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	15 Cu Control passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC2+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LCDSSLCC passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRCP1+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_SLC+10Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR4+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ER2+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRRD+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRABCH+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	GH_FR1+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_SLC+10Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	20 Cu Control passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	RG_MIDAG+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRABCH+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRRD+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC2+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	15 Cu Control passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRCP1+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	Lab Control FM passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC3+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ER2+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	10Cu Control passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	GH_FR1+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR2+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	EV_HC1+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC5+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR4+15Cu passed hatch rate	1

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_DCDS+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ERC+10Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	EV_MC2+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_UFR1+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_MULTIPLATE passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LCDSSLCC passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC1+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	EV_MC2+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LCDSSLCC passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	Lab Control FM passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_DCDS+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_UFR1+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	20 Cu Control passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR4+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_MULTIPLATE passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR2+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC5+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ERC+10Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	10Cu Control passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	EV_HC1+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	RG_MIDAG+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ER2+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRCP1+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC1+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRRD+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRABCH+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	15 Cu Control passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	GH_FR1+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC3+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC2+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_SLC+10Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR4+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR2+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	EV_HC1+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ER2+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC5+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC3+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_DCDS+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LCDSSLCC passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRRD+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_MULTIPLATE passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	15 Cu Control passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_UFR1+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	10Cu Control passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC1+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	20 Cu Control passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC2+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	RG_MIDAG+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_SLC+10Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	Lab Control FM passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ERC+10Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	GH_FR1+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	EV_MC2+20Cu passed hatch rate	1

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRCP1+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRABCH+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	10Cu Control passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC1+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	GH_FR1+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	15 Cu Control passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR2+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	RG_MIDAG+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ER2+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC5+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_UFR1+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ERC+10Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_MULTIPLATE passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC2+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_DCDS+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_SLC+10Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR4+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	20 Cu Control passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	EV_MC2+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LCDSSLCC passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	EV_HC1+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC3+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRRD+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRCP1+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRABCH+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	Lab Control FM passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRABCH+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC5+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	20 Cu Control passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_MULTIPLATE passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ER2+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LCDSSLCC passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRRD+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC3+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRCP1+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	GH_FR1+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_SLC+10Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR2+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ERC+10Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_UFR1+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	15 Cu Control passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	RG_MIDAG+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC1+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	Lab Control FM passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	LC_DCDS+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	EV_HC1+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	EV_MC2+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC2+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR4+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	1.0000	10Cu Control passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	0.7043	GH_FR1+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	0.7043	FR_FR4+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	0.7043	FR_FRCP1+20Cu passed hatch rate	1

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	0.7043	EV_MC2+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	0.7043	LC_LC5+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	0.7043	LC_LC3+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	0.7043	FR_FRRD+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	0.7043	EV_HC1+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	0.7043	LC_LCDSSLCC passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	0.7043	RG_MIDAG+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	0.7043	20 Cu Control passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	0.7043	LC_SLC+10Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	0.7043	Lab Control FM passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	0.7043	10Cu Control passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	0.7043	FR_FRABCH+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	0.7043	LC_DCDS+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	0.7043	FR_FR2+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	0.7043	FR_MULTIPLATE passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	0.7043	FR_UFR1+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	0.7043	CM_MC1+15Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	0.7043	GH_ERC+10Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	0.7043	CM_MC2+20Cu passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	0.7043	15 Cu Control passed hatch rate	1
08-6423-3754	Hatch Rate	Fisher Exact/Bonferroni Adj Test	0.7043	GH_ER2+15Cu passed hatch rate	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9988	CM_MC1+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9988	EV_MC2+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9988	20 Cu Control passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9988	FR_MULTIPLATE passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9988	LC_SLC+10Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9988	GH_ER2+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9988	RG_MIDAG+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9988	Lab Control FM passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9988	GH_FR1+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9988	GH_ERC+10Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9988	LC_LC3+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9988	FR_UFR1+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9988	10Cu Control passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9988	FR_FRABCH+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9988	LC_DCDS+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9988	15 Cu Control passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9988	FR_FR2+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9988	LC_LCDSSLCC passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9988	LC_LC5+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9988	EV_HC1+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9988	CM_MC2+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9988	FR_FRRD+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9988	FR_FRCP1+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9988	FR_FR4+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9982	LC_LC5+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9982	EV_MC2+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9982	LC_DCDS+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9982	FR_UFR1+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9982	EV_HC1+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9982	RG_MIDAG+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9982	GH_FR1+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9982	FR_FRRD+15Cu passed length	1

Analyst: KL QA: MS 2021/11/18

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9982	FR_MULTIPLATE passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9982	CM_MC2+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9982	GH_ERC+10Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9982	FR_FR2+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9982	LC_LC3+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9982	Lab Control FM passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9982	LC_SLC+10Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9982	CM_MC1+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9982	20 Cu Control passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9982	LC_LCDSSLCC passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9982	GH_ER2+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9982	15 Cu Control passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9982	FR_FR4+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9982	FR_FRCP1+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9982	FR_FRABCH+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9982	10Cu Control passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	1.0000	Lab Control FM passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	1.0000	FR_FR4+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	1.0000	FR_FRCP1+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	1.0000	10Cu Control passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	1.0000	GH_ERC+10Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	1.0000	FR_FRABCH+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	1.0000	GH_ER2+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	1.0000	EV_HC1+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	1.0000	LC_DCDS+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	1.0000	FR_UFR1+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	1.0000	LC_LC3+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	1.0000	FR_FRRD+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	1.0000	FR_MULTIPLATE passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	1.0000	LC_LCDSSLCC passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	1.0000	CM_MC2+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	1.0000	15 Cu Control passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	1.0000	LC_SLC+10Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	1.0000	20 Cu Control passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	1.0000	CM_MC1+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	1.0000	FR_FR2+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	1.0000	RG_MIDAG+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	1.0000	EV_MC2+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	1.0000	LC_LC5+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	1.0000	GH_FR1+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.8909	RG_MIDAG+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.8909	CM_MC1+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.8909	FR_FRABCH+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.8909	GH_ER2+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.8909	EV_MC2+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.8909	CM_MC2+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.8909	FR_FR4+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.8909	GH_ERC+10Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.8909	FR_FRRD+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.8909	FR_FRCP1+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.8909	20 Cu Control passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.8909	FR_MULTIPLATE passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.8909	GH_FR1+20Cu passed length	1

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.8909	FR_FR2+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.8909	15 Cu Control passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.8909	LC_LC5+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.8909	LC_LCDSSLCC passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.8909	10Cu Control passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.8909	EV_HC1+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.8909	FR_UFR1+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.8909	LC_LC3+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.8909	Lab Control FM passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.8909	LC_SLC+10Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.8909	LC_DCDS+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.4511	20 Cu Control passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.4511	EV_HC1+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.4511	FR_MULTIPLATE passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.4511	RG_MIDAG+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.4511	CM_MC1+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.4511	FR_FR2+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.4511	LC_LCDSSLCC passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.4511	LC_LC5+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.4511	GH_ER2+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.4511	LC_DCDS+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.4511	Lab Control FM passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.4511	FR_UFR1+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.4511	10Cu Control passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.4511	LC_LC3+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.4511	EV_MC2+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.4511	FR_FRRD+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.4511	15 Cu Control passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.4511	GH_ERC+10Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.4511	FR_FRABCH+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.4511	CM_MC2+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.4511	LC_SLC+10Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.4511	GH_FR1+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.4511	FR_FR4+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.4511	FR_FRCP1+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.2743	FR_FRRD+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.2743	CM_MC2+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.2743	FR_UFR1+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.2743	LC_LCDSSLCC passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.2743	FR_MULTIPLATE passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.2743	LC_LC5+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.2743	CM_MC1+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.2743	10Cu Control passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.2743	GH_ER2+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.2743	EV_MC2+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.2743	FR_FRABCH+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.2743	20 Cu Control passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.2743	EV_HC1+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.2743	LC_LC3+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.2743	FR_FR2+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.2743	LC_SLC+10Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.2743	15 Cu Control passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.2743	GH_ERC+10Cu passed length	1

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.2743	FR_FR4+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.2743	LC_DCDS+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.2743	GH_FR1+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.2743	Lab Control FM passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.2743	FR_FRCP1+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.2743	RG_MIDAG+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9583	GH_ER2+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9583	LC_LC5+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9583	EV_MC2+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9583	FR_FRCP1+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9583	FR_FRRD+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9583	FR_FRABCH+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9583	LC_LC3+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9583	10Cu Control passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9583	FR_FR4+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9583	FR_UFR1+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9583	LC_LCDSSLCC passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9583	GH_ERC+10Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9583	LC_DCDS+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9583	Lab Control FM passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9583	EV_HC1+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9583	15 Cu Control passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9583	CM_MC1+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9583	CM_MC2+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9583	GH_FR1+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9583	LC_SLC+10Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9583	FR_FR2+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9583	RG_MIDAG+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9583	FR_MULTIPLATE passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9583	20 Cu Control passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.8909	RG_MIDAG+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.8909	FR_FRRD+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.8909	10Cu Control passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.8909	FR_FRABCH+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.8909	FR_UFR1+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.8909	GH_ER2+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.8909	LC_LCDSSLCC passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.8909	LC_LC3+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.8909	LC_SLC+10Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.8909	CM_MC1+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.8909	FR_FR4+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.8909	EV_HC1+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.8909	15 Cu Control passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.8909	GH_FR1+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.8909	CM_MC2+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.8909	Lab Control FM passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.8909	EV_MC2+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.8909	LC_LC5+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.8909	GH_ERC+10Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.8909	FR_FR2+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.8909	20 Cu Control passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.8909	LC_DCDS+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.8909	FR_FRCP1+20Cu passed length	1

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Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.8909	FR_MULTIPLATE passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.1435	LC_DCDS+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.1435	FR_FR2+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.1435	LC_LCDSSLCC passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.1435	FR_FR4+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.1435	GH_ERC+10Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.1435	CM_MC2+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.1435	20 Cu Control passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.1435	EV_HC1+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.1435	FR_FRRD+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.1435	10Cu Control passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.1435	Lab Control FM passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.1435	FR_FRCP1+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.1435	LC_LC5+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.1435	FR_UFR1+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.1435	FR_MULTIPLATE passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.1435	15 Cu Control passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.1435	RG_MIDAG+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.1435	GH_ER2+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.1435	FR_FRABCH+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.1435	LC_SLC+10Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.1435	LC_LC3+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.1435	GH_FR1+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.1435	CM_MC1+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.1435	EV_MC2+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.2743	20 Cu Control passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.2743	LC_LCDSSLCC passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.2743	LC_LC5+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.2743	15 Cu Control passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.2743	LC_LC3+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.2743	FR_MULTIPLATE passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.2743	10Cu Control passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.2743	FR_FRRD+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.2743	GH_FR1+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.2743	FR_FRCP1+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.2743	FR_FR2+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.2743	LC_DCDS+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.2743	GH_ERC+10Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.2743	EV_MC2+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.2743	FR_FR4+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.2743	CM_MC1+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.2743	EV_HC1+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.2743	RG_MIDAG+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.2743	FR_UFR1+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.2743	FR_FRABCH+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.2743	GH_ER2+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.2743	Lab Control FM passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.2743	LC_SLC+10Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.2743	CM_MC2+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9999	EV_MC2+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9999	CM_MC1+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9999	LC_SLC+10Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9999	LC_LCDSSLCC passed length	1

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SIngle Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9999	LC_LC3+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9999	15 Cu Control passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9999	Lab Control FM passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9999	FR_FRCP1+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9999	10Cu Control passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9999	FR_FR4+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9999	LC_DCDS+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9999	GH_ERC+10Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9999	FR_FRRD+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9999	RG_MIDAG+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9999	EV_HC1+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9999	GH_ER2+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9999	GH_FR1+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9999	CM_MC2+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9999	FR_UFR1+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9999	20 Cu Control passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9999	FR_FRABCH+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9999	LC_LC5+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9999	FR_MULTIPLATE passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9999	FR_FR2+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9990	15 Cu Control passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9990	FR_FR4+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9990	RG_MIDAG+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9990	GH_ER2+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9990	FR_FRRD+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9990	FR_MULTIPLATE passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9990	LC_LC5+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9990	EV_MC2+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9990	LC_LC3+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9990	FR_FR2+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9990	CM_MC2+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9990	FR_FRCP1+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9990	Lab Control FM passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9990	GH_FR1+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9990	FR_FRABCH+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9990	EV_HC1+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9990	FR_UFR1+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9990	20 Cu Control passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9990	LC_LCDSSLCC passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9990	LC_SLC+10Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9990	10Cu Control passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9990	LC_DCDS+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9990	GH_ERC+10Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9990	CM_MC1+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.3810	20 Cu Control passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.3810	FR_MULTIPLATE passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.3810	CM_MC2+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.3810	RG_MIDAG+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.3810	FR_FR4+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.3810	CM_MC1+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.3810	FR_FRCP1+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.3810	LC_LC5+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.3810	15 Cu Control passed length	1

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SIngle Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.3810	FR_FR2+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.3810	GH_ERC+10Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.3810	GH_FR1+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.3810	LC_SLC+10Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.3810	LC_LCDSSLCC passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.3810	10Cu Control passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.3810	EV_HC1+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.3810	FR_UFR1+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.3810	EV_MC2+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.3810	LC_LC3+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.3810	FR_FRRD+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.3810	FR_FRABCH+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.3810	Lab Control FM passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.3810	GH_ER2+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.3810	LC_DCDS+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.1711	FR_FRABCH+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.1711	CM_MC2+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.1711	Lab Control FM passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.1711	GH_FR1+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.1711	FR_FR2+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.1711	LC_DCDS+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.1711	20 Cu Control passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.1711	FR_FR4+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.1711	CM_MC1+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.1711	EV_HC1+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.1711	EV_MC2+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.1711	FR_MULTIPLATE passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.1711	GH_ER2+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.1711	LC_SLC+10Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.1711	RG_MIDAG+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.1711	GH_ERC+10Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.1711	FR_FRCP1+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.1711	FR_FRRD+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.1711	FR_UFR1+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.1711	10Cu Control passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.1711	15 Cu Control passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.1711	LC_LCDSSLCC passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.1711	LC_LC3+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.1711	LC_LC5+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9922	FR_FR4+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9922	LC_LCDSSLCC passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9922	FR_FRRD+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9922	CM_MC2+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9922	Lab Control FM passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9922	FR_UFR1+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9922	LC_DCDS+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9922	GH_ER2+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9922	EV_MC2+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9922	LC_LC3+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9922	CM_MC1+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9922	EV_HC1+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9922	LC_SLC+10Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9922	GH_ERC+10Cu passed length	1

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Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9922	FR_FR2+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9922	GH_FR1+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9922	FR_FRABCH+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9922	FR_FRCP1+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9922	RG_MIDAG+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9922	FR_MULTIPLATE passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9922	LC_LC5+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9922	10Cu Control passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9922	15 Cu Control passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9922	20 Cu Control passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9974	CM_MC1+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9974	GH_ER2+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9974	FR_FR4+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9974	LC_LCDSSLCC passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9974	15 Cu Control passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9974	Lab Control FM passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9974	FR_MULTIPLATE passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9974	LC_SLC+10Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9974	CM_MC2+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9974	20 Cu Control passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9974	FR_FRCP1+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9974	FR_FR2+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9974	GH_ERC+10Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9974	GH_FR1+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9974	LC_LC3+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9974	LC_LC5+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9974	LC_DCDS+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9974	FR_UFR1+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9974	EV_HC1+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9974	RG_MIDAG+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9974	FR_FRRD+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9974	FR_FRABCH+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9974	EV_MC2+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9974	10Cu Control passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9922	LC_LCDSSLCC passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9922	10Cu Control passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9922	CM_MC1+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9922	GH_ER2+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9922	LC_SLC+10Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9922	20 Cu Control passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9922	Lab Control FM passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9922	15 Cu Control passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9922	FR_UFR1+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9922	FR_MULTIPLATE passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9922	EV_MC2+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9922	RG_MIDAG+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9922	LC_LC3+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9922	FR_FRABCH+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9922	EV_HC1+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9922	LC_LC5+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9922	FR_FRRD+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9922	CM_MC2+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9922	FR_FR4+15Cu passed length	1

Analyst: KC QA: MG 2021/11/18

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

SIngle Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9922	GH_ERC+10Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9922	GH_FR1+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9922	FR_FR2+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9922	FR_FRCP1+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9922	LC_DCDS+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9998	LC_LC3+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9998	Lab Control FM passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9998	FR_FRRD+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9998	LC_LC5+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9998	FR_MULTIPLATE passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9998	15 Cu Control passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9998	FR_FR2+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9998	20 Cu Control passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9998	10Cu Control passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9998	LC_DCDS+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9998	EV_HC1+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9998	GH_FR1+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9998	EV_MC2+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9998	RG_MIDAG+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9998	GH_ER2+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9998	FR_FR4+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9998	CM_MC2+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9998	CM_MC1+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9998	GH_ERC+10Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9998	LC_LCDSSLCC passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9998	FR_FRCP1+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9998	LC_SLC+10Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9998	FR_FRABCH+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9998	FR_UFR1+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9850	EV_HC1+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9850	FR_FRABCH+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9850	LC_SLC+10Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9850	FR_FRCP1+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9850	GH_FR1+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9850	GH_ERC+10Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9850	CM_MC2+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9850	FR_MULTIPLATE passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9850	RG_MIDAG+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9850	EV_MC2+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9850	GH_ER2+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9850	FR_FR2+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9850	FR_UFR1+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9850	LC_DCDS+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9850	Lab Control FM passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9850	CM_MC1+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9850	LC_LC5+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9850	LC_LC3+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9850	FR_FR4+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9850	20 Cu Control passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9850	15 Cu Control passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9850	FR_FRRD+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9850	10Cu Control passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.9850	LC_LCDSSLCC passed length	1

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.5234	LC_SLC+10Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.5234	FR_FRABCH+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.5234	15 Cu Control passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.5234	10Cu Control passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.5234	FR_FRCP1+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.5234	GH_FR1+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.5234	GH_ERC+10Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.5234	EV_MC2+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.5234	CM_MC2+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.5234	RG_MIDAG+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.5234	20 Cu Control passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.5234	LC_LC3+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.5234	EV_HC1+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.5234	Lab Control FM passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.5234	LC_DCDS+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.5234	FR_UFR1+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.5234	LC_LCDSSLCC passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.5234	FR_MULTIPLATE passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.5234	FR_FR4+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.5234	FR_FRRD+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.5234	CM_MC1+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.5234	FR_FR2+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.5234	GH_ER2+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.5234	LC_LC5+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.2366	FR_FR2+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.2366	GH_ER2+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.2366	FR_MULTIPLATE passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.2366	20 Cu Control passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.2366	FR_FR4+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.2366	FR_FRRD+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.2366	LC_LC3+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.2366	RG_MIDAG+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.2366	GH_ERC+10Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.2366	Lab Control FM passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.2366	CM_MC1+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.2366	LC_LCDSSLCC passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.2366	GH_FR1+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.2366	15 Cu Control passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.2366	LC_SLC+10Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.2366	EV_HC1+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.2366	10Cu Control passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.2366	LC_DCDS+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.2366	EV_MC2+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.2366	FR_FRABCH+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.2366	FR_FRCP1+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.2366	LC_LC5+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.2366	CM_MC2+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.2366	FR_UFR1+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.5953	CM_MC2+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.5953	FR_FRRD+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.5953	LC_DCDS+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.5953	FR_FR4+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.5953	FR_FR2+20Cu passed length	1

Fathead minnow 32-d (Pimephales promelas) survival and growth test

Nautilus Environmental Calgary

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.5953	RG_MIDAG+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.5953	FR_UFR1+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.5953	EV_HC1+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.5953	Lab Control FM passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.5953	15 Cu Control passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.5953	GH_ER2+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.5953	LC_SLC+10Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.5953	10Cu Control passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.5953	FR_FRABCH+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.5953	LC_LC5+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.5953	FR_FRCP1+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.5953	20 Cu Control passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.5953	GH_FR1+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.5953	LC_LC3+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.5953	GH_ERC+10Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.5953	EV_MC2+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.5953	LC_LCDSSLCC passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.5953	FR_MULTIPLATE passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.5953	CM_MC1+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.4274	15 Cu Control passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.4274	LC_LC3+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.4274	LC_LCDSSLCC passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.4274	LC_DCDS+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.4274	LC_LC5+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.4274	10Cu Control passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.4274	Lab Control FM passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.4274	20 Cu Control passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.4274	FR_FR2+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.4274	CM_MC1+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.4274	FR_FRABCH+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.4274	FR_MULTIPLATE passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.4274	FR_FRCP1+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.4274	GH_ER2+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.4274	FR_UFR1+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.4274	LC_SLC+10Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.4274	GH_ERC+10Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.4274	FR_FR4+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.4274	RG_MIDAG+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.4274	EV_MC2+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.4274	FR_FRRD+15Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.4274	EV_HC1+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.4274	GH_FR1+20Cu passed length	1
10-8030-5525	Length	Dunnett Multiple Comparison Test	0.4274	CM_MC2+20Cu passed length	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9974	GH_ER2+15Cu passed mean dry biomass	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9974	FR_UFR1+15Cu passed mean dry biomas	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9974	FR_FRRD+15Cu passed mean dry biomas	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9974	20 Cu Control passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9974	EV_HC1+20Cu passed mean dry biomass	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9974	LC_LC3+15Cu passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9974	15 Cu Control passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9974	FR_FR4+15Cu passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9974	LC_LCDSSLCC passed mean dry biomas	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9974	10Cu Control passed mean dry biomass-m	1

Analyst: KSL QA: MG 2021/11/18

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9974	LC_DCDS+20Cu passed mean dry biomas	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9974	CM_MC2+20Cu passed mean dry biomas	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9974	GH_ERC+10Cu passed mean dry biomass	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9974	GH_FR1+20Cu passed mean dry biomass	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9974	FR_FRCP1+20Cu passed mean dry bioma	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9974	RG_MIDAG+15Cu passed mean dry biom	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9974	LC_LC5+15Cu passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9974	EV_MC2+20Cu passed mean dry biomass	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9974	LC_SLC+10Cu passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9974	CM_MC1+15Cu passed mean dry biomas	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9974	Lab Control FM passed mean dry biomass	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9974	FR_MULTIPLATE passed mean dry bioma	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9974	FR_FR2+20Cu passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9974	FR_FRABCH+20Cu passed mean dry bio	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.8705	FR_FRRD+15Cu passed mean dry biomas	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.8705	FR_MULTIPLATE passed mean dry bioma	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.8705	FR_FR4+15Cu passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.8705	FR_FR2+20Cu passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.8705	LC_LCDSSLCC passed mean dry biomas	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.8705	FR_FRABCH+20Cu passed mean dry bio	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.8705	EV_MC2+20Cu passed mean dry biomass	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.8705	RG_MIDAG+15Cu passed mean dry biom	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.8705	CM_MC2+20Cu passed mean dry biomas	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.8705	LC_LC5+15Cu passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.8705	GH_FR1+20Cu passed mean dry biomass	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.8705	FR_FRCP1+20Cu passed mean dry bioma	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.8705	EV_HC1+20Cu passed mean dry biomass	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.8705	LC_DCDS+20Cu passed mean dry biomas	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.8705	GH_ERC+10Cu passed mean dry biomass	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.8705	LC_SLC+10Cu passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.8705	LC_LC3+15Cu passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.8705	CM_MC1+15Cu passed mean dry biomas	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.8705	15 Cu Control passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.8705	GH_ER2+15Cu passed mean dry biomass	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.8705	FR_UFR1+15Cu passed mean dry biomas	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.8705	Lab Control FM passed mean dry biomass	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.8705	20 Cu Control passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.8705	10Cu Control passed mean dry biomass-m	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9825	FR_MULTIPLATE passed mean dry bioma	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9825	EV_MC2+20Cu passed mean dry biomass	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9825	RG_MIDAG+15Cu passed mean dry biom	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9825	Lab Control FM passed mean dry biomass	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9825	CM_MC2+20Cu passed mean dry biomas	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9825	10Cu Control passed mean dry biomass-m	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9825	GH_ERC+10Cu passed mean dry biomass	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9825	LC_SLC+10Cu passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9825	GH_FR1+20Cu passed mean dry biomass	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9825	GH_ER2+15Cu passed mean dry biomass	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9825	FR_FRCP1+20Cu passed mean dry bioma	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9825	15 Cu Control passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9825	FR_FRABCH+20Cu passed mean dry bio	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9825	20 Cu Control passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9825	FR_UFR1+15Cu passed mean dry biomas	1

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Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9825	CM_MC1+15Cu passed mean dry biomas	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9825	LC_DCDS+20Cu passed mean dry biomas	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9825	LC_LC3+15Cu passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9825	EV_HC1+20Cu passed mean dry biomass	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9825	LC_LC5+15Cu passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9825	LC_LCDSSLCC passed mean dry biomas	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9825	FR_FR4+15Cu passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9825	FR_FRRD+15Cu passed mean dry biomas	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9825	FR_FR2+20Cu passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.7345	GH_ERC+10Cu passed mean dry biomass	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.7345	FR_FRRD+15Cu passed mean dry biomas	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.7345	FR_UFR1+15Cu passed mean dry biomas	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.7345	GH_FR1+20Cu passed mean dry biomass	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.7345	20 Cu Control passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.7345	FR_FRCP1+20Cu passed mean dry bioma	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.7345	LC_LCDSSLCC passed mean dry biomas	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.7345	GH_ER2+15Cu passed mean dry biomass	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.7345	FR_FR4+15Cu passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.7345	FR_FRABCH+20Cu passed mean dry bio	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.7345	CM_MC1+15Cu passed mean dry biomas	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.7345	LC_DCDS+20Cu passed mean dry biomas	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.7345	LC_LC3+15Cu passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.7345	RG_MIDAG+15Cu passed mean dry biom	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.7345	FR_MULTIPLATE passed mean dry bioma	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.7345	LC_LC5+15Cu passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.7345	Lab Control FM passed mean dry biomass	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.7345	EV_MC2+20Cu passed mean dry biomass	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.7345	10Cu Control passed mean dry biomass-m	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.7345	LC_SLC+10Cu passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.7345	FR_FR2+20Cu passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.7345	15 Cu Control passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.7345	CM_MC2+20Cu passed mean dry biomas	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.7345	EV_HC1+20Cu passed mean dry biomass	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9397	FR_UFR1+15Cu passed mean dry biomas	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9397	LC_LC3+15Cu passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9397	20 Cu Control passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9397	GH_ER2+15Cu passed mean dry biomass	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9397	LC_LC5+15Cu passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9397	Lab Control FM passed mean dry biomass	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9397	LC_LCDSSLCC passed mean dry biomas	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9397	15 Cu Control passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9397	CM_MC1+15Cu passed mean dry biomas	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9397	10Cu Control passed mean dry biomass-m	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9397	FR_FRRD+15Cu passed mean dry biomas	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9397	EV_MC2+20Cu passed mean dry biomass	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9397	FR_FR2+20Cu passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9397	RG_MIDAG+15Cu passed mean dry biom	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9397	CM_MC2+20Cu passed mean dry biomas	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9397	EV_HC1+20Cu passed mean dry biomass	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9397	GH_ERC+10Cu passed mean dry biomass	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9397	LC_DCDS+20Cu passed mean dry biomas	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9397	GH_FR1+20Cu passed mean dry biomass	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9397	FR_FRCP1+20Cu passed mean dry bioma	1

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9397	FR_FRABCH+20Cu passed mean dry bio	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9397	LC_SLC+10Cu passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9397	FR_FR4+15Cu passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9397	FR_MULTIPLATE passed mean dry bioma	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.2940	FR_FRRD+15Cu passed mean dry biomas	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.2940	EV_MC2+20Cu passed mean dry biomass	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.2940	FR_MULTIPLATE passed mean dry bioma	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.2940	LC_DCDS+20Cu passed mean dry biomas	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.2940	FR_FR2+20Cu passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.2940	Lab Control FM passed mean dry biomass	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.2940	CM_MC1+15Cu passed mean dry biomas	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.2940	LC_LC5+15Cu passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.2940	RG_MIDAG+15Cu passed mean dry biom	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.2940	FR_FRCP1+20Cu passed mean dry bioma	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.2940	CM_MC2+20Cu passed mean dry biomas	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.2940	LC_LC3+15Cu passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.2940	FR_FR4+15Cu passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.2940	FR_UFR1+15Cu passed mean dry biomas	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.2940	EV_HC1+20Cu passed mean dry biomass	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.2940	15 Cu Control passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.2940	GH_ERC+10Cu passed mean dry biomass	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.2940	LC_SLC+10Cu passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.2940	FR_FRABCH+20Cu passed mean dry bio	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.2940	GH_ER2+15Cu passed mean dry biomass	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.2940	20 Cu Control passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.2940	GH_FR1+20Cu passed mean dry biomass	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.2940	LC_LCDSSLCC passed mean dry biomas	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.2940	10Cu Control passed mean dry biomass-m	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9929	FR_FRRD+15Cu passed mean dry biomas	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9929	EV_MC2+20Cu passed mean dry biomass	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9929	LC_LC5+15Cu passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9929	FR_UFR1+15Cu passed mean dry biomas	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9929	RG_MIDAG+15Cu passed mean dry biom	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9929	FR_FR4+15Cu passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9929	GH_ER2+15Cu passed mean dry biomass	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9929	20 Cu Control passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9929	CM_MC1+15Cu passed mean dry biomas	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9929	FR_FR2+20Cu passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9929	LC_SLC+10Cu passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9929	GH_ERC+10Cu passed mean dry biomass	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9929	FR_FRABCH+20Cu passed mean dry bio	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9929	CM_MC2+20Cu passed mean dry biomas	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9929	LC_LC3+15Cu passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9929	GH_FR1+20Cu passed mean dry biomass	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9929	FR_FRCP1+20Cu passed mean dry bioma	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9929	LC_LCDSSLCC passed mean dry biomas	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9929	LC_DCDS+20Cu passed mean dry biomas	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9929	Lab Control FM passed mean dry biomass	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9929	FR_MULTIPLATE passed mean dry bioma	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9929	EV_HC1+20Cu passed mean dry biomass	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9929	10Cu Control passed mean dry biomass-m	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9929	15 Cu Control passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9869	RG_MIDAG+15Cu passed mean dry biom	1

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Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

SIngle Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9869	FR_FRRD+15Cu passed mean dry biomas	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9869	10Cu Control passed mean dry biomass-m	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9869	LC_SLC+10Cu passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9869	GH_ERC+10Cu passed mean dry biomass	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9869	LC_LCDSSLCC passed mean dry biomas	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9869	LC_DCDS+20Cu passed mean dry biomas	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9869	CM_MC1+15Cu passed mean dry biomas	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9869	GH_FR1+20Cu passed mean dry biomass	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9869	Lab Control FM passed mean dry biomass	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9869	FR_FR4+15Cu passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9869	FR_FRCP1+20Cu passed mean dry bioma	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9869	LC_LC3+15Cu passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9869	FR_FRABCH+20Cu passed mean dry bio	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9869	CM_MC2+20Cu passed mean dry biomas	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9869	20 Cu Control passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9869	LC_LC5+15Cu passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9869	FR_FR2+20Cu passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9869	GH_ER2+15Cu passed mean dry biomass	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9869	EV_HC1+20Cu passed mean dry biomass	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9869	FR_MULTIPLATE passed mean dry bioma	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9869	EV_MC2+20Cu passed mean dry biomass	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9869	15 Cu Control passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9869	FR_UFR1+15Cu passed mean dry biomas	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9017	EV_MC2+20Cu passed mean dry biomass	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9017	LC_DCDS+20Cu passed mean dry biomas	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9017	RG_MIDAG+15Cu passed mean dry biom	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9017	LC_LC3+15Cu passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9017	LC_LCDSSLCC passed mean dry biomas	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9017	LC_LC5+15Cu passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9017	CM_MC2+20Cu passed mean dry biomas	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9017	GH_ERC+10Cu passed mean dry biomass	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9017	EV_HC1+20Cu passed mean dry biomass	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9017	GH_FR1+20Cu passed mean dry biomass	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9017	FR_MULTIPLATE passed mean dry bioma	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9017	20 Cu Control passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9017	GH_ER2+15Cu passed mean dry biomass	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9017	15 Cu Control passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9017	FR_FRRD+15Cu passed mean dry biomas	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9017	FR_FR2+20Cu passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9017	CM_MC1+15Cu passed mean dry biomas	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9017	FR_UFR1+15Cu passed mean dry biomas	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9017	LC_SLC+10Cu passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9017	10Cu Control passed mean dry biomass-m	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9017	Lab Control FM passed mean dry biomass	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9017	FR_FRABCH+20Cu passed mean dry bio	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9017	FR_FR4+15Cu passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9017	FR_FRCP1+20Cu passed mean dry bioma	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9125	EV_HC1+20Cu passed mean dry biomass	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9125	FR_MULTIPLATE passed mean dry bioma	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9125	Lab Control FM passed mean dry biomass	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9125	LC_LC3+15Cu passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9125	15 Cu Control passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9125	EV_MC2+20Cu passed mean dry biomass	1

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9125	FR_FR2+20Cu passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9125	LC_DCDS+20Cu passed mean dry biomas	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9125	20 Cu Control passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9125	10Cu Control passed mean dry biomass-m	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9125	GH_ERC+10Cu passed mean dry biomass	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9125	FR_FR4+15Cu passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9125	GH_FR1+20Cu passed mean dry biomass	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9125	LC_LCDSSLCC passed mean dry biomas	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9125	LC_SLC+10Cu passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9125	CM_MC1+15Cu passed mean dry biomas	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9125	RG_MIDAG+15Cu passed mean dry biom	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9125	FR_FRRD+15Cu passed mean dry biomas	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9125	GH_ER2+15Cu passed mean dry biomass	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9125	CM_MC2+20Cu passed mean dry biomas	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9125	LC_LC5+15Cu passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9125	FR_FRCP1+20Cu passed mean dry bioma	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9125	FR_UFR1+15Cu passed mean dry biomas	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9125	FR_FRABCH+20Cu passed mean dry bio	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9750	FR_FR2+20Cu passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9750	FR_FRRD+15Cu passed mean dry biomas	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9750	FR_FR4+15Cu passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9750	FR_MULTIPLATE passed mean dry bioma	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9750	LC_LCDSSLCC passed mean dry biomas	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9750	LC_LC5+15Cu passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9750	GH_ERC+10Cu passed mean dry biomass	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9750	LC_SLC+10Cu passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9750	GH_ER2+15Cu passed mean dry biomass	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9750	FR_FRCP1+20Cu passed mean dry bioma	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9750	FR_UFR1+15Cu passed mean dry biomas	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9750	GH_FR1+20Cu passed mean dry biomass	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9750	20 Cu Control passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9750	CM_MC1+15Cu passed mean dry biomas	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9750	LC_LC3+15Cu passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9750	FR_FRABCH+20Cu passed mean dry bio	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9750	15 Cu Control passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9750	CM_MC2+20Cu passed mean dry biomas	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9750	RG_MIDAG+15Cu passed mean dry biom	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9750	10Cu Control passed mean dry biomass-m	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9750	EV_MC2+20Cu passed mean dry biomass	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9750	EV_HC1+20Cu passed mean dry biomass	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9750	Lab Control FM passed mean dry biomass	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9750	LC_DCDS+20Cu passed mean dry biomas	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.4871	FR_FR2+20Cu passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.4871	10Cu Control passed mean dry biomass-m	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.4871	20 Cu Control passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.4871	Lab Control FM passed mean dry biomass	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.4871	FR_FRRD+15Cu passed mean dry biomas	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.4871	FR_UFR1+15Cu passed mean dry biomas	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.4871	GH_ER2+15Cu passed mean dry biomass	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.4871	15 Cu Control passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.4871	GH_FR1+20Cu passed mean dry biomass	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.4871	EV_HC1+20Cu passed mean dry biomass	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.4871	EV_MC2+20Cu passed mean dry biomass	1

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

SIngle Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.4871	LC_LC3+15Cu passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.4871	RG_MIDAG+15Cu passed mean dry biom	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.4871	CM_MC2+20Cu passed mean dry biomas	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.4871	LC_SLC+10Cu passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.4871	LC_LC5+15Cu passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.4871	CM_MC1+15Cu passed mean dry biomas	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.4871	FR_FRCP1+20Cu passed mean dry bioma	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.4871	LC_LCDSSLCC passed mean dry biomas	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.4871	LC_DCDS+20Cu passed mean dry biomas	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.4871	FR_FRABCH+20Cu passed mean dry bio	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.4871	GH_ERC+10Cu passed mean dry biomass	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.4871	FR_FR4+15Cu passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.4871	FR_MULTIPLATE passed mean dry bioma	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.7751	Lab Control FM passed mean dry biomass	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.7751	FR_FR4+15Cu passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.7751	FR_UFR1+15Cu passed mean dry biomas	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.7751	GH_ER2+15Cu passed mean dry biomass	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.7751	FR_FRRD+15Cu passed mean dry biomas	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.7751	FR_FR2+20Cu passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.7751	CM_MC1+15Cu passed mean dry biomas	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.7751	LC_SLC+10Cu passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.7751	FR_MULTIPLATE passed mean dry bioma	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.7751	LC_LC5+15Cu passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.7751	EV_HC1+20Cu passed mean dry biomass	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.7751	LC_DCDS+20Cu passed mean dry biomas	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.7751	FR_FRCP1+20Cu passed mean dry bioma	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.7751	EV_MC2+20Cu passed mean dry biomass	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.7751	LC_LC3+15Cu passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.7751	RG_MIDAG+15Cu passed mean dry biom	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.7751	GH_FR1+20Cu passed mean dry biomass	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.7751	CM_MC2+20Cu passed mean dry biomas	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.7751	10Cu Control passed mean dry biomass-m	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.7751	GH_ERC+10Cu passed mean dry biomass	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.7751	FR_FRABCH+20Cu passed mean dry bio	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.7751	15 Cu Control passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.7751	20 Cu Control passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.7751	LC_LCDSSLCC passed mean dry biomas	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9786	LC_LC3+15Cu passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9786	FR_MULTIPLATE passed mean dry bioma	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9786	Lab Control FM passed mean dry biomass	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9786	FR_FR2+20Cu passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9786	GH_ER2+15Cu passed mean dry biomass	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9786	LC_LCDSSLCC passed mean dry biomas	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9786	EV_MC2+20Cu passed mean dry biomass	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9786	FR_FRABCH+20Cu passed mean dry bio	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9786	FR_FRCP1+20Cu passed mean dry bioma	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9786	FR_FRRD+15Cu passed mean dry biomas	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9786	LC_SLC+10Cu passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9786	LC_DCDS+20Cu passed mean dry biomas	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9786	CM_MC1+15Cu passed mean dry biomas	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9786	EV_HC1+20Cu passed mean dry biomass	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9786	CM_MC2+20Cu passed mean dry biomas	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9786	GH_ERC+10Cu passed mean dry biomass	1

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

SIngle Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9786	LC_LC5+15Cu passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9786	15 Cu Control passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9786	FR_FR4+15Cu passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9786	20 Cu Control passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9786	GH_FR1+20Cu passed mean dry biomass	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9786	RG_MIDAG+15Cu passed mean dry biom	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9786	FR_UFR1+15Cu passed mean dry biomas	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9786	10Cu Control passed mean dry biomass-m	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.2469	RG_MIDAG+15Cu passed mean dry biom	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.2469	GH_ERC+10Cu passed mean dry biomass	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.2469	CM_MC1+15Cu passed mean dry biomas	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.2469	FR_FR2+20Cu passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.2469	EV_MC2+20Cu passed mean dry biomass	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.2469	FR_FRCP1+20Cu passed mean dry bioma	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.2469	LC_SLC+10Cu passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.2469	FR_MULTIPLATE passed mean dry bioma	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.2469	LC_LCDSSLCC passed mean dry biomas	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.2469	Lab Control FM passed mean dry biomass	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.2469	10Cu Control passed mean dry biomass-m	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.2469	FR_FRABCH+20Cu passed mean dry bio	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.2469	EV_HC1+20Cu passed mean dry biomass	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.2469	CM_MC2+20Cu passed mean dry biomas	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.2469	GH_FR1+20Cu passed mean dry biomass	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.2469	15 Cu Control passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.2469	FR_FR4+15Cu passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.2469	LC_DCDS+20Cu passed mean dry biomas	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.2469	FR_UFR1+15Cu passed mean dry biomas	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.2469	GH_ER2+15Cu passed mean dry biomass	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.2469	LC_LC5+15Cu passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.2469	20 Cu Control passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.2469	FR_FRRD+15Cu passed mean dry biomas	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.2469	LC_LC3+15Cu passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.8837	LC_LCDSSLCC passed mean dry biomas	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.8837	10Cu Control passed mean dry biomass-m	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.8837	FR_FRRD+15Cu passed mean dry biomas	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.8837	EV_MC2+20Cu passed mean dry biomass	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.8837	FR_FRABCH+20Cu passed mean dry bio	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.8837	RG_MIDAG+15Cu passed mean dry biom	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.8837	LC_LC5+15Cu passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.8837	FR_UFR1+15Cu passed mean dry biomas	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.8837	EV_HC1+20Cu passed mean dry biomass	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.8837	FR_MULTIPLATE passed mean dry bioma	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.8837	GH_ER2+15Cu passed mean dry biomass	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.8837	LC_LC3+15Cu passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.8837	FR_FRCP1+20Cu passed mean dry bioma	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.8837	FR_FR4+15Cu passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.8837	GH_ERC+10Cu passed mean dry biomass	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.8837	LC_SLC+10Cu passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.8837	LC_DCDS+20Cu passed mean dry biomas	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.8837	CM_MC1+15Cu passed mean dry biomas	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.8837	20 Cu Control passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.8837	CM_MC2+20Cu passed mean dry biomas	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.8837	GH_FR1+20Cu passed mean dry biomass	1

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Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.8837	15 Cu Control passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.8837	Lab Control FM passed mean dry biomass	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.8837	FR_FR2+20Cu passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9956	Lab Control FM passed mean dry biomass	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9956	EV_MC2+20Cu passed mean dry biomass	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9956	FR_UFR1+15Cu passed mean dry biomas	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9956	FR_FRCP1+20Cu passed mean dry bioma	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9956	GH_FR1+20Cu passed mean dry biomass	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9956	LC_LC5+15Cu passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9956	CM_MC2+20Cu passed mean dry biomas	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9956	FR_FR4+15Cu passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9956	RG_MIDAG+15Cu passed mean dry biom	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9956	10Cu Control passed mean dry biomass-m	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9956	15 Cu Control passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9956	EV_HC1+20Cu passed mean dry biomass	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9956	GH_ERC+10Cu passed mean dry biomass	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9956	FR_MULTIPLATE passed mean dry bioma	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9956	LC_LC3+15Cu passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9956	20 Cu Control passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9956	FR_FR2+20Cu passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9956	LC_SLC+10Cu passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9956	FR_FRRD+15Cu passed mean dry biomas	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9956	FR_FRABCH+20Cu passed mean dry bio	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9956	CM_MC1+15Cu passed mean dry biomas	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9956	GH_ER2+15Cu passed mean dry biomass	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9956	LC_DCDS+20Cu passed mean dry biomas	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9956	LC_LCDSSLCC passed mean dry biomas	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9569	Lab Control FM passed mean dry biomass	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9569	15 Cu Control passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9569	RG_MIDAG+15Cu passed mean dry biom	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9569	LC_SLC+10Cu passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9569	FR_FRRD+15Cu passed mean dry biomas	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9569	CM_MC2+20Cu passed mean dry biomas	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9569	FR_FR2+20Cu passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9569	GH_ERC+10Cu passed mean dry biomass	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9569	LC_DCDS+20Cu passed mean dry biomas	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9569	CM_MC1+15Cu passed mean dry biomas	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9569	20 Cu Control passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9569	GH_FR1+20Cu passed mean dry biomass	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9569	FR_FR4+15Cu passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9569	EV_HC1+20Cu passed mean dry biomass	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9569	FR_UFR1+15Cu passed mean dry biomas	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9569	FR_FRCP1+20Cu passed mean dry bioma	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9569	LC_LC3+15Cu passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9569	EV_MC2+20Cu passed mean dry biomass	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9569	GH_ER2+15Cu passed mean dry biomass	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9569	FR_FRABCH+20Cu passed mean dry bio	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9569	LC_LCDSSLCC passed mean dry biomas	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9569	LC_LC5+15Cu passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9569	10Cu Control passed mean dry biomass-m	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9569	FR_MULTIPLATE passed mean dry bioma	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.6616	EV_MC2+20Cu passed mean dry biomass	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.6616	FR_MULTIPLATE passed mean dry bioma	1

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.6616	LC_LCDSSLCC passed mean dry biomas	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.6616	GH_ERC+10Cu passed mean dry biomass	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.6616	LC_LC3+15Cu passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.6616	LC_DCDS+20Cu passed mean dry biomas	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.6616	FR_FRRD+15Cu passed mean dry biomas	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.6616	FR_FR4+15Cu passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.6616	CM_MC2+20Cu passed mean dry biomas	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.6616	Lab Control FM passed mean dry biomass	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.6616	LC_LC5+15Cu passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.6616	EV_HC1+20Cu passed mean dry biomass	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.6616	RG_MIDAG+15Cu passed mean dry biom	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.6616	FR_FR2+20Cu passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.6616	20 Cu Control passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.6616	FR_FRCP1+20Cu passed mean dry bioma	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.6616	CM_MC1+15Cu passed mean dry biomas	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.6616	FR_FRABCH+20Cu passed mean dry bio	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.6616	FR_UFR1+15Cu passed mean dry biomas	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.6616	LC_SLC+10Cu passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.6616	GH_FR1+20Cu passed mean dry biomass	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.6616	10Cu Control passed mean dry biomass-m	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.6616	15 Cu Control passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.6616	GH_ER2+15Cu passed mean dry biomass	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.7292	LC_LC5+15Cu passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.7292	LC_LC3+15Cu passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.7292	CM_MC2+20Cu passed mean dry biomas	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.7292	FR_FRCP1+20Cu passed mean dry bioma	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.7292	RG_MIDAG+15Cu passed mean dry biom	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.7292	FR_UFR1+15Cu passed mean dry biomas	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.7292	EV_MC2+20Cu passed mean dry biomass	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.7292	FR_FRRD+15Cu passed mean dry biomas	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.7292	FR_FR2+20Cu passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.7292	CM_MC1+15Cu passed mean dry biomas	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.7292	LC_DCDS+20Cu passed mean dry biomas	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.7292	GH_ER2+15Cu passed mean dry biomass	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.7292	GH_FR1+20Cu passed mean dry biomass	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.7292	Lab Control FM passed mean dry biomass	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.7292	LC_SLC+10Cu passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.7292	GH_ERC+10Cu passed mean dry biomass	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.7292	15 Cu Control passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.7292	20 Cu Control passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.7292	10Cu Control passed mean dry biomass-m	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.7292	FR_MULTIPLATE passed mean dry bioma	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.7292	FR_FR4+15Cu passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.7292	LC_LCDSSLCC passed mean dry biomas	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.7292	EV_HC1+20Cu passed mean dry biomass	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.7292	FR_FRABCH+20Cu passed mean dry bio	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9993	FR_MULTIPLATE passed mean dry bioma	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9993	CM_MC1+15Cu passed mean dry biomas	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9993	LC_LC5+15Cu passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9993	EV_MC2+20Cu passed mean dry biomass	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9993	FR_FR2+20Cu passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9993	10Cu Control passed mean dry biomass-m	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9993	LC_SLC+10Cu passed mean dry biomass-	1

Fathead minnow 32-d (Pimephales promelas) survival and growth test

Nautilus Environmental Calgary

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9993	FR_FRABCH+20Cu passed mean dry bio	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9993	GH_ER2+15Cu passed mean dry biomass	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9993	LC_LC3+15Cu passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9993	20 Cu Control passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9993	FR_FRCP1+20Cu passed mean dry bioma	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9993	FR_UFR1+15Cu passed mean dry biomas	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9993	CM_MC2+20Cu passed mean dry biomas	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9993	RG_MIDAG+15Cu passed mean dry biom	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9993	FR_FR4+15Cu passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9993	LC_LCDSSLCC passed mean dry biomas	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9993	FR_FRRD+15Cu passed mean dry biomas	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9993	EV_HC1+20Cu passed mean dry biomass	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9993	15 Cu Control passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9993	Lab Control FM passed mean dry biomass	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9993	GH_ERC+10Cu passed mean dry biomass	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9993	LC_DCDS+20Cu passed mean dry biomas	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9993	GH_FR1+20Cu passed mean dry biomass	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9991	LC_LCDSSLCC passed mean dry biomas	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9991	15 Cu Control passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9991	10Cu Control passed mean dry biomass-m	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9991	LC_SLC+10Cu passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9991	LC_LC3+15Cu passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9991	20 Cu Control passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9991	FR_FRRD+15Cu passed mean dry biomas	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9991	FR_FR4+15Cu passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9991	FR_UFR1+15Cu passed mean dry biomas	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9991	FR_FR2+20Cu passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9991	GH_ER2+15Cu passed mean dry biomass	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9991	CM_MC1+15Cu passed mean dry biomas	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9991	FR_MULTIPLATE passed mean dry bioma	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9991	LC_DCDS+20Cu passed mean dry biomas	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9991	EV_HC1+20Cu passed mean dry biomass	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9991	LC_LC5+15Cu passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9991	GH_FR1+20Cu passed mean dry biomass	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9991	GH_ERC+10Cu passed mean dry biomass	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9991	FR_FRABCH+20Cu passed mean dry bio	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9991	FR_FRCP1+20Cu passed mean dry bioma	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9991	CM_MC2+20Cu passed mean dry biomas	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9991	Lab Control FM passed mean dry biomass	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9991	EV_MC2+20Cu passed mean dry biomass	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.9991	RG_MIDAG+15Cu passed mean dry biom	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.4427	CM_MC1+15Cu passed mean dry biomas	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.4427	FR_FRCP1+20Cu passed mean dry bioma	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.4427	LC_DCDS+20Cu passed mean dry biomas	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.4427	FR_FRRD+15Cu passed mean dry biomas	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.4427	Lab Control FM passed mean dry biomass	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.4427	FR_MULTIPLATE passed mean dry bioma	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.4427	RG_MIDAG+15Cu passed mean dry biom	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.4427	FR_FR4+15Cu passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.4427	GH_ER2+15Cu passed mean dry biomass	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.4427	CM_MC2+20Cu passed mean dry biomas	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.4427	20 Cu Control passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.4427	LC_LC3+15Cu passed mean dry biomass-	1

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.4427	LC_LCDSSLCC passed mean dry biomas	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.4427	LC_LC5+15Cu passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.4427	GH_ERC+10Cu passed mean dry biomass	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.4427	FR_UFR1+15Cu passed mean dry biomas	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.4427	EV_MC2+20Cu passed mean dry biomass	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.4427	GH_FR1+20Cu passed mean dry biomass	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.4427	15 Cu Control passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.4427	FR_FRABCH+20Cu passed mean dry bio	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.4427	LC_SLC+10Cu passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.4427	10Cu Control passed mean dry biomass-m	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.4427	FR_FR2+20Cu passed mean dry biomass-	1
20-6526-8836	Mean Dry Biomass-mg	Nemenyi-Damico-Wolfe Test	0.4427	EV_HC1+20Cu passed mean dry biomass	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	GH_FR1+20Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	Lab Control FM passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ER2+15Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR2+20Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRRD+15Cu passed post hatch surviv	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	LC_DCDS+20Cu passed post hatch surviv	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC2+20Cu passed post hatch surviva	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRCP1+20Cu passed post hatch survi	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LCDSSLCC passed post hatch surviva	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC3+15Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC1+15Cu passed post hatch surviva	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRABCH+20Cu passed post hatch sur	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	LC_SLC+10Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	EV_HC1+20Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	RG_MIDAG+15Cu passed post hatch survi	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_UFR1+15Cu passed post hatch surviv	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ERC+10Cu passed post hatch surviva	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	20 Cu Control passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR4+15Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	10Cu Control passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	EV_MC2+20Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC5+15Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	15 Cu Control passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_MULTIPLATE passed post hatch survi	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	GH_FR1+20Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	10Cu Control passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	15 Cu Control passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	RG_MIDAG+15Cu passed post hatch survi	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	20 Cu Control passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ERC+10Cu passed post hatch surviva	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR4+15Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	LC_SLC+10Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LCDSSLCC passed post hatch surviva	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC3+15Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC1+15Cu passed post hatch surviva	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	LC_DCDS+20Cu passed post hatch surviv	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC2+20Cu passed post hatch surviva	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRRD+15Cu passed post hatch surviv	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	EV_HC1+20Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRABCH+20Cu passed post hatch sur	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC5+15Cu passed post hatch survival	1

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR2+20Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ER2+15Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	Lab Control FM passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	EV_MC2+20Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_UFR1+15Cu passed post hatch surviv	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRCP1+20Cu passed post hatch survi	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_MULTIPLATE passed post hatch survi	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	Lab Control FM passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR4+15Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ERC+10Cu passed post hatch surviva	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	LC_SLC+10Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	20 Cu Control passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	LC_DCDS+20Cu passed post hatch surviv	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	15 Cu Control passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	EV_HC1+20Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	10Cu Control passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	EV_MC2+20Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC3+15Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRCP1+20Cu passed post hatch survi	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRABCH+20Cu passed post hatch sur	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	GH_FR1+20Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_UFR1+15Cu passed post hatch surviv	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC1+15Cu passed post hatch surviva	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LCDSSLCC passed post hatch surviva	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRRD+15Cu passed post hatch surviv	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR2+20Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC2+20Cu passed post hatch surviva	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC5+15Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ER2+15Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	RG_MIDAG+15Cu passed post hatch survi	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_MULTIPLATE passed post hatch survi	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.0118	15 Cu Control failed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.0118	FR_FRCP1+20Cu failed post hatch surviv	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.0118	10Cu Control failed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.0118	20 Cu Control failed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.0118	GH_ER2+15Cu failed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.0118	GH_FR1+20Cu failed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.0118	FR_UFR1+15Cu failed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.0118	FR_FRABCH+20Cu failed post hatch survi	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.0118	GH_ERC+10Cu failed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.0118	FR_FR4+15Cu failed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.0118	LC_LC3+15Cu failed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.0118	CM_MC1+15Cu failed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.0118	EV_MC2+20Cu failed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.0118	LC_LCDSSLCC failed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.0118	FR_FR2+20Cu failed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.0118	FR_FRRD+15Cu failed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.0118	CM_MC2+20Cu failed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.0118	EV_HC1+20Cu failed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.0118	Lab Control FM failed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.0118	LC_SLC+10Cu failed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.0118	LC_LC5+15Cu failed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.0118	RG_MIDAG+15Cu failed post hatch surviv	1

Analyst: VC QA: nlb 2021/11/18

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.0118	LC_DCDS+20Cu failed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.0118	FR_MULTIPLATE failed post hatch surviva	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC1+15Cu passed post hatch surviva	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRABCH+20Cu passed post hatch sur	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LCDSSLCC passed post hatch surviva	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ERC+10Cu passed post hatch surviva	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC2+20Cu passed post hatch surviva	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	LC_SLC+10Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	LC_DCDS+20Cu passed post hatch surviv	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRRD+15Cu passed post hatch surviv	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	10Cu Control passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_UFR1+15Cu passed post hatch surviv	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	GH_FR1+20Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ER2+15Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	15 Cu Control passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC5+15Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRCP1+20Cu passed post hatch survi	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	Lab Control FM passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	RG_MIDAG+15Cu passed post hatch survi	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR4+15Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR2+20Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC3+15Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	EV_MC2+20Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	EV_HC1+20Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	20 Cu Control passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_MULTIPLATE passed post hatch survi	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.1397	CM_MC2+20Cu passed post hatch surviva	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.1397	GH_ER2+15Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.1397	FR_UFR1+15Cu passed post hatch surviv	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.1397	GH_ERC+10Cu passed post hatch surviva	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.1397	FR_FR4+15Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.1397	GH_FR1+20Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.1397	CM_MC1+15Cu passed post hatch surviva	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.1397	LC_LC5+15Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.1397	LC_LC3+15Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.1397	FR_FRABCH+20Cu passed post hatch sur	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.1397	10Cu Control passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.1397	EV_MC2+20Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.1397	FR_FR2+20Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.1397	FR_FRRD+15Cu passed post hatch surviv	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.1397	20 Cu Control passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.1397	Lab Control FM passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.1397	RG_MIDAG+15Cu passed post hatch survi	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.1397	LC_LCDSSLCC passed post hatch surviva	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.1397	LC_DCDS+20Cu passed post hatch surviv	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.1397	EV_HC1+20Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.1397	FR_FRCP1+20Cu passed post hatch survi	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.1397	LC_SLC+10Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.1397	15 Cu Control passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.1397	FR_MULTIPLATE passed post hatch survi	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_UFR1+15Cu passed post hatch surviv	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC3+15Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	RG_MIDAG+15Cu passed post hatch survi	1

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR2+20Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	15 Cu Control passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRCP1+20Cu passed post hatch survi	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	Lab Control FM passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	EV_HC1+20Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR4+15Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	20 Cu Control passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	LC_DCDS+20Cu passed post hatch surviv	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRABCH+20Cu passed post hatch sur	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	GH_FR1+20Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC5+15Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	LC_SLC+10Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRRD+15Cu passed post hatch surviv	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	EV_MC2+20Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC2+20Cu passed post hatch surviva	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LCDSSLCC passed post hatch surviva	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	10Cu Control passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC1+15Cu passed post hatch surviva	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ERC+10Cu passed post hatch surviva	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ER2+15Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_MULTIPLATE passed post hatch survi	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	RG_MIDAG+15Cu passed post hatch survi	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	20 Cu Control passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	LC_DCDS+20Cu passed post hatch surviv	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR4+15Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	GH_FR1+20Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRCP1+20Cu passed post hatch survi	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ERC+10Cu passed post hatch surviva	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_UFR1+15Cu passed post hatch surviv	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	LC_SLC+10Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	15 Cu Control passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRABCH+20Cu passed post hatch sur	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	Lab Control FM passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC1+15Cu passed post hatch surviva	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC5+15Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ER2+15Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR2+20Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRRD+15Cu passed post hatch surviv	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LCDSSLCC passed post hatch surviva	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	EV_MC2+20Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	EV_HC1+20Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	10Cu Control passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC3+15Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC2+20Cu passed post hatch surviva	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_MULTIPLATE passed post hatch survi	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	EV_MC2+20Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR4+15Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	20 Cu Control passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRABCH+20Cu passed post hatch sur	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	LC_SLC+10Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_UFR1+15Cu passed post hatch surviv	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	Lab Control FM passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	15 Cu Control passed post hatch survival	1

Analyst: [signature] QA: 2021/11/18

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC1+15Cu passed post hatch surviva	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR2+20Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	GH_FR1+20Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	RG_MIDAG+15Cu passed post hatch survi	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRRD+15Cu passed post hatch surviv	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	10Cu Control passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ER2+15Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ERC+10Cu passed post hatch surviva	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	EV_HC1+20Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	LC_DCDS+20Cu passed post hatch surviv	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC2+20Cu passed post hatch surviva	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC3+15Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRCP1+20Cu passed post hatch survi	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LCDSSLCC passed post hatch surviva	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC5+15Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_MULTIPLATE passed post hatch survi	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR4+15Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRRD+15Cu passed post hatch surviv	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LCDSSLCC passed post hatch surviva	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	GH_FR1+20Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	LC_SLC+10Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRABCH+20Cu passed post hatch sur	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	10Cu Control passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR2+20Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	20 Cu Control passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	LC_DCDS+20Cu passed post hatch surviv	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC1+15Cu passed post hatch surviva	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	15 Cu Control passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRCP1+20Cu passed post hatch survi	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_UFR1+15Cu passed post hatch surviv	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC2+20Cu passed post hatch surviva	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	EV_MC2+20Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC5+15Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	Lab Control FM passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	EV_HC1+20Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC3+15Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ERC+10Cu passed post hatch surviva	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ER2+15Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	RG_MIDAG+15Cu passed post hatch survi	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_MULTIPLATE passed post hatch survi	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.2704	CM_MC2+20Cu passed post hatch surviva	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.2704	EV_MC2+20Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.2704	FR_FR2+20Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.2704	FR_UFR1+15Cu passed post hatch surviv	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.2704	FR_FRRD+15Cu passed post hatch surviv	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.2704	GH_ERC+10Cu passed post hatch surviva	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.2704	LC_LC3+15Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.2704	CM_MC1+15Cu passed post hatch surviva	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.2704	GH_FR1+20Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.2704	20 Cu Control passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.2704	FR_FRCP1+20Cu passed post hatch survi	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.2704	FR_FR4+15Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.2704	LC_LC5+15Cu passed post hatch survival	1

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.2704	15 Cu Control passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.2704	Lab Control FM passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.2704	10Cu Control passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.2704	LC_DCDS+20Cu passed post hatch surviv	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.2704	LC_LCDSSLCC passed post hatch surviva	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.2704	EV_HC1+20Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.2704	RG_MIDAG+15Cu passed post hatch survi	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.2704	LC_SLC+10Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.2704	GH_ER2+15Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.2704	FR_FRABCH+20Cu passed post hatch sur	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.2704	FR_MULTIPLATE passed post hatch survi	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.5785	Lab Control FM passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.5785	LC_LC5+15Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.5785	LC_LCDSSLCC passed post hatch surviva	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.5785	EV_HC1+20Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.5785	GH_ER2+15Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.5785	CM_MC2+20Cu passed post hatch surviva	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.5785	RG_MIDAG+15Cu passed post hatch survi	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.5785	FR_FR2+20Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.5785	FR_FR4+15Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.5785	LC_LC3+15Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.5785	EV_MC2+20Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.5785	FR_UFR1+15Cu passed post hatch surviv	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.5785	CM_MC1+15Cu passed post hatch surviva	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.5785	GH_ERC+10Cu passed post hatch surviva	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.5785	15 Cu Control passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.5785	GH_FR1+20Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.5785	LC_SLC+10Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.5785	FR_FRABCH+20Cu passed post hatch sur	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.5785	FR_FRCP1+20Cu passed post hatch survi	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.5785	20 Cu Control passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.5785	LC_DCDS+20Cu passed post hatch surviv	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.5785	10Cu Control passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.5785	FR_FRRD+15Cu passed post hatch surviv	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.5785	FR_MULTIPLATE passed post hatch survi	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ER2+15Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	RG_MIDAG+15Cu passed post hatch survi	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRABCH+20Cu passed post hatch sur	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC3+15Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	EV_HC1+20Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	LC_DCDS+20Cu passed post hatch surviv	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR4+15Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	EV_MC2+20Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	10Cu Control passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC1+15Cu passed post hatch surviva	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	15 Cu Control passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LCDSSLCC passed post hatch surviva	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_UFR1+15Cu passed post hatch surviv	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ERC+10Cu passed post hatch surviva	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRRD+15Cu passed post hatch surviv	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	GH_FR1+20Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	20 Cu Control passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC2+20Cu passed post hatch surviva	1

Fathead minnow 32-d (Pimephales promelas) survival and growth test **Nautilus Environmental Calgary**

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRCP1+20Cu passed post hatch survi	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	LC_SLC+10Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	Lab Control FM passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC5+15Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR2+20Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_MULTIPLATE passed post hatch survi	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRRD+15Cu passed post hatch surviv	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRCP1+20Cu passed post hatch survi	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	EV_MC2+20Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ERC+10Cu passed post hatch surviva	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	RG_MIDAG+15Cu passed post hatch survi	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	15 Cu Control passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	LC_SLC+10Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC5+15Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRABCH+20Cu passed post hatch sur	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	20 Cu Control passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ER2+15Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	LC_DCDS+20Cu passed post hatch surviv	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR4+15Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	10Cu Control passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC3+15Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	Lab Control FM passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_UFR1+15Cu passed post hatch surviv	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC1+15Cu passed post hatch surviva	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	GH_FR1+20Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC2+20Cu passed post hatch surviva	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	EV_HC1+20Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LCDSSLCC passed post hatch surviva	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR2+20Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_MULTIPLATE passed post hatch survi	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.0417	EV_MC2+20Cu failed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.0417	GH_ER2+15Cu failed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.0417	FR_FRRD+15Cu failed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.0417	FR_UFR1+15Cu failed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.0417	GH_FR1+20Cu failed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.0417	10Cu Control failed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.0417	Lab Control FM failed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.0417	FR_FRCP1+20Cu failed post hatch surviv	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.0417	LC_LC3+15Cu failed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.0417	LC_LC5+15Cu failed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.0417	RG_MIDAG+15Cu failed post hatch surviv	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.0417	CM_MC2+20Cu failed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.0417	15 Cu Control failed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.0417	LC_LCDSSLCC failed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.0417	CM_MC1+15Cu failed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.0417	FR_FR4+15Cu failed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.0417	FR_FRABCH+20Cu failed post hatch survi	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.0417	EV_HC1+20Cu failed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.0417	20 Cu Control failed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.0417	GH_ERC+10Cu failed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.0417	LC_SLC+10Cu failed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.0417	LC_DCDS+20Cu failed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.0417	FR_MULTIPLATE failed post hatch surviva	1

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.0417	FR_FR2+20Cu failed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.4144	LC_DCDS+20Cu passed post hatch surviv	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.4144	10Cu Control passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.4144	EV_HC1+20Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.4144	GH_ERC+10Cu passed post hatch surviva	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.4144	FR_FRRD+15Cu passed post hatch surviv	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.4144	FR_UFR1+15Cu passed post hatch surviv	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.4144	FR_FRCP1+20Cu passed post hatch survi	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.4144	15 Cu Control passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.4144	CM_MC1+15Cu passed post hatch surviva	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.4144	CM_MC2+20Cu passed post hatch surviva	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.4144	LC_LC3+15Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.4144	LC_LC5+15Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.4144	RG_MIDAG+15Cu passed post hatch survi	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.4144	Lab Control FM passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.4144	GH_FR1+20Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.4144	FR_FR4+15Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.4144	GH_ER2+15Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.4144	FR_FRABCH+20Cu passed post hatch sur	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.4144	EV_MC2+20Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.4144	LC_SLC+10Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.4144	20 Cu Control passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.4144	LC_LCDSSLCC passed post hatch surviva	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.4144	FR_MULTIPLATE passed post hatch survi	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.4144	FR_FR2+20Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.6545	LC_SLC+10Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.6545	FR_FRRD+15Cu passed post hatch surviv	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.6545	FR_FRABCH+20Cu passed post hatch sur	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.6545	CM_MC1+15Cu passed post hatch surviva	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.6545	LC_LC5+15Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.6545	GH_FR1+20Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.6545	RG_MIDAG+15Cu passed post hatch survi	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.6545	EV_MC2+20Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.6545	LC_LC3+15Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.6545	EV_HC1+20Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.6545	LC_DCDS+20Cu passed post hatch surviv	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.6545	Lab Control FM passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.6545	FR_UFR1+15Cu passed post hatch surviv	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.6545	20 Cu Control passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.6545	LC_LCDSSLCC passed post hatch surviva	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.6545	FR_FR4+15Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.6545	GH_ERC+10Cu passed post hatch surviva	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.6545	15 Cu Control passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.6545	FR_FRCP1+20Cu passed post hatch survi	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.6545	10Cu Control passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.6545	GH_ER2+15Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.6545	CM_MC2+20Cu passed post hatch surviva	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.6545	FR_MULTIPLATE passed post hatch survi	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.6545	FR_FR2+20Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.5785	15 Cu Control passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.5785	LC_LC5+15Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.5785	CM_MC1+15Cu passed post hatch surviva	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.5785	20 Cu Control passed post hatch survival	1

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.5785	LC_LCDSSLCC passed post hatch surviva	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.5785	Lab Control FM passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.5785	FR_FR4+15Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.5785	LC_DCDS+20Cu passed post hatch surviv	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.5785	FR_FRABCH+20Cu passed post hatch sur	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.5785	10Cu Control passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.5785	GH_ER2+15Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.5785	GH_ERC+10Cu passed post hatch surviva	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.5785	CM_MC2+20Cu passed post hatch surviva	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.5785	GH_FR1+20Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.5785	LC_LC3+15Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.5785	FR_FRCP1+20Cu passed post hatch survi	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.5785	FR_UFR1+15Cu passed post hatch surviv	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.5785	FR_FRRD+15Cu passed post hatch surviv	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.5785	EV_HC1+20Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.5785	RG_MIDAG+15Cu passed post hatch survi	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.5785	LC_SLC+10Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.5785	EV_MC2+20Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.5785	FR_FR2+20Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.5785	FR_MULTIPLATE passed post hatch survi	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.0188	LC_LC5+15Cu failed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.0188	CM_MC2+20Cu failed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.0188	GH_ER2+15Cu failed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.0188	FR_FR4+15Cu failed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.0188	LC_LCDSSLCC failed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.0188	LC_LC3+15Cu failed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.0188	Lab Control FM failed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.0188	GH_FR1+20Cu failed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.0188	FR_UFR1+15Cu failed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.0188	CM_MC1+15Cu failed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.0188	LC_DCDS+20Cu failed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.0188	10Cu Control failed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.0188	FR_FRABCH+20Cu failed post hatch survi	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.0188	LC_SLC+10Cu failed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.0188	EV_HC1+20Cu failed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.0188	20 Cu Control failed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.0188	EV_MC2+20Cu failed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.0188	15 Cu Control failed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.0188	RG_MIDAG+15Cu failed post hatch surviv	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.0188	FR_FRRD+15Cu failed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.0188	FR_FRCP1+20Cu failed post hatch surviv	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.0188	GH_ERC+10Cu failed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.0188	FR_MULTIPLATE failed post hatch surviva	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	0.0188	FR_FR2+20Cu failed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	RG_MIDAG+15Cu passed post hatch survi	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	GH_FR1+20Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	LC_SLC+10Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	LC_DCDS+20Cu passed post hatch surviv	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC1+15Cu passed post hatch surviva	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_UFR1+15Cu passed post hatch surviv	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	Lab Control FM passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	15 Cu Control passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC3+15Cu passed post hatch survival	1

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LCDSSLCC passed post hatch surviva	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRRD+15Cu passed post hatch surviv	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	EV_HC1+20Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ERC+10Cu passed post hatch surviva	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	10Cu Control passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	EV_MC2+20Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRCP1+20Cu passed post hatch survi	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRABCH+20Cu passed post hatch sur	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR4+15Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC5+15Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	20 Cu Control passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC2+20Cu passed post hatch surviva	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ER2+15Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR2+20Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_MULTIPLATE passed post hatch survi	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRRD+15Cu passed post hatch surviv	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC5+15Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LCDSSLCC passed post hatch surviva	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	10Cu Control passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRABCH+20Cu passed post hatch sur	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	Lab Control FM passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR4+15Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ERC+10Cu passed post hatch surviva	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	EV_HC1+20Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	LC_DCDS+20Cu passed post hatch surviv	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_UFR1+15Cu passed post hatch surviv	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	GH_FR1+20Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	20 Cu Control passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	EV_MC2+20Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	RG_MIDAG+15Cu passed post hatch survi	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC3+15Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	LC_SLC+10Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRCP1+20Cu passed post hatch survi	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ER2+15Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	15 Cu Control passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC1+15Cu passed post hatch surviva	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC2+20Cu passed post hatch surviva	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR2+20Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_MULTIPLATE passed post hatch survi	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC5+15Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	EV_HC1+20Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR4+15Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ER2+15Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ERC+10Cu passed post hatch surviva	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC1+15Cu passed post hatch surviva	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_UFR1+15Cu passed post hatch surviv	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	LC_DCDS+20Cu passed post hatch surviv	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	LC_SLC+10Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	RG_MIDAG+15Cu passed post hatch survi	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	EV_MC2+20Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	20 Cu Control passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRRD+15Cu passed post hatch surviv	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	GH_FR1+20Cu passed post hatch survival	1

Analyst: VSe QA: mb 2021/11/15

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LCDSSLCC passed post hatch surviva	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRCP1+20Cu passed post hatch survi	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	10Cu Control passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	15 Cu Control passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC3+15Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	Lab Control FM passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRABCH+20Cu passed post hatch sur	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC2+20Cu passed post hatch surviva	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR2+20Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_MULTIPLATE passed post hatch survi	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC1+15Cu passed post hatch surviva	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRABCH+20Cu passed post hatch sur	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	EV_MC2+20Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC2+20Cu passed post hatch surviva	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	LC_DCDS+20Cu passed post hatch surviv	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	EV_HC1+20Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	LC_SLC+10Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	15 Cu Control passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR4+15Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	10Cu Control passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ER2+15Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRCP1+20Cu passed post hatch survi	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRRD+15Cu passed post hatch surviv	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	RG_MIDAG+15Cu passed post hatch survi	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	Lab Control FM passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LCDSSLCC passed post hatch surviva	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	20 Cu Control passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ERC+10Cu passed post hatch surviva	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC3+15Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_UFR1+15Cu passed post hatch surviv	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	GH_FR1+20Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC5+15Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR2+20Cu passed post hatch survival	1
20-4130-8406	Post Hatch Survival	Fisher Exact/Bonferroni Adj Test	1.0000	FR_MULTIPLATE passed post hatch survi	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LCDSSLCC passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	Lab Control FM passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ERC+10Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	10Cu Control passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR4+15Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	15 Cu Control passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRCP1+20Cu passed proportion norm	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC5+15Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	RG_MIDAG+15Cu passed proportion norm	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC3+15Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_DCDS+20Cu passed proportion norma	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	EV_MC2+20Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRRD+15Cu passed proportion norma	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRABCH+20Cu passed proportion nor	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_MULTIPLATE passed proportion norm	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC1+15Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_SLC+10Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	GH_FR1+20Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ER2+15Cu passed proportion normal	1

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

SIngle Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR2+20Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC2+20Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_UFR1+15Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	EV_HC1+20Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	20 Cu Control passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRCP1+20Cu passed proportion norm	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRABCH+20Cu passed proportion nor	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC5+15Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_SLC+10Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC1+15Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	15 Cu Control passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LCDSSLCC passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ER2+15Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_UFR1+15Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	20 Cu Control passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	10Cu Control passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_MULTIPLATE passed proportion norm	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRRD+15Cu passed proportion norma	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ERC+10Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR2+20Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC3+15Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC2+20Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	RG_MIDAG+15Cu passed proportion norm	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_DCDS+20Cu passed proportion norma	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	EV_MC2+20Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	Lab Control FM passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	EV_HC1+20Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	GH_FR1+20Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR4+15Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_UFR1+15Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_DCDS+20Cu passed proportion norma	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	EV_HC1+20Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC2+20Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	GH_FR1+20Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ER2+15Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_SLC+10Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC3+15Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC1+15Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRCP1+20Cu passed proportion norm	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRABCH+20Cu passed proportion nor	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	EV_MC2+20Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_MULTIPLATE passed proportion norm	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC5+15Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	RG_MIDAG+15Cu passed proportion norm	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR2+20Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	15 Cu Control passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	Lab Control FM passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	10Cu Control passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR4+15Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LCDSSLCC passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ERC+10Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRRD+15Cu passed proportion norma	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	20 Cu Control passed proportion normal	1

Analyst: KL QA: IM 2021/11/18

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	GH_FR1+20Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC2+20Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_UFR1+15Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LCDSSLCC passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR4+15Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_MULTIPLATE passed proportion norm	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC5+15Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC1+15Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	RG_MIDAG+15Cu passed proportion norm	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_SLC+10Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRABCH+20Cu passed proportion nor	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	EV_MC2+20Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRCP1+20Cu passed proportion norm	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRRD+15Cu passed proportion norma	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	EV_HC1+20Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	10Cu Control passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	Lab Control FM passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	15 Cu Control passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	20 Cu Control passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ERC+10Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_DCDS+20Cu passed proportion norma	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR2+20Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC3+15Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ER2+15Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	GH_FR1+20Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRABCH+20Cu passed proportion nor	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRRD+15Cu passed proportion norma	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	EV_HC1+20Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ERC+10Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRCP1+20Cu passed proportion norm	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_DCDS+20Cu passed proportion norma	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	Lab Control FM passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_UFR1+15Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	EV_MC2+20Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_SLC+10Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC2+20Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_MULTIPLATE passed proportion norm	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	10Cu Control passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC5+15Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ER2+15Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LCDSSLCC passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR4+15Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR2+20Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC3+15Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	20 Cu Control passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC1+15Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	15 Cu Control passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	RG_MIDAG+15Cu passed proportion norm	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRCP1+20Cu passed proportion norm	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	EV_HC1+20Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC2+20Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	RG_MIDAG+15Cu passed proportion norm	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	20 Cu Control passed proportion normal	1

MG

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	Lab Control FM passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	10Cu Control passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	GH_FR1+20Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	EV_MC2+20Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRABCH+20Cu passed proportion nor	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_SLC+10Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	15 Cu Control passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC1+15Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ER2+15Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_UFR1+15Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ERC+10Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_DCDS+20Cu passed proportion norma	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC3+15Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_MULTIPLATE passed proportion norm	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC5+15Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR4+15Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR2+20Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRRD+15Cu passed proportion norma	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LCDSSLCC passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ER2+15Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_SLC+10Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRRD+15Cu passed proportion norma	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR2+20Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_UFR1+15Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_MULTIPLATE passed proportion norm	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	20 Cu Control passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC1+15Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRABCH+20Cu passed proportion nor	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	RG_MIDAG+15Cu passed proportion norm	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRCP1+20Cu passed proportion norm	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	GH_FR1+20Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LCDSSLCC passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC2+20Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ERC+10Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC5+15Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC3+15Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	EV_MC2+20Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_DCDS+20Cu passed proportion norma	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	EV_HC1+20Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR4+15Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	10Cu Control passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	Lab Control FM passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	15 Cu Control passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ER2+15Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRRD+15Cu passed proportion norma	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC2+20Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR4+15Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	10Cu Control passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	EV_MC2+20Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC1+15Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_UFR1+15Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	EV_HC1+20Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC5+15Cu passed proportion normal	1

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRABCH+20Cu passed proportion nor	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_DCDS+20Cu passed proportion norma	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC3+15Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LCDSSLCC passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	GH_FR1+20Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRCP1+20Cu passed proportion norm	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_MULTIPLATE passed proportion norm	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	Lab Control FM passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	15 Cu Control passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_SLC+10Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR2+20Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	20 Cu Control passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ERC+10Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	RG_MIDAG+15Cu passed proportion norm	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ERC+10Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRABCH+20Cu passed proportion nor	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	15 Cu Control passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRCP1+20Cu passed proportion norm	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC2+20Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	EV_MC2+20Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	EV_HC1+20Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	10Cu Control passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_SLC+10Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_DCDS+20Cu passed proportion norma	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	RG_MIDAG+15Cu passed proportion norm	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC1+15Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	GH_FR1+20Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ER2+15Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC5+15Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LCDSSLCC passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRRD+15Cu passed proportion norma	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	20 Cu Control passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_UFR1+15Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR4+15Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	Lab Control FM passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_MULTIPLATE passed proportion norm	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC3+15Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR2+20Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	10Cu Control passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	15 Cu Control passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC1+15Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC2+20Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	Lab Control FM passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_DCDS+20Cu passed proportion norma	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ERC+10Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	GH_FR1+20Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRRD+15Cu passed proportion norma	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR2+20Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_SLC+10Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRCP1+20Cu passed proportion norm	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_MULTIPLATE passed proportion norm	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRABCH+20Cu passed proportion nor	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	20 Cu Control passed proportion normal	1

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Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

SIngle Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LCDSSLCC passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ER2+15Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_UFR1+15Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	EV_HC1+20Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC3+15Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC5+15Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	RG_MIDAG+15Cu passed proportion norm	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR4+15Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	EV_MC2+20Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	EV_HC1+20Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRABCH+20Cu passed proportion nor	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_DCDS+20Cu passed proportion norma	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC3+15Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR2+20Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_MULTIPLATE passed proportion norm	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRCP1+20Cu passed proportion norm	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRRD+15Cu passed proportion norma	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	GH_FR1+20Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	Lab Control FM passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	EV_MC2+20Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ERC+10Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LCDSSLCC passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC2+20Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	10Cu Control passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	RG_MIDAG+15Cu passed proportion norm	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR4+15Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC5+15Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC1+15Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_UFR1+15Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	15 Cu Control passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_SLC+10Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	20 Cu Control passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ER2+15Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRCP1+20Cu passed proportion norm	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_SLC+10Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC1+15Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	EV_MC2+20Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LCDSSLCC passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	15 Cu Control passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	10Cu Control passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	20 Cu Control passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	Lab Control FM passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_UFR1+15Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC2+20Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	EV_HC1+20Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	GH_FR1+20Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_DCDS+20Cu passed proportion norma	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRRD+15Cu passed proportion norma	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR2+20Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR4+15Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_MULTIPLATE passed proportion norm	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC5+15Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ER2+15Cu passed proportion normal	1

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRABCH+20Cu passed proportion nor	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC3+15Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ERC+10Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	RG_MIDAG+15Cu passed proportion norm	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LCDSSLCC passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	10Cu Control passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	GH_FR1+20Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ERC+10Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC2+20Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC1+15Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	Lab Control FM passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	RG_MIDAG+15Cu passed proportion norm	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_UFR1+15Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	15 Cu Control passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	EV_MC2+20Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC3+15Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ER2+15Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	EV_HC1+20Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR2+20Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_DCDS+20Cu passed proportion norma	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC5+15Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	20 Cu Control passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRCP1+20Cu passed proportion norm	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_SLC+10Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR4+15Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRRD+15Cu passed proportion norma	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_MULTIPLATE passed proportion norm	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRABCH+20Cu passed proportion nor	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	RG_MIDAG+15Cu passed proportion norm	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRABCH+20Cu passed proportion nor	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR4+15Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	EV_MC2+20Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	10Cu Control passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	15 Cu Control passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ERC+10Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC1+15Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC2+20Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC5+15Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRCP1+20Cu passed proportion norm	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_UFR1+15Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	20 Cu Control passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_SLC+10Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_MULTIPLATE passed proportion norm	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_DCDS+20Cu passed proportion norma	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	GH_FR1+20Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LCDSSLCC passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	EV_HC1+20Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRRD+15Cu passed proportion norma	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	Lab Control FM passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ER2+15Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR2+20Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC3+15Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR4+15Cu passed proportion normal	1

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Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRRD+15Cu passed proportion norma	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	15 Cu Control passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	RG_MIDAG+15Cu passed proportion norm	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ER2+15Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_UFR1+15Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRABCH+20Cu passed proportion nor	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	EV_HC1+20Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	EV_MC2+20Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC3+15Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC5+15Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	20 Cu Control passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_SLC+10Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR2+20Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	10Cu Control passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	Lab Control FM passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ERC+10Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_DCDS+20Cu passed proportion norma	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LCDSSLCC passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC1+15Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRCP1+20Cu passed proportion norm	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_MULTIPLATE passed proportion norm	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	GH_FR1+20Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC2+20Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR2+20Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	Lab Control FM passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	EV_MC2+20Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRRD+15Cu passed proportion norma	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ERC+10Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	GH_FR1+20Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	EV_HC1+20Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_SLC+10Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRABCH+20Cu passed proportion nor	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_DCDS+20Cu passed proportion norma	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC3+15Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LCDSSLCC passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	15 Cu Control passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_UFR1+15Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	10Cu Control passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_MULTIPLATE passed proportion norm	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR4+15Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ER2+15Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC5+15Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC2+20Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	20 Cu Control passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	RG_MIDAG+15Cu passed proportion norm	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC1+15Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRCP1+20Cu passed proportion norm	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	10Cu Control passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC3+15Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	EV_HC1+20Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	EV_MC2+20Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR4+15Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_SLC+10Cu passed proportion normal	1

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LCDSSLCC passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	GH_FR1+20Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_DCDS+20Cu passed proportion norma	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC2+20Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_UFR1+15Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRABCH+20Cu passed proportion nor	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	20 Cu Control passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC1+15Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR2+20Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_MULTIPLATE passed proportion norm	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	Lab Control FM passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ER2+15Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ERC+10Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	15 Cu Control passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRRD+15Cu passed proportion norma	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	RG_MIDAG+15Cu passed proportion norm	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRCP1+20Cu passed proportion norm	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC5+15Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC5+15Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC3+15Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_DCDS+20Cu passed proportion norma	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LCDSSLCC passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	20 Cu Control passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_UFR1+15Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR4+15Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	Lab Control FM passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRRD+15Cu passed proportion norma	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	EV_HC1+20Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	15 Cu Control passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_MULTIPLATE passed proportion norm	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	10Cu Control passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ER2+15Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	RG_MIDAG+15Cu passed proportion norm	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	EV_MC2+20Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	GH_FR1+20Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ERC+10Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR2+20Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRCP1+20Cu passed proportion norm	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRABCH+20Cu passed proportion nor	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_SLC+10Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC1+15Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC2+20Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	20 Cu Control passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ERC+10Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	EV_MC2+20Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	RG_MIDAG+15Cu passed proportion norm	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LCDSSLCC passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_UFR1+15Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	GH_FR1+20Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRRD+15Cu passed proportion norma	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	15 Cu Control passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC2+20Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC5+15Cu passed proportion normal	1

Fathead minnow 32-d (Pimephales promelas) survival and growth test

Nautilus Environmental Calgary

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC1+15Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	EV_HC1+20Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_SLC+10Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_DCDS+20Cu passed proportion norma	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRABCH+20Cu passed proportion nor	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRCP1+20Cu passed proportion norm	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	Lab Control FM passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR2+20Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ER2+15Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR4+15Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_MULTIPLATE passed proportion norm	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	10Cu Control passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC3+15Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	0.8226	CM_MC1+15Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	0.8226	LC_SLC+10Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	0.8226	20 Cu Control passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	0.8226	10Cu Control passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	0.8226	FR_FR4+15Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	0.8226	FR_MULTIPLATE passed proportion norm	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	0.8226	FR_FRRD+15Cu passed proportion norma	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	0.8226	GH_FR1+20Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	0.8226	FR_FRCP1+20Cu passed proportion norm	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	0.8226	LC_LCDSSLCC passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	0.8226	FR_FRABCH+20Cu passed proportion nor	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	0.8226	FR_FR2+20Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	0.8226	FR_UFR1+15Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	0.8226	LC_DCDS+20Cu passed proportion norma	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	0.8226	Lab Control FM passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	0.8226	EV_HC1+20Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	0.8226	EV_MC2+20Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	0.8226	LC_LC3+15Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	0.8226	GH_ER2+15Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	0.8226	RG_MIDAG+15Cu passed proportion norm	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	0.8226	LC_LC5+15Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	0.8226	GH_ERC+10Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	0.8226	15 Cu Control passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	0.8226	CM_MC2+20Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_UFR1+15Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_SLC+10Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_MULTIPLATE passed proportion norm	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	10Cu Control passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_DCDS+20Cu passed proportion norma	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	Lab Control FM passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRABCH+20Cu passed proportion nor	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC5+15Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR4+15Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC3+15Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	EV_MC2+20Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRCP1+20Cu passed proportion norm	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	15 Cu Control passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ER2+15Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC1+15Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	GH_FR1+20Cu passed proportion normal	1

Analyst: [illegible] QA: 2021/11/18

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Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	RG_MIDAG+15Cu passed proportion norm	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LCDSSLCC passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR2+20Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRRD+15Cu passed proportion norma	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC2+20Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ERC+10Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	EV_HC1+20Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	20 Cu Control passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	15 Cu Control passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_MULTIPLATE passed proportion norm	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR2+20Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRRD+15Cu passed proportion norma	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	RG_MIDAG+15Cu passed proportion norm	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_SLC+10Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRABCH+20Cu passed proportion nor	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	10Cu Control passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRCP1+20Cu passed proportion norm	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC1+15Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	GH_FR1+20Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ERC+10Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC2+20Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ER2+15Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	EV_MC2+20Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	EV_HC1+20Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	Lab Control FM passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_UFR1+15Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LCDSSLCC passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_DCDS+20Cu passed proportion norma	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC5+15Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	20 Cu Control passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC3+15Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR4+15Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRABCH+20Cu passed proportion nor	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LCDSSLCC passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ERC+10Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_SLC+10Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRRD+15Cu passed proportion norma	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	10Cu Control passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC1+15Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	20 Cu Control passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_MULTIPLATE passed proportion norm	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FRCP1+20Cu passed proportion norm	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	RG_MIDAG+15Cu passed proportion norm	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC5+15Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	CM_MC2+20Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	GH_ER2+15Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR2+20Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	EV_HC1+20Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_LC3+15Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_FR4+15Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	EV_MC2+20Cu passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	Lab Control FM passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	FR_UFR1+15Cu passed proportion normal	1

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	15 Cu Control passed proportion normal	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	LC_DCDS+20Cu passed proportion norma	1
11-7932-6502	Proportion Normal	Fisher Exact/Bonferroni Adj Test	1.0000	GH_FR1+20Cu passed proportion normal	1

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Hatch Rate Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
Lab Control FM		4	0.9833	0.9303	1.0000	0.9333	1.0000	0.0167	0.0333	3.39%	0.00%
10Cu Control	10	4	0.9833	0.9303	1.0000	0.9333	1.0000	0.0167	0.0333	3.39%	0.00%
15 Cu Control		4	0.9667	0.9054	1.0000	0.9333	1.0000	0.0193	0.0385	3.98%	1.69%
20 Cu Control		4	0.9500	0.8970	1.0000	0.9333	1.0000	0.0167	0.0333	3.51%	3.39%
FR_UFR1+15Cu		4	0.9333	0.8467	1.0000	0.8667	1.0000	0.0272	0.0544	5.83%	5.08%
GH_ER2+15Cu		4	0.9500	0.8484	1.0000	0.8667	1.0000	0.0319	0.0638	6.72%	3.39%
CM_MC1+15Cu		4	0.8833	0.8303	0.9364	0.8667	0.9333	0.0167	0.0333	3.77%	10.17%
LC_SLC+10Cu		4	0.9333	0.9333	0.9333	0.9333	0.9333	0.0000	0.0000	0.00%	5.08%
FR_FRABCH+20Cu		4	0.9167	0.8151	1.0000	0.8667	1.0000	0.0319	0.0638	6.96%	6.78%
FR_FRCP1+20Cu		4	0.9667	0.9054	1.0000	0.9333	1.0000	0.0193	0.0385	3.98%	1.69%
GH_FR1+20Cu		4	0.9667	0.8606	1.0000	0.8667	1.0000	0.0333	0.0667	6.90%	1.69%
GH_ERC+10Cu		4	0.9500	0.8484	1.0000	0.8667	1.0000	0.0319	0.0638	6.72%	3.39%
CM_MC2+20Cu		4	0.9833	0.9303	1.0000	0.9333	1.0000	0.0167	0.0333	3.39%	0.00%
RG_MIDAG+15Cu		4	0.9667	0.8606	1.0000	0.8667	1.0000	0.0333	0.0667	6.90%	1.69%
EV_MC2+20Cu		4	0.9667	0.9054	1.0000	0.9333	1.0000	0.0193	0.0385	3.98%	1.69%
EV_HC1+20Cu		4	0.8833	0.7499	1.0000	0.8000	1.0000	0.0419	0.0839	9.50%	10.17%
LC_DCDS+20Cu		4	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	-1.69%
LC_LC3+15Cu		4	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	-1.69%
LC_LC5+15Cu		4	0.9833	0.9303	1.0000	0.9333	1.0000	0.0167	0.0333	3.39%	0.00%
LC_LCDSSLCC		4	0.9667	0.9054	1.0000	0.9333	1.0000	0.0193	0.0385	3.98%	1.69%
FR_FR4+15Cu		4	0.9500	0.7909	1.0000	0.8000	1.0000	0.0500	0.1000	10.53%	3.39%
FR_FRRD+15Cu		4	0.9833	0.9303	1.0000	0.9333	1.0000	0.0167	0.0333	3.39%	0.00%
FR_FR2+20Cu		4	0.9667	0.9054	1.0000	0.9333	1.0000	0.0193	0.0385	3.98%	1.69%
FR_MULTIPLATE		4	0.8833	0.7242	1.0000	0.8000	1.0000	0.0500	0.1000	11.32%	10.17%

Length Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
Lab Control FM		4	11.9	11.15	12.65	11.3	12.4	0.2345	0.469	3.94%	0.00%
10Cu Control	10	4	12.43	11.66	13.19	11.8	12.8	0.2394	0.4787	3.85%	-4.41%
15 Cu Control		4	12.37	10.89	13.86	11.4	13.4	0.4661	0.9323	7.53%	-3.99%
20 Cu Control		4	13.03	12.67	13.38	12.8	13.3	0.1109	0.2217	1.70%	-9.45%
FR_UFR1+15Cu		4	11.7	10.85	12.55	10.9	12	0.2677	0.5354	4.58%	1.68%
GH_ER2+15Cu		4	11.15	10.87	11.43	11	11.3	0.0866	0.1732	1.55%	6.30%
CM_MC1+15Cu		4	10.95	10.06	11.84	10.2	11.5	0.2784	0.5568	5.08%	7.98%
LC_SLC+10Cu		4	11.9	11.12	12.68	11.5	12.5	0.2449	0.4899	4.12%	0.00%
FR_FRABCH+20Cu		4	11.7	10.38	13.02	10.8	12.7	0.4143	0.8287	7.08%	1.68%
FR_FRCP1+20Cu		4	10.75	9.243	12.26	9.4	11.6	0.4735	0.9469	8.81%	9.66%
GH_FR1+20Cu		4	10.95	10.33	11.57	10.5	11.4	0.1936	0.3873	3.54%	7.98%
GH_ERC+10Cu		4	12.7	12.15	13.25	12.4	13	0.1732	0.3464	2.73%	-6.72%
CM_MC2+20Cu		4	12.45	11.06	13.84	11.3	13.4	0.4368	0.8737	7.02%	-4.62%
RG_MIDAG+15Cu		4	11.08	10.09	12.06	10.6	11.9	0.3092	0.6185	5.58%	6.93%
EV_MC2+20Cu		4	10.8	9.236	12.36	9.9	12.1	0.4916	0.9832	9.10%	9.24%
EV_HC1+20Cu		4	12.18	9.553	14.8	10.1	13.5	0.824	1.648	13.54%	-2.31%
LC_DCDS+20Cu		4	12.33	11.45	13.2	11.6	12.8	0.275	0.55	4.46%	-3.57%
LC_LC3+15Cu		4	12.18	10.8	13.55	11.3	13.1	0.4308	0.8617	7.08%	-2.31%
LC_LC5+15Cu		4	12.62	10.78	14.47	11.2	13.8	0.5808	1.162	9.20%	-6.09%
LC_LCDSSLCC		4	12.08	11.47	12.68	11.6	12.5	0.1887	0.3775	3.13%	-1.47%
FR_FR4+15Cu		4	11.23	10.62	11.83	10.8	11.7	0.1887	0.3775	3.36%	5.67%
FR_FRRD+15Cu		4	10.9	10.47	11.33	10.5	11.1	0.1354	0.2708	2.48%	8.40%
FR_FR2+20Cu		4	11.3	10.58	12.02	10.9	11.9	0.2273	0.4546	4.02%	5.04%
FR_MULTIPLATE		4	11.12	9.736	12.51	10.2	12.3	0.4366	0.8732	7.85%	6.51%

Fathead minnow 32-d (Pimephales promelas) survival and growth test

Nautilus Environmental Calgary

Mean Dry Biomass-mg Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
Lab Control FM		4	2.627	1.997	3.257	2.333	3.199	0.1981	0.3961	15.08%	0.00%
10Cu Control	10	4	2.768	2.171	3.366	2.278	3.139	0.1879	0.3757	13.57%	-5.38%
15 Cu Control		4	2.439	1.994	2.885	2.026	2.64	0.14	0.2799	11.47%	7.15%
20 Cu Control		4	2.611	2.495	2.728	2.504	2.661	0.03658	0.07316	2.80%	0.60%
FR_UFR1+15Cu		4	2.163	0.8123	3.514	1.001	3.036	0.4244	0.8489	39.24%	17.67%
GH_ER2+15Cu		4	2.484	1.959	3.01	1.999	2.737	0.1651	0.3303	13.29%	5.44%
CM_MC1+15Cu		4	1.909	1.062	2.757	1.331	2.615	0.2664	0.5327	27.90%	27.33%
LC_SLC+10Cu		4	2.639	2.465	2.813	2.477	2.71	0.05459	0.1092	4.14%	-0.45%
FR_FRABCH+20Cu		4	2.634	2.222	3.047	2.421	2.965	0.1297	0.2594	9.85%	-0.27%
FR_FRCP1+20Cu		4	2.458	1.98	2.935	2.079	2.768	0.1501	0.3003	12.22%	6.45%
GH_FR1+20Cu		4	2.511	2.25	2.772	2.279	2.665	0.082	0.164	6.53%	4.42%
GH_ERC+10Cu		4	2.58	2.29	2.87	2.364	2.771	0.09109	0.1822	7.06%	1.78%
CM_MC2+20Cu		4	2.273	1.992	2.555	2.015	2.399	0.08836	0.1767	7.77%	13.46%
RG_MIDAG+15Cu		4	2.406	2.053	2.76	2.206	2.713	0.1112	0.2223	9.24%	8.41%
EV_MC2+20Cu		4	2.577	2.242	2.913	2.353	2.77	0.1054	0.2108	8.18%	1.89%
EV_HC1+20Cu		4	2.065	1.635	2.495	1.851	2.437	0.1351	0.2702	13.08%	21.39%
LC_DCDS+20Cu		4	2.457	2.005	2.909	2.143	2.808	0.142	0.284	11.56%	6.48%
LC_LC3+15Cu		4	2.663	2.343	2.982	2.412	2.847	0.1004	0.2008	7.54%	-1.34%
LC_LC5+15Cu		4	2.538	2.182	2.894	2.215	2.689	0.1118	0.2237	8.81%	3.39%
LC_LCDSSLCC		4	2.283	1.678	2.888	1.896	2.67	0.1902	0.3804	16.66%	13.11%
FR_FR4+15Cu		4	2.356	1.645	3.067	1.901	2.971	0.2234	0.4468	18.96%	10.31%
FR_FRRD+15Cu		4	2.735	2.532	2.938	2.555	2.843	0.06394	0.1279	4.68%	-4.10%
FR_FR2+20Cu		4	2.748	2.405	3.091	2.465	2.988	0.1079	0.2157	7.85%	-4.61%
FR_MULTIPLATE		4	2.233	1.92	2.546	2.041	2.482	0.09838	0.1968	8.81%	14.99%

Post Hatch Survival Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
Lab Control FM		4	0.8476	0.7149	0.9803	0.7333	0.9333	0.0417	0.0834	9.84%	0.00%
10Cu Control	10	4	0.8310	0.7737	0.8882	0.8000	0.8667	0.0180	0.0360	4.33%	1.97%
15 Cu Control		4	0.7095	0.3719	1.0000	0.5333	1.0000	0.1061	0.2122	29.90%	16.29%
20 Cu Control		4	0.7512	0.4780	1.0000	0.5714	0.9333	0.0859	0.1717	22.86%	11.38%
FR_UFR1+15Cu		4	0.5528	0.1774	0.9283	0.2143	0.7333	0.1180	0.2359	42.68%	34.78%
GH_ER2+15Cu		4	0.7860	0.5809	0.9911	0.6154	0.9286	0.0644	0.1289	16.40%	7.27%
CM_MC1+15Cu		4	0.6223	0.3216	0.9229	0.3846	0.8462	0.0945	0.1889	30.36%	26.59%
LC_SLC+10Cu		4	0.8571	0.7643	0.9499	0.7857	0.9286	0.0292	0.0583	6.80%	-1.12%
FR_FRABCH+20Cu		4	0.7438	0.6196	0.8679	0.6923	0.8571	0.0390	0.0780	10.49%	12.25%
FR_FRCP1+20Cu		4	0.7940	0.5527	1.0000	0.6429	1.0000	0.0758	0.1517	19.10%	6.32%
GH_FR1+20Cu		4	0.8115	0.7748	0.8483	0.8000	0.8462	0.0115	0.0231	2.84%	4.26%
GH_ERC+10Cu		4	0.6556	0.4411	0.8701	0.5333	0.8462	0.0674	0.1348	20.56%	22.66%
CM_MC2+20Cu		4	0.6750	0.2819	1.0000	0.4667	1.0000	0.1235	0.2470	36.60%	20.37%
RG_MIDAG+15Cu		4	0.7923	0.6403	0.9443	0.6667	0.8667	0.0478	0.0955	12.06%	6.53%
EV_MC2+20Cu		4	0.8440	0.6988	0.9893	0.7143	0.9286	0.0457	0.0913	10.82%	0.42%
EV_HC1+20Cu		4	0.5705	0.0413	1.0000	0.3077	1.0000	0.1663	0.3326	58.30%	32.69%
LC_DCDS+20Cu		4	0.6667	0.3312	1.0000	0.4667	0.9333	0.1054	0.2108	31.62%	21.35%
LC_LC3+15Cu		4	0.6833	0.5022	0.8645	0.5333	0.8000	0.0569	0.1139	16.66%	19.38%
LC_LC5+15Cu		4	0.6762	0.3764	0.9760	0.4667	0.8667	0.0942	0.1884	27.86%	20.22%
LC_LCDSSLCC		4	0.5726	0.3546	0.7907	0.4000	0.7143	0.0685	0.1370	23.93%	32.44%
FR_FR4+15Cu		4	0.7125	0.4307	0.9943	0.5333	0.9167	0.0886	0.1771	24.86%	15.94%
FR_FRRD+15Cu		4	0.8655	0.7819	0.9490	0.8000	0.9286	0.0263	0.0525	6.07%	-2.11%
FR_FR2+20Cu		4	0.8500	0.5710	1.0000	0.6667	1.0000	0.0877	0.1753	20.63%	-0.28%
FR_MULTIPLATE		4	0.7821	0.4763	1.0000	0.5000	0.9286	0.0961	0.1922	24.57%	7.72%

Analyst: KW QA: 2021/11/18

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Proportion Normal Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
Lab Control FM		4	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
10Cu Control	10	4	0.9808	0.9196	1.0000	0.9231	1.0000	0.0192	0.0385	3.92%	1.92%
15 Cu Control		4	0.9821	0.9253	1.0000	0.9286	1.0000	0.0179	0.0357	3.64%	1.79%
20 Cu Control		4	0.9410	0.8321	1.0000	0.8750	1.0000	0.0342	0.0684	7.27%	5.90%
FR_UFR1+15Cu		4	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
GH_ER2+15Cu		4	0.9792	0.9129	1.0000	0.9167	1.0000	0.0208	0.0417	4.26%	2.08%
CM_MC1+15Cu		4	0.9500	0.7909	1.0000	0.8000	1.0000	0.0500	0.1000	10.53%	5.00%
LC_SLC+10Cu		4	0.9792	0.9129	1.0000	0.9167	1.0000	0.0208	0.0417	4.26%	2.08%
FR_FRABCH+20Cu		4	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
FR_FRCP1+20Cu		4	0.9514	0.8603	1.0000	0.8889	1.0000	0.0286	0.0573	6.02%	4.86%
GH_FR1+20Cu		4	0.9375	0.8105	1.0000	0.8333	1.0000	0.0399	0.0798	8.51%	6.25%
GH_ERC+10Cu		4	0.9722	0.8838	1.0000	0.8889	1.0000	0.0278	0.0556	5.71%	2.78%
CM_MC2+20Cu		4	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
RG_MIDAG+15Cu		4	0.9115	0.8094	1.0000	0.8462	1.0000	0.0321	0.0642	7.04%	8.85%
EV_MC2+20Cu		4	0.9231	0.8231	1.0000	0.8462	1.0000	0.0314	0.0628	6.80%	7.69%
EV_HC1+20Cu		4	0.9833	0.9303	1.0000	0.9333	1.0000	0.0167	0.0333	3.39%	1.67%
LC_DCDS+20Cu		4	0.9416	0.8290	1.0000	0.8571	1.0000	0.0354	0.0707	7.51%	5.84%
LC_LC3+15Cu		4	0.9564	0.8763	1.0000	0.9091	1.0000	0.0252	0.0504	5.27%	4.36%
LC_LC5+15Cu		4	0.9808	0.9196	1.0000	0.9231	1.0000	0.0192	0.0385	3.92%	1.92%
LC_LCDSSLCC		4	0.9750	0.8954	1.0000	0.9000	1.0000	0.0250	0.0500	5.13%	2.50%
FR_FR4+15Cu		4	0.9148	0.7271	1.0000	0.7500	1.0000	0.0590	0.1179	12.89%	8.52%
FR_FRRD+15Cu		4	0.9792	0.9129	1.0000	0.9167	1.0000	0.0208	0.0417	4.26%	2.08%
FR_FR2+20Cu		4	0.9821	0.9253	1.0000	0.9286	1.0000	0.0179	0.0357	3.64%	1.79%
FR_MULTIPLATE		4	0.9750	0.8954	1.0000	0.9000	1.0000	0.0250	0.0500	5.13%	2.50%

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Hatch Rate Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Lab Control FM		0.9333	1.0000	1.0000	1.0000
10Cu Control	10	1.0000	1.0000	0.9333	1.0000
15 Cu Control		1.0000	0.9333	1.0000	0.9333
20 Cu Control		0.9333	0.9333	1.0000	0.9333
FR_UFR1+15Cu		0.9333	1.0000	0.9333	0.8667
GH_ER2+15Cu		1.0000	0.9333	0.8667	1.0000
CM_MC1+15Cu		0.8667	0.9333	0.8667	0.8667
LC_SLC+10Cu		0.9333	0.9333	0.9333	0.9333
FR_FRABCH+20Cu		0.8667	0.8667	1.0000	0.9333
FR_FRCP1+20Cu		1.0000	0.9333	0.9333	1.0000
GH_FR1+20Cu		1.0000	1.0000	1.0000	0.8667
GH_ERC+10Cu		0.9333	1.0000	0.8667	1.0000
CM_MC2+20Cu		0.9333	1.0000	1.0000	1.0000
RG_MIDAG+15Cu		1.0000	1.0000	1.0000	0.8667
EV_MC2+20Cu		1.0000	1.0000	0.9333	0.9333
EV_HC1+20Cu		0.8667	0.8000	0.8667	1.0000
LC_DCDS+20Cu		1.0000	1.0000	1.0000	1.0000
LC_LC3+15Cu		1.0000	1.0000	1.0000	1.0000
LC_LC5+15Cu		1.0000	1.0000	1.0000	0.9333
LC_LCDSSLCC		0.9333	1.0000	1.0000	0.9333
FR_FR4+15Cu		1.0000	1.0000	1.0000	0.8000
FR_FRRD+15Cu		1.0000	1.0000	1.0000	0.9333
FR_FR2+20Cu		0.9333	1.0000	1.0000	0.9333
FR_MULTIPLATE		0.8000	0.8000	1.0000	0.9333

Length Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Lab Control FM		12.4	11.3	12.1	11.8
10Cu Control	10	11.8	12.3	12.8	12.8
15 Cu Control		12.9	11.8	13.4	11.4
20 Cu Control		13.3	12.9	12.8	13.1
FR_UFR1+15Cu		11.9	10.9	12	12
GH_ER2+15Cu		11.3	11.3	11	11
CM_MC1+15Cu		11.5	10.9	11.2	10.2
LC_SLC+10Cu		11.5	12.5	12.1	11.5
FR_FRABCH+20Cu		12.7	12	10.8	11.3
FR_FRCP1+20Cu		11.1	10.9	9.4	11.6
GH_FR1+20Cu		11.1	10.5	10.8	11.4
GH_ERC+10Cu		13	12.4	12.4	13
CM_MC2+20Cu		12.7	11.3	12.4	13.4
RG_MIDAG+15Cu		10.6	10.6	11.2	11.9
EV_MC2+20Cu		9.9	10.2	11	12.1
EV_HC1+20Cu		13.5	11.6	13.5	10.1
LC_DCDS+20Cu		12.7	12.8	12.2	11.6
LC_LC3+15Cu		12.7	13.1	11.3	11.6
LC_LC5+15Cu		11.2	13.3	12.2	13.8
LC_LCDSSLCC		12.2	12	11.6	12.5
FR_FR4+15Cu		11.3	10.8	11.1	11.7
FR_FRRD+15Cu		10.5	11	11	11.1
FR_FR2+20Cu		11	11.9	11.4	10.9
FR_MULTIPLATE		11.1	12.3	10.2	10.9

Analyst: KL QA: MG 2021/11/18

Fathead minnow 32-d (Pimephales promelas) survival and growth test **Nautilus Environmental Calgary**

Mean Dry Biomass-mg Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Lab Control FM		2.583	2.333	2.393	3.199
10Cu Control	10	2.278	2.69	2.967	3.139
15 Cu Control		2.52	2.026	2.64	2.571
20 Cu Control		2.661	2.504	2.654	2.626
FR_UFR1+15Cu		2.25	2.365	1.001	3.036
GH_ER2+15Cu		2.613	2.588	1.999	2.737
CM_MC1+15Cu		1.769	1.921	2.615	1.331
LC_SLC+10Cu		2.477	2.675	2.71	2.695
FR_FRABCH+20Cu		2.434	2.718	2.421	2.965
FR_FRCP1+20Cu		2.611	2.373	2.079	2.768
GH_FR1+20Cu		2.665	2.279	2.55	2.551
GH_ERC+10Cu		2.683	2.364	2.771	2.503
CM_MC2+20Cu		2.015	2.308	2.399	2.373
RG_MIDAG+15Cu		2.419	2.287	2.206	2.713
EV_MC2+20Cu		2.353	2.443	2.77	2.744
EV_HC1+20Cu		1.881	2.092	1.851	2.437
LC_DCDS+20Cu		2.143	2.339	2.808	2.537
LC_LC3+15Cu		2.591	2.8	2.412	2.847
LC_LC5+15Cu		2.689	2.215	2.561	2.687
LC_LCDSSLCC		2.542	1.896	2.023	2.67
FR_FR4+15Cu		2.257	2.295	1.901	2.971
FR_FRRD+15Cu		2.555	2.843	2.735	2.806
FR_FR2+20Cu		2.745	2.794	2.465	2.988
FR_MULTIPLATE		2.294	2.041	2.116	2.482

Post Hatch Survival Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Lab Control FM		0.8571	0.9333	0.7333	0.8667
10Cu Control	10	0.8000	0.8000	0.8571	0.8667
15 Cu Control		0.7333	0.5714	0.5333	1.0000
20 Cu Control		0.8571	0.5714	0.9333	0.6429
FR_UFR1+15Cu		0.5714	0.7333	0.2143	0.6923
GH_ER2+15Cu		0.8000	0.9286	0.6154	0.8000
CM_MC1+15Cu		0.6154	0.6429	0.8462	0.3846
LC_SLC+10Cu		0.8571	0.7857	0.8571	0.9286
FR_FRABCH+20Cu		0.6923	0.6923	0.7333	0.8571
FR_FRCP1+20Cu		0.8000	1.0000	0.6429	0.7333
GH_FR1+20Cu		0.8000	0.8000	0.8000	0.8462
GH_ERC+10Cu		0.6429	0.6000	0.8462	0.5333
CM_MC2+20Cu		0.5000	1.0000	0.7333	0.4667
RG_MIDAG+15Cu		0.8667	0.6667	0.8667	0.7692
EV_MC2+20Cu		0.8667	0.8667	0.9286	0.7143
EV_HC1+20Cu		0.3077	0.6667	0.3077	1.0000
LC_DCDS+20Cu		0.4667	0.5333	0.7333	0.9333
LC_LC3+15Cu		0.6667	0.5333	0.8000	0.7333
LC_LC5+15Cu		0.8667	0.4667	0.8000	0.5714
LC_LCDSSLCC		0.6429	0.4000	0.5333	0.7143
FR_FR4+15Cu		0.6000	0.8000	0.5333	0.9167
FR_FRRD+15Cu		0.8667	0.8000	0.8667	0.9286
FR_FR2+20Cu		1.0000	0.6667	0.7333	1.0000
FR_MULTIPLATE		0.8333	0.5000	0.8667	0.9286

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Proportion Normal Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Lab Control FM		1.0000	1.0000	1.0000	1.0000
10Cu Control	10	1.0000	1.0000	1.0000	0.9231
15 Cu Control		1.0000	1.0000	1.0000	0.9286
20 Cu Control		1.0000	0.8750	1.0000	0.8889
FR_UFR1+15Cu		1.0000	1.0000	1.0000	1.0000
GH_ER2+15Cu		0.9167	1.0000	1.0000	1.0000
CM_MC1+15Cu		1.0000	1.0000	1.0000	0.8000
LC_SLC+10Cu		0.9167	1.0000	1.0000	1.0000
FR_FRABCH+20Cu		1.0000	1.0000	1.0000	1.0000
FR_FRCP1+20Cu		0.9167	1.0000	0.8889	1.0000
GH_FR1+20Cu		1.0000	0.9167	0.8333	1.0000
GH_ERC+10Cu		1.0000	0.8889	1.0000	1.0000
CM_MC2+20Cu		1.0000	1.0000	1.0000	1.0000
RG_MIDAG+15Cu		0.8462	0.9000	1.0000	0.9000
EV_MC2+20Cu		0.8462	0.9231	0.9231	1.0000
EV_HC1+20Cu		1.0000	1.0000	1.0000	0.9333
LC_DCDS+20Cu		0.8571	1.0000	0.9091	1.0000
LC_LC3+15Cu		1.0000	1.0000	0.9167	0.9091
LC_LC5+15Cu		0.9231	1.0000	1.0000	1.0000
LC_LCDSSLCC		1.0000	1.0000	1.0000	0.9000
FR_FR4+15Cu		1.0000	0.7500	1.0000	0.9091
FR_FRRD+15Cu		1.0000	0.9167	1.0000	1.0000
FR_FR2+20Cu		1.0000	1.0000	1.0000	0.9286
FR_MULTIPLATE		0.9000	1.0000	1.0000	1.0000

Analyst: KA QA: MG 2021/11/18

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Hatch Rate Binomials

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Lab Control FM		14/15	15/15	15/15	15/15
10Cu Control	10	15/15	15/15	14/15	15/15
15 Cu Control		15/15	14/15	15/15	14/15
20 Cu Control		14/15	14/15	15/15	14/15
FR_UFR1+15Cu		14/15	15/15	14/15	13/15
GH_ER2+15Cu		15/15	14/15	13/15	15/15
CM_MC1+15Cu		13/15	14/15	13/15	13/15
LC_SLC+10Cu		14/15	14/15	14/15	14/15
FR_FRABCH+20Cu		13/15	13/15	15/15	14/15
FR_FRCP1+20Cu		15/15	14/15	14/15	15/15
GH_FR1+20Cu		15/15	15/15	15/15	13/15
GH_ERC+10Cu		14/15	15/15	13/15	15/15
CM_MC2+20Cu		14/15	15/15	15/15	15/15
RG_MIDAG+15Cu		15/15	15/15	15/15	13/15
EV_MC2+20Cu		15/15	15/15	14/15	14/15
EV_HC1+20Cu		13/15	12/15	13/15	15/15
LC_DCDS+20Cu		15/15	15/15	15/15	15/15
LC_LC3+15Cu		15/15	15/15	15/15	15/15
LC_LC5+15Cu		15/15	15/15	15/15	14/15
LC_LCDSSLCC		14/15	15/15	15/15	14/15
FR_FR4+15Cu		15/15	15/15	15/15	12/15
FR_FRRD+15Cu		15/15	15/15	15/15	14/15
FR_FR2+20Cu		14/15	15/15	15/15	14/15
FR_MULTIPLATE		12/15	12/15	15/15	14/15

Post Hatch Survival Binomials

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Lab Control FM		12/14	14/15	11/15	13/15
10Cu Control	10	12/15	12/15	12/14	13/15
15 Cu Control		11/15	8/14	8/15	14/14
20 Cu Control		12/14	8/14	14/15	9/14
FR_UFR1+15Cu		8/14	11/15	3/14	9/13
GH_ER2+15Cu		12/15	13/14	8/13	12/15
CM_MC1+15Cu		8/13	9/14	11/13	5/13
LC_SLC+10Cu		12/14	11/14	12/14	13/14
FR_FRABCH+20Cu		9/13	9/13	11/15	12/14
FR_FRCP1+20Cu		12/15	14/14	9/14	11/15
GH_FR1+20Cu		12/15	12/15	12/15	11/13
GH_ERC+10Cu		9/14	9/15	11/13	8/15
CM_MC2+20Cu		7/14	15/15	11/15	7/15
RG_MIDAG+15Cu		13/15	10/15	13/15	10/13
EV_MC2+20Cu		13/15	13/15	13/14	10/14
EV_HC1+20Cu		4/13	8/12	4/13	15/15
LC_DCDS+20Cu		7/15	8/15	11/15	14/15
LC_LC3+15Cu		10/15	8/15	12/15	11/15
LC_LC5+15Cu		13/15	7/15	12/15	8/14
LC_LCDSSLCC		9/14	6/15	8/15	10/14
FR_FR4+15Cu		9/15	12/15	8/15	11/12
FR_FRRD+15Cu		13/15	12/15	13/15	13/14
FR_FR2+20Cu		14/14	10/15	11/15	14/14
FR_MULTIPLATE		10/12	6/12	13/15	13/14

Analyst: KSL QA: MG 2021/11/18

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Proportion Normal Binomials

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Lab Control FM		12/12	14/14	11/11	13/13
10Cu Control	10	12/12	12/12	12/12	12/13
15 Cu Control		11/11	8/8	8/8	13/14
20 Cu Control		12/12	7/8	14/14	8/9
FR_UFR1+15Cu		8/8	11/11	3/3	9/9
GH_ER2+15Cu		11/12	13/13	8/8	12/12
CM_MC1+15Cu		8/8	9/9	11/11	4/5
LC_SLC+10Cu		11/12	11/11	12/12	13/13
FR_FRABCH+20Cu		9/9	9/9	11/11	12/12
FR_FRCP1+20Cu		11/12	14/14	8/9	11/11
GH_FR1+20Cu		12/12	11/12	10/12	11/11
GH_ERC+10Cu		9/9	8/9	11/11	8/8
CM_MC2+20Cu		7/7	15/15	11/11	7/7
RG_MIDAG+15Cu		11/13	9/10	13/13	9/10
EV_MC2+20Cu		11/13	12/13	12/13	10/10
EV_HC1+20Cu		4/4	8/8	4/4	14/15
LC_DCDS+20Cu		6/7	8/8	10/11	14/14
LC_LC3+15Cu		10/10	8/8	11/12	10/11
LC_LC5+15Cu		12/13	7/7	12/12	8/8
LC_LCDSSLCC		9/9	6/6	8/8	9/10
FR_FR4+15Cu		9/9	9/12	8/8	10/11
FR_FRRD+15Cu		13/13	11/12	13/13	13/13
FR_FR2+20Cu		14/14	10/10	11/11	13/14
FR_MULTIPLATE		9/10	6/6	13/13	13/13

Analyst: KW QA: 2021/11/18 MG

CETIS Analytical Report

Test Code/ID: FM Lab Control / 06-2855-8538

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID:	20-6526-8836	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.9.4
Analyzed:	30 Oct-21 15:26	**Analysis:**	Nonparametric-Control vs Treatments	**Status Level:**	1
Batch ID:	19-0275-1751	**Test Type:**	32 Day Fathead Minnow Test	**Analyst:**	Kayla Knol
Start Date:	13 Aug-21	**Protocol:**	ASTM E1241-05 (2013)	**Diluent:**	Dechlorinated Tap Water
Ending Date:	13 Sep-21	**Species:**	Pimephales promelas	**Brine:**	
Test Length:	31d 0h	**Taxon:**	Actinopterygii	**Source:**	Aquatox, AR **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
Lab Control FM	11-5032-4817	10 Aug-21	11 Aug-21	72h	Teck Coal Ltd	
10Cu Control	04-3348-8996	10 Aug-21	11 Aug-21	72h		
15 Cu Control	05-5139-9319	10 Aug-21	11 Aug-21	72h		
20 Cu Control	18-8853-3252	10 Aug-21	11 Aug-21	72h		
FR_UFR1+15Cu	13-9616-5903	10 Aug-21	11 Aug-21	72h (14.7 °C)		
GH_ER2+15Cu	19-5052-7846	10 Aug-21	11 Aug-21	72h (12.1 °C)		
CM_MC1+15Cu	15-1448-1664	10 Aug-21	11 Aug-21	72h (12.3 °C)		
LC_SLC+10Cu	10-0118-5065	10 Aug-21	11 Aug-21	72h (11.8 °C)		
FR_FRABCH+20Cu	12-2763-5905	10 Aug-21	11 Aug-21	72h (14.6 °C)		
FR_FRCP1+20Cu	05-5162-7629	10 Aug-21	11 Aug-21	72h (13.8 °C)		
GH_FR1+20Cu	18-3989-2491	10 Aug-21	11 Aug-21	72h (12 °C)		
GH_ERC+10Cu	14-6940-9296	10 Aug-21	11 Aug-21	72h (15.4 °C)		
CM_MC2+20Cu	17-0166-2336	10 Aug-21	11 Aug-21	72h (13.1 °C)		
RG_MIDAG+15Cu	18-0148-8949	10 Aug-21	11 Aug-21	72h (12.4 °C)		
EV_MC2+20Cu	08-5423-9441	10 Aug-21	11 Aug-21	72h (13.1 °C)		
EV_HC1+20Cu	19-8320-0922	10 Aug-21	11 Aug-21	72h (12.1 °C)		
LC_DCDS+20Cu	12-7443-1043	10 Aug-21	11 Aug-21	72h (12.3 °C)		
LC_LC3+15Cu	06-5017-0795	10 Aug-21	11 Aug-21	72h (12.4 °C)		
LC_LC5+15Cu	10-4683-7945	10 Aug-21	11 Aug-21	72h (15.1 °C)		
LC_LCDSSLCC	11-9856-2953	10 Aug-21	11 Aug-21	72h (10.8 °C)		
FR_FR4+15Cu	16-1388-5677	10 Aug-21	11 Aug-21	72h (14.1 °C)		
FR_FRRD+15Cu	18-8883-2370	10 Aug-21	11 Aug-21	72h (14.7 °C)		
FR_FR2+20Cu	20-1752-8591	10 Aug-21	11 Aug-21	72h (15.3 °C)		
FR_MULTIPLATE	15-0654-9876	10 Aug-21	11 Aug-21	72h (13.6 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
Lab Control FM	Ambient Sample	Teck Coal Ltd	Lab Control FM	
10Cu Control	Ambient Sample	Teck Coal Ltd	10 Cu Control	
15 Cu Control	Ambient Sample	Teck Coal Ltd	15 Cu Control	
20 Cu Control	Ambient Sample	Teck Coal Ltd	20 Cu Control	
FR_UFR1+15Cu	Ambient Sample	Teck Coal Ltd	FR_UFR1_MON_2021-08-0	
GH_ER2+15Cu	Ambient Sample	Teck Coal Ltd	GH_ER2_WS_2021-08-10_	
CM_MC1+15Cu	Ambient Sample	Teck Coal Ltd	CM_MC1_WS_2021-08-10	
LC_SLC+10Cu	Ambient Sample	Teck Coal Ltd	LC_SLC_WS_2021-08-10_	
FR_FRABCH+20Cu	Ambient Sample	Teck Coal Ltd	FR_FRABCH_MON_2021-	
FR_FRCP1+20Cu	Ambient Sample	Teck Coal Ltd	FR_FRCP1_MON_2021-08	
GH_FR1+20Cu	Ambient Sample	Teck Coal Ltd	GH_FR1_WS_2021-08-10_	
GH_ERC+10Cu	Ambient Sample	Teck Coal Ltd	GH_ERC_WS_2021-08-10	
CM_MC2+20Cu	Ambient Sample	Teck Coal Ltd	CM_MC2_WS_2021-08-10	
RG_MIDAG+15Cu	Ambient Sample	Teck Coal Ltd	RG_MIDAG_WS_2021-08-	
EV_MC2+20Cu	Ambient Sample	Teck Coal Ltd	EV_MC2_WS_2021_Q3_W	
EV_HC1+20Cu	Ambient Sample	Teck Coal Ltd	EV_HC1_WS_2021_Q3_W	
LC_DCDS+20Cu	Ambient Sample	Teck Coal Ltd	LC_DCDS_WS_2021-08-1	
LC_LC3+15Cu	Ambient Sample	Teck Coal Ltd	LC_LC3_WS_2021-08-10_	
LC_LC5+15Cu	Ambient Sample	Teck Coal Ltd	LC_LC5_WS_2021-08-10_	
LC_LCDSSLCC	Ambient Sample	Teck Coal Ltd	LC_LCDSSLCC_WS_2021-	
FR_FR4+15Cu	Ambient Sample	Teck Coal Ltd	FR_FR4_WS_2021-08-10_	
FR_FRRD+15Cu	Ambient Sample	Teck Coal Ltd	FR_FRRD_WS_2021-08-1	

Analyst: YK QA: MG NOV 09 2021

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID:	20-6526-8836	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.9.4
Analyzed:	30 Oct-21 15:26	**Analysis:**	Nonparametric-Control vs Treatments	**Status Level:**	1

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_FR2+20Cu	Ambient Sample	Teck Coal Ltd	FR_FR2_WS_2021-08-10_	
FR_MULTIPLATE	Ambient Sample	Teck Coal Ltd	FR_MULTIPLATE_WS_20	

Nemenyi-Damico-Wolfe Test

Sample I	vs	Sample II	Test Stat	Critical	Ties	P-Type	P-Value	Decision(α:5%)
Lab Control		10Cu Control	-65	211.4	0	CDF	0.9974	Non-Significant Effect
		15 Cu Control	37	211.4	0	CDF	0.8705	Non-Significant Effect
		20 Cu Control	-23	211.4	0	CDF	0.9825	Non-Significant Effect
		FR_UFR1+15Cu	68	211.4	0	CDF	0.7345	Non-Significant Effect
		GH_ER2+15Cu	11	211.4	0	CDF	0.9397	Non-Significant Effect
		CM_MC1+15Cu	141	211.4	0	CDF	0.2940	Non-Significant Effect
		LC_SLC+10Cu	-44	211.4	0	CDF	0.9929	Non-Significant Effect
		FR_FRABCH+20Cu	-30	211.4	0	CDF	0.9869	Non-Significant Effect
		FR_FRCP1+20Cu	27	211.4	0	CDF	0.9017	Non-Significant Effect
		GH_FR1+20Cu	23	211.4	0	CDF	0.9125	Non-Significant Effect
		GH_ERC+10Cu	-14	211.4	0	CDF	0.9750	Non-Significant Effect
		CM_MC2+20Cu	109	211.4	0	CDF	0.4871	Non-Significant Effect
		RG_MIDAG+15Cu	60	211.4	0	CDF	0.7751	Non-Significant Effect
		EV_MC2+20Cu	-18	211.4	0	CDF	0.9786	Non-Significant Effect
		EV_HC1+20Cu	150	211.4	0	CDF	0.2469	Non-Significant Effect
		LC_DCDS+20Cu	33	211.4	0	CDF	0.8837	Non-Significant Effect
		LC_LC3+15Cu	-54	211.4	0	CDF	0.9956	Non-Significant Effect
		LC_LC5+15Cu	1	211.4	0	CDF	0.9569	Non-Significant Effect
		LC_LCDSSLCC	81	211.4	0	CDF	0.6616	Non-Significant Effect
		FR_FR4+15Cu	69	211.4	0	CDF	0.7292	Non-Significant Effect
		FR_FRRD+15Cu	-89	211.4	0	CDF	0.9993	Non-Significant Effect
		FR_FR2+20Cu	-85	211.4	0	CDF	0.9991	Non-Significant Effect
		FR_MULTIPLATE	116	211.4	0	CDF	0.4427	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	4.104	3.37	0.0017	Outlier Detected
Treatment Effect	Fligner-Wolfe Omnibus Test	4483		0.3585	Non-Significant Overall Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	4.49634	0.195493	23	1.847	0.0258	Significant Effect
Error	7.61906	0.10582	72			
Total	12.1154		95			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Variances	Bartlett Equality of Variance Test	34.81	35.17	0.0544	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9596	0.9737	0.0048	Non-Normal Distribution

MG
NOV 09 2021

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 20-6526-8836 **Endpoint:** Mean Dry Biomass-mg **CETIS Version:** CETISv1.9.4
Analyzed: 30 Oct-21 15:26 **Analysis:** Nonparametric-Control vs Treatments **Status Level:** 1

Mean Dry Biomass-mg Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
Lab Control FM	LC	4	2.627	1.997	3.257	2.488	2.333	3.199	0.1981	15.08%	0.00%
10Cu Control		4	2.768	2.171	3.366	2.828	2.278	3.139	0.1879	13.57%	-5.38%
15 Cu Control		4	2.439	1.994	2.885	2.546	2.026	2.64	0.14	11.47%	7.15%
20 Cu Control		4	2.611	2.495	2.728	2.64	2.504	2.661	0.03658	2.80%	0.60%
FR_UFR1+15Cu		4	2.163	0.8123	3.514	2.308	1.001	3.036	0.4244	39.24%	17.67%
GH_ER2+15Cu		4	2.484	1.959	3.01	2.601	1.999	2.737	0.1651	13.29%	5.44%
CM_MC1+15Cu		4	1.909	1.062	2.757	1.845	1.331	2.615	0.2664	27.90%	27.33%
LC_SLC+10Cu		4	2.639	2.465	2.813	2.685	2.477	2.71	0.05459	4.14%	-0.45%
FR_FRABCH+20Cu		4	2.634	2.222	3.047	2.576	2.421	2.965	0.1297	9.85%	-0.27%
FR_FRCP1+20Cu		4	2.458	1.98	2.935	2.492	2.079	2.768	0.1501	12.22%	6.45%
GH_FR1+20Cu		4	2.511	2.25	2.772	2.55	2.279	2.665	0.082	6.53%	4.42%
GH_ERC+10Cu		4	2.58	2.29	2.87	2.593	2.364	2.771	0.09109	7.06%	1.78%
CM_MC2+20Cu		4	2.273	1.992	2.555	2.34	2.015	2.399	0.08836	7.77%	13.46%
RG_MIDAG+15Cu		4	2.406	2.053	2.76	2.353	2.206	2.713	0.1112	9.24%	8.41%
EV_MC2+20Cu		4	2.577	2.242	2.913	2.594	2.353	2.77	0.1054	8.18%	1.89%
EV_HC1+20Cu		4	2.065	1.635	2.495	1.986	1.851	2.437	0.1351	13.08%	21.39%
LC_DCDS+20Cu		4	2.457	2.005	2.909	2.438	2.143	2.808	0.142	11.56%	6.48%
LC_LC3+15Cu		4	2.663	2.343	2.982	2.695	2.412	2.847	0.1004	7.54%	-1.34%
LC_LC5+15Cu		4	2.538	2.182	2.894	2.624	2.215	2.689	0.1118	8.81%	3.39%
LC_LCDSSLCC		4	2.283	1.678	2.888	2.283	1.896	2.67	0.1902	16.66%	13.11%
FR_FR4+15Cu		4	2.356	1.645	3.067	2.276	1.901	2.971	0.2234	18.96%	10.31%
FR_FRRD+15Cu		4	2.735	2.532	2.938	2.771	2.555	2.843	0.06394	4.68%	-4.10%
FR_FR2+20Cu		4	2.748	2.405	3.091	2.77	2.465	2.988	0.1079	7.85%	-4.61%
FR_MULTIPLATE		4	2.233	1.92	2.546	2.205	2.041	2.482	0.09838	8.81%	14.99%

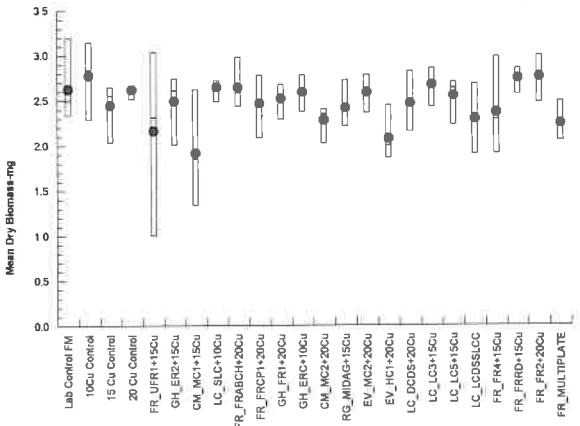
Mean Dry Biomass-mg Detail

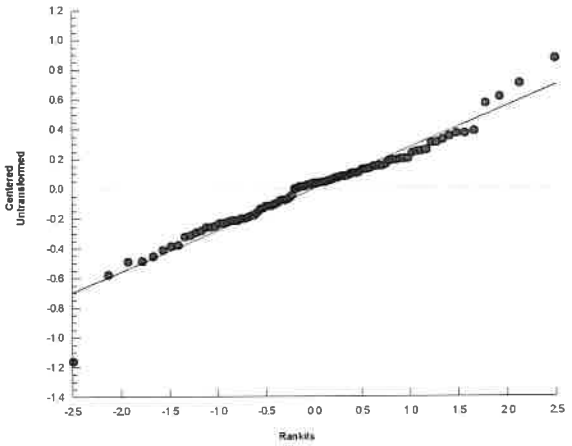
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Lab Control FM	LC	2.583	2.333	2.393	3.199
10Cu Control		2.278	2.69	2.967	3.139
15 Cu Control		2.52	2.026	2.64	2.571
20 Cu Control		2.661	2.504	2.654	2.626
FR_UFR1+15Cu		2.25	2.365	1.001	3.036
GH_ER2+15Cu		2.613	2.588	1.999	2.737
CM_MC1+15Cu		1.769	1.921	2.615	1.331
LC_SLC+10Cu		2.477	2.675	2.71	2.695
FR_FRABCH+20Cu		2.434	2.718	2.421	2.965
FR_FRCP1+20Cu		2.611	2.373	2.079	2.768
GH_FR1+20Cu		2.665	2.279	2.55	2.551
GH_ERC+10Cu		2.683	2.364	2.771	2.503
CM_MC2+20Cu		2.015	2.308	2.399	2.373
RG_MIDAG+15Cu		2.419	2.287	2.206	2.713
EV_MC2+20Cu		2.353	2.443	2.77	2.744
EV_HC1+20Cu		1.881	2.092	1.851	2.437
LC_DCDS+20Cu		2.143	2.339	2.808	2.537
LC_LC3+15Cu		2.591	2.8	2.412	2.847
LC_LC5+15Cu		2.689	2.215	2.561	2.687
LC_LCDSSLCC		2.542	1.896	2.023	2.67
FR_FR4+15Cu		2.257	2.295	1.901	2.971
FR_FRRD+15Cu		2.555	2.843	2.735	2.806
FR_FR2+20Cu		2.745	2.794	2.465	2.988
FR_MULTIPLATE		2.294	2.041	2.116	2.482

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID:	20-6526-8836	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.9.4
Analyzed:	30 Oct-21 15:26	**Analysis:**	Nonparametric-Control vs Treatments	**Status Level:**	1

Graphics





Analyst: KC QA: MG NOV 09 2021

CETIS Analytical Report

Test Code/ID: FM Lab Control / 06-2855-8538

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID:	08-6423-3754	**Endpoint:**	Hatch Rate	**CETIS Version:**	CETISv1.9.4
Analyzed:	02 Nov-21 9:22	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1
Batch ID:	19-0275-1751	**Test Type:**	32 Day Fathead Minnow Test	**Analyst:**	Kayla Knol
Start Date:	13 Aug-21	**Protocol:**	ASTM E1241-05 (2013)	**Diluent:**	Dechlorinated Tap Water
Ending Date:	13 Sep-21	**Species:**	Pimephales promelas	**Brine:**	
Test Length:	31d 0h	**Taxon:**	Actinopterygii	**Source:**	Aquatox, AR **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
Lab Control FM	11-5032-4817	10 Aug-21	11 Aug-21	72h	Teck Coal Ltd	
10Cu Control	04-3348-8996	10 Aug-21	11 Aug-21	72h		
15 Cu Control	05-5139-9319	10 Aug-21	11 Aug-21	72h		
20 Cu Control	18-8853-3252	10 Aug-21	11 Aug-21	72h		
FR_UFR1+15Cu	13-9616-5903	10 Aug-21	11 Aug-21	72h (14.7 °C)		
GH_ER2+15Cu	19-5052-7846	10 Aug-21	11 Aug-21	72h (12.1 °C)		
CM_MC1+15Cu	15-1448-1664	10 Aug-21	11 Aug-21	72h (12.3 °C)		
LC_SLC+10Cu	10-0118-5065	10 Aug-21	11 Aug-21	72h (11.8 °C)		
FR_FRABCH+20Cu	12-2763-5905	10 Aug-21	11 Aug-21	72h (14.6 °C)		
FR_FRCP1+20Cu	05-5162-7629	10 Aug-21	11 Aug-21	72h (13.8 °C)		
GH_FR1+20Cu	18-3989-2491	10 Aug-21	11 Aug-21	72h (12 °C)		
GH_ERC+10Cu	14-6940-9296	10 Aug-21	11 Aug-21	72h (15.4 °C)		
CM_MC2+20Cu	17-0166-2336	10 Aug-21	11 Aug-21	72h (13.1 °C)		
RG_MIDAG+15Cu	18-0148-8949	10 Aug-21	11 Aug-21	72h (12.4 °C)		
EV_MC2+20Cu	08-5423-9441	10 Aug-21	11 Aug-21	72h (13.1 °C)		
EV_HC1+20Cu	19-8320-0922	10 Aug-21	11 Aug-21	72h (12.1 °C)		
LC_DCDS+20Cu	12-7443-1043	10 Aug-21	11 Aug-21	72h (12.3 °C)		
LC_LC3+15Cu	06-5017-0795	10 Aug-21	11 Aug-21	72h (12.4 °C)		
LC_LC5+15Cu	10-4683-7945	10 Aug-21	11 Aug-21	72h (15.1 °C)		
LC_LCDSSLCC	11-9856-2953	10 Aug-21	11 Aug-21	72h (10.8 °C)		
FR_FR4+15Cu	16-1388-5677	10 Aug-21	11 Aug-21	72h (14.1 °C)		
FR_FRRD+15Cu	18-8883-2370	10 Aug-21	11 Aug-21	72h (14.7 °C)		
FR_FR2+20Cu	20-1752-8591	10 Aug-21	11 Aug-21	72h (15.3 °C)		
FR_MULTIPLATE	15-0654-9876	10 Aug-21	11 Aug-21	72h (13.6 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
Lab Control FM	Ambient Sample	Teck Coal Ltd	Lab Control FM	
10Cu Control	Ambient Sample	Teck Coal Ltd	10 Cu Control	
15 Cu Control	Ambient Sample	Teck Coal Ltd	15 Cu Control	
20 Cu Control	Ambient Sample	Teck Coal Ltd	20 Cu Control	
FR_UFR1+15Cu	Ambient Sample	Teck Coal Ltd	FR_UFR1_MON_2021-08-0	
GH_ER2+15Cu	Ambient Sample	Teck Coal Ltd	GH_ER2_WS_2021-08-10_	
CM_MC1+15Cu	Ambient Sample	Teck Coal Ltd	CM_MC1_WS_2021-08-10	
LC_SLC+10Cu	Ambient Sample	Teck Coal Ltd	LC_SLC_WS_2021-08-10_	
FR_FRABCH+20Cu	Ambient Sample	Teck Coal Ltd	FR_FRABCH_MON_2021-	
FR_FRCP1+20Cu	Ambient Sample	Teck Coal Ltd	FR_FRCP1_MON_2021-08	
GH_FR1+20Cu	Ambient Sample	Teck Coal Ltd	GH_FR1_WS_2021-08-10_	
GH_ERC+10Cu	Ambient Sample	Teck Coal Ltd	GH_ERC_WS_2021-08-10	
CM_MC2+20Cu	Ambient Sample	Teck Coal Ltd	CM_MC2_WS_2021-08-10	
RG_MIDAG+15Cu	Ambient Sample	Teck Coal Ltd	RG_MIDAG_WS_2021-08-	
EV_MC2+20Cu	Ambient Sample	Teck Coal Ltd	EV_MC2_WS_2021_Q3_W	
EV_HC1+20Cu	Ambient Sample	Teck Coal Ltd	EV_HC1_WS_2021_Q3_W	
LC_DCDS+20Cu	Ambient Sample	Teck Coal Ltd	LC_DCDS_WS_2021-08-1	
LC_LC3+15Cu	Ambient Sample	Teck Coal Ltd	LC_LC3_WS_2021-08-10_	
LC_LC5+15Cu	Ambient Sample	Teck Coal Ltd	LC_LC5_WS_2021-08-10_	
LC_LCDSSLCC	Ambient Sample	Teck Coal Ltd	LC_LCDSSLCC_WS_2021-	
FR_FR4+15Cu	Ambient Sample	Teck Coal Ltd	FR_FR4_WS_2021-08-10_	
FR_FRRD+15Cu	Ambient Sample	Teck Coal Ltd	FR_FRRD_WS_2021-08-1	

Analyst: KK QA: NOV 09 2021

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 08-6423-3754 **Endpoint:** Hatch Rate **CETIS Version:** CETISv1.9.4
Analyzed: 02 Nov-21 9:22 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_FR2+20Cu	Ambient Sample	Teck Coal Ltd	FR_FR2_WS_2021-08-10_	
FR_MULTIPLATE	Ambient Sample	Teck Coal Ltd	FR_MULTIPLATE_WS_20	

Fisher Exact/Bonferroni Adj Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
Lab Control		10Cu Control	0.7521	Exact	1.0000	Non-Significant Effect
		15 Cu Control	0.5000	Exact	1.0000	Non-Significant Effect
		20 Cu Control	0.3093	Exact	1.0000	Non-Significant Effect
		FR_UFR1+15Cu	0.1822	Exact	1.0000	Non-Significant Effect
		GH_ER2+15Cu	0.3093	Exact	1.0000	Non-Significant Effect
		CM_MC1+15Cu	0.0306	Exact	0.7043	Non-Significant Effect
		LC_SLC+10Cu	0.1822	Exact	1.0000	Non-Significant Effect
		FR_FRABCH+20Cu	0.1034	Exact	1.0000	Non-Significant Effect
		FR_FRCP1+20Cu	0.5000	Exact	1.0000	Non-Significant Effect
		GH_FR1+20Cu	0.5000	Exact	1.0000	Non-Significant Effect
		GH_ERC+10Cu	0.3093	Exact	1.0000	Non-Significant Effect
		CM_MC2+20Cu	0.7521	Exact	1.0000	Non-Significant Effect
		RG_MIDAG+15Cu	0.5000	Exact	1.0000	Non-Significant Effect
		EV_MC2+20Cu	0.5000	Exact	1.0000	Non-Significant Effect
		EV_HC1+20Cu	0.0306	Exact	0.7043	Non-Significant Effect
		LC_DCDS+20Cu	1.0000	Exact	1.0000	Non-Significant Effect
		LC_LC3+15Cu	1.0000	Exact	1.0000	Non-Significant Effect
		LC_LC5+15Cu	0.7521	Exact	1.0000	Non-Significant Effect
		LC_LCDSSLCC	0.5000	Exact	1.0000	Non-Significant Effect
		FR_FR4+15Cu	0.3093	Exact	1.0000	Non-Significant Effect
		FR_FRRD+15Cu	0.7521	Exact	1.0000	Non-Significant Effect
		FR_FR2+20Cu	0.5000	Exact	1.0000	Non-Significant Effect
		FR_MULTIPLATE	0.0306	Exact	0.7043	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	3.044	3.37	0.1764	No Outliers Detected

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 08-6423-3754 **Endpoint:** Hatch Rate **CETIS Version:** CETISv1.9.4
Analyzed: 02 Nov-21 9:22 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Data Summary

Sample	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
Lab Control FM	LC	59	1	60	0.9833	0.01667	0.0%
10Cu Control		59	1	60	0.9833	0.01667	0.0%
15 Cu Control		58	2	60	0.9667	0.03333	1.7%
20 Cu Control		57	3	60	0.95	0.05	3.39%
FR_UFR1+15Cu		56	4	60	0.9333	0.06667	5.09%
GH_ER2+15Cu		57	3	60	0.95	0.05	3.39%
CM_MC1+15Cu		53	7	60	0.8833	0.1167	10.17%
LC_SLC+10Cu		56	4	60	0.9333	0.06667	5.09%
FR_FRABCH+20Cu		55	5	60	0.9167	0.08333	6.78%
FR_FRCP1+20Cu		58	2	60	0.9667	0.03333	1.7%
GH_FR1+20Cu		58	2	60	0.9667	0.03333	1.7%
GH_ERC+10Cu		57	3	60	0.95	0.05	3.39%
CM_MC2+20Cu		59	1	60	0.9833	0.01667	0.0%
RG_MIDAG+15Cu		58	2	60	0.9667	0.03333	1.7%
EV_MC2+20Cu		58	2	60	0.9667	0.03333	1.7%
EV_HC1+20Cu		53	7	60	0.8833	0.1167	10.17%
LC_DCDS+20Cu		60	0	60	1	0	-1.7%
LC_LC3+15Cu		60	0	60	1	0	-1.7%
LC_LC5+15Cu		59	1	60	0.9833	0.01667	0.0%
LC_LCDSSLCC		58	2	60	0.9667	0.03333	1.7%
FR_FR4+15Cu		57	3	60	0.95	0.05	3.39%
FR_FRRD+15Cu		59	1	60	0.9833	0.01667	0.0%
FR_FR2+20Cu		58	2	60	0.9667	0.03333	1.7%
FR_MULTIPLATE		53	7	60	0.8833	0.1167	10.17%

Hatch Rate Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Lab Control FM	LC	0.9333	1.0000	1.0000	1.0000
10Cu Control		1.0000	1.0000	0.9333	1.0000
15 Cu Control		1.0000	0.9333	1.0000	0.9333
20 Cu Control		0.9333	0.9333	1.0000	0.9333
FR_UFR1+15Cu		0.9333	1.0000	0.9333	0.8667
GH_ER2+15Cu		1.0000	0.9333	0.8667	1.0000
CM_MC1+15Cu		0.8667	0.9333	0.8667	0.8667
LC_SLC+10Cu		0.9333	0.9333	0.9333	0.9333
FR_FRABCH+20Cu		0.8667	0.8667	1.0000	0.9333
FR_FRCP1+20Cu		1.0000	0.9333	0.9333	1.0000
GH_FR1+20Cu		1.0000	1.0000	1.0000	0.8667
GH_ERC+10Cu		0.9333	1.0000	0.8667	1.0000
CM_MC2+20Cu		0.9333	1.0000	1.0000	1.0000
RG_MIDAG+15Cu		1.0000	1.0000	1.0000	0.8667
EV_MC2+20Cu		1.0000	1.0000	0.9333	0.9333
EV_HC1+20Cu		0.8667	0.8000	0.8667	1.0000
LC_DCDS+20Cu		1.0000	1.0000	1.0000	1.0000
LC_LC3+15Cu		1.0000	1.0000	1.0000	1.0000
LC_LC5+15Cu		1.0000	1.0000	1.0000	0.9333
LC_LCDSSLCC		0.9333	1.0000	1.0000	0.9333
FR_FR4+15Cu		1.0000	1.0000	1.0000	0.8000
FR_FRRD+15Cu		1.0000	1.0000	1.0000	0.9333
FR_FR2+20Cu		0.9333	1.0000	1.0000	0.9333
FR_MULTIPLATE		0.8000	0.8000	1.0000	0.9333

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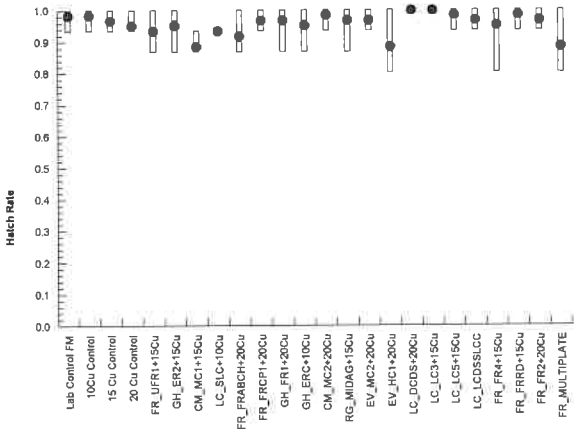
Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 08-6423-3754 **Endpoint:** Hatch Rate **CETIS Version:** CETISv1.9.4
Analyzed: 02 Nov-21 9:22 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Hatch Rate Binomials

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Lab Control FM	LC	14/15	15/15	15/15	15/15
10Cu Control		15/15	15/15	14/15	15/15
15 Cu Control		15/15	14/15	15/15	14/15
20 Cu Control		14/15	14/15	15/15	14/15
FR_UFR1+15Cu		14/15	15/15	14/15	13/15
GH_ER2+15Cu		15/15	14/15	13/15	15/15
CM_MC1+15Cu		13/15	14/15	13/15	13/15
LC_SLC+10Cu		14/15	14/15	14/15	14/15
FR_FRABCH+20Cu		13/15	13/15	15/15	14/15
FR_FRCP1+20Cu		15/15	14/15	14/15	15/15
GH_FR1+20Cu		15/15	15/15	15/15	13/15
GH_ERC+10Cu		14/15	15/15	13/15	15/15
CM_MC2+20Cu		14/15	15/15	15/15	15/15
RG_MIDAG+15Cu		15/15	15/15	15/15	13/15
EV_MC2+20Cu		15/15	15/15	14/15	14/15
EV_HC1+20Cu		13/15	12/15	13/15	15/15
LC_DCDS+20Cu		15/15	15/15	15/15	15/15
LC_LC3+15Cu		15/15	15/15	15/15	15/15
LC_LC5+15Cu		15/15	15/15	15/15	14/15
LC_LCDSSLCC		14/15	15/15	15/15	14/15
FR_FR4+15Cu		15/15	15/15	15/15	12/15
FR_FRRD+15Cu		15/15	15/15	15/15	14/15
FR_FR2+20Cu		14/15	15/15	15/15	14/15
FR_MULTIPLATE		12/15	12/15	15/15	14/15

Graphics



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CETIS Analytical Report

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID:	10-8030-5525	**Endpoint:**	Length	**CETIS Version:**	CETISv1.9.4
Analyzed:	30 Oct-21 15:24	**Analysis:**	Parametric-Control vs Treatments	**Status Level:**	1
Batch ID:	19-0275-1751	**Test Type:**	32 Day Fathead Minnow Test	**Analyst:**	Kayla Knol
Start Date:	13 Aug-21	**Protocol:**	ASTM E1241-05 (2013)	**Diluent:**	Dechlorinated Tap Water
Ending Date:	13 Sep-21	**Species:**	Pimephales promelas	**Brine:**	
Test Length:	31d 0h	**Taxon:**	Actinopterygii	**Source:**	Aquatox, AR **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
Lab Control FM	11-5032-4817	10 Aug-21	11 Aug-21	72h	Teck Coal Ltd	
10Cu Control	04-3348-8996	10 Aug-21	11 Aug-21	72h		
15 Cu Control	05-5139-9319	10 Aug-21	11 Aug-21	72h		
20 Cu Control	18-8853-3252	10 Aug-21	11 Aug-21	72h		
FR_UFR1+15Cu	13-9616-5903	10 Aug-21	11 Aug-21	72h (14.7 °C)		
GH_ER2+15Cu	19-5052-7846	10 Aug-21	11 Aug-21	72h (12.1 °C)		
CM_MC1+15Cu	15-1448-1664	10 Aug-21	11 Aug-21	72h (12.3 °C)		
LC_SLC+10Cu	10-0118-5065	10 Aug-21	11 Aug-21	72h (11.8 °C)		
FR_FRABCH+20Cu	12-2763-5905	10 Aug-21	11 Aug-21	72h (14.6 °C)		
FR_FRCP1+20Cu	05-5162-7629	10 Aug-21	11 Aug-21	72h (13.8 °C)		
GH_FR1+20Cu	18-3989-2491	10 Aug-21	11 Aug-21	72h (12 °C)		
GH_ERC+10Cu	14-6940-9296	10 Aug-21	11 Aug-21	72h (15.4 °C)		
CM_MC2+20Cu	17-0166-2336	10 Aug-21	11 Aug-21	72h (13.1 °C)		
RG_MIDAG+15Cu	18-0148-8949	10 Aug-21	11 Aug-21	72h (12.4 °C)		
EV_MC2+20Cu	08-5423-9441	10 Aug-21	11 Aug-21	72h (13.1 °C)		
EV_HC1+20Cu	19-8320-0922	10 Aug-21	11 Aug-21	72h (12.1 °C)		
LC_DCDS+20Cu	12-7443-1043	10 Aug-21	11 Aug-21	72h (12.3 °C)		
LC_LC3+15Cu	06-5017-0795	10 Aug-21	11 Aug-21	72h (12.4 °C)		
LC_LC5+15Cu	10-4683-7945	10 Aug-21	11 Aug-21	72h (15.1 °C)		
LC_LCDSSLCC	11-9856-2953	10 Aug-21	11 Aug-21	72h (10.8 °C)		
FR_FR4+15Cu	16-1388-5677	10 Aug-21	11 Aug-21	72h (14.1 °C)		
FR_FRRD+15Cu	18-8883-2370	10 Aug-21	11 Aug-21	72h (14.7 °C)		
FR_FR2+20Cu	20-1752-8591	10 Aug-21	11 Aug-21	72h (15.3 °C)		
FR_MULTIPLATE	15-0654-9876	10 Aug-21	11 Aug-21	72h (13.6 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
Lab Control FM	Ambient Sample	Teck Coal Ltd	Lab Control FM	
10Cu Control	Ambient Sample	Teck Coal Ltd	10 Cu Control	
15 Cu Control	Ambient Sample	Teck Coal Ltd	15 Cu Control	
20 Cu Control	Ambient Sample	Teck Coal Ltd	20 Cu Control	
FR_UFR1+15Cu	Ambient Sample	Teck Coal Ltd	FR_UFR1_MON_2021-08-0	
GH_ER2+15Cu	Ambient Sample	Teck Coal Ltd	GH_ER2_WS_2021-08-10_	
CM_MC1+15Cu	Ambient Sample	Teck Coal Ltd	CM_MC1_WS_2021-08-10	
LC_SLC+10Cu	Ambient Sample	Teck Coal Ltd	LC_SLC_WS_2021-08-10_	
FR_FRABCH+20Cu	Ambient Sample	Teck Coal Ltd	FR_FRABCH_MON_2021-	
FR_FRCP1+20Cu	Ambient Sample	Teck Coal Ltd	FR_FRCP1_MON_2021-08	
GH_FR1+20Cu	Ambient Sample	Teck Coal Ltd	GH_FR1_WS_2021-08-10_	
GH_ERC+10Cu	Ambient Sample	Teck Coal Ltd	GH_ERC_WS_2021-08-10	
CM_MC2+20Cu	Ambient Sample	Teck Coal Ltd	CM_MC2_WS_2021-08-10	
RG_MIDAG+15Cu	Ambient Sample	Teck Coal Ltd	RG_MIDAG_WS_2021-08-	
EV_MC2+20Cu	Ambient Sample	Teck Coal Ltd	EV_MC2_WS_2021_Q3_W	
EV_HC1+20Cu	Ambient Sample	Teck Coal Ltd	EV_HC1_WS_2021_Q3_W	
LC_DCDS+20Cu	Ambient Sample	Teck Coal Ltd	LC_DCDS_WS_2021-08-1	
LC_LC3+15Cu	Ambient Sample	Teck Coal Ltd	LC_LC3_WS_2021-08-10_	
LC_LC5+15Cu	Ambient Sample	Teck Coal Ltd	LC_LC5_WS_2021-08-10_	
LC_LCDSSLCC	Ambient Sample	Teck Coal Ltd	LC_LCDSSLCC_WS_2021-	
FR_FR4+15Cu	Ambient Sample	Teck Coal Ltd	FR_FR4_WS_2021-08-10_	
FR_FRRD+15Cu	Ambient Sample	Teck Coal Ltd	FR_FRRD_WS_2021-08-1	

Analyst: KK QA: NOV 09 2021

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID:	10-8030-5525	**Endpoint:**	Length	**CETIS Version:**	CETISv1.9.4
Analyzed:	30 Oct-21 15:24	**Analysis:**	Parametric-Control vs Treatments	**Status Level:**	1

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_FR2+20Cu	Ambient Sample	Teck Coal Ltd	FR_FR2_WS_2021-08-10_	
FR_MULTIPLATE	Ambient Sample	Teck Coal Ltd	FR_MULTIPLATE_WS_20	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	10Cu Control passed length	11.83%
		15 Cu Control passed length	11.83%
		20 Cu Control passed length	11.83%
		FR_UFR1+15Cu passed length	11.83%
		GH_ER2+15Cu passed length	11.83%
		CM_MC1+15Cu passed length	11.83%
		LC_SLC+10Cu passed length	11.83%
		FR_FRABCH+20Cu passed length	11.83%
		FR_FRCP1+20Cu passed length	11.83%
		GH_FR1+20Cu passed length	11.83%
		GH_ERC+10Cu passed length	11.83%
		CM_MC2+20Cu passed length	11.83%
		RG_MIDAG+15Cu passed length	11.83%
		EV_MC2+20Cu passed length	11.83%
		EV_HC1+20Cu passed length	11.83%
		LC_DCDS+20Cu passed length	11.83%
		LC_LC3+15Cu passed length	11.83%
		LC_LC5+15Cu passed length	11.83%
		LC_LCDSSLCC passed length	11.83%
		FR_FR4+15Cu passed length	11.83%
		FR_FRRD+15Cu passed length	11.83%
		FR_FR2+20Cu passed length	11.83%
		FR_MULTIPLATE passed length	11.83%

Dunnett Multiple Comparison Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Lab Control		10Cu Control	-1.023	2.744	1.408	6	CDF	0.9988	Non-Significant Effect
		15 Cu Control	-0.9257	2.744	1.408	6	CDF	0.9982	Non-Significant Effect
		20 Cu Control	-2.193	2.744	1.408	6	CDF	1.0000	Non-Significant Effect
		FR_UFR1+15Cu	0.3898	2.744	1.408	6	CDF	0.8909	Non-Significant Effect
		GH_ER2+15Cu	1.462	2.744	1.408	6	CDF	0.4511	Non-Significant Effect
		CM_MC1+15Cu	1.851	2.744	1.408	6	CDF	0.2743	Non-Significant Effect
		LC_SLC+10Cu	0	2.744	1.408	6	CDF	0.9583	Non-Significant Effect
		FR_FRABCH+20Cu	0.3898	2.744	1.408	6	CDF	0.8909	Non-Significant Effect
		FR_FRCP1+20Cu	2.241	2.744	1.408	6	CDF	0.1435	Non-Significant Effect
		GH_FR1+20Cu	1.851	2.744	1.408	6	CDF	0.2743	Non-Significant Effect
		GH_ERC+10Cu	-1.559	2.744	1.408	6	CDF	0.9999	Non-Significant Effect
		CM_MC2+20Cu	-1.072	2.744	1.408	6	CDF	0.9990	Non-Significant Effect
		RG_MIDAG+15Cu	1.608	2.744	1.408	6	CDF	0.3810	Non-Significant Effect
		EV_MC2+20Cu	2.144	2.744	1.408	6	CDF	0.1711	Non-Significant Effect
		EV_HC1+20Cu	-0.5359	2.744	1.408	6	CDF	0.9922	Non-Significant Effect
		LC_DCDS+20Cu	-0.8283	2.744	1.408	6	CDF	0.9974	Non-Significant Effect
		LC_LC3+15Cu	-0.5359	2.744	1.408	6	CDF	0.9922	Non-Significant Effect
		LC_LC5+15Cu	-1.413	2.744	1.408	6	CDF	0.9998	Non-Significant Effect
		LC_LCDSSLCC	-0.3411	2.744	1.408	6	CDF	0.9850	Non-Significant Effect
		FR_FR4+15Cu	1.316	2.744	1.408	6	CDF	0.5234	Non-Significant Effect
		FR_FRRD+15Cu	1.949	2.744	1.408	6	CDF	0.2366	Non-Significant Effect
		FR_FR2+20Cu	1.169	2.744	1.408	6	CDF	0.5953	Non-Significant Effect
		FR_MULTIPLATE	1.51	2.744	1.408	6	CDF	0.4274	Non-Significant Effect

Auxiliary Tests

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Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 10-8030-5525 **Endpoint:** Length **CETIS Version:** CETISv1.9.4
Analyzed: 30 Oct-21 15:24 **Analysis:** Parametric-Control vs Treatments **Status Level:** 1

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	3.285	3.37	0.0706	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	44.2591	1.92431	23	3.654	1.3E-05	Significant Effect
Error	37.9125	0.526563	72			
Total	82.1716		95			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Variances	Bartlett Equality of Variance Test	33.4	35.17	0.0744	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9854	0.9737	0.3692	Normal Distribution

Length Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
Lab Control FM	LC	4	11.9	11.15	12.65	11.95	11.3	12.4	0.2345	3.94%	0.00%
10Cu Control		4	12.43	11.66	13.19	12.55	11.8	12.8	0.2394	3.85%	-4.41%
15 Cu Control		4	12.37	10.89	13.86	12.35	11.4	13.4	0.4661	7.53%	-3.99%
20 Cu Control		4	13.03	12.67	13.38	13	12.8	13.3	0.1109	1.70%	-9.45%
FR_UFR1+15Cu		4	11.7	10.85	12.55	11.95	10.9	12	0.2677	4.58%	1.68%
GH_ER2+15Cu		4	11.15	10.87	11.43	11.15	11	11.3	0.0866	1.55%	6.30%
CM_MC1+15Cu		4	10.95	10.06	11.84	11.05	10.2	11.5	0.2784	5.08%	7.98%
LC_SLC+10Cu		4	11.9	11.12	12.68	11.8	11.5	12.5	0.2449	4.12%	0.00%
FR_FRABCH+20Cu		4	11.7	10.38	13.02	11.65	10.8	12.7	0.4143	7.08%	1.68%
FR_FRCP1+20Cu		4	10.75	9.243	12.26	11	9.4	11.6	0.4735	8.81%	9.66%
GH_FR1+20Cu		4	10.95	10.33	11.57	10.95	10.5	11.4	0.1936	3.54%	7.98%
GH_ERC+10Cu		4	12.7	12.15	13.25	12.7	12.4	13	0.1732	2.73%	-6.72%
CM_MC2+20Cu		4	12.45	11.06	13.84	12.55	11.3	13.4	0.4368	7.02%	-4.62%
RG_MIDAG+15Cu		4	11.08	10.09	12.06	10.9	10.6	11.9	0.3092	5.58%	6.93%
EV_MC2+20Cu		4	10.8	9.236	12.36	10.6	9.9	12.1	0.4916	9.10%	9.24%
EV_HC1+20Cu		4	12.18	9.553	14.8	12.55	10.1	13.5	0.824	13.54%	-2.31%
LC_DCDS+20Cu		4	12.33	11.45	13.2	12.45	11.6	12.8	0.275	4.46%	-3.57%
LC_LC3+15Cu		4	12.18	10.8	13.55	12.15	11.3	13.1	0.4308	7.08%	-2.31%
LC_LC5+15Cu		4	12.62	10.78	14.47	12.75	11.2	13.8	0.5808	9.20%	-6.09%
LC_LCDSSLCC		4	12.08	11.47	12.68	12.1	11.6	12.5	0.1887	3.13%	-1.47%
FR_FR4+15Cu		4	11.23	10.62	11.83	11.2	10.8	11.7	0.1887	3.36%	5.67%
FR_FRRD+15Cu		4	10.9	10.47	11.33	11	10.5	11.1	0.1354	2.48%	8.40%
FR_FR2+20Cu		4	11.3	10.58	12.02	11.2	10.9	11.9	0.2273	4.02%	5.04%
FR_MULTIPLATE		4	11.12	9.736	12.51	11	10.2	12.3	0.4366	7.85%	6.51%

MG

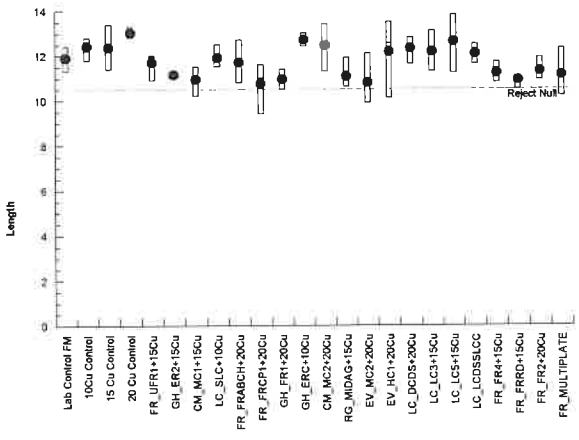
Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

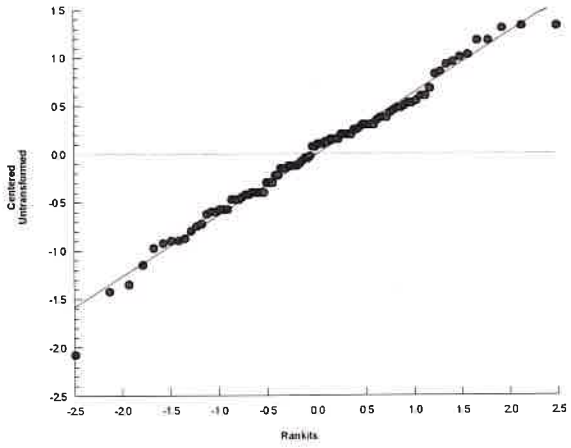
Analysis ID: 10-8030-5525 **Endpoint:** Length **CETIS Version:** CETISv1.9.4
Analyzed: 30 Oct-21 15:24 **Analysis:** Parametric-Control vs Treatments **Status Level:** 1

Length Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Lab Control FM	LC	12.4	11.3	12.1	11.8
10Cu Control		11.8	12.3	12.8	12.8
15 Cu Control		12.9	11.8	13.4	11.4
20 Cu Control		13.3	12.9	12.8	13.1
FR_UFR1+15Cu		11.9	10.9	12	12
GH_ER2+15Cu		11.3	11.3	11	11
CM_MC1+15Cu		11.5	10.9	11.2	10.2
LC_SLC+10Cu		11.5	12.5	12.1	11.5
FR_FRABCH+20Cu		12.7	12	10.8	11.3
FR_FRCP1+20Cu		11.1	10.9	9.4	11.6
GH_FR1+20Cu		11.1	10.5	10.8	11.4
GH_ERC+10Cu		13	12.4	12.4	13
CM_MC2+20Cu		12.7	11.3	12.4	13.4
RG_MIDAG+15Cu		10.6	10.6	11.2	11.9
EV_MC2+20Cu		9.9	10.2	11	12.1
EV_HC1+20Cu		13.5	11.6	13.5	10.1
LC_DCDS+20Cu		12.7	12.8	12.2	11.6
LC_LC3+15Cu		12.7	13.1	11.3	11.6
LC_LC5+15Cu		11.2	13.3	12.2	13.8
LC_LCDSSLCC		12.2	12	11.6	12.5
FR_FR4+15Cu		11.3	10.8	11.1	11.7
FR_FRRD+15Cu		10.5	11	11	11.1
FR_FR2+20Cu		11	11.9	11.4	10.9
FR_MULTIPLATE		11.1	12.3	10.2	10.9

Graphics





CETIS Analytical Report

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID:	11-7932-6502	**Endpoint:**	Proportion Normal	**CETIS Version:**	CETISv1.9.4
Analyzed:	30 Oct-21 15:28	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1
Batch ID:	19-0275-1751	**Test Type:**	32 Day Fathead Minnow Test	**Analyst:**	Kayla Knol
Start Date:	13 Aug-21	**Protocol:**	ASTM E1241-05 (2013)	**Diluent:**	Dechlorinated Tap Water
Ending Date:	13 Sep-21	**Species:**	Pimephales promelas	**Brine:**	
Test Length:	31d 0h	**Taxon:**	Actinopterygii	**Source:**	Aquatox, AR **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
Lab Control FM	11-5032-4817	10 Aug-21	11 Aug-21	72h	Teck Coal Ltd	
10Cu Control	04-3348-8996	10 Aug-21	11 Aug-21	72h		
15 Cu Control	05-5139-9319	10 Aug-21	11 Aug-21	72h		
20 Cu Control	18-8853-3252	10 Aug-21	11 Aug-21	72h		
FR_UFR1+15Cu	13-9616-5903	10 Aug-21	11 Aug-21	72h (14.7 °C)		
GH_ER2+15Cu	19-5052-7846	10 Aug-21	11 Aug-21	72h (12.1 °C)		
CM_MC1+15Cu	15-1448-1664	10 Aug-21	11 Aug-21	72h (12.3 °C)		
LC_SLC+10Cu	10-0118-5065	10 Aug-21	11 Aug-21	72h (11.8 °C)		
FR_FRABCH+20Cu	12-2763-5905	10 Aug-21	11 Aug-21	72h (14.6 °C)		
FR_FRCP1+20Cu	05-5162-7629	10 Aug-21	11 Aug-21	72h (13.8 °C)		
GH_FR1+20Cu	18-3989-2491	10 Aug-21	11 Aug-21	72h (12 °C)		
GH_ERC+10Cu	14-6940-9296	10 Aug-21	11 Aug-21	72h (15.4 °C)		
CM_MC2+20Cu	17-0166-2336	10 Aug-21	11 Aug-21	72h (13.1 °C)		
RG_MIDAG+15Cu	18-0148-8949	10 Aug-21	11 Aug-21	72h (12.4 °C)		
EV_MC2+20Cu	08-5423-9441	10 Aug-21	11 Aug-21	72h (13.1 °C)		
EV_HC1+20Cu	19-8320-0922	10 Aug-21	11 Aug-21	72h (12.1 °C)		
LC_DCDS+20Cu	12-7443-1043	10 Aug-21	11 Aug-21	72h (12.3 °C)		
LC_LC3+15Cu	06-5017-0795	10 Aug-21	11 Aug-21	72h (12.4 °C)		
LC_LC5+15Cu	10-4683-7945	10 Aug-21	11 Aug-21	72h (15.1 °C)		
LC_LCDSSLCC	11-9856-2953	10 Aug-21	11 Aug-21	72h (10.8 °C)		
FR_FR4+15Cu	16-1388-5677	10 Aug-21	11 Aug-21	72h (14.1 °C)		
FR_FRRD+15Cu	18-8883-2370	10 Aug-21	11 Aug-21	72h (14.7 °C)		
FR_FR2+20Cu	20-1752-8591	10 Aug-21	11 Aug-21	72h (15.3 °C)		
FR_MULTIPLATE	15-0654-9876	10 Aug-21	11 Aug-21	72h (13.6 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
Lab Control FM	Ambient Sample	Teck Coal Ltd	Lab Control FM	
10Cu Control	Ambient Sample	Teck Coal Ltd	10 Cu Control	
15 Cu Control	Ambient Sample	Teck Coal Ltd	15 Cu Control	
20 Cu Control	Ambient Sample	Teck Coal Ltd	20 Cu Control	
FR_UFR1+15Cu	Ambient Sample	Teck Coal Ltd	FR_UFR1_MON_2021-08-0	
GH_ER2+15Cu	Ambient Sample	Teck Coal Ltd	GH_ER2_WS_2021-08-10_	
CM_MC1+15Cu	Ambient Sample	Teck Coal Ltd	CM_MC1_WS_2021-08-10	
LC_SLC+10Cu	Ambient Sample	Teck Coal Ltd	LC_SLC_WS_2021-08-10_	
FR_FRABCH+20Cu	Ambient Sample	Teck Coal Ltd	FR_FRABCH_MON_2021-	
FR_FRCP1+20Cu	Ambient Sample	Teck Coal Ltd	FR_FRCP1_MON_2021-08	
GH_FR1+20Cu	Ambient Sample	Teck Coal Ltd	GH_FR1_WS_2021-08-10_	
GH_ERC+10Cu	Ambient Sample	Teck Coal Ltd	GH_ERC_WS_2021-08-10	
CM_MC2+20Cu	Ambient Sample	Teck Coal Ltd	CM_MC2_WS_2021-08-10	
RG_MIDAG+15Cu	Ambient Sample	Teck Coal Ltd	RG_MIDAG_WS_2021-08-	
EV_MC2+20Cu	Ambient Sample	Teck Coal Ltd	EV_MC2_WS_2021_Q3_W	
EV_HC1+20Cu	Ambient Sample	Teck Coal Ltd	EV_HC1_WS_2021_Q3_W	
LC_DCDS+20Cu	Ambient Sample	Teck Coal Ltd	LC_DCDS_WS_2021-08-1	
LC_LC3+15Cu	Ambient Sample	Teck Coal Ltd	LC_LC3_WS_2021-08-10_	
LC_LC5+15Cu	Ambient Sample	Teck Coal Ltd	LC_LC5_WS_2021-08-10_	
LC_LCDSSLCC	Ambient Sample	Teck Coal Ltd	LC_LCDSSLCC_WS_2021-	
FR_FR4+15Cu	Ambient Sample	Teck Coal Ltd	FR_FR4_WS_2021-08-10_	
FR_FRRD+15Cu	Ambient Sample	Teck Coal Ltd	FR_FRRD_WS_2021-08-1	

Analyst: KL QA: NOV 09 2021

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID:	11-7932-6502	**Endpoint:**	Proportion Normal	**CETIS Version:**	CETISv1.9.4
Analyzed:	30 Oct-21 15:28	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_FR2+20Cu	Ambient Sample	Teck Coal Ltd	FR_FR2_WS_2021-08-10_	
FR_MULTIPLATE	Ambient Sample	Teck Coal Ltd	FR_MULTIPLATE_WS_20	

Fisher Exact/Bonferroni Adj Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
Lab Control		10Cu Control	0.4949	Exact	1.0000	Non-Significant Effect
		15 Cu Control	0.4505	Exact	1.0000	Non-Significant Effect
		20 Cu Control	0.2111	Exact	1.0000	Non-Significant Effect
		FR_UFR1+15Cu	1.0000	Exact	1.0000	Non-Significant Effect
		GH_ER2+15Cu	0.4737	Exact	1.0000	Non-Significant Effect
		CM_MC1+15Cu	0.3976	Exact	1.0000	Non-Significant Effect
		LC_SLC+10Cu	0.4898	Exact	1.0000	Non-Significant Effect
		FR_FRABCH+20Cu	1.0000	Exact	1.0000	Non-Significant Effect
		FR_FRCP1+20Cu	0.2270	Exact	1.0000	Non-Significant Effect
		GH_FR1+20Cu	0.1100	Exact	1.0000	Non-Significant Effect
		GH_ERC+10Cu	0.4253	Exact	1.0000	Non-Significant Effect
		CM_MC2+20Cu	1.0000	Exact	1.0000	Non-Significant Effect
		RG_MIDAG+15Cu	0.0491	Exact	1.0000	Non-Significant Effect
		EV_MC2+20Cu	0.0563	Exact	1.0000	Non-Significant Effect
		EV_HC1+20Cu	0.3827	Exact	1.0000	Non-Significant Effect
		LC_DCDS+20Cu	0.1948	Exact	1.0000	Non-Significant Effect
		LC_LC3+15Cu	0.2002	Exact	1.0000	Non-Significant Effect
		LC_LC5+15Cu	0.4444	Exact	1.0000	Non-Significant Effect
		LC_LCDSSLCC	0.3976	Exact	1.0000	Non-Significant Effect
		FR_FR4+15Cu	0.0358	Exact	0.8226	Non-Significant Effect
		FR_FRRD+15Cu	0.5050	Exact	1.0000	Non-Significant Effect
		FR_FR2+20Cu	0.4949	Exact	1.0000	Non-Significant Effect
		FR_MULTIPLATE	0.4565	Exact	1.0000	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	2.949	3.37	0.2489	No Outliers Detected
Treatment Effect	Fligner-Wolfe Omnibus Test	1.339	1.645	0.0903	Non-Significant Overall Effect

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Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 11-7932-6502 **Endpoint:** Proportion Normal **CETIS Version:** CETISv1.9.4
Analyzed: 30 Oct-21 15:28 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Data Summary

Sample	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
Lab Control FM	LC	50	0	50	1	0	0.0%
10Cu Control		48	1	49	0.9796	0.02041	2.04%
15 Cu Control		40	1	41	0.9756	0.02439	2.44%
20 Cu Control		41	2	43	0.9535	0.04651	4.65%
FR_UFR1+15Cu		31	0	31	1	0	0.0%
GH_ER2+15Cu		44	1	45	0.9778	0.02222	2.22%
CM_MC1+15Cu		32	1	33	0.9697	0.0303	3.03%
LC_SLC+10Cu		47	1	48	0.9792	0.02083	2.08%
FR_FRABCH+20Cu		41	0	41	1	0	0.0%
FR_FRCP1+20Cu		44	2	46	0.9565	0.04348	4.35%
GH_FR1+20Cu		44	3	47	0.9362	0.06383	6.38%
GH_ERC+10Cu		36	1	37	0.973	0.02703	2.7%
CM_MC2+20Cu		40	0	40	1	0	0.0%
RG_MIDAG+15Cu		42	4	46	0.913	0.08696	8.7%
EV_MC2+20Cu		45	4	49	0.9184	0.08163	8.16%
EV_HC1+20Cu		30	1	31	0.9677	0.03226	3.23%
LC_DCDS+20Cu		38	2	40	0.95	0.05	5.0%
LC_LC3+15Cu		39	2	41	0.9512	0.04878	4.88%
LC_LC5+15Cu		39	1	40	0.975	0.025	2.5%
LC_LCDSSLCC		32	1	33	0.9697	0.0303	3.03%
FR_FR4+15Cu		36	4	40	0.9	0.1	10.0%
FR_FRRD+15Cu		50	1	51	0.9804	0.01961	1.96%
FR_FR2+20Cu		48	1	49	0.9796	0.02041	2.04%
FR_MULTIPLATE		41	1	42	0.9762	0.02381	2.38%

Proportion Normal Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Lab Control FM	LC	1.0000	1.0000	1.0000	1.0000
10Cu Control		1.0000	1.0000	1.0000	0.9231
15 Cu Control		1.0000	1.0000	1.0000	0.9286
20 Cu Control		1.0000	0.8750	1.0000	0.8889
FR_UFR1+15Cu		1.0000	1.0000	1.0000	1.0000
GH_ER2+15Cu		0.9167	1.0000	1.0000	1.0000
CM_MC1+15Cu		1.0000	1.0000	1.0000	0.8000
LC_SLC+10Cu		0.9167	1.0000	1.0000	1.0000
FR_FRABCH+20Cu		1.0000	1.0000	1.0000	1.0000
FR_FRCP1+20Cu		0.9167	1.0000	0.8889	1.0000
GH_FR1+20Cu		1.0000	0.9167	0.8333	1.0000
GH_ERC+10Cu		1.0000	0.8889	1.0000	1.0000
CM_MC2+20Cu		1.0000	1.0000	1.0000	1.0000
RG_MIDAG+15Cu		0.8462	0.9000	1.0000	0.9000
EV_MC2+20Cu		0.8462	0.9231	0.9231	1.0000
EV_HC1+20Cu		1.0000	1.0000	1.0000	0.9333
LC_DCDS+20Cu		0.8571	1.0000	0.9091	1.0000
LC_LC3+15Cu		1.0000	1.0000	0.9167	0.9091
LC_LC5+15Cu		0.9231	1.0000	1.0000	1.0000
LC_LCDSSLCC		1.0000	1.0000	1.0000	0.9000
FR_FR4+15Cu		1.0000	0.7500	1.0000	0.9091
FR_FRRD+15Cu		1.0000	0.9167	1.0000	1.0000
FR_FR2+20Cu		1.0000	1.0000	1.0000	0.9286
FR_MULTIPLATE		0.9000	1.0000	1.0000	1.0000

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NOV 09 2021

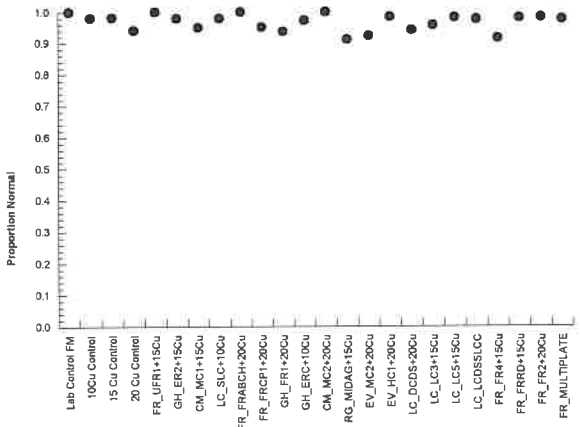
Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 11-7932-6502 **Endpoint:** Proportion Normal **CETIS Version:** CETISv1.9.4
Analyzed: 30 Oct-21 15:28 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Proportion Normal Binomials

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Lab Control FM	LC	12/12	14/14	11/11	13/13
10Cu Control		12/12	12/12	12/12	12/13
15 Cu Control		11/11	8/8	8/8	13/14
20 Cu Control		12/12	7/8	14/14	8/9
FR_UFR1+15Cu		8/8	11/11	3/3	9/9
GH_ER2+15Cu		11/12	13/13	8/8	12/12
CM_MC1+15Cu		8/8	9/9	11/11	4/5
LC_SLC+10Cu		11/12	11/11	12/12	13/13
FR_FRABCH+20Cu		9/9	9/9	11/11	12/12
FR_FRCP1+20Cu		11/12	14/14	8/9	11/11
GH_FR1+20Cu		12/12	11/12	10/12	11/11
GH_ERC+10Cu		9/9	8/9	11/11	8/8
CM_MC2+20Cu		7/7	15/15	11/11	7/7
RG_MIDAG+15Cu		11/13	9/10	13/13	9/10
EV_MC2+20Cu		11/13	12/13	12/13	10/10
EV_HC1+20Cu		4/4	8/8	4/4	14/15
LC_DCDS+20Cu		6/7	8/8	10/11	14/14
LC_LC3+15Cu		10/10	8/8	11/12	10/11
LC_LC5+15Cu		12/13	7/7	12/12	8/8
LC_LCDSSLCC		9/9	6/6	8/8	9/10
FR_FR4+15Cu		9/9	9/12	8/8	10/11
FR_FRRD+15Cu		13/13	11/12	13/13	13/13
FR_FR2+20Cu		14/14	10/10	11/11	13/14
FR_MULTIPLATE		9/10	6/6	13/13	13/13

Graphics



Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID:	20-4130-8406	**Endpoint:**	Post Hatch Survival	**CETIS Version:**	CETISv1.9.4
Analyzed:	15 Nov-21 8:32	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1
Batch ID:	19-0275-1751	**Test Type:**	32 Day Fathead Minnow Test	**Analyst:**	Kayla Knol
Start Date:	13 Aug-21	**Protocol:**	ASTM E1241-05 (2013)	**Diluent:**	Dechlorinated Tap Water
Ending Date:	13 Sep-21	**Species:**	Pimephales promelas	**Brine:**	
Test Length:	31d 0h	**Taxon:**	Actinopterygii	**Source:**	Aquatox, AR **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
Lab Control FM	11-5032-4817	10 Aug-21	11 Aug-21	72h	Teck Coal Ltd	
10Cu Control	04-3348-8996	10 Aug-21	11 Aug-21	72h		
15 Cu Control	05-5139-9319	10 Aug-21	11 Aug-21	72h		
20 Cu Control	18-8853-3252	10 Aug-21	11 Aug-21	72h		
FR_UFR1+15Cu	13-9616-5903	10 Aug-21	11 Aug-21	72h (14.7 °C)		
GH_ER2+15Cu	19-5052-7846	10 Aug-21	11 Aug-21	72h (12.1 °C)		
CM_MC1+15Cu	15-1448-1664	10 Aug-21	11 Aug-21	72h (12.3 °C)		
LC_SLC+10Cu	10-0118-5065	10 Aug-21	11 Aug-21	72h (11.8 °C)		
FR_FRABCH+20Cu	12-2763-5905	10 Aug-21	11 Aug-21	72h (14.6 °C)		
FR_FRCP1+20Cu	05-5162-7629	10 Aug-21	11 Aug-21	72h (13.8 °C)		
GH_FR1+20Cu	18-3989-2491	10 Aug-21	11 Aug-21	72h (12 °C)		
GH_ERC+10Cu	14-6940-9296	10 Aug-21	11 Aug-21	72h (15.4 °C)		
CM_MC2+20Cu	17-0166-2336	10 Aug-21	11 Aug-21	72h (13.1 °C)		
RG_MIDAG+15Cu	18-0148-8949	10 Aug-21	11 Aug-21	72h (12.4 °C)		
EV_MC2+20Cu	08-5423-9441	10 Aug-21	11 Aug-21	72h (13.1 °C)		
EV_HC1+20Cu	19-8320-0922	10 Aug-21	11 Aug-21	72h (12.1 °C)		
LC_DCDS+20Cu	12-7443-1043	10 Aug-21	11 Aug-21	72h (12.3 °C)		
LC_LC3+15Cu	06-5017-0795	10 Aug-21	11 Aug-21	72h (12.4 °C)		
LC_LC5+15Cu	10-4683-7945	10 Aug-21	11 Aug-21	72h (15.1 °C)		
LC_LCDSSLCC	11-9856-2953	10 Aug-21	11 Aug-21	72h (10.8 °C)		
FR_FR4+15Cu	16-1388-5677	10 Aug-21	11 Aug-21	72h (14.1 °C)		
FR_FRRD+15Cu	18-8883-2370	10 Aug-21	11 Aug-21	72h (14.7 °C)		
FR_FR2+20Cu	20-1752-8591	10 Aug-21	11 Aug-21	72h (15.3 °C)		
FR_MULTIPLATE	15-0654-9876	10 Aug-21	11 Aug-21	72h (13.6 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
Lab Control FM	Ambient Sample	Teck Coal Ltd	Lab Control FM	
10Cu Control	Ambient Sample	Teck Coal Ltd	10 Cu Control	
15 Cu Control	Ambient Sample	Teck Coal Ltd	15 Cu Control	
20 Cu Control	Ambient Sample	Teck Coal Ltd	20 Cu Control	
FR_UFR1+15Cu	Ambient Sample	Teck Coal Ltd	FR_UFR1_MON_2021-08-0	
GH_ER2+15Cu	Ambient Sample	Teck Coal Ltd	GH_ER2_WS_2021-08-10_	
CM_MC1+15Cu	Ambient Sample	Teck Coal Ltd	CM_MC1_WS_2021-08-10	
LC_SLC+10Cu	Ambient Sample	Teck Coal Ltd	LC_SLC_WS_2021-08-10_	
FR_FRABCH+20Cu	Ambient Sample	Teck Coal Ltd	FR_FRABCH_MON_2021-	
FR_FRCP1+20Cu	Ambient Sample	Teck Coal Ltd	FR_FRCP1_MON_2021-08	
GH_FR1+20Cu	Ambient Sample	Teck Coal Ltd	GH_FR1_WS_2021-08-10_	
GH_ERC+10Cu	Ambient Sample	Teck Coal Ltd	GH_ERC_WS_2021-08-10	
CM_MC2+20Cu	Ambient Sample	Teck Coal Ltd	CM_MC2_WS_2021-08-10	
RG_MIDAG+15Cu	Ambient Sample	Teck Coal Ltd	RG_MIDAG_WS_2021-08-	
EV_MC2+20Cu	Ambient Sample	Teck Coal Ltd	EV_MC2_WS_2021_Q3_W	
EV_HC1+20Cu	Ambient Sample	Teck Coal Ltd	EV_HC1_WS_2021_Q3_W	
LC_DCDS+20Cu	Ambient Sample	Teck Coal Ltd	LC_DCDS_WS_2021-08-1	
LC_LC3+15Cu	Ambient Sample	Teck Coal Ltd	LC_LC3_WS_2021-08-10_	
LC_LC5+15Cu	Ambient Sample	Teck Coal Ltd	LC_LC5_WS_2021-08-10_	
LC_LCDSSLCC	Ambient Sample	Teck Coal Ltd	LC_LCDSSLCC_WS_2021-	
FR_FR4+15Cu	Ambient Sample	Teck Coal Ltd	FR_FR4_WS_2021-08-10_	
FR_FRRD+15Cu	Ambient Sample	Teck Coal Ltd	FR_FRRD_WS_2021-08-1	

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 20-4130-8406 **Endpoint:** Post Hatch Survival **CETIS Version:** CETISv1.9.4
Analyzed: 15 Nov-21 8:32 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_FR2+20Cu	Ambient Sample	Teck Coal Ltd	FR_FR2_WS_2021-08-10_	
FR_MULTIPLATE	Ambient Sample	Teck Coal Ltd	FR_MULTIPLATE_WS_20	

Fisher Exact/Bonferroni Adj Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
Lab Control		10Cu Control	0.5000	Exact	1.0000	Non-Significant Effect
		15 Cu Control	0.0536	Exact	1.0000	Non-Significant Effect
		20 Cu Control	0.1529	Exact	1.0000	Non-Significant Effect
		FR_UFR1+15Cu*	0.0005	Exact	0.0118	Significant Effect
		GH_ER2+15Cu	0.2846	Exact	1.0000	Non-Significant Effect
		CM_MC1+15Cu	0.0061	Exact	0.1397	Non-Significant Effect
		LC_SLC+10Cu	0.6577	Exact	1.0000	Non-Significant Effect
		FR_FRABCH+20Cu	0.1308	Exact	1.0000	Non-Significant Effect
		FR_FRCP1+20Cu	0.3001	Exact	1.0000	Non-Significant Effect
		GH_FR1+20Cu	0.3870	Exact	1.0000	Non-Significant Effect
		GH_ERC+10Cu	0.0118	Exact	0.2704	Non-Significant Effect
		CM_MC2+20Cu	0.0252	Exact	0.5785	Non-Significant Effect
		RG_MIDAG+15Cu	0.3001	Exact	1.0000	Non-Significant Effect
		EV_MC2+20Cu	0.5853	Exact	1.0000	Non-Significant Effect
		EV_HC1+20Cu*	0.0018	Exact	0.0417	Significant Effect
		LC_DCDS+20Cu	0.0180	Exact	0.4144	Non-Significant Effect
		LC_LC3+15Cu	0.0285	Exact	0.6545	Non-Significant Effect
		LC_LC5+15Cu	0.0252	Exact	0.5785	Non-Significant Effect
		LC_LCDSSLCC*	0.0008	Exact	0.0188	Significant Effect
		FR_FR4+15Cu	0.0482	Exact	1.0000	Non-Significant Effect
		FR_FRRD+15Cu	0.6994	Exact	1.0000	Non-Significant Effect
		FR_FR2+20Cu	0.5853	Exact	1.0000	Non-Significant Effect
		FR_MULTIPLATE	0.3041	Exact	1.0000	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	3.147	3.37	0.1204	No Outliers Detected

MG

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 20-4130-8406 **Endpoint:** Post Hatch Survival **CETIS Version:** CETISv1.9.4
Analyzed: 15 Nov-21 8:32 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Data Summary

Sample	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
Lab Control FM	LC	50	9	59	0.8475	0.1525	0.0%
10Cu Control		49	10	59	0.8305	0.1695	2.0%
15 Cu Control		41	17	58	0.7069	0.2931	16.59%
20 Cu Control		43	14	57	0.7544	0.2456	10.98%
FR_UFR1+15Cu		31	25	56	0.5536	0.4464	34.68%
GH_ER2+15Cu		45	12	57	0.7895	0.2105	6.84%
CM_MC1+15Cu		33	20	53	0.6226	0.3774	26.53%
LC_SLC+10Cu		48	8	56	0.8571	0.1429	-1.14%
FR_FRABCH+20Cu		41	14	55	0.7455	0.2545	12.04%
FR_FRCP1+20Cu		46	12	58	0.7931	0.2069	6.41%
GH_FR1+20Cu		47	11	58	0.8103	0.1897	4.38%
GH_ERC+10Cu		37	20	57	0.6491	0.3509	23.4%
CM_MC2+20Cu		40	19	59	0.678	0.322	20.0%
RG_MIDAG+15Cu		46	12	58	0.7931	0.2069	6.41%
EV_MC2+20Cu		49	9	58	0.8448	0.1552	0.31%
EV_HC1+20Cu		31	22	53	0.5849	0.4151	30.98%
LC_DCDS+20Cu		40	20	60	0.6667	0.3333	21.33%
LC_LC3+15Cu		41	19	60	0.6833	0.3167	19.37%
LC_LC5+15Cu		40	19	59	0.678	0.322	20.0%
LC_LCDSSLCC		33	25	58	0.569	0.431	32.86%
FR_FR4+15Cu		40	17	57	0.7018	0.2982	17.19%
FR_FRRD+15Cu		51	8	59	0.8644	0.1356	-2.0%
FR_FR2+20Cu		49	9	58	0.8448	0.1552	0.31%
FR_MULTIPLATE		42	11	53	0.7925	0.2075	6.49%

Post Hatch Survival Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Lab Control FM	LC	0.8571	0.9333	0.7333	0.8667
10Cu Control		0.8000	0.8000	0.8571	0.8667
15 Cu Control		0.7333	0.5714	0.5333	1.0000
20 Cu Control		0.8571	0.5714	0.9333	0.6429
FR_UFR1+15Cu		0.5714	0.7333	0.2143	0.6923
GH_ER2+15Cu		0.8000	0.9286	0.6154	0.8000
CM_MC1+15Cu		0.6154	0.6429	0.8462	0.3846
LC_SLC+10Cu		0.8571	0.7857	0.8571	0.9286
FR_FRABCH+20Cu		0.6923	0.6923	0.7333	0.8571
FR_FRCP1+20Cu		0.8000	1.0000	0.6429	0.7333
GH_FR1+20Cu		0.8000	0.8000	0.8000	0.8462
GH_ERC+10Cu		0.6429	0.6000	0.8462	0.5333
CM_MC2+20Cu		0.5000	1.0000	0.7333	0.4667
RG_MIDAG+15Cu		0.8667	0.6667	0.8667	0.7692
EV_MC2+20Cu		0.8667	0.8667	0.9286	0.7143
EV_HC1+20Cu		0.3077	0.6667	0.3077	1.0000
LC_DCDS+20Cu		0.4667	0.5333	0.7333	0.9333
LC_LC3+15Cu		0.6667	0.5333	0.8000	0.7333
LC_LC5+15Cu		0.8667	0.4667	0.8000	0.5714
LC_LCDSSLCC		0.6429	0.4000	0.5333	0.7143
FR_FR4+15Cu		0.6000	0.8000	0.5333	0.9167
FR_FRRD+15Cu		0.8667	0.8000	0.8667	0.9286
FR_FR2+20Cu		1.0000	0.6667	0.7333	1.0000
FR_MULTIPLATE		0.8333	0.5000	0.8667	0.9286

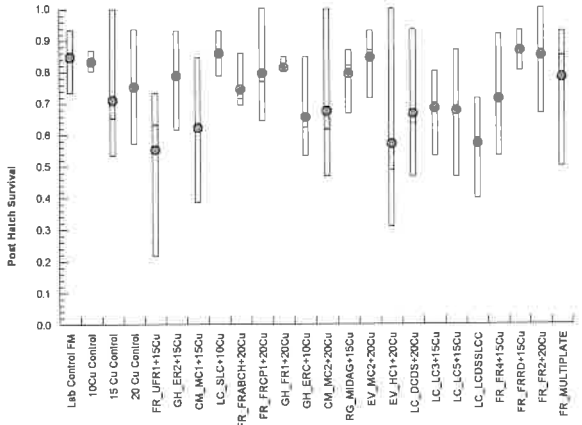
Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 20-4130-8406 **Endpoint:** Post Hatch Survival **CETIS Version:** CETISv1.9.4
Analyzed: 15 Nov-21 8:32 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Post Hatch Survival Binomials

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Lab Control FM	LC	12/14	14/15	11/15	13/15
10Cu Control		12/15	12/15	12/14	13/15
15 Cu Control		11/15	8/14	8/15	14/14
20 Cu Control		12/14	8/14	14/15	9/14
FR_UFR1+15Cu		8/14	11/15	3/14	9/13
GH_ER2+15Cu		12/15	13/14	8/13	12/15
CM_MC1+15Cu		8/13	9/14	11/13	5/13
LC_SLC+10Cu		12/14	11/14	12/14	13/14
FR_FRABCH+20Cu		9/13	9/13	11/15	12/14
FR_FRCP1+20Cu		12/15	14/14	9/14	11/15
GH_FR1+20Cu		12/15	12/15	12/15	11/13
GH_ERC+10Cu		9/14	9/15	11/13	8/15
CM_MC2+20Cu		7/14	15/15	11/15	7/15
RG_MIDAG+15Cu		13/15	10/15	13/15	10/13
EV_MC2+20Cu		13/15	13/15	13/14	10/14
EV_HC1+20Cu		4/13	8/12	4/13	15/15
LC_DCDS+20Cu		7/15	8/15	11/15	14/15
LC_LC3+15Cu		10/15	8/15	12/15	11/15
LC_LC5+15Cu		13/15	7/15	12/15	8/14
LC_LCDSSLCC		9/14	6/15	8/15	10/14
FR_FR4+15Cu		9/15	12/15	8/15	11/12
FR_FRRD+15Cu		13/15	12/15	13/15	13/14
FR_FR2+20Cu		14/14	10/15	11/15	14/14
FR_MULTIPLATE		10/12	6/12	13/15	13/14

Graphics



Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID:	12-7799-1284	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.9.4
Analyzed:	02 Nov-21 9:30	**Analysis:**	Nonparametric-Control vs Treatments	**Status Level:**	1
Batch ID:	19-0275-1751	**Test Type:**	32 Day Fathead Minnow Test	**Analyst:**	Kayla Knol
Start Date:	13 Aug-21	**Protocol:**	ASTM E1241-05 (2013)	**Diluent:**	Dechlorinated Tap Water
Ending Date:	13 Sep-21	**Species:**	Pimephales promelas	**Brine:**	
Test Length:	31d 0h	**Taxon:**	Actinopterygii	**Source:**	Aquatox, AR **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
Lab Control FM	11-5032-4817	10 Aug-21	11 Aug-21	72h	Teck Coal Ltd	
10Cu Control	04-3348-8996	10 Aug-21	11 Aug-21	72h		
15 Cu Control	05-5139-9319	10 Aug-21	11 Aug-21	72h		
20 Cu Control	18-8853-3252	10 Aug-21	11 Aug-21	72h		
FR_UFR1+15Cu	13-9616-5903	10 Aug-21	11 Aug-21	72h (14.7 °C)		
GH_ER2+15Cu	19-5052-7846	10 Aug-21	11 Aug-21	72h (12.1 °C)		
CM_MC1+15Cu	15-1448-1664	10 Aug-21	11 Aug-21	72h (12.3 °C)		
LC_SLC+10Cu	10-0118-5065	10 Aug-21	11 Aug-21	72h (11.8 °C)		
FR_FRABCH+20Cu	12-2763-5905	10 Aug-21	11 Aug-21	72h (14.6 °C)		
FR_FRCP1+20Cu	05-5162-7629	10 Aug-21	11 Aug-21	72h (13.8 °C)		
GH_FR1+20Cu	18-3989-2491	10 Aug-21	11 Aug-21	72h (12 °C)		
GH_ERC+10Cu	14-6940-9296	10 Aug-21	11 Aug-21	72h (15.4 °C)		
CM_MC2+20Cu	17-0166-2336	10 Aug-21	11 Aug-21	72h (13.1 °C)		
RG_MIDAG+15Cu	18-0148-8949	10 Aug-21	11 Aug-21	72h (12.4 °C)		
EV_MC2+20Cu	08-5423-9441	10 Aug-21	11 Aug-21	72h (13.1 °C)		
EV_HC1+20Cu	19-8320-0922	10 Aug-21	11 Aug-21	72h (12.1 °C)		
LC_DCDS+20Cu	12-7443-1043	10 Aug-21	11 Aug-21	72h (12.3 °C)		
LC_LC3+15Cu	06-5017-0795	10 Aug-21	11 Aug-21	72h (12.4 °C)		
LC_LC5+15Cu	10-4683-7945	10 Aug-21	11 Aug-21	72h (15.1 °C)		
LC_LCDSSLCC	11-9856-2953	10 Aug-21	11 Aug-21	72h (10.8 °C)		
FR_FR4+15Cu	16-1388-5677	10 Aug-21	11 Aug-21	72h (14.1 °C)		
FR_FRRD+15Cu	18-8883-2370	10 Aug-21	11 Aug-21	72h (14.7 °C)		
FR_FR2+20Cu	20-1752-8591	10 Aug-21	11 Aug-21	72h (15.3 °C)		
FR_MULTIPLATE	15-0654-9876	10 Aug-21	11 Aug-21	72h (13.6 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
Lab Control FM	Ambient Sample	Teck Coal Ltd	Lab Control FM	
10Cu Control	Ambient Sample	Teck Coal Ltd	10 Cu Control	
15 Cu Control	Ambient Sample	Teck Coal Ltd	15 Cu Control	
20 Cu Control	Ambient Sample	Teck Coal Ltd	20 Cu Control	
FR_UFR1+15Cu	Ambient Sample	Teck Coal Ltd	FR_UFR1_MON_2021-08-0	
GH_ER2+15Cu	Ambient Sample	Teck Coal Ltd	GH_ER2_WS_2021-08-10_	
CM_MC1+15Cu	Ambient Sample	Teck Coal Ltd	CM_MC1_WS_2021-08-10	
LC_SLC+10Cu	Ambient Sample	Teck Coal Ltd	LC_SLC_WS_2021-08-10_	
FR_FRABCH+20Cu	Ambient Sample	Teck Coal Ltd	FR_FRABCH_MON_2021-	
FR_FRCP1+20Cu	Ambient Sample	Teck Coal Ltd	FR_FRCP1_MON_2021-08	
GH_FR1+20Cu	Ambient Sample	Teck Coal Ltd	GH_FR1_WS_2021-08-10_	
GH_ERC+10Cu	Ambient Sample	Teck Coal Ltd	GH_ERC_WS_2021-08-10	
CM_MC2+20Cu	Ambient Sample	Teck Coal Ltd	CM_MC2_WS_2021-08-10	
RG_MIDAG+15Cu	Ambient Sample	Teck Coal Ltd	RG_MIDAG_WS_2021-08-	
EV_MC2+20Cu	Ambient Sample	Teck Coal Ltd	EV_MC2_WS_2021_Q3_W	
EV_HC1+20Cu	Ambient Sample	Teck Coal Ltd	EV_HC1_WS_2021_Q3_W	
LC_DCDS+20Cu	Ambient Sample	Teck Coal Ltd	LC_DCDS_WS_2021-08-1	
LC_LC3+15Cu	Ambient Sample	Teck Coal Ltd	LC_LC3_WS_2021-08-10_	
LC_LC5+15Cu	Ambient Sample	Teck Coal Ltd	LC_LC5_WS_2021-08-10_	
LC_LCDSSLCC	Ambient Sample	Teck Coal Ltd	LC_LCDSSLCC_WS_2021-	
FR_FR4+15Cu	Ambient Sample	Teck Coal Ltd	FR_FR4_WS_2021-08-10_	
FR_FRRD+15Cu	Ambient Sample	Teck Coal Ltd	FR_FRRD_WS_2021-08-1	

MG
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Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID:	12-7799-1284	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.9.4
Analyzed:	02 Nov-21 9:30	**Analysis:**	Nonparametric-Control vs Treatments	**Status Level:**	1

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_FR2+20Cu	Ambient Sample	Teck Coal Ltd	FR_FR2_WS_2021-08-10_	
FR_MULTIPLATE	Ambient Sample	Teck Coal Ltd	FR_MULTIPLATE_WS_20	

Nemenyi-Damico-Wolfe Test

Sample I	vs	Sample II	Test Stat	Critical	Ties	P-Type	P-Value	Decision(α:5%)
10Cu Control		Lab Control FM	65	211.4	0	CDF	0.7501	Non-Significant Effect
		15 Cu Control	102	211.4	0	CDF	0.5317	Non-Significant Effect
		20 Cu Control	42	211.4	0	CDF	0.8525	Non-Significant Effect
		FR_UFR1+15Cu	133	211.4	0	CDF	0.3391	Non-Significant Effect
		GH_ER2+15Cu	76	211.4	0	CDF	0.6906	Non-Significant Effect
		CM_MC1+15Cu	206	211.4	0	CDF	0.0592	Non-Significant Effect
		LC_SLC+10Cu	21	211.4	0	CDF	0.9176	Non-Significant Effect
		FR_FRABCH+20Cu	35	211.4	0	CDF	0.8772	Non-Significant Effect
		FR_FRCP1+20Cu	92	211.4	0	CDF	0.5948	Non-Significant Effect
		GH_FR1+20Cu	88	211.4	0	CDF	0.6195	Non-Significant Effect
		GH_ERC+10Cu	51	211.4	0	CDF	0.8163	Non-Significant Effect
		CM_MC2+20Cu	174	211.4	0	CDF	0.1440	Non-Significant Effect
		RG_MIDAG+15Cu	125	211.4	0	CDF	0.3868	Non-Significant Effect
		EV_MC2+20Cu	47	211.4	0	CDF	0.8330	Non-Significant Effect
		EV_HC1+20Cu*	215	211.4	0	CDF	0.0445	Significant Effect
		LC_DCDS+20Cu	98	211.4	0	CDF	0.5572	Non-Significant Effect
		LC_LC3+15Cu	11	211.4	0	CDF	0.9397	Non-Significant Effect
		LC_LC5+15Cu	66	211.4	0	CDF	0.7450	Non-Significant Effect
		LC_LCDSSLCC	146	211.4	0	CDF	0.2673	Non-Significant Effect
		FR_FR4+15Cu	134	211.4	0	CDF	0.3333	Non-Significant Effect
		FR_FRRD+15Cu	-24	211.4	0	CDF	0.9832	Non-Significant Effect
		FR_FR2+20Cu	-20	211.4	0	CDF	0.9803	Non-Significant Effect
		FR_MULTIPLATE	181	211.4	0	CDF	0.1206	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	4.104	3.37	0.0017	Outlier Detected
Treatment Effect	Fligner-Wolfe Omnibus Test	4548		0.0599	Non-Significant Overall Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	4.49634	0.195493	23	1.847	0.0258	Significant Effect
Error	7.61906	0.10582	72			
Total	12.1154		95			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Variances	Bartlett Equality of Variance Test	34.81	35.17	0.0544	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9596	0.9737	0.0048	Non-Normal Distribution

MG

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 12-7799-1284 **Endpoint:** Mean Dry Biomass-mg **CETIS Version:** CETISv1.9.4
Analyzed: 02 Nov-21 9:30 **Analysis:** Nonparametric-Control vs Treatments **Status Level:** 1

Mean Dry Biomass-mg Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
Lab Control FM		4	2.627	1.997	3.257	2.488	2.333	3.199	0.1981	15.08%	0.00%
10Cu Control	10	4	2.768	2.171	3.366	2.828	2.278	3.139	0.1879	13.57%	-5.38%
15 Cu Control		4	2.439	1.994	2.885	2.546	2.026	2.64	0.14	11.47%	7.15%
20 Cu Control		4	2.611	2.495	2.728	2.64	2.504	2.661	0.03658	2.80%	0.60%
FR_UFR1+15Cu		4	2.163	0.8123	3.514	2.308	1.001	3.036	0.4244	39.24%	17.67%
GH_ER2+15Cu		4	2.484	1.959	3.01	2.601	1.999	2.737	0.1651	13.29%	5.44%
CM_MC1+15Cu		4	1.909	1.062	2.757	1.845	1.331	2.615	0.2664	27.90%	27.33%
LC_SLC+10Cu		4	2.639	2.465	2.813	2.685	2.477	2.71	0.05459	4.14%	-0.45%
FR_FRABCH+20Cu		4	2.634	2.222	3.047	2.576	2.421	2.965	0.1297	9.85%	-0.27%
FR_FRCP1+20Cu		4	2.458	1.98	2.935	2.492	2.079	2.768	0.1501	12.22%	6.45%
GH_FR1+20Cu		4	2.511	2.25	2.772	2.55	2.279	2.665	0.082	6.53%	4.42%
GH_ERC+10Cu		4	2.58	2.29	2.87	2.593	2.364	2.771	0.09109	7.06%	1.78%
CM_MC2+20Cu		4	2.273	1.992	2.555	2.34	2.015	2.399	0.08836	7.77%	13.46%
RG_MIDAG+15Cu		4	2.406	2.053	2.76	2.353	2.206	2.713	0.1112	9.24%	8.41%
EV_MC2+20Cu		4	2.577	2.242	2.913	2.594	2.353	2.77	0.1054	8.18%	1.89%
EV_HC1+20Cu		4	2.065	1.635	2.495	1.986	1.851	2.437	0.1351	13.08%	21.39%
LC_DCDS+20Cu		4	2.457	2.005	2.909	2.438	2.143	2.808	0.142	11.56%	6.48%
LC_LC3+15Cu		4	2.663	2.343	2.982	2.695	2.412	2.847	0.1004	7.54%	-1.34%
LC_LC5+15Cu		4	2.538	2.182	2.894	2.624	2.215	2.689	0.1118	8.81%	3.39%
LC_LCDSSLCC		4	2.283	1.678	2.888	2.283	1.896	2.67	0.1902	16.66%	13.11%
FR_FR4+15Cu		4	2.356	1.645	3.067	2.276	1.901	2.971	0.2234	18.96%	10.31%
FR_FRRD+15Cu		4	2.735	2.532	2.938	2.771	2.555	2.843	0.06394	4.68%	-4.10%
FR_FR2+20Cu		4	2.748	2.405	3.091	2.77	2.465	2.988	0.1079	7.85%	-4.61%
FR_MULTIPLATE		4	2.233	1.92	2.546	2.205	2.041	2.482	0.09838	8.81%	14.99%

Mean Dry Biomass-mg Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Lab Control FM		2.583	2.333	2.393	3.199
10Cu Control	10	2.278	2.69	2.967	3.139
15 Cu Control		2.52	2.026	2.64	2.571
20 Cu Control		2.661	2.504	2.654	2.626
FR_UFR1+15Cu		2.25	2.365	1.001	3.036
GH_ER2+15Cu		2.613	2.588	1.999	2.737
CM_MC1+15Cu		1.769	1.921	2.615	1.331
LC_SLC+10Cu		2.477	2.675	2.71	2.695
FR_FRABCH+20Cu		2.434	2.718	2.421	2.965
FR_FRCP1+20Cu		2.611	2.373	2.079	2.768
GH_FR1+20Cu		2.665	2.279	2.55	2.551
GH_ERC+10Cu		2.683	2.364	2.771	2.503
CM_MC2+20Cu		2.015	2.308	2.399	2.373
RG_MIDAG+15Cu		2.419	2.287	2.206	2.713
EV_MC2+20Cu		2.353	2.443	2.77	2.744
EV_HC1+20Cu		1.881	2.092	1.851	2.437
LC_DCDS+20Cu		2.143	2.339	2.808	2.537
LC_LC3+15Cu		2.591	2.8	2.412	2.847
LC_LC5+15Cu		2.689	2.215	2.561	2.687
LC_LCDSSLCC		2.542	1.896	2.023	2.67
FR_FR4+15Cu		2.257	2.295	1.901	2.971
FR_FRRD+15Cu		2.555	2.843	2.735	2.806
FR_FR2+20Cu		2.745	2.794	2.465	2.988
FR_MULTIPLATE		2.294	2.041	2.116	2.482

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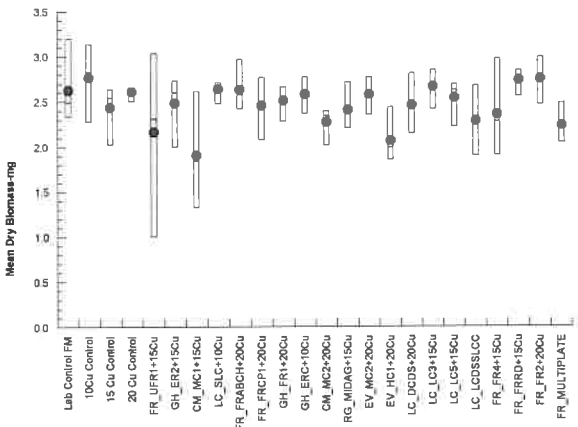
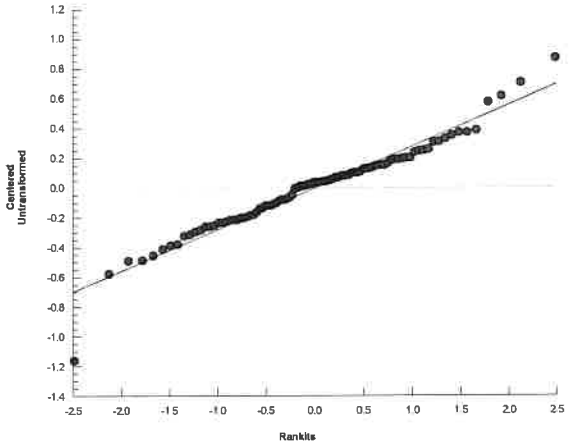
Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID:	12-7799-1284	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.9.4
Analyzed:	02 Nov-21 9:30	**Analysis:**	Nonparametric-Control vs Treatments	**Status Level:**	1

Graphics





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CETIS Analytical Report

Test Code/ID: FM Lab Control / 06-2855-8538

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID:	07-4117-1628	**Endpoint:**	Hatch Rate	**CETIS Version:**	CETISv1.9.4
Analyzed:	02 Nov-21 9:28	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1
Batch ID:	19-0275-1751	**Test Type:**	32 Day Fathead Minnow Test	**Analyst:**	Kayla Knol
Start Date:	13 Aug-21	**Protocol:**	ASTM E1241-05 (2013)	**Diluent:**	Dechlorinated Tap Water
Ending Date:	13 Sep-21	**Species:**	Pimephales promelas	**Brine:**	
Test Length:	31d 0h	**Taxon:**	Actinopterygii	**Source:**	Aquatox, AR **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
Lab Control FM	11-5032-4817	10 Aug-21	11 Aug-21	72h	Teck Coal Ltd	
10Cu Control	04-3348-8996	10 Aug-21	11 Aug-21	72h		
15 Cu Control	05-5139-9319	10 Aug-21	11 Aug-21	72h		
20 Cu Control	18-8853-3252	10 Aug-21	11 Aug-21	72h		
FR_UFR1+15Cu	13-9616-5903	10 Aug-21	11 Aug-21	72h (14.7 °C)		
GH_ER2+15Cu	19-5052-7846	10 Aug-21	11 Aug-21	72h (12.1 °C)		
CM_MC1+15Cu	15-1448-1664	10 Aug-21	11 Aug-21	72h (12.3 °C)		
LC_SLC+10Cu	10-0118-5065	10 Aug-21	11 Aug-21	72h (11.8 °C)		
FR_FRABCH+20Cu	12-2763-5905	10 Aug-21	11 Aug-21	72h (14.6 °C)		
FR_FRCP1+20Cu	05-5162-7629	10 Aug-21	11 Aug-21	72h (13.8 °C)		
GH_FR1+20Cu	18-3989-2491	10 Aug-21	11 Aug-21	72h (12 °C)		
GH_ERC+10Cu	14-6940-9296	10 Aug-21	11 Aug-21	72h (15.4 °C)		
CM_MC2+20Cu	17-0166-2336	10 Aug-21	11 Aug-21	72h (13.1 °C)		
RG_MIDAG+15Cu	18-0148-8949	10 Aug-21	11 Aug-21	72h (12.4 °C)		
EV_MC2+20Cu	08-5423-9441	10 Aug-21	11 Aug-21	72h (13.1 °C)		
EV_HC1+20Cu	19-8320-0922	10 Aug-21	11 Aug-21	72h (12.1 °C)		
LC_DCDS+20Cu	12-7443-1043	10 Aug-21	11 Aug-21	72h (12.3 °C)		
LC_LC3+15Cu	06-5017-0795	10 Aug-21	11 Aug-21	72h (12.4 °C)		
LC_LC5+15Cu	10-4683-7945	10 Aug-21	11 Aug-21	72h (15.1 °C)		
LC_LCDSSLCC	11-9856-2953	10 Aug-21	11 Aug-21	72h (10.8 °C)		
FR_FR4+15Cu	16-1388-5677	10 Aug-21	11 Aug-21	72h (14.1 °C)		
FR_FRRD+15Cu	18-8883-2370	10 Aug-21	11 Aug-21	72h (14.7 °C)		
FR_FR2+20Cu	20-1752-8591	10 Aug-21	11 Aug-21	72h (15.3 °C)		
FR_MULTIPLATE	15-0654-9876	10 Aug-21	11 Aug-21	72h (13.6 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
Lab Control FM	Ambient Sample	Teck Coal Ltd	Lab Control FM	
10Cu Control	Ambient Sample	Teck Coal Ltd	10 Cu Control	
15 Cu Control	Ambient Sample	Teck Coal Ltd	15 Cu Control	
20 Cu Control	Ambient Sample	Teck Coal Ltd	20 Cu Control	
FR_UFR1+15Cu	Ambient Sample	Teck Coal Ltd	FR_UFR1_MON_2021-08-0	
GH_ER2+15Cu	Ambient Sample	Teck Coal Ltd	GH_ER2_WS_2021-08-10_	
CM_MC1+15Cu	Ambient Sample	Teck Coal Ltd	CM_MC1_WS_2021-08-10	
LC_SLC+10Cu	Ambient Sample	Teck Coal Ltd	LC_SLC_WS_2021-08-10_	
FR_FRABCH+20Cu	Ambient Sample	Teck Coal Ltd	FR_FRABCH_MON_2021-	
FR_FRCP1+20Cu	Ambient Sample	Teck Coal Ltd	FR_FRCP1_MON_2021-08	
GH_FR1+20Cu	Ambient Sample	Teck Coal Ltd	GH_FR1_WS_2021-08-10_	
GH_ERC+10Cu	Ambient Sample	Teck Coal Ltd	GH_ERC_WS_2021-08-10	
CM_MC2+20Cu	Ambient Sample	Teck Coal Ltd	CM_MC2_WS_2021-08-10	
RG_MIDAG+15Cu	Ambient Sample	Teck Coal Ltd	RG_MIDAG_WS_2021-08-	
EV_MC2+20Cu	Ambient Sample	Teck Coal Ltd	EV_MC2_WS_2021_Q3_W	
EV_HC1+20Cu	Ambient Sample	Teck Coal Ltd	EV_HC1_WS_2021_Q3_W	
LC_DCDS+20Cu	Ambient Sample	Teck Coal Ltd	LC_DCDS_WS_2021-08-1	
LC_LC3+15Cu	Ambient Sample	Teck Coal Ltd	LC_LC3_WS_2021-08-10_	
LC_LC5+15Cu	Ambient Sample	Teck Coal Ltd	LC_LC5_WS_2021-08-10_	
LC_LCDSSLCC	Ambient Sample	Teck Coal Ltd	LC_LCDSSLCC_WS_2021-	
FR_FR4+15Cu	Ambient Sample	Teck Coal Ltd	FR_FR4_WS_2021-08-10_	
FR_FRRD+15Cu	Ambient Sample	Teck Coal Ltd	FR_FRRD_WS_2021-08-1	

Analyst: KL QA: MG NOV 09 2021

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 07-4117-1628 **Endpoint:** Hatch Rate **CETIS Version:** CETISv1.9.4
Analyzed: 02 Nov-21 9:28 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_FR2+20Cu	Ambient Sample	Teck Coal Ltd	FR_FR2_WS_2021-08-10_	
FR_MULTIPLATE	Ambient Sample	Teck Coal Ltd	FR_MULTIPLATE_WS_20	

Fisher Exact/Bonferroni Adj Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
10Cu Control		Lab Control FM	0.7521	Exact	1.0000	Non-Significant Effect
		15 Cu Control	0.5000	Exact	1.0000	Non-Significant Effect
		20 Cu Control	0.3093	Exact	1.0000	Non-Significant Effect
		FR_UFR1+15Cu	0.1822	Exact	1.0000	Non-Significant Effect
		GH_ER2+15Cu	0.3093	Exact	1.0000	Non-Significant Effect
		CM_MC1+15Cu	0.0306	Exact	0.7043	Non-Significant Effect
		LC_SLC+10Cu	0.1822	Exact	1.0000	Non-Significant Effect
		FR_FRABCH+20Cu	0.1034	Exact	1.0000	Non-Significant Effect
		FR_FRCP1+20Cu	0.5000	Exact	1.0000	Non-Significant Effect
		GH_FR1+20Cu	0.5000	Exact	1.0000	Non-Significant Effect
		GH_ERC+10Cu	0.3093	Exact	1.0000	Non-Significant Effect
		CM_MC2+20Cu	0.7521	Exact	1.0000	Non-Significant Effect
		RG_MIDAG+15Cu	0.5000	Exact	1.0000	Non-Significant Effect
		EV_MC2+20Cu	0.5000	Exact	1.0000	Non-Significant Effect
		EV_HC1+20Cu	0.0306	Exact	0.7043	Non-Significant Effect
		LC_DCDS+20Cu	1.0000	Exact	1.0000	Non-Significant Effect
		LC_LC3+15Cu	1.0000	Exact	1.0000	Non-Significant Effect
		LC_LC5+15Cu	0.7521	Exact	1.0000	Non-Significant Effect
		LC_LCDSSLCC	0.5000	Exact	1.0000	Non-Significant Effect
		FR_FR4+15Cu	0.3093	Exact	1.0000	Non-Significant Effect
		FR_FRRD+15Cu	0.7521	Exact	1.0000	Non-Significant Effect
		FR_FR2+20Cu	0.5000	Exact	1.0000	Non-Significant Effect
		FR_MULTIPLATE	0.0306	Exact	0.7043	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	3.044	3.37	0.1764	No Outliers Detected

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Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 07-4117-1628 **Endpoint:** Hatch Rate **CETIS Version:** CETISv1.9.4
Analyzed: 02 Nov-21 9:28 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Data Summary

Sample	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
Lab Control FM		59	1	60	0.9833	0.01667	0.0%
10Cu Control	10	59	1	60	0.9833	0.01667	0.0%
15 Cu Control		58	2	60	0.9667	0.03333	1.7%
20 Cu Control		57	3	60	0.95	0.05	3.39%
FR_UFR1+15Cu		56	4	60	0.9333	0.06667	5.09%
GH_ER2+15Cu		57	3	60	0.95	0.05	3.39%
CM_MC1+15Cu		53	7	60	0.8833	0.1167	10.17%
LC_SLC+10Cu		56	4	60	0.9333	0.06667	5.09%
FR_FRABCH+20Cu		55	5	60	0.9167	0.08333	6.78%
FR_FRCP1+20Cu		58	2	60	0.9667	0.03333	1.7%
GH_FR1+20Cu		58	2	60	0.9667	0.03333	1.7%
GH_ERC+10Cu		57	3	60	0.95	0.05	3.39%
CM_MC2+20Cu		59	1	60	0.9833	0.01667	0.0%
RG_MIDAG+15Cu		58	2	60	0.9667	0.03333	1.7%
EV_MC2+20Cu		58	2	60	0.9667	0.03333	1.7%
EV_HC1+20Cu		53	7	60	0.8833	0.1167	10.17%
LC_DCDS+20Cu		60	0	60	1	0	-1.7%
LC_LC3+15Cu		60	0	60	1	0	-1.7%
LC_LC5+15Cu		59	1	60	0.9833	0.01667	0.0%
LC_LCDSSLCC		58	2	60	0.9667	0.03333	1.7%
FR_FR4+15Cu		57	3	60	0.95	0.05	3.39%
FR_FRRD+15Cu		59	1	60	0.9833	0.01667	0.0%
FR_FR2+20Cu		58	2	60	0.9667	0.03333	1.7%
FR_MULTIPLATE		53	7	60	0.8833	0.1167	10.17%

Hatch Rate Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Lab Control FM		0.9333	1.0000	1.0000	1.0000
10Cu Control	10	1.0000	1.0000	0.9333	1.0000
15 Cu Control		1.0000	0.9333	1.0000	0.9333
20 Cu Control		0.9333	0.9333	1.0000	0.9333
FR_UFR1+15Cu		0.9333	1.0000	0.9333	0.8667
GH_ER2+15Cu		1.0000	0.9333	0.8667	1.0000
CM_MC1+15Cu		0.8667	0.9333	0.8667	0.8667
LC_SLC+10Cu		0.9333	0.9333	0.9333	0.9333
FR_FRABCH+20Cu		0.8667	0.8667	1.0000	0.9333
FR_FRCP1+20Cu		1.0000	0.9333	0.9333	1.0000
GH_FR1+20Cu		1.0000	1.0000	1.0000	0.8667
GH_ERC+10Cu		0.9333	1.0000	0.8667	1.0000
CM_MC2+20Cu		0.9333	1.0000	1.0000	1.0000
RG_MIDAG+15Cu		1.0000	1.0000	1.0000	0.8667
EV_MC2+20Cu		1.0000	1.0000	0.9333	0.9333
EV_HC1+20Cu		0.8667	0.8000	0.8667	1.0000
LC_DCDS+20Cu		1.0000	1.0000	1.0000	1.0000
LC_LC3+15Cu		1.0000	1.0000	1.0000	1.0000
LC_LC5+15Cu		1.0000	1.0000	1.0000	0.9333
LC_LCDSSLCC		0.9333	1.0000	1.0000	0.9333
FR_FR4+15Cu		1.0000	1.0000	1.0000	0.8000
FR_FRRD+15Cu		1.0000	1.0000	1.0000	0.9333
FR_FR2+20Cu		0.9333	1.0000	1.0000	0.9333
FR_MULTIPLATE		0.8000	0.8000	1.0000	0.9333

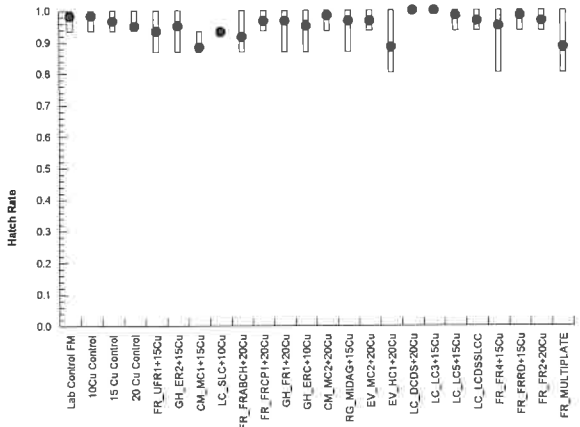
Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 07-4117-1628 **Endpoint:** Hatch Rate **CETIS Version:** CETISv1.9.4
Analyzed: 02 Nov-21 9:28 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Hatch Rate Binomials

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Lab Control FM		14/15	15/15	15/15	15/15
10Cu Control	10	15/15	15/15	14/15	15/15
15 Cu Control		15/15	14/15	15/15	14/15
20 Cu Control		14/15	14/15	15/15	14/15
FR_UFR1+15Cu		14/15	15/15	14/15	13/15
GH_ER2+15Cu		15/15	14/15	13/15	15/15
CM_MC1+15Cu		13/15	14/15	13/15	13/15
LC_SLC+10Cu		14/15	14/15	14/15	14/15
FR_FRABCH+20Cu		13/15	13/15	15/15	14/15
FR_FRCP1+20Cu		15/15	14/15	14/15	15/15
GH_FR1+20Cu		15/15	15/15	15/15	13/15
GH_ERC+10Cu		14/15	15/15	13/15	15/15
CM_MC2+20Cu		14/15	15/15	15/15	15/15
RG_MIDAG+15Cu		15/15	15/15	15/15	13/15
EV_MC2+20Cu		15/15	15/15	14/15	14/15
EV_HC1+20Cu		13/15	12/15	13/15	15/15
LC_DCDS+20Cu		15/15	15/15	15/15	15/15
LC_LC3+15Cu		15/15	15/15	15/15	15/15
LC_LC5+15Cu		15/15	15/15	15/15	14/15
LC_LCDSSLCC		14/15	15/15	15/15	14/15
FR_FR4+15Cu		15/15	15/15	15/15	12/15
FR_FRRD+15Cu		15/15	15/15	15/15	14/15
FR_FR2+20Cu		14/15	15/15	15/15	14/15
FR_MULTIPLATE		12/15	12/15	15/15	14/15

Graphics



Analyst: KK QA: NOV 03 2021

CETIS Analytical Report

Test Code/ID: FM Lab Control / 06-2855-8538

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID:	18-5505-0171	**Endpoint:**	Length	**CETIS Version:**	CETISv1.9.4
Analyzed:	15 Nov-21 8:33	**Analysis:**	Parametric-Control vs Treatments	**Status Level:**	1
Batch ID:	19-0275-1751	**Test Type:**	32 Day Fathead Minnow Test	**Analyst:**	Kayla Knol
Start Date:	13 Aug-21	**Protocol:**	ASTM E1241-05 (2013)	**Diluent:**	Dechlorinated Tap Water
Ending Date:	13 Sep-21	**Species:**	Pimephales promelas	**Brine:**	
Test Length:	31d 0h	**Taxon:**	Actinopterygii	**Source:**	Aquatox, AR **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
Lab Control FM	11-5032-4817	10 Aug-21	11 Aug-21	72h	Teck Coal Ltd	
10Cu Control	04-3348-8996	10 Aug-21	11 Aug-21	72h		
15 Cu Control	05-5139-9319	10 Aug-21	11 Aug-21	72h		
20 Cu Control	18-8853-3252	10 Aug-21	11 Aug-21	72h		
FR_UFR1+15Cu	13-9616-5903	10 Aug-21	11 Aug-21	72h (14.7 °C)		
GH_ER2+15Cu	19-5052-7846	10 Aug-21	11 Aug-21	72h (12.1 °C)		
CM_MC1+15Cu	15-1448-1664	10 Aug-21	11 Aug-21	72h (12.3 °C)		
LC_SLC+10Cu	10-0118-5065	10 Aug-21	11 Aug-21	72h (11.8 °C)		
FR_FRABCH+20Cu	12-2763-5905	10 Aug-21	11 Aug-21	72h (14.6 °C)		
FR_FRCP1+20Cu	05-5162-7629	10 Aug-21	11 Aug-21	72h (13.8 °C)		
GH_FR1+20Cu	18-3989-2491	10 Aug-21	11 Aug-21	72h (12 °C)		
GH_ERC+10Cu	14-6940-9296	10 Aug-21	11 Aug-21	72h (15.4 °C)		
CM_MC2+20Cu	17-0166-2336	10 Aug-21	11 Aug-21	72h (13.1 °C)		
RG_MIDAG+15Cu	18-0148-8949	10 Aug-21	11 Aug-21	72h (12.4 °C)		
EV_MC2+20Cu	08-5423-9441	10 Aug-21	11 Aug-21	72h (13.1 °C)		
EV_HC1+20Cu	19-8320-0922	10 Aug-21	11 Aug-21	72h (12.1 °C)		
LC_DCDS+20Cu	12-7443-1043	10 Aug-21	11 Aug-21	72h (12.3 °C)		
LC_LC3+15Cu	06-5017-0795	10 Aug-21	11 Aug-21	72h (12.4 °C)		
LC_LC5+15Cu	10-4683-7945	10 Aug-21	11 Aug-21	72h (15.1 °C)		
LC_LCDSSLCC	11-9856-2953	10 Aug-21	11 Aug-21	72h (10.8 °C)		
FR_FR4+15Cu	16-1388-5677	10 Aug-21	11 Aug-21	72h (14.1 °C)		
FR_FRRD+15Cu	18-8883-2370	10 Aug-21	11 Aug-21	72h (14.7 °C)		
FR_FR2+20Cu	20-1752-8591	10 Aug-21	11 Aug-21	72h (15.3 °C)		
FR_MULTIPLATE	15-0654-9876	10 Aug-21	11 Aug-21	72h (13.6 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
Lab Control FM	Ambient Sample	Teck Coal Ltd	Lab Control FM	
10Cu Control	Ambient Sample	Teck Coal Ltd	10 Cu Control	
15 Cu Control	Ambient Sample	Teck Coal Ltd	15 Cu Control	
20 Cu Control	Ambient Sample	Teck Coal Ltd	20 Cu Control	
FR_UFR1+15Cu	Ambient Sample	Teck Coal Ltd	FR_UFR1_MON_2021-08-0	
GH_ER2+15Cu	Ambient Sample	Teck Coal Ltd	GH_ER2_WS_2021-08-10_	
CM_MC1+15Cu	Ambient Sample	Teck Coal Ltd	CM_MC1_WS_2021-08-10	
LC_SLC+10Cu	Ambient Sample	Teck Coal Ltd	LC_SLC_WS_2021-08-10_	
FR_FRABCH+20Cu	Ambient Sample	Teck Coal Ltd	FR_FRABCH_MON_2021-	
FR_FRCP1+20Cu	Ambient Sample	Teck Coal Ltd	FR_FRCP1_MON_2021-08	
GH_FR1+20Cu	Ambient Sample	Teck Coal Ltd	GH_FR1_WS_2021-08-10_	
GH_ERC+10Cu	Ambient Sample	Teck Coal Ltd	GH_ERC_WS_2021-08-10	
CM_MC2+20Cu	Ambient Sample	Teck Coal Ltd	CM_MC2_WS_2021-08-10	
RG_MIDAG+15Cu	Ambient Sample	Teck Coal Ltd	RG_MIDAG_WS_2021-08-	
EV_MC2+20Cu	Ambient Sample	Teck Coal Ltd	EV_MC2_WS_2021_Q3_W	
EV_HC1+20Cu	Ambient Sample	Teck Coal Ltd	EV_HC1_WS_2021_Q3_W	
LC_DCDS+20Cu	Ambient Sample	Teck Coal Ltd	LC_DCDS_WS_2021-08-1	
LC_LC3+15Cu	Ambient Sample	Teck Coal Ltd	LC_LC3_WS_2021-08-10_	
LC_LC5+15Cu	Ambient Sample	Teck Coal Ltd	LC_LC5_WS_2021-08-10_	
LC_LCDSSLCC	Ambient Sample	Teck Coal Ltd	LC_LCDSSLCC_WS_2021-	
FR_FR4+15Cu	Ambient Sample	Teck Coal Ltd	FR_FR4_WS_2021-08-10_	
FR_FRRD+15Cu	Ambient Sample	Teck Coal Ltd	FR_FRRD_WS_2021-08-1	

Analyst: KK QA: MG 2021/11/18

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID:	18-5505-0171	**Endpoint:**	Length	**CETIS Version:**	CETISv1.9.4
Analyzed:	15 Nov-21 8:33	**Analysis:**	Parametric-Control vs Treatments	**Status Level:**	1

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_FR2+20Cu	Ambient Sample	Teck Coal Ltd	FR_FR2_WS_2021-08-10_	
FR_MULTIPLATE	Ambient Sample	Teck Coal Ltd	FR_MULTIPLATE_WS_20	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	Lab Control FM passed length	11.33%
		15 Cu Control passed length	11.33%
		20 Cu Control passed length	11.33%
		FR_UFR1+15Cu passed length	11.33%
		GH_ER2+15Cu passed length	11.33%
		CM_MC1+15Cu failed length	11.33%
		LC_SLC+10Cu passed length	11.33%
		FR_FRABCH+20Cu passed length	11.33%
		FR_FRCP1+20Cu failed length	11.33%
		GH_FR1+20Cu failed length	11.33%
		GH_ERC+10Cu passed length	11.33%
		CM_MC2+20Cu passed length	11.33%
		RG_MIDAG+15Cu passed length	11.33%
		EV_MC2+20Cu failed length	11.33%
		EV_HC1+20Cu passed length	11.33%
		LC_DCDS+20Cu passed length	11.33%
		LC_LC3+15Cu passed length	11.33%
		LC_LC5+15Cu passed length	11.33%
		LC_LCDSSLCC passed length	11.33%
		FR_FR4+15Cu passed length	11.33%
		FR_FRRD+15Cu failed length	11.33%
		FR_FR2+20Cu passed length	11.33%
		FR_MULTIPLATE passed length	11.33%

Dunnett Multiple Comparison Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
10Cu Control		Lab Control FM	1.023	2.744	1.408	6	CDF	0.6646	Non-Significant Effect
		15 Cu Control	0.09745	2.744	1.408	6	CDF	0.9459	Non-Significant Effect
		20 Cu Control	-1.169	2.744	1.408	6	CDF	0.9994	Non-Significant Effect
		FR_UFR1+15Cu	1.413	2.744	1.408	6	CDF	0.4751	Non-Significant Effect
		GH_ER2+15Cu	2.485	2.744	1.408	6	CDF	0.0887	Non-Significant Effect
		CM_MC1+15Cu*	2.875	2.744	1.408	6	CDF	0.0366	Significant Effect
		LC_SLC+10Cu	1.023	2.744	1.408	6	CDF	0.6646	Non-Significant Effect
		FR_FRABCH+20Cu	1.413	2.744	1.408	6	CDF	0.4751	Non-Significant Effect
		FR_FRCP1+20Cu*	3.264	2.744	1.408	6	CDF	0.0132	Significant Effect
		GH_FR1+20Cu*	2.875	2.744	1.408	6	CDF	0.0366	Significant Effect
		GH_ERC+10Cu	-0.5359	2.744	1.408	6	CDF	0.9922	Non-Significant Effect
		CM_MC2+20Cu	-0.04872	2.744	1.408	6	CDF	0.9636	Non-Significant Effect
		RG_MIDAG+15Cu	2.631	2.744	1.408	6	CDF	0.0647	Non-Significant Effect
		EV_MC2+20Cu*	3.167	2.744	1.408	6	CDF	0.0172	Significant Effect
		EV_HC1+20Cu	0.4872	2.744	1.408	6	CDF	0.8658	Non-Significant Effect
		LC_DCDS+20Cu	0.1949	2.744	1.408	6	CDF	0.9308	Non-Significant Effect
		LC_LC3+15Cu	0.4872	2.744	1.408	6	CDF	0.8658	Non-Significant Effect
		LC_LC5+15Cu	-0.3898	2.744	1.408	6	CDF	0.9872	Non-Significant Effect
		LC_LCDSSLCC	0.6821	2.744	1.408	6	CDF	0.8045	Non-Significant Effect
		FR_FR4+15Cu	2.339	2.744	1.408	6	CDF	0.1192	Non-Significant Effect
		FR_FRRD+15Cu*	2.972	2.744	1.408	6	CDF	0.0287	Significant Effect
		FR_FR2+20Cu	2.193	2.744	1.408	6	CDF	0.1568	Non-Significant Effect
		FR_MULTIPLATE	2.534	2.744	1.408	6	CDF	0.0800	Non-Significant Effect

Auxiliary Tests

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 18-5505-0171 **Endpoint:** Length **CETIS Version:** CETISv1.9.4
Analyzed: 15 Nov-21 8:33 **Analysis:** Parametric-Control vs Treatments **Status Level:** 1

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	3.285	3.37	0.0706	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	44.2591	1.92431	23	3.654	1.3E-05	Significant Effect
Error	37.9125	0.526563	72			
Total	82.1716		95			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Variances	Bartlett Equality of Variance Test	33.4	35.17	0.0744	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9854	0.9737	0.3692	Normal Distribution

Length Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
Lab Control FM		4	11.9	11.15	12.65	11.95	11.3	12.4	0.2345	3.94%	0.00%
10Cu Control	10	4	12.43	11.66	13.19	12.55	11.8	12.8	0.2394	3.85%	-4.41%
15 Cu Control		4	12.37	10.89	13.86	12.35	11.4	13.4	0.4661	7.53%	-3.99%
20 Cu Control		4	13.03	12.67	13.38	13	12.8	13.3	0.1109	1.70%	-9.45%
FR_UFR1+15Cu		4	11.7	10.85	12.55	11.95	10.9	12	0.2677	4.58%	1.68%
GH_ER2+15Cu		4	11.15	10.87	11.43	11.15	11	11.3	0.0866	1.55%	6.30%
CM_MC1+15Cu		4	10.95	10.06	11.84	11.05	10.2	11.5	0.2784	5.08%	7.98%
LC_SLC+10Cu		4	11.9	11.12	12.68	11.8	11.5	12.5	0.2449	4.12%	0.00%
FR_FRABCH+20Cu		4	11.7	10.38	13.02	11.65	10.8	12.7	0.4143	7.08%	1.68%
FR_FRCP1+20Cu		4	10.75	9.243	12.26	11	9.4	11.6	0.4735	8.81%	9.66%
GH_FR1+20Cu		4	10.95	10.33	11.57	10.95	10.5	11.4	0.1936	3.54%	7.98%
GH_ERC+10Cu		4	12.7	12.15	13.25	12.7	12.4	13	0.1732	2.73%	-6.72%
CM_MC2+20Cu		4	12.45	11.06	13.84	12.55	11.3	13.4	0.4368	7.02%	-4.62%
RG_MIDAG+15Cu		4	11.08	10.09	12.06	10.9	10.6	11.9	0.3092	5.58%	6.93%
EV_MC2+20Cu		4	10.8	9.236	12.36	10.6	9.9	12.1	0.4916	9.10%	9.24%
EV_HC1+20Cu		4	12.18	9.553	14.8	12.55	10.1	13.5	0.824	13.54%	-2.31%
LC_DCDS+20Cu		4	12.33	11.45	13.2	12.45	11.6	12.8	0.275	4.46%	-3.57%
LC_LC3+15Cu		4	12.18	10.8	13.55	12.15	11.3	13.1	0.4308	7.08%	-2.31%
LC_LC5+15Cu		4	12.62	10.78	14.47	12.75	11.2	13.8	0.5808	9.20%	-6.09%
LC_LCDSSLCC		4	12.08	11.47	12.68	12.1	11.6	12.5	0.1887	3.13%	-1.47%
FR_FR4+15Cu		4	11.23	10.62	11.83	11.2	10.8	11.7	0.1887	3.36%	5.67%
FR_FRRD+15Cu		4	10.9	10.47	11.33	11	10.5	11.1	0.1354	2.48%	8.40%
FR_FR2+20Cu		4	11.3	10.58	12.02	11.2	10.9	11.9	0.2273	4.02%	5.04%
FR_MULTIPLATE		4	11.12	9.736	12.51	11	10.2	12.3	0.4366	7.85%	6.51%

MG

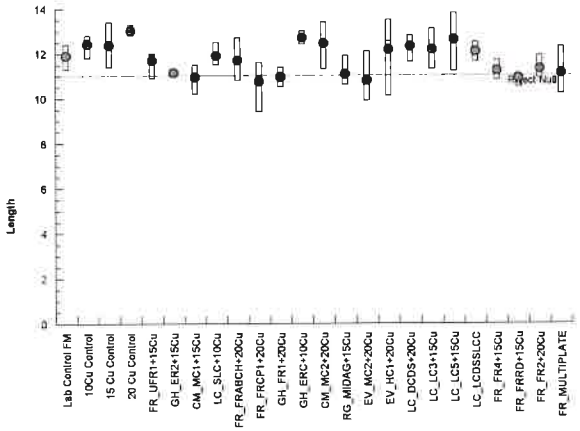
Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

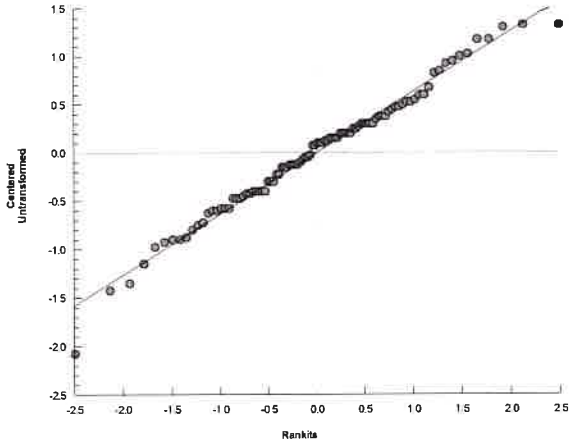
Analysis ID: 18-5505-0171 **Endpoint:** Length **CETIS Version:** CETISv1.9.4
Analyzed: 15 Nov-21 8:33 **Analysis:** Parametric-Control vs Treatments **Status Level:** 1

Length Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Lab Control FM		12.4	11.3	12.1	11.8
10Cu Control	10	11.8	12.3	12.8	12.8
15 Cu Control		12.9	11.8	13.4	11.4
20 Cu Control		13.3	12.9	12.8	13.1
FR_UFR1+15Cu		11.9	10.9	12	12
GH_ER2+15Cu		11.3	11.3	11	11
CM_MC1+15Cu		11.5	10.9	11.2	10.2
LC_SLC+10Cu		11.5	12.5	12.1	11.5
FR_FRABCH+20Cu		12.7	12	10.8	11.3
FR_FRCP1+20Cu		11.1	10.9	9.4	11.6
GH_FR1+20Cu		11.1	10.5	10.8	11.4
GH_ERC+10Cu		13	12.4	12.4	13
CM_MC2+20Cu		12.7	11.3	12.4	13.4
RG_MIDAG+15Cu		10.6	10.6	11.2	11.9
EV_MC2+20Cu		9.9	10.2	11	12.1
EV_HC1+20Cu		13.5	11.6	13.5	10.1
LC_DCDS+20Cu		12.7	12.8	12.2	11.6
LC_LC3+15Cu		12.7	13.1	11.3	11.6
LC_LC5+15Cu		11.2	13.3	12.2	13.8
LC_LCDSSLCC		12.2	12	11.6	12.5
FR_FR4+15Cu		11.3	10.8	11.1	11.7
FR_FRRD+15Cu		10.5	11	11	11.1
FR_FR2+20Cu		11	11.9	11.4	10.9
FR_MULTIPLATE		11.1	12.3	10.2	10.9

Graphics





CETIS Analytical Report

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID:	20-9284-3462	**Endpoint:**	Proportion Normal	**CETIS Version:**	CETISv1.9.4
Analyzed:	02 Nov-21 9:32	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1
Batch ID:	19-0275-1751	**Test Type:**	32 Day Fathead Minnow Test	**Analyst:**	Kayla Knol
Start Date:	13 Aug-21	**Protocol:**	ASTM E1241-05 (2013)	**Diluent:**	Dechlorinated Tap Water
Ending Date:	13 Sep-21	**Species:**	Pimephales promelas	**Brine:**	
Test Length:	31d 0h	**Taxon:**	Actinopterygii	**Source:**	Aquatox, AR **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
Lab Control FM	11-5032-4817	10 Aug-21	11 Aug-21	72h	Teck Coal Ltd	
10Cu Control	04-3348-8996	10 Aug-21	11 Aug-21	72h		
15 Cu Control	05-5139-9319	10 Aug-21	11 Aug-21	72h		
20 Cu Control	18-8853-3252	10 Aug-21	11 Aug-21	72h		
FR_UFR1+15Cu	13-9616-5903	10 Aug-21	11 Aug-21	72h (14.7 °C)		
GH_ER2+15Cu	19-5052-7846	10 Aug-21	11 Aug-21	72h (12.1 °C)		
CM_MC1+15Cu	15-1448-1664	10 Aug-21	11 Aug-21	72h (12.3 °C)		
LC_SLC+10Cu	10-0118-5065	10 Aug-21	11 Aug-21	72h (11.8 °C)		
FR_FRABCH+20Cu	12-2763-5905	10 Aug-21	11 Aug-21	72h (14.6 °C)		
FR_FRCP1+20Cu	05-5162-7629	10 Aug-21	11 Aug-21	72h (13.8 °C)		
GH_FR1+20Cu	18-3989-2491	10 Aug-21	11 Aug-21	72h (12 °C)		
GH_ERC+10Cu	14-6940-9296	10 Aug-21	11 Aug-21	72h (15.4 °C)		
CM_MC2+20Cu	17-0166-2336	10 Aug-21	11 Aug-21	72h (13.1 °C)		
RG_MIDAG+15Cu	18-0148-8949	10 Aug-21	11 Aug-21	72h (12.4 °C)		
EV_MC2+20Cu	08-5423-9441	10 Aug-21	11 Aug-21	72h (13.1 °C)		
EV_HC1+20Cu	19-8320-0922	10 Aug-21	11 Aug-21	72h (12.1 °C)		
LC_DCDS+20Cu	12-7443-1043	10 Aug-21	11 Aug-21	72h (12.3 °C)		
LC_LC3+15Cu	06-5017-0795	10 Aug-21	11 Aug-21	72h (12.4 °C)		
LC_LC5+15Cu	10-4683-7945	10 Aug-21	11 Aug-21	72h (15.1 °C)		
LC_LCDSSLCC	11-9856-2953	10 Aug-21	11 Aug-21	72h (10.8 °C)		
FR_FR4+15Cu	16-1388-5677	10 Aug-21	11 Aug-21	72h (14.1 °C)		
FR_FRRD+15Cu	18-8883-2370	10 Aug-21	11 Aug-21	72h (14.7 °C)		
FR_FR2+20Cu	20-1752-8591	10 Aug-21	11 Aug-21	72h (15.3 °C)		
FR_MULTIPLATE	15-0654-9876	10 Aug-21	11 Aug-21	72h (13.6 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
Lab Control FM	Ambient Sample	Teck Coal Ltd	Lab Control FM	
10Cu Control	Ambient Sample	Teck Coal Ltd	10 Cu Control	
15 Cu Control	Ambient Sample	Teck Coal Ltd	15 Cu Control	
20 Cu Control	Ambient Sample	Teck Coal Ltd	20 Cu Control	
FR_UFR1+15Cu	Ambient Sample	Teck Coal Ltd	FR_UFR1_MON_2021-08-0	
GH_ER2+15Cu	Ambient Sample	Teck Coal Ltd	GH_ER2_WS_2021-08-10_	
CM_MC1+15Cu	Ambient Sample	Teck Coal Ltd	CM_MC1_WS_2021-08-10	
LC_SLC+10Cu	Ambient Sample	Teck Coal Ltd	LC_SLC_WS_2021-08-10_	
FR_FRABCH+20Cu	Ambient Sample	Teck Coal Ltd	FR_FRABCH_MON_2021-	
FR_FRCP1+20Cu	Ambient Sample	Teck Coal Ltd	FR_FRCP1_MON_2021-08	
GH_FR1+20Cu	Ambient Sample	Teck Coal Ltd	GH_FR1_WS_2021-08-10_	
GH_ERC+10Cu	Ambient Sample	Teck Coal Ltd	GH_ERC_WS_2021-08-10	
CM_MC2+20Cu	Ambient Sample	Teck Coal Ltd	CM_MC2_WS_2021-08-10	
RG_MIDAG+15Cu	Ambient Sample	Teck Coal Ltd	RG_MIDAG_WS_2021-08-	
EV_MC2+20Cu	Ambient Sample	Teck Coal Ltd	EV_MC2_WS_2021_Q3_W	
EV_HC1+20Cu	Ambient Sample	Teck Coal Ltd	EV_HC1_WS_2021_Q3_W	
LC_DCDS+20Cu	Ambient Sample	Teck Coal Ltd	LC_DCDS_WS_2021-08-1	
LC_LC3+15Cu	Ambient Sample	Teck Coal Ltd	LC_LC3_WS_2021-08-10_	
LC_LC5+15Cu	Ambient Sample	Teck Coal Ltd	LC_LC5_WS_2021-08-10_	
LC_LCDSSLCC	Ambient Sample	Teck Coal Ltd	LC_LCDSSLCC_WS_2021-	
FR_FR4+15Cu	Ambient Sample	Teck Coal Ltd	FR_FR4_WS_2021-08-10_	
FR_FRRD+15Cu	Ambient Sample	Teck Coal Ltd	FR_FRRD_WS_2021-08-1	

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Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID:	20-9284-3462	**Endpoint:**	Proportion Normal	**CETIS Version:**	CETISv1.9.4
Analyzed:	02 Nov-21 9:32	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_FR2+20Cu	Ambient Sample	Teck Coal Ltd	FR_FR2_WS_2021-08-10_	
FR_MULTIPLATE	Ambient Sample	Teck Coal Ltd	FR_MULTIPLATE_WS_20	

Fisher Exact/Bonferroni Adj Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
10Cu Control		Lab Control FM	1.0000	Exact	1.0000	Non-Significant Effect
		15 Cu Control	0.7064	Exact	1.0000	Non-Significant Effect
		20 Cu Control	0.4506	Exact	1.0000	Non-Significant Effect
		FR_UFR1+15Cu	1.0000	Exact	1.0000	Non-Significant Effect
		GH_ER2+15Cu	0.7310	Exact	1.0000	Non-Significant Effect
		CM_MC1+15Cu	0.6459	Exact	1.0000	Non-Significant Effect
		LC_SLC+10Cu	0.7474	Exact	1.0000	Non-Significant Effect
		FR_FRABCH+20Cu	1.0000	Exact	1.0000	Non-Significant Effect
		FR_FRCP1+20Cu	0.4761	Exact	1.0000	Non-Significant Effect
		GH_FR1+20Cu	0.2929	Exact	1.0000	Non-Significant Effect
		GH_ERC+10Cu	0.6782	Exact	1.0000	Non-Significant Effect
		CM_MC2+20Cu	1.0000	Exact	1.0000	Non-Significant Effect
		RG_MIDAG+15Cu	0.1617	Exact	1.0000	Non-Significant Effect
		EV_MC2+20Cu	0.1810	Exact	1.0000	Non-Significant Effect
		EV_HC1+20Cu	0.6278	Exact	1.0000	Non-Significant Effect
		LC_DCDS+20Cu	0.4235	Exact	1.0000	Non-Significant Effect
		LC_LC3+15Cu	0.4328	Exact	1.0000	Non-Significant Effect
		LC_LC5+15Cu	0.6997	Exact	1.0000	Non-Significant Effect
		LC_LCDSSLCC	0.6459	Exact	1.0000	Non-Significant Effect
		FR_FR4+15Cu	0.1237	Exact	1.0000	Non-Significant Effect
		FR_FRRD+15Cu	0.7624	Exact	1.0000	Non-Significant Effect
		FR_FR2+20Cu	0.7526	Exact	1.0000	Non-Significant Effect
		FR_MULTIPLATE	0.7128	Exact	1.0000	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	2.949	3.37	0.2489	No Outliers Detected
Treatment Effect	Fligner-Wolfe Omnibus Test	0.491	1.645	0.3117	Non-Significant Overall Effect

MG

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 20-9284-3462 **Endpoint:** Proportion Normal **CETIS Version:** CETISv1.9.4
Analyzed: 02 Nov-21 9:32 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Data Summary

Sample	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
Lab Control FM		50	0	50	1	0	-2.08%
10Cu Control	10	48	1	49	0.9796	0.02041	0.0%
15 Cu Control		40	1	41	0.9756	0.02439	0.41%
20 Cu Control		41	2	43	0.9535	0.04651	2.67%
FR_UFR1+15Cu		31	0	31	1	0	-2.08%
GH_ER2+15Cu		44	1	45	0.9778	0.02222	0.19%
CM_MC1+15Cu		32	1	33	0.9697	0.0303	1.01%
LC_SLC+10Cu		47	1	48	0.9792	0.02083	0.04%
FR_FRABCH+20Cu		41	0	41	1	0	-2.08%
FR_FRCP1+20Cu		44	2	46	0.9565	0.04348	2.36%
GH_FR1+20Cu		44	3	47	0.9362	0.06383	4.43%
GH_ERC+10Cu		36	1	37	0.973	0.02703	0.68%
CM_MC2+20Cu		40	0	40	1	0	-2.08%
RG_MIDAG+15Cu		42	4	46	0.913	0.08696	6.79%
EV_MC2+20Cu		45	4	49	0.9184	0.08163	6.25%
EV_HC1+20Cu		30	1	31	0.9677	0.03226	1.21%
LC_DCDS+20Cu		38	2	40	0.95	0.05	3.02%
LC_LC3+15Cu		39	2	41	0.9512	0.04878	2.9%
LC_LC5+15Cu		39	1	40	0.975	0.025	0.47%
LC_LCDSSLCC		32	1	33	0.9697	0.0303	1.01%
FR_FR4+15Cu		36	4	40	0.9	0.1	8.13%
FR_FRRD+15Cu		50	1	51	0.9804	0.01961	-0.08%
FR_FR2+20Cu		48	1	49	0.9796	0.02041	0.0%
FR_MULTIPLATE		41	1	42	0.9762	0.02381	0.35%

Proportion Normal Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Lab Control FM		1.0000	1.0000	1.0000	1.0000
10Cu Control	10	1.0000	1.0000	1.0000	0.9231
15 Cu Control		1.0000	1.0000	1.0000	0.9286
20 Cu Control		1.0000	0.8750	1.0000	0.8889
FR_UFR1+15Cu		1.0000	1.0000	1.0000	1.0000
GH_ER2+15Cu		0.9167	1.0000	1.0000	1.0000
CM_MC1+15Cu		1.0000	1.0000	1.0000	0.8000
LC_SLC+10Cu		0.9167	1.0000	1.0000	1.0000
FR_FRABCH+20Cu		1.0000	1.0000	1.0000	1.0000
FR_FRCP1+20Cu		0.9167	1.0000	0.8889	1.0000
GH_FR1+20Cu		1.0000	0.9167	0.8333	1.0000
GH_ERC+10Cu		1.0000	0.8889	1.0000	1.0000
CM_MC2+20Cu		1.0000	1.0000	1.0000	1.0000
RG_MIDAG+15Cu		0.8462	0.9000	1.0000	0.9000
EV_MC2+20Cu		0.8462	0.9231	0.9231	1.0000
EV_HC1+20Cu		1.0000	1.0000	1.0000	0.9333
LC_DCDS+20Cu		0.8571	1.0000	0.9091	1.0000
LC_LC3+15Cu		1.0000	1.0000	0.9167	0.9091
LC_LC5+15Cu		0.9231	1.0000	1.0000	1.0000
LC_LCDSSLCC		1.0000	1.0000	1.0000	0.9000
FR_FR4+15Cu		1.0000	0.7500	1.0000	0.9091
FR_FRRD+15Cu		1.0000	0.9167	1.0000	1.0000
FR_FR2+20Cu		1.0000	1.0000	1.0000	0.9286
FR_MULTIPLATE		0.9000	1.0000	1.0000	1.0000

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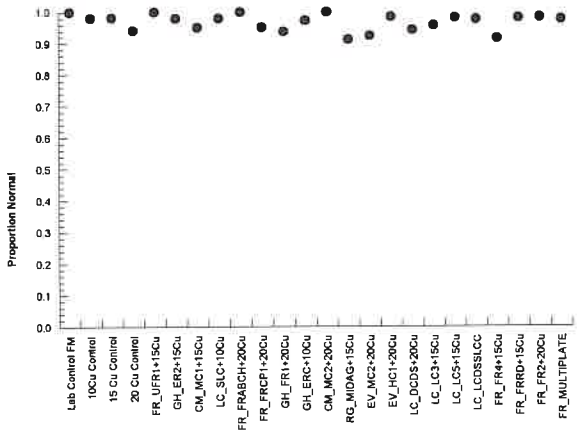
Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 20-9284-3462 **Endpoint:** Proportion Normal **CETIS Version:** CETISv1.9.4
Analyzed: 02 Nov-21 9:32 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Proportion Normal Binomials

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Lab Control FM		12/12	14/14	11/11	13/13
10Cu Control	10	12/12	12/12	12/12	12/13
15 Cu Control		11/11	8/8	8/8	13/14
20 Cu Control		12/12	7/8	14/14	8/9
FR_UFR1+15Cu		8/8	11/11	3/3	9/9
GH_ER2+15Cu		11/12	13/13	8/8	12/12
CM_MC1+15Cu		8/8	9/9	11/11	4/5
LC_SLC+10Cu		11/12	11/11	12/12	13/13
FR_FRABCH+20Cu		9/9	9/9	11/11	12/12
FR_FRCP1+20Cu		11/12	14/14	8/9	11/11
GH_FR1+20Cu		12/12	11/12	10/12	11/11
GH_ERC+10Cu		9/9	8/9	11/11	8/8
CM_MC2+20Cu		7/7	15/15	11/11	7/7
RG_MIDAG+15Cu		11/13	9/10	13/13	9/10
EV_MC2+20Cu		11/13	12/13	12/13	10/10
EV_HC1+20Cu		4/4	8/8	4/4	14/15
LC_DCDS+20Cu		6/7	8/8	10/11	14/14
LC_LC3+15Cu		10/10	8/8	11/12	10/11
LC_LC5+15Cu		12/13	7/7	12/12	8/8
LC_LCDSSLCC		9/9	6/6	8/8	9/10
FR_FR4+15Cu		9/9	9/12	8/8	10/11
FR_FRRD+15Cu		13/13	11/12	13/13	13/13
FR_FR2+20Cu		14/14	10/10	11/11	13/14
FR_MULTIPLATE		9/10	6/6	13/13	13/13

Graphics



CETIS Analytical Report

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID:	12-9984-5554	**Endpoint:**	Post Hatch Survival	**CETIS Version:**	CETISv1.9.4
Analyzed:	02 Nov-21 9:31	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1
Batch ID:	19-0275-1751	**Test Type:**	32 Day Fathead Minnow Test	**Analyst:**	Kayla Knol
Start Date:	13 Aug-21	**Protocol:**	ASTM E1241-05 (2013)	**Diluent:**	Dechlorinated Tap Water
Ending Date:	13 Sep-21	**Species:**	Pimephales promelas	**Brine:**	
Test Length:	31d 0h	**Taxon:**	Actinopterygii	**Source:**	Aquatox, AR **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
Lab Control FM	11-5032-4817	10 Aug-21	11 Aug-21	72h	Teck Coal Ltd	
10Cu Control	04-3348-8996	10 Aug-21	11 Aug-21	72h		
15 Cu Control	05-5139-9319	10 Aug-21	11 Aug-21	72h		
20 Cu Control	18-8853-3252	10 Aug-21	11 Aug-21	72h		
FR_UFR1+15Cu	13-9616-5903	10 Aug-21	11 Aug-21	72h (14.7 °C)		
GH_ER2+15Cu	19-5052-7846	10 Aug-21	11 Aug-21	72h (12.1 °C)		
CM_MC1+15Cu	15-1448-1664	10 Aug-21	11 Aug-21	72h (12.3 °C)		
LC_SLC+10Cu	10-0118-5065	10 Aug-21	11 Aug-21	72h (11.8 °C)		
FR_FRABCH+20Cu	12-2763-5905	10 Aug-21	11 Aug-21	72h (14.6 °C)		
FR_FRCP1+20Cu	05-5162-7629	10 Aug-21	11 Aug-21	72h (13.8 °C)		
GH_FR1+20Cu	18-3989-2491	10 Aug-21	11 Aug-21	72h (12 °C)		
GH_ERC+10Cu	14-6940-9296	10 Aug-21	11 Aug-21	72h (15.4 °C)		
CM_MC2+20Cu	17-0166-2336	10 Aug-21	11 Aug-21	72h (13.1 °C)		
RG_MIDAG+15Cu	18-0148-8949	10 Aug-21	11 Aug-21	72h (12.4 °C)		
EV_MC2+20Cu	08-5423-9441	10 Aug-21	11 Aug-21	72h (13.1 °C)		
EV_HC1+20Cu	19-8320-0922	10 Aug-21	11 Aug-21	72h (12.1 °C)		
LC_DCDS+20Cu	12-7443-1043	10 Aug-21	11 Aug-21	72h (12.3 °C)		
LC_LC3+15Cu	06-5017-0795	10 Aug-21	11 Aug-21	72h (12.4 °C)		
LC_LC5+15Cu	10-4683-7945	10 Aug-21	11 Aug-21	72h (15.1 °C)		
LC_LCDSSLCC	11-9856-2953	10 Aug-21	11 Aug-21	72h (10.8 °C)		
FR_FR4+15Cu	16-1388-5677	10 Aug-21	11 Aug-21	72h (14.1 °C)		
FR_FRRD+15Cu	18-8883-2370	10 Aug-21	11 Aug-21	72h (14.7 °C)		
FR_FR2+20Cu	20-1752-8591	10 Aug-21	11 Aug-21	72h (15.3 °C)		
FR_MULTIPLATE	15-0654-9876	10 Aug-21	11 Aug-21	72h (13.6 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
Lab Control FM	Ambient Sample	Teck Coal Ltd	Lab Control FM	
10Cu Control	Ambient Sample	Teck Coal Ltd	10 Cu Control	
15 Cu Control	Ambient Sample	Teck Coal Ltd	15 Cu Control	
20 Cu Control	Ambient Sample	Teck Coal Ltd	20 Cu Control	
FR_UFR1+15Cu	Ambient Sample	Teck Coal Ltd	FR_UFR1_MON_2021-08-0	
GH_ER2+15Cu	Ambient Sample	Teck Coal Ltd	GH_ER2_WS_2021-08-10_	
CM_MC1+15Cu	Ambient Sample	Teck Coal Ltd	CM_MC1_WS_2021-08-10	
LC_SLC+10Cu	Ambient Sample	Teck Coal Ltd	LC_SLC_WS_2021-08-10_	
FR_FRABCH+20Cu	Ambient Sample	Teck Coal Ltd	FR_FRABCH_MON_2021-	
FR_FRCP1+20Cu	Ambient Sample	Teck Coal Ltd	FR_FRCP1_MON_2021-08	
GH_FR1+20Cu	Ambient Sample	Teck Coal Ltd	GH_FR1_WS_2021-08-10_	
GH_ERC+10Cu	Ambient Sample	Teck Coal Ltd	GH_ERC_WS_2021-08-10	
CM_MC2+20Cu	Ambient Sample	Teck Coal Ltd	CM_MC2_WS_2021-08-10	
RG_MIDAG+15Cu	Ambient Sample	Teck Coal Ltd	RG_MIDAG_WS_2021-08-	
EV_MC2+20Cu	Ambient Sample	Teck Coal Ltd	EV_MC2_WS_2021_Q3_W	
EV_HC1+20Cu	Ambient Sample	Teck Coal Ltd	EV_HC1_WS_2021_Q3_W	
LC_DCDS+20Cu	Ambient Sample	Teck Coal Ltd	LC_DCDS_WS_2021-08-1	
LC_LC3+15Cu	Ambient Sample	Teck Coal Ltd	LC_LC3_WS_2021-08-10_	
LC_LC5+15Cu	Ambient Sample	Teck Coal Ltd	LC_LC5_WS_2021-08-10_	
LC_LCDSSLCC	Ambient Sample	Teck Coal Ltd	LC_LCDSSLCC_WS_2021-	
FR_FR4+15Cu	Ambient Sample	Teck Coal Ltd	FR_FR4_WS_2021-08-10_	
FR_FRRD+15Cu	Ambient Sample	Teck Coal Ltd	FR_FRRD_WS_2021-08-1	

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Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID:	12-9984-5554	**Endpoint:**	Post Hatch Survival	**CETIS Version:**	CETISv1.9.4
Analyzed:	02 Nov-21 9:31	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_FR2+20Cu	Ambient Sample	Teck Coal Ltd	FR_FR2_WS_2021-08-10_	
FR_MULTIPLATE	Ambient Sample	Teck Coal Ltd	FR_MULTIPLATE_WS_20	

Fisher Exact/Bonferroni Adj Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
10Cu Control		Lab Control FM	0.6913	Exact	1.0000	Non-Significant Effect
		15 Cu Control	0.0855	Exact	1.0000	Non-Significant Effect
		20 Cu Control	0.2171	Exact	1.0000	Non-Significant Effect
		FR_UFR1+15Cu*	0.0011	Exact	0.0263	Significant Effect
		GH_ER2+15Cu	0.3720	Exact	1.0000	Non-Significant Effect
		CM_MC1+15Cu	0.0115	Exact	0.2642	Non-Significant Effect
		LC_SLC+10Cu	0.7413	Exact	1.0000	Non-Significant Effect
		FR_FRABCH+20Cu	0.1886	Exact	1.0000	Non-Significant Effect
		FR_FRCP1+20Cu	0.3894	Exact	1.0000	Non-Significant Effect
		GH_FR1+20Cu	0.4826	Exact	1.0000	Non-Significant Effect
		GH_ERC+10Cu	0.0214	Exact	0.4913	Non-Significant Effect
		CM_MC2+20Cu	0.0431	Exact	0.9907	Non-Significant Effect
		RG_MIDAG+15Cu	0.3894	Exact	1.0000	Non-Significant Effect
		EV_MC2+20Cu	0.6769	Exact	1.0000	Non-Significant Effect
		EV_HC1+20Cu	0.0037	Exact	0.0855	Non-Significant Effect
		LC_DCDS+20Cu	0.0318	Exact	0.7316	Non-Significant Effect
		LC_LC3+15Cu	0.0483	Exact	1.0000	Non-Significant Effect
		LC_LC5+15Cu	0.0431	Exact	0.9907	Non-Significant Effect
		LC_LCDSSLCC*	0.0018	Exact	0.0411	Significant Effect
		FR_FR4+15Cu	0.0774	Exact	1.0000	Non-Significant Effect
		FR_FRRD+15Cu	0.7784	Exact	1.0000	Non-Significant Effect
		FR_FR2+20Cu	0.6769	Exact	1.0000	Non-Significant Effect
		FR_MULTIPLATE	0.3918	Exact	1.0000	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	3.147	3.37	0.1204	No Outliers Detected
Treatment Effect	Fligner-Wolfe Omnibus Test	1.139	1.645	0.1274	Non-Significant Overall Effect

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Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 12-9984-5554 **Endpoint:** Post Hatch Survival **CETIS Version:** CETISv1.9.4
Analyzed: 02 Nov-21 9:31 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Data Summary

Sample	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
Lab Control FM		50	9	59	0.8475	0.1525	-2.04%
10Cu Control	10	49	10	59	0.8305	0.1695	0.0%
15 Cu Control		41	17	58	0.7069	0.2931	14.88%
20 Cu Control		43	14	57	0.7544	0.2456	9.17%
FR_UFR1+15Cu		31	25	56	0.5536	0.4464	33.35%
GH_ER2+15Cu		45	12	57	0.7895	0.2105	4.94%
CM_MC1+15Cu		33	20	53	0.6226	0.3774	25.03%
LC_SLC+10Cu		48	8	56	0.8571	0.1429	-3.21%
FR_FRABCH+20Cu		41	14	55	0.7455	0.2545	10.24%
FR_FRCP1+20Cu		46	12	58	0.7931	0.2069	4.5%
GH_FR1+20Cu		47	11	58	0.8103	0.1897	2.43%
GH_ERC+10Cu		37	20	57	0.6491	0.3509	21.84%
CM_MC2+20Cu		40	19	59	0.678	0.322	18.37%
RG_MIDAG+15Cu		46	12	58	0.7931	0.2069	4.5%
EV_MC2+20Cu		49	9	58	0.8448	0.1552	-1.72%
EV_HC1+20Cu		31	22	53	0.5849	0.4151	29.57%
LC_DCDS+20Cu		40	20	60	0.6667	0.3333	19.73%
LC_LC3+15Cu		41	19	60	0.6833	0.3167	17.72%
LC_LC5+15Cu		40	19	59	0.678	0.322	18.37%
LC_LCDSSLCC		33	25	58	0.569	0.431	31.49%
FR_FR4+15Cu		40	17	57	0.7018	0.2982	15.5%
FR_FRRD+15Cu		51	8	59	0.8644	0.1356	-4.08%
FR_FR2+20Cu		49	9	58	0.8448	0.1552	-1.72%
FR_MULTIPLATE		42	11	53	0.7925	0.2075	4.58%

Post Hatch Survival Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Lab Control FM		0.8571	0.9333	0.7333	0.8667
10Cu Control	10	0.8000	0.8000	0.8571	0.8667
15 Cu Control		0.7333	0.5714	0.5333	1.0000
20 Cu Control		0.8571	0.5714	0.9333	0.6429
FR_UFR1+15Cu		0.5714	0.7333	0.2143	0.6923
GH_ER2+15Cu		0.8000	0.9286	0.6154	0.8000
CM_MC1+15Cu		0.6154	0.6429	0.8462	0.3846
LC_SLC+10Cu		0.8571	0.7857	0.8571	0.9286
FR_FRABCH+20Cu		0.6923	0.6923	0.7333	0.8571
FR_FRCP1+20Cu		0.8000	1.0000	0.6429	0.7333
GH_FR1+20Cu		0.8000	0.8000	0.8000	0.8462
GH_ERC+10Cu		0.6429	0.6000	0.8462	0.5333
CM_MC2+20Cu		0.5000	1.0000	0.7333	0.4667
RG_MIDAG+15Cu		0.8667	0.6667	0.8667	0.7692
EV_MC2+20Cu		0.8667	0.8667	0.9286	0.7143
EV_HC1+20Cu		0.3077	0.6667	0.3077	1.0000
LC_DCDS+20Cu		0.4667	0.5333	0.7333	0.9333
LC_LC3+15Cu		0.6667	0.5333	0.8000	0.7333
LC_LC5+15Cu		0.8667	0.4667	0.8000	0.5714
LC_LCDSSLCC		0.6429	0.4000	0.5333	0.7143
FR_FR4+15Cu		0.6000	0.8000	0.5333	0.9167
FR_FRRD+15Cu		0.8667	0.8000	0.8667	0.9286
FR_FR2+20Cu		1.0000	0.6667	0.7333	1.0000
FR_MULTIPLATE		0.8333	0.5000	0.8667	0.9286

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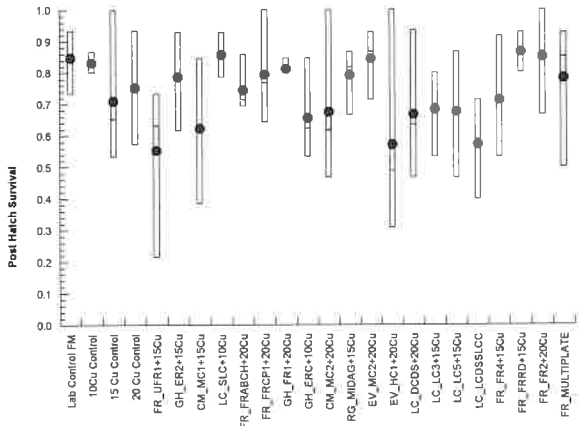
Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 12-9984-5554 **Endpoint:** Post Hatch Survival **CETIS Version:** CETISv1.9.4
Analyzed: 02 Nov-21 9:31 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Post Hatch Survival Binomials

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Lab Control FM		12/14	14/15	11/15	13/15
10Cu Control	10	12/15	12/15	12/14	13/15
15 Cu Control		11/15	8/14	8/15	14/14
20 Cu Control		12/14	8/14	14/15	9/14
FR_UFR1+15Cu		8/14	11/15	3/14	9/13
GH_ER2+15Cu		12/15	13/14	8/13	12/15
CM_MC1+15Cu		8/13	9/14	11/13	5/13
LC_SLC+10Cu		12/14	11/14	12/14	13/14
FR_FRABCH+20Cu		9/13	9/13	11/15	12/14
FR_FRCP1+20Cu		12/15	14/14	9/14	11/15
GH_FR1+20Cu		12/15	12/15	12/15	11/13
GH_ERC+10Cu		9/14	9/15	11/13	8/15
CM_MC2+20Cu		7/14	15/15	11/15	7/15
RG_MIDAG+15Cu		13/15	10/15	13/15	10/13
EV_MC2+20Cu		13/15	13/15	13/14	10/14
EV_HC1+20Cu		4/13	8/12	4/13	15/15
LC_DCDS+20Cu		7/15	8/15	11/15	14/15
LC_LC3+15Cu		10/15	8/15	12/15	11/15
LC_LC5+15Cu		13/15	7/15	12/15	8/14
LC_LCDSSLCC		9/14	6/15	8/15	10/14
FR_FR4+15Cu		9/15	12/15	8/15	11/12
FR_FRRD+15Cu		13/15	12/15	13/15	13/14
FR_FR2+20Cu		14/14	10/15	11/15	14/14
FR_MULTIPLATE		10/12	6/12	13/15	13/14

Graphics



Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID:	14-9081-3888	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.9.4
Analyzed:	02 Nov-21 9:34	**Analysis:**	Nonparametric-Control vs Treatments	**Status Level:**	1
Batch ID:	19-0275-1751	**Test Type:**	32 Day Fathead Minnow Test	**Analyst:**	Kayla Knol
Start Date:	13 Aug-21	**Protocol:**	ASTM E1241-05 (2013)	**Diluent:**	Dechlorinated Tap Water
Ending Date:	13 Sep-21	**Species:**	Pimephales promelas	**Brine:**	
Test Length:	31d 0h	**Taxon:**	Actinopterygii	**Source:**	Aquatox, AR **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
Lab Control FM	11-5032-4817	10 Aug-21	11 Aug-21	72h	Teck Coal Ltd	
10Cu Control	04-3348-8996	10 Aug-21	11 Aug-21	72h		
15 Cu Control	05-5139-9319	10 Aug-21	11 Aug-21	72h		
20 Cu Control	18-8853-3252	10 Aug-21	11 Aug-21	72h		
FR_UFR1+15Cu	13-9616-5903	10 Aug-21	11 Aug-21	72h (14.7 °C)		
GH_ER2+15Cu	19-5052-7846	10 Aug-21	11 Aug-21	72h (12.1 °C)		
CM_MC1+15Cu	15-1448-1664	10 Aug-21	11 Aug-21	72h (12.3 °C)		
LC_SLC+10Cu	10-0118-5065	10 Aug-21	11 Aug-21	72h (11.8 °C)		
FR_FRABCH+20Cu	12-2763-5905	10 Aug-21	11 Aug-21	72h (14.6 °C)		
FR_FRCP1+20Cu	05-5162-7629	10 Aug-21	11 Aug-21	72h (13.8 °C)		
GH_FR1+20Cu	18-3989-2491	10 Aug-21	11 Aug-21	72h (12 °C)		
GH_ERC+10Cu	14-6940-9296	10 Aug-21	11 Aug-21	72h (15.4 °C)		
CM_MC2+20Cu	17-0166-2336	10 Aug-21	11 Aug-21	72h (13.1 °C)		
RG_MIDAG+15Cu	18-0148-8949	10 Aug-21	11 Aug-21	72h (12.4 °C)		
EV_MC2+20Cu	08-5423-9441	10 Aug-21	11 Aug-21	72h (13.1 °C)		
EV_HC1+20Cu	19-8320-0922	10 Aug-21	11 Aug-21	72h (12.1 °C)		
LC_DCDS+20Cu	12-7443-1043	10 Aug-21	11 Aug-21	72h (12.3 °C)		
LC_LC3+15Cu	06-5017-0795	10 Aug-21	11 Aug-21	72h (12.4 °C)		
LC_LC5+15Cu	10-4683-7945	10 Aug-21	11 Aug-21	72h (15.1 °C)		
LC_LCDSSLCC	11-9856-2953	10 Aug-21	11 Aug-21	72h (10.8 °C)		
FR_FR4+15Cu	16-1388-5677	10 Aug-21	11 Aug-21	72h (14.1 °C)		
FR_FRRD+15Cu	18-8883-2370	10 Aug-21	11 Aug-21	72h (14.7 °C)		
FR_FR2+20Cu	20-1752-8591	10 Aug-21	11 Aug-21	72h (15.3 °C)		
FR_MULTIPLATE	15-0654-9876	10 Aug-21	11 Aug-21	72h (13.6 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
Lab Control FM	Ambient Sample	Teck Coal Ltd	Lab Control FM	
10Cu Control	Ambient Sample	Teck Coal Ltd	10 Cu Control	
15 Cu Control	Ambient Sample	Teck Coal Ltd	15 Cu Control	
20 Cu Control	Ambient Sample	Teck Coal Ltd	20 Cu Control	
FR_UFR1+15Cu	Ambient Sample	Teck Coal Ltd	FR_UFR1_MON_2021-08-0	
GH_ER2+15Cu	Ambient Sample	Teck Coal Ltd	GH_ER2_WS_2021-08-10_	
CM_MC1+15Cu	Ambient Sample	Teck Coal Ltd	CM_MC1_WS_2021-08-10	
LC_SLC+10Cu	Ambient Sample	Teck Coal Ltd	LC_SLC_WS_2021-08-10_	
FR_FRABCH+20Cu	Ambient Sample	Teck Coal Ltd	FR_FRABCH_MON_2021-	
FR_FRCP1+20Cu	Ambient Sample	Teck Coal Ltd	FR_FRCP1_MON_2021-08	
GH_FR1+20Cu	Ambient Sample	Teck Coal Ltd	GH_FR1_WS_2021-08-10_	
GH_ERC+10Cu	Ambient Sample	Teck Coal Ltd	GH_ERC_WS_2021-08-10	
CM_MC2+20Cu	Ambient Sample	Teck Coal Ltd	CM_MC2_WS_2021-08-10	
RG_MIDAG+15Cu	Ambient Sample	Teck Coal Ltd	RG_MIDAG_WS_2021-08-	
EV_MC2+20Cu	Ambient Sample	Teck Coal Ltd	EV_MC2_WS_2021_Q3_W	
EV_HC1+20Cu	Ambient Sample	Teck Coal Ltd	EV_HC1_WS_2021_Q3_W	
LC_DCDS+20Cu	Ambient Sample	Teck Coal Ltd	LC_DCDS_WS_2021-08-1	
LC_LC3+15Cu	Ambient Sample	Teck Coal Ltd	LC_LC3_WS_2021-08-10_	
LC_LC5+15Cu	Ambient Sample	Teck Coal Ltd	LC_LC5_WS_2021-08-10_	
LC_LCDSSLCC	Ambient Sample	Teck Coal Ltd	LC_LCDSSLCC_WS_2021-	
FR_FR4+15Cu	Ambient Sample	Teck Coal Ltd	FR_FR4_WS_2021-08-10_	
FR_FRRD+15Cu	Ambient Sample	Teck Coal Ltd	FR_FRRD_WS_2021-08-1	

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 14-9081-3888 **Endpoint:** Mean Dry Biomass-mg **CETIS Version:** CETISv1.9.4
Analyzed: 02 Nov-21 9:34 **Analysis:** Nonparametric-Control vs Treatments **Status Level:** 1

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_FR2+20Cu	Ambient Sample	Teck Coal Ltd	FR_FR2_WS_2021-08-10_	
FR_MULTIPLATE	Ambient Sample	Teck Coal Ltd	FR_MULTIPLATE_WS_20	

Nemenyi-Damico-Wolfe Test

Sample I	vs	Sample II	Test Stat	Critical	Ties	P-Type	P-Value	Decision(α:5%)
15Cu Control		Lab Control FM	-37	211.4	0	CDF	0.9903	Non-Significant Effect
		10Cu Control	-102	211.4	0	CDF	0.9997	Non-Significant Effect
		20 Cu Control	-60	211.4	0	CDF	0.9967	Non-Significant Effect
		FR_UFR1+15Cu	31	211.4	0	CDF	0.8899	Non-Significant Effect
		GH_ER2+15Cu	-26	211.4	0	CDF	0.9845	Non-Significant Effect
		CM_MC1+15Cu	104	211.4	0	CDF	0.5190	Non-Significant Effect
		LC_SLC+10Cu	-81	211.4	0	CDF	0.9989	Non-Significant Effect
		FR_FRABCH+20Cu	-67	211.4	0	CDF	0.9977	Non-Significant Effect
		FR_FRCP1+20Cu	-10	211.4	0	CDF	0.9710	Non-Significant Effect
		GH_FR1+20Cu	-14	211.4	0	CDF	0.9750	Non-Significant Effect
		GH_ERC+10Cu	-51	211.4	0	CDF	0.9949	Non-Significant Effect
		CM_MC2+20Cu	72	211.4	0	CDF	0.7129	Non-Significant Effect
		RG_MIDAG+15Cu	23	211.4	0	CDF	0.9125	Non-Significant Effect
		EV_MC2+20Cu	-55	211.4	0	CDF	0.9958	Non-Significant Effect
		EV_HC1+20Cu	113	211.4	0	CDF	0.4616	Non-Significant Effect
		LC_DCDS+20Cu	-4	211.4	0	CDF	0.9638	Non-Significant Effect
		LC_LC3+15Cu	-91	211.4	0	CDF	0.9994	Non-Significant Effect
		LC_LC5+15Cu	-36	211.4	0	CDF	0.9899	Non-Significant Effect
		LC_LCDSSLCC	44	211.4	0	CDF	0.8449	Non-Significant Effect
		FR_FR4+15Cu	32	211.4	0	CDF	0.8868	Non-Significant Effect
		FR_FRRD+15Cu	-126	211.4	0	CDF	0.9999	Non-Significant Effect
		FR_FR2+20Cu	-122	211.4	0	CDF	0.9999	Non-Significant Effect
		FR_MULTIPLATE	79	211.4	0	CDF	0.6733	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	4.104	3.37	0.0017	Outlier Detected
Treatment Effect	Fligner-Wolfe Omnibus Test	4446		0.6148	Non-Significant Overall Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	4.49634	0.195493	23	1.847	0.0258	Significant Effect
Error	7.61906	0.10582	72			
Total	12.1154		95			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Variances	Bartlett Equality of Variance Test	34.81	35.17	0.0544	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9596	0.9737	0.0048	Non-Normal Distribution

MG

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 14-9081-3888 **Endpoint:** Mean Dry Biomass-mg **CETIS Version:** CETISv1.9.4
Analyzed: 02 Nov-21 9:34 **Analysis:** Nonparametric-Control vs Treatments **Status Level:** 1

Mean Dry Biomass-mg Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
Lab Control FM		4	2.627	1.997	3.257	2.488	2.333	3.199	0.1981	15.08%	0.00%
10Cu Control		4	2.768	2.171	3.366	2.828	2.278	3.139	0.1879	13.57%	-5.38%
15 Cu Control	15	4	2.439	1.994	2.885	2.546	2.026	2.64	0.14	11.47%	7.15%
20 Cu Control		4	2.611	2.495	2.728	2.64	2.504	2.661	0.03658	2.80%	0.60%
FR_UFR1+15Cu		4	2.163	0.8123	3.514	2.308	1.001	3.036	0.4244	39.24%	17.67%
GH_ER2+15Cu		4	2.484	1.959	3.01	2.601	1.999	2.737	0.1651	13.29%	5.44%
CM_MC1+15Cu		4	1.909	1.062	2.757	1.845	1.331	2.615	0.2664	27.90%	27.33%
LC_SLC+10Cu		4	2.639	2.465	2.813	2.685	2.477	2.71	0.05459	4.14%	-0.45%
FR_FRABCH+20Cu		4	2.634	2.222	3.047	2.576	2.421	2.965	0.1297	9.85%	-0.27%
FR_FRCP1+20Cu		4	2.458	1.98	2.935	2.492	2.079	2.768	0.1501	12.22%	6.45%
GH_FR1+20Cu		4	2.511	2.25	2.772	2.55	2.279	2.665	0.082	6.53%	4.42%
GH_ERC+10Cu		4	2.58	2.29	2.87	2.593	2.364	2.771	0.09109	7.06%	1.78%
CM_MC2+20Cu		4	2.273	1.992	2.555	2.34	2.015	2.399	0.08836	7.77%	13.46%
RG_MIDAG+15Cu		4	2.406	2.053	2.76	2.353	2.206	2.713	0.1112	9.24%	8.41%
EV_MC2+20Cu		4	2.577	2.242	2.913	2.594	2.353	2.77	0.1054	8.18%	1.89%
EV_HC1+20Cu		4	2.065	1.635	2.495	1.986	1.851	2.437	0.1351	13.08%	21.39%
LC_DCDS+20Cu		4	2.457	2.005	2.909	2.438	2.143	2.808	0.142	11.56%	6.48%
LC_LC3+15Cu		4	2.663	2.343	2.982	2.695	2.412	2.847	0.1004	7.54%	-1.34%
LC_LC5+15Cu		4	2.538	2.182	2.894	2.624	2.215	2.689	0.1118	8.81%	3.39%
LC_LCDSSLCC		4	2.283	1.678	2.888	2.283	1.896	2.67	0.1902	16.66%	13.11%
FR_FR4+15Cu		4	2.356	1.645	3.067	2.276	1.901	2.971	0.2234	18.96%	10.31%
FR_FRRD+15Cu		4	2.735	2.532	2.938	2.771	2.555	2.843	0.06394	4.68%	-4.10%
FR_FR2+20Cu		4	2.748	2.405	3.091	2.77	2.465	2.988	0.1079	7.85%	-4.61%
FR_MULTIPLATE		4	2.233	1.92	2.546	2.205	2.041	2.482	0.09838	8.81%	14.99%

Mean Dry Biomass-mg Detail

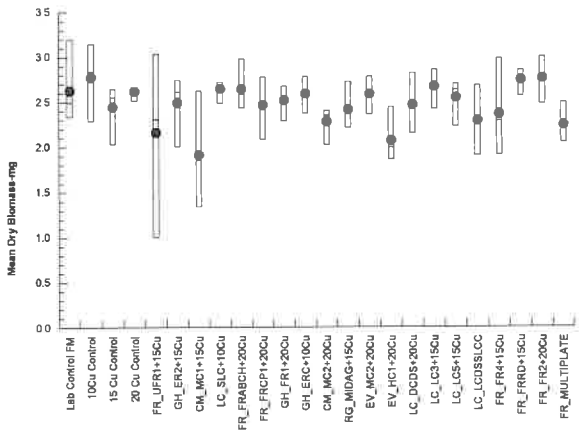
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Lab Control FM		2.583	2.333	2.393	3.199
10Cu Control		2.278	2.69	2.967	3.139
15 Cu Control	15	2.52	2.026	2.64	2.571
20 Cu Control		2.661	2.504	2.654	2.626
FR_UFR1+15Cu		2.25	2.365	1.001	3.036
GH_ER2+15Cu		2.613	2.588	1.999	2.737
CM_MC1+15Cu		1.769	1.921	2.615	1.331
LC_SLC+10Cu		2.477	2.675	2.71	2.695
FR_FRABCH+20Cu		2.434	2.718	2.421	2.965
FR_FRCP1+20Cu		2.611	2.373	2.079	2.768
GH_FR1+20Cu		2.665	2.279	2.55	2.551
GH_ERC+10Cu		2.683	2.364	2.771	2.503
CM_MC2+20Cu		2.015	2.308	2.399	2.373
RG_MIDAG+15Cu		2.419	2.287	2.206	2.713
EV_MC2+20Cu		2.353	2.443	2.77	2.744
EV_HC1+20Cu		1.881	2.092	1.851	2.437
LC_DCDS+20Cu		2.143	2.339	2.808	2.537
LC_LC3+15Cu		2.591	2.8	2.412	2.847
LC_LC5+15Cu		2.689	2.215	2.561	2.687
LC_LCDSSLCC		2.542	1.896	2.023	2.67
FR_FR4+15Cu		2.257	2.295	1.901	2.971
FR_FRRD+15Cu		2.555	2.843	2.735	2.806
FR_FR2+20Cu		2.745	2.794	2.465	2.988
FR_MULTIPLATE		2.294	2.041	2.116	2.482

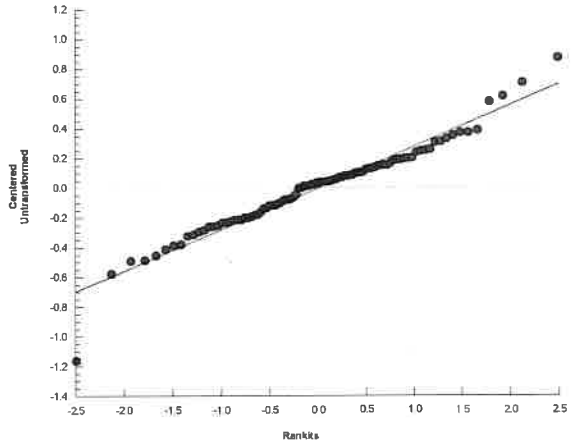
MG

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID:	14-9081-3888	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.9.4
Analyzed:	02 Nov-21 9:34	**Analysis:**	Nonparametric-Control vs Treatments	**Status Level:**	1

Graphics





Analyst: KSC QA: MG NOV 09 2021

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID:	00-9095-0440	**Endpoint:**	Hatch Rate	**CETIS Version:**	CETISv1.9.4
Analyzed:	02 Nov-21 9:33	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1
Batch ID:	19-0275-1751	**Test Type:**	32 Day Fathead Minnow Test	**Analyst:**	Kayla Knol
Start Date:	13 Aug-21	**Protocol:**	ASTM E1241-05 (2013)	**Diluent:**	Dechlorinated Tap Water
Ending Date:	13 Sep-21	**Species:**	Pimephales promelas	**Brine:**	
Test Length:	31d 0h	**Taxon:**	Actinopterygii	**Source:**	Aquatox, AR **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
Lab Control FM	11-5032-4817	10 Aug-21	11 Aug-21	72h	Teck Coal Ltd	
10Cu Control	04-3348-8996	10 Aug-21	11 Aug-21	72h		
15 Cu Control	05-5139-9319	10 Aug-21	11 Aug-21	72h		
20 Cu Control	18-8853-3252	10 Aug-21	11 Aug-21	72h		
FR_UFR1+15Cu	13-9616-5903	10 Aug-21	11 Aug-21	72h (14.7 °C)		
GH_ER2+15Cu	19-5052-7846	10 Aug-21	11 Aug-21	72h (12.1 °C)		
CM_MC1+15Cu	15-1448-1664	10 Aug-21	11 Aug-21	72h (12.3 °C)		
LC_SLC+10Cu	10-0118-5065	10 Aug-21	11 Aug-21	72h (11.8 °C)		
FR_FRABCH+20Cu	12-2763-5905	10 Aug-21	11 Aug-21	72h (14.6 °C)		
FR_FRCP1+20Cu	05-5162-7629	10 Aug-21	11 Aug-21	72h (13.8 °C)		
GH_FR1+20Cu	18-3989-2491	10 Aug-21	11 Aug-21	72h (12 °C)		
GH_ERC+10Cu	14-6940-9296	10 Aug-21	11 Aug-21	72h (15.4 °C)		
CM_MC2+20Cu	17-0166-2336	10 Aug-21	11 Aug-21	72h (13.1 °C)		
RG_MIDAG+15Cu	18-0148-8949	10 Aug-21	11 Aug-21	72h (12.4 °C)		
EV_MC2+20Cu	08-5423-9441	10 Aug-21	11 Aug-21	72h (13.1 °C)		
EV_HC1+20Cu	19-8320-0922	10 Aug-21	11 Aug-21	72h (12.1 °C)		
LC_DCDS+20Cu	12-7443-1043	10 Aug-21	11 Aug-21	72h (12.3 °C)		
LC_LC3+15Cu	06-5017-0795	10 Aug-21	11 Aug-21	72h (12.4 °C)		
LC_LC5+15Cu	10-4683-7945	10 Aug-21	11 Aug-21	72h (15.1 °C)		
LC_LCDSSLCC	11-9856-2953	10 Aug-21	11 Aug-21	72h (10.8 °C)		
FR_FR4+15Cu	16-1388-5677	10 Aug-21	11 Aug-21	72h (14.1 °C)		
FR_FRRD+15Cu	18-8883-2370	10 Aug-21	11 Aug-21	72h (14.7 °C)		
FR_FR2+20Cu	20-1752-8591	10 Aug-21	11 Aug-21	72h (15.3 °C)		
FR_MULTIPLATE	15-0654-9876	10 Aug-21	11 Aug-21	72h (13.6 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
Lab Control FM	Ambient Sample	Teck Coal Ltd	Lab Control FM	
10Cu Control	Ambient Sample	Teck Coal Ltd	10 Cu Control	
15 Cu Control	Ambient Sample	Teck Coal Ltd	15 Cu Control	
20 Cu Control	Ambient Sample	Teck Coal Ltd	20 Cu Control	
FR_UFR1+15Cu	Ambient Sample	Teck Coal Ltd	FR_UFR1_MON_2021-08-0	
GH_ER2+15Cu	Ambient Sample	Teck Coal Ltd	GH_ER2_WS_2021-08-10_	
CM_MC1+15Cu	Ambient Sample	Teck Coal Ltd	CM_MC1_WS_2021-08-10	
LC_SLC+10Cu	Ambient Sample	Teck Coal Ltd	LC_SLC_WS_2021-08-10_	
FR_FRABCH+20Cu	Ambient Sample	Teck Coal Ltd	FR_FRABCH_MON_2021-	
FR_FRCP1+20Cu	Ambient Sample	Teck Coal Ltd	FR_FRCP1_MON_2021-08	
GH_FR1+20Cu	Ambient Sample	Teck Coal Ltd	GH_FR1_WS_2021-08-10_	
GH_ERC+10Cu	Ambient Sample	Teck Coal Ltd	GH_ERC_WS_2021-08-10	
CM_MC2+20Cu	Ambient Sample	Teck Coal Ltd	CM_MC2_WS_2021-08-10	
RG_MIDAG+15Cu	Ambient Sample	Teck Coal Ltd	RG_MIDAG_WS_2021-08-	
EV_MC2+20Cu	Ambient Sample	Teck Coal Ltd	EV_MC2_WS_2021_Q3_W	
EV_HC1+20Cu	Ambient Sample	Teck Coal Ltd	EV_HC1_WS_2021_Q3_W	
LC_DCDS+20Cu	Ambient Sample	Teck Coal Ltd	LC_DCDS_WS_2021-08-1	
LC_LC3+15Cu	Ambient Sample	Teck Coal Ltd	LC_LC3_WS_2021-08-10_	
LC_LC5+15Cu	Ambient Sample	Teck Coal Ltd	LC_LC5_WS_2021-08-10_	
LC_LCDSSLCC	Ambient Sample	Teck Coal Ltd	LC_LCDSSLCC_WS_2021-	
FR_FR4+15Cu	Ambient Sample	Teck Coal Ltd	FR_FR4_WS_2021-08-10_	
FR_FRRD+15Cu	Ambient Sample	Teck Coal Ltd	FR_FRRD_WS_2021-08-1	

MG

NOV 09 2021

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID:	00-9095-0440	**Endpoint:**	Hatch Rate	**CETIS Version:**	CETISv1.9.4
Analyzed:	02 Nov-21 9:33	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_FR2+20Cu	Ambient Sample	Teck Coal Ltd	FR_FR2_WS_2021-08-10_	
FR_MULTIPLATE	Ambient Sample	Teck Coal Ltd	FR_MULTIPLATE_WS_20	

Fisher Exact/Bonferroni Adj Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
15Cu Control		Lab Control FM	0.8782	Exact	1.0000	Non-Significant Effect
		10Cu Control	0.8782	Exact	1.0000	Non-Significant Effect
		20 Cu Control	0.5000	Exact	1.0000	Non-Significant Effect
		FR_UFR1+15Cu	0.3397	Exact	1.0000	Non-Significant Effect
		GH_ER2+15Cu	0.5000	Exact	1.0000	Non-Significant Effect
		CM_MC1+15Cu	0.0815	Exact	1.0000	Non-Significant Effect
		LC_SLC+10Cu	0.3397	Exact	1.0000	Non-Significant Effect
		FR_FRABCH+20Cu	0.2195	Exact	1.0000	Non-Significant Effect
		FR_FRCP1+20Cu	0.6907	Exact	1.0000	Non-Significant Effect
		GH_FR1+20Cu	0.6907	Exact	1.0000	Non-Significant Effect
		GH_ERC+10Cu	0.5000	Exact	1.0000	Non-Significant Effect
		CM_MC2+20Cu	0.8782	Exact	1.0000	Non-Significant Effect
		RG_MIDAG+15Cu	0.6907	Exact	1.0000	Non-Significant Effect
		EV_MC2+20Cu	0.6907	Exact	1.0000	Non-Significant Effect
		EV_HC1+20Cu	0.0815	Exact	1.0000	Non-Significant Effect
		LC_DCDS+20Cu	1.0000	Exact	1.0000	Non-Significant Effect
		LC_LC3+15Cu	1.0000	Exact	1.0000	Non-Significant Effect
		LC_LC5+15Cu	0.8782	Exact	1.0000	Non-Significant Effect
		LC_LCDSSLCC	0.6907	Exact	1.0000	Non-Significant Effect
		FR_FR4+15Cu	0.5000	Exact	1.0000	Non-Significant Effect
		FR_FRRD+15Cu	0.8782	Exact	1.0000	Non-Significant Effect
		FR_FR2+20Cu	0.6907	Exact	1.0000	Non-Significant Effect
		FR_MULTIPLATE	0.0815	Exact	1.0000	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	3.044	3.37	0.1764	No Outliers Detected

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 00-9095-0440 **Endpoint:** Hatch Rate **CETIS Version:** CETISv1.9.4
Analyzed: 02 Nov-21 9:33 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Data Summary

Sample	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
Lab Control FM		59	1	60	0.9833	0.01667	-1.72%
10Cu Control		59	1	60	0.9833	0.01667	-1.72%
15 Cu Control	15	58	2	60	0.9667	0.03333	0.0%
20 Cu Control		57	3	60	0.95	0.05	1.72%
FR_UFR1+15Cu		56	4	60	0.9333	0.06667	3.45%
GH_ER2+15Cu		57	3	60	0.95	0.05	1.72%
CM_MC1+15Cu		53	7	60	0.8833	0.1167	8.62%
LC_SLC+10Cu		56	4	60	0.9333	0.06667	3.45%
FR_FRABCH+20Cu		55	5	60	0.9167	0.08333	5.17%
FR_FRCP1+20Cu		58	2	60	0.9667	0.03333	0.0%
GH_FR1+20Cu		58	2	60	0.9667	0.03333	0.0%
GH_ERC+10Cu		57	3	60	0.95	0.05	1.72%
CM_MC2+20Cu		59	1	60	0.9833	0.01667	-1.72%
RG_MIDAG+15Cu		58	2	60	0.9667	0.03333	0.0%
EV_MC2+20Cu		58	2	60	0.9667	0.03333	0.0%
EV_HC1+20Cu		53	7	60	0.8833	0.1167	8.62%
LC_DCDS+20Cu		60	0	60	1	0	-3.45%
LC_LC3+15Cu		60	0	60	1	0	-3.45%
LC_LC5+15Cu		59	1	60	0.9833	0.01667	-1.72%
LC_LCDSSLCC		58	2	60	0.9667	0.03333	0.0%
FR_FR4+15Cu		57	3	60	0.95	0.05	1.72%
FR_FRRD+15Cu		59	1	60	0.9833	0.01667	-1.72%
FR_FR2+20Cu		58	2	60	0.9667	0.03333	0.0%
FR_MULTIPLATE		53	7	60	0.8833	0.1167	8.62%

Hatch Rate Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Lab Control FM		0.9333	1.0000	1.0000	1.0000
10Cu Control		1.0000	1.0000	0.9333	1.0000
15 Cu Control	15	1.0000	0.9333	1.0000	0.9333
20 Cu Control		0.9333	0.9333	1.0000	0.9333
FR_UFR1+15Cu		0.9333	1.0000	0.9333	0.8667
GH_ER2+15Cu		1.0000	0.9333	0.8667	1.0000
CM_MC1+15Cu		0.8667	0.9333	0.8667	0.8667
LC_SLC+10Cu		0.9333	0.9333	0.9333	0.9333
FR_FRABCH+20Cu		0.8667	0.8667	1.0000	0.9333
FR_FRCP1+20Cu		1.0000	0.9333	0.9333	1.0000
GH_FR1+20Cu		1.0000	1.0000	1.0000	0.8667
GH_ERC+10Cu		0.9333	1.0000	0.8667	1.0000
CM_MC2+20Cu		0.9333	1.0000	1.0000	1.0000
RG_MIDAG+15Cu		1.0000	1.0000	1.0000	0.8667
EV_MC2+20Cu		1.0000	1.0000	0.9333	0.9333
EV_HC1+20Cu		0.8667	0.8000	0.8667	1.0000
LC_DCDS+20Cu		1.0000	1.0000	1.0000	1.0000
LC_LC3+15Cu		1.0000	1.0000	1.0000	1.0000
LC_LC5+15Cu		1.0000	1.0000	1.0000	0.9333
LC_LCDSSLCC		0.9333	1.0000	1.0000	0.9333
FR_FR4+15Cu		1.0000	1.0000	1.0000	0.8000
FR_FRRD+15Cu		1.0000	1.0000	1.0000	0.9333
FR_FR2+20Cu		0.9333	1.0000	1.0000	0.9333
FR_MULTIPLATE		0.8000	0.8000	1.0000	0.9333

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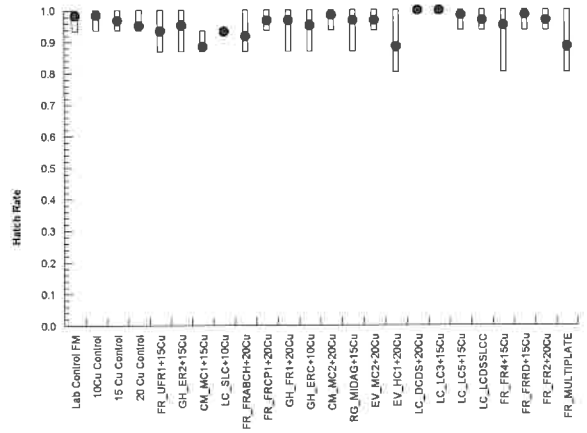
Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 00-9095-0440 **Endpoint:** Hatch Rate **CETIS Version:** CETISv1.9.4
Analyzed: 02 Nov-21 9:33 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Hatch Rate Binomials

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Lab Control FM		14/15	15/15	15/15	15/15
10Cu Control		15/15	15/15	14/15	15/15
15 Cu Control	15	15/15	14/15	15/15	14/15
20 Cu Control		14/15	14/15	15/15	14/15
FR_UFR1+15Cu		14/15	15/15	14/15	13/15
GH_ER2+15Cu		15/15	14/15	13/15	15/15
CM_MC1+15Cu		13/15	14/15	13/15	13/15
LC_SLC+10Cu		14/15	14/15	14/15	14/15
FR_FRABCH+20Cu		13/15	13/15	15/15	14/15
FR_FRCP1+20Cu		15/15	14/15	14/15	15/15
GH_FR1+20Cu		15/15	15/15	15/15	13/15
GH_ERC+10Cu		14/15	15/15	13/15	15/15
CM_MC2+20Cu		14/15	15/15	15/15	15/15
RG_MIDAG+15Cu		15/15	15/15	15/15	13/15
EV_MC2+20Cu		15/15	15/15	14/15	14/15
EV_HC1+20Cu		13/15	12/15	13/15	15/15
LC_DCDS+20Cu		15/15	15/15	15/15	15/15
LC_LC3+15Cu		15/15	15/15	15/15	15/15
LC_LC5+15Cu		15/15	15/15	15/15	14/15
LC_LCDSSLCC		14/15	15/15	15/15	14/15
FR_FR4+15Cu		15/15	15/15	15/15	12/15
FR_FRRD+15Cu		15/15	15/15	15/15	14/15
FR_FR2+20Cu		14/15	15/15	15/15	14/15
FR_MULTIPLATE		12/15	12/15	15/15	14/15

Graphics



Analyst: KSC QA: NOV 09 2021

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID:	07-2144-1293	**Endpoint:**	Length	**CETIS Version:**	CETISv1.9.4
Analyzed:	02 Nov-21 9:33	**Analysis:**	Parametric-Control vs Treatments	**Status Level:**	1
Batch ID:	19-0275-1751	**Test Type:**	32 Day Fathead Minnow Test	**Analyst:**	Kayla Knol
Start Date:	13 Aug-21	**Protocol:**	ASTM E1241-05 (2013)	**Diluent:**	Dechlorinated Tap Water
Ending Date:	13 Sep-21	**Species:**	Pimephales promelas	**Brine:**	
Test Length:	31d 0h	**Taxon:**	Actinopterygii	**Source:**	Aquatox, AR **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
Lab Control FM	11-5032-4817	10 Aug-21	11 Aug-21	72h	Teck Coal Ltd	
10Cu Control	04-3348-8996	10 Aug-21	11 Aug-21	72h		
15 Cu Control	05-5139-9319	10 Aug-21	11 Aug-21	72h		
20 Cu Control	18-8853-3252	10 Aug-21	11 Aug-21	72h		
FR_UFR1+15Cu	13-9616-5903	10 Aug-21	11 Aug-21	72h (14.7 °C)		
GH_ER2+15Cu	19-5052-7846	10 Aug-21	11 Aug-21	72h (12.1 °C)		
CM_MC1+15Cu	15-1448-1664	10 Aug-21	11 Aug-21	72h (12.3 °C)		
LC_SLC+10Cu	10-0118-5065	10 Aug-21	11 Aug-21	72h (11.8 °C)		
FR_FRABCH+20Cu	12-2763-5905	10 Aug-21	11 Aug-21	72h (14.6 °C)		
FR_FRCP1+20Cu	05-5162-7629	10 Aug-21	11 Aug-21	72h (13.8 °C)		
GH_FR1+20Cu	18-3989-2491	10 Aug-21	11 Aug-21	72h (12 °C)		
GH_ERC+10Cu	14-6940-9296	10 Aug-21	11 Aug-21	72h (15.4 °C)		
CM_MC2+20Cu	17-0166-2336	10 Aug-21	11 Aug-21	72h (13.1 °C)		
RG_MIDAG+15Cu	18-0148-8949	10 Aug-21	11 Aug-21	72h (12.4 °C)		
EV_MC2+20Cu	08-5423-9441	10 Aug-21	11 Aug-21	72h (13.1 °C)		
EV_HC1+20Cu	19-8320-0922	10 Aug-21	11 Aug-21	72h (12.1 °C)		
LC_DCDS+20Cu	12-7443-1043	10 Aug-21	11 Aug-21	72h (12.3 °C)		
LC_LC3+15Cu	06-5017-0795	10 Aug-21	11 Aug-21	72h (12.4 °C)		
LC_LC5+15Cu	10-4683-7945	10 Aug-21	11 Aug-21	72h (15.1 °C)		
LC_LCDSSLCC	11-9856-2953	10 Aug-21	11 Aug-21	72h (10.8 °C)		
FR_FR4+15Cu	16-1388-5677	10 Aug-21	11 Aug-21	72h (14.1 °C)		
FR_FRRD+15Cu	18-8883-2370	10 Aug-21	11 Aug-21	72h (14.7 °C)		
FR_FR2+20Cu	20-1752-8591	10 Aug-21	11 Aug-21	72h (15.3 °C)		
FR_MULTIPLATE	15-0654-9876	10 Aug-21	11 Aug-21	72h (13.6 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
Lab Control FM	Ambient Sample	Teck Coal Ltd	Lab Control FM	
10Cu Control	Ambient Sample	Teck Coal Ltd	10 Cu Control	
15 Cu Control	Ambient Sample	Teck Coal Ltd	15 Cu Control	
20 Cu Control	Ambient Sample	Teck Coal Ltd	20 Cu Control	
FR_UFR1+15Cu	Ambient Sample	Teck Coal Ltd	FR_UFR1_MON_2021-08-0	
GH_ER2+15Cu	Ambient Sample	Teck Coal Ltd	GH_ER2_WS_2021-08-10_	
CM_MC1+15Cu	Ambient Sample	Teck Coal Ltd	CM_MC1_WS_2021-08-10	
LC_SLC+10Cu	Ambient Sample	Teck Coal Ltd	LC_SLC_WS_2021-08-10_	
FR_FRABCH+20Cu	Ambient Sample	Teck Coal Ltd	FR_FRABCH_MON_2021-	
FR_FRCP1+20Cu	Ambient Sample	Teck Coal Ltd	FR_FRCP1_MON_2021-08	
GH_FR1+20Cu	Ambient Sample	Teck Coal Ltd	GH_FR1_WS_2021-08-10_	
GH_ERC+10Cu	Ambient Sample	Teck Coal Ltd	GH_ERC_WS_2021-08-10	
CM_MC2+20Cu	Ambient Sample	Teck Coal Ltd	CM_MC2_WS_2021-08-10	
RG_MIDAG+15Cu	Ambient Sample	Teck Coal Ltd	RG_MIDAG_WS_2021-08-	
EV_MC2+20Cu	Ambient Sample	Teck Coal Ltd	EV_MC2_WS_2021_Q3_W	
EV_HC1+20Cu	Ambient Sample	Teck Coal Ltd	EV_HC1_WS_2021_Q3_W	
LC_DCDS+20Cu	Ambient Sample	Teck Coal Ltd	LC_DCDS_WS_2021-08-1	
LC_LC3+15Cu	Ambient Sample	Teck Coal Ltd	LC_LC3_WS_2021-08-10_	
LC_LC5+15Cu	Ambient Sample	Teck Coal Ltd	LC_LC5_WS_2021-08-10_	
LC_LCDSSLCC	Ambient Sample	Teck Coal Ltd	LC_LCDSSLCC_WS_2021-	
FR_FR4+15Cu	Ambient Sample	Teck Coal Ltd	FR_FR4_WS_2021-08-10_	
FR_FRRD+15Cu	Ambient Sample	Teck Coal Ltd	FR_FRRD_WS_2021-08-1	

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NOV 09 2021

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID:	07-2144-1293	**Endpoint:**	Length	**CETIS Version:**	CETISv1.9.4
Analyzed:	02 Nov-21 9:33	**Analysis:**	Parametric-Control vs Treatments	**Status Level:**	1

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_FR2+20Cu	Ambient Sample	Teck Coal Ltd	FR_FR2_WS_2021-08-10_	
FR_MULTIPLATE	Ambient Sample	Teck Coal Ltd	FR_MULTIPLATE_WS_20	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	Lab Control FM passed length	11.38%
		10Cu Control passed length	11.38%
		20 Cu Control passed length	11.38%
		FR_UFR1+15Cu passed length	11.38%
		GH_ER2+15Cu passed length	11.38%
		CM_MC1+15Cu failed length	11.38%
		LC_SLC+10Cu passed length	11.38%
		FR_FRABCH+20Cu passed length	11.38%
		FR_FRCP1+20Cu failed length	11.38%
		GH_FR1+20Cu failed length	11.38%
		GH_ERC+10Cu passed length	11.38%
		CM_MC2+20Cu passed length	11.38%
		RG_MIDAG+15Cu passed length	11.38%
		EV_MC2+20Cu failed length	11.38%
		EV_HC1+20Cu passed length	11.38%
		LC_DCDS+20Cu passed length	11.38%
		LC_LC3+15Cu passed length	11.38%
		LC_LC5+15Cu passed length	11.38%
		LC_LCDSSLCC passed length	11.38%
		FR_FR4+15Cu passed length	11.38%
		FR_FRRD+15Cu failed length	11.38%
		FR_FR2+20Cu passed length	11.38%
		FR_MULTIPLATE passed length	11.38%

Dunnett Multiple Comparison Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
15Cu Control		Lab Control FM	0.9257	2.744	1.408	6	CDF	0.7083	Non-Significant Effect
		10Cu Control	-0.09745	2.744	1.408	6	CDF	0.9683	Non-Significant Effect
		20 Cu Control	-1.267	2.744	1.408	6	CDF	0.9996	Non-Significant Effect
		FR_UFR1+15Cu	1.316	2.744	1.408	6	CDF	0.5234	Non-Significant Effect
		GH_ER2+15Cu	2.387	2.744	1.408	6	CDF	0.1082	Non-Significant Effect
		CM_MC1+15Cu*	2.777	2.744	1.408	6	CDF	0.0462	Significant Effect
		LC_SLC+10Cu	0.9257	2.744	1.408	6	CDF	0.7083	Non-Significant Effect
		FR_FRABCH+20Cu	1.316	2.744	1.408	6	CDF	0.5234	Non-Significant Effect
		FR_FRCP1+20Cu*	3.167	2.744	1.408	6	CDF	0.0172	Significant Effect
		GH_FR1+20Cu*	2.777	2.744	1.408	6	CDF	0.0462	Significant Effect
		GH_ERC+10Cu	-0.6334	2.744	1.408	6	CDF	0.9945	Non-Significant Effect
		CM_MC2+20Cu	-0.1462	2.744	1.408	6	CDF	0.9725	Non-Significant Effect
		RG_MIDAG+15Cu	2.534	2.744	1.408	6	CDF	0.0800	Non-Significant Effect
		EV_MC2+20Cu*	3.07	2.744	1.408	6	CDF	0.0223	Significant Effect
		EV_HC1+20Cu	0.3898	2.744	1.408	6	CDF	0.8909	Non-Significant Effect
		LC_DCDS+20Cu	0.09744	2.744	1.408	6	CDF	0.9459	Non-Significant Effect
		LC_LC3+15Cu	0.3898	2.744	1.408	6	CDF	0.8909	Non-Significant Effect
		LC_LC5+15Cu	-0.4872	2.744	1.408	6	CDF	0.9908	Non-Significant Effect
		LC_LCDSSLCC	0.5847	2.744	1.408	6	CDF	0.8370	Non-Significant Effect
		FR_FR4+15Cu	2.241	2.744	1.408	6	CDF	0.1435	Non-Significant Effect
		FR_FRRD+15Cu*	2.875	2.744	1.408	6	CDF	0.0366	Significant Effect
		FR_FR2+20Cu	2.095	2.744	1.408	6	CDF	0.1862	Non-Significant Effect
		FR_MULTIPLATE	2.436	2.744	1.408	6	CDF	0.0981	Non-Significant Effect

Auxiliary Tests

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Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 07-2144-1293 **Endpoint:** Length **CETIS Version:** CETISv1.9.4
Analyzed: 02 Nov-21 9:33 **Analysis:** Parametric-Control vs Treatments **Status Level:** 1

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	3.285	3.37	0.0706	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	44.2591	1.92431	23	3.654	1.3E-05	Significant Effect
Error	37.9125	0.526563	72			
Total	82.1716		95			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Variances	Bartlett Equality of Variance Test	33.4	35.17	0.0744	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9854	0.9737	0.3692	Normal Distribution

Length Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
Lab Control FM		4	11.9	11.15	12.65	11.95	11.3	12.4	0.2345	3.94%	0.00%
10Cu Control		4	12.43	11.66	13.19	12.55	11.8	12.8	0.2394	3.85%	-4.41%
15 Cu Control	15	4	12.37	10.89	13.86	12.35	11.4	13.4	0.4661	7.53%	-3.99%
20 Cu Control		4	13.03	12.67	13.38	13	12.8	13.3	0.1109	1.70%	-9.45%
FR_UFR1+15Cu		4	11.7	10.85	12.55	11.95	10.9	12	0.2677	4.58%	1.68%
GH_ER2+15Cu		4	11.15	10.87	11.43	11.15	11	11.3	0.0866	1.55%	6.30%
CM_MC1+15Cu		4	10.95	10.06	11.84	11.05	10.2	11.5	0.2784	5.08%	7.98%
LC_SLC+10Cu		4	11.9	11.12	12.68	11.8	11.5	12.5	0.2449	4.12%	0.00%
FR_FRABCH+20Cu		4	11.7	10.38	13.02	11.65	10.8	12.7	0.4143	7.08%	1.68%
FR_FRCP1+20Cu		4	10.75	9.243	12.26	11	9.4	11.6	0.4735	8.81%	9.66%
GH_FR1+20Cu		4	10.95	10.33	11.57	10.95	10.5	11.4	0.1936	3.54%	7.98%
GH_ERC+10Cu		4	12.7	12.15	13.25	12.7	12.4	13	0.1732	2.73%	-6.72%
CM_MC2+20Cu		4	12.45	11.06	13.84	12.55	11.3	13.4	0.4368	7.02%	-4.62%
RG_MIDAG+15Cu		4	11.08	10.09	12.06	10.9	10.6	11.9	0.3092	5.58%	6.93%
EV_MC2+20Cu		4	10.8	9.236	12.36	10.6	9.9	12.1	0.4916	9.10%	9.24%
EV_HC1+20Cu		4	12.18	9.553	14.8	12.55	10.1	13.5	0.824	13.54%	-2.31%
LC_DCDS+20Cu		4	12.33	11.45	13.2	12.45	11.6	12.8	0.275	4.46%	-3.57%
LC_LC3+15Cu		4	12.18	10.8	13.55	12.15	11.3	13.1	0.4308	7.08%	-2.31%
LC_LC5+15Cu		4	12.62	10.78	14.47	12.75	11.2	13.8	0.5808	9.20%	-6.09%
LC_LCDSSLCC		4	12.08	11.47	12.68	12.1	11.6	12.5	0.1887	3.13%	-1.47%
FR_FR4+15Cu		4	11.23	10.62	11.83	11.2	10.8	11.7	0.1887	3.36%	5.67%
FR_FRRD+15Cu		4	10.9	10.47	11.33	11	10.5	11.1	0.1354	2.48%	8.40%
FR_FR2+20Cu		4	11.3	10.58	12.02	11.2	10.9	11.9	0.2273	4.02%	5.04%
FR_MULTIPLATE		4	11.12	9.736	12.51	11	10.2	12.3	0.4366	7.85%	6.51%

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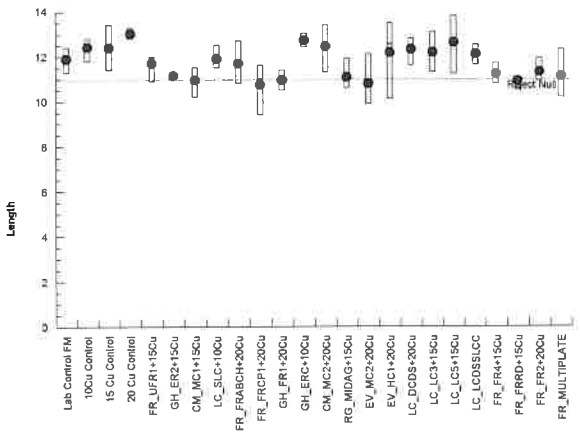
Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

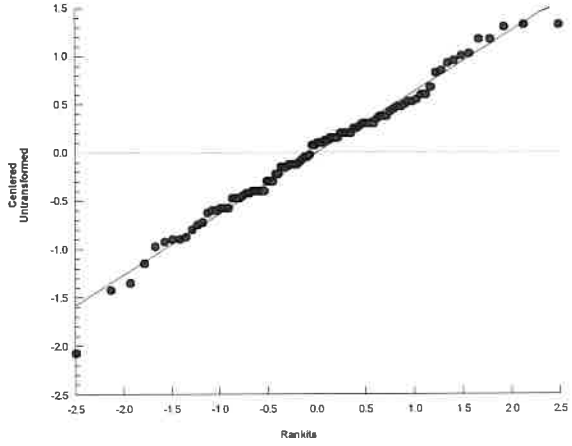
Analysis ID: 07-2144-1293 **Endpoint:** Length **CETIS Version:** CETISv1.9.4
Analyzed: 02 Nov-21 9:33 **Analysis:** Parametric-Control vs Treatments **Status Level:** 1

Length Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Lab Control FM		12.4	11.3	12.1	11.8
10Cu Control		11.8	12.3	12.8	12.8
15 Cu Control	15	12.9	11.8	13.4	11.4
20 Cu Control		13.3	12.9	12.8	13.1
FR_UFR1+15Cu		11.9	10.9	12	12
GH_ER2+15Cu		11.3	11.3	11	11
CM_MC1+15Cu		11.5	10.9	11.2	10.2
LC_SLC+10Cu		11.5	12.5	12.1	11.5
FR_FRABCH+20Cu		12.7	12	10.8	11.3
FR_FRCP1+20Cu		11.1	10.9	9.4	11.6
GH_FR1+20Cu		11.1	10.5	10.8	11.4
GH_ERC+10Cu		13	12.4	12.4	13
CM_MC2+20Cu		12.7	11.3	12.4	13.4
RG_MIDAG+15Cu		10.6	10.6	11.2	11.9
EV_MC2+20Cu		9.9	10.2	11	12.1
EV_HC1+20Cu		13.5	11.6	13.5	10.1
LC_DCDS+20Cu		12.7	12.8	12.2	11.6
LC_LC3+15Cu		12.7	13.1	11.3	11.6
LC_LC5+15Cu		11.2	13.3	12.2	13.8
LC_LCDSSLCC		12.2	12	11.6	12.5
FR_FR4+15Cu		11.3	10.8	11.1	11.7
FR_FRRD+15Cu		10.5	11	11	11.1
FR_FR2+20Cu		11	11.9	11.4	10.9
FR_MULTIPLATE		11.1	12.3	10.2	10.9

Graphics





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CETIS Analytical Report

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID:	12-4671-3995	**Endpoint:**	Proportion Normal	**CETIS Version:**	CETISv1.9.4
Analyzed:	02 Nov-21 9:35	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1
Batch ID:	19-0275-1751	**Test Type:**	32 Day Fathead Minnow Test	**Analyst:**	Kayla Knol
Start Date:	13 Aug-21	**Protocol:**	ASTM E1241-05 (2013)	**Diluent:**	Dechlorinated Tap Water
Ending Date:	13 Sep-21	**Species:**	Pimephales promelas	**Brine:**	
Test Length:	31d 0h	**Taxon:**	Actinopterygii	**Source:**	Aquatox, AR **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
Lab Control FM	11-5032-4817	10 Aug-21	11 Aug-21	72h	Teck Coal Ltd	
10Cu Control	04-3348-8996	10 Aug-21	11 Aug-21	72h		
15 Cu Control	05-5139-9319	10 Aug-21	11 Aug-21	72h		
20 Cu Control	18-8853-3252	10 Aug-21	11 Aug-21	72h		
FR_UFR1+15Cu	13-9616-5903	10 Aug-21	11 Aug-21	72h (14.7 °C)		
GH_ER2+15Cu	19-5052-7846	10 Aug-21	11 Aug-21	72h (12.1 °C)		
CM_MC1+15Cu	15-1448-1664	10 Aug-21	11 Aug-21	72h (12.3 °C)		
LC_SLC+10Cu	10-0118-5065	10 Aug-21	11 Aug-21	72h (11.8 °C)		
FR_FRABCH+20Cu	12-2763-5905	10 Aug-21	11 Aug-21	72h (14.6 °C)		
FR_FRCP1+20Cu	05-5162-7629	10 Aug-21	11 Aug-21	72h (13.8 °C)		
GH_FR1+20Cu	18-3989-2491	10 Aug-21	11 Aug-21	72h (12 °C)		
GH_ERC+10Cu	14-6940-9296	10 Aug-21	11 Aug-21	72h (15.4 °C)		
CM_MC2+20Cu	17-0166-2336	10 Aug-21	11 Aug-21	72h (13.1 °C)		
RG_MIDAG+15Cu	18-0148-8949	10 Aug-21	11 Aug-21	72h (12.4 °C)		
EV_MC2+20Cu	08-5423-9441	10 Aug-21	11 Aug-21	72h (13.1 °C)		
EV_HC1+20Cu	19-8320-0922	10 Aug-21	11 Aug-21	72h (12.1 °C)		
LC_DCDS+20Cu	12-7443-1043	10 Aug-21	11 Aug-21	72h (12.3 °C)		
LC_LC3+15Cu	06-5017-0795	10 Aug-21	11 Aug-21	72h (12.4 °C)		
LC_LC5+15Cu	10-4683-7945	10 Aug-21	11 Aug-21	72h (15.1 °C)		
LC_LCDSSLCC	11-9856-2953	10 Aug-21	11 Aug-21	72h (10.8 °C)		
FR_FR4+15Cu	16-1388-5677	10 Aug-21	11 Aug-21	72h (14.1 °C)		
FR_FRRD+15Cu	18-8883-2370	10 Aug-21	11 Aug-21	72h (14.7 °C)		
FR_FR2+20Cu	20-1752-8591	10 Aug-21	11 Aug-21	72h (15.3 °C)		
FR_MULTIPLATE	15-0654-9876	10 Aug-21	11 Aug-21	72h (13.6 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
Lab Control FM	Ambient Sample	Teck Coal Ltd	Lab Control FM	
10Cu Control	Ambient Sample	Teck Coal Ltd	10 Cu Control	
15 Cu Control	Ambient Sample	Teck Coal Ltd	15 Cu Control	
20 Cu Control	Ambient Sample	Teck Coal Ltd	20 Cu Control	
FR_UFR1+15Cu	Ambient Sample	Teck Coal Ltd	FR_UFR1_MON_2021-08-0	
GH_ER2+15Cu	Ambient Sample	Teck Coal Ltd	GH_ER2_WS_2021-08-10_	
CM_MC1+15Cu	Ambient Sample	Teck Coal Ltd	CM_MC1_WS_2021-08-10	
LC_SLC+10Cu	Ambient Sample	Teck Coal Ltd	LC_SLC_WS_2021-08-10_	
FR_FRABCH+20Cu	Ambient Sample	Teck Coal Ltd	FR_FRABCH_MON_2021-	
FR_FRCP1+20Cu	Ambient Sample	Teck Coal Ltd	FR_FRCP1_MON_2021-08	
GH_FR1+20Cu	Ambient Sample	Teck Coal Ltd	GH_FR1_WS_2021-08-10_	
GH_ERC+10Cu	Ambient Sample	Teck Coal Ltd	GH_ERC_WS_2021-08-10	
CM_MC2+20Cu	Ambient Sample	Teck Coal Ltd	CM_MC2_WS_2021-08-10	
RG_MIDAG+15Cu	Ambient Sample	Teck Coal Ltd	RG_MIDAG_WS_2021-08-	
EV_MC2+20Cu	Ambient Sample	Teck Coal Ltd	EV_MC2_WS_2021_Q3_W	
EV_HC1+20Cu	Ambient Sample	Teck Coal Ltd	EV_HC1_WS_2021_Q3_W	
LC_DCDS+20Cu	Ambient Sample	Teck Coal Ltd	LC_DCDS_WS_2021-08-1	
LC_LC3+15Cu	Ambient Sample	Teck Coal Ltd	LC_LC3_WS_2021-08-10_	
LC_LC5+15Cu	Ambient Sample	Teck Coal Ltd	LC_LC5_WS_2021-08-10_	
LC_LCDSSLCC	Ambient Sample	Teck Coal Ltd	LC_LCDSSLCC_WS_2021-	
FR_FR4+15Cu	Ambient Sample	Teck Coal Ltd	FR_FR4_WS_2021-08-10_	
FR_FRRD+15Cu	Ambient Sample	Teck Coal Ltd	FR_FRRD_WS_2021-08-1	

Analyst: KK QA MG NOV 09 2021

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID:	12-4671-3995	**Endpoint:**	Proportion Normal	**CETIS Version:**	CETISv1.9.4
Analyzed:	02 Nov-21 9:35	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_FR2+20Cu	Ambient Sample	Teck Coal Ltd	FR_FR2_WS_2021-08-10_	
FR_MULTIPLATE	Ambient Sample	Teck Coal Ltd	FR_MULTIPLATE_WS_20	

Fisher Exact/Bonferroni Adj Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
15Cu Control		Lab Control FM	1.0000	Exact	1.0000	Non-Significant Effect
		10Cu Control	0.7953	Exact	1.0000	Non-Significant Effect
		20 Cu Control	0.5181	Exact	1.0000	Non-Significant Effect
		FR_UFR1+15Cu	1.0000	Exact	1.0000	Non-Significant Effect
		GH_ER2+15Cu	0.7756	Exact	1.0000	Non-Significant Effect
		CM_MC1+15Cu	0.6964	Exact	1.0000	Non-Significant Effect
		LC_SLC+10Cu	0.7906	Exact	1.0000	Non-Significant Effect
		FR_FRABCH+20Cu	1.0000	Exact	1.0000	Non-Significant Effect
		FR_FRCP1+20Cu	0.5436	Exact	1.0000	Non-Significant Effect
		GH_FR1+20Cu	0.3616	Exact	1.0000	Non-Significant Effect
		GH_ERC+10Cu	0.7269	Exact	1.0000	Non-Significant Effect
		CM_MC2+20Cu	1.0000	Exact	1.0000	Non-Significant Effect
		RG_MIDAG+15Cu	0.2182	Exact	1.0000	Non-Significant Effect
		EV_MC2+20Cu	0.2410	Exact	1.0000	Non-Significant Effect
		EV_HC1+20Cu	0.6792	Exact	1.0000	Non-Significant Effect
		LC_DCDS+20Cu	0.4906	Exact	1.0000	Non-Significant Effect
		LC_LC3+15Cu	0.5000	Exact	1.0000	Non-Significant Effect
		LC_LC5+15Cu	0.7469	Exact	1.0000	Non-Significant Effect
		LC_LCDSSLCC	0.6964	Exact	1.0000	Non-Significant Effect
		FR_FR4+15Cu	0.1719	Exact	1.0000	Non-Significant Effect
		FR_FRRD+15Cu	0.8041	Exact	1.0000	Non-Significant Effect
		FR_FR2+20Cu	0.7953	Exact	1.0000	Non-Significant Effect
		FR_MULTIPLATE	0.7590	Exact	1.0000	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	2.949	3.37	0.2489	No Outliers Detected
Treatment Effect	Fligner-Wolfe Omnibus Test	0.5579	1.645	0.2885	Non-Significant Overall Effect

MG

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 12-4671-3995 **Endpoint:** Proportion Normal **CETIS Version:** CETISv1.9.4
Analyzed: 02 Nov-21 9:35 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Data Summary

Sample	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
Lab Control FM		50	0	50	1	0	-2.5%
10Cu Control		48	1	49	0.9796	0.02041	-0.41%
15 Cu Control	15	40	1	41	0.9756	0.02439	0.0%
20 Cu Control		41	2	43	0.9535	0.04651	2.27%
FR_UFR1+15Cu		31	0	31	1	0	-2.5%
GH_ER2+15Cu		44	1	45	0.9778	0.02222	-0.22%
CM_MC1+15Cu		32	1	33	0.9697	0.0303	0.61%
LC_SLC+10Cu		47	1	48	0.9792	0.02083	-0.36%
FR_FRABCH+20Cu		41	0	41	1	0	-2.5%
FR_FRCP1+20Cu		44	2	46	0.9565	0.04348	1.96%
GH_FR1+20Cu		44	3	47	0.9362	0.06383	4.04%
GH_ERC+10Cu		36	1	37	0.973	0.02703	0.27%
CM_MC2+20Cu		40	0	40	1	0	-2.5%
RG_MIDAG+15Cu		42	4	46	0.913	0.08696	6.41%
EV_MC2+20Cu		45	4	49	0.9184	0.08163	5.87%
EV_HC1+20Cu		30	1	31	0.9677	0.03226	0.81%
LC_DCDS+20Cu		38	2	40	0.95	0.05	2.63%
LC_LC3+15Cu		39	2	41	0.9512	0.04878	2.5%
LC_LC5+15Cu		39	1	40	0.975	0.025	0.06%
LC_LCDSSLCC		32	1	33	0.9697	0.0303	0.61%
FR_FR4+15Cu		36	4	40	0.9	0.1	7.75%
FR_FRRD+15Cu		50	1	51	0.9804	0.01961	-0.49%
FR_FR2+20Cu		48	1	49	0.9796	0.02041	-0.41%
FR_MULTIPLATE		41	1	42	0.9762	0.02381	-0.06%

Proportion Normal Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Lab Control FM		1.0000	1.0000	1.0000	1.0000
10Cu Control		1.0000	1.0000	1.0000	0.9231
15 Cu Control	15	1.0000	1.0000	1.0000	0.9286
20 Cu Control		1.0000	0.8750	1.0000	0.8889
FR_UFR1+15Cu		1.0000	1.0000	1.0000	1.0000
GH_ER2+15Cu		0.9167	1.0000	1.0000	1.0000
CM_MC1+15Cu		1.0000	1.0000	1.0000	0.8000
LC_SLC+10Cu		0.9167	1.0000	1.0000	1.0000
FR_FRABCH+20Cu		1.0000	1.0000	1.0000	1.0000
FR_FRCP1+20Cu		0.9167	1.0000	0.8889	1.0000
GH_FR1+20Cu		1.0000	0.9167	0.8333	1.0000
GH_ERC+10Cu		1.0000	0.8889	1.0000	1.0000
CM_MC2+20Cu		1.0000	1.0000	1.0000	1.0000
RG_MIDAG+15Cu		0.8462	0.9000	1.0000	0.9000
EV_MC2+20Cu		0.8462	0.9231	0.9231	1.0000
EV_HC1+20Cu		1.0000	1.0000	1.0000	0.9333
LC_DCDS+20Cu		0.8571	1.0000	0.9091	1.0000
LC_LC3+15Cu		1.0000	1.0000	0.9167	0.9091
LC_LC5+15Cu		0.9231	1.0000	1.0000	1.0000
LC_LCDSSLCC		1.0000	1.0000	1.0000	0.9000
FR_FR4+15Cu		1.0000	0.7500	1.0000	0.9091
FR_FRRD+15Cu		1.0000	0.9167	1.0000	1.0000
FR_FR2+20Cu		1.0000	1.0000	1.0000	0.9286
FR_MULTIPLATE		0.9000	1.0000	1.0000	1.0000

MG

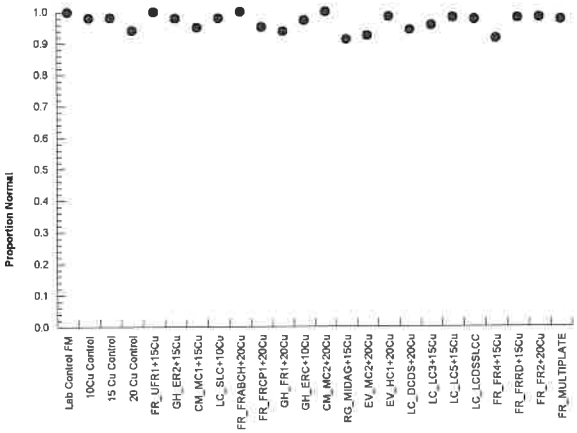
Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 12-4671-3995 **Endpoint:** Proportion Normal **CETIS Version:** CETISv1.9.4
Analyzed: 02 Nov-21 9:35 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Proportion Normal Binomials

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Lab Control FM		12/12	14/14	11/11	13/13
10Cu Control		12/12	12/12	12/12	12/13
15 Cu Control	15	11/11	8/8	8/8	13/14
20 Cu Control		12/12	7/8	14/14	8/9
FR_UFR1+15Cu		8/8	11/11	3/3	9/9
GH_ER2+15Cu		11/12	13/13	8/8	12/12
CM_MC1+15Cu		8/8	9/9	11/11	4/5
LC_SLC+10Cu		11/12	11/11	12/12	13/13
FR_FRABCH+20Cu		9/9	9/9	11/11	12/12
FR_FRCP1+20Cu		11/12	14/14	8/9	11/11
GH_FR1+20Cu		12/12	11/12	10/12	11/11
GH_ERC+10Cu		9/9	8/9	11/11	8/8
CM_MC2+20Cu		7/7	15/15	11/11	7/7
RG_MIDAG+15Cu		11/13	9/10	13/13	9/10
EV_MC2+20Cu		11/13	12/13	12/13	10/10
EV_HC1+20Cu		4/4	8/8	4/4	14/15
LC_DCDS+20Cu		6/7	8/8	10/11	14/14
LC_LC3+15Cu		10/10	8/8	11/12	10/11
LC_LC5+15Cu		12/13	7/7	12/12	8/8
LC_LCDSSLCC		9/9	6/6	8/8	9/10
FR_FR4+15Cu		9/9	9/12	8/8	10/11
FR_FRRD+15Cu		13/13	11/12	13/13	13/13
FR_FR2+20Cu		14/14	10/10	11/11	13/14
FR_MULTIPLATE		9/10	6/6	13/13	13/13

Graphics



Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID:	16-8722-8053	**Endpoint:**	Post Hatch Survival	**CETIS Version:**	CETISv1.9.4
Analyzed:	02 Nov-21 9:35	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1
Batch ID:	19-0275-1751	**Test Type:**	32 Day Fathead Minnow Test	**Analyst:**	Kayla Knol
Start Date:	13 Aug-21	**Protocol:**	ASTM E1241-05 (2013)	**Diluent:**	Dechlorinated Tap Water
Ending Date:	13 Sep-21	**Species:**	Pimephales promelas	**Brine:**	
Test Length:	31d 0h	**Taxon:**	Actinopterygii	**Source:**	Aquatox, AR **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
Lab Control FM	11-5032-4817	10 Aug-21	11 Aug-21	72h	Teck Coal Ltd	
10Cu Control	04-3348-8996	10 Aug-21	11 Aug-21	72h		
15 Cu Control	05-5139-9319	10 Aug-21	11 Aug-21	72h		
20 Cu Control	18-8853-3252	10 Aug-21	11 Aug-21	72h		
FR_UFR1+15Cu	13-9616-5903	10 Aug-21	11 Aug-21	72h (14.7 °C)		
GH_ER2+15Cu	19-5052-7846	10 Aug-21	11 Aug-21	72h (12.1 °C)		
CM_MC1+15Cu	15-1448-1664	10 Aug-21	11 Aug-21	72h (12.3 °C)		
LC_SLC+10Cu	10-0118-5065	10 Aug-21	11 Aug-21	72h (11.8 °C)		
FR_FRABCH+20Cu	12-2763-5905	10 Aug-21	11 Aug-21	72h (14.6 °C)		
FR_FRCP1+20Cu	05-5162-7629	10 Aug-21	11 Aug-21	72h (13.8 °C)		
GH_FR1+20Cu	18-3989-2491	10 Aug-21	11 Aug-21	72h (12 °C)		
GH_ERC+10Cu	14-6940-9296	10 Aug-21	11 Aug-21	72h (15.4 °C)		
CM_MC2+20Cu	17-0166-2336	10 Aug-21	11 Aug-21	72h (13.1 °C)		
RG_MIDAG+15Cu	18-0148-8949	10 Aug-21	11 Aug-21	72h (12.4 °C)		
EV_MC2+20Cu	08-5423-9441	10 Aug-21	11 Aug-21	72h (13.1 °C)		
EV_HC1+20Cu	19-8320-0922	10 Aug-21	11 Aug-21	72h (12.1 °C)		
LC_DCDS+20Cu	12-7443-1043	10 Aug-21	11 Aug-21	72h (12.3 °C)		
LC_LC3+15Cu	06-5017-0795	10 Aug-21	11 Aug-21	72h (12.4 °C)		
LC_LC5+15Cu	10-4683-7945	10 Aug-21	11 Aug-21	72h (15.1 °C)		
LC_LCDSSLCC	11-9856-2953	10 Aug-21	11 Aug-21	72h (10.8 °C)		
FR_FR4+15Cu	16-1388-5677	10 Aug-21	11 Aug-21	72h (14.1 °C)		
FR_FRRD+15Cu	18-8883-2370	10 Aug-21	11 Aug-21	72h (14.7 °C)		
FR_FR2+20Cu	20-1752-8591	10 Aug-21	11 Aug-21	72h (15.3 °C)		
FR_MULTIPLATE	15-0654-9876	10 Aug-21	11 Aug-21	72h (13.6 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
Lab Control FM	Ambient Sample	Teck Coal Ltd	Lab Control FM	
10Cu Control	Ambient Sample	Teck Coal Ltd	10 Cu Control	
15 Cu Control	Ambient Sample	Teck Coal Ltd	15 Cu Control	
20 Cu Control	Ambient Sample	Teck Coal Ltd	20 Cu Control	
FR_UFR1+15Cu	Ambient Sample	Teck Coal Ltd	FR_UFR1_MON_2021-08-0	
GH_ER2+15Cu	Ambient Sample	Teck Coal Ltd	GH_ER2_WS_2021-08-10_	
CM_MC1+15Cu	Ambient Sample	Teck Coal Ltd	CM_MC1_WS_2021-08-10	
LC_SLC+10Cu	Ambient Sample	Teck Coal Ltd	LC_SLC_WS_2021-08-10_	
FR_FRABCH+20Cu	Ambient Sample	Teck Coal Ltd	FR_FRABCH_MON_2021-	
FR_FRCP1+20Cu	Ambient Sample	Teck Coal Ltd	FR_FRCP1_MON_2021-08	
GH_FR1+20Cu	Ambient Sample	Teck Coal Ltd	GH_FR1_WS_2021-08-10_	
GH_ERC+10Cu	Ambient Sample	Teck Coal Ltd	GH_ERC_WS_2021-08-10	
CM_MC2+20Cu	Ambient Sample	Teck Coal Ltd	CM_MC2_WS_2021-08-10	
RG_MIDAG+15Cu	Ambient Sample	Teck Coal Ltd	RG_MIDAG_WS_2021-08-	
EV_MC2+20Cu	Ambient Sample	Teck Coal Ltd	EV_MC2_WS_2021_Q3_W	
EV_HC1+20Cu	Ambient Sample	Teck Coal Ltd	EV_HC1_WS_2021_Q3_W	
LC_DCDS+20Cu	Ambient Sample	Teck Coal Ltd	LC_DCDS_WS_2021-08-1	
LC_LC3+15Cu	Ambient Sample	Teck Coal Ltd	LC_LC3_WS_2021-08-10_	
LC_LC5+15Cu	Ambient Sample	Teck Coal Ltd	LC_LC5_WS_2021-08-10_	
LC_LCDSSLCC	Ambient Sample	Teck Coal Ltd	LC_LCDSSLCC_WS_2021-	
FR_FR4+15Cu	Ambient Sample	Teck Coal Ltd	FR_FR4_WS_2021-08-10_	
FR_FRRD+15Cu	Ambient Sample	Teck Coal Ltd	FR_FRRD_WS_2021-08-1	

MG

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID:	16-8722-8053	**Endpoint:**	Post Hatch Survival	**CETIS Version:**	CETISv1.9.4
Analyzed:	02 Nov-21 9:35	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_FR2+20Cu	Ambient Sample	Teck Coal Ltd	FR_FR2_WS_2021-08-10_	
FR_MULTIPLATE	Ambient Sample	Teck Coal Ltd	FR_MULTIPLATE_WS_20	

Fisher Exact/Bonferroni Adj Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
15Cu Control		Lab Control FM	0.9804	Exact	1.0000	Non-Significant Effect
		10Cu Control	0.9651	Exact	1.0000	Non-Significant Effect
		20 Cu Control	0.7833	Exact	1.0000	Non-Significant Effect
		FR_UFR1+15Cu	0.0663	Exact	1.0000	Non-Significant Effect
		GH_ER2+15Cu	0.8917	Exact	1.0000	Non-Significant Effect
		CM_MC1+15Cu	0.2299	Exact	1.0000	Non-Significant Effect
		LC_SLC+10Cu	0.9855	Exact	1.0000	Non-Significant Effect
		FR_FRABCH+20Cu	0.7482	Exact	1.0000	Non-Significant Effect
		FR_FRCP1+20Cu	0.9011	Exact	1.0000	Non-Significant Effect
		GH_FR1+20Cu	0.9360	Exact	1.0000	Non-Significant Effect
		GH_ERC+10Cu	0.3216	Exact	1.0000	Non-Significant Effect
		CM_MC2+20Cu	0.4450	Exact	1.0000	Non-Significant Effect
		RG_MIDAG+15Cu	0.9011	Exact	1.0000	Non-Significant Effect
		EV_MC2+20Cu	0.9781	Exact	1.0000	Non-Significant Effect
		EV_HC1+20Cu	0.1259	Exact	1.0000	Non-Significant Effect
		LC_DCDS+20Cu	0.3929	Exact	1.0000	Non-Significant Effect
		LC_LC3+15Cu	0.4692	Exact	1.0000	Non-Significant Effect
		LC_LC5+15Cu	0.4450	Exact	1.0000	Non-Significant Effect
		LC_LCDSSLCC	0.0880	Exact	1.0000	Non-Significant Effect
		FR_FR4+15Cu	0.5571	Exact	1.0000	Non-Significant Effect
		FR_FRRD+15Cu	0.9899	Exact	1.0000	Non-Significant Effect
		FR_FR2+20Cu	0.9781	Exact	1.0000	Non-Significant Effect
		FR_MULTIPLATE	0.8957	Exact	1.0000	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	3.147	3.37	0.1204	No Outliers Detected
Treatment Effect	Fligner-Wolfe Omnibus Test	-0.4679	1.645	0.6801	Non-Significant Overall Effect

MG

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 16-8722-8053 **Endpoint:** Post Hatch Survival **CETIS Version:** CETISv1.9.4
Analyzed: 02 Nov-21 9:35 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Data Summary

Sample	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
Lab Control FM		50	9	59	0.8475	0.1525	-19.88%
10Cu Control		49	10	59	0.8305	0.1695	-17.49%
15 Cu Control	15	41	17	58	0.7069	0.2931	0.0%
20 Cu Control		43	14	57	0.7544	0.2456	-6.72%
FR_UFR1+15Cu		31	25	56	0.5536	0.4464	21.69%
GH_ER2+15Cu		45	12	57	0.7895	0.2105	-11.68%
CM_MC1+15Cu		33	20	53	0.6226	0.3774	11.92%
LC_SLC+10Cu		48	8	56	0.8571	0.1429	-21.25%
FR_FRABCH+20Cu		41	14	55	0.7455	0.2545	-5.46%
FR_FRCP1+20Cu		46	12	58	0.7931	0.2069	-12.2%
GH_FR1+20Cu		47	11	58	0.8103	0.1897	-14.63%
GH_ERC+10Cu		37	20	57	0.6491	0.3509	8.17%
CM_MC2+20Cu		40	19	59	0.678	0.322	4.09%
RG_MIDAG+15Cu		46	12	58	0.7931	0.2069	-12.2%
EV_MC2+20Cu		49	9	58	0.8448	0.1552	-19.51%
EV_HC1+20Cu		31	22	53	0.5849	0.4151	17.26%
LC_DCDS+20Cu		40	20	60	0.6667	0.3333	5.69%
LC_LC3+15Cu		41	19	60	0.6833	0.3167	3.33%
LC_LC5+15Cu		40	19	59	0.678	0.322	4.09%
LC_LCDSSLCC		33	25	58	0.569	0.431	19.51%
FR_FR4+15Cu		40	17	57	0.7018	0.2982	0.73%
FR_FRRD+15Cu		51	8	59	0.8644	0.1356	-22.28%
FR_FR2+20Cu		49	9	58	0.8448	0.1552	-19.51%
FR_MULTIPLATE		42	11	53	0.7925	0.2075	-12.1%

Post Hatch Survival Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Lab Control FM		0.8571	0.9333	0.7333	0.8667
10Cu Control		0.8000	0.8000	0.8571	0.8667
15 Cu Control	15	0.7333	0.5714	0.5333	1.0000
20 Cu Control		0.8571	0.5714	0.9333	0.6429
FR_UFR1+15Cu		0.5714	0.7333	0.2143	0.6923
GH_ER2+15Cu		0.8000	0.9286	0.6154	0.8000
CM_MC1+15Cu		0.6154	0.6429	0.8462	0.3846
LC_SLC+10Cu		0.8571	0.7857	0.8571	0.9286
FR_FRABCH+20Cu		0.6923	0.6923	0.7333	0.8571
FR_FRCP1+20Cu		0.8000	1.0000	0.6429	0.7333
GH_FR1+20Cu		0.8000	0.8000	0.8000	0.8462
GH_ERC+10Cu		0.6429	0.6000	0.8462	0.5333
CM_MC2+20Cu		0.5000	1.0000	0.7333	0.4667
RG_MIDAG+15Cu		0.8667	0.6667	0.8667	0.7692
EV_MC2+20Cu		0.8667	0.8667	0.9286	0.7143
EV_HC1+20Cu		0.3077	0.6667	0.3077	1.0000
LC_DCDS+20Cu		0.4667	0.5333	0.7333	0.9333
LC_LC3+15Cu		0.6667	0.5333	0.8000	0.7333
LC_LC5+15Cu		0.8667	0.4667	0.8000	0.5714
LC_LCDSSLCC		0.6429	0.4000	0.5333	0.7143
FR_FR4+15Cu		0.6000	0.8000	0.5333	0.9167
FR_FRRD+15Cu		0.8667	0.8000	0.8667	0.9286
FR_FR2+20Cu		1.0000	0.6667	0.7333	1.0000
FR_MULTIPLATE		0.8333	0.5000	0.8667	0.9286

MG

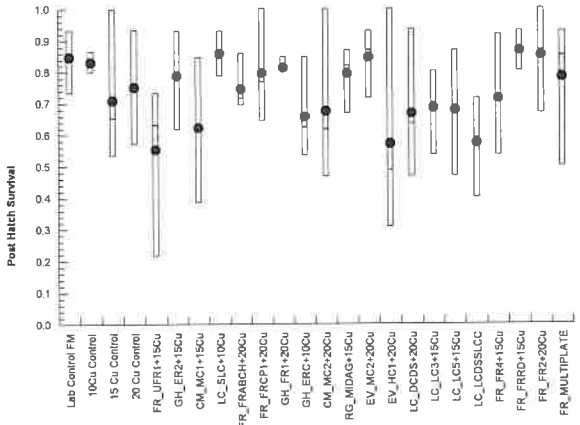
Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID:	16-8722-8053	**Endpoint:**	Post Hatch Survival	**CETIS Version:**	CETISv1.9.4
Analyzed:	02 Nov-21 9:35	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1

Post Hatch Survival Binomials

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Lab Control FM		12/14	14/15	11/15	13/15
10Cu Control		12/15	12/15	12/14	13/15
15 Cu Control	15	11/15	8/14	8/15	14/14
20 Cu Control		12/14	8/14	14/15	9/14
FR_UFR1+15Cu		8/14	11/15	3/14	9/13
GH_ER2+15Cu		12/15	13/14	8/13	12/15
CM_MC1+15Cu		8/13	9/14	11/13	5/13
LC_SLC+10Cu		12/14	11/14	12/14	13/14
FR_FRABCH+20Cu		9/13	9/13	11/15	12/14
FR_FRCP1+20Cu		12/15	14/14	9/14	11/15
GH_FR1+20Cu		12/15	12/15	12/15	11/13
GH_ERC+10Cu		9/14	9/15	11/13	8/15
CM_MC2+20Cu		7/14	15/15	11/15	7/15
RG_MIDAG+15Cu		13/15	10/15	13/15	10/13
EV_MC2+20Cu		13/15	13/15	13/14	10/14
EV_HC1+20Cu		4/13	8/12	4/13	15/15
LC_DCDS+20Cu		7/15	8/15	11/15	14/15
LC_LC3+15Cu		10/15	8/15	12/15	11/15
LC_LC5+15Cu		13/15	7/15	12/15	8/14
LC_LCDSSLCC		9/14	6/15	8/15	10/14
FR_FR4+15Cu		9/15	12/15	8/15	11/12
FR_FRRD+15Cu		13/15	12/15	13/15	13/14
FR_FR2+20Cu		14/14	10/15	11/15	14/14
FR_MULTIPLATE		10/12	6/12	13/15	13/14

Graphics



Analyst: KC QA: NOV 09 2021

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID:	11-1616-1665	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.9.4
Analyzed:	02 Nov-21 9:40	**Analysis:**	Nonparametric-Control vs Treatments	**Status Level:**	1
Batch ID:	19-0275-1751	**Test Type:**	32 Day Fathead Minnow Test	**Analyst:**	Kayla Knol
Start Date:	13 Aug-21	**Protocol:**	ASTM E1241-05 (2013)	**Diluent:**	Dechlorinated Tap Water
Ending Date:	13 Sep-21	**Species:**	Pimephales promelas	**Brine:**	
Test Length:	31d 0h	**Taxon:**	Actinopterygii	**Source:**	Aquatox, AR **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
Lab Control FM	11-5032-4817	10 Aug-21	11 Aug-21	72h	Teck Coal Ltd	
10Cu Control	04-3348-8996	10 Aug-21	11 Aug-21	72h		
15 Cu Control	05-5139-9319	10 Aug-21	11 Aug-21	72h		
20 Cu Control	18-8853-3252	10 Aug-21	11 Aug-21	72h		
FR_UFR1+15Cu	13-9616-5903	10 Aug-21	11 Aug-21	72h (14.7 °C)		
GH_ER2+15Cu	19-5052-7846	10 Aug-21	11 Aug-21	72h (12.1 °C)		
CM_MC1+15Cu	15-1448-1664	10 Aug-21	11 Aug-21	72h (12.3 °C)		
LC_SLC+10Cu	10-0118-5065	10 Aug-21	11 Aug-21	72h (11.8 °C)		
FR_FRABCH+20Cu	12-2763-5905	10 Aug-21	11 Aug-21	72h (14.6 °C)		
FR_FRCP1+20Cu	05-5162-7629	10 Aug-21	11 Aug-21	72h (13.8 °C)		
GH_FR1+20Cu	18-3989-2491	10 Aug-21	11 Aug-21	72h (12 °C)		
GH_ERC+10Cu	14-6940-9296	10 Aug-21	11 Aug-21	72h (15.4 °C)		
CM_MC2+20Cu	17-0166-2336	10 Aug-21	11 Aug-21	72h (13.1 °C)		
RG_MIDAG+15Cu	18-0148-8949	10 Aug-21	11 Aug-21	72h (12.4 °C)		
EV_MC2+20Cu	08-5423-9441	10 Aug-21	11 Aug-21	72h (13.1 °C)		
EV_HC1+20Cu	19-8320-0922	10 Aug-21	11 Aug-21	72h (12.1 °C)		
LC_DCDS+20Cu	12-7443-1043	10 Aug-21	11 Aug-21	72h (12.3 °C)		
LC_LC3+15Cu	06-5017-0795	10 Aug-21	11 Aug-21	72h (12.4 °C)		
LC_LC5+15Cu	10-4683-7945	10 Aug-21	11 Aug-21	72h (15.1 °C)		
LC_LCDSSLCC	11-9856-2953	10 Aug-21	11 Aug-21	72h (10.8 °C)		
FR_FR4+15Cu	16-1388-5677	10 Aug-21	11 Aug-21	72h (14.1 °C)		
FR_FRRD+15Cu	18-8883-2370	10 Aug-21	11 Aug-21	72h (14.7 °C)		
FR_FR2+20Cu	20-1752-8591	10 Aug-21	11 Aug-21	72h (15.3 °C)		
FR_MULTIPLATE	15-0654-9876	10 Aug-21	11 Aug-21	72h (13.6 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
Lab Control FM	Ambient Sample	Teck Coal Ltd	Lab Control FM	
10Cu Control	Ambient Sample	Teck Coal Ltd	10 Cu Control	
15 Cu Control	Ambient Sample	Teck Coal Ltd	15 Cu Control	
20 Cu Control	Ambient Sample	Teck Coal Ltd	20 Cu Control	
FR_UFR1+15Cu	Ambient Sample	Teck Coal Ltd	FR_UFR1_MON_2021-08-0	
GH_ER2+15Cu	Ambient Sample	Teck Coal Ltd	GH_ER2_WS_2021-08-10_	
CM_MC1+15Cu	Ambient Sample	Teck Coal Ltd	CM_MC1_WS_2021-08-10	
LC_SLC+10Cu	Ambient Sample	Teck Coal Ltd	LC_SLC_WS_2021-08-10_	
FR_FRABCH+20Cu	Ambient Sample	Teck Coal Ltd	FR_FRABCH_MON_2021-	
FR_FRCP1+20Cu	Ambient Sample	Teck Coal Ltd	FR_FRCP1_MON_2021-08	
GH_FR1+20Cu	Ambient Sample	Teck Coal Ltd	GH_FR1_WS_2021-08-10_	
GH_ERC+10Cu	Ambient Sample	Teck Coal Ltd	GH_ERC_WS_2021-08-10	
CM_MC2+20Cu	Ambient Sample	Teck Coal Ltd	CM_MC2_WS_2021-08-10	
RG_MIDAG+15Cu	Ambient Sample	Teck Coal Ltd	RG_MIDAG_WS_2021-08-	
EV_MC2+20Cu	Ambient Sample	Teck Coal Ltd	EV_MC2_WS_2021_Q3_W	
EV_HC1+20Cu	Ambient Sample	Teck Coal Ltd	EV_HC1_WS_2021_Q3_W	
LC_DCDS+20Cu	Ambient Sample	Teck Coal Ltd	LC_DCDS_WS_2021-08-1	
LC_LC3+15Cu	Ambient Sample	Teck Coal Ltd	LC_LC3_WS_2021-08-10_	
LC_LC5+15Cu	Ambient Sample	Teck Coal Ltd	LC_LC5_WS_2021-08-10_	
LC_LCDSSLCC	Ambient Sample	Teck Coal Ltd	LC_LCDSSLCC_WS_2021-	
FR_FR4+15Cu	Ambient Sample	Teck Coal Ltd	FR_FR4_WS_2021-08-10_	
FR_FRRD+15Cu	Ambient Sample	Teck Coal Ltd	FR_FRRD_WS_2021-08-1	

MG

NOV 09 2021

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID:	11-1616-1665	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.9.4
Analyzed:	02 Nov-21 9:40	**Analysis:**	Nonparametric-Control vs Treatments	**Status Level:**	1

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_FR2+20Cu	Ambient Sample	Teck Coal Ltd	FR_FR2_WS_2021-08-10_	
FR_MULTIPLATE	Ambient Sample	Teck Coal Ltd	FR_MULTIPLATE_WS_20	

Nemenyi-Damico-Wolfe Test

Sample I	vs	Sample II	Test Stat	Critical	Ties	P-Type	P-Value	Decision(α:5%)
20Cu Control		Lab Control FM	23	211.4	0	CDF	0.9125	Non-Significant Effect
		10Cu Control	-42	211.4	0	CDF	0.9923	Non-Significant Effect
		15 Cu Control	60	211.4	0	CDF	0.7751	Non-Significant Effect
		FR_UFR1+15Cu	91	211.4	0	CDF	0.6011	Non-Significant Effect
		GH_ER2+15Cu	34	211.4	0	CDF	0.8805	Non-Significant Effect
		CM_MC1+15Cu	164	211.4	0	CDF	0.1827	Non-Significant Effect
		LC_SLC+10Cu	-21	211.4	0	CDF	0.9810	Non-Significant Effect
		FR_FRABCH+20Cu	-7	211.4	0	CDF	0.9676	Non-Significant Effect
		FR_FRCP1+20Cu	50	211.4	0	CDF	0.8206	Non-Significant Effect
		GH_FR1+20Cu	46	211.4	0	CDF	0.8371	Non-Significant Effect
		GH_ERC+10Cu	9	211.4	0	CDF	0.9435	Non-Significant Effect
		CM_MC2+20Cu	132	211.4	0	CDF	0.3449	Non-Significant Effect
		RG_MIDAG+15Cu	83	211.4	0	CDF	0.6498	Non-Significant Effect
		EV_MC2+20Cu	5	211.4	0	CDF	0.9505	Non-Significant Effect
		EV_HC1+20Cu	173	211.4	0	CDF	0.1476	Non-Significant Effect
		LC_DCDS+20Cu	56	211.4	0	CDF	0.7940	Non-Significant Effect
		LC_LC3+15Cu	-31	211.4	0	CDF	0.9874	Non-Significant Effect
		LC_LC5+15Cu	24	211.4	0	CDF	0.9099	Non-Significant Effect
		LC_LCDSSLCC	104	211.4	0	CDF	0.5190	Non-Significant Effect
		FR_FR4+15Cu	92	211.4	0	CDF	0.5948	Non-Significant Effect
		FR_FRRD+15Cu	-66	211.4	0	CDF	0.9976	Non-Significant Effect
		FR_FR2+20Cu	-62	211.4	0	CDF	0.9970	Non-Significant Effect
		FR_MULTIPLATE	139	211.4	0	CDF	0.3050	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	4.104	3.37	0.0017	Outlier Detected
Treatment Effect	Fligner-Wolfe Omnibus Test	4506		0.2200	Non-Significant Overall Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	4.49634	0.195493	23	1.847	0.0258	Significant Effect
Error	7.61906	0.10582	72			
Total	12.1154		95			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Variances	Bartlett Equality of Variance Test	34.81	35.17	0.0544	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9596	0.9737	0.0048	Non-Normal Distribution

MG

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 11-1616-1665 **Endpoint:** Mean Dry Biomass-mg **CETIS Version:** CETISv1.9.4
Analyzed: 02 Nov-21 9:40 **Analysis:** Nonparametric-Control vs Treatments **Status Level:** 1

Mean Dry Biomass-mg Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
Lab Control FM		4	2.627	1.997	3.257	2.488	2.333	3.199	0.1981	15.08%	0.00%
10Cu Control		4	2.768	2.171	3.366	2.828	2.278	3.139	0.1879	13.57%	-5.38%
15 Cu Control		4	2.439	1.994	2.885	2.546	2.026	2.64	0.14	11.47%	7.15%
20 Cu Control	20	4	2.611	2.495	2.728	2.64	2.504	2.661	0.03658	2.80%	0.60%
FR_UFR1+15Cu		4	2.163	0.8123	3.514	2.308	1.001	3.036	0.4244	39.24%	17.67%
GH_ER2+15Cu		4	2.484	1.959	3.01	2.601	1.999	2.737	0.1651	13.29%	5.44%
CM_MC1+15Cu		4	1.909	1.062	2.757	1.845	1.331	2.615	0.2664	27.90%	27.33%
LC_SLC+10Cu		4	2.639	2.465	2.813	2.685	2.477	2.71	0.05459	4.14%	-0.45%
FR_FRABCH+20Cu		4	2.634	2.222	3.047	2.576	2.421	2.965	0.1297	9.85%	-0.27%
FR_FRCP1+20Cu		4	2.458	1.98	2.935	2.492	2.079	2.768	0.1501	12.22%	6.45%
GH_FR1+20Cu		4	2.511	2.25	2.772	2.55	2.279	2.665	0.082	6.53%	4.42%
GH_ERC+10Cu		4	2.58	2.29	2.87	2.593	2.364	2.771	0.09109	7.06%	1.78%
CM_MC2+20Cu		4	2.273	1.992	2.555	2.34	2.015	2.399	0.08836	7.77%	13.46%
RG_MIDAG+15Cu		4	2.406	2.053	2.76	2.353	2.206	2.713	0.1112	9.24%	8.41%
EV_MC2+20Cu		4	2.577	2.242	2.913	2.594	2.353	2.77	0.1054	8.18%	1.89%
EV_HC1+20Cu		4	2.065	1.635	2.495	1.986	1.851	2.437	0.1351	13.08%	21.39%
LC_DCDS+20Cu		4	2.457	2.005	2.909	2.438	2.143	2.808	0.142	11.56%	6.48%
LC_LC3+15Cu		4	2.663	2.343	2.982	2.695	2.412	2.847	0.1004	7.54%	-1.34%
LC_LC5+15Cu		4	2.538	2.182	2.894	2.624	2.215	2.689	0.1118	8.81%	3.39%
LC_LCDSSLCC		4	2.283	1.678	2.888	2.283	1.896	2.67	0.1902	16.66%	13.11%
FR_FR4+15Cu		4	2.356	1.645	3.067	2.276	1.901	2.971	0.2234	18.96%	10.31%
FR_FRRD+15Cu		4	2.735	2.532	2.938	2.771	2.555	2.843	0.06394	4.68%	-4.10%
FR_FR2+20Cu		4	2.748	2.405	3.091	2.77	2.465	2.988	0.1079	7.85%	-4.61%
FR_MULTIPLATE		4	2.233	1.92	2.546	2.205	2.041	2.482	0.09838	8.81%	14.99%

Mean Dry Biomass-mg Detail

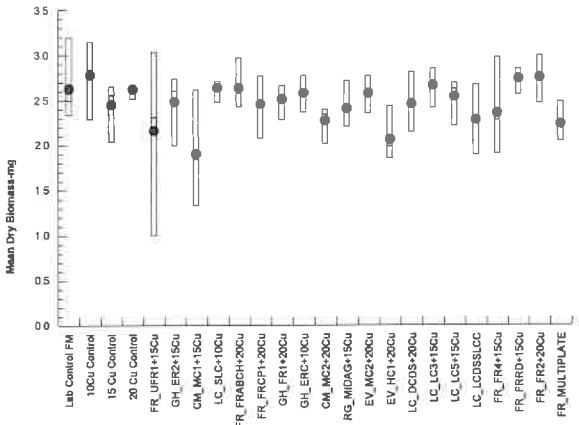
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Lab Control FM		2.583	2.333	2.393	3.199
10Cu Control		2.278	2.69	2.967	3.139
15 Cu Control		2.52	2.026	2.64	2.571
20 Cu Control	20	2.661	2.504	2.654	2.626
FR_UFR1+15Cu		2.25	2.365	1.001	3.036
GH_ER2+15Cu		2.613	2.588	1.999	2.737
CM_MC1+15Cu		1.769	1.921	2.615	1.331
LC_SLC+10Cu		2.477	2.675	2.71	2.695
FR_FRABCH+20Cu		2.434	2.718	2.421	2.965
FR_FRCP1+20Cu		2.611	2.373	2.079	2.768
GH_FR1+20Cu		2.665	2.279	2.55	2.551
GH_ERC+10Cu		2.683	2.364	2.771	2.503
CM_MC2+20Cu		2.015	2.308	2.399	2.373
RG_MIDAG+15Cu		2.419	2.287	2.206	2.713
EV_MC2+20Cu		2.353	2.443	2.77	2.744
EV_HC1+20Cu		1.881	2.092	1.851	2.437
LC_DCDS+20Cu		2.143	2.339	2.808	2.537
LC_LC3+15Cu		2.591	2.8	2.412	2.847
LC_LC5+15Cu		2.689	2.215	2.561	2.687
LC_LCDSSLCC		2.542	1.896	2.023	2.67
FR_FR4+15Cu		2.257	2.295	1.901	2.971
FR_FRRD+15Cu		2.555	2.843	2.735	2.806
FR_FR2+20Cu		2.745	2.794	2.465	2.988
FR_MULTIPLATE		2.294	2.041	2.116	2.482

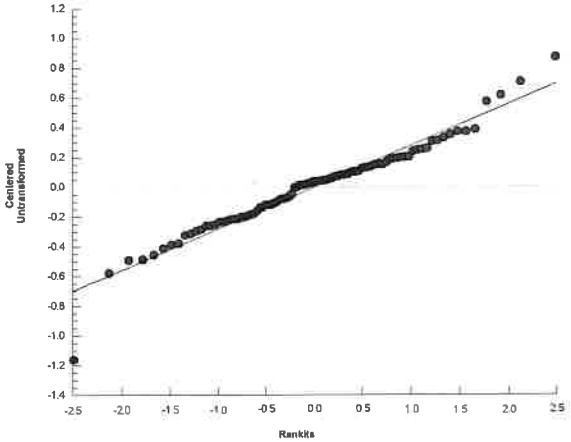
MG

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID:	11-1616-1665	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.9.4
Analyzed:	02 Nov-21 9:40	**Analysis:**	Nonparametric-Control vs Treatments	**Status Level:**	1

Graphics





Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID:	17-9744-0204	**Endpoint:**	Hatch Rate	**CETIS Version:**	CETISv1.9.4
Analyzed:	02 Nov-21 9:36	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1
Batch ID:	19-0275-1751	**Test Type:**	32 Day Fathead Minnow Test	**Analyst:**	Kayla Knol
Start Date:	13 Aug-21	**Protocol:**	ASTM E1241-05 (2013)	**Diluent:**	Dechlorinated Tap Water
Ending Date:	13 Sep-21	**Species:**	Pimephales promelas	**Brine:**	
Test Length:	31d 0h	**Taxon:**	Actinopterygii	**Source:**	Aquatox, AR **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
Lab Control FM	11-5032-4817	10 Aug-21	11 Aug-21	72h	Teck Coal Ltd	
10Cu Control	04-3348-8996	10 Aug-21	11 Aug-21	72h		
15 Cu Control	05-5139-9319	10 Aug-21	11 Aug-21	72h		
20 Cu Control	18-8853-3252	10 Aug-21	11 Aug-21	72h		
FR_UFR1+15Cu	13-9616-5903	10 Aug-21	11 Aug-21	72h (14.7 °C)		
GH_ER2+15Cu	19-5052-7846	10 Aug-21	11 Aug-21	72h (12.1 °C)		
CM_MC1+15Cu	15-1448-1664	10 Aug-21	11 Aug-21	72h (12.3 °C)		
LC_SLC+10Cu	10-0118-5065	10 Aug-21	11 Aug-21	72h (11.8 °C)		
FR_FRABCH+20Cu	12-2763-5905	10 Aug-21	11 Aug-21	72h (14.6 °C)		
FR_FRCP1+20Cu	05-5162-7629	10 Aug-21	11 Aug-21	72h (13.8 °C)		
GH_FR1+20Cu	18-3989-2491	10 Aug-21	11 Aug-21	72h (12 °C)		
GH_ERC+10Cu	14-6940-9296	10 Aug-21	11 Aug-21	72h (15.4 °C)		
CM_MC2+20Cu	17-0166-2336	10 Aug-21	11 Aug-21	72h (13.1 °C)		
RG_MIDAG+15Cu	18-0148-8949	10 Aug-21	11 Aug-21	72h (12.4 °C)		
EV_MC2+20Cu	08-5423-9441	10 Aug-21	11 Aug-21	72h (13.1 °C)		
EV_HC1+20Cu	19-8320-0922	10 Aug-21	11 Aug-21	72h (12.1 °C)		
LC_DCDS+20Cu	12-7443-1043	10 Aug-21	11 Aug-21	72h (12.3 °C)		
LC_LC3+15Cu	06-5017-0795	10 Aug-21	11 Aug-21	72h (12.4 °C)		
LC_LC5+15Cu	10-4683-7945	10 Aug-21	11 Aug-21	72h (15.1 °C)		
LC_LCDSSLCC	11-9856-2953	10 Aug-21	11 Aug-21	72h (10.8 °C)		
FR_FR4+15Cu	16-1388-5677	10 Aug-21	11 Aug-21	72h (14.1 °C)		
FR_FRRD+15Cu	18-8883-2370	10 Aug-21	11 Aug-21	72h (14.7 °C)		
FR_FR2+20Cu	20-1752-8591	10 Aug-21	11 Aug-21	72h (15.3 °C)		
FR_MULTIPLATE	15-0654-9876	10 Aug-21	11 Aug-21	72h (13.6 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
Lab Control FM	Ambient Sample	Teck Coal Ltd	Lab Control FM	
10Cu Control	Ambient Sample	Teck Coal Ltd	10 Cu Control	
15 Cu Control	Ambient Sample	Teck Coal Ltd	15 Cu Control	
20 Cu Control	Ambient Sample	Teck Coal Ltd	20 Cu Control	
FR_UFR1+15Cu	Ambient Sample	Teck Coal Ltd	FR_UFR1_MON_2021-08-0	
GH_ER2+15Cu	Ambient Sample	Teck Coal Ltd	GH_ER2_WS_2021-08-10_	
CM_MC1+15Cu	Ambient Sample	Teck Coal Ltd	CM_MC1_WS_2021-08-10	
LC_SLC+10Cu	Ambient Sample	Teck Coal Ltd	LC_SLC_WS_2021-08-10_	
FR_FRABCH+20Cu	Ambient Sample	Teck Coal Ltd	FR_FRABCH_MON_2021-	
FR_FRCP1+20Cu	Ambient Sample	Teck Coal Ltd	FR_FRCP1_MON_2021-08	
GH_FR1+20Cu	Ambient Sample	Teck Coal Ltd	GH_FR1_WS_2021-08-10_	
GH_ERC+10Cu	Ambient Sample	Teck Coal Ltd	GH_ERC_WS_2021-08-10	
CM_MC2+20Cu	Ambient Sample	Teck Coal Ltd	CM_MC2_WS_2021-08-10	
RG_MIDAG+15Cu	Ambient Sample	Teck Coal Ltd	RG_MIDAG_WS_2021-08-	
EV_MC2+20Cu	Ambient Sample	Teck Coal Ltd	EV_MC2_WS_2021_Q3_W	
EV_HC1+20Cu	Ambient Sample	Teck Coal Ltd	EV_HC1_WS_2021_Q3_W	
LC_DCDS+20Cu	Ambient Sample	Teck Coal Ltd	LC_DCDS_WS_2021-08-1	
LC_LC3+15Cu	Ambient Sample	Teck Coal Ltd	LC_LC3_WS_2021-08-10_	
LC_LC5+15Cu	Ambient Sample	Teck Coal Ltd	LC_LC5_WS_2021-08-10_	
LC_LCDSSLCC	Ambient Sample	Teck Coal Ltd	LC_LCDSSLCC_WS_2021-	
FR_FR4+15Cu	Ambient Sample	Teck Coal Ltd	FR_FR4_WS_2021-08-10_	
FR_FRRD+15Cu	Ambient Sample	Teck Coal Ltd	FR_FRRD_WS_2021-08-1	

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NOV 09 2021

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID:	17-9744-0204	**Endpoint:**	Hatch Rate	**CETIS Version:**	CETISv1.9.4
Analyzed:	02 Nov-21 9:36	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_FR2+20Cu	Ambient Sample	Teck Coal Ltd	FR_FR2_WS_2021-08-10_	
FR_MULTIPLATE	Ambient Sample	Teck Coal Ltd	FR_MULTIPLATE_WS_20	

Fisher Exact/Bonferroni Adj Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
20Cu Control		Lab Control FM	0.9406	Exact	1.0000	Non-Significant Effect
		10Cu Control	0.9406	Exact	1.0000	Non-Significant Effect
		15 Cu Control	0.8178	Exact	1.0000	Non-Significant Effect
		FR_UFR1+15Cu	0.5000	Exact	1.0000	Non-Significant Effect
		GH_ER2+15Cu	0.6603	Exact	1.0000	Non-Significant Effect
		CM_MC1+15Cu	0.1612	Exact	1.0000	Non-Significant Effect
		LC_SLC+10Cu	0.5000	Exact	1.0000	Non-Significant Effect
		FR_FRABCH+20Cu	0.3585	Exact	1.0000	Non-Significant Effect
		FR_FRCP1+20Cu	0.8178	Exact	1.0000	Non-Significant Effect
		GH_FR1+20Cu	0.8178	Exact	1.0000	Non-Significant Effect
		GH_ERC+10Cu	0.6603	Exact	1.0000	Non-Significant Effect
		CM_MC2+20Cu	0.9406	Exact	1.0000	Non-Significant Effect
		RG_MIDAG+15Cu	0.8178	Exact	1.0000	Non-Significant Effect
		EV_MC2+20Cu	0.8178	Exact	1.0000	Non-Significant Effect
		EV_HC1+20Cu	0.1612	Exact	1.0000	Non-Significant Effect
		LC_DCDS+20Cu	1.0000	Exact	1.0000	Non-Significant Effect
		LC_LC3+15Cu	1.0000	Exact	1.0000	Non-Significant Effect
		LC_LC5+15Cu	0.9406	Exact	1.0000	Non-Significant Effect
		LC_LCDSSLCC	0.8178	Exact	1.0000	Non-Significant Effect
		FR_FR4+15Cu	0.6603	Exact	1.0000	Non-Significant Effect
		FR_FRRD+15Cu	0.9406	Exact	1.0000	Non-Significant Effect
		FR_FR2+20Cu	0.8178	Exact	1.0000	Non-Significant Effect
		FR_MULTIPLATE	0.1612	Exact	1.0000	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	3.044	3.37	0.1764	No Outliers Detected

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Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 17-9744-0204 **Endpoint:** Hatch Rate **CETIS Version:** CETISv1.9.4
Analyzed: 02 Nov-21 9:36 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Data Summary

Sample	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
Lab Control FM		59	1	60	0.9833	0.01667	-3.51%
10Cu Control		59	1	60	0.9833	0.01667	-3.51%
15 Cu Control		58	2	60	0.9667	0.03333	-1.75%
20 Cu Control	20	57	3	60	0.95	0.05	0.0%
FR_UFR1+15Cu		56	4	60	0.9333	0.06667	1.75%
GH_ER2+15Cu		57	3	60	0.95	0.05	0.0%
CM_MC1+15Cu		53	7	60	0.8833	0.1167	7.02%
LC_SLC+10Cu		56	4	60	0.9333	0.06667	1.75%
FR_FRABCH+20Cu		55	5	60	0.9167	0.08333	3.51%
FR_FRCP1+20Cu		58	2	60	0.9667	0.03333	-1.75%
GH_FR1+20Cu		58	2	60	0.9667	0.03333	-1.75%
GH_ERC+10Cu		57	3	60	0.95	0.05	0.0%
CM_MC2+20Cu		59	1	60	0.9833	0.01667	-3.51%
RG_MIDAG+15Cu		58	2	60	0.9667	0.03333	-1.75%
EV_MC2+20Cu		58	2	60	0.9667	0.03333	-1.75%
EV_HC1+20Cu		53	7	60	0.8833	0.1167	7.02%
LC_DCDS+20Cu		60	0	60	1	0	-5.26%
LC_LC3+15Cu		60	0	60	1	0	-5.26%
LC_LC5+15Cu		59	1	60	0.9833	0.01667	-3.51%
LC_LCDSSLCC		58	2	60	0.9667	0.03333	-1.75%
FR_FR4+15Cu		57	3	60	0.95	0.05	0.0%
FR_FRRD+15Cu		59	1	60	0.9833	0.01667	-3.51%
FR_FR2+20Cu		58	2	60	0.9667	0.03333	-1.75%
FR_MULTIPLATE		53	7	60	0.8833	0.1167	7.02%

Hatch Rate Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Lab Control FM		0.9333	1.0000	1.0000	1.0000
10Cu Control		1.0000	1.0000	0.9333	1.0000
15 Cu Control		1.0000	0.9333	1.0000	0.9333
20 Cu Control	20	0.9333	0.9333	1.0000	0.9333
FR_UFR1+15Cu		0.9333	1.0000	0.9333	0.8667
GH_ER2+15Cu		1.0000	0.9333	0.8667	1.0000
CM_MC1+15Cu		0.8667	0.9333	0.8667	0.8667
LC_SLC+10Cu		0.9333	0.9333	0.9333	0.9333
FR_FRABCH+20Cu		0.8667	0.8667	1.0000	0.9333
FR_FRCP1+20Cu		1.0000	0.9333	0.9333	1.0000
GH_FR1+20Cu		1.0000	1.0000	1.0000	0.8667
GH_ERC+10Cu		0.9333	1.0000	0.8667	1.0000
CM_MC2+20Cu		0.9333	1.0000	1.0000	1.0000
RG_MIDAG+15Cu		1.0000	1.0000	1.0000	0.8667
EV_MC2+20Cu		1.0000	1.0000	0.9333	0.9333
EV_HC1+20Cu		0.8667	0.8000	0.8667	1.0000
LC_DCDS+20Cu		1.0000	1.0000	1.0000	1.0000
LC_LC3+15Cu		1.0000	1.0000	1.0000	1.0000
LC_LC5+15Cu		1.0000	1.0000	1.0000	0.9333
LC_LCDSSLCC		0.9333	1.0000	1.0000	0.9333
FR_FR4+15Cu		1.0000	1.0000	1.0000	0.8000
FR_FRRD+15Cu		1.0000	1.0000	1.0000	0.9333
FR_FR2+20Cu		0.9333	1.0000	1.0000	0.9333
FR_MULTIPLATE		0.8000	0.8000	1.0000	0.9333

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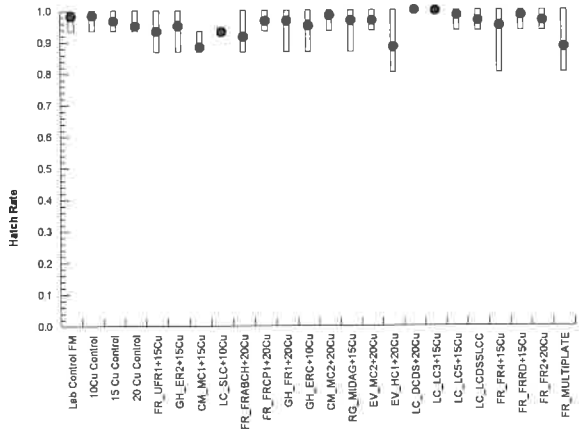
Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 17-9744-0204 **Endpoint:** Hatch Rate **CETIS Version:** CETISv1.9.4
Analyzed: 02 Nov-21 9:36 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Hatch Rate Binomials

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Lab Control FM		14/15	15/15	15/15	15/15
10Cu Control		15/15	15/15	14/15	15/15
15 Cu Control		15/15	14/15	15/15	14/15
20 Cu Control	20	14/15	14/15	15/15	14/15
FR_UFR1+15Cu		14/15	15/15	14/15	13/15
GH_ER2+15Cu		15/15	14/15	13/15	15/15
CM_MC1+15Cu		13/15	14/15	13/15	13/15
LC_SLC+10Cu		14/15	14/15	14/15	14/15
FR_FRABCH+20Cu		13/15	13/15	15/15	14/15
FR_FRCP1+20Cu		15/15	14/15	14/15	15/15
GH_FR1+20Cu		15/15	15/15	15/15	13/15
GH_ERC+10Cu		14/15	15/15	13/15	15/15
CM_MC2+20Cu		14/15	15/15	15/15	15/15
RG_MIDAG+15Cu		15/15	15/15	15/15	13/15
EV_MC2+20Cu		15/15	15/15	14/15	14/15
EV_HC1+20Cu		13/15	12/15	13/15	15/15
LC_DCDS+20Cu		15/15	15/15	15/15	15/15
LC_LC3+15Cu		15/15	15/15	15/15	15/15
LC_LC5+15Cu		15/15	15/15	15/15	14/15
LC_LCDSSLCC		14/15	15/15	15/15	14/15
FR_FR4+15Cu		15/15	15/15	15/15	12/15
FR_FRRD+15Cu		15/15	15/15	15/15	14/15
FR_FR2+20Cu		14/15	15/15	15/15	14/15
FR_MULTIPLATE		12/15	12/15	15/15	14/15

Graphics



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NOV 05 2021

CETIS Analytical Report

Test Code/ID: FM Lab Control / 06-2855-8538

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID:	01-7178-5788	**Endpoint:**	Length	**CETIS Version:**	CETISv1.9.4
Analyzed:	02 Nov-21 9:37	**Analysis:**	Parametric-Control vs Treatments	**Status Level:**	1
Batch ID:	19-0275-1751	**Test Type:**	32 Day Fathead Minnow Test	**Analyst:**	Kayla Knol
Start Date:	13 Aug-21	**Protocol:**	ASTM E1241-05 (2013)	**Diluent:**	Dechlorinated Tap Water
Ending Date:	13 Sep-21	**Species:**	Pimephales promelas	**Brine:**	
Test Length:	31d 0h	**Taxon:**	Actinopterygii	**Source:**	Aquatox, AR **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
Lab Control FM	11-5032-4817	10 Aug-21	11 Aug-21	72h	Teck Coal Ltd	
10Cu Control	04-3348-8996	10 Aug-21	11 Aug-21	72h		
15 Cu Control	05-5139-9319	10 Aug-21	11 Aug-21	72h		
20 Cu Control	18-8853-3252	10 Aug-21	11 Aug-21	72h		
FR_UFR1+15Cu	13-9616-5903	10 Aug-21	11 Aug-21	72h (14.7 °C)		
GH_ER2+15Cu	19-5052-7846	10 Aug-21	11 Aug-21	72h (12.1 °C)		
CM_MC1+15Cu	15-1448-1664	10 Aug-21	11 Aug-21	72h (12.3 °C)		
LC_SLC+10Cu	10-0118-5065	10 Aug-21	11 Aug-21	72h (11.8 °C)		
FR_FRABCH+20Cu	12-2763-5905	10 Aug-21	11 Aug-21	72h (14.6 °C)		
FR_FRCP1+20Cu	05-5162-7629	10 Aug-21	11 Aug-21	72h (13.8 °C)		
GH_FR1+20Cu	18-3989-2491	10 Aug-21	11 Aug-21	72h (12 °C)		
GH_ERC+10Cu	14-6940-9296	10 Aug-21	11 Aug-21	72h (15.4 °C)		
CM_MC2+20Cu	17-0166-2336	10 Aug-21	11 Aug-21	72h (13.1 °C)		
RG_MIDAG+15Cu	18-0148-8949	10 Aug-21	11 Aug-21	72h (12.4 °C)		
EV_MC2+20Cu	08-5423-9441	10 Aug-21	11 Aug-21	72h (13.1 °C)		
EV_HC1+20Cu	19-8320-0922	10 Aug-21	11 Aug-21	72h (12.1 °C)		
LC_DCDS+20Cu	12-7443-1043	10 Aug-21	11 Aug-21	72h (12.3 °C)		
LC_LC3+15Cu	06-5017-0795	10 Aug-21	11 Aug-21	72h (12.4 °C)		
LC_LC5+15Cu	10-4683-7945	10 Aug-21	11 Aug-21	72h (15.1 °C)		
LC_LCDSSLCC	11-9856-2953	10 Aug-21	11 Aug-21	72h (10.8 °C)		
FR_FR4+15Cu	16-1388-5677	10 Aug-21	11 Aug-21	72h (14.1 °C)		
FR_FRRD+15Cu	18-8883-2370	10 Aug-21	11 Aug-21	72h (14.7 °C)		
FR_FR2+20Cu	20-1752-8591	10 Aug-21	11 Aug-21	72h (15.3 °C)		
FR_MULTIPLATE	15-0654-9876	10 Aug-21	11 Aug-21	72h (13.6 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
Lab Control FM	Ambient Sample	Teck Coal Ltd	Lab Control FM	
10Cu Control	Ambient Sample	Teck Coal Ltd	10 Cu Control	
15 Cu Control	Ambient Sample	Teck Coal Ltd	15 Cu Control	
20 Cu Control	Ambient Sample	Teck Coal Ltd	20 Cu Control	
FR_UFR1+15Cu	Ambient Sample	Teck Coal Ltd	FR_UFR1_MON_2021-08-0	
GH_ER2+15Cu	Ambient Sample	Teck Coal Ltd	GH_ER2_WS_2021-08-10_	
CM_MC1+15Cu	Ambient Sample	Teck Coal Ltd	CM_MC1_WS_2021-08-10	
LC_SLC+10Cu	Ambient Sample	Teck Coal Ltd	LC_SLC_WS_2021-08-10_	
FR_FRABCH+20Cu	Ambient Sample	Teck Coal Ltd	FR_FRABCH_MON_2021-	
FR_FRCP1+20Cu	Ambient Sample	Teck Coal Ltd	FR_FRCP1_MON_2021-08	
GH_FR1+20Cu	Ambient Sample	Teck Coal Ltd	GH_FR1_WS_2021-08-10_	
GH_ERC+10Cu	Ambient Sample	Teck Coal Ltd	GH_ERC_WS_2021-08-10	
CM_MC2+20Cu	Ambient Sample	Teck Coal Ltd	CM_MC2_WS_2021-08-10	
RG_MIDAG+15Cu	Ambient Sample	Teck Coal Ltd	RG_MIDAG_WS_2021-08-	
EV_MC2+20Cu	Ambient Sample	Teck Coal Ltd	EV_MC2_WS_2021_Q3_W	
EV_HC1+20Cu	Ambient Sample	Teck Coal Ltd	EV_HC1_WS_2021_Q3_W	
LC_DCDS+20Cu	Ambient Sample	Teck Coal Ltd	LC_DCDS_WS_2021-08-1	
LC_LC3+15Cu	Ambient Sample	Teck Coal Ltd	LC_LC3_WS_2021-08-10_	
LC_LC5+15Cu	Ambient Sample	Teck Coal Ltd	LC_LC5_WS_2021-08-10_	
LC_LCDSSLCC	Ambient Sample	Teck Coal Ltd	LC_LCDSSLCC_WS_2021-	
FR_FR4+15Cu	Ambient Sample	Teck Coal Ltd	FR_FR4_WS_2021-08-10_	
FR_FRRD+15Cu	Ambient Sample	Teck Coal Ltd	FR_FRRD_WS_2021-08-1	

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 Analyst: KC QA: NOV 09 2021

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID:	01-7178-5788	**Endpoint:**	Length	**CETIS Version:**	CETISv1.9.4
Analyzed:	02 Nov-21 9:37	**Analysis:**	Parametric-Control vs Treatments	**Status Level:**	1

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_FR2+20Cu	Ambient Sample	Teck Coal Ltd	FR_FR2_WS_2021-08-10_	
FR_MULTIPLATE	Ambient Sample	Teck Coal Ltd	FR_MULTIPLATE_WS_20	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	Lab Control FM passed length	10.81%
		10Cu Control passed length	10.81%
		15 Cu Control passed length	10.81%
		FR_UFR1+15Cu passed length	10.81%
		GH_ER2+15Cu failed length	10.81%
		CM_MC1+15Cu failed length	10.81%
		LC_SLC+10Cu passed length	10.81%
		FR_FRABCH+20Cu passed length	10.81%
		FR_FRCP1+20Cu failed length	10.81%
		GH_FR1+20Cu failed length	10.81%
		GH_ERC+10Cu passed length	10.81%
		CM_MC2+20Cu passed length	10.81%
		RG_MIDAG+15Cu failed length	10.81%
		EV_MC2+20Cu failed length	10.81%
		EV_HC1+20Cu passed length	10.81%
		LC_DCDS+20Cu passed length	10.81%
		LC_LC3+15Cu passed length	10.81%
		LC_LC5+15Cu passed length	10.81%
		LC_LCDSSLCC passed length	10.81%
		FR_FR4+15Cu failed length	10.81%
		FR_FRRD+15Cu failed length	10.81%
		FR_FR2+20Cu failed length	10.81%
		FR_MULTIPLATE failed length	10.81%

Dunnett Multiple Comparison Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
20Cu Control		Lab Control FM	2.193	2.744	1.408	6	CDF	0.1568	Non-Significant Effect
		10Cu Control	1.169	2.744	1.408	6	CDF	0.5953	Non-Significant Effect
		15 Cu Control	1.267	2.744	1.408	6	CDF	0.5475	Non-Significant Effect
		FR_UFR1+15Cu	2.582	2.744	1.408	6	CDF	0.0720	Non-Significant Effect
		GH_ER2+15Cu*	3.654	2.744	1.408	6	CDF	0.0042	Significant Effect
		CM_MC1+15Cu*	4.044	2.744	1.408	6	CDF	0.0012	Significant Effect
		LC_SLC+10Cu	2.193	2.744	1.408	6	CDF	0.1568	Non-Significant Effect
		FR_FRABCH+20Cu	2.582	2.744	1.408	6	CDF	0.0720	Non-Significant Effect
		FR_FRCP1+20Cu*	4.434	2.744	1.408	6	CDF	3.2E-04	Significant Effect
		GH_FR1+20Cu*	4.044	2.744	1.408	6	CDF	0.0012	Significant Effect
		GH_ERC+10Cu	0.6334	2.744	1.408	6	CDF	0.8212	Non-Significant Effect
		CM_MC2+20Cu	1.121	2.744	1.408	6	CDF	0.6189	Non-Significant Effect
		RG_MIDAG+15Cu*	3.8	2.744	1.408	6	CDF	0.0027	Significant Effect
		EV_MC2+20Cu*	4.336	2.744	1.408	6	CDF	4.6E-04	Significant Effect
		EV_HC1+20Cu	1.657	2.744	1.408	6	CDF	0.3584	Non-Significant Effect
		LC_DCDS+20Cu	1.364	2.744	1.408	6	CDF	0.4992	Non-Significant Effect
		LC_LC3+15Cu	1.657	2.744	1.408	6	CDF	0.3584	Non-Significant Effect
		LC_LC5+15Cu	0.7796	2.744	1.408	6	CDF	0.7684	Non-Significant Effect
		LC_LCDSSLCC	1.851	2.744	1.408	6	CDF	0.2743	Non-Significant Effect
		FR_FR4+15Cu*	3.508	2.744	1.408	6	CDF	0.0066	Significant Effect
		FR_FRRD+15Cu*	4.141	2.744	1.408	6	CDF	8.9E-04	Significant Effect
		FR_FR2+20Cu*	3.362	2.744	1.408	6	CDF	0.0100	Significant Effect
		FR_MULTIPLATE*	3.703	2.744	1.408	6	CDF	0.0036	Significant Effect

Auxiliary Tests

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Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 01-7178-5788 **Endpoint:** Length **CETIS Version:** CETISv1.9.4
Analyzed: 02 Nov-21 9:37 **Analysis:** Parametric-Control vs Treatments **Status Level:** 1

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	3.285	3.37	0.0706	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	44.2591	1.92431	23	3.654	1.3E-05	Significant Effect
Error	37.9125	0.526563	72			
Total	82.1716		95			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Variances	Bartlett Equality of Variance Test	33.4	35.17	0.0744	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9854	0.9737	0.3692	Normal Distribution

Length Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
Lab Control FM		4	11.9	11.15	12.65	11.95	11.3	12.4	0.2345	3.94%	0.00%
10Cu Control		4	12.43	11.66	13.19	12.55	11.8	12.8	0.2394	3.85%	-4.41%
15 Cu Control		4	12.37	10.89	13.86	12.35	11.4	13.4	0.4661	7.53%	-3.99%
20 Cu Control	20	4	13.03	12.67	13.38	13	12.8	13.3	0.1109	1.70%	-9.45%
FR_UFR1+15Cu		4	11.7	10.85	12.55	11.95	10.9	12	0.2677	4.58%	1.68%
GH_ER2+15Cu		4	11.15	10.87	11.43	11.15	11	11.3	0.0866	1.55%	6.30%
CM_MC1+15Cu		4	10.95	10.06	11.84	11.05	10.2	11.5	0.2784	5.08%	7.98%
LC_SLC+10Cu		4	11.9	11.12	12.68	11.8	11.5	12.5	0.2449	4.12%	0.00%
FR_FRABCH+20Cu		4	11.7	10.38	13.02	11.65	10.8	12.7	0.4143	7.08%	1.68%
FR_FRCP1+20Cu		4	10.75	9.243	12.26	11	9.4	11.6	0.4735	8.81%	9.66%
GH_FR1+20Cu		4	10.95	10.33	11.57	10.95	10.5	11.4	0.1936	3.54%	7.98%
GH_ERC+10Cu		4	12.7	12.15	13.25	12.7	12.4	13	0.1732	2.73%	-6.72%
CM_MC2+20Cu		4	12.45	11.06	13.84	12.55	11.3	13.4	0.4368	7.02%	-4.62%
RG_MIDAG+15Cu		4	11.08	10.09	12.06	10.9	10.6	11.9	0.3092	5.58%	6.93%
EV_MC2+20Cu		4	10.8	9.236	12.36	10.6	9.9	12.1	0.4916	9.10%	9.24%
EV_HC1+20Cu		4	12.18	9.553	14.8	12.55	10.1	13.5	0.824	13.54%	-2.31%
LC_DCDS+20Cu		4	12.33	11.45	13.2	12.45	11.6	12.8	0.275	4.46%	-3.57%
LC_LC3+15Cu		4	12.18	10.8	13.55	12.15	11.3	13.1	0.4308	7.08%	-2.31%
LC_LC5+15Cu		4	12.62	10.78	14.47	12.75	11.2	13.8	0.5808	9.20%	-6.09%
LC_LCDSSLCC		4	12.08	11.47	12.68	12.1	11.6	12.5	0.1887	3.13%	-1.47%
FR_FR4+15Cu		4	11.23	10.62	11.83	11.2	10.8	11.7	0.1887	3.36%	5.67%
FR_FRRD+15Cu		4	10.9	10.47	11.33	11	10.5	11.1	0.1354	2.48%	8.40%
FR_FR2+20Cu		4	11.3	10.58	12.02	11.2	10.9	11.9	0.2273	4.02%	5.04%
FR_MULTIPLATE		4	11.12	9.736	12.51	11	10.2	12.3	0.4366	7.85%	6.51%

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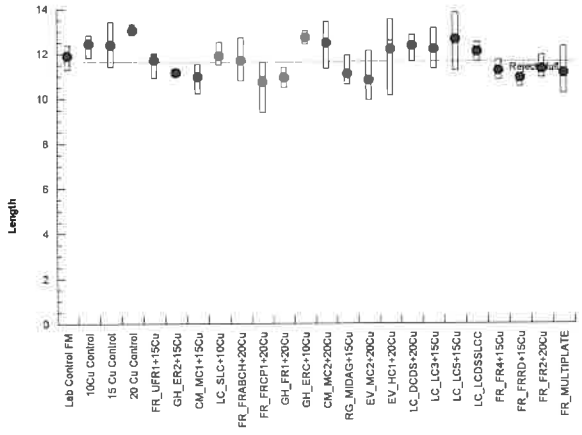
Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

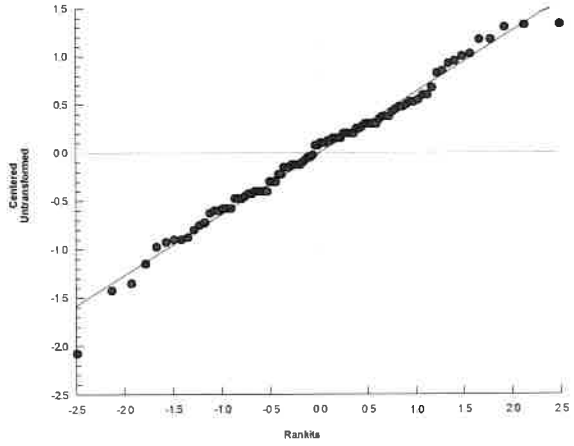
Analysis ID: 01-7178-5788 **Endpoint:** Length **CETIS Version:** CETISv1.9.4
Analyzed: 02 Nov-21 9:37 **Analysis:** Parametric-Control vs Treatments **Status Level:** 1

Length Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Lab Control FM		12.4	11.3	12.1	11.8
10Cu Control		11.8	12.3	12.8	12.8
15 Cu Control		12.9	11.8	13.4	11.4
20 Cu Control	20	13.3	12.9	12.8	13.1
FR_UFR1+15Cu		11.9	10.9	12	12
GH_ER2+15Cu		11.3	11.3	11	11
CM_MC1+15Cu		11.5	10.9	11.2	10.2
LC_SLC+10Cu		11.5	12.5	12.1	11.5
FR_FRABCH+20Cu		12.7	12	10.8	11.3
FR_FRCP1+20Cu		11.1	10.9	9.4	11.6
GH_FR1+20Cu		11.1	10.5	10.8	11.4
GH_ERC+10Cu		13	12.4	12.4	13
CM_MC2+20Cu		12.7	11.3	12.4	13.4
RG_MIDAG+15Cu		10.6	10.6	11.2	11.9
EV_MC2+20Cu		9.9	10.2	11	12.1
EV_HC1+20Cu		13.5	11.6	13.5	10.1
LC_DCDS+20Cu		12.7	12.8	12.2	11.6
LC_LC3+15Cu		12.7	13.1	11.3	11.6
LC_LC5+15Cu		11.2	13.3	12.2	13.8
LC_LCDSSLCC		12.2	12	11.6	12.5
FR_FR4+15Cu		11.3	10.8	11.1	11.7
FR_FRRD+15Cu		10.5	11	11	11.1
FR_FR2+20Cu		11	11.9	11.4	10.9
FR_MULTIPLATE		11.1	12.3	10.2	10.9

Graphics





Analyst: KC QA: MG NOV 03 2021

CETIS Analytical Report

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID:	20-2628-2812	**Endpoint:**	Proportion Normal	**CETIS Version:**	CETISv1.9.4
Analyzed:	02 Nov-21 9:41	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1
Batch ID:	19-0275-1751	**Test Type:**	32 Day Fathead Minnow Test	**Analyst:**	Kayla Knol
Start Date:	13 Aug-21	**Protocol:**	ASTM E1241-05 (2013)	**Diluent:**	Dechlorinated Tap Water
Ending Date:	13 Sep-21	**Species:**	Pimephales promelas	**Brine:**	
Test Length:	31d 0h	**Taxon:**	Actinopterygii	**Source:**	Aquatox, AR **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
Lab Control FM	11-5032-4817	10 Aug-21	11 Aug-21	72h	Teck Coal Ltd	
10Cu Control	04-3348-8996	10 Aug-21	11 Aug-21	72h		
15 Cu Control	05-5139-9319	10 Aug-21	11 Aug-21	72h		
20 Cu Control	18-8853-3252	10 Aug-21	11 Aug-21	72h		
FR_UFR1+15Cu	13-9616-5903	10 Aug-21	11 Aug-21	72h (14.7 °C)		
GH_ER2+15Cu	19-5052-7846	10 Aug-21	11 Aug-21	72h (12.1 °C)		
CM_MC1+15Cu	15-1448-1664	10 Aug-21	11 Aug-21	72h (12.3 °C)		
LC_SLC+10Cu	10-0118-5065	10 Aug-21	11 Aug-21	72h (11.8 °C)		
FR_FRABCH+20Cu	12-2763-5905	10 Aug-21	11 Aug-21	72h (14.6 °C)		
FR_FRCP1+20Cu	05-5162-7629	10 Aug-21	11 Aug-21	72h (13.8 °C)		
GH_FR1+20Cu	18-3989-2491	10 Aug-21	11 Aug-21	72h (12 °C)		
GH_ERC+10Cu	14-6940-9296	10 Aug-21	11 Aug-21	72h (15.4 °C)		
CM_MC2+20Cu	17-0166-2336	10 Aug-21	11 Aug-21	72h (13.1 °C)		
RG_MIDAG+15Cu	18-0148-8949	10 Aug-21	11 Aug-21	72h (12.4 °C)		
EV_MC2+20Cu	08-5423-9441	10 Aug-21	11 Aug-21	72h (13.1 °C)		
EV_HC1+20Cu	19-8320-0922	10 Aug-21	11 Aug-21	72h (12.1 °C)		
LC_DCDS+20Cu	12-7443-1043	10 Aug-21	11 Aug-21	72h (12.3 °C)		
LC_LC3+15Cu	06-5017-0795	10 Aug-21	11 Aug-21	72h (12.4 °C)		
LC_LC5+15Cu	10-4683-7945	10 Aug-21	11 Aug-21	72h (15.1 °C)		
LC_LCDSSLCC	11-9856-2953	10 Aug-21	11 Aug-21	72h (10.8 °C)		
FR_FR4+15Cu	16-1388-5677	10 Aug-21	11 Aug-21	72h (14.1 °C)		
FR_FRRD+15Cu	18-8883-2370	10 Aug-21	11 Aug-21	72h (14.7 °C)		
FR_FR2+20Cu	20-1752-8591	10 Aug-21	11 Aug-21	72h (15.3 °C)		
FR_MULTIPLATE	15-0654-9876	10 Aug-21	11 Aug-21	72h (13.6 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
Lab Control FM	Ambient Sample	Teck Coal Ltd	Lab Control FM	
10Cu Control	Ambient Sample	Teck Coal Ltd	10 Cu Control	
15 Cu Control	Ambient Sample	Teck Coal Ltd	15 Cu Control	
20 Cu Control	Ambient Sample	Teck Coal Ltd	20 Cu Control	
FR_UFR1+15Cu	Ambient Sample	Teck Coal Ltd	FR_UFR1_MON_2021-08-0	
GH_ER2+15Cu	Ambient Sample	Teck Coal Ltd	GH_ER2_WS_2021-08-10_	
CM_MC1+15Cu	Ambient Sample	Teck Coal Ltd	CM_MC1_WS_2021-08-10	
LC_SLC+10Cu	Ambient Sample	Teck Coal Ltd	LC_SLC_WS_2021-08-10_	
FR_FRABCH+20Cu	Ambient Sample	Teck Coal Ltd	FR_FRABCH_MON_2021-	
FR_FRCP1+20Cu	Ambient Sample	Teck Coal Ltd	FR_FRCP1_MON_2021-08	
GH_FR1+20Cu	Ambient Sample	Teck Coal Ltd	GH_FR1_WS_2021-08-10_	
GH_ERC+10Cu	Ambient Sample	Teck Coal Ltd	GH_ERC_WS_2021-08-10	
CM_MC2+20Cu	Ambient Sample	Teck Coal Ltd	CM_MC2_WS_2021-08-10	
RG_MIDAG+15Cu	Ambient Sample	Teck Coal Ltd	RG_MIDAG_WS_2021-08-	
EV_MC2+20Cu	Ambient Sample	Teck Coal Ltd	EV_MC2_WS_2021_Q3_W	
EV_HC1+20Cu	Ambient Sample	Teck Coal Ltd	EV_HC1_WS_2021_Q3_W	
LC_DCDS+20Cu	Ambient Sample	Teck Coal Ltd	LC_DCDS_WS_2021-08-1	
LC_LC3+15Cu	Ambient Sample	Teck Coal Ltd	LC_LC3_WS_2021-08-10_	
LC_LC5+15Cu	Ambient Sample	Teck Coal Ltd	LC_LC5_WS_2021-08-10_	
LC_LCDSSLCC	Ambient Sample	Teck Coal Ltd	LC_LCDSSLCC_WS_2021-	
FR_FR4+15Cu	Ambient Sample	Teck Coal Ltd	FR_FR4_WS_2021-08-10_	
FR_FRRD+15Cu	Ambient Sample	Teck Coal Ltd	FR_FRRD_WS_2021-08-1	

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Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID:	20-2628-2812	**Endpoint:**	Proportion Normal	**CETIS Version:**	CETISv1.9.4
Analyzed:	02 Nov-21 9:41	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_FR2+20Cu	Ambient Sample	Teck Coal Ltd	FR_FR2_WS_2021-08-10_	
FR_MULTIPLATE	Ambient Sample	Teck Coal Ltd	FR_MULTIPLATE_WS_20	

Fisher Exact/Bonferroni Adj Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
20Cu Control		Lab Control FM	1.0000	Exact	1.0000	Non-Significant Effect
		10Cu Control	0.9017	Exact	1.0000	Non-Significant Effect
		15 Cu Control	0.8705	Exact	1.0000	Non-Significant Effect
		FR_UFR1+15Cu	1.0000	Exact	1.0000	Non-Significant Effect
		GH_ER2+15Cu	0.8875	Exact	1.0000	Non-Significant Effect
		CM_MC1+15Cu	0.8245	Exact	1.0000	Non-Significant Effect
		LC_SLC+10Cu	0.8984	Exact	1.0000	Non-Significant Effect
		FR_FRABCH+20Cu	1.0000	Exact	1.0000	Non-Significant Effect
		FR_FRCP1+20Cu	0.7170	Exact	1.0000	Non-Significant Effect
		GH_FR1+20Cu	0.5426	Exact	1.0000	Non-Significant Effect
		GH_ERC+10Cu	0.8498	Exact	1.0000	Non-Significant Effect
		CM_MC2+20Cu	1.0000	Exact	1.0000	Non-Significant Effect
		RG_MIDAG+15Cu	0.3711	Exact	1.0000	Non-Significant Effect
		EV_MC2+20Cu	0.4029	Exact	1.0000	Non-Significant Effect
		EV_HC1+20Cu	0.8096	Exact	1.0000	Non-Significant Effect
		LC_DCDS+20Cu	0.6642	Exact	1.0000	Non-Significant Effect
		LC_LC3+15Cu	0.6738	Exact	1.0000	Non-Significant Effect
		LC_LC5+15Cu	0.8657	Exact	1.0000	Non-Significant Effect
		LC_LCDSSLCC	0.8245	Exact	1.0000	Non-Significant Effect
		FR_FR4+15Cu	0.3038	Exact	1.0000	Non-Significant Effect
		FR_FRRD+15Cu	0.9079	Exact	1.0000	Non-Significant Effect
		FR_FR2+20Cu	0.9017	Exact	1.0000	Non-Significant Effect
		FR_MULTIPLATE	0.8751	Exact	1.0000	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	2.949	3.37	0.2489	No Outliers Detected

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NOV 03 2021

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 20-2628-2812 **Endpoint:** Proportion Normal **CETIS Version:** CETISv1.9.4
Analyzed: 02 Nov-21 9:41 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Data Summary

Sample	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
Lab Control FM		50	0	50	1	0	-4.88%
10Cu Control		48	1	49	0.9796	0.02041	-2.74%
15 Cu Control		40	1	41	0.9756	0.02439	-2.32%
20 Cu Control	20	41	2	43	0.9535	0.04651	0.0%
FR_UFR1+15Cu		31	0	31	1	0	-4.88%
GH_ER2+15Cu		44	1	45	0.9778	0.02222	-2.55%
CM_MC1+15Cu		32	1	33	0.9697	0.0303	-1.7%
LC_SLC+10Cu		47	1	48	0.9792	0.02083	-2.69%
FR_FRABCH+20Cu		41	0	41	1	0	-4.88%
FR_FRCP1+20Cu		44	2	46	0.9565	0.04348	-0.32%
GH_FR1+20Cu		44	3	47	0.9362	0.06383	1.82%
GH_ERC+10Cu		36	1	37	0.973	0.02703	-2.04%
CM_MC2+20Cu		40	0	40	1	0	-4.88%
RG_MIDAG+15Cu		42	4	46	0.913	0.08696	4.24%
EV_MC2+20Cu		45	4	49	0.9184	0.08163	3.68%
EV_HC1+20Cu		30	1	31	0.9677	0.03226	-1.5%
LC_DCDS+20Cu		38	2	40	0.95	0.05	0.37%
LC_LC3+15Cu		39	2	41	0.9512	0.04878	0.24%
LC_LC5+15Cu		39	1	40	0.975	0.025	-2.26%
LC_LCDSSLCC		32	1	33	0.9697	0.0303	-1.7%
FR_FR4+15Cu		36	4	40	0.9	0.1	5.61%
FR_FRRD+15Cu		50	1	51	0.9804	0.01961	-2.82%
FR_FR2+20Cu		48	1	49	0.9796	0.02041	-2.74%
FR_MULTIPLATE		41	1	42	0.9762	0.02381	-2.38%

Proportion Normal Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Lab Control FM		1.0000	1.0000	1.0000	1.0000
10Cu Control		1.0000	1.0000	1.0000	0.9231
15 Cu Control		1.0000	1.0000	1.0000	0.9286
20 Cu Control	20	1.0000	0.8750	1.0000	0.8889
FR_UFR1+15Cu		1.0000	1.0000	1.0000	1.0000
GH_ER2+15Cu		0.9167	1.0000	1.0000	1.0000
CM_MC1+15Cu		1.0000	1.0000	1.0000	0.8000
LC_SLC+10Cu		0.9167	1.0000	1.0000	1.0000
FR_FRABCH+20Cu		1.0000	1.0000	1.0000	1.0000
FR_FRCP1+20Cu		0.9167	1.0000	0.8889	1.0000
GH_FR1+20Cu		1.0000	0.9167	0.8333	1.0000
GH_ERC+10Cu		1.0000	0.8889	1.0000	1.0000
CM_MC2+20Cu		1.0000	1.0000	1.0000	1.0000
RG_MIDAG+15Cu		0.8462	0.9000	1.0000	0.9000
EV_MC2+20Cu		0.8462	0.9231	0.9231	1.0000
EV_HC1+20Cu		1.0000	1.0000	1.0000	0.9333
LC_DCDS+20Cu		0.8571	1.0000	0.9091	1.0000
LC_LC3+15Cu		1.0000	1.0000	0.9167	0.9091
LC_LC5+15Cu		0.9231	1.0000	1.0000	1.0000
LC_LCDSSLCC		1.0000	1.0000	1.0000	0.9000
FR_FR4+15Cu		1.0000	0.7500	1.0000	0.9091
FR_FRRD+15Cu		1.0000	0.9167	1.0000	1.0000
FR_FR2+20Cu		1.0000	1.0000	1.0000	0.9286
FR_MULTIPLATE		0.9000	1.0000	1.0000	1.0000

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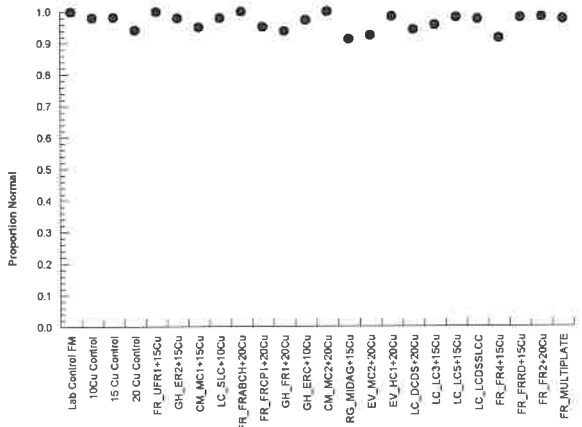
Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 20-2628-2812 **Endpoint:** Proportion Normal **CETIS Version:** CETISv1.9.4
Analyzed: 02 Nov-21 9:41 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Proportion Normal Binomials

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Lab Control FM		12/12	14/14	11/11	13/13
10Cu Control		12/12	12/12	12/12	12/13
15 Cu Control		11/11	8/8	8/8	13/14
20 Cu Control	20	12/12	7/8	14/14	8/9
FR_UFR1+15Cu		8/8	11/11	3/3	9/9
GH_ER2+15Cu		11/12	13/13	8/8	12/12
CM_MC1+15Cu		8/8	9/9	11/11	4/5
LC_SLC+10Cu		11/12	11/11	12/12	13/13
FR_FRABCH+20Cu		9/9	9/9	11/11	12/12
FR_FRCP1+20Cu		11/12	14/14	8/9	11/11
GH_FR1+20Cu		12/12	11/12	10/12	11/11
GH_ERC+10Cu		9/9	8/9	11/11	8/8
CM_MC2+20Cu		7/7	15/15	11/11	7/7
RG_MIDAG+15Cu		11/13	9/10	13/13	9/10
EV_MC2+20Cu		11/13	12/13	12/13	10/10
EV_HC1+20Cu		4/4	8/8	4/4	14/15
LC_DCDS+20Cu		6/7	8/8	10/11	14/14
LC_LC3+15Cu		10/10	8/8	11/12	10/11
LC_LC5+15Cu		12/13	7/7	12/12	8/8
LC_LCDSSLCC		9/9	6/6	8/8	9/10
FR_FR4+15Cu		9/9	9/12	8/8	10/11
FR_FRRD+15Cu		13/13	11/12	13/13	13/13
FR_FR2+20Cu		14/14	10/10	11/11	13/14
FR_MULTIPLATE		9/10	6/6	13/13	13/13

Graphics



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CETIS Analytical Report

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID:	04-0705-9430	**Endpoint:**	Post Hatch Survival	**CETIS Version:**	CETISv1.9.4
Analyzed:	02 Nov-21 9:40	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1
Batch ID:	19-0275-1751	**Test Type:**	32 Day Fathead Minnow Test	**Analyst:**	Kayla Knol
Start Date:	13 Aug-21	**Protocol:**	ASTM E1241-05 (2013)	**Diluent:**	Dechlorinated Tap Water
Ending Date:	13 Sep-21	**Species:**	Pimephales promelas	**Brine:**	
Test Length:	31d 0h	**Taxon:**	Actinopterygii	**Source:**	Aquatox, AR **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
Lab Control FM	11-5032-4817	10 Aug-21	11 Aug-21	72h	Teck Coal Ltd	
10Cu Control	04-3348-8996	10 Aug-21	11 Aug-21	72h		
15 Cu Control	05-5139-9319	10 Aug-21	11 Aug-21	72h		
20 Cu Control	18-8853-3252	10 Aug-21	11 Aug-21	72h		
FR_UFR1+15Cu	13-9616-5903	10 Aug-21	11 Aug-21	72h (14.7 °C)		
GH_ER2+15Cu	19-5052-7846	10 Aug-21	11 Aug-21	72h (12.1 °C)		
CM_MC1+15Cu	15-1448-1664	10 Aug-21	11 Aug-21	72h (12.3 °C)		
LC_SLC+10Cu	10-0118-5065	10 Aug-21	11 Aug-21	72h (11.8 °C)		
FR_FRABCH+20Cu	12-2763-5905	10 Aug-21	11 Aug-21	72h (14.6 °C)		
FR_FRCP1+20Cu	05-5162-7629	10 Aug-21	11 Aug-21	72h (13.8 °C)		
GH_FR1+20Cu	18-3989-2491	10 Aug-21	11 Aug-21	72h (12 °C)		
GH_ERC+10Cu	14-6940-9296	10 Aug-21	11 Aug-21	72h (15.4 °C)		
CM_MC2+20Cu	17-0166-2336	10 Aug-21	11 Aug-21	72h (13.1 °C)		
RG_MIDAG+15Cu	18-0148-8949	10 Aug-21	11 Aug-21	72h (12.4 °C)		
EV_MC2+20Cu	08-5423-9441	10 Aug-21	11 Aug-21	72h (13.1 °C)		
EV_HC1+20Cu	19-8320-0922	10 Aug-21	11 Aug-21	72h (12.1 °C)		
LC_DCDS+20Cu	12-7443-1043	10 Aug-21	11 Aug-21	72h (12.3 °C)		
LC_LC3+15Cu	06-5017-0795	10 Aug-21	11 Aug-21	72h (12.4 °C)		
LC_LC5+15Cu	10-4683-7945	10 Aug-21	11 Aug-21	72h (15.1 °C)		
LC_LCDSSLCC	11-9856-2953	10 Aug-21	11 Aug-21	72h (10.8 °C)		
FR_FR4+15Cu	16-1388-5677	10 Aug-21	11 Aug-21	72h (14.1 °C)		
FR_FRRD+15Cu	18-8883-2370	10 Aug-21	11 Aug-21	72h (14.7 °C)		
FR_FR2+20Cu	20-1752-8591	10 Aug-21	11 Aug-21	72h (15.3 °C)		
FR_MULTIPLATE	15-0654-9876	10 Aug-21	11 Aug-21	72h (13.6 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
Lab Control FM	Ambient Sample	Teck Coal Ltd	Lab Control FM	
10Cu Control	Ambient Sample	Teck Coal Ltd	10 Cu Control	
15 Cu Control	Ambient Sample	Teck Coal Ltd	15 Cu Control	
20 Cu Control	Ambient Sample	Teck Coal Ltd	20 Cu Control	
FR_UFR1+15Cu	Ambient Sample	Teck Coal Ltd	FR_UFR1_MON_2021-08-0	
GH_ER2+15Cu	Ambient Sample	Teck Coal Ltd	GH_ER2_WS_2021-08-10_	
CM_MC1+15Cu	Ambient Sample	Teck Coal Ltd	CM_MC1_WS_2021-08-10	
LC_SLC+10Cu	Ambient Sample	Teck Coal Ltd	LC_SLC_WS_2021-08-10_	
FR_FRABCH+20Cu	Ambient Sample	Teck Coal Ltd	FR_FRABCH_MON_2021-	
FR_FRCP1+20Cu	Ambient Sample	Teck Coal Ltd	FR_FRCP1_MON_2021-08	
GH_FR1+20Cu	Ambient Sample	Teck Coal Ltd	GH_FR1_WS_2021-08-10_	
GH_ERC+10Cu	Ambient Sample	Teck Coal Ltd	GH_ERC_WS_2021-08-10	
CM_MC2+20Cu	Ambient Sample	Teck Coal Ltd	CM_MC2_WS_2021-08-10	
RG_MIDAG+15Cu	Ambient Sample	Teck Coal Ltd	RG_MIDAG_WS_2021-08-	
EV_MC2+20Cu	Ambient Sample	Teck Coal Ltd	EV_MC2_WS_2021_Q3_W	
EV_HC1+20Cu	Ambient Sample	Teck Coal Ltd	EV_HC1_WS_2021_Q3_W	
LC_DCDS+20Cu	Ambient Sample	Teck Coal Ltd	LC_DCDS_WS_2021-08-1	
LC_LC3+15Cu	Ambient Sample	Teck Coal Ltd	LC_LC3_WS_2021-08-10_	
LC_LC5+15Cu	Ambient Sample	Teck Coal Ltd	LC_LC5_WS_2021-08-10_	
LC_LCDSSLCC	Ambient Sample	Teck Coal Ltd	LC_LCDSSLCC_WS_2021-	
FR_FR4+15Cu	Ambient Sample	Teck Coal Ltd	FR_FR4_WS_2021-08-10_	
FR_FRRD+15Cu	Ambient Sample	Teck Coal Ltd	FR_FRRD_WS_2021-08-1	

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Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID:	04-0705-9430	**Endpoint:**	Post Hatch Survival	**CETIS Version:**	CETISv1.9.4
Analyzed:	02 Nov-21 9:40	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_FR2+20Cu	Ambient Sample	Teck Coal Ltd	FR_FR2_WS_2021-08-10_	
FR_MULTIPLATE	Ambient Sample	Teck Coal Ltd	FR_MULTIPLATE_WS_20	

Fisher Exact/Bonferroni Adj Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
20Cu Control		Lab Control FM	0.9323	Exact	1.0000	Non-Significant Effect
		10Cu Control	0.8929	Exact	1.0000	Non-Significant Effect
		15 Cu Control	0.3583	Exact	1.0000	Non-Significant Effect
		FR_UFR1+15Cu	0.0200	Exact	0.4604	Non-Significant Effect
		GH_ER2+15Cu	0.7482	Exact	1.0000	Non-Significant Effect
		CM_MC1+15Cu	0.0989	Exact	1.0000	Non-Significant Effect
		LC_SLC+10Cu	0.9478	Exact	1.0000	Non-Significant Effect
		FR_FRABCH+20Cu	0.5431	Exact	1.0000	Non-Significant Effect
		FR_FRCP1+20Cu	0.7638	Exact	1.0000	Non-Significant Effect
		GH_FR1+20Cu	0.8298	Exact	1.0000	Non-Significant Effect
		GH_ERC+10Cu	0.1530	Exact	1.0000	Non-Significant Effect
		CM_MC2+20Cu	0.2403	Exact	1.0000	Non-Significant Effect
		RG_MIDAG+15Cu	0.7638	Exact	1.0000	Non-Significant Effect
		EV_MC2+20Cu	0.9263	Exact	1.0000	Non-Significant Effect
		EV_HC1+20Cu	0.0454	Exact	1.0000	Non-Significant Effect
		LC_DCDS+20Cu	0.2004	Exact	1.0000	Non-Significant Effect
		LC_LC3+15Cu	0.2588	Exact	1.0000	Non-Significant Effect
		LC_LC5+15Cu	0.2403	Exact	1.0000	Non-Significant Effect
		LC_LCDSSLCC	0.0281	Exact	0.6473	Non-Significant Effect
		FR_FR4+15Cu	0.3371	Exact	1.0000	Non-Significant Effect
		FR_FRRD+15Cu	0.9604	Exact	1.0000	Non-Significant Effect
		FR_FR2+20Cu	0.9263	Exact	1.0000	Non-Significant Effect
		FR_MULTIPLATE	0.7587	Exact	1.0000	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	3.147	3.37	0.1204	No Outliers Detected

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Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 04-0705-9430 **Endpoint:** Post Hatch Survival **CETIS Version:** CETISv1.9.4
Analyzed: 02 Nov-21 9:40 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Data Summary

Sample	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
Lab Control FM		50	9	59	0.8475	0.1525	-12.34%
10Cu Control		49	10	59	0.8305	0.1695	-10.09%
15 Cu Control		41	17	58	0.7069	0.2931	6.3%
20 Cu Control	20	43	14	57	0.7544	0.2456	0.0%
FR_UFR1+15Cu		31	25	56	0.5536	0.4464	26.62%
GH_ER2+15Cu		45	12	57	0.7895	0.2105	-4.65%
CM_MC1+15Cu		33	20	53	0.6226	0.3774	17.46%
LC_SLC+10Cu		48	8	56	0.8571	0.1429	-13.62%
FR_FRABCH+20Cu		41	14	55	0.7455	0.2545	1.18%
FR_FRCP1+20Cu		46	12	58	0.7931	0.2069	-5.13%
GH_FR1+20Cu		47	11	58	0.8103	0.1897	-7.42%
GH_ERC+10Cu		37	20	57	0.6491	0.3509	13.95%
CM_MC2+20Cu		40	19	59	0.678	0.322	10.13%
RG_MIDAG+15Cu		46	12	58	0.7931	0.2069	-5.13%
EV_MC2+20Cu		49	9	58	0.8448	0.1552	-11.99%
EV_HC1+20Cu		31	22	53	0.5849	0.4151	22.47%
LC_DCDS+20Cu		40	20	60	0.6667	0.3333	11.63%
LC_LC3+15Cu		41	19	60	0.6833	0.3167	9.42%
LC_LC5+15Cu		40	19	59	0.678	0.322	10.13%
LC_LCDSSLCC		33	25	58	0.569	0.431	24.58%
FR_FR4+15Cu		40	17	57	0.7018	0.2982	6.98%
FR_FRRD+15Cu		51	8	59	0.8644	0.1356	-14.58%
FR_FR2+20Cu		49	9	58	0.8448	0.1552	-11.99%
FR_MULTIPLATE		42	11	53	0.7925	0.2075	-5.05%

Post Hatch Survival Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Lab Control FM		0.8571	0.9333	0.7333	0.8667
10Cu Control		0.8000	0.8000	0.8571	0.8667
15 Cu Control		0.7333	0.5714	0.5333	1.0000
20 Cu Control	20	0.8571	0.5714	0.9333	0.6429
FR_UFR1+15Cu		0.5714	0.7333	0.2143	0.6923
GH_ER2+15Cu		0.8000	0.9286	0.6154	0.8000
CM_MC1+15Cu		0.6154	0.6429	0.8462	0.3846
LC_SLC+10Cu		0.8571	0.7857	0.8571	0.9286
FR_FRABCH+20Cu		0.6923	0.6923	0.7333	0.8571
FR_FRCP1+20Cu		0.8000	1.0000	0.6429	0.7333
GH_FR1+20Cu		0.8000	0.8000	0.8000	0.8462
GH_ERC+10Cu		0.6429	0.6000	0.8462	0.5333
CM_MC2+20Cu		0.5000	1.0000	0.7333	0.4667
RG_MIDAG+15Cu		0.8667	0.6667	0.8667	0.7692
EV_MC2+20Cu		0.8667	0.8667	0.9286	0.7143
EV_HC1+20Cu		0.3077	0.6667	0.3077	1.0000
LC_DCDS+20Cu		0.4667	0.5333	0.7333	0.9333
LC_LC3+15Cu		0.6667	0.5333	0.8000	0.7333
LC_LC5+15Cu		0.8667	0.4667	0.8000	0.5714
LC_LCDSSLCC		0.6429	0.4000	0.5333	0.7143
FR_FR4+15Cu		0.6000	0.8000	0.5333	0.9167
FR_FRRD+15Cu		0.8667	0.8000	0.8667	0.9286
FR_FR2+20Cu		1.0000	0.6667	0.7333	1.0000
FR_MULTIPLATE		0.8333	0.5000	0.8667	0.9286

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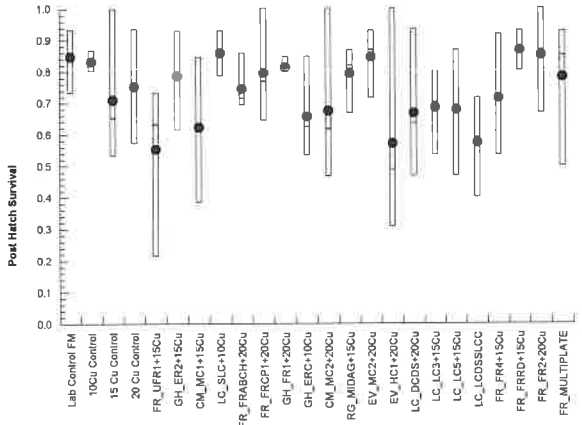
Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID:	04-0705-9430	**Endpoint:**	Post Hatch Survival	**CETIS Version:**	CETISv1.9.4
Analyzed:	02 Nov-21 9:40	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1

Post Hatch Survival Binomials

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Lab Control FM		12/14	14/15	11/15	13/15
10Cu Control		12/15	12/15	12/14	13/15
15 Cu Control		11/15	8/14	8/15	14/14
20 Cu Control	20	12/14	8/14	14/15	9/14
FR_UFR1+15Cu		8/14	11/15	3/14	9/13
GH_ER2+15Cu		12/15	13/14	8/13	12/15
CM_MC1+15Cu		8/13	9/14	11/13	5/13
LC_SLC+10Cu		12/14	11/14	12/14	13/14
FR_FRABCH+20Cu		9/13	9/13	11/15	12/14
FR_FRCP1+20Cu		12/15	14/14	9/14	11/15
GH_FR1+20Cu		12/15	12/15	12/15	11/13
GH_ERC+10Cu		9/14	9/15	11/13	8/15
CM_MC2+20Cu		7/14	15/15	11/15	7/15
RG_MIDAG+15Cu		13/15	10/15	13/15	10/13
EV_MC2+20Cu		13/15	13/15	13/14	10/14
EV_HC1+20Cu		4/13	8/12	4/13	15/15
LC_DCDS+20Cu		7/15	8/15	11/15	14/15
LC_LC3+15Cu		10/15	8/15	12/15	11/15
LC_LC5+15Cu		13/15	7/15	12/15	8/14
LC_LCDSSLCC		9/14	6/15	8/15	10/14
FR_FR4+15Cu		9/15	12/15	8/15	11/12
FR_FRRD+15Cu		13/15	12/15	13/15	13/14
FR_FR2+20Cu		14/14	10/15	11/15	14/14
FR_MULTIPLATE		10/12	6/12	13/15	13/14

Graphics



Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID:	14-5612-9486	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.9.4
Analyzed:	02 Nov-21 14:32	**Analysis:**	Nonparametric-Control vs Treatments	**Status Level:**	1
Batch ID:	19-0275-1751	**Test Type:**	32 Day Fathead Minnow Test	**Analyst:**	Kayla Knol
Start Date:	13 Aug-21	**Protocol:**	ASTM E1241-05 (2013)	**Diluent:**	Dechlorinated Tap Water
Ending Date:	13 Sep-21	**Species:**	Pimephales promelas	**Brine:**	
Test Length:	31d 0h	**Taxon:**	Actinopterygii	**Source:**	Aquatox, AR **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
Lab Control FM	11-5032-4817	10 Aug-21	11 Aug-21	72h	Teck Coal Ltd	
10Cu Control	04-3348-8996	10 Aug-21	11 Aug-21	72h		
15 Cu Control	05-5139-9319	10 Aug-21	11 Aug-21	72h		
20 Cu Control	18-8853-3252	10 Aug-21	11 Aug-21	72h		
FR_UFR1+15Cu	13-9616-5903	10 Aug-21	11 Aug-21	72h (14.7 °C)		
GH_ER2+15Cu	19-5052-7846	10 Aug-21	11 Aug-21	72h (12.1 °C)		
CM_MC1+15Cu	15-1448-1664	10 Aug-21	11 Aug-21	72h (12.3 °C)		
LC_SLC+10Cu	10-0118-5065	10 Aug-21	11 Aug-21	72h (11.8 °C)		
FR_FRABCH+20Cu	12-2763-5905	10 Aug-21	11 Aug-21	72h (14.6 °C)		
FR_FRCP1+20Cu	05-5162-7629	10 Aug-21	11 Aug-21	72h (13.8 °C)		
GH_FR1+20Cu	18-3989-2491	10 Aug-21	11 Aug-21	72h (12 °C)		
GH_ERC+10Cu	14-6940-9296	10 Aug-21	11 Aug-21	72h (15.4 °C)		
CM_MC2+20Cu	17-0166-2336	10 Aug-21	11 Aug-21	72h (13.1 °C)		
RG_MIDAG+15Cu	18-0148-8949	10 Aug-21	11 Aug-21	72h (12.4 °C)		
EV_MC2+20Cu	08-5423-9441	10 Aug-21	11 Aug-21	72h (13.1 °C)		
EV_HC1+20Cu	19-8320-0922	10 Aug-21	11 Aug-21	72h (12.1 °C)		
LC_DCDS+20Cu	12-7443-1043	10 Aug-21	11 Aug-21	72h (12.3 °C)		
LC_LC3+15Cu	06-5017-0795	10 Aug-21	11 Aug-21	72h (12.4 °C)		
LC_LC5+15Cu	10-4683-7945	10 Aug-21	11 Aug-21	72h (15.1 °C)		
LC_LCDSSLCC	11-9856-2953	10 Aug-21	11 Aug-21	72h (10.8 °C)		
FR_FR4+15Cu	16-1388-5677	10 Aug-21	11 Aug-21	72h (14.1 °C)		
FR_FRRD+15Cu	18-8883-2370	10 Aug-21	11 Aug-21	72h (14.7 °C)		
FR_FR2+20Cu	20-1752-8591	10 Aug-21	11 Aug-21	72h (15.3 °C)		
FR_MULTIPLATE	15-0654-9876	10 Aug-21	11 Aug-21	72h (13.6 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
Lab Control FM	Ambient Sample	Teck Coal Ltd	Lab Control FM	
10Cu Control	Ambient Sample	Teck Coal Ltd	10 Cu Control	
15 Cu Control	Ambient Sample	Teck Coal Ltd	15 Cu Control	
20 Cu Control	Ambient Sample	Teck Coal Ltd	20 Cu Control	
FR_UFR1+15Cu	Ambient Sample	Teck Coal Ltd	FR_UFR1_MON_2021-08-0	
GH_ER2+15Cu	Ambient Sample	Teck Coal Ltd	GH_ER2_WS_2021-08-10_	
CM_MC1+15Cu	Ambient Sample	Teck Coal Ltd	CM_MC1_WS_2021-08-10	
LC_SLC+10Cu	Ambient Sample	Teck Coal Ltd	LC_SLC_WS_2021-08-10_	
FR_FRABCH+20Cu	Ambient Sample	Teck Coal Ltd	FR_FRABCH_MON_2021-	
FR_FRCP1+20Cu	Ambient Sample	Teck Coal Ltd	FR_FRCP1_MON_2021-08	
GH_FR1+20Cu	Ambient Sample	Teck Coal Ltd	GH_FR1_WS_2021-08-10_	
GH_ERC+10Cu	Ambient Sample	Teck Coal Ltd	GH_ERC_WS_2021-08-10	
CM_MC2+20Cu	Ambient Sample	Teck Coal Ltd	CM_MC2_WS_2021-08-10	
RG_MIDAG+15Cu	Ambient Sample	Teck Coal Ltd	RG_MIDAG_WS_2021-08-	
EV_MC2+20Cu	Ambient Sample	Teck Coal Ltd	EV_MC2_WS_2021_Q3_W	
EV_HC1+20Cu	Ambient Sample	Teck Coal Ltd	EV_HC1_WS_2021_Q3_W	
LC_DCDS+20Cu	Ambient Sample	Teck Coal Ltd	LC_DCDS_WS_2021-08-1	
LC_LC3+15Cu	Ambient Sample	Teck Coal Ltd	LC_LC3_WS_2021-08-10_	
LC_LC5+15Cu	Ambient Sample	Teck Coal Ltd	LC_LC5_WS_2021-08-10_	
LC_LCDSSLCC	Ambient Sample	Teck Coal Ltd	LC_LCDSSLCC_WS_2021-	
FR_FR4+15Cu	Ambient Sample	Teck Coal Ltd	FR_FR4_WS_2021-08-10_	
FR_FRRD+15Cu	Ambient Sample	Teck Coal Ltd	FR_FRRD_WS_2021-08-1	

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Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID:	14-5612-9486	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.9.4
Analyzed:	02 Nov-21 14:32	**Analysis:**	Nonparametric-Control vs Treatments	**Status Level:**	1

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_FR2+20Cu	Ambient Sample	Teck Coal Ltd	FR_FR2_WS_2021-08-10_	
FR_MULTIPLATE	Ambient Sample	Teck Coal Ltd	FR_MULTIPLATE_WS_20	

Nemenyi-Damico-Wolfe Test

Sample I	vs	Sample II	Test Stat	Critical	Ties	P-Type	P-Value	Decision(α:5%)
Site Control		Lab Control FM	-141	211.4	0	CDF	1.0000	Non-Significant Effect
CM_MC1		10Cu Control	-206	211.4	0	CDF	1.0000	Non-Significant Effect
		15 Cu Control	-104	211.4	0	CDF	0.9997	Non-Significant Effect
		20 Cu Control	-164	211.4	0	CDF	1.0000	Non-Significant Effect
		FR_UFR1+15Cu	-73	211.4	0	CDF	0.9983	Non-Significant Effect
		GH_ER2+15Cu	-130	211.4	0	CDF	0.9999	Non-Significant Effect
		LC_SLC+10Cu	-185	211.4	0	CDF	1.0000	Non-Significant Effect
		FR_FRABCH+20Cu	-171	211.4	0	CDF	1.0000	Non-Significant Effect
		FR_FRCP1+20Cu	-114	211.4	0	CDF	0.9998	Non-Significant Effect
		GH_FR1+20Cu	-118	211.4	0	CDF	0.9999	Non-Significant Effect
		GH_ERC+10Cu	-155	211.4	0	CDF	1.0000	Non-Significant Effect
		CM_MC2+20Cu	-32	211.4	0	CDF	0.9880	Non-Significant Effect
		RG_MIDAG+15Cu	-81	211.4	0	CDF	0.9989	Non-Significant Effect
		EV_MC2+20Cu	-159	211.4	0	CDF	1.0000	Non-Significant Effect
		EV_HC1+20Cu	9	211.4	0	CDF	0.9435	Non-Significant Effect
		LC_DCDS+20Cu	-108	211.4	0	CDF	0.9998	Non-Significant Effect
		LC_LC3+15Cu	-195	211.4	0	CDF	1.0000	Non-Significant Effect
		LC_LC5+15Cu	-140	211.4	0	CDF	1.0000	Non-Significant Effect
		LC_LCDSSLCC	-60	211.4	0	CDF	0.9967	Non-Significant Effect
		FR_FR4+15Cu	-72	211.4	0	CDF	0.9982	Non-Significant Effect
		FR_FRRD+15Cu	-230	211.4	0	CDF	1.0000	Non-Significant Effect
		FR_FR2+20Cu	-226	211.4	0	CDF	1.0000	Non-Significant Effect
		FR_MULTIPLATE	-25	211.4	0	CDF	0.9839	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	4.104	3.37	0.0017	Outlier Detected
Treatment Effect	Fligner-Wolfe Omnibus Test	4342		0.9885	Non-Significant Overall Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	4.49634	0.195493	23	1.847	0.0258	Significant Effect
Error	7.61906	0.10582	72			
Total	12.1154		95			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Variances	Bartlett Equality of Variance Test	34.81	35.17	0.0544	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9596	0.9737	0.0048	Non-Normal Distribution

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 14-5612-9486 **Endpoint:** Mean Dry Biomass-mg **CETIS Version:** CETISv1.9.4
Analyzed: 02 Nov-21 14:32 **Analysis:** Nonparametric-Control vs Treatments **Status Level:** 1

Mean Dry Biomass-mg Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
Lab Control FM		4	2.627	1.997	3.257	2.488	2.333	3.199	0.1981	15.08%	0.00%
10Cu Control		4	2.768	2.171	3.366	2.828	2.278	3.139	0.1879	13.57%	-5.38%
15 Cu Control		4	2.439	1.994	2.885	2.546	2.026	2.64	0.14	11.47%	7.15%
20 Cu Control		4	2.611	2.495	2.728	2.64	2.504	2.661	0.03658	2.80%	0.60%
FR_UFR1+15Cu		4	2.163	0.8123	3.514	2.308	1.001	3.036	0.4244	39.24%	17.67%
GH_ER2+15Cu		4	2.484	1.959	3.01	2.601	1.999	2.737	0.1651	13.29%	5.44%
CM_MC1+15Cu	XC	4	1.909	1.062	2.757	1.845	1.331	2.615	0.2664	27.90%	27.33%
LC_SLC+10Cu		4	2.639	2.465	2.813	2.685	2.477	2.71	0.05459	4.14%	-0.45%
FR_FRABCH+20Cu		4	2.634	2.222	3.047	2.576	2.421	2.965	0.1297	9.85%	-0.27%
FR_FRCP1+20Cu		4	2.458	1.98	2.935	2.492	2.079	2.768	0.1501	12.22%	6.45%
GH_FR1+20Cu		4	2.511	2.25	2.772	2.55	2.279	2.665	0.082	6.53%	4.42%
GH_ERC+10Cu		4	2.58	2.29	2.87	2.593	2.364	2.771	0.09109	7.06%	1.78%
CM_MC2+20Cu		4	2.273	1.992	2.555	2.34	2.015	2.399	0.08836	7.77%	13.46%
RG_MIDAG+15Cu		4	2.406	2.053	2.76	2.353	2.206	2.713	0.1112	9.24%	8.41%
EV_MC2+20Cu		4	2.577	2.242	2.913	2.594	2.353	2.77	0.1054	8.18%	1.89%
EV_HC1+20Cu		4	2.065	1.635	2.495	1.986	1.851	2.437	0.1351	13.08%	21.39%
LC_DCDS+20Cu		4	2.457	2.005	2.909	2.438	2.143	2.808	0.142	11.56%	6.48%
LC_LC3+15Cu		4	2.663	2.343	2.982	2.695	2.412	2.847	0.1004	7.54%	-1.34%
LC_LC5+15Cu		4	2.538	2.182	2.894	2.624	2.215	2.689	0.1118	8.81%	3.39%
LC_LCDSSLCC		4	2.283	1.678	2.888	2.283	1.896	2.67	0.1902	16.66%	13.11%
FR_FR4+15Cu		4	2.356	1.645	3.067	2.276	1.901	2.971	0.2234	18.96%	10.31%
FR_FRRD+15Cu		4	2.735	2.532	2.938	2.771	2.555	2.843	0.06394	4.68%	-4.10%
FR_FR2+20Cu		4	2.748	2.405	3.091	2.77	2.465	2.988	0.1079	7.85%	-4.61%
FR_MULTIPLATE		4	2.233	1.92	2.546	2.205	2.041	2.482	0.09838	8.81%	14.99%

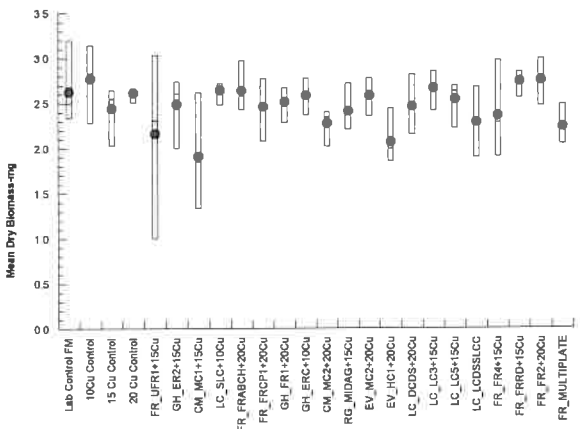
Mean Dry Biomass-mg Detail

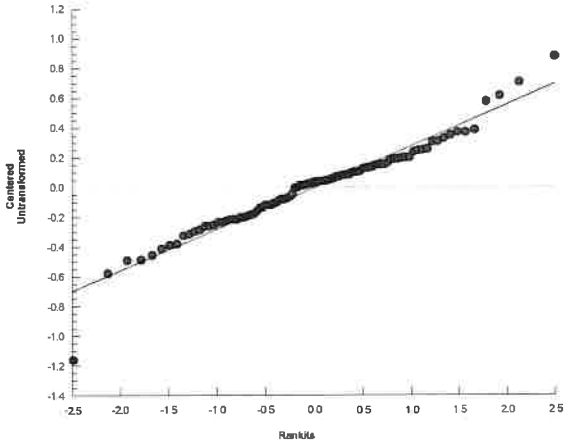
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Lab Control FM		2.583	2.333	2.393	3.199
10Cu Control		2.278	2.69	2.967	3.139
15 Cu Control		2.52	2.026	2.64	2.571
20 Cu Control		2.661	2.504	2.654	2.626
FR_UFR1+15Cu		2.25	2.365	1.001	3.036
GH_ER2+15Cu		2.613	2.588	1.999	2.737
CM_MC1+15Cu	XC	1.769	1.921	2.615	1.331
LC_SLC+10Cu		2.477	2.675	2.71	2.695
FR_FRABCH+20Cu		2.434	2.718	2.421	2.965
FR_FRCP1+20Cu		2.611	2.373	2.079	2.768
GH_FR1+20Cu		2.665	2.279	2.55	2.551
GH_ERC+10Cu		2.683	2.364	2.771	2.503
CM_MC2+20Cu		2.015	2.308	2.399	2.373
RG_MIDAG+15Cu		2.419	2.287	2.206	2.713
EV_MC2+20Cu		2.353	2.443	2.77	2.744
EV_HC1+20Cu		1.881	2.092	1.851	2.437
LC_DCDS+20Cu		2.143	2.339	2.808	2.537
LC_LC3+15Cu		2.591	2.8	2.412	2.847
LC_LC5+15Cu		2.689	2.215	2.561	2.687
LC_LCDSSLCC		2.542	1.896	2.023	2.67
FR_FR4+15Cu		2.257	2.295	1.901	2.971
FR_FRRD+15Cu		2.555	2.843	2.735	2.806
FR_FR2+20Cu		2.745	2.794	2.465	2.988
FR_MULTIPLATE		2.294	2.041	2.116	2.482

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID:	14-5612-9486	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.9.4
Analyzed:	02 Nov-21 14:32	**Analysis:**	Nonparametric-Control vs Treatments	**Status Level:**	1

Graphics





CETIS Analytical Report

Test Code/ID: FM Lab Control / 06-2855-8538

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID:	16-4510-9302	**Endpoint:**	Hatch Rate	**CETIS Version:**	CETISv1.9.4
Analyzed:	02 Nov-21 14:30	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1
Batch ID:	19-0275-1751	**Test Type:**	32 Day Fathead Minnow Test	**Analyst:**	Kayla Knol
Start Date:	13 Aug-21	**Protocol:**	ASTM E1241-05 (2013)	**Diluent:**	Dechlorinated Tap Water
Ending Date:	13 Sep-21	**Species:**	Pimephales promelas	**Brine:**	
Test Length:	31d 0h	**Taxon:**	Actinopterygii	**Source:**	Aquatox, AR **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
Lab Control FM	11-5032-4817	10 Aug-21	11 Aug-21	72h	Teck Coal Ltd	
10Cu Control	04-3348-8996	10 Aug-21	11 Aug-21	72h		
15 Cu Control	05-5139-9319	10 Aug-21	11 Aug-21	72h		
20 Cu Control	18-8853-3252	10 Aug-21	11 Aug-21	72h		
FR_UFR1+15Cu	13-9616-5903	10 Aug-21	11 Aug-21	72h (14.7 °C)		
GH_ER2+15Cu	19-5052-7846	10 Aug-21	11 Aug-21	72h (12.1 °C)		
CM_MC1+15Cu	15-1448-1664	10 Aug-21	11 Aug-21	72h (12.3 °C)		
LC_SLC+10Cu	10-0118-5065	10 Aug-21	11 Aug-21	72h (11.8 °C)		
FR_FRABCH+20Cu	12-2763-5905	10 Aug-21	11 Aug-21	72h (14.6 °C)		
FR_FRCP1+20Cu	05-5162-7629	10 Aug-21	11 Aug-21	72h (13.8 °C)		
GH_FR1+20Cu	18-3989-2491	10 Aug-21	11 Aug-21	72h (12 °C)		
GH_ERC+10Cu	14-6940-9296	10 Aug-21	11 Aug-21	72h (15.4 °C)		
CM_MC2+20Cu	17-0166-2336	10 Aug-21	11 Aug-21	72h (13.1 °C)		
RG_MIDAG+15Cu	18-0148-8949	10 Aug-21	11 Aug-21	72h (12.4 °C)		
EV_MC2+20Cu	08-5423-9441	10 Aug-21	11 Aug-21	72h (13.1 °C)		
EV_HC1+20Cu	19-8320-0922	10 Aug-21	11 Aug-21	72h (12.1 °C)		
LC_DCDS+20Cu	12-7443-1043	10 Aug-21	11 Aug-21	72h (12.3 °C)		
LC_LC3+15Cu	06-5017-0795	10 Aug-21	11 Aug-21	72h (12.4 °C)		
LC_LC5+15Cu	10-4683-7945	10 Aug-21	11 Aug-21	72h (15.1 °C)		
LC_LCDSSLCC	11-9856-2953	10 Aug-21	11 Aug-21	72h (10.8 °C)		
FR_FR4+15Cu	16-1388-5677	10 Aug-21	11 Aug-21	72h (14.1 °C)		
FR_FRRD+15Cu	18-8883-2370	10 Aug-21	11 Aug-21	72h (14.7 °C)		
FR_FR2+20Cu	20-1752-8591	10 Aug-21	11 Aug-21	72h (15.3 °C)		
FR_MULTIPLATE	15-0654-9876	10 Aug-21	11 Aug-21	72h (13.6 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
Lab Control FM	Ambient Sample	Teck Coal Ltd	Lab Control FM	
10Cu Control	Ambient Sample	Teck Coal Ltd	10 Cu Control	
15 Cu Control	Ambient Sample	Teck Coal Ltd	15 Cu Control	
20 Cu Control	Ambient Sample	Teck Coal Ltd	20 Cu Control	
FR_UFR1+15Cu	Ambient Sample	Teck Coal Ltd	FR_UFR1_MON_2021-08-0	
GH_ER2+15Cu	Ambient Sample	Teck Coal Ltd	GH_ER2_WS_2021-08-10_	
CM_MC1+15Cu	Ambient Sample	Teck Coal Ltd	CM_MC1_WS_2021-08-10	
LC_SLC+10Cu	Ambient Sample	Teck Coal Ltd	LC_SLC_WS_2021-08-10_	
FR_FRABCH+20Cu	Ambient Sample	Teck Coal Ltd	FR_FRABCH_MON_2021-	
FR_FRCP1+20Cu	Ambient Sample	Teck Coal Ltd	FR_FRCP1_MON_2021-08	
GH_FR1+20Cu	Ambient Sample	Teck Coal Ltd	GH_FR1_WS_2021-08-10_	
GH_ERC+10Cu	Ambient Sample	Teck Coal Ltd	GH_ERC_WS_2021-08-10	
CM_MC2+20Cu	Ambient Sample	Teck Coal Ltd	CM_MC2_WS_2021-08-10	
RG_MIDAG+15Cu	Ambient Sample	Teck Coal Ltd	RG_MIDAG_WS_2021-08-	
EV_MC2+20Cu	Ambient Sample	Teck Coal Ltd	EV_MC2_WS_2021_Q3_W	
EV_HC1+20Cu	Ambient Sample	Teck Coal Ltd	EV_HC1_WS_2021_Q3_W	
LC_DCDS+20Cu	Ambient Sample	Teck Coal Ltd	LC_DCDS_WS_2021-08-1	
LC_LC3+15Cu	Ambient Sample	Teck Coal Ltd	LC_LC3_WS_2021-08-10_	
LC_LC5+15Cu	Ambient Sample	Teck Coal Ltd	LC_LC5_WS_2021-08-10_	
LC_LCDSSLCC	Ambient Sample	Teck Coal Ltd	LC_LCDSSLCC_WS_2021-	
FR_FR4+15Cu	Ambient Sample	Teck Coal Ltd	FR_FR4_WS_2021-08-10_	
FR_FRRD+15Cu	Ambient Sample	Teck Coal Ltd	FR_FRRD_WS_2021-08-1	

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Analyst: KK QA: NOV 09 2021

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 16-4510-9302 **Endpoint:** Hatch Rate **CETIS Version:** CETISv1.9.4
Analyzed: 02 Nov-21 14:30 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_FR2+20Cu	Ambient Sample	Teck Coal Ltd	FR_FR2_WS_2021-08-10_	
FR_MULTIPLATE	Ambient Sample	Teck Coal Ltd	FR_MULTIPLATE_WS_20	

Fisher Exact/Bonferroni Adj Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
Site Control		Lab Control FM	0.9970	Exact	1.0000	Non-Significant Effect
(MMC)		10Cu Control	0.9970	Exact	1.0000	Non-Significant Effect
		15 Cu Control	0.9839	Exact	1.0000	Non-Significant Effect
		20 Cu Control	0.9527	Exact	1.0000	Non-Significant Effect
		FR_UFR1+15Cu	0.8978	Exact	1.0000	Non-Significant Effect
		GH_ER2+15Cu	0.9527	Exact	1.0000	Non-Significant Effect
		LC_SLC+10Cu	0.8978	Exact	1.0000	Non-Significant Effect
		FR_FRABCH+20Cu	0.8189	Exact	1.0000	Non-Significant Effect
		FR_FRCP1+20Cu	0.9839	Exact	1.0000	Non-Significant Effect
		GH_FR1+20Cu	0.9839	Exact	1.0000	Non-Significant Effect
		GH_ERC+10Cu	0.9527	Exact	1.0000	Non-Significant Effect
		CM_MC2+20Cu	0.9970	Exact	1.0000	Non-Significant Effect
		RG_MIDAG+15Cu	0.9839	Exact	1.0000	Non-Significant Effect
		EV_MC2+20Cu	0.9839	Exact	1.0000	Non-Significant Effect
		EV_HC1+20Cu	0.6114	Exact	1.0000	Non-Significant Effect
		LC_DCDS+20Cu	1.0000	Exact	1.0000	Non-Significant Effect
		LC_LC3+15Cu	1.0000	Exact	1.0000	Non-Significant Effect
		LC_LC5+15Cu	0.9970	Exact	1.0000	Non-Significant Effect
		LC_LCDSSLCC	0.9839	Exact	1.0000	Non-Significant Effect
		FR_FR4+15Cu	0.9527	Exact	1.0000	Non-Significant Effect
		FR_FRRD+15Cu	0.9970	Exact	1.0000	Non-Significant Effect
		FR_FR2+20Cu	0.9839	Exact	1.0000	Non-Significant Effect
		FR_MULTIPLATE	0.6114	Exact	1.0000	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	3.044	3.37	0.1764	No Outliers Detected

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NOV 03 2021

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 16-4510-9302 **Endpoint:** Hatch Rate **CETIS Version:** CETISv1.9.4
Analyzed: 02 Nov-21 14:30 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Data Summary

Sample	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
Lab Control FM		59	1	60	0.9833	0.01667	-11.32%
10Cu Control		59	1	60	0.9833	0.01667	-11.32%
15 Cu Control		58	2	60	0.9667	0.03333	-9.43%
20 Cu Control		57	3	60	0.95	0.05	-7.55%
FR_UFR1+15Cu		56	4	60	0.9333	0.06667	-5.66%
GH_ER2+15Cu		57	3	60	0.95	0.05	-7.55%
CM_MC1+15Cu	XC	53	7	60	0.8833	0.1167	0.0%
LC_SLC+10Cu		56	4	60	0.9333	0.06667	-5.66%
FR_FRABCH+20Cu		55	5	60	0.9167	0.08333	-3.77%
FR_FRCP1+20Cu		58	2	60	0.9667	0.03333	-9.43%
GH_FR1+20Cu		58	2	60	0.9667	0.03333	-9.43%
GH_ERC+10Cu		57	3	60	0.95	0.05	-7.55%
CM_MC2+20Cu		59	1	60	0.9833	0.01667	-11.32%
RG_MIDAG+15Cu		58	2	60	0.9667	0.03333	-9.43%
EV_MC2+20Cu		58	2	60	0.9667	0.03333	-9.43%
EV_HC1+20Cu		53	7	60	0.8833	0.1167	0.0%
LC_DCDS+20Cu		60	0	60	1	0	-13.21%
LC_LC3+15Cu		60	0	60	1	0	-13.21%
LC_LC5+15Cu		59	1	60	0.9833	0.01667	-11.32%
LC_LCDSSLCC		58	2	60	0.9667	0.03333	-9.43%
FR_FR4+15Cu		57	3	60	0.95	0.05	-7.55%
FR_FRRD+15Cu		59	1	60	0.9833	0.01667	-11.32%
FR_FR2+20Cu		58	2	60	0.9667	0.03333	-9.43%
FR_MULTIPLATE		53	7	60	0.8833	0.1167	0.0%

Hatch Rate Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Lab Control FM		0.9333	1.0000	1.0000	1.0000
10Cu Control		1.0000	1.0000	0.9333	1.0000
15 Cu Control		1.0000	0.9333	1.0000	0.9333
20 Cu Control		0.9333	0.9333	1.0000	0.9333
FR_UFR1+15Cu		0.9333	1.0000	0.9333	0.8667
GH_ER2+15Cu		1.0000	0.9333	0.8667	1.0000
CM_MC1+15Cu	XC	0.8667	0.9333	0.8667	0.8667
LC_SLC+10Cu		0.9333	0.9333	0.9333	0.9333
FR_FRABCH+20Cu		0.8667	0.8667	1.0000	0.9333
FR_FRCP1+20Cu		1.0000	0.9333	0.9333	1.0000
GH_FR1+20Cu		1.0000	1.0000	1.0000	0.8667
GH_ERC+10Cu		0.9333	1.0000	0.8667	1.0000
CM_MC2+20Cu		0.9333	1.0000	1.0000	1.0000
RG_MIDAG+15Cu		1.0000	1.0000	1.0000	0.8667
EV_MC2+20Cu		1.0000	1.0000	0.9333	0.9333
EV_HC1+20Cu		0.8667	0.8000	0.8667	1.0000
LC_DCDS+20Cu		1.0000	1.0000	1.0000	1.0000
LC_LC3+15Cu		1.0000	1.0000	1.0000	1.0000
LC_LC5+15Cu		1.0000	1.0000	1.0000	0.9333
LC_LCDSSLCC		0.9333	1.0000	1.0000	0.9333
FR_FR4+15Cu		1.0000	1.0000	1.0000	0.8000
FR_FRRD+15Cu		1.0000	1.0000	1.0000	0.9333
FR_FR2+20Cu		0.9333	1.0000	1.0000	0.9333
FR_MULTIPLATE		0.8000	0.8000	1.0000	0.9333

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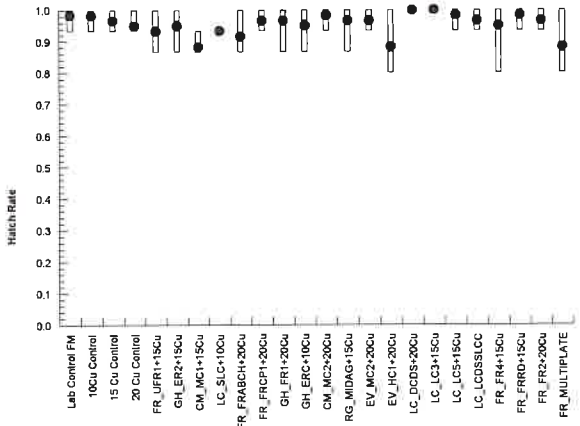
Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 16-4510-9302 **Endpoint:** Hatch Rate **CETIS Version:** CETISv1.9.4
Analyzed: 02 Nov-21 14:30 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Hatch Rate Binomials

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Lab Control FM		14/15	15/15	15/15	15/15
10Cu Control		15/15	15/15	14/15	15/15
15 Cu Control		15/15	14/15	15/15	14/15
20 Cu Control		14/15	14/15	15/15	14/15
FR_UFR1+15Cu		14/15	15/15	14/15	13/15
GH_ER2+15Cu		15/15	14/15	13/15	15/15
CM_MC1+15Cu	XC	13/15	14/15	13/15	13/15
LC_SLC+10Cu		14/15	14/15	14/15	14/15
FR_FRABCH+20Cu		13/15	13/15	15/15	14/15
FR_FRCP1+20Cu		15/15	14/15	14/15	15/15
GH_FR1+20Cu		15/15	15/15	15/15	13/15
GH_ERC+10Cu		14/15	15/15	13/15	15/15
CM_MC2+20Cu		14/15	15/15	15/15	15/15
RG_MIDAG+15Cu		15/15	15/15	15/15	13/15
EV_MC2+20Cu		15/15	15/15	14/15	14/15
EV_HC1+20Cu		13/15	12/15	13/15	15/15
LC_DCDS+20Cu		15/15	15/15	15/15	15/15
LC_LC3+15Cu		15/15	15/15	15/15	15/15
LC_LC5+15Cu		15/15	15/15	15/15	14/15
LC_LCDSSLCC		14/15	15/15	15/15	14/15
FR_FR4+15Cu		15/15	15/15	15/15	12/15
FR_FRRD+15Cu		15/15	15/15	15/15	14/15
FR_FR2+20Cu		14/15	15/15	15/15	14/15
FR_MULTIPLATE		12/15	12/15	15/15	14/15

Graphics



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NOV 09 2021

CETIS Analytical Report

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID:	09-2062-7923	**Endpoint:**	Length	**CETIS Version:**	CETISv1.9.4
Analyzed:	02 Nov-21 14:31	**Analysis:**	Parametric-Control vs Treatments	**Status Level:**	1
Batch ID:	19-0275-1751	**Test Type:**	32 Day Fathead Minnow Test	**Analyst:**	Kayla Knol
Start Date:	13 Aug-21	**Protocol:**	ASTM E1241-05 (2013)	**Diluent:**	Dechlorinated Tap Water
Ending Date:	13 Sep-21	**Species:**	Pimephales promelas	**Brine:**	
Test Length:	31d 0h	**Taxon:**	Actinopterygii	**Source:**	Aquatox, AR **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
Lab Control FM	11-5032-4817	10 Aug-21	11 Aug-21	72h	Teck Coal Ltd	
10Cu Control	04-3348-8996	10 Aug-21	11 Aug-21	72h		
15 Cu Control	05-5139-9319	10 Aug-21	11 Aug-21	72h		
20 Cu Control	18-8853-3252	10 Aug-21	11 Aug-21	72h		
FR_UFR1+15Cu	13-9616-5903	10 Aug-21	11 Aug-21	72h (14.7 °C)		
GH_ER2+15Cu	19-5052-7846	10 Aug-21	11 Aug-21	72h (12.1 °C)		
CM_MC1+15Cu	15-1448-1664	10 Aug-21	11 Aug-21	72h (12.3 °C)		
LC_SLC+10Cu	10-0118-5065	10 Aug-21	11 Aug-21	72h (11.8 °C)		
FR_FRABCH+20Cu	12-2763-5905	10 Aug-21	11 Aug-21	72h (14.6 °C)		
FR_FRCP1+20Cu	05-5162-7629	10 Aug-21	11 Aug-21	72h (13.8 °C)		
GH_FR1+20Cu	18-3989-2491	10 Aug-21	11 Aug-21	72h (12 °C)		
GH_ERC+10Cu	14-6940-9296	10 Aug-21	11 Aug-21	72h (15.4 °C)		
CM_MC2+20Cu	17-0166-2336	10 Aug-21	11 Aug-21	72h (13.1 °C)		
RG_MIDAG+15Cu	18-0148-8949	10 Aug-21	11 Aug-21	72h (12.4 °C)		
EV_MC2+20Cu	08-5423-9441	10 Aug-21	11 Aug-21	72h (13.1 °C)		
EV_HC1+20Cu	19-8320-0922	10 Aug-21	11 Aug-21	72h (12.1 °C)		
LC_DCDS+20Cu	12-7443-1043	10 Aug-21	11 Aug-21	72h (12.3 °C)		
LC_LC3+15Cu	06-5017-0795	10 Aug-21	11 Aug-21	72h (12.4 °C)		
LC_LC5+15Cu	10-4683-7945	10 Aug-21	11 Aug-21	72h (15.1 °C)		
LC_LCDSSLCC	11-9856-2953	10 Aug-21	11 Aug-21	72h (10.8 °C)		
FR_FR4+15Cu	16-1388-5677	10 Aug-21	11 Aug-21	72h (14.1 °C)		
FR_FRRD+15Cu	18-8883-2370	10 Aug-21	11 Aug-21	72h (14.7 °C)		
FR_FR2+20Cu	20-1752-8591	10 Aug-21	11 Aug-21	72h (15.3 °C)		
FR_MULTIPLATE	15-0654-9876	10 Aug-21	11 Aug-21	72h (13.6 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
Lab Control FM	Ambient Sample	Teck Coal Ltd	Lab Control FM	
10Cu Control	Ambient Sample	Teck Coal Ltd	10 Cu Control	
15 Cu Control	Ambient Sample	Teck Coal Ltd	15 Cu Control	
20 Cu Control	Ambient Sample	Teck Coal Ltd	20 Cu Control	
FR_UFR1+15Cu	Ambient Sample	Teck Coal Ltd	FR_UFR1_MON_2021-08-0	
GH_ER2+15Cu	Ambient Sample	Teck Coal Ltd	GH_ER2_WS_2021-08-10_	
CM_MC1+15Cu	Ambient Sample	Teck Coal Ltd	CM_MC1_WS_2021-08-10	
LC_SLC+10Cu	Ambient Sample	Teck Coal Ltd	LC_SLC_WS_2021-08-10_	
FR_FRABCH+20Cu	Ambient Sample	Teck Coal Ltd	FR_FRABCH_MON_2021-	
FR_FRCP1+20Cu	Ambient Sample	Teck Coal Ltd	FR_FRCP1_MON_2021-08	
GH_FR1+20Cu	Ambient Sample	Teck Coal Ltd	GH_FR1_WS_2021-08-10_	
GH_ERC+10Cu	Ambient Sample	Teck Coal Ltd	GH_ERC_WS_2021-08-10	
CM_MC2+20Cu	Ambient Sample	Teck Coal Ltd	CM_MC2_WS_2021-08-10	
RG_MIDAG+15Cu	Ambient Sample	Teck Coal Ltd	RG_MIDAG_WS_2021-08-	
EV_MC2+20Cu	Ambient Sample	Teck Coal Ltd	EV_MC2_WS_2021_Q3_W	
EV_HC1+20Cu	Ambient Sample	Teck Coal Ltd	EV_HC1_WS_2021_Q3_W	
LC_DCDS+20Cu	Ambient Sample	Teck Coal Ltd	LC_DCDS_WS_2021-08-1	
LC_LC3+15Cu	Ambient Sample	Teck Coal Ltd	LC_LC3_WS_2021-08-10_	
LC_LC5+15Cu	Ambient Sample	Teck Coal Ltd	LC_LC5_WS_2021-08-10_	
LC_LCDSSLCC	Ambient Sample	Teck Coal Ltd	LC_LCDSSLCC_WS_2021-	
FR_FR4+15Cu	Ambient Sample	Teck Coal Ltd	FR_FR4_WS_2021-08-10_	
FR_FRRD+15Cu	Ambient Sample	Teck Coal Ltd	FR_FRRD_WS_2021-08-1	

MG

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID:	09-2062-7923	**Endpoint:**	Length	**CETIS Version:**	CETISv1.9.4
Analyzed:	02 Nov-21 14:31	**Analysis:**	Parametric-Control vs Treatments	**Status Level:**	1

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_FR2+20Cu	Ambient Sample	Teck Coal Ltd	FR_FR2_WS_2021-08-10_	
FR_MULTIPLATE	Ambient Sample	Teck Coal Ltd	FR_MULTIPLATE_WS_20	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	Lab Control FM passed length	12.86%
		10Cu Control passed length	12.86%
		15 Cu Control passed length	12.86%
		20 Cu Control passed length	12.86%
		FR_UFR1+15Cu passed length	12.86%
		GH_ER2+15Cu passed length	12.86%
		LC_SLC+10Cu passed length	12.86%
		FR_FRABCH+20Cu passed length	12.86%
		FR_FRCP1+20Cu passed length	12.86%
		GH_FR1+20Cu passed length	12.86%
		GH_ERC+10Cu passed length	12.86%
		CM_MC2+20Cu passed length	12.86%
		RG_MIDAG+15Cu passed length	12.86%
		EV_MC2+20Cu passed length	12.86%
		EV_HC1+20Cu passed length	12.86%
		LC_DCDS+20Cu passed length	12.86%
		LC_LC3+15Cu passed length	12.86%
		LC_LC5+15Cu passed length	12.86%
		LC_LCDSSLCC passed length	12.86%
		FR_FR4+15Cu passed length	12.86%
		FR_FRRD+15Cu passed length	12.86%
		FR_FR2+20Cu passed length	12.86%
		FR_MULTIPLATE passed length	12.86%

Dunnett Multiple Comparison Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Site Control		Lab Control FM	-1.851	2.744	1.408	6	CDF	1.0000	Non-Significant Effect
CM-MC1		10Cu Control	-2.875	2.744	1.408	6	CDF	1.0000	Non-Significant Effect
		15 Cu Control	-2.777	2.744	1.408	6	CDF	1.0000	Non-Significant Effect
		20 Cu Control	-4.044	2.744	1.408	6	CDF	1.0000	Non-Significant Effect
		FR_UFR1+15Cu	-1.462	2.744	1.408	6	CDF	0.9998	Non-Significant Effect
		GH_ER2+15Cu	-0.3898	2.744	1.408	6	CDF	0.9872	Non-Significant Effect
		LC_SLC+10Cu	-1.851	2.744	1.408	6	CDF	1.0000	Non-Significant Effect
		FR_FRABCH+20Cu	-1.462	2.744	1.408	6	CDF	0.9998	Non-Significant Effect
		FR_FRCP1+20Cu	0.3898	2.744	1.408	6	CDF	0.8909	Non-Significant Effect
		GH_FR1+20Cu	-4.6E-07	2.744	1.408	6	CDF	0.9583	Non-Significant Effect
		GH_ERC+10Cu	-3.411	2.744	1.408	6	CDF	1.0000	Non-Significant Effect
		CM_MC2+20Cu	-2.923	2.744	1.408	6	CDF	1.0000	Non-Significant Effect
		RG_MIDAG+15Cu	-0.2436	2.744	1.408	6	CDF	0.9795	Non-Significant Effect
		EV_MC2+20Cu	0.2923	2.744	1.408	6	CDF	0.9125	Non-Significant Effect
		EV_HC1+20Cu	-2.387	2.744	1.408	6	CDF	1.0000	Non-Significant Effect
		LC_DCDS+20Cu	-2.68	2.744	1.408	6	CDF	1.0000	Non-Significant Effect
		LC_LC3+15Cu	-2.387	2.744	1.408	6	CDF	1.0000	Non-Significant Effect
		LC_LC5+15Cu	-3.264	2.744	1.408	6	CDF	1.0000	Non-Significant Effect
		LC_LCDSSLCC	-2.193	2.744	1.408	6	CDF	1.0000	Non-Significant Effect
		FR_FR4+15Cu	-0.5359	2.744	1.408	6	CDF	0.9922	Non-Significant Effect
		FR_FRRD+15Cu	0.09744	2.744	1.408	6	CDF	0.9459	Non-Significant Effect
		FR_FR2+20Cu	-0.6821	2.744	1.408	6	CDF	0.9954	Non-Significant Effect
		FR_MULTIPLATE	-0.3411	2.744	1.408	6	CDF	0.9850	Non-Significant Effect

Auxiliary Tests

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 09-2062-7923 **Endpoint:** Length **CETIS Version:** CETISv1.9.4
Analyzed: 02 Nov-21 14:31 **Analysis:** Parametric-Control vs Treatments **Status Level:** 1

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	3.285	3.37	0.0706	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	44.2591	1.92431	23	3.654	1.3E-05	Significant Effect
Error	37.9125	0.526563	72			
Total	82.1716		95			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Variances	Bartlett Equality of Variance Test	33.4	35.17	0.0744	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9854	0.9737	0.3692	Normal Distribution

Length Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
Lab Control FM		4	11.9	11.15	12.65	11.95	11.3	12.4	0.2345	3.94%	0.00%
10Cu Control		4	12.43	11.66	13.19	12.55	11.8	12.8	0.2394	3.85%	-4.41%
15 Cu Control		4	12.37	10.89	13.86	12.35	11.4	13.4	0.4661	7.53%	-3.99%
20 Cu Control		4	13.03	12.67	13.38	13	12.8	13.3	0.1109	1.70%	-9.45%
FR_UFR1+15Cu		4	11.7	10.85	12.55	11.95	10.9	12	0.2677	4.58%	1.68%
GH_ER2+15Cu		4	11.15	10.87	11.43	11.15	11	11.3	0.0866	1.55%	6.30%
CM_MC1+15Cu	XC	4	10.95	10.06	11.84	11.05	10.2	11.5	0.2784	5.08%	7.98%
LC_SLC+10Cu		4	11.9	11.12	12.68	11.8	11.5	12.5	0.2449	4.12%	0.00%
FR_FRABCH+20Cu		4	11.7	10.38	13.02	11.65	10.8	12.7	0.4143	7.08%	1.68%
FR_FRCP1+20Cu		4	10.75	9.243	12.26	11	9.4	11.6	0.4735	8.81%	9.66%
GH_FR1+20Cu		4	10.95	10.33	11.57	10.95	10.5	11.4	0.1936	3.54%	7.98%
GH_ERC+10Cu		4	12.7	12.15	13.25	12.7	12.4	13	0.1732	2.73%	-6.72%
CM_MC2+20Cu		4	12.45	11.06	13.84	12.55	11.3	13.4	0.4368	7.02%	-4.62%
RG_MIDAG+15Cu		4	11.08	10.09	12.06	10.9	10.6	11.9	0.3092	5.58%	6.93%
EV_MC2+20Cu		4	10.8	9.236	12.36	10.6	9.9	12.1	0.4916	9.10%	9.24%
EV_HC1+20Cu		4	12.18	9.553	14.8	12.55	10.1	13.5	0.824	13.54%	-2.31%
LC_DCDS+20Cu		4	12.33	11.45	13.2	12.45	11.6	12.8	0.275	4.46%	-3.57%
LC_LC3+15Cu		4	12.18	10.8	13.55	12.15	11.3	13.1	0.4308	7.08%	-2.31%
LC_LC5+15Cu		4	12.62	10.78	14.47	12.75	11.2	13.8	0.5808	9.20%	-6.09%
LC_LCDSSLCC		4	12.08	11.47	12.68	12.1	11.6	12.5	0.1887	3.13%	-1.47%
FR_FR4+15Cu		4	11.23	10.62	11.83	11.2	10.8	11.7	0.1887	3.36%	5.67%
FR_FRRD+15Cu		4	10.9	10.47	11.33	11	10.5	11.1	0.1354	2.48%	8.40%
FR_FR2+20Cu		4	11.3	10.58	12.02	11.2	10.9	11.9	0.2273	4.02%	5.04%
FR_MULTIPLATE		4	11.12	9.736	12.51	11	10.2	12.3	0.4366	7.85%	6.51%

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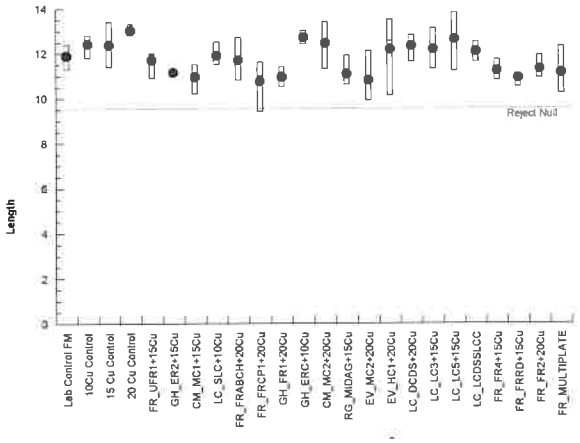
Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

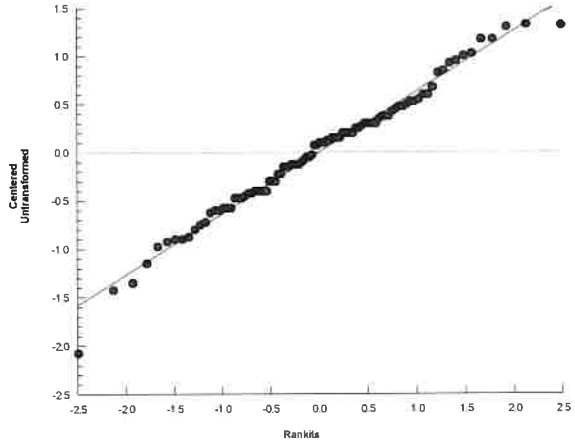
Analysis ID: 09-2062-7923 **Endpoint:** Length **CETIS Version:** CETISv1.9.4
Analyzed: 02 Nov-21 14:31 **Analysis:** Parametric-Control vs Treatments **Status Level:** 1

Length Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Lab Control FM		12.4	11.3	12.1	11.8
10Cu Control		11.8	12.3	12.8	12.8
15 Cu Control		12.9	11.8	13.4	11.4
20 Cu Control		13.3	12.9	12.8	13.1
FR_UFR1+15Cu		11.9	10.9	12	12
GH_ER2+15Cu		11.3	11.3	11	11
CM_MC1+15Cu	XC	11.5	10.9	11.2	10.2
LC_SLC+10Cu		11.5	12.5	12.1	11.5
FR_FRABCH+20Cu		12.7	12	10.8	11.3
FR_FRCP1+20Cu		11.1	10.9	9.4	11.6
GH_FR1+20Cu		11.1	10.5	10.8	11.4
GH_ERC+10Cu		13	12.4	12.4	13
CM_MC2+20Cu		12.7	11.3	12.4	13.4
RG_MIDAG+15Cu		10.6	10.6	11.2	11.9
EV_MC2+20Cu		9.9	10.2	11	12.1
EV_HC1+20Cu		13.5	11.6	13.5	10.1
LC_DCDS+20Cu		12.7	12.8	12.2	11.6
LC_LC3+15Cu		12.7	13.1	11.3	11.6
LC_LC5+15Cu		11.2	13.3	12.2	13.8
LC_LCDSSLCC		12.2	12	11.6	12.5
FR_FR4+15Cu		11.3	10.8	11.1	11.7
FR_FRRD+15Cu		10.5	11	11	11.1
FR_FR2+20Cu		11	11.9	11.4	10.9
FR_MULTIPLATE		11.1	12.3	10.2	10.9

Graphics





CETIS Analytical Report

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID:	20-5993-1757	**Endpoint:**	Proportion Normal	**CETIS Version:**	CETISv1.9.4
Analyzed:	02 Nov-21 14:33	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1
Batch ID:	19-0275-1751	**Test Type:**	32 Day Fathead Minnow Test	**Analyst:**	Kayla Knol
Start Date:	13 Aug-21	**Protocol:**	ASTM E1241-05 (2013)	**Diluent:**	Dechlorinated Tap Water
Ending Date:	13 Sep-21	**Species:**	Pimephales promelas	**Brine:**	
Test Length:	31d 0h	**Taxon:**	Actinopterygii	**Source:**	Aquatox, AR **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
Lab Control FM	11-5032-4817	10 Aug-21	11 Aug-21	72h	Teck Coal Ltd	
10Cu Control	04-3348-8996	10 Aug-21	11 Aug-21	72h		
15 Cu Control	05-5139-9319	10 Aug-21	11 Aug-21	72h		
20 Cu Control	18-8853-3252	10 Aug-21	11 Aug-21	72h		
FR_UFR1+15Cu	13-9616-5903	10 Aug-21	11 Aug-21	72h (14.7 °C)		
GH_ER2+15Cu	19-5052-7846	10 Aug-21	11 Aug-21	72h (12.1 °C)		
CM_MC1+15Cu	15-1448-1664	10 Aug-21	11 Aug-21	72h (12.3 °C)		
LC_SLC+10Cu	10-0118-5065	10 Aug-21	11 Aug-21	72h (11.8 °C)		
FR_FRABCH+20Cu	12-2763-5905	10 Aug-21	11 Aug-21	72h (14.6 °C)		
FR_FRCP1+20Cu	05-5162-7629	10 Aug-21	11 Aug-21	72h (13.8 °C)		
GH_FR1+20Cu	18-3989-2491	10 Aug-21	11 Aug-21	72h (12 °C)		
GH_ERC+10Cu	14-6940-9296	10 Aug-21	11 Aug-21	72h (15.4 °C)		
CM_MC2+20Cu	17-0166-2336	10 Aug-21	11 Aug-21	72h (13.1 °C)		
RG_MIDAG+15Cu	18-0148-8949	10 Aug-21	11 Aug-21	72h (12.4 °C)		
EV_MC2+20Cu	08-5423-9441	10 Aug-21	11 Aug-21	72h (13.1 °C)		
EV_HC1+20Cu	19-8320-0922	10 Aug-21	11 Aug-21	72h (12.1 °C)		
LC_DCDS+20Cu	12-7443-1043	10 Aug-21	11 Aug-21	72h (12.3 °C)		
LC_LC3+15Cu	06-5017-0795	10 Aug-21	11 Aug-21	72h (12.4 °C)		
LC_LC5+15Cu	10-4683-7945	10 Aug-21	11 Aug-21	72h (15.1 °C)		
LC_LCDSSLCC	11-9856-2953	10 Aug-21	11 Aug-21	72h (10.8 °C)		
FR_FR4+15Cu	16-1388-5677	10 Aug-21	11 Aug-21	72h (14.1 °C)		
FR_FRRD+15Cu	18-8883-2370	10 Aug-21	11 Aug-21	72h (14.7 °C)		
FR_FR2+20Cu	20-1752-8591	10 Aug-21	11 Aug-21	72h (15.3 °C)		
FR_MULTIPLATE	15-0654-9876	10 Aug-21	11 Aug-21	72h (13.6 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
Lab Control FM	Ambient Sample	Teck Coal Ltd	Lab Control FM	
10Cu Control	Ambient Sample	Teck Coal Ltd	10 Cu Control	
15 Cu Control	Ambient Sample	Teck Coal Ltd	15 Cu Control	
20 Cu Control	Ambient Sample	Teck Coal Ltd	20 Cu Control	
FR_UFR1+15Cu	Ambient Sample	Teck Coal Ltd	FR_UFR1_MON_2021-08-0	
GH_ER2+15Cu	Ambient Sample	Teck Coal Ltd	GH_ER2_WS_2021-08-10_	
CM_MC1+15Cu	Ambient Sample	Teck Coal Ltd	CM_MC1_WS_2021-08-10	
LC_SLC+10Cu	Ambient Sample	Teck Coal Ltd	LC_SLC_WS_2021-08-10_	
FR_FRABCH+20Cu	Ambient Sample	Teck Coal Ltd	FR_FRABCH_MON_2021-	
FR_FRCP1+20Cu	Ambient Sample	Teck Coal Ltd	FR_FRCP1_MON_2021-08	
GH_FR1+20Cu	Ambient Sample	Teck Coal Ltd	GH_FR1_WS_2021-08-10_	
GH_ERC+10Cu	Ambient Sample	Teck Coal Ltd	GH_ERC_WS_2021-08-10	
CM_MC2+20Cu	Ambient Sample	Teck Coal Ltd	CM_MC2_WS_2021-08-10	
RG_MIDAG+15Cu	Ambient Sample	Teck Coal Ltd	RG_MIDAG_WS_2021-08-	
EV_MC2+20Cu	Ambient Sample	Teck Coal Ltd	EV_MC2_WS_2021_Q3_W	
EV_HC1+20Cu	Ambient Sample	Teck Coal Ltd	EV_HC1_WS_2021_Q3_W	
LC_DCDS+20Cu	Ambient Sample	Teck Coal Ltd	LC_DCDS_WS_2021-08-1	
LC_LC3+15Cu	Ambient Sample	Teck Coal Ltd	LC_LC3_WS_2021-08-10_	
LC_LC5+15Cu	Ambient Sample	Teck Coal Ltd	LC_LC5_WS_2021-08-10_	
LC_LCDSSLCC	Ambient Sample	Teck Coal Ltd	LC_LCDSSLCC_WS_2021-	
FR_FR4+15Cu	Ambient Sample	Teck Coal Ltd	FR_FR4_WS_2021-08-10_	
FR_FRRD+15Cu	Ambient Sample	Teck Coal Ltd	FR_FRRD_WS_2021-08-1	

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Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID:	20-5993-1757	**Endpoint:**	Proportion Normal	**CETIS Version:**	CETISv1.9.4
Analyzed:	02 Nov-21 14:33	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_FR2+20Cu	Ambient Sample	Teck Coal Ltd	FR_FR2_WS_2021-08-10_	
FR_MULTIPLATE	Ambient Sample	Teck Coal Ltd	FR_MULTIPLATE_WS_20	

Fisher Exact/Bonferroni Adj Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
Site Control CM-NC1		Lab Control FM	1.0000	Exact	1.0000	Non-Significant Effect
		10Cu Control	0.8410	Exact	1.0000	Non-Significant Effect
		15 Cu Control	0.8045	Exact	1.0000	Non-Significant Effect
		20 Cu Control	0.5994	Exact	1.0000	Non-Significant Effect
		FR_UFR1+15Cu	1.0000	Exact	1.0000	Non-Significant Effect
		GH_ER2+15Cu	0.8242	Exact	1.0000	Non-Significant Effect
		LC_SLC+10Cu	0.8370	Exact	1.0000	Non-Significant Effect
		FR_FRABCH+20Cu	1.0000	Exact	1.0000	Non-Significant Effect
		FR_FRCP1+20Cu	0.6239	Exact	1.0000	Non-Significant Effect
		GH_FR1+20Cu	0.4511	Exact	1.0000	Non-Significant Effect
		GH_ERC+10Cu	0.7814	Exact	1.0000	Non-Significant Effect
		CM_MC2+20Cu	1.0000	Exact	1.0000	Non-Significant Effect
		RG_MIDAG+15Cu	0.2998	Exact	1.0000	Non-Significant Effect
		EV_MC2+20Cu	0.3261	Exact	1.0000	Non-Significant Effect
		EV_HC1+20Cu	0.7381	Exact	1.0000	Non-Significant Effect
		LC_DCDS+20Cu	0.5727	Exact	1.0000	Non-Significant Effect
		LC_LC3+15Cu	0.5819	Exact	1.0000	Non-Significant Effect
		LC_LC5+15Cu	0.7991	Exact	1.0000	Non-Significant Effect
		LC_LCDSSLCC	0.7538	Exact	1.0000	Non-Significant Effect
		FR_FR4+15Cu	0.2446	Exact	1.0000	Non-Significant Effect
		FR_FRRD+15Cu	0.8485	Exact	1.0000	Non-Significant Effect
		FR_FR2+20Cu	0.8410	Exact	1.0000	Non-Significant Effect
		FR_MULTIPLATE	0.8097	Exact	1.0000	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	2.949	3.37	0.2489	No Outliers Detected

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NOV 09 2021

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 20-5993-1757 **Endpoint:** Proportion Normal **CETIS Version:** CETISv1.9.4
Analyzed: 02 Nov-21 14:33 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Data Summary

Sample	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
Lab Control FM		50	0	50	1	0	-3.13%
10Cu Control		48	1	49	0.9796	0.02041	-1.02%
15 Cu Control		40	1	41	0.9756	0.02439	-0.61%
20 Cu Control		41	2	43	0.9535	0.04651	1.67%
FR_UFR1+15Cu		31	0	31	1	0	-3.13%
GH_ER2+15Cu		44	1	45	0.9778	0.02222	-0.83%
CM_MC1+15Cu	XC	32	1	33	0.9697	0.0303	0.0%
LC_SLC+10Cu		47	1	48	0.9792	0.02083	-0.98%
FR_FRABCH+20Cu		41	0	41	1	0	-3.13%
FR_FRCP1+20Cu		44	2	46	0.9565	0.04348	1.36%
GH_FR1+20Cu		44	3	47	0.9362	0.06383	3.46%
GH_ERC+10Cu		36	1	37	0.973	0.02703	-0.34%
CM_MC2+20Cu		40	0	40	1	0	-3.13%
RG_MIDAG+15Cu		42	4	46	0.913	0.08696	5.84%
EV_MC2+20Cu		45	4	49	0.9184	0.08163	5.29%
EV_HC1+20Cu		30	1	31	0.9677	0.03226	0.2%
LC_DCDS+20Cu		38	2	40	0.95	0.05	2.03%
LC_LC3+15Cu		39	2	41	0.9512	0.04878	1.91%
LC_LC5+15Cu		39	1	40	0.975	0.025	-0.55%
LC_LCDSSLCC		32	1	33	0.9697	0.0303	0.0%
FR_FR4+15Cu		36	4	40	0.9	0.1	7.19%
FR_FRRD+15Cu		50	1	51	0.9804	0.01961	-1.1%
FR_FR2+20Cu		48	1	49	0.9796	0.02041	-1.02%
FR_MULTIPLATE		41	1	42	0.9762	0.02381	-0.67%

Proportion Normal Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Lab Control FM		1.0000	1.0000	1.0000	1.0000
10Cu Control		1.0000	1.0000	1.0000	0.9231
15 Cu Control		1.0000	1.0000	1.0000	0.9286
20 Cu Control		1.0000	0.8750	1.0000	0.8889
FR_UFR1+15Cu		1.0000	1.0000	1.0000	1.0000
GH_ER2+15Cu		0.9167	1.0000	1.0000	1.0000
CM_MC1+15Cu	XC	1.0000	1.0000	1.0000	0.8000
LC_SLC+10Cu		0.9167	1.0000	1.0000	1.0000
FR_FRABCH+20Cu		1.0000	1.0000	1.0000	1.0000
FR_FRCP1+20Cu		0.9167	1.0000	0.8889	1.0000
GH_FR1+20Cu		1.0000	0.9167	0.8333	1.0000
GH_ERC+10Cu		1.0000	0.8889	1.0000	1.0000
CM_MC2+20Cu		1.0000	1.0000	1.0000	1.0000
RG_MIDAG+15Cu		0.8462	0.9000	1.0000	0.9000
EV_MC2+20Cu		0.8462	0.9231	0.9231	1.0000
EV_HC1+20Cu		1.0000	1.0000	1.0000	0.9333
LC_DCDS+20Cu		0.8571	1.0000	0.9091	1.0000
LC_LC3+15Cu		1.0000	1.0000	0.9167	0.9091
LC_LC5+15Cu		0.9231	1.0000	1.0000	1.0000
LC_LCDSSLCC		1.0000	1.0000	1.0000	0.9000
FR_FR4+15Cu		1.0000	0.7500	1.0000	0.9091
FR_FRRD+15Cu		1.0000	0.9167	1.0000	1.0000
FR_FR2+20Cu		1.0000	1.0000	1.0000	0.9286
FR_MULTIPLATE		0.9000	1.0000	1.0000	1.0000

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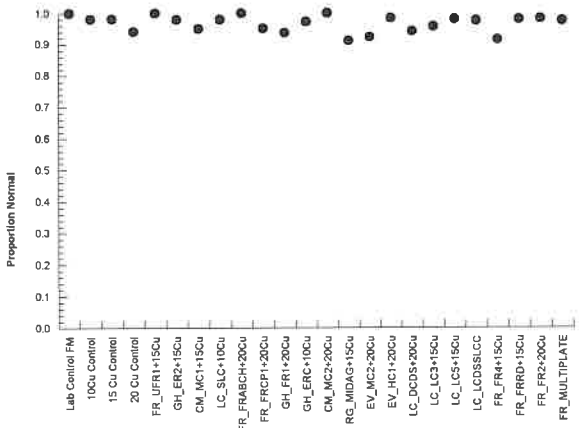
Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 20-5993-1757 **Endpoint:** Proportion Normal **CETIS Version:** CETISv1.9.4
Analyzed: 02 Nov-21 14:33 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Proportion Normal Binomials

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Lab Control FM		12/12	14/14	11/11	13/13
10Cu Control		12/12	12/12	12/12	12/13
15 Cu Control		11/11	8/8	8/8	13/14
20 Cu Control		12/12	7/8	14/14	8/9
FR_UFR1+15Cu		8/8	11/11	3/3	9/9
GH_ER2+15Cu		11/12	13/13	8/8	12/12
CM_MC1+15Cu	XC	8/8	9/9	11/11	4/5
LC_SLC+10Cu		11/12	11/11	12/12	13/13
FR_FRABCH+20Cu		9/9	9/9	11/11	12/12
FR_FRCP1+20Cu		11/12	14/14	8/9	11/11
GH_FR1+20Cu		12/12	11/12	10/12	11/11
GH_ERC+10Cu		9/9	8/9	11/11	8/8
CM_MC2+20Cu		7/7	15/15	11/11	7/7
RG_MIDAG+15Cu		11/13	9/10	13/13	9/10
EV_MC2+20Cu		11/13	12/13	12/13	10/10
EV_HC1+20Cu		4/4	8/8	4/4	14/15
LC_DCDS+20Cu		6/7	8/8	10/11	14/14
LC_LC3+15Cu		10/10	8/8	11/12	10/11
LC_LC5+15Cu		12/13	7/7	12/12	8/8
LC_LCDSSLCC		9/9	6/6	8/8	9/10
FR_FR4+15Cu		9/9	9/12	8/8	10/11
FR_FRRD+15Cu		13/13	11/12	13/13	13/13
FR_FR2+20Cu		14/14	10/10	11/11	13/14
FR_MULTIPLATE		9/10	6/6	13/13	13/13

Graphics



Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID:	20-9327-1554	**Endpoint:**	Post Hatch Survival	**CETIS Version:**	CETISv1.9.4
Analyzed:	02 Nov-21 14:33	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1
Batch ID:	19-0275-1751	**Test Type:**	32 Day Fathead Minnow Test	**Analyst:**	Kayla Knol
Start Date:	13 Aug-21	**Protocol:**	ASTM E1241-05 (2013)	**Diluent:**	Dechlorinated Tap Water
Ending Date:	13 Sep-21	**Species:**	Pimephales promelas	**Brine:**	
Test Length:	31d 0h	**Taxon:**	Actinopterygii	**Source:**	Aquatox, AR

Age:

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
Lab Control FM	11-5032-4817	10 Aug-21	11 Aug-21	72h	Teck Coal Ltd	
10Cu Control	04-3348-8996	10 Aug-21	11 Aug-21	72h		
15 Cu Control	05-5139-9319	10 Aug-21	11 Aug-21	72h		
20 Cu Control	18-8853-3252	10 Aug-21	11 Aug-21	72h		
FR_UFR1+15Cu	13-9616-5903	10 Aug-21	11 Aug-21	72h (14.7 °C)		
GH_ER2+15Cu	19-5052-7846	10 Aug-21	11 Aug-21	72h (12.1 °C)		
CM_MC1+15Cu	15-1448-1664	10 Aug-21	11 Aug-21	72h (12.3 °C)		
LC_SLC+10Cu	10-0118-5065	10 Aug-21	11 Aug-21	72h (11.8 °C)		
FR_FRABCH+20Cu	12-2763-5905	10 Aug-21	11 Aug-21	72h (14.6 °C)		
FR_FRCP1+20Cu	05-5162-7629	10 Aug-21	11 Aug-21	72h (13.8 °C)		
GH_FR1+20Cu	18-3989-2491	10 Aug-21	11 Aug-21	72h (12 °C)		
GH_ERC+10Cu	14-6940-9296	10 Aug-21	11 Aug-21	72h (15.4 °C)		
CM_MC2+20Cu	17-0166-2336	10 Aug-21	11 Aug-21	72h (13.1 °C)		
RG_MIDAG+15Cu	18-0148-8949	10 Aug-21	11 Aug-21	72h (12.4 °C)		
EV_MC2+20Cu	08-5423-9441	10 Aug-21	11 Aug-21	72h (13.1 °C)		
EV_HC1+20Cu	19-8320-0922	10 Aug-21	11 Aug-21	72h (12.1 °C)		
LC_DCDS+20Cu	12-7443-1043	10 Aug-21	11 Aug-21	72h (12.3 °C)		
LC_LC3+15Cu	06-5017-0795	10 Aug-21	11 Aug-21	72h (12.4 °C)		
LC_LC5+15Cu	10-4683-7945	10 Aug-21	11 Aug-21	72h (15.1 °C)		
LC_LCDSSLCC	11-9856-2953	10 Aug-21	11 Aug-21	72h (10.8 °C)		
FR_FR4+15Cu	16-1388-5677	10 Aug-21	11 Aug-21	72h (14.1 °C)		
FR_FRRD+15Cu	18-8883-2370	10 Aug-21	11 Aug-21	72h (14.7 °C)		
FR_FR2+20Cu	20-1752-8591	10 Aug-21	11 Aug-21	72h (15.3 °C)		
FR_MULTIPLATE	15-0654-9876	10 Aug-21	11 Aug-21	72h (13.6 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
Lab Control FM	Ambient Sample	Teck Coal Ltd	Lab Control FM	
10Cu Control	Ambient Sample	Teck Coal Ltd	10 Cu Control	
15 Cu Control	Ambient Sample	Teck Coal Ltd	15 Cu Control	
20 Cu Control	Ambient Sample	Teck Coal Ltd	20 Cu Control	
FR_UFR1+15Cu	Ambient Sample	Teck Coal Ltd	FR_UFR1_MON_2021-08-0	
GH_ER2+15Cu	Ambient Sample	Teck Coal Ltd	GH_ER2_WS_2021-08-10_	
CM_MC1+15Cu	Ambient Sample	Teck Coal Ltd	CM_MC1_WS_2021-08-10	
LC_SLC+10Cu	Ambient Sample	Teck Coal Ltd	LC_SLC_WS_2021-08-10_	
FR_FRABCH+20Cu	Ambient Sample	Teck Coal Ltd	FR_FRABCH_MON_2021-	
FR_FRCP1+20Cu	Ambient Sample	Teck Coal Ltd	FR_FRCP1_MON_2021-08	
GH_FR1+20Cu	Ambient Sample	Teck Coal Ltd	GH_FR1_WS_2021-08-10_	
GH_ERC+10Cu	Ambient Sample	Teck Coal Ltd	GH_ERC_WS_2021-08-10	
CM_MC2+20Cu	Ambient Sample	Teck Coal Ltd	CM_MC2_WS_2021-08-10	
RG_MIDAG+15Cu	Ambient Sample	Teck Coal Ltd	RG_MIDAG_WS_2021-08-	
EV_MC2+20Cu	Ambient Sample	Teck Coal Ltd	EV_MC2_WS_2021_Q3_W	
EV_HC1+20Cu	Ambient Sample	Teck Coal Ltd	EV_HC1_WS_2021_Q3_W	
LC_DCDS+20Cu	Ambient Sample	Teck Coal Ltd	LC_DCDS_WS_2021-08-1	
LC_LC3+15Cu	Ambient Sample	Teck Coal Ltd	LC_LC3_WS_2021-08-10_	
LC_LC5+15Cu	Ambient Sample	Teck Coal Ltd	LC_LC5_WS_2021-08-10_	
LC_LCDSSLCC	Ambient Sample	Teck Coal Ltd	LC_LCDSSLCC_WS_2021-	
FR_FR4+15Cu	Ambient Sample	Teck Coal Ltd	FR_FR4_WS_2021-08-10_	
FR_FRRD+15Cu	Ambient Sample	Teck Coal Ltd	FR_FRRD_WS_2021-08-1	

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NOV 09 2021

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID:	20-9327-1554	**Endpoint:**	Post Hatch Survival	**CETIS Version:**	CETISv1.9.4
Analyzed:	02 Nov-21 14:33	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_FR2+20Cu	Ambient Sample	Teck Coal Ltd	FR_FR2_WS_2021-08-10_	
FR_MULTIPLATE	Ambient Sample	Teck Coal Ltd	FR_MULTIPLATE_WS_20	

Fisher Exact/Bonferroni Adj Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
Site Control		Lab Control FM	0.9984	Exact	1.0000	Non-Significant Effect
CM-MCl		10Cu Control	0.9966	Exact	1.0000	Non-Significant Effect
		15 Cu Control	0.8733	Exact	1.0000	Non-Significant Effect
		20 Cu Control	0.9557	Exact	1.0000	Non-Significant Effect
		FR_UFR1+15Cu	0.2957	Exact	1.0000	Non-Significant Effect
		GH_ER2+15Cu	0.9839	Exact	1.0000	Non-Significant Effect
		LC_SLC+10Cu	0.9989	Exact	1.0000	Non-Significant Effect
		FR_FRABCH+20Cu	0.9433	Exact	1.0000	Non-Significant Effect
		FR_FRCP1+20Cu	0.9860	Exact	1.0000	Non-Significant Effect
		GH_FR1+20Cu	0.9923	Exact	1.0000	Non-Significant Effect
		GH_ERC+10Cu	0.6868	Exact	1.0000	Non-Significant Effect
		CM_MC2+20Cu	0.7917	Exact	1.0000	Non-Significant Effect
		RG_MIDAG+15Cu	0.9860	Exact	1.0000	Non-Significant Effect
		EV_MC2+20Cu	0.9981	Exact	1.0000	Non-Significant Effect
		EV_HC1+20Cu	0.4214	Exact	1.0000	Non-Significant Effect
		LC_DCDS+20Cu	0.7536	Exact	1.0000	Non-Significant Effect
		LC_LC3+15Cu	0.8094	Exact	1.0000	Non-Significant Effect
		LC_LC5+15Cu	0.7917	Exact	1.0000	Non-Significant Effect
		LC_LCDSSLCC	0.3516	Exact	1.0000	Non-Significant Effect
		FR_FR4+15Cu	0.8598	Exact	1.0000	Non-Significant Effect
		FR_FRRD+15Cu	0.9993	Exact	1.0000	Non-Significant Effect
		FR_FR2+20Cu	0.9981	Exact	1.0000	Non-Significant Effect
		FR_MULTIPLATE	0.9841	Exact	1.0000	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	3.147	3.37	0.1204	No Outliers Detected

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NOV 08 2021

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 20-9327-1554 **Endpoint:** Post Hatch Survival **CETIS Version:** CETISv1.9.4
Analyzed: 02 Nov-21 14:33 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Data Summary

Sample	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
Lab Control FM		50	9	59	0.8475	0.1525	-36.11%
10Cu Control		49	10	59	0.8305	0.1695	-33.38%
15 Cu Control		41	17	58	0.7069	0.2931	-13.53%
20 Cu Control		43	14	57	0.7544	0.2456	-21.16%
FR_UFR1+15Cu		31	25	56	0.5536	0.4464	11.09%
GH_ER2+15Cu		45	12	57	0.7895	0.2105	-26.79%
CM_MC1+15Cu	XC	33	20	53	0.6226	0.3774	0.0%
LC_SLC+10Cu		48	8	56	0.8571	0.1429	-37.66%
FR_FRABCH+20Cu		41	14	55	0.7455	0.2545	-19.72%
FR_FRCP1+20Cu		46	12	58	0.7931	0.2069	-27.38%
GH_FR1+20Cu		47	11	58	0.8103	0.1897	-30.15%
GH_ERC+10Cu		37	20	57	0.6491	0.3509	-4.25%
CM_MC2+20Cu		40	19	59	0.678	0.322	-8.89%
RG_MIDAG+15Cu		46	12	58	0.7931	0.2069	-27.38%
EV_MC2+20Cu		49	9	58	0.8448	0.1552	-35.68%
EV_HC1+20Cu		31	22	53	0.5849	0.4151	6.06%
LC_DCDS+20Cu		40	20	60	0.6667	0.3333	-7.07%
LC_LC3+15Cu		41	19	60	0.6833	0.3167	-9.75%
LC_LC5+15Cu		40	19	59	0.678	0.322	-8.89%
LC_LCDSSLCC		33	25	58	0.569	0.431	8.62%
FR_FR4+15Cu		40	17	57	0.7018	0.2982	-12.71%
FR_FRRD+15Cu		51	8	59	0.8644	0.1356	-38.83%
FR_FR2+20Cu		49	9	58	0.8448	0.1552	-35.68%
FR_MULTIPLATE		42	11	53	0.7925	0.2075	-27.27%

Post Hatch Survival Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Lab Control FM		0.8571	0.9333	0.7333	0.8667
10Cu Control		0.8000	0.8000	0.8571	0.8667
15 Cu Control		0.7333	0.5714	0.5333	1.0000
20 Cu Control		0.8571	0.5714	0.9333	0.6429
FR_UFR1+15Cu		0.5714	0.7333	0.2143	0.6923
GH_ER2+15Cu		0.8000	0.9286	0.6154	0.8000
CM_MC1+15Cu	XC	0.6154	0.6429	0.8462	0.3846
LC_SLC+10Cu		0.8571	0.7857	0.8571	0.9286
FR_FRABCH+20Cu		0.6923	0.6923	0.7333	0.8571
FR_FRCP1+20Cu		0.8000	1.0000	0.6429	0.7333
GH_FR1+20Cu		0.8000	0.8000	0.8000	0.8462
GH_ERC+10Cu		0.6429	0.6000	0.8462	0.5333
CM_MC2+20Cu		0.5000	1.0000	0.7333	0.4667
RG_MIDAG+15Cu		0.8667	0.6667	0.8667	0.7692
EV_MC2+20Cu		0.8667	0.8667	0.9286	0.7143
EV_HC1+20Cu		0.3077	0.6667	0.3077	1.0000
LC_DCDS+20Cu		0.4667	0.5333	0.7333	0.9333
LC_LC3+15Cu		0.6667	0.5333	0.8000	0.7333
LC_LC5+15Cu		0.8667	0.4667	0.8000	0.5714
LC_LCDSSLCC		0.6429	0.4000	0.5333	0.7143
FR_FR4+15Cu		0.6000	0.8000	0.5333	0.9167
FR_FRRD+15Cu		0.8667	0.8000	0.8667	0.9286
FR_FR2+20Cu		1.0000	0.6667	0.7333	1.0000
FR_MULTIPLATE		0.8333	0.5000	0.8667	0.9286

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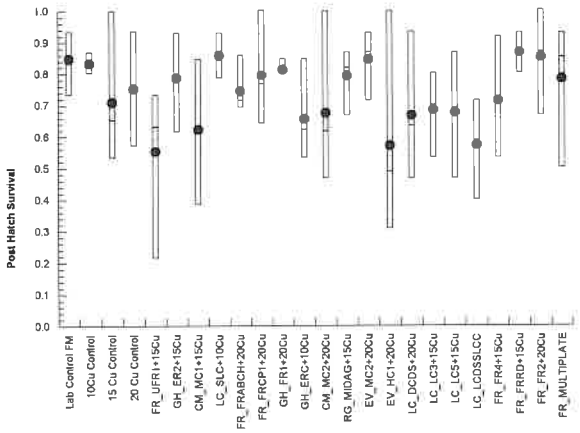
Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 20-9327-1554 **Endpoint:** Post Hatch Survival **CETIS Version:** CETISv1.9.4
Analyzed: 02 Nov-21 14:33 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Post Hatch Survival Binomials

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Lab Control FM		12/14	14/15	11/15	13/15
10Cu Control		12/15	12/15	12/14	13/15
15 Cu Control		11/15	8/14	8/15	14/14
20 Cu Control		12/14	8/14	14/15	9/14
FR_UFR1+15Cu		8/14	11/15	3/14	9/13
GH_ER2+15Cu		12/15	13/14	8/13	12/15
CM_MC1+15Cu	XC	8/13	9/14	11/13	5/13
LC_SLC+10Cu		12/14	11/14	12/14	13/14
FR_FRABCH+20Cu		9/13	9/13	11/15	12/14
FR_FRCP1+20Cu		12/15	14/14	9/14	11/15
GH_FR1+20Cu		12/15	12/15	12/15	11/13
GH_ERC+10Cu		9/14	9/15	11/13	8/15
CM_MC2+20Cu		7/14	15/15	11/15	7/15
RG_MIDAG+15Cu		13/15	10/15	13/15	10/13
EV_MC2+20Cu		13/15	13/15	13/14	10/14
EV_HC1+20Cu		4/13	8/12	4/13	15/15
LC_DCDS+20Cu		7/15	8/15	11/15	14/15
LC_LC3+15Cu		10/15	8/15	12/15	11/15
LC_LC5+15Cu		13/15	7/15	12/15	8/14
LC_LCDSSLCC		9/14	6/15	8/15	10/14
FR_FR4+15Cu		9/15	12/15	8/15	11/12
FR_FRRD+15Cu		13/15	12/15	13/15	13/14
FR_FR2+20Cu		14/14	10/15	11/15	14/14
FR_MULTIPLATE		10/12	6/12	13/15	13/14

Graphics



CETIS Analytical Report

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID:	18-4480-4381	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.9.4
Analyzed:	02 Nov-21 14:22	**Analysis:**	Nonparametric-Control vs Treatments	**Status Level:**	1
Batch ID:	19-0275-1751	**Test Type:**	32 Day Fathead Minnow Test	**Analyst:**	Kayla Knol
Start Date:	13 Aug-21	**Protocol:**	ASTM E1241-05 (2013)	**Diluent:**	Dechlorinated Tap Water
Ending Date:	13 Sep-21	**Species:**	Pimephales promelas	**Brine:**	
Test Length:	31d 0h	**Taxon:**	Actinopterygii	**Source:**	Aquatox, AR **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
Lab Control FM	11-5032-4817	10 Aug-21	11 Aug-21	72h	Teck Coal Ltd	
10Cu Control	04-3348-8996	10 Aug-21	11 Aug-21	72h		
15 Cu Control	05-5139-9319	10 Aug-21	11 Aug-21	72h		
20 Cu Control	18-8853-3252	10 Aug-21	11 Aug-21	72h		
FR_UFR1+15Cu	13-9616-5903	10 Aug-21	11 Aug-21	72h (14.7 °C)		
GH_ER2+15Cu	19-5052-7846	10 Aug-21	11 Aug-21	72h (12.1 °C)		
CM_MC1+15Cu	15-1448-1664	10 Aug-21	11 Aug-21	72h (12.3 °C)		
LC_SLC+10Cu	10-0118-5065	10 Aug-21	11 Aug-21	72h (11.8 °C)		
FR_FRABCH+20Cu	12-2763-5905	10 Aug-21	11 Aug-21	72h (14.6 °C)		
FR_FRCP1+20Cu	05-5162-7629	10 Aug-21	11 Aug-21	72h (13.8 °C)		
GH_FR1+20Cu	18-3989-2491	10 Aug-21	11 Aug-21	72h (12 °C)		
GH_ERC+10Cu	14-6940-9296	10 Aug-21	11 Aug-21	72h (15.4 °C)		
CM_MC2+20Cu	17-0166-2336	10 Aug-21	11 Aug-21	72h (13.1 °C)		
RG_MIDAG+15Cu	18-0148-8949	10 Aug-21	11 Aug-21	72h (12.4 °C)		
EV_MC2+20Cu	08-5423-9441	10 Aug-21	11 Aug-21	72h (13.1 °C)		
EV_HC1+20Cu	19-8320-0922	10 Aug-21	11 Aug-21	72h (12.1 °C)		
LC_DCDS+20Cu	12-7443-1043	10 Aug-21	11 Aug-21	72h (12.3 °C)		
LC_LC3+15Cu	06-5017-0795	10 Aug-21	11 Aug-21	72h (12.4 °C)		
LC_LC5+15Cu	10-4683-7945	10 Aug-21	11 Aug-21	72h (15.1 °C)		
LC_LCDSSLCC	11-9856-2953	10 Aug-21	11 Aug-21	72h (10.8 °C)		
FR_FR4+15Cu	16-1388-5677	10 Aug-21	11 Aug-21	72h (14.1 °C)		
FR_FRRD+15Cu	18-8883-2370	10 Aug-21	11 Aug-21	72h (14.7 °C)		
FR_FR2+20Cu	20-1752-8591	10 Aug-21	11 Aug-21	72h (15.3 °C)		
FR_MULTIPLATE	15-0654-9876	10 Aug-21	11 Aug-21	72h (13.6 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
Lab Control FM	Ambient Sample	Teck Coal Ltd	Lab Control FM	
10Cu Control	Ambient Sample	Teck Coal Ltd	10 Cu Control	
15 Cu Control	Ambient Sample	Teck Coal Ltd	15 Cu Control	
20 Cu Control	Ambient Sample	Teck Coal Ltd	20 Cu Control	
FR_UFR1+15Cu	Ambient Sample	Teck Coal Ltd	FR_UFR1_MON_2021-08-0	
GH_ER2+15Cu	Ambient Sample	Teck Coal Ltd	GH_ER2_WS_2021-08-10_	
CM_MC1+15Cu	Ambient Sample	Teck Coal Ltd	CM_MC1_WS_2021-08-10	
LC_SLC+10Cu	Ambient Sample	Teck Coal Ltd	LC_SLC_WS_2021-08-10_	
FR_FRABCH+20Cu	Ambient Sample	Teck Coal Ltd	FR_FRABCH_MON_2021-	
FR_FRCP1+20Cu	Ambient Sample	Teck Coal Ltd	FR_FRCP1_MON_2021-08	
GH_FR1+20Cu	Ambient Sample	Teck Coal Ltd	GH_FR1_WS_2021-08-10_	
GH_ERC+10Cu	Ambient Sample	Teck Coal Ltd	GH_ERC_WS_2021-08-10	
CM_MC2+20Cu	Ambient Sample	Teck Coal Ltd	CM_MC2_WS_2021-08-10	
RG_MIDAG+15Cu	Ambient Sample	Teck Coal Ltd	RG_MIDAG_WS_2021-08-	
EV_MC2+20Cu	Ambient Sample	Teck Coal Ltd	EV_MC2_WS_2021_Q3_W	
EV_HC1+20Cu	Ambient Sample	Teck Coal Ltd	EV_HC1_WS_2021_Q3_W	
LC_DCDS+20Cu	Ambient Sample	Teck Coal Ltd	LC_DCDS_WS_2021-08-1	
LC_LC3+15Cu	Ambient Sample	Teck Coal Ltd	LC_LC3_WS_2021-08-10_	
LC_LC5+15Cu	Ambient Sample	Teck Coal Ltd	LC_LC5_WS_2021-08-10_	
LC_LCDSSLCC	Ambient Sample	Teck Coal Ltd	LC_LCDSSLCC_WS_2021-	
FR_FR4+15Cu	Ambient Sample	Teck Coal Ltd	FR_FR4_WS_2021-08-10_	
FR_FRRD+15Cu	Ambient Sample	Teck Coal Ltd	FR_FRRD_WS_2021-08-1	

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 18-4480-4381 **Endpoint:** Mean Dry Biomass-mg **CETIS Version:** CETISv1.9.4
Analyzed: 02 Nov-21 14:22 **Analysis:** Nonparametric-Control vs Treatments **Status Level:** 1

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_FR2+20Cu	Ambient Sample	Teck Coal Ltd	FR_FR2_WS_2021-08-10_	
FR_MULTIPLATE	Ambient Sample	Teck Coal Ltd	FR_MULTIPLATE_WS_20	

Nemenyi-Damico-Wolfe Test

Sample I	vs	Sample II	Test Stat	Critical	Ties	P-Type	P-Value	Decision(α:5%)
Site Control		Lab Control FM	-68	211.4	0	CDF	0.9978	Non-Significant Effect
FR_VFR1		10Cu Control	-133	211.4	0	CDF	1.0000	Non-Significant Effect
		15 Cu Control	-31	211.4	0	CDF	0.9874	Non-Significant Effect
		20 Cu Control	-91	211.4	0	CDF	0.9994	Non-Significant Effect
		GH_ER2+15Cu	-57	211.4	0	CDF	0.9962	Non-Significant Effect
		CM_MC1+15Cu	73	211.4	0	CDF	0.7074	Non-Significant Effect
		LC_SLC+10Cu	-112	211.4	0	CDF	0.9998	Non-Significant Effect
		FR_FRABCH+20Cu	-98	211.4	0	CDF	0.9996	Non-Significant Effect
		FR_FRCP1+20Cu	-41	211.4	0	CDF	0.9919	Non-Significant Effect
		GH_FR1+20Cu	-45	211.4	0	CDF	0.9932	Non-Significant Effect
		GH_ERC+10Cu	-82	211.4	0	CDF	0.9990	Non-Significant Effect
		CM_MC2+20Cu	41	211.4	0	CDF	0.8562	Non-Significant Effect
		RG_MIDAG+15Cu	-8	211.4	0	CDF	0.9687	Non-Significant Effect
		EV_MC2+20Cu	-86	211.4	0	CDF	0.9992	Non-Significant Effect
		EV_HC1+20Cu	82	211.4	0	CDF	0.6557	Non-Significant Effect
		LC_DCDS+20Cu	-35	211.4	0	CDF	0.9894	Non-Significant Effect
		LC_LC3+15Cu	-122	211.4	0	CDF	0.9999	Non-Significant Effect
		LC_LC5+15Cu	-67	211.4	0	CDF	0.9977	Non-Significant Effect
		LC_LCDSSLCC	13	211.4	0	CDF	0.9357	Non-Significant Effect
		FR_FR4+15Cu	1	211.4	0	CDF	0.9569	Non-Significant Effect
		FR_FRRD+15Cu	-157	211.4	0	CDF	1.0000	Non-Significant Effect
		FR_FR2+20Cu	-153	211.4	0	CDF	1.0000	Non-Significant Effect
		FR_MULTIPLATE	48	211.4	0	CDF	0.8290	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	4.104	3.37	0.0017	Outlier Detected
Treatment Effect	Fligner-Wolfe Omnibus Test	4415		0.8008	Non-Significant Overall Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	4.49634	0.195493	23	1.847	0.0258	Significant Effect
Error	7.61906	0.10582	72			
Total	12.1154		95			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Variances	Bartlett Equality of Variance Test	34.81	35.17	0.0544	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9596	0.9737	0.0048	Non-Normal Distribution

M/7

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 18-4480-4381 **Endpoint:** Mean Dry Biomass-mg **CETIS Version:** CETISv1.9.4
Analyzed: 02 Nov-21 14:22 **Analysis:** Nonparametric-Control vs Treatments **Status Level:** 1

Mean Dry Biomass-mg Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
Lab Control FM		4	2.627	1.997	3.257	2.488	2.333	3.199	0.1981	15.08%	0.00%
10Cu Control		4	2.768	2.171	3.366	2.828	2.278	3.139	0.1879	13.57%	-5.38%
15 Cu Control		4	2.439	1.994	2.885	2.546	2.026	2.64	0.14	11.47%	7.15%
20 Cu Control		4	2.611	2.495	2.728	2.64	2.504	2.661	0.03658	2.80%	0.60%
FR_UFR1+15Cu	XC	4	2.163	0.8123	3.514	2.308	1.001	3.036	0.4244	39.24%	17.67%
GH_ER2+15Cu		4	2.484	1.959	3.01	2.601	1.999	2.737	0.1651	13.29%	5.44%
CM_MC1+15Cu		4	1.909	1.062	2.757	1.845	1.331	2.615	0.2664	27.90%	27.33%
LC_SLC+10Cu		4	2.639	2.465	2.813	2.685	2.477	2.71	0.05459	4.14%	-0.45%
FR_FRABCH+20Cu		4	2.634	2.222	3.047	2.576	2.421	2.965	0.1297	9.85%	-0.27%
FR_FRCP1+20Cu		4	2.458	1.98	2.935	2.492	2.079	2.768	0.1501	12.22%	6.45%
GH_FR1+20Cu		4	2.511	2.25	2.772	2.55	2.279	2.665	0.082	6.53%	4.42%
GH_ERC+10Cu		4	2.58	2.29	2.87	2.593	2.364	2.771	0.09109	7.06%	1.78%
CM_MC2+20Cu		4	2.273	1.992	2.555	2.34	2.015	2.399	0.08836	7.77%	13.46%
RG_MIDAG+15Cu		4	2.406	2.053	2.76	2.353	2.206	2.713	0.1112	9.24%	8.41%
EV_MC2+20Cu		4	2.577	2.242	2.913	2.594	2.353	2.77	0.1054	8.18%	1.89%
EV_HC1+20Cu		4	2.065	1.635	2.495	1.986	1.851	2.437	0.1351	13.08%	21.39%
LC_DCDS+20Cu		4	2.457	2.005	2.909	2.438	2.143	2.808	0.142	11.56%	6.48%
LC_LC3+15Cu		4	2.663	2.343	2.982	2.695	2.412	2.847	0.1004	7.54%	-1.34%
LC_LC5+15Cu		4	2.538	2.182	2.894	2.624	2.215	2.689	0.1118	8.81%	3.39%
LC_LCDSSLCC		4	2.283	1.678	2.888	2.283	1.896	2.67	0.1902	16.66%	13.11%
FR_FR4+15Cu		4	2.356	1.645	3.067	2.276	1.901	2.971	0.2234	18.96%	10.31%
FR_FRRD+15Cu		4	2.735	2.532	2.938	2.771	2.555	2.843	0.06394	4.68%	-4.10%
FR_FR2+20Cu		4	2.748	2.405	3.091	2.77	2.465	2.988	0.1079	7.85%	-4.61%
FR_MULTIPLATE		4	2.233	1.92	2.546	2.205	2.041	2.482	0.09838	8.81%	14.99%

Mean Dry Biomass-mg Detail

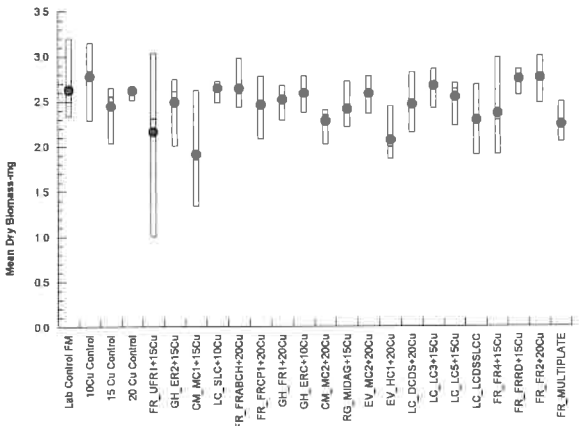
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Lab Control FM		2.583	2.333	2.393	3.199
10Cu Control		2.278	2.69	2.967	3.139
15 Cu Control		2.52	2.026	2.64	2.571
20 Cu Control		2.661	2.504	2.654	2.626
FR_UFR1+15Cu	XC	2.25	2.365	1.001	3.036
GH_ER2+15Cu		2.613	2.588	1.999	2.737
CM_MC1+15Cu		1.769	1.921	2.615	1.331
LC_SLC+10Cu		2.477	2.675	2.71	2.695
FR_FRABCH+20Cu		2.434	2.718	2.421	2.965
FR_FRCP1+20Cu		2.611	2.373	2.079	2.768
GH_FR1+20Cu		2.665	2.279	2.55	2.551
GH_ERC+10Cu		2.683	2.364	2.771	2.503
CM_MC2+20Cu		2.015	2.308	2.399	2.373
RG_MIDAG+15Cu		2.419	2.287	2.206	2.713
EV_MC2+20Cu		2.353	2.443	2.77	2.744
EV_HC1+20Cu		1.881	2.092	1.851	2.437
LC_DCDS+20Cu		2.143	2.339	2.808	2.537
LC_LC3+15Cu		2.591	2.8	2.412	2.847
LC_LC5+15Cu		2.689	2.215	2.561	2.687
LC_LCDSSLCC		2.542	1.896	2.023	2.67
FR_FR4+15Cu		2.257	2.295	1.901	2.971
FR_FRRD+15Cu		2.555	2.843	2.735	2.806
FR_FR2+20Cu		2.745	2.794	2.465	2.988
FR_MULTIPLATE		2.294	2.041	2.116	2.482

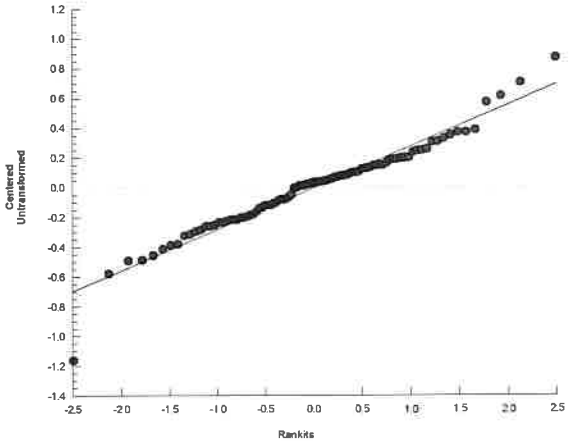
MG

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID:	18-4480-4381	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.9.4
Analyzed:	02 Nov-21 14:22	**Analysis:**	Nonparametric-Control vs Treatments	**Status Level:**	1

Graphics





Analyst: KK QA: NOV 05 2021

CETIS Analytical Report

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID:	15-7079-0635	**Endpoint:**	Hatch Rate	**CETIS Version:**	CETISv1.9.4
Analyzed:	02 Nov-21 14:20	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1
Batch ID:	19-0275-1751	**Test Type:**	32 Day Fathead Minnow Test	**Analyst:**	Kayla Knol
Start Date:	13 Aug-21	**Protocol:**	ASTM E1241-05 (2013)	**Diluent:**	Dechlorinated Tap Water
Ending Date:	13 Sep-21	**Species:**	Pimephales promelas	**Brine:**	
Test Length:	31d 0h	**Taxon:**	Actinopterygii	**Source:**	Aquatox, AR **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
Lab Control FM	11-5032-4817	10 Aug-21	11 Aug-21	72h	Teck Coal Ltd	
10Cu Control	04-3348-8996	10 Aug-21	11 Aug-21	72h		
15 Cu Control	05-5139-9319	10 Aug-21	11 Aug-21	72h		
20 Cu Control	18-8853-3252	10 Aug-21	11 Aug-21	72h		
FR_UFR1+15Cu	13-9616-5903	10 Aug-21	11 Aug-21	72h (14.7 °C)		
GH_ER2+15Cu	19-5052-7846	10 Aug-21	11 Aug-21	72h (12.1 °C)		
CM_MC1+15Cu	15-1448-1664	10 Aug-21	11 Aug-21	72h (12.3 °C)		
LC_SLC+10Cu	10-0118-5065	10 Aug-21	11 Aug-21	72h (11.8 °C)		
FR_FRABCH+20Cu	12-2763-5905	10 Aug-21	11 Aug-21	72h (14.6 °C)		
FR_FRCP1+20Cu	05-5162-7629	10 Aug-21	11 Aug-21	72h (13.8 °C)		
GH_FR1+20Cu	18-3989-2491	10 Aug-21	11 Aug-21	72h (12 °C)		
GH_ERC+10Cu	14-6940-9296	10 Aug-21	11 Aug-21	72h (15.4 °C)		
CM_MC2+20Cu	17-0166-2336	10 Aug-21	11 Aug-21	72h (13.1 °C)		
RG_MIDAG+15Cu	18-0148-8949	10 Aug-21	11 Aug-21	72h (12.4 °C)		
EV_MC2+20Cu	08-5423-9441	10 Aug-21	11 Aug-21	72h (13.1 °C)		
EV_HC1+20Cu	19-8320-0922	10 Aug-21	11 Aug-21	72h (12.1 °C)		
LC_DCDS+20Cu	12-7443-1043	10 Aug-21	11 Aug-21	72h (12.3 °C)		
LC_LC3+15Cu	06-5017-0795	10 Aug-21	11 Aug-21	72h (12.4 °C)		
LC_LC5+15Cu	10-4683-7945	10 Aug-21	11 Aug-21	72h (15.1 °C)		
LC_LCDSSLCC	11-9856-2953	10 Aug-21	11 Aug-21	72h (10.8 °C)		
FR_FR4+15Cu	16-1388-5677	10 Aug-21	11 Aug-21	72h (14.1 °C)		
FR_FRRD+15Cu	18-8883-2370	10 Aug-21	11 Aug-21	72h (14.7 °C)		
FR_FR2+20Cu	20-1752-8591	10 Aug-21	11 Aug-21	72h (15.3 °C)		
FR_MULTIPLATE	15-0654-9876	10 Aug-21	11 Aug-21	72h (13.6 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
Lab Control FM	Ambient Sample	Teck Coal Ltd	Lab Control FM	
10Cu Control	Ambient Sample	Teck Coal Ltd	10 Cu Control	
15 Cu Control	Ambient Sample	Teck Coal Ltd	15 Cu Control	
20 Cu Control	Ambient Sample	Teck Coal Ltd	20 Cu Control	
FR_UFR1+15Cu	Ambient Sample	Teck Coal Ltd	FR_UFR1_MON_2021-08-0	
GH_ER2+15Cu	Ambient Sample	Teck Coal Ltd	GH_ER2_WS_2021-08-10_	
CM_MC1+15Cu	Ambient Sample	Teck Coal Ltd	CM_MC1_WS_2021-08-10	
LC_SLC+10Cu	Ambient Sample	Teck Coal Ltd	LC_SLC_WS_2021-08-10_	
FR_FRABCH+20Cu	Ambient Sample	Teck Coal Ltd	FR_FRABCH_MON_2021-	
FR_FRCP1+20Cu	Ambient Sample	Teck Coal Ltd	FR_FRCP1_MON_2021-08	
GH_FR1+20Cu	Ambient Sample	Teck Coal Ltd	GH_FR1_WS_2021-08-10_	
GH_ERC+10Cu	Ambient Sample	Teck Coal Ltd	GH_ERC_WS_2021-08-10	
CM_MC2+20Cu	Ambient Sample	Teck Coal Ltd	CM_MC2_WS_2021-08-10	
RG_MIDAG+15Cu	Ambient Sample	Teck Coal Ltd	RG_MIDAG_WS_2021-08-	
EV_MC2+20Cu	Ambient Sample	Teck Coal Ltd	EV_MC2_WS_2021_Q3_W	
EV_HC1+20Cu	Ambient Sample	Teck Coal Ltd	EV_HC1_WS_2021_Q3_W	
LC_DCDS+20Cu	Ambient Sample	Teck Coal Ltd	LC_DCDS_WS_2021-08-1	
LC_LC3+15Cu	Ambient Sample	Teck Coal Ltd	LC_LC3_WS_2021-08-10_	
LC_LC5+15Cu	Ambient Sample	Teck Coal Ltd	LC_LC5_WS_2021-08-10_	
LC_LCDSSLCC	Ambient Sample	Teck Coal Ltd	LC_LCDSSLCC_WS_2021-	
FR_FR4+15Cu	Ambient Sample	Teck Coal Ltd	FR_FR4_WS_2021-08-10_	
FR_FRRD+15Cu	Ambient Sample	Teck Coal Ltd	FR_FRRD_WS_2021-08-1	

MG

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID:	15-7079-0635	**Endpoint:**	Hatch Rate	**CETIS Version:**	CETISv1.9.4
Analyzed:	02 Nov-21 14:20	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_FR2+20Cu	Ambient Sample	Teck Coal Ltd	FR_FR2_WS_2021-08-10_	
FR_MULTIPLATE	Ambient Sample	Teck Coal Ltd	FR_MULTIPLATE_WS_20	

Fisher Exact/Bonferroni Adj Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
Site Control		Lab Control FM	0.9713	Exact	1.0000	Non-Significant Effect
FR-UFRC1		10Cu Control	0.9713	Exact	1.0000	Non-Significant Effect
		15 Cu Control	0.8966	Exact	1.0000	Non-Significant Effect
		20 Cu Control	0.7805	Exact	1.0000	Non-Significant Effect
		GH_ER2+15Cu	0.7805	Exact	1.0000	Non-Significant Effect
		CM_MC1+15Cu	0.2644	Exact	1.0000	Non-Significant Effect
		LC_SLC+10Cu	0.6415	Exact	1.0000	Non-Significant Effect
		FR_FRABCH+20Cu	0.5000	Exact	1.0000	Non-Significant Effect
		FR_FRCP1+20Cu	0.8966	Exact	1.0000	Non-Significant Effect
		GH_FR1+20Cu	0.8966	Exact	1.0000	Non-Significant Effect
		GH_ERC+10Cu	0.7805	Exact	1.0000	Non-Significant Effect
		CM_MC2+20Cu	0.9713	Exact	1.0000	Non-Significant Effect
		RG_MIDAG+15Cu	0.8966	Exact	1.0000	Non-Significant Effect
		EV_MC2+20Cu	0.8966	Exact	1.0000	Non-Significant Effect
		EV_HC1+20Cu	0.2644	Exact	1.0000	Non-Significant Effect
		LC_DCDS+20Cu	1.0000	Exact	1.0000	Non-Significant Effect
		LC_LC3+15Cu	1.0000	Exact	1.0000	Non-Significant Effect
		LC_LC5+15Cu	0.9713	Exact	1.0000	Non-Significant Effect
		LC_LCDSSLCC	0.8966	Exact	1.0000	Non-Significant Effect
		FR_FR4+15Cu	0.7805	Exact	1.0000	Non-Significant Effect
		FR_FRRD+15Cu	0.9713	Exact	1.0000	Non-Significant Effect
		FR_FR2+20Cu	0.8966	Exact	1.0000	Non-Significant Effect
		FR_MULTIPLATE	0.2644	Exact	1.0000	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	3.044	3.37	0.1764	No Outliers Detected

MG
NOV 09 2021

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 15-7079-0635 **Endpoint:** Hatch Rate **CETIS Version:** CETISv1.9.4
Analyzed: 02 Nov-21 14:20 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Data Summary

Sample	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
Lab Control FM		59	1	60	0.9833	0.01667	-5.36%
10Cu Control		59	1	60	0.9833	0.01667	-5.36%
15 Cu Control		58	2	60	0.9667	0.03333	-3.57%
20 Cu Control		57	3	60	0.95	0.05	-1.79%
FR_UFR1+15Cu	XC	56	4	60	0.9333	0.06667	0.0%
GH_ER2+15Cu		57	3	60	0.95	0.05	-1.79%
CM_MC1+15Cu		53	7	60	0.8833	0.1167	5.36%
LC_SLC+10Cu		56	4	60	0.9333	0.06667	0.0%
FR_FRABCH+20Cu		55	5	60	0.9167	0.08333	1.79%
FR_FRCP1+20Cu		58	2	60	0.9667	0.03333	-3.57%
GH_FR1+20Cu		58	2	60	0.9667	0.03333	-3.57%
GH_ERC+10Cu		57	3	60	0.95	0.05	-1.79%
CM_MC2+20Cu		59	1	60	0.9833	0.01667	-5.36%
RG_MIDAG+15Cu		58	2	60	0.9667	0.03333	-3.57%
EV_MC2+20Cu		58	2	60	0.9667	0.03333	-3.57%
EV_HC1+20Cu		53	7	60	0.8833	0.1167	5.36%
LC_DCDS+20Cu		60	0	60	1	0	-7.14%
LC_LC3+15Cu		60	0	60	1	0	-7.14%
LC_LC5+15Cu		59	1	60	0.9833	0.01667	-5.36%
LC_LCDSSLCC		58	2	60	0.9667	0.03333	-3.57%
FR_FR4+15Cu		57	3	60	0.95	0.05	-1.79%
FR_FRRD+15Cu		59	1	60	0.9833	0.01667	-5.36%
FR_FR2+20Cu		58	2	60	0.9667	0.03333	-3.57%
FR_MULTIPLATE		53	7	60	0.8833	0.1167	5.36%

Hatch Rate Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Lab Control FM		0.9333	1.0000	1.0000	1.0000
10Cu Control		1.0000	1.0000	0.9333	1.0000
15 Cu Control		1.0000	0.9333	1.0000	0.9333
20 Cu Control		0.9333	0.9333	1.0000	0.9333
FR_UFR1+15Cu	XC	0.9333	1.0000	0.9333	0.8667
GH_ER2+15Cu		1.0000	0.9333	0.8667	1.0000
CM_MC1+15Cu		0.8667	0.9333	0.8667	0.8667
LC_SLC+10Cu		0.9333	0.9333	0.9333	0.9333
FR_FRABCH+20Cu		0.8667	0.8667	1.0000	0.9333
FR_FRCP1+20Cu		1.0000	0.9333	0.9333	1.0000
GH_FR1+20Cu		1.0000	1.0000	1.0000	0.8667
GH_ERC+10Cu		0.9333	1.0000	0.8667	1.0000
CM_MC2+20Cu		0.9333	1.0000	1.0000	1.0000
RG_MIDAG+15Cu		1.0000	1.0000	1.0000	0.8667
EV_MC2+20Cu		1.0000	1.0000	0.9333	0.9333
EV_HC1+20Cu		0.8667	0.8000	0.8667	1.0000
LC_DCDS+20Cu		1.0000	1.0000	1.0000	1.0000
LC_LC3+15Cu		1.0000	1.0000	1.0000	1.0000
LC_LC5+15Cu		1.0000	1.0000	1.0000	0.9333
LC_LCDSSLCC		0.9333	1.0000	1.0000	0.9333
FR_FR4+15Cu		1.0000	1.0000	1.0000	0.8000
FR_FRRD+15Cu		1.0000	1.0000	1.0000	0.9333
FR_FR2+20Cu		0.9333	1.0000	1.0000	0.9333
FR_MULTIPLATE		0.8000	0.8000	1.0000	0.9333

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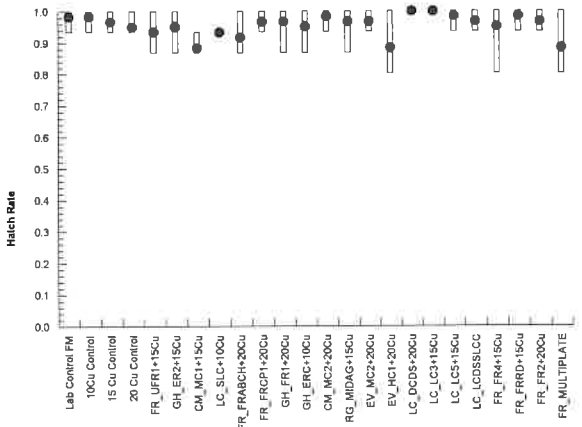
Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 15-7079-0635 **Endpoint:** Hatch Rate **CETIS Version:** CETISv1.9.4
Analyzed: 02 Nov-21 14:20 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Hatch Rate Binomials

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Lab Control FM		14/15	15/15	15/15	15/15
10Cu Control		15/15	15/15	14/15	15/15
15 Cu Control		15/15	14/15	15/15	14/15
20 Cu Control		14/15	14/15	15/15	14/15
FR_UFR1+15Cu	XC	14/15	15/15	14/15	13/15
GH_ER2+15Cu		15/15	14/15	13/15	15/15
CM_MC1+15Cu		13/15	14/15	13/15	13/15
LC_SLC+10Cu		14/15	14/15	14/15	14/15
FR_FRABCH+20Cu		13/15	13/15	15/15	14/15
FR_FRCP1+20Cu		15/15	14/15	14/15	15/15
GH_FR1+20Cu		15/15	15/15	15/15	13/15
GH_ERC+10Cu		14/15	15/15	13/15	15/15
CM_MC2+20Cu		14/15	15/15	15/15	15/15
RG_MIDAG+15Cu		15/15	15/15	15/15	13/15
EV_MC2+20Cu		15/15	15/15	14/15	14/15
EV_HC1+20Cu		13/15	12/15	13/15	15/15
LC_DCDS+20Cu		15/15	15/15	15/15	15/15
LC_LC3+15Cu		15/15	15/15	15/15	15/15
LC_LC5+15Cu		15/15	15/15	15/15	14/15
LC_LCDSSLCC		14/15	15/15	15/15	14/15
FR_FR4+15Cu		15/15	15/15	15/15	12/15
FR_FRRD+15Cu		15/15	15/15	15/15	14/15
FR_FR2+20Cu		14/15	15/15	15/15	14/15
FR_MULTIPLATE		12/15	12/15	15/15	14/15

Graphics



Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID:	12-9234-6847	**Endpoint:**	Length	**CETIS Version:**	CETISv1.9.4
Analyzed:	02 Nov-21 14:21	**Analysis:**	Parametric-Control vs Treatments	**Status Level:**	1
Batch ID:	19-0275-1751	**Test Type:**	32 Day Fathead Minnow Test	**Analyst:**	Kayla Knol
Start Date:	13 Aug-21	**Protocol:**	ASTM E1241-05 (2013)	**Diluent:**	Dechlorinated Tap Water
Ending Date:	13 Sep-21	**Species:**	Pimephales promelas	**Brine:**	
Test Length:	31d 0h	**Taxon:**	Actinopterygii	**Source:**	Aquatox, AR **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
Lab Control FM	11-5032-4817	10 Aug-21	11 Aug-21	72h	Teck Coal Ltd	
10Cu Control	04-3348-8996	10 Aug-21	11 Aug-21	72h		
15 Cu Control	05-5139-9319	10 Aug-21	11 Aug-21	72h		
20 Cu Control	18-8853-3252	10 Aug-21	11 Aug-21	72h		
FR_UFR1+15Cu	13-9616-5903	10 Aug-21	11 Aug-21	72h (14.7 °C)		
GH_ER2+15Cu	19-5052-7846	10 Aug-21	11 Aug-21	72h (12.1 °C)		
CM_MC1+15Cu	15-1448-1664	10 Aug-21	11 Aug-21	72h (12.3 °C)		
LC_SLC+10Cu	10-0118-5065	10 Aug-21	11 Aug-21	72h (11.8 °C)		
FR_FRABCH+20Cu	12-2763-5905	10 Aug-21	11 Aug-21	72h (14.6 °C)		
FR_FRCP1+20Cu	05-5162-7629	10 Aug-21	11 Aug-21	72h (13.8 °C)		
GH_FR1+20Cu	18-3989-2491	10 Aug-21	11 Aug-21	72h (12 °C)		
GH_ERC+10Cu	14-6940-9296	10 Aug-21	11 Aug-21	72h (15.4 °C)		
CM_MC2+20Cu	17-0166-2336	10 Aug-21	11 Aug-21	72h (13.1 °C)		
RG_MIDAG+15Cu	18-0148-8949	10 Aug-21	11 Aug-21	72h (12.4 °C)		
EV_MC2+20Cu	08-5423-9441	10 Aug-21	11 Aug-21	72h (13.1 °C)		
EV_HC1+20Cu	19-8320-0922	10 Aug-21	11 Aug-21	72h (12.1 °C)		
LC_DCDS+20Cu	12-7443-1043	10 Aug-21	11 Aug-21	72h (12.3 °C)		
LC_LC3+15Cu	06-5017-0795	10 Aug-21	11 Aug-21	72h (12.4 °C)		
LC_LC5+15Cu	10-4683-7945	10 Aug-21	11 Aug-21	72h (15.1 °C)		
LC_LCDSSLCC	11-9856-2953	10 Aug-21	11 Aug-21	72h (10.8 °C)		
FR_FR4+15Cu	16-1388-5677	10 Aug-21	11 Aug-21	72h (14.1 °C)		
FR_FRRD+15Cu	18-8883-2370	10 Aug-21	11 Aug-21	72h (14.7 °C)		
FR_FR2+20Cu	20-1752-8591	10 Aug-21	11 Aug-21	72h (15.3 °C)		
FR_MULTIPLATE	15-0654-9876	10 Aug-21	11 Aug-21	72h (13.6 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
Lab Control FM	Ambient Sample	Teck Coal Ltd	Lab Control FM	
10Cu Control	Ambient Sample	Teck Coal Ltd	10 Cu Control	
15 Cu Control	Ambient Sample	Teck Coal Ltd	15 Cu Control	
20 Cu Control	Ambient Sample	Teck Coal Ltd	20 Cu Control	
FR_UFR1+15Cu	Ambient Sample	Teck Coal Ltd	FR_UFR1_MON_2021-08-0	
GH_ER2+15Cu	Ambient Sample	Teck Coal Ltd	GH_ER2_WS_2021-08-10_	
CM_MC1+15Cu	Ambient Sample	Teck Coal Ltd	CM_MC1_WS_2021-08-10	
LC_SLC+10Cu	Ambient Sample	Teck Coal Ltd	LC_SLC_WS_2021-08-10_	
FR_FRABCH+20Cu	Ambient Sample	Teck Coal Ltd	FR_FRABCH_MON_2021-	
FR_FRCP1+20Cu	Ambient Sample	Teck Coal Ltd	FR_FRCP1_MON_2021-08	
GH_FR1+20Cu	Ambient Sample	Teck Coal Ltd	GH_FR1_WS_2021-08-10_	
GH_ERC+10Cu	Ambient Sample	Teck Coal Ltd	GH_ERC_WS_2021-08-10	
CM_MC2+20Cu	Ambient Sample	Teck Coal Ltd	CM_MC2_WS_2021-08-10	
RG_MIDAG+15Cu	Ambient Sample	Teck Coal Ltd	RG_MIDAG_WS_2021-08-	
EV_MC2+20Cu	Ambient Sample	Teck Coal Ltd	EV_MC2_WS_2021_Q3_W	
EV_HC1+20Cu	Ambient Sample	Teck Coal Ltd	EV_HC1_WS_2021_Q3_W	
LC_DCDS+20Cu	Ambient Sample	Teck Coal Ltd	LC_DCDS_WS_2021-08-1	
LC_LC3+15Cu	Ambient Sample	Teck Coal Ltd	LC_LC3_WS_2021-08-10_	
LC_LC5+15Cu	Ambient Sample	Teck Coal Ltd	LC_LC5_WS_2021-08-10_	
LC_LCDSSLCC	Ambient Sample	Teck Coal Ltd	LC_LCDSSLCC_WS_2021-	
FR_FR4+15Cu	Ambient Sample	Teck Coal Ltd	FR_FR4_WS_2021-08-10_	
FR_FRRD+15Cu	Ambient Sample	Teck Coal Ltd	FR_FRRD_WS_2021-08-1	

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Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 12-9234-6847 **Endpoint:** Length **CETIS Version:** CETISv1.9.4
Analyzed: 02 Nov-21 14:21 **Analysis:** Parametric-Control vs Treatments **Status Level:** 1

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_FR2+20Cu	Ambient Sample	Teck Coal Ltd	FR_FR2_WS_2021-08-10_	
FR_MULTIPLATE	Ambient Sample	Teck Coal Ltd	FR_MULTIPLATE_WS_20	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	Lab Control FM passed length	12.03%
		10Cu Control passed length	12.03%
		15 Cu Control passed length	12.03%
		20 Cu Control passed length	12.03%
		GH_ER2+15Cu passed length	12.03%
		CM_MC1+15Cu passed length	12.03%
		LC_SLC+10Cu passed length	12.03%
		FR_FRABCH+20Cu passed length	12.03%
		FR_FRCP1+20Cu passed length	12.03%
		GH_FR1+20Cu passed length	12.03%
		GH_ERC+10Cu passed length	12.03%
		CM_MC2+20Cu passed length	12.03%
		RG_MIDAG+15Cu passed length	12.03%
		EV_MC2+20Cu passed length	12.03%
		EV_HC1+20Cu passed length	12.03%
		LC_DCDS+20Cu passed length	12.03%
		LC_LC3+15Cu passed length	12.03%
		LC_LC5+15Cu passed length	12.03%
		LC_LCDSSLCC passed length	12.03%
		FR_FR4+15Cu passed length	12.03%
		FR_FRRD+15Cu passed length	12.03%
		FR_FR2+20Cu passed length	12.03%
		FR_MULTIPLATE passed length	12.03%

Dunnett Multiple Comparison Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Site Control		Lab Control FM	-0.3898	2.744	1.408	6	CDF	0.9872	Non-Significant Effect
FR_UFR1		10Cu Control	-1.413	2.744	1.408	6	CDF	0.9998	Non-Significant Effect
		15 Cu Control	-1.316	2.744	1.408	6	CDF	0.9997	Non-Significant Effect
		20 Cu Control	-2.582	2.744	1.408	6	CDF	1.0000	Non-Significant Effect
		GH_ER2+15Cu	1.072	2.744	1.408	6	CDF	0.6420	Non-Significant Effect
		CM_MC1+15Cu	1.462	2.744	1.408	6	CDF	0.4511	Non-Significant Effect
		LC_SLC+10Cu	-0.3898	2.744	1.408	6	CDF	0.9872	Non-Significant Effect
		FR_FRABCH+20Cu	-4.6E-07	2.744	1.408	6	CDF	0.9583	Non-Significant Effect
		FR_FRCP1+20Cu	1.851	2.744	1.408	6	CDF	0.2743	Non-Significant Effect
		GH_FR1+20Cu	1.462	2.744	1.408	6	CDF	0.4511	Non-Significant Effect
		GH_ERC+10Cu	-1.949	2.744	1.408	6	CDF	1.0000	Non-Significant Effect
		CM_MC2+20Cu	-1.462	2.744	1.408	6	CDF	0.9998	Non-Significant Effect
		RG_MIDAG+15Cu	1.218	2.744	1.408	6	CDF	0.5715	Non-Significant Effect
		EV_MC2+20Cu	1.754	2.744	1.408	6	CDF	0.3151	Non-Significant Effect
		EV_HC1+20Cu	-0.9257	2.744	1.408	6	CDF	0.9982	Non-Significant Effect
		LC_DCDS+20Cu	-1.218	2.744	1.408	6	CDF	0.9995	Non-Significant Effect
		LC_LC3+15Cu	-0.9257	2.744	1.408	6	CDF	0.9982	Non-Significant Effect
		LC_LC5+15Cu	-1.803	2.744	1.408	6	CDF	1.0000	Non-Significant Effect
		LC_LCDSSLCC	-0.7308	2.744	1.408	6	CDF	0.9962	Non-Significant Effect
		FR_FR4+15Cu	0.9257	2.744	1.408	6	CDF	0.7083	Non-Significant Effect
		FR_FRRD+15Cu	1.559	2.744	1.408	6	CDF	0.4040	Non-Significant Effect
		FR_FR2+20Cu	0.7796	2.744	1.408	6	CDF	0.7684	Non-Significant Effect
		FR_MULTIPLATE	1.121	2.744	1.408	6	CDF	0.6189	Non-Significant Effect

Auxiliary Tests

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 12-9234-6847 **Endpoint:** Length **CETIS Version:** CETISv1.9.4
Analyzed: 02 Nov-21 14:21 **Analysis:** Parametric-Control vs Treatments **Status Level:** 1

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	3.285	3.37	0.0706	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	44.2591	1.92431	23	3.654	1.3E-05	Significant Effect
Error	37.9125	0.526563	72			
Total	82.1716		95			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Variances	Bartlett Equality of Variance Test	33.4	35.17	0.0744	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9854	0.9737	0.3692	Normal Distribution

Length Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
Lab Control FM		4	11.9	11.15	12.65	11.95	11.3	12.4	0.2345	3.94%	0.00%
10Cu Control		4	12.43	11.66	13.19	12.55	11.8	12.8	0.2394	3.85%	-4.41%
15 Cu Control		4	12.37	10.89	13.86	12.35	11.4	13.4	0.4661	7.53%	-3.99%
20 Cu Control		4	13.03	12.67	13.38	13	12.8	13.3	0.1109	1.70%	-9.45%
FR_UFR1+15Cu	XC	4	11.7	10.85	12.55	11.95	10.9	12	0.2677	4.58%	1.68%
GH_ER2+15Cu		4	11.15	10.87	11.43	11.15	11	11.3	0.0866	1.55%	6.30%
CM_MC1+15Cu		4	10.95	10.06	11.84	11.05	10.2	11.5	0.2784	5.08%	7.98%
LC_SLC+10Cu		4	11.9	11.12	12.68	11.8	11.5	12.5	0.2449	4.12%	0.00%
FR_FRABCH+20Cu		4	11.7	10.38	13.02	11.65	10.8	12.7	0.4143	7.08%	1.68%
FR_FRCP1+20Cu		4	10.75	9.243	12.26	11	9.4	11.6	0.4735	8.81%	9.66%
GH_FR1+20Cu		4	10.95	10.33	11.57	10.95	10.5	11.4	0.1936	3.54%	7.98%
GH_ERC+10Cu		4	12.7	12.15	13.25	12.7	12.4	13	0.1732	2.73%	-6.72%
CM_MC2+20Cu		4	12.45	11.06	13.84	12.55	11.3	13.4	0.4368	7.02%	-4.62%
RG_MIDAG+15Cu		4	11.08	10.09	12.06	10.9	10.6	11.9	0.3092	5.58%	6.93%
EV_MC2+20Cu		4	10.8	9.236	12.36	10.6	9.9	12.1	0.4916	9.10%	9.24%
EV_HC1+20Cu		4	12.18	9.553	14.8	12.55	10.1	13.5	0.824	13.54%	-2.31%
LC_DCDS+20Cu		4	12.33	11.45	13.2	12.45	11.6	12.8	0.275	4.46%	-3.57%
LC_LC3+15Cu		4	12.18	10.8	13.55	12.15	11.3	13.1	0.4308	7.08%	-2.31%
LC_LC5+15Cu		4	12.62	10.78	14.47	12.75	11.2	13.8	0.5808	9.20%	-6.09%
LC_LCDSSLCC		4	12.08	11.47	12.68	12.1	11.6	12.5	0.1887	3.13%	-1.47%
FR_FR4+15Cu		4	11.23	10.62	11.83	11.2	10.8	11.7	0.1887	3.36%	5.67%
FR_FRRD+15Cu		4	10.9	10.47	11.33	11	10.5	11.1	0.1354	2.48%	8.40%
FR_FR2+20Cu		4	11.3	10.58	12.02	11.2	10.9	11.9	0.2273	4.02%	5.04%
FR_MULTIPLATE		4	11.12	9.736	12.51	11	10.2	12.3	0.4366	7.85%	6.51%

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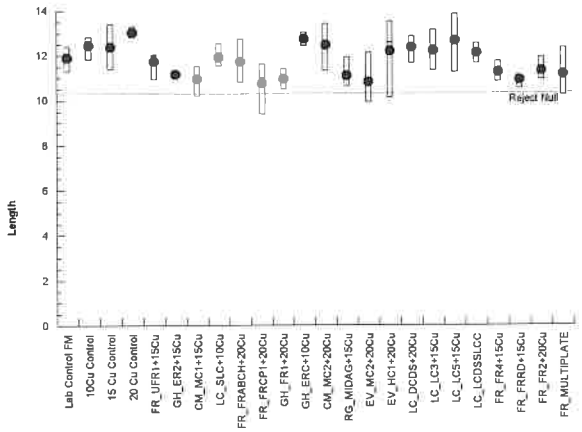
Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

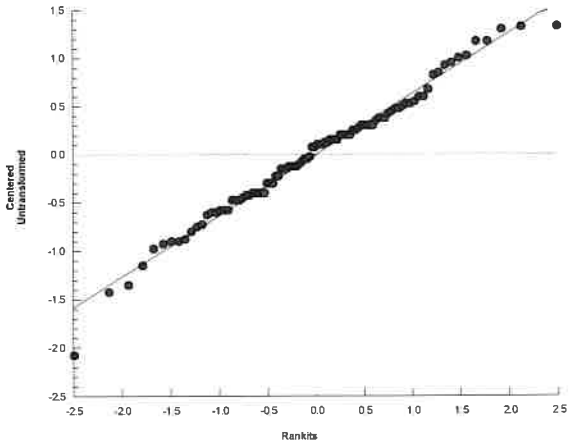
Analysis ID: 12-9234-6847 **Endpoint:** Length **CETIS Version:** CETISv1.9.4
Analyzed: 02 Nov-21 14:21 **Analysis:** Parametric-Control vs Treatments **Status Level:** 1

Length Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Lab Control FM		12.4	11.3	12.1	11.8
10Cu Control		11.8	12.3	12.8	12.8
15 Cu Control		12.9	11.8	13.4	11.4
20 Cu Control		13.3	12.9	12.8	13.1
FR_UFR1+15Cu	XC	11.9	10.9	12	12
GH_ER2+15Cu		11.3	11.3	11	11
CM_MC1+15Cu		11.5	10.9	11.2	10.2
LC_SLC+10Cu		11.5	12.5	12.1	11.5
FR_FRABCH+20Cu		12.7	12	10.8	11.3
FR_FRCP1+20Cu		11.1	10.9	9.4	11.6
GH_FR1+20Cu		11.1	10.5	10.8	11.4
GH_ERC+10Cu		13	12.4	12.4	13
CM_MC2+20Cu		12.7	11.3	12.4	13.4
RG_MIDAG+15Cu		10.6	10.6	11.2	11.9
EV_MC2+20Cu		9.9	10.2	11	12.1
EV_HC1+20Cu		13.5	11.6	13.5	10.1
LC_DCDS+20Cu		12.7	12.8	12.2	11.6
LC_LC3+15Cu		12.7	13.1	11.3	11.6
LC_LC5+15Cu		11.2	13.3	12.2	13.8
LC_LCDSSLCC		12.2	12	11.6	12.5
FR_FR4+15Cu		11.3	10.8	11.1	11.7
FR_FRRD+15Cu		10.5	11	11	11.1
FR_FR2+20Cu		11	11.9	11.4	10.9
FR_MULTIPLATE		11.1	12.3	10.2	10.9

Graphics





Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID:	06-3586-0790	**Endpoint:**	Proportion Normal	**CETIS Version:**	CETISv1.9.4
Analyzed:	02 Nov-21 14:24	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1
Batch ID:	19-0275-1751	**Test Type:**	32 Day Fathead Minnow Test	**Analyst:**	Kayla Knol
Start Date:	13 Aug-21	**Protocol:**	ASTM E1241-05 (2013)	**Diluent:**	Dechlorinated Tap Water
Ending Date:	13 Sep-21	**Species:**	Pimephales promelas	**Brine:**	
Test Length:	31d 0h	**Taxon:**	Actinopterygii	**Source:**	Aquatox, AR **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
Lab Control FM	11-5032-4817	10 Aug-21	11 Aug-21	72h	Teck Coal Ltd	
10Cu Control	04-3348-8996	10 Aug-21	11 Aug-21	72h		
15 Cu Control	05-5139-9319	10 Aug-21	11 Aug-21	72h		
20 Cu Control	18-8853-3252	10 Aug-21	11 Aug-21	72h		
FR_UFR1+15Cu	13-9616-5903	10 Aug-21	11 Aug-21	72h (14.7 °C)		
GH_ER2+15Cu	19-5052-7846	10 Aug-21	11 Aug-21	72h (12.1 °C)		
CM_MC1+15Cu	15-1448-1664	10 Aug-21	11 Aug-21	72h (12.3 °C)		
LC_SLC+10Cu	10-0118-5065	10 Aug-21	11 Aug-21	72h (11.8 °C)		
FR_FRABCH+20Cu	12-2763-5905	10 Aug-21	11 Aug-21	72h (14.6 °C)		
FR_FRCP1+20Cu	05-5162-7629	10 Aug-21	11 Aug-21	72h (13.8 °C)		
GH_FR1+20Cu	18-3989-2491	10 Aug-21	11 Aug-21	72h (12 °C)		
GH_ERC+10Cu	14-6940-9296	10 Aug-21	11 Aug-21	72h (15.4 °C)		
CM_MC2+20Cu	17-0166-2336	10 Aug-21	11 Aug-21	72h (13.1 °C)		
RG_MIDAG+15Cu	18-0148-8949	10 Aug-21	11 Aug-21	72h (12.4 °C)		
EV_MC2+20Cu	08-5423-9441	10 Aug-21	11 Aug-21	72h (13.1 °C)		
EV_HC1+20Cu	19-8320-0922	10 Aug-21	11 Aug-21	72h (12.1 °C)		
LC_DCDS+20Cu	12-7443-1043	10 Aug-21	11 Aug-21	72h (12.3 °C)		
LC_LC3+15Cu	06-5017-0795	10 Aug-21	11 Aug-21	72h (12.4 °C)		
LC_LC5+15Cu	10-4683-7945	10 Aug-21	11 Aug-21	72h (15.1 °C)		
LC_LCDSSLCC	11-9856-2953	10 Aug-21	11 Aug-21	72h (10.8 °C)		
FR_FR4+15Cu	16-1388-5677	10 Aug-21	11 Aug-21	72h (14.1 °C)		
FR_FRRD+15Cu	18-8883-2370	10 Aug-21	11 Aug-21	72h (14.7 °C)		
FR_FR2+20Cu	20-1752-8591	10 Aug-21	11 Aug-21	72h (15.3 °C)		
FR_MULTIPLATE	15-0654-9876	10 Aug-21	11 Aug-21	72h (13.6 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
Lab Control FM	Ambient Sample	Teck Coal Ltd	Lab Control FM	
10Cu Control	Ambient Sample	Teck Coal Ltd	10 Cu Control	
15 Cu Control	Ambient Sample	Teck Coal Ltd	15 Cu Control	
20 Cu Control	Ambient Sample	Teck Coal Ltd	20 Cu Control	
FR_UFR1+15Cu	Ambient Sample	Teck Coal Ltd	FR_UFR1_MON_2021-08-0	
GH_ER2+15Cu	Ambient Sample	Teck Coal Ltd	GH_ER2_WS_2021-08-10_	
CM_MC1+15Cu	Ambient Sample	Teck Coal Ltd	CM_MC1_WS_2021-08-10	
LC_SLC+10Cu	Ambient Sample	Teck Coal Ltd	LC_SLC_WS_2021-08-10_	
FR_FRABCH+20Cu	Ambient Sample	Teck Coal Ltd	FR_FRABCH_MON_2021-	
FR_FRCP1+20Cu	Ambient Sample	Teck Coal Ltd	FR_FRCP1_MON_2021-08	
GH_FR1+20Cu	Ambient Sample	Teck Coal Ltd	GH_FR1_WS_2021-08-10_	
GH_ERC+10Cu	Ambient Sample	Teck Coal Ltd	GH_ERC_WS_2021-08-10	
CM_MC2+20Cu	Ambient Sample	Teck Coal Ltd	CM_MC2_WS_2021-08-10	
RG_MIDAG+15Cu	Ambient Sample	Teck Coal Ltd	RG_MIDAG_WS_2021-08-	
EV_MC2+20Cu	Ambient Sample	Teck Coal Ltd	EV_MC2_WS_2021_Q3_W	
EV_HC1+20Cu	Ambient Sample	Teck Coal Ltd	EV_HC1_WS_2021_Q3_W	
LC_DCDS+20Cu	Ambient Sample	Teck Coal Ltd	LC_DCDS_WS_2021-08-1	
LC_LC3+15Cu	Ambient Sample	Teck Coal Ltd	LC_LC3_WS_2021-08-10_	
LC_LC5+15Cu	Ambient Sample	Teck Coal Ltd	LC_LC5_WS_2021-08-10_	
LC_LCDSSLCC	Ambient Sample	Teck Coal Ltd	LC_LCDSSLCC_WS_2021-	
FR_FR4+15Cu	Ambient Sample	Teck Coal Ltd	FR_FR4_WS_2021-08-10_	
FR_FRRD+15Cu	Ambient Sample	Teck Coal Ltd	FR_FRRD_WS_2021-08-1	

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 06-3586-0790 **Endpoint:** Proportion Normal **CETIS Version:** CETISv1.9.4
Analyzed: 02 Nov-21 14:24 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_FR2+20Cu	Ambient Sample	Teck Coal Ltd	FR_FR2_WS_2021-08-10_	
FR_MULTIPLATE	Ambient Sample	Teck Coal Ltd	FR_MULTIPLATE_WS_20	

Fisher Exact/Bonferroni Adj Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
Site Control		Lab Control FM	1.0000	Exact	1.0000	Non-Significant Effect
FR_UFRC		10Cu Control	0.6125	Exact	1.0000	Non-Significant Effect
		15 Cu Control	0.5694	Exact	1.0000	Non-Significant Effect
		20 Cu Control	0.3343	Exact	1.0000	Non-Significant Effect
		GH_ER2+15Cu	0.5921	Exact	1.0000	Non-Significant Effect
		CM_MC1+15Cu	0.5156	Exact	1.0000	Non-Significant Effect
		LC_SLC+10Cu	0.6076	Exact	1.0000	Non-Significant Effect
		FR_FRABCH+20Cu	1.0000	Exact	1.0000	Non-Significant Effect
		FR_FRCP1+20Cu	0.3537	Exact	1.0000	Non-Significant Effect
		GH_FR1+20Cu	0.2131	Exact	1.0000	Non-Significant Effect
		GH_ERC+10Cu	0.5441	Exact	1.0000	Non-Significant Effect
		CM_MC2+20Cu	1.0000	Exact	1.0000	Non-Significant Effect
		RG_MIDAG+15Cu	0.1206	Exact	1.0000	Non-Significant Effect
		EV_MC2+20Cu	0.1340	Exact	1.0000	Non-Significant Effect
		EV_HC1+20Cu	0.5000	Exact	1.0000	Non-Significant Effect
		LC_DCDS+20Cu	0.3139	Exact	1.0000	Non-Significant Effect
		LC_LC3+15Cu	0.3208	Exact	1.0000	Non-Significant Effect
		LC_LC5+15Cu	0.5634	Exact	1.0000	Non-Significant Effect
		LC_LCDSSLCC	0.5156	Exact	1.0000	Non-Significant Effect
		FR_FR4+15Cu	0.0941	Exact	1.0000	Non-Significant Effect
		FR_FRRD+15Cu	0.6220	Exact	1.0000	Non-Significant Effect
		FR_FR2+20Cu	0.6125	Exact	1.0000	Non-Significant Effect
		FR_MULTIPLATE	0.5753	Exact	1.0000	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	2.949	3.37	0.2489	No Outliers Detected

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 06-3586-0790 **Endpoint:** Proportion Normal **CETIS Version:** CETISv1.9.4
Analyzed: 02 Nov-21 14:24 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Data Summary

Sample	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
Lab Control FM		50	0	50	1	0	0.0%
10Cu Control		48	1	49	0.9796	0.02041	2.04%
15 Cu Control		40	1	41	0.9756	0.02439	2.44%
20 Cu Control		41	2	43	0.9535	0.04651	4.65%
FR_UFR1+15Cu	XC	31	0	31	1	0	0.0%
GH_ER2+15Cu		44	1	45	0.9778	0.02222	2.22%
CM_MC1+15Cu		32	1	33	0.9697	0.0303	3.03%
LC_SLC+10Cu		47	1	48	0.9792	0.02083	2.08%
FR_FRABCH+20Cu		41	0	41	1	0	0.0%
FR_FRCP1+20Cu		44	2	46	0.9565	0.04348	4.35%
GH_FR1+20Cu		44	3	47	0.9362	0.06383	6.38%
GH_ERC+10Cu		36	1	37	0.973	0.02703	2.7%
CM_MC2+20Cu		40	0	40	1	0	0.0%
RG_MIDAG+15Cu		42	4	46	0.913	0.08696	8.7%
EV_MC2+20Cu		45	4	49	0.9184	0.08163	8.16%
EV_HC1+20Cu		30	1	31	0.9677	0.03226	3.23%
LC_DCDS+20Cu		38	2	40	0.95	0.05	5.0%
LC_LC3+15Cu		39	2	41	0.9512	0.04878	4.88%
LC_LC5+15Cu		39	1	40	0.975	0.025	2.5%
LC_LCDSSLCC		32	1	33	0.9697	0.0303	3.03%
FR_FR4+15Cu		36	4	40	0.9	0.1	10.0%
FR_FRRD+15Cu		50	1	51	0.9804	0.01961	1.96%
FR_FR2+20Cu		48	1	49	0.9796	0.02041	2.04%
FR_MULTIPLATE		41	1	42	0.9762	0.02381	2.38%

Proportion Normal Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Lab Control FM		1.0000	1.0000	1.0000	1.0000
10Cu Control		1.0000	1.0000	1.0000	0.9231
15 Cu Control		1.0000	1.0000	1.0000	0.9286
20 Cu Control		1.0000	0.8750	1.0000	0.8889
FR_UFR1+15Cu	XC	1.0000	1.0000	1.0000	1.0000
GH_ER2+15Cu		0.9167	1.0000	1.0000	1.0000
CM_MC1+15Cu		1.0000	1.0000	1.0000	0.8000
LC_SLC+10Cu		0.9167	1.0000	1.0000	1.0000
FR_FRABCH+20Cu		1.0000	1.0000	1.0000	1.0000
FR_FRCP1+20Cu		0.9167	1.0000	0.8889	1.0000
GH_FR1+20Cu		1.0000	0.9167	0.8333	1.0000
GH_ERC+10Cu		1.0000	0.8889	1.0000	1.0000
CM_MC2+20Cu		1.0000	1.0000	1.0000	1.0000
RG_MIDAG+15Cu		0.8462	0.9000	1.0000	0.9000
EV_MC2+20Cu		0.8462	0.9231	0.9231	1.0000
EV_HC1+20Cu		1.0000	1.0000	1.0000	0.9333
LC_DCDS+20Cu		0.8571	1.0000	0.9091	1.0000
LC_LC3+15Cu		1.0000	1.0000	0.9167	0.9091
LC_LC5+15Cu		0.9231	1.0000	1.0000	1.0000
LC_LCDSSLCC		1.0000	1.0000	1.0000	0.9000
FR_FR4+15Cu		1.0000	0.7500	1.0000	0.9091
FR_FRRD+15Cu		1.0000	0.9167	1.0000	1.0000
FR_FR2+20Cu		1.0000	1.0000	1.0000	0.9286
FR_MULTIPLATE		0.9000	1.0000	1.0000	1.0000

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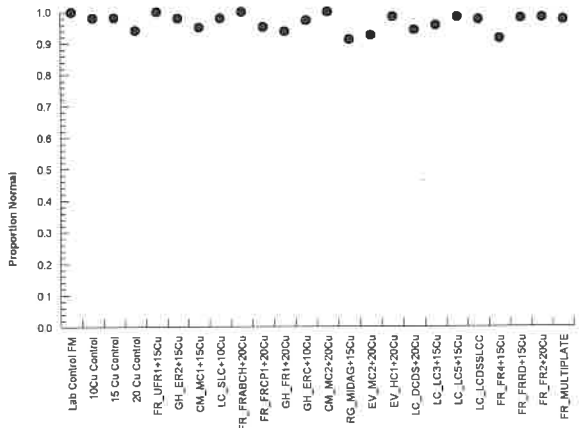
Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 06-3586-0790 **Endpoint:** Proportion Normal **CETIS Version:** CETISv1.9.4
Analyzed: 02 Nov-21 14:24 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Proportion Normal Binomials

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Lab Control FM		12/12	14/14	11/11	13/13
10Cu Control		12/12	12/12	12/12	12/13
15 Cu Control		11/11	8/8	8/8	13/14
20 Cu Control		12/12	7/8	14/14	8/9
FR_UFR1+15Cu	XC	8/8	11/11	3/3	9/9
GH_ER2+15Cu		11/12	13/13	8/8	12/12
CM_MC1+15Cu		8/8	9/9	11/11	4/5
LC_SLC+10Cu		11/12	11/11	12/12	13/13
FR_FRABCH+20Cu		9/9	9/9	11/11	12/12
FR_FRCP1+20Cu		11/12	14/14	8/9	11/11
GH_FR1+20Cu		12/12	11/12	10/12	11/11
GH_ERC+10Cu		9/9	8/9	11/11	8/8
CM_MC2+20Cu		7/7	15/15	11/11	7/7
RG_MIDAG+15Cu		11/13	9/10	13/13	9/10
EV_MC2+20Cu		11/13	12/13	12/13	10/10
EV_HC1+20Cu		4/4	8/8	4/4	14/15
LC_DCDS+20Cu		6/7	8/8	10/11	14/14
LC_LC3+15Cu		10/10	8/8	11/12	10/11
LC_LC5+15Cu		12/13	7/7	12/12	8/8
LC_LCDSSLCC		9/9	6/6	8/8	9/10
FR_FR4+15Cu		9/9	9/12	8/8	10/11
FR_FRRD+15Cu		13/13	11/12	13/13	13/13
FR_FR2+20Cu		14/14	10/10	11/11	13/14
FR_MULTIPLATE		9/10	6/6	13/13	13/13

Graphics



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Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID:	20-0977-8100	**Endpoint:**	Post Hatch Survival	**CETIS Version:**	CETISv1.9.4
Analyzed:	02 Nov-21 14:23	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1
Batch ID:	19-0275-1751	**Test Type:**	32 Day Fathead Minnow Test	**Analyst:**	Kayla Knol
Start Date:	13 Aug-21	**Protocol:**	ASTM E1241-05 (2013)	**Diluent:**	Dechlorinated Tap Water
Ending Date:	13 Sep-21	**Species:**	Pimephales promelas	**Brine:**	
Test Length:	31d 0h	**Taxon:**	Actinopterygii	**Source:**	Aquatox, AR **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
Lab Control FM	11-5032-4817	10 Aug-21	11 Aug-21	72h	Teck Coal Ltd	
10Cu Control	04-3348-8996	10 Aug-21	11 Aug-21	72h		
15 Cu Control	05-5139-9319	10 Aug-21	11 Aug-21	72h		
20 Cu Control	18-8853-3252	10 Aug-21	11 Aug-21	72h		
FR_UFR1+15Cu	13-9616-5903	10 Aug-21	11 Aug-21	72h (14.7 °C)		
GH_ER2+15Cu	19-5052-7846	10 Aug-21	11 Aug-21	72h (12.1 °C)		
CM_MC1+15Cu	15-1448-1664	10 Aug-21	11 Aug-21	72h (12.3 °C)		
LC_SLC+10Cu	10-0118-5065	10 Aug-21	11 Aug-21	72h (11.8 °C)		
FR_FRABCH+20Cu	12-2763-5905	10 Aug-21	11 Aug-21	72h (14.6 °C)		
FR_FRCP1+20Cu	05-5162-7629	10 Aug-21	11 Aug-21	72h (13.8 °C)		
GH_FR1+20Cu	18-3989-2491	10 Aug-21	11 Aug-21	72h (12 °C)		
GH_ERC+10Cu	14-6940-9296	10 Aug-21	11 Aug-21	72h (15.4 °C)		
CM_MC2+20Cu	17-0166-2336	10 Aug-21	11 Aug-21	72h (13.1 °C)		
RG_MIDAG+15Cu	18-0148-8949	10 Aug-21	11 Aug-21	72h (12.4 °C)		
EV_MC2+20Cu	08-5423-9441	10 Aug-21	11 Aug-21	72h (13.1 °C)		
EV_HC1+20Cu	19-8320-0922	10 Aug-21	11 Aug-21	72h (12.1 °C)		
LC_DCDS+20Cu	12-7443-1043	10 Aug-21	11 Aug-21	72h (12.3 °C)		
LC_LC3+15Cu	06-5017-0795	10 Aug-21	11 Aug-21	72h (12.4 °C)		
LC_LC5+15Cu	10-4683-7945	10 Aug-21	11 Aug-21	72h (15.1 °C)		
LC_LCDSSLCC	11-9856-2953	10 Aug-21	11 Aug-21	72h (10.8 °C)		
FR_FR4+15Cu	16-1388-5677	10 Aug-21	11 Aug-21	72h (14.1 °C)		
FR_FRRD+15Cu	18-8883-2370	10 Aug-21	11 Aug-21	72h (14.7 °C)		
FR_FR2+20Cu	20-1752-8591	10 Aug-21	11 Aug-21	72h (15.3 °C)		
FR_MULTIPLATE	15-0654-9876	10 Aug-21	11 Aug-21	72h (13.6 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
Lab Control FM	Ambient Sample	Teck Coal Ltd	Lab Control FM	
10Cu Control	Ambient Sample	Teck Coal Ltd	10 Cu Control	
15 Cu Control	Ambient Sample	Teck Coal Ltd	15 Cu Control	
20 Cu Control	Ambient Sample	Teck Coal Ltd	20 Cu Control	
FR_UFR1+15Cu	Ambient Sample	Teck Coal Ltd	FR_UFR1_MON_2021-08-0	
GH_ER2+15Cu	Ambient Sample	Teck Coal Ltd	GH_ER2_WS_2021-08-10_	
CM_MC1+15Cu	Ambient Sample	Teck Coal Ltd	CM_MC1_WS_2021-08-10	
LC_SLC+10Cu	Ambient Sample	Teck Coal Ltd	LC_SLC_WS_2021-08-10_	
FR_FRABCH+20Cu	Ambient Sample	Teck Coal Ltd	FR_FRABCH_MON_2021-	
FR_FRCP1+20Cu	Ambient Sample	Teck Coal Ltd	FR_FRCP1_MON_2021-08	
GH_FR1+20Cu	Ambient Sample	Teck Coal Ltd	GH_FR1_WS_2021-08-10_	
GH_ERC+10Cu	Ambient Sample	Teck Coal Ltd	GH_ERC_WS_2021-08-10	
CM_MC2+20Cu	Ambient Sample	Teck Coal Ltd	CM_MC2_WS_2021-08-10	
RG_MIDAG+15Cu	Ambient Sample	Teck Coal Ltd	RG_MIDAG_WS_2021-08-	
EV_MC2+20Cu	Ambient Sample	Teck Coal Ltd	EV_MC2_WS_2021_Q3_W	
EV_HC1+20Cu	Ambient Sample	Teck Coal Ltd	EV_HC1_WS_2021_Q3_W	
LC_DCDS+20Cu	Ambient Sample	Teck Coal Ltd	LC_DCDS_WS_2021-08-1	
LC_LC3+15Cu	Ambient Sample	Teck Coal Ltd	LC_LC3_WS_2021-08-10_	
LC_LC5+15Cu	Ambient Sample	Teck Coal Ltd	LC_LC5_WS_2021-08-10_	
LC_LCDSSLCC	Ambient Sample	Teck Coal Ltd	LC_LCDSSLCC_WS_2021-	
FR_FR4+15Cu	Ambient Sample	Teck Coal Ltd	FR_FR4_WS_2021-08-10_	
FR_FRRD+15Cu	Ambient Sample	Teck Coal Ltd	FR_FRRD_WS_2021-08-1	

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Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 20-0977-8100 **Endpoint:** Post Hatch Survival **CETIS Version:** CETISv1.9.4
Analyzed: 02 Nov-21 14:23 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_FR2+20Cu	Ambient Sample	Teck Coal Ltd	FR_FR2_WS_2021-08-10_	
FR_MULTIPLATE	Ambient Sample	Teck Coal Ltd	FR_MULTIPLATE_WS_20	

Fisher Exact/Bonferroni Adj Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
Site Control		Lab Control FM	0.9999	Exact	1.0000	Non-Significant Effect
FR-UFR1		10Cu Control	0.9997	Exact	1.0000	Non-Significant Effect
		15 Cu Control	0.9709	Exact	1.0000	Non-Significant Effect
		20 Cu Control	0.9930	Exact	1.0000	Non-Significant Effect
		GH_ER2+15Cu	0.9981	Exact	1.0000	Non-Significant Effect
		CM_MC1+15Cu	0.8229	Exact	1.0000	Non-Significant Effect
		LC_SLC+10Cu	0.9999	Exact	1.0000	Non-Significant Effect
		FR_FRABCH+20Cu	0.9900	Exact	1.0000	Non-Significant Effect
		FR_FRCP1+20Cu	0.9984	Exact	1.0000	Non-Significant Effect
		GH_FR1+20Cu	0.9993	Exact	1.0000	Non-Significant Effect
		GH_ERC+10Cu	0.8907	Exact	1.0000	Non-Significant Effect
		CM_MC2+20Cu	0.9412	Exact	1.0000	Non-Significant Effect
		RG_MIDAG+15Cu	0.9984	Exact	1.0000	Non-Significant Effect
		EV_MC2+20Cu	0.9999	Exact	1.0000	Non-Significant Effect
		EV_HC1+20Cu	0.6996	Exact	1.0000	Non-Significant Effect
		LC_DCDS+20Cu	0.9251	Exact	1.0000	Non-Significant Effect
		LC_LC3+15Cu	0.9487	Exact	1.0000	Non-Significant Effect
		LC_LC5+15Cu	0.9412	Exact	1.0000	Non-Significant Effect
		LC_LCDSSLCC	0.6384	Exact	1.0000	Non-Significant Effect
		FR_FR4+15Cu	0.9662	Exact	1.0000	Non-Significant Effect
		FR_FRRD+15Cu	1.0000	Exact	1.0000	Non-Significant Effect
		FR_FR2+20Cu	0.9999	Exact	1.0000	Non-Significant Effect
		FR_MULTIPLATE	0.9980	Exact	1.0000	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	3.147	3.37	0.1204	No Outliers Detected

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NOV 09 2021

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 20-0977-8100 **Endpoint:** Post Hatch Survival **CETIS Version:** CETISv1.9.4
Analyzed: 02 Nov-21 14:23 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Data Summary

Sample	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
Lab Control FM		50	9	59	0.8475	0.1525	-13.68%
10Cu Control		49	10	59	0.8305	0.1695	-11.41%
15 Cu Control		41	17	58	0.7069	0.2931	5.17%
20 Cu Control		43	14	57	0.7544	0.2456	-1.2%
FR_UFR1+15Cu	XC	31	25	56	0.5536	0.4464	25.74%
GH_ER2+15Cu		45	12	57	0.7895	0.2105	-5.91%
CM_MC1+15Cu		33	20	53	0.6226	0.3774	16.47%
LC_SLC+10Cu		48	8	56	0.8571	0.1429	-14.98%
FR_FRABCH+20Cu		41	14	55	0.7455	0.2545	0.0%
FR_FRCP1+20Cu		46	12	58	0.7931	0.2069	-6.39%
GH_FR1+20Cu		47	11	58	0.8103	0.1897	-8.71%
GH_ERC+10Cu		37	20	57	0.6491	0.3509	12.92%
CM_MC2+20Cu		40	19	59	0.678	0.322	9.05%
RG_MIDAG+15Cu		46	12	58	0.7931	0.2069	-6.39%
EV_MC2+20Cu		49	9	58	0.8448	0.1552	-13.33%
EV_HC1+20Cu		31	22	53	0.5849	0.4151	21.54%
LC_DCDS+20Cu		40	20	60	0.6667	0.3333	10.57%
LC_LC3+15Cu		41	19	60	0.6833	0.3167	8.33%
LC_LC5+15Cu		40	19	59	0.678	0.322	9.05%
LC_LCDSSLCC		33	25	58	0.569	0.431	23.68%
FR_FR4+15Cu		40	17	57	0.7018	0.2982	5.86%
FR_FRRD+15Cu		51	8	59	0.8644	0.1356	-15.96%
FR_FR2+20Cu		49	9	58	0.8448	0.1552	-13.33%
FR_MULTIPLATE		42	11	53	0.7925	0.2075	-6.31%

Post Hatch Survival Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Lab Control FM		0.8571	0.9333	0.7333	0.8667
10Cu Control		0.8000	0.8000	0.8571	0.8667
15 Cu Control		0.7333	0.5714	0.5333	1.0000
20 Cu Control		0.8571	0.5714	0.9333	0.6429
FR_UFR1+15Cu	XC	0.5714	0.7333	0.2143	0.6923
GH_ER2+15Cu		0.8000	0.9286	0.6154	0.8000
CM_MC1+15Cu		0.6154	0.6429	0.8462	0.3846
LC_SLC+10Cu		0.8571	0.7857	0.8571	0.9286
FR_FRABCH+20Cu		0.6923	0.6923	0.7333	0.8571
FR_FRCP1+20Cu		0.8000	1.0000	0.6429	0.7333
GH_FR1+20Cu		0.8000	0.8000	0.8000	0.8462
GH_ERC+10Cu		0.6429	0.6000	0.8462	0.5333
CM_MC2+20Cu		0.5000	1.0000	0.7333	0.4667
RG_MIDAG+15Cu		0.8667	0.6667	0.8667	0.7692
EV_MC2+20Cu		0.8667	0.8667	0.9286	0.7143
EV_HC1+20Cu		0.3077	0.6667	0.3077	1.0000
LC_DCDS+20Cu		0.4667	0.5333	0.7333	0.9333
LC_LC3+15Cu		0.6667	0.5333	0.8000	0.7333
LC_LC5+15Cu		0.8667	0.4667	0.8000	0.5714
LC_LCDSSLCC		0.6429	0.4000	0.5333	0.7143
FR_FR4+15Cu		0.6000	0.8000	0.5333	0.9167
FR_FRRD+15Cu		0.8667	0.8000	0.8667	0.9286
FR_FR2+20Cu		1.0000	0.6667	0.7333	1.0000
FR_MULTIPLATE		0.8333	0.5000	0.8667	0.9286

MG

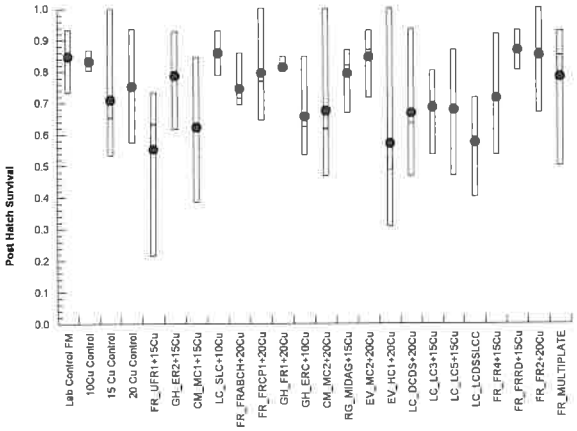
Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID:	20-0977-8100	**Endpoint:**	Post Hatch Survival	**CETIS Version:**	CETISv1.9.4
Analyzed:	02 Nov-21 14:23	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1

Post Hatch Survival Binomials

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Lab Control FM		12/14	14/15	11/15	13/15
10Cu Control		12/15	12/15	12/14	13/15
15 Cu Control		11/15	8/14	8/15	14/14
20 Cu Control		12/14	8/14	14/15	9/14
FR_UFR1+15Cu	XC	8/14	11/15	3/14	9/13
GH_ER2+15Cu		12/15	13/14	8/13	12/15
CM_MC1+15Cu		8/13	9/14	11/13	5/13
LC_SLC+10Cu		12/14	11/14	12/14	13/14
FR_FRABCH+20Cu		9/13	9/13	11/15	12/14
FR_FRCP1+20Cu		12/15	14/14	9/14	11/15
GH_FR1+20Cu		12/15	12/15	12/15	11/13
GH_ERC+10Cu		9/14	9/15	11/13	8/15
CM_MC2+20Cu		7/14	15/15	11/15	7/15
RG_MIDAG+15Cu		13/15	10/15	13/15	10/13
EV_MC2+20Cu		13/15	13/15	13/14	10/14
EV_HC1+20Cu		4/13	8/12	4/13	15/15
LC_DCDS+20Cu		7/15	8/15	11/15	14/15
LC_LC3+15Cu		10/15	8/15	12/15	11/15
LC_LC5+15Cu		13/15	7/15	12/15	8/14
LC_LCDSSLCC		9/14	6/15	8/15	10/14
FR_FR4+15Cu		9/15	12/15	8/15	11/12
FR_FRRD+15Cu		13/15	12/15	13/15	13/14
FR_FR2+20Cu		14/14	10/15	11/15	14/14
FR_MULTIPLATE		10/12	6/12	13/15	13/14

Graphics



MG
NOV 09 2021

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID:	03-1285-8918	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.9.4
Analyzed:	02 Nov-21 14:28	**Analysis:**	Nonparametric-Control vs Treatments	**Status Level:**	1
Batch ID:	19-0275-1751	**Test Type:**	32 Day Fathead Minnow Test	**Analyst:**	Kayla Knol
Start Date:	13 Aug-21	**Protocol:**	ASTM E1241-05 (2013)	**Diluent:**	Dechlorinated Tap Water
Ending Date:	13 Sep-21	**Species:**	Pimephales promelas	**Brine:**	
Test Length:	31d 0h	**Taxon:**	Actinopterygii	**Source:**	Aquatox, AR **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
Lab Control FM	11-5032-4817	10 Aug-21	11 Aug-21	72h	Teck Coal Ltd	
10Cu Control	04-3348-8996	10 Aug-21	11 Aug-21	72h		
15 Cu Control	05-5139-9319	10 Aug-21	11 Aug-21	72h		
20 Cu Control	18-8853-3252	10 Aug-21	11 Aug-21	72h		
FR_UFR1+15Cu	13-9616-5903	10 Aug-21	11 Aug-21	72h (14.7 °C)		
GH_ER2+15Cu	19-5052-7846	10 Aug-21	11 Aug-21	72h (12.1 °C)		
CM_MC1+15Cu	15-1448-1664	10 Aug-21	11 Aug-21	72h (12.3 °C)		
LC_SLC+10Cu	10-0118-5065	10 Aug-21	11 Aug-21	72h (11.8 °C)		
FR_FRABCH+20Cu	12-2763-5905	10 Aug-21	11 Aug-21	72h (14.6 °C)		
FR_FRCP1+20Cu	05-5162-7629	10 Aug-21	11 Aug-21	72h (13.8 °C)		
GH_FR1+20Cu	18-3989-2491	10 Aug-21	11 Aug-21	72h (12 °C)		
GH_ERC+10Cu	14-6940-9296	10 Aug-21	11 Aug-21	72h (15.4 °C)		
CM_MC2+20Cu	17-0166-2336	10 Aug-21	11 Aug-21	72h (13.1 °C)		
RG_MIDAG+15Cu	18-0148-8949	10 Aug-21	11 Aug-21	72h (12.4 °C)		
EV_MC2+20Cu	08-5423-9441	10 Aug-21	11 Aug-21	72h (13.1 °C)		
EV_HC1+20Cu	19-8320-0922	10 Aug-21	11 Aug-21	72h (12.1 °C)		
LC_DCDS+20Cu	12-7443-1043	10 Aug-21	11 Aug-21	72h (12.3 °C)		
LC_LC3+15Cu	06-5017-0795	10 Aug-21	11 Aug-21	72h (12.4 °C)		
LC_LC5+15Cu	10-4683-7945	10 Aug-21	11 Aug-21	72h (15.1 °C)		
LC_LCDSSLCC	11-9856-2953	10 Aug-21	11 Aug-21	72h (10.8 °C)		
FR_FR4+15Cu	16-1388-5677	10 Aug-21	11 Aug-21	72h (14.1 °C)		
FR_FRRD+15Cu	18-8883-2370	10 Aug-21	11 Aug-21	72h (14.7 °C)		
FR_FR2+20Cu	20-1752-8591	10 Aug-21	11 Aug-21	72h (15.3 °C)		
FR_MULTIPLATE	15-0654-9876	10 Aug-21	11 Aug-21	72h (13.6 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
Lab Control FM	Ambient Sample	Teck Coal Ltd	Lab Control FM	
10Cu Control	Ambient Sample	Teck Coal Ltd	10 Cu Control	
15 Cu Control	Ambient Sample	Teck Coal Ltd	15 Cu Control	
20 Cu Control	Ambient Sample	Teck Coal Ltd	20 Cu Control	
FR_UFR1+15Cu	Ambient Sample	Teck Coal Ltd	FR_UFR1_MON_2021-08-0	
GH_ER2+15Cu	Ambient Sample	Teck Coal Ltd	GH_ER2_WS_2021-08-10_	
CM_MC1+15Cu	Ambient Sample	Teck Coal Ltd	CM_MC1_WS_2021-08-10	
LC_SLC+10Cu	Ambient Sample	Teck Coal Ltd	LC_SLC_WS_2021-08-10_	
FR_FRABCH+20Cu	Ambient Sample	Teck Coal Ltd	FR_FRABCH_MON_2021-	
FR_FRCP1+20Cu	Ambient Sample	Teck Coal Ltd	FR_FRCP1_MON_2021-08	
GH_FR1+20Cu	Ambient Sample	Teck Coal Ltd	GH_FR1_WS_2021-08-10_	
GH_ERC+10Cu	Ambient Sample	Teck Coal Ltd	GH_ERC_WS_2021-08-10	
CM_MC2+20Cu	Ambient Sample	Teck Coal Ltd	CM_MC2_WS_2021-08-10	
RG_MIDAG+15Cu	Ambient Sample	Teck Coal Ltd	RG_MIDAG_WS_2021-08-	
EV_MC2+20Cu	Ambient Sample	Teck Coal Ltd	EV_MC2_WS_2021_Q3_W	
EV_HC1+20Cu	Ambient Sample	Teck Coal Ltd	EV_HC1_WS_2021_Q3_W	
LC_DCDS+20Cu	Ambient Sample	Teck Coal Ltd	LC_DCDS_WS_2021-08-1	
LC_LC3+15Cu	Ambient Sample	Teck Coal Ltd	LC_LC3_WS_2021-08-10_	
LC_LC5+15Cu	Ambient Sample	Teck Coal Ltd	LC_LC5_WS_2021-08-10_	
LC_LCDSSLCC	Ambient Sample	Teck Coal Ltd	LC_LCDSSLCC_WS_2021-	
FR_FR4+15Cu	Ambient Sample	Teck Coal Ltd	FR_FR4_WS_2021-08-10_	
FR_FRRD+15Cu	Ambient Sample	Teck Coal Ltd	FR_FRRD_WS_2021-08-1	

MG

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID:	03-1285-8918	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.9.4
Analyzed:	02 Nov-21 14:28	**Analysis:**	Nonparametric-Control vs Treatments	**Status Level:**	1

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_FR2+20Cu	Ambient Sample	Teck Coal Ltd	FR_FR2_WS_2021-08-10_	
FR_MULTIPLATE	Ambient Sample	Teck Coal Ltd	FR_MULTIPLATE_WS_20	

Nemenyi-Damico-Wolfe Test

Sample I	vs	Sample II	Test Stat	Critical	Ties	P-Type	P-Value	Decision(α:5%)
Site Control		Lab Control FM	-11	211.4	0	CDF	0.9720	Non-Significant Effect
GH_ER2		10Cu Control	-76	211.4	0	CDF	0.9986	Non-Significant Effect
		15 Cu Control	26	211.4	0	CDF	0.9045	Non-Significant Effect
		20 Cu Control	-34	211.4	0	CDF	0.9890	Non-Significant Effect
		FR_UFR1+15Cu	57	211.4	0	CDF	0.7894	Non-Significant Effect
		CM_MC1+15Cu	130	211.4	0	CDF	0.3567	Non-Significant Effect
		LC_SLC+10Cu	-55	211.4	0	CDF	0.9958	Non-Significant Effect
		FR_FRABCH+20Cu	-41	211.4	0	CDF	0.9919	Non-Significant Effect
		FR_FRCP1+20Cu	16	211.4	0	CDF	0.9293	Non-Significant Effect
		GH_FR1+20Cu	12	211.4	0	CDF	0.9377	Non-Significant Effect
		GH_ERC+10Cu	-25	211.4	0	CDF	0.9839	Non-Significant Effect
		CM_MC2+20Cu	98	211.4	0	CDF	0.5572	Non-Significant Effect
		RG_MIDAG+15Cu	49	211.4	0	CDF	0.8248	Non-Significant Effect
		EV_MC2+20Cu	-29	211.4	0	CDF	0.9863	Non-Significant Effect
		EV_HC1+20Cu	139	211.4	0	CDF	0.3050	Non-Significant Effect
		LC_DCDS+20Cu	22	211.4	0	CDF	0.9151	Non-Significant Effect
		LC_LC3+15Cu	-65	211.4	0	CDF	0.9974	Non-Significant Effect
		LC_LC5+15Cu	-10	211.4	0	CDF	0.9710	Non-Significant Effect
		LC_LCDSSLCC	70	211.4	0	CDF	0.7238	Non-Significant Effect
		FR_FR4+15Cu	58	211.4	0	CDF	0.7847	Non-Significant Effect
		FR_FRRD+15Cu	-100	211.4	0	CDF	0.9996	Non-Significant Effect
		FR_FR2+20Cu	-96	211.4	0	CDF	0.9995	Non-Significant Effect
		FR_MULTIPLATE	105	211.4	0	CDF	0.5126	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	4.104	3.37	0.0017	Outlier Detected
Treatment Effect	Fligner-Wolfe Omnibus Test	4472		0.4333	Non-Significant Overall Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	4.49634	0.195493	23	1.847	0.0258	Significant Effect
Error	7.61906	0.10582	72			
Total	12.1154		95			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Variances	Bartlett Equality of Variance Test	34.81	35.17	0.0544	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9596	0.9737	0.0048	Non-Normal Distribution

MG
NOV 09 2021

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 03-1285-8918 **Endpoint:** Mean Dry Biomass-mg **CETIS Version:** CETISv1.9.4
Analyzed: 02 Nov-21 14:28 **Analysis:** Nonparametric-Control vs Treatments **Status Level:** 1

Mean Dry Biomass-mg Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
Lab Control FM		4	2.627	1.997	3.257	2.488	2.333	3.199	0.1981	15.08%	0.00%
10Cu Control		4	2.768	2.171	3.366	2.828	2.278	3.139	0.1879	13.57%	-5.38%
15 Cu Control		4	2.439	1.994	2.885	2.546	2.026	2.64	0.14	11.47%	7.15%
20 Cu Control		4	2.611	2.495	2.728	2.64	2.504	2.661	0.03658	2.80%	0.60%
FR_UFR1+15Cu		4	2.163	0.8123	3.514	2.308	1.001	3.036	0.4244	39.24%	17.67%
GH_ER2+15Cu	XC	4	2.484	1.959	3.01	2.601	1.999	2.737	0.1651	13.29%	5.44%
CM_MC1+15Cu		4	1.909	1.062	2.757	1.845	1.331	2.615	0.2664	27.90%	27.33%
LC_SLC+10Cu		4	2.639	2.465	2.813	2.685	2.477	2.71	0.05459	4.14%	-0.45%
FR_FRABCH+20Cu		4	2.634	2.222	3.047	2.576	2.421	2.965	0.1297	9.85%	-0.27%
FR_FRCP1+20Cu		4	2.458	1.98	2.935	2.492	2.079	2.768	0.1501	12.22%	6.45%
GH_FR1+20Cu		4	2.511	2.25	2.772	2.55	2.279	2.665	0.082	6.53%	4.42%
GH_ERC+10Cu		4	2.58	2.29	2.87	2.593	2.364	2.771	0.09109	7.06%	1.78%
CM_MC2+20Cu		4	2.273	1.992	2.555	2.34	2.015	2.399	0.08836	7.77%	13.46%
RG_MIDAG+15Cu		4	2.406	2.053	2.76	2.353	2.206	2.713	0.1112	9.24%	8.41%
EV_MC2+20Cu		4	2.577	2.242	2.913	2.594	2.353	2.77	0.1054	8.18%	1.89%
EV_HC1+20Cu		4	2.065	1.635	2.495	1.986	1.851	2.437	0.1351	13.08%	21.39%
LC_DCDS+20Cu		4	2.457	2.005	2.909	2.438	2.143	2.808	0.142	11.56%	6.48%
LC_LC3+15Cu		4	2.663	2.343	2.982	2.695	2.412	2.847	0.1004	7.54%	-1.34%
LC_LC5+15Cu		4	2.538	2.182	2.894	2.624	2.215	2.689	0.1118	8.81%	3.39%
LC_LCDSSLCC		4	2.283	1.678	2.888	2.283	1.896	2.67	0.1902	16.66%	13.11%
FR_FR4+15Cu		4	2.356	1.645	3.067	2.276	1.901	2.971	0.2234	18.96%	10.31%
FR_FRRD+15Cu		4	2.735	2.532	2.938	2.771	2.555	2.843	0.06394	4.68%	-4.10%
FR_FR2+20Cu		4	2.748	2.405	3.091	2.77	2.465	2.988	0.1079	7.85%	-4.61%
FR_MULTIPLATE		4	2.233	1.92	2.546	2.205	2.041	2.482	0.09838	8.81%	14.99%

Mean Dry Biomass-mg Detail

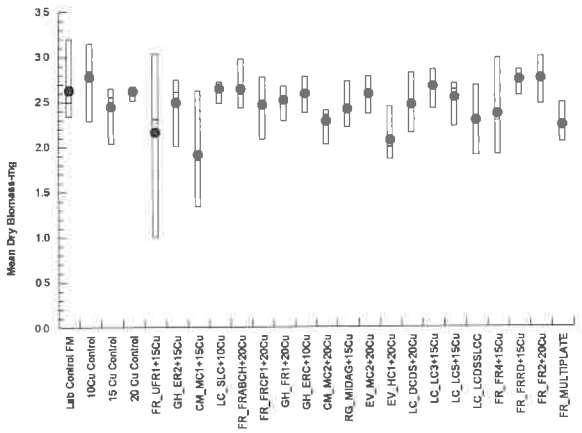
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Lab Control FM		2.583	2.333	2.393	3.199
10Cu Control		2.278	2.69	2.967	3.139
15 Cu Control		2.52	2.026	2.64	2.571
20 Cu Control		2.661	2.504	2.654	2.626
FR_UFR1+15Cu		2.25	2.365	1.001	3.036
GH_ER2+15Cu	XC	2.613	2.588	1.999	2.737
CM_MC1+15Cu		1.769	1.921	2.615	1.331
LC_SLC+10Cu		2.477	2.675	2.71	2.695
FR_FRABCH+20Cu		2.434	2.718	2.421	2.965
FR_FRCP1+20Cu		2.611	2.373	2.079	2.768
GH_FR1+20Cu		2.665	2.279	2.55	2.551
GH_ERC+10Cu		2.683	2.364	2.771	2.503
CM_MC2+20Cu		2.015	2.308	2.399	2.373
RG_MIDAG+15Cu		2.419	2.287	2.206	2.713
EV_MC2+20Cu		2.353	2.443	2.77	2.744
EV_HC1+20Cu		1.881	2.092	1.851	2.437
LC_DCDS+20Cu		2.143	2.339	2.808	2.537
LC_LC3+15Cu		2.591	2.8	2.412	2.847
LC_LC5+15Cu		2.689	2.215	2.561	2.687
LC_LCDSSLCC		2.542	1.896	2.023	2.67
FR_FR4+15Cu		2.257	2.295	1.901	2.971
FR_FRRD+15Cu		2.555	2.843	2.735	2.806
FR_FR2+20Cu		2.745	2.794	2.465	2.988
FR_MULTIPLATE		2.294	2.041	2.116	2.482

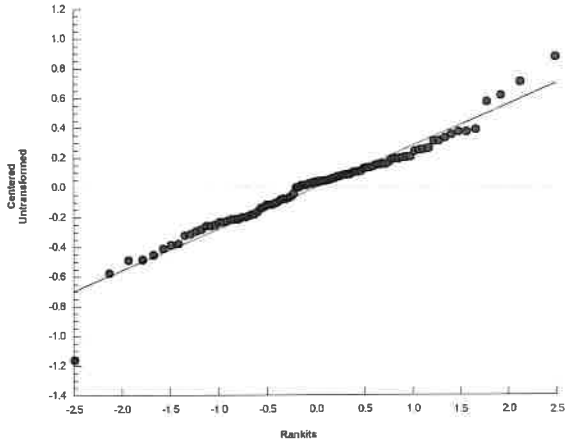
MG

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID:	03-1285-8918	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.9.4
Analyzed:	02 Nov-21 14:28	**Analysis:**	Nonparametric-Control vs Treatments	**Status Level:**	1

Graphics





Analyst: KC QA: NOV 05 2021

CETIS Analytical Report

Test Code/ID: FM Lab Control / 06-2855-8538

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID:	02-4011-2953	**Endpoint:**	Hatch Rate	**CETIS Version:**	CETISv1.9.4
Analyzed:	02 Nov-21 14:26	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1
Batch ID:	19-0275-1751	**Test Type:**	32 Day Fathead Minnow Test	**Analyst:**	Kayla Knol
Start Date:	13 Aug-21	**Protocol:**	ASTM E1241-05 (2013)	**Diluent:**	Dechlorinated Tap Water
Ending Date:	13 Sep-21	**Species:**	Pimephales promelas	**Brine:**	
Test Length:	31d 0h	**Taxon:**	Actinopterygii	**Source:**	Aquatox, AR **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
Lab Control FM	11-5032-4817	10 Aug-21	11 Aug-21	72h	Teck Coal Ltd	
10Cu Control	04-3348-8996	10 Aug-21	11 Aug-21	72h		
15 Cu Control	05-5139-9319	10 Aug-21	11 Aug-21	72h		
20 Cu Control	18-8853-3252	10 Aug-21	11 Aug-21	72h		
FR_UFR1+15Cu	13-9616-5903	10 Aug-21	11 Aug-21	72h (14.7 °C)		
GH_ER2+15Cu	19-5052-7846	10 Aug-21	11 Aug-21	72h (12.1 °C)		
CM_MC1+15Cu	15-1448-1664	10 Aug-21	11 Aug-21	72h (12.3 °C)		
LC_SLC+10Cu	10-0118-5065	10 Aug-21	11 Aug-21	72h (11.8 °C)		
FR_FRABCH+20Cu	12-2763-5905	10 Aug-21	11 Aug-21	72h (14.6 °C)		
FR_FRCP1+20Cu	05-5162-7629	10 Aug-21	11 Aug-21	72h (13.8 °C)		
GH_FR1+20Cu	18-3989-2491	10 Aug-21	11 Aug-21	72h (12 °C)		
GH_ERC+10Cu	14-6940-9296	10 Aug-21	11 Aug-21	72h (15.4 °C)		
CM_MC2+20Cu	17-0166-2336	10 Aug-21	11 Aug-21	72h (13.1 °C)		
RG_MIDAG+15Cu	18-0148-8949	10 Aug-21	11 Aug-21	72h (12.4 °C)		
EV_MC2+20Cu	08-5423-9441	10 Aug-21	11 Aug-21	72h (13.1 °C)		
EV_HC1+20Cu	19-8320-0922	10 Aug-21	11 Aug-21	72h (12.1 °C)		
LC_DCDS+20Cu	12-7443-1043	10 Aug-21	11 Aug-21	72h (12.3 °C)		
LC_LC3+15Cu	06-5017-0795	10 Aug-21	11 Aug-21	72h (12.4 °C)		
LC_LC5+15Cu	10-4683-7945	10 Aug-21	11 Aug-21	72h (15.1 °C)		
LC_LCDSSLCC	11-9856-2953	10 Aug-21	11 Aug-21	72h (10.8 °C)		
FR_FR4+15Cu	16-1388-5677	10 Aug-21	11 Aug-21	72h (14.1 °C)		
FR_FRRD+15Cu	18-8883-2370	10 Aug-21	11 Aug-21	72h (14.7 °C)		
FR_FR2+20Cu	20-1752-8591	10 Aug-21	11 Aug-21	72h (15.3 °C)		
FR_MULTIPLATE	15-0654-9876	10 Aug-21	11 Aug-21	72h (13.6 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
Lab Control FM	Ambient Sample	Teck Coal Ltd	Lab Control FM	
10Cu Control	Ambient Sample	Teck Coal Ltd	10 Cu Control	
15 Cu Control	Ambient Sample	Teck Coal Ltd	15 Cu Control	
20 Cu Control	Ambient Sample	Teck Coal Ltd	20 Cu Control	
FR_UFR1+15Cu	Ambient Sample	Teck Coal Ltd	FR_UFR1_MON_2021-08-0	
GH_ER2+15Cu	Ambient Sample	Teck Coal Ltd	GH_ER2_WS_2021-08-10_	
CM_MC1+15Cu	Ambient Sample	Teck Coal Ltd	CM_MC1_WS_2021-08-10	
LC_SLC+10Cu	Ambient Sample	Teck Coal Ltd	LC_SLC_WS_2021-08-10_	
FR_FRABCH+20Cu	Ambient Sample	Teck Coal Ltd	FR_FRABCH_MON_2021-	
FR_FRCP1+20Cu	Ambient Sample	Teck Coal Ltd	FR_FRCP1_MON_2021-08	
GH_FR1+20Cu	Ambient Sample	Teck Coal Ltd	GH_FR1_WS_2021-08-10_	
GH_ERC+10Cu	Ambient Sample	Teck Coal Ltd	GH_ERC_WS_2021-08-10	
CM_MC2+20Cu	Ambient Sample	Teck Coal Ltd	CM_MC2_WS_2021-08-10	
RG_MIDAG+15Cu	Ambient Sample	Teck Coal Ltd	RG_MIDAG_WS_2021-08-	
EV_MC2+20Cu	Ambient Sample	Teck Coal Ltd	EV_MC2_WS_2021_Q3_W	
EV_HC1+20Cu	Ambient Sample	Teck Coal Ltd	EV_HC1_WS_2021_Q3_W	
LC_DCDS+20Cu	Ambient Sample	Teck Coal Ltd	LC_DCDS_WS_2021-08-1	
LC_LC3+15Cu	Ambient Sample	Teck Coal Ltd	LC_LC3_WS_2021-08-10_	
LC_LC5+15Cu	Ambient Sample	Teck Coal Ltd	LC_LC5_WS_2021-08-10_	
LC_LCDSSLCC	Ambient Sample	Teck Coal Ltd	LC_LCDSSLCC_WS_2021-	
FR_FR4+15Cu	Ambient Sample	Teck Coal Ltd	FR_FR4_WS_2021-08-10_	
FR_FRRD+15Cu	Ambient Sample	Teck Coal Ltd	FR_FRRD_WS_2021-08-1	

MB

Analyst: KC QA: NOV 09 2021

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 02-4011-2953 **Endpoint:** Hatch Rate **CETIS Version:** CETISv1.9.4
Analyzed: 02 Nov-21 14:26 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_FR2+20Cu	Ambient Sample	Teck Coal Ltd	FR_FR2_WS_2021-08-10_	
FR_MULTIPLATE	Ambient Sample	Teck Coal Ltd	FR_MULTIPLATE_WS_20	

Fisher Exact/Bonferroni Adj Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
Site Control		Lab Control FM	0.9406	Exact	1.0000	Non-Significant Effect
GH-ER2		10Cu Control	0.9406	Exact	1.0000	Non-Significant Effect
		15 Cu Control	0.8178	Exact	1.0000	Non-Significant Effect
		20 Cu Control	0.6603	Exact	1.0000	Non-Significant Effect
		FR_UFR1+15Cu	0.5000	Exact	1.0000	Non-Significant Effect
		CM_MC1+15Cu	0.1612	Exact	1.0000	Non-Significant Effect
		LC_SLC+10Cu	0.5000	Exact	1.0000	Non-Significant Effect
		FR_FRABCH+20Cu	0.3585	Exact	1.0000	Non-Significant Effect
		FR_FRCP1+20Cu	0.8178	Exact	1.0000	Non-Significant Effect
		GH_FR1+20Cu	0.8178	Exact	1.0000	Non-Significant Effect
		GH_ERC+10Cu	0.6603	Exact	1.0000	Non-Significant Effect
		CM_MC2+20Cu	0.9406	Exact	1.0000	Non-Significant Effect
		RG_MIDAG+15Cu	0.8178	Exact	1.0000	Non-Significant Effect
		EV_MC2+20Cu	0.8178	Exact	1.0000	Non-Significant Effect
		EV_HC1+20Cu	0.1612	Exact	1.0000	Non-Significant Effect
		LC_DCDS+20Cu	1.0000	Exact	1.0000	Non-Significant Effect
		LC_LC3+15Cu	1.0000	Exact	1.0000	Non-Significant Effect
		LC_LC5+15Cu	0.9406	Exact	1.0000	Non-Significant Effect
		LC_LCDSSLCC	0.8178	Exact	1.0000	Non-Significant Effect
		FR_FR4+15Cu	0.6603	Exact	1.0000	Non-Significant Effect
		FR_FRRD+15Cu	0.9406	Exact	1.0000	Non-Significant Effect
		FR_FR2+20Cu	0.8178	Exact	1.0000	Non-Significant Effect
		FR_MULTIPLATE	0.1612	Exact	1.0000	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	3.044	3.37	0.1764	No Outliers Detected

MG
NOV 05 2021

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 02-4011-2953 **Endpoint:** Hatch Rate **CETIS Version:** CETISv1.9.4
Analyzed: 02 Nov-21 14:26 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Data Summary

Sample	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
Lab Control FM		59	1	60	0.9833	0.01667	-3.51%
10Cu Control		59	1	60	0.9833	0.01667	-3.51%
15 Cu Control		58	2	60	0.9667	0.03333	-1.75%
20 Cu Control		57	3	60	0.95	0.05	0.0%
FR_UFR1+15Cu		56	4	60	0.9333	0.06667	1.75%
GH_ER2+15Cu	XC	57	3	60	0.95	0.05	0.0%
CM_MC1+15Cu		53	7	60	0.8833	0.1167	7.02%
LC_SLC+10Cu		56	4	60	0.9333	0.06667	1.75%
FR_FRABCH+20Cu		55	5	60	0.9167	0.08333	3.51%
FR_FRCP1+20Cu		58	2	60	0.9667	0.03333	-1.75%
GH_FR1+20Cu		58	2	60	0.9667	0.03333	-1.75%
GH_ERC+10Cu		57	3	60	0.95	0.05	0.0%
CM_MC2+20Cu		59	1	60	0.9833	0.01667	-3.51%
RG_MIDAG+15Cu		58	2	60	0.9667	0.03333	-1.75%
EV_MC2+20Cu		58	2	60	0.9667	0.03333	-1.75%
EV_HC1+20Cu		53	7	60	0.8833	0.1167	7.02%
LC_DCDS+20Cu		60	0	60	1	0	-5.26%
LC_LC3+15Cu		60	0	60	1	0	-5.26%
LC_LC5+15Cu		59	1	60	0.9833	0.01667	-3.51%
LC_LCDSSLCC		58	2	60	0.9667	0.03333	-1.75%
FR_FR4+15Cu		57	3	60	0.95	0.05	0.0%
FR_FRRD+15Cu		59	1	60	0.9833	0.01667	-3.51%
FR_FR2+20Cu		58	2	60	0.9667	0.03333	-1.75%
FR_MULTIPLATE		53	7	60	0.8833	0.1167	7.02%

Hatch Rate Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Lab Control FM		0.9333	1.0000	1.0000	1.0000
10Cu Control		1.0000	1.0000	0.9333	1.0000
15 Cu Control		1.0000	0.9333	1.0000	0.9333
20 Cu Control		0.9333	0.9333	1.0000	0.9333
FR_UFR1+15Cu		0.9333	1.0000	0.9333	0.8667
GH_ER2+15Cu	XC	1.0000	0.9333	0.8667	1.0000
CM_MC1+15Cu		0.8667	0.9333	0.8667	0.8667
LC_SLC+10Cu		0.9333	0.9333	0.9333	0.9333
FR_FRABCH+20Cu		0.8667	0.8667	1.0000	0.9333
FR_FRCP1+20Cu		1.0000	0.9333	0.9333	1.0000
GH_FR1+20Cu		1.0000	1.0000	1.0000	0.8667
GH_ERC+10Cu		0.9333	1.0000	0.8667	1.0000
CM_MC2+20Cu		0.9333	1.0000	1.0000	1.0000
RG_MIDAG+15Cu		1.0000	1.0000	1.0000	0.8667
EV_MC2+20Cu		1.0000	1.0000	0.9333	0.9333
EV_HC1+20Cu		0.8667	0.8000	0.8667	1.0000
LC_DCDS+20Cu		1.0000	1.0000	1.0000	1.0000
LC_LC3+15Cu		1.0000	1.0000	1.0000	1.0000
LC_LC5+15Cu		1.0000	1.0000	1.0000	0.9333
LC_LCDSSLCC		0.9333	1.0000	1.0000	0.9333
FR_FR4+15Cu		1.0000	1.0000	1.0000	0.8000
FR_FRRD+15Cu		1.0000	1.0000	1.0000	0.9333
FR_FR2+20Cu		0.9333	1.0000	1.0000	0.9333
FR_MULTIPLATE		0.8000	0.8000	1.0000	0.9333

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NOV 09 2021

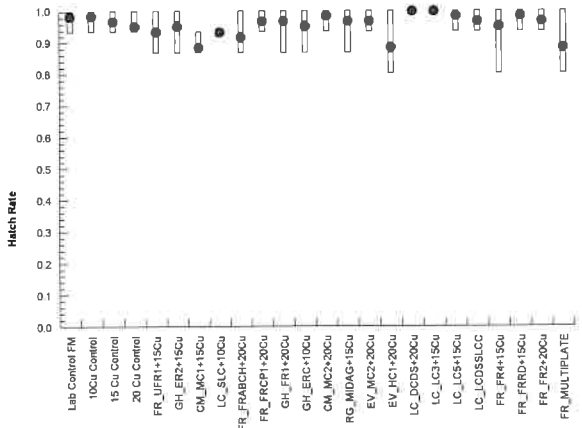
Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 02-4011-2953 **Endpoint:** Hatch Rate **CETIS Version:** CETISv1.9.4
Analyzed: 02 Nov-21 14:26 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Hatch Rate Binomials

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Lab Control FM		14/15	15/15	15/15	15/15
10Cu Control		15/15	15/15	14/15	15/15
15 Cu Control		15/15	14/15	15/15	14/15
20 Cu Control		14/15	14/15	15/15	14/15
FR_UFR1+15Cu		14/15	15/15	14/15	13/15
GH_ER2+15Cu	XC	15/15	14/15	13/15	15/15
CM_MC1+15Cu		13/15	14/15	13/15	13/15
LC_SLC+10Cu		14/15	14/15	14/15	14/15
FR_FRABCH+20Cu		13/15	13/15	15/15	14/15
FR_FRCP1+20Cu		15/15	14/15	14/15	15/15
GH_FR1+20Cu		15/15	15/15	15/15	13/15
GH_ERC+10Cu		14/15	15/15	13/15	15/15
CM_MC2+20Cu		14/15	15/15	15/15	15/15
RG_MIDAG+15Cu		15/15	15/15	15/15	13/15
EV_MC2+20Cu		15/15	15/15	14/15	14/15
EV_HC1+20Cu		13/15	12/15	13/15	15/15
LC_DCDS+20Cu		15/15	15/15	15/15	15/15
LC_LC3+15Cu		15/15	15/15	15/15	15/15
LC_LC5+15Cu		15/15	15/15	15/15	14/15
LC_LCDSSLCC		14/15	15/15	15/15	14/15
FR_FR4+15Cu		15/15	15/15	15/15	12/15
FR_FRRD+15Cu		15/15	15/15	15/15	14/15
FR_FR2+20Cu		14/15	15/15	15/15	14/15
FR_MULTIPLATE		12/15	12/15	15/15	14/15

Graphics



CETIS Analytical Report

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID:	02-0326-0644	**Endpoint:**	Length	**CETIS Version:**	CETISv1.9.4
Analyzed:	02 Nov-21 14:27	**Analysis:**	Parametric-Control vs Treatments	**Status Level:**	1
Batch ID:	19-0275-1751	**Test Type:**	32 Day Fathead Minnow Test	**Analyst:**	Kayla Knol
Start Date:	13 Aug-21	**Protocol:**	ASTM E1241-05 (2013)	**Diluent:**	Dechlorinated Tap Water
Ending Date:	13 Sep-21	**Species:**	Pimephales promelas	**Brine:**	
Test Length:	31d 0h	**Taxon:**	Actinopterygii	**Source:**	Aquatox, AR **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
Lab Control FM	11-5032-4817	10 Aug-21	11 Aug-21	72h	Teck Coal Ltd	
10Cu Control	04-3348-8996	10 Aug-21	11 Aug-21	72h		
15 Cu Control	05-5139-9319	10 Aug-21	11 Aug-21	72h		
20 Cu Control	18-8853-3252	10 Aug-21	11 Aug-21	72h		
FR_UFR1+15Cu	13-9616-5903	10 Aug-21	11 Aug-21	72h (14.7 °C)		
GH_ER2+15Cu	19-5052-7846	10 Aug-21	11 Aug-21	72h (12.1 °C)		
CM_MC1+15Cu	15-1448-1664	10 Aug-21	11 Aug-21	72h (12.3 °C)		
LC_SLC+10Cu	10-0118-5065	10 Aug-21	11 Aug-21	72h (11.8 °C)		
FR_FRABCH+20Cu	12-2763-5905	10 Aug-21	11 Aug-21	72h (14.6 °C)		
FR_FRCP1+20Cu	05-5162-7629	10 Aug-21	11 Aug-21	72h (13.8 °C)		
GH_FR1+20Cu	18-3989-2491	10 Aug-21	11 Aug-21	72h (12 °C)		
GH_ERC+10Cu	14-6940-9296	10 Aug-21	11 Aug-21	72h (15.4 °C)		
CM_MC2+20Cu	17-0166-2336	10 Aug-21	11 Aug-21	72h (13.1 °C)		
RG_MIDAG+15Cu	18-0148-8949	10 Aug-21	11 Aug-21	72h (12.4 °C)		
EV_MC2+20Cu	08-5423-9441	10 Aug-21	11 Aug-21	72h (13.1 °C)		
EV_HC1+20Cu	19-8320-0922	10 Aug-21	11 Aug-21	72h (12.1 °C)		
LC_DCDS+20Cu	12-7443-1043	10 Aug-21	11 Aug-21	72h (12.3 °C)		
LC_LC3+15Cu	06-5017-0795	10 Aug-21	11 Aug-21	72h (12.4 °C)		
LC_LC5+15Cu	10-4683-7945	10 Aug-21	11 Aug-21	72h (15.1 °C)		
LC_LCDSSLCC	11-9856-2953	10 Aug-21	11 Aug-21	72h (10.8 °C)		
FR_FR4+15Cu	16-1388-5677	10 Aug-21	11 Aug-21	72h (14.1 °C)		
FR_FRRD+15Cu	18-8883-2370	10 Aug-21	11 Aug-21	72h (14.7 °C)		
FR_FR2+20Cu	20-1752-8591	10 Aug-21	11 Aug-21	72h (15.3 °C)		
FR_MULTIPLATE	15-0654-9876	10 Aug-21	11 Aug-21	72h (13.6 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
Lab Control FM	Ambient Sample	Teck Coal Ltd	Lab Control FM	
10Cu Control	Ambient Sample	Teck Coal Ltd	10 Cu Control	
15 Cu Control	Ambient Sample	Teck Coal Ltd	15 Cu Control	
20 Cu Control	Ambient Sample	Teck Coal Ltd	20 Cu Control	
FR_UFR1+15Cu	Ambient Sample	Teck Coal Ltd	FR_UFR1_MON_2021-08-0	
GH_ER2+15Cu	Ambient Sample	Teck Coal Ltd	GH_ER2_WS_2021-08-10_	
CM_MC1+15Cu	Ambient Sample	Teck Coal Ltd	CM_MC1_WS_2021-08-10	
LC_SLC+10Cu	Ambient Sample	Teck Coal Ltd	LC_SLC_WS_2021-08-10_	
FR_FRABCH+20Cu	Ambient Sample	Teck Coal Ltd	FR_FRABCH_MON_2021-	
FR_FRCP1+20Cu	Ambient Sample	Teck Coal Ltd	FR_FRCP1_MON_2021-08	
GH_FR1+20Cu	Ambient Sample	Teck Coal Ltd	GH_FR1_WS_2021-08-10_	
GH_ERC+10Cu	Ambient Sample	Teck Coal Ltd	GH_ERC_WS_2021-08-10	
CM_MC2+20Cu	Ambient Sample	Teck Coal Ltd	CM_MC2_WS_2021-08-10	
RG_MIDAG+15Cu	Ambient Sample	Teck Coal Ltd	RG_MIDAG_WS_2021-08-	
EV_MC2+20Cu	Ambient Sample	Teck Coal Ltd	EV_MC2_WS_2021_Q3_W	
EV_HC1+20Cu	Ambient Sample	Teck Coal Ltd	EV_HC1_WS_2021_Q3_W	
LC_DCDS+20Cu	Ambient Sample	Teck Coal Ltd	LC_DCDS_WS_2021-08-1	
LC_LC3+15Cu	Ambient Sample	Teck Coal Ltd	LC_LC3_WS_2021-08-10_	
LC_LC5+15Cu	Ambient Sample	Teck Coal Ltd	LC_LC5_WS_2021-08-10_	
LC_LCDSSLCC	Ambient Sample	Teck Coal Ltd	LC_LCDSSLCC_WS_2021-	
FR_FR4+15Cu	Ambient Sample	Teck Coal Ltd	FR_FR4_WS_2021-08-10_	
FR_FRRD+15Cu	Ambient Sample	Teck Coal Ltd	FR_FRRD_WS_2021-08-1	

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NOV 09 2021

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID:	02-0326-0644	**Endpoint:**	Length	**CETIS Version:**	CETISv1.9.4
Analyzed:	02 Nov-21 14:27	**Analysis:**	Parametric-Control vs Treatments	**Status Level:**	1

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_FR2+20Cu	Ambient Sample	Teck Coal Ltd	FR_FR2_WS_2021-08-10_	
FR_MULTIPLATE	Ambient Sample	Teck Coal Ltd	FR_MULTIPLATE_WS_20	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	Lab Control FM passed length	12.63%
		10Cu Control passed length	12.63%
		15 Cu Control passed length	12.63%
		20 Cu Control passed length	12.63%
		FR_UFR1+15Cu passed length	12.63%
		CM_MC1+15Cu passed length	12.63%
		LC_SLC+10Cu passed length	12.63%
		FR_FRABCH+20Cu passed length	12.63%
		FR_FRCP1+20Cu passed length	12.63%
		GH_FR1+20Cu passed length	12.63%
		GH_ERC+10Cu passed length	12.63%
		CM_MC2+20Cu passed length	12.63%
		RG_MIDAG+15Cu passed length	12.63%
		EV_MC2+20Cu passed length	12.63%
		EV_HC1+20Cu passed length	12.63%
		LC_DCDS+20Cu passed length	12.63%
		LC_LC3+15Cu passed length	12.63%
		LC_LC5+15Cu passed length	12.63%
		LC_LCDSSLCC passed length	12.63%
		FR_FR4+15Cu passed length	12.63%
		FR_FRRD+15Cu passed length	12.63%
		FR_FR2+20Cu passed length	12.63%
		FR_MULTIPLATE passed length	12.63%

Dunnett Multiple Comparison Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Site Control		Lab Control FM	-1.462	2.744	1.408	6	CDF	0.9998	Non-Significant Effect
GH - ERZ		10Cu Control	-2.485	2.744	1.408	6	CDF	1.0000	Non-Significant Effect
		15 Cu Control	-2.387	2.744	1.408	6	CDF	1.0000	Non-Significant Effect
		20 Cu Control	-3.654	2.744	1.408	6	CDF	1.0000	Non-Significant Effect
		FR_UFR1+15Cu	-1.072	2.744	1.408	6	CDF	0.9990	Non-Significant Effect
		CM_MC1+15Cu	0.3898	2.744	1.408	6	CDF	0.8909	Non-Significant Effect
		LC_SLC+10Cu	-1.462	2.744	1.408	6	CDF	0.9998	Non-Significant Effect
		FR_FRABCH+20Cu	-1.072	2.744	1.408	6	CDF	0.9990	Non-Significant Effect
		FR_FRCP1+20Cu	0.7796	2.744	1.408	6	CDF	0.7684	Non-Significant Effect
		GH_FR1+20Cu	0.3898	2.744	1.408	6	CDF	0.8909	Non-Significant Effect
		GH_ERC+10Cu	-3.021	2.744	1.408	6	CDF	1.0000	Non-Significant Effect
		CM_MC2+20Cu	-2.534	2.744	1.408	6	CDF	1.0000	Non-Significant Effect
		RG_MIDAG+15Cu	0.1462	2.744	1.408	6	CDF	0.9387	Non-Significant Effect
		EV_MC2+20Cu	0.6821	2.744	1.408	6	CDF	0.8045	Non-Significant Effect
		EV_HC1+20Cu	-1.998	2.744	1.408	6	CDF	1.0000	Non-Significant Effect
		LC_DCDS+20Cu	-2.29	2.744	1.408	6	CDF	1.0000	Non-Significant Effect
		LC_LC3+15Cu	-1.998	2.744	1.408	6	CDF	1.0000	Non-Significant Effect
		LC_LC5+15Cu	-2.875	2.744	1.408	6	CDF	1.0000	Non-Significant Effect
		LC_LCDSSLCC	-1.803	2.744	1.408	6	CDF	1.0000	Non-Significant Effect
		FR_FR4+15Cu	-0.1462	2.744	1.408	6	CDF	0.9725	Non-Significant Effect
		FR_FRRD+15Cu	0.4872	2.744	1.408	6	CDF	0.8658	Non-Significant Effect
		FR_FR2+20Cu	-0.2923	2.744	1.408	6	CDF	0.9824	Non-Significant Effect
		FR_MULTIPLATE	0.04872	2.744	1.408	6	CDF	0.9525	Non-Significant Effect

Auxiliary Tests

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NOV 09 2021

Fathead minnow 32-d (Pimephales promelas) survival and growth test **Nautilus Environmental Calgary**

Analysis ID: 02-0326-0644 **Endpoint:** Length **CETIS Version:** CETISv1.9.4
Analyzed: 02 Nov-21 14:27 **Analysis:** Parametric-Control vs Treatments **Status Level:** 1

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	3.285	3.37	0.0706	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	44.2591	1.92431	23	3.654	1.3E-05	Significant Effect
Error	37.9125	0.526563	72			
Total	82.1716		95			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Variances	Bartlett Equality of Variance Test	33.4	35.17	0.0744	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9854	0.9737	0.3692	Normal Distribution

Length Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
Lab Control FM		4	11.9	11.15	12.65	11.95	11.3	12.4	0.2345	3.94%	0.00%
10Cu Control		4	12.43	11.66	13.19	12.55	11.8	12.8	0.2394	3.85%	-4.41%
15 Cu Control		4	12.37	10.89	13.86	12.35	11.4	13.4	0.4661	7.53%	-3.99%
20 Cu Control		4	13.03	12.67	13.38	13	12.8	13.3	0.1109	1.70%	-9.45%
FR_UFR1+15Cu		4	11.7	10.85	12.55	11.95	10.9	12	0.2677	4.58%	1.68%
GH_ER2+15Cu	XC	4	11.15	10.87	11.43	11.15	11	11.3	0.0866	1.55%	6.30%
CM_MC1+15Cu		4	10.95	10.06	11.84	11.05	10.2	11.5	0.2784	5.08%	7.98%
LC_SLC+10Cu		4	11.9	11.12	12.68	11.8	11.5	12.5	0.2449	4.12%	0.00%
FR_FRABCH+20Cu		4	11.7	10.38	13.02	11.65	10.8	12.7	0.4143	7.08%	1.68%
FR_FRCP1+20Cu		4	10.75	9.243	12.26	11	9.4	11.6	0.4735	8.81%	9.66%
GH_FR1+20Cu		4	10.95	10.33	11.57	10.95	10.5	11.4	0.1936	3.54%	7.98%
GH_ERC+10Cu		4	12.7	12.15	13.25	12.7	12.4	13	0.1732	2.73%	-6.72%
CM_MC2+20Cu		4	12.45	11.06	13.84	12.55	11.3	13.4	0.4368	7.02%	-4.62%
RG_MIDAG+15Cu		4	11.08	10.09	12.06	10.9	10.6	11.9	0.3092	5.58%	6.93%
EV_MC2+20Cu		4	10.8	9.236	12.36	10.6	9.9	12.1	0.4916	9.10%	9.24%
EV_HC1+20Cu		4	12.18	9.553	14.8	12.55	10.1	13.5	0.824	13.54%	-2.31%
LC_DCDS+20Cu		4	12.33	11.45	13.2	12.45	11.6	12.8	0.275	4.46%	-3.57%
LC_LC3+15Cu		4	12.18	10.8	13.55	12.15	11.3	13.1	0.4308	7.08%	-2.31%
LC_LC5+15Cu		4	12.62	10.78	14.47	12.75	11.2	13.8	0.5808	9.20%	-6.09%
LC_LCDSSLCC		4	12.08	11.47	12.68	12.1	11.6	12.5	0.1887	3.13%	-1.47%
FR_FR4+15Cu		4	11.23	10.62	11.83	11.2	10.8	11.7	0.1887	3.36%	5.67%
FR_FRRD+15Cu		4	10.9	10.47	11.33	11	10.5	11.1	0.1354	2.48%	8.40%
FR_FR2+20Cu		4	11.3	10.58	12.02	11.2	10.9	11.9	0.2273	4.02%	5.04%
FR_MULTIPLATE		4	11.12	9.736	12.51	11	10.2	12.3	0.4366	7.85%	6.51%

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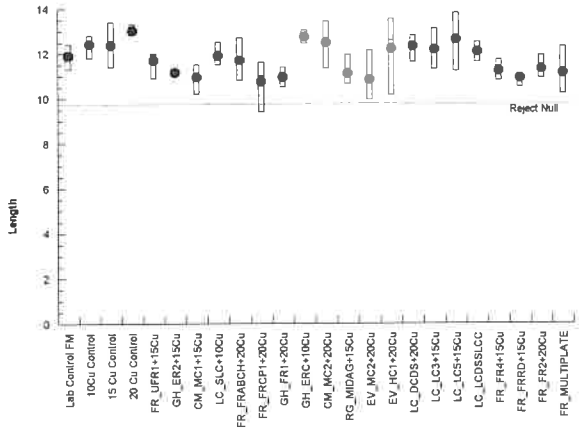
Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

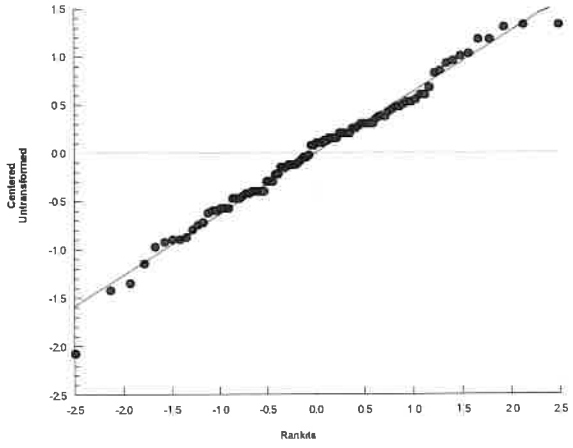
Analysis ID: 02-0326-0644 **Endpoint:** Length **CETIS Version:** CETISv1.9.4
Analyzed: 02 Nov-21 14:27 **Analysis:** Parametric-Control vs Treatments **Status Level:** 1

Length Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Lab Control FM		12.4	11.3	12.1	11.8
10Cu Control		11.8	12.3	12.8	12.8
15 Cu Control		12.9	11.8	13.4	11.4
20 Cu Control		13.3	12.9	12.8	13.1
FR_UFR1+15Cu		11.9	10.9	12	12
GH_ER2+15Cu	XC	11.3	11.3	11	11
CM_MC1+15Cu		11.5	10.9	11.2	10.2
LC_SLC+10Cu		11.5	12.5	12.1	11.5
FR_FRABCH+20Cu		12.7	12	10.8	11.3
FR_FRCP1+20Cu		11.1	10.9	9.4	11.6
GH_FR1+20Cu		11.1	10.5	10.8	11.4
GH_ERC+10Cu		13	12.4	12.4	13
CM_MC2+20Cu		12.7	11.3	12.4	13.4
RG_MIDAG+15Cu		10.6	10.6	11.2	11.9
EV_MC2+20Cu		9.9	10.2	11	12.1
EV_HC1+20Cu		13.5	11.6	13.5	10.1
LC_DCDS+20Cu		12.7	12.8	12.2	11.6
LC_LC3+15Cu		12.7	13.1	11.3	11.6
LC_LC5+15Cu		11.2	13.3	12.2	13.8
LC_LCDSSLCC		12.2	12	11.6	12.5
FR_FR4+15Cu		11.3	10.8	11.1	11.7
FR_FRRD+15Cu		10.5	11	11	11.1
FR_FR2+20Cu		11	11.9	11.4	10.9
FR_MULTIPLATE		11.1	12.3	10.2	10.9

Graphics





Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID:	06-3715-4917	**Endpoint:**	Proportion Normal	**CETIS Version:**	CETISv1.9.4
Analyzed:	02 Nov-21 14:29	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1
Batch ID:	19-0275-1751	**Test Type:**	32 Day Fathead Minnow Test	**Analyst:**	Kayla Knol
Start Date:	13 Aug-21	**Protocol:**	ASTM E1241-05 (2013)	**Diluent:**	Dechlorinated Tap Water
Ending Date:	13 Sep-21	**Species:**	Pimephales promelas	**Brine:**	
Test Length:	31d 0h	**Taxon:**	Actinopterygii	**Source:**	Aquatox, AR **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
Lab Control FM	11-5032-4817	10 Aug-21	11 Aug-21	72h	Teck Coal Ltd	
10Cu Control	04-3348-8996	10 Aug-21	11 Aug-21	72h		
15 Cu Control	05-5139-9319	10 Aug-21	11 Aug-21	72h		
20 Cu Control	18-8853-3252	10 Aug-21	11 Aug-21	72h		
FR_UFR1+15Cu	13-9616-5903	10 Aug-21	11 Aug-21	72h (14.7 °C)		
GH_ER2+15Cu	19-5052-7846	10 Aug-21	11 Aug-21	72h (12.1 °C)		
CM_MC1+15Cu	15-1448-1664	10 Aug-21	11 Aug-21	72h (12.3 °C)		
LC_SLC+10Cu	10-0118-5065	10 Aug-21	11 Aug-21	72h (11.8 °C)		
FR_FRABCH+20Cu	12-2763-5905	10 Aug-21	11 Aug-21	72h (14.6 °C)		
FR_FRCP1+20Cu	05-5162-7629	10 Aug-21	11 Aug-21	72h (13.8 °C)		
GH_FR1+20Cu	18-3989-2491	10 Aug-21	11 Aug-21	72h (12 °C)		
GH_ERC+10Cu	14-6940-9296	10 Aug-21	11 Aug-21	72h (15.4 °C)		
CM_MC2+20Cu	17-0166-2336	10 Aug-21	11 Aug-21	72h (13.1 °C)		
RG_MIDAG+15Cu	18-0148-8949	10 Aug-21	11 Aug-21	72h (12.4 °C)		
EV_MC2+20Cu	08-5423-9441	10 Aug-21	11 Aug-21	72h (13.1 °C)		
EV_HC1+20Cu	19-8320-0922	10 Aug-21	11 Aug-21	72h (12.1 °C)		
LC_DCDS+20Cu	12-7443-1043	10 Aug-21	11 Aug-21	72h (12.3 °C)		
LC_LC3+15Cu	06-5017-0795	10 Aug-21	11 Aug-21	72h (12.4 °C)		
LC_LC5+15Cu	10-4683-7945	10 Aug-21	11 Aug-21	72h (15.1 °C)		
LC_LCDSSLCC	11-9856-2953	10 Aug-21	11 Aug-21	72h (10.8 °C)		
FR_FR4+15Cu	16-1388-5677	10 Aug-21	11 Aug-21	72h (14.1 °C)		
FR_FRRD+15Cu	18-8883-2370	10 Aug-21	11 Aug-21	72h (14.7 °C)		
FR_FR2+20Cu	20-1752-8591	10 Aug-21	11 Aug-21	72h (15.3 °C)		
FR_MULTIPLATE	15-0654-9876	10 Aug-21	11 Aug-21	72h (13.6 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
Lab Control FM	Ambient Sample	Teck Coal Ltd	Lab Control FM	
10Cu Control	Ambient Sample	Teck Coal Ltd	10 Cu Control	
15 Cu Control	Ambient Sample	Teck Coal Ltd	15 Cu Control	
20 Cu Control	Ambient Sample	Teck Coal Ltd	20 Cu Control	
FR_UFR1+15Cu	Ambient Sample	Teck Coal Ltd	FR_UFR1_MON_2021-08-0	
GH_ER2+15Cu	Ambient Sample	Teck Coal Ltd	GH_ER2_WS_2021-08-10_	
CM_MC1+15Cu	Ambient Sample	Teck Coal Ltd	CM_MC1_WS_2021-08-10	
LC_SLC+10Cu	Ambient Sample	Teck Coal Ltd	LC_SLC_WS_2021-08-10_	
FR_FRABCH+20Cu	Ambient Sample	Teck Coal Ltd	FR_FRABCH_MON_2021-	
FR_FRCP1+20Cu	Ambient Sample	Teck Coal Ltd	FR_FRCP1_MON_2021-08	
GH_FR1+20Cu	Ambient Sample	Teck Coal Ltd	GH_FR1_WS_2021-08-10_	
GH_ERC+10Cu	Ambient Sample	Teck Coal Ltd	GH_ERC_WS_2021-08-10	
CM_MC2+20Cu	Ambient Sample	Teck Coal Ltd	CM_MC2_WS_2021-08-10	
RG_MIDAG+15Cu	Ambient Sample	Teck Coal Ltd	RG_MIDAG_WS_2021-08-	
EV_MC2+20Cu	Ambient Sample	Teck Coal Ltd	EV_MC2_WS_2021_Q3_W	
EV_HC1+20Cu	Ambient Sample	Teck Coal Ltd	EV_HC1_WS_2021_Q3_W	
LC_DCDS+20Cu	Ambient Sample	Teck Coal Ltd	LC_DCDS_WS_2021-08-1	
LC_LC3+15Cu	Ambient Sample	Teck Coal Ltd	LC_LC3_WS_2021-08-10_	
LC_LC5+15Cu	Ambient Sample	Teck Coal Ltd	LC_LC5_WS_2021-08-10_	
LC_LCDSSLCC	Ambient Sample	Teck Coal Ltd	LC_LCDSSLCC_WS_2021-	
FR_FR4+15Cu	Ambient Sample	Teck Coal Ltd	FR_FR4_WS_2021-08-10_	
FR_FRRD+15Cu	Ambient Sample	Teck Coal Ltd	FR_FRRD_WS_2021-08-1	

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Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID:	06-3715-4917	**Endpoint:**	Proportion Normal	**CETIS Version:**	CETISv1.9.4
Analyzed:	02 Nov-21 14:29	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_FR2+20Cu	Ambient Sample	Teck Coal Ltd	FR_FR2_WS_2021-08-10_	
FR_MULTIPLATE	Ambient Sample	Teck Coal Ltd	FR_MULTIPLATE_WS_20	

Fisher Exact/Bonferroni Adj Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
Site Control		Lab Control FM	1.0000	Exact	1.0000	Non-Significant Effect
GH-ERZ		10Cu Control	0.7735	Exact	1.0000	Non-Significant Effect
		15 Cu Control	0.7291	Exact	1.0000	Non-Significant Effect
		20 Cu Control	0.4828	Exact	1.0000	Non-Significant Effect
		FR_UFR1+15Cu	1.0000	Exact	1.0000	Non-Significant Effect
		CM_MC1+15Cu	0.6703	Exact	1.0000	Non-Significant Effect
		LC_SLC+10Cu	0.7686	Exact	1.0000	Non-Significant Effect
		FR_FRABCH+20Cu	1.0000	Exact	1.0000	Non-Significant Effect
		FR_FRCP1+20Cu	0.5083	Exact	1.0000	Non-Significant Effect
		GH_FR1+20Cu	0.3250	Exact	1.0000	Non-Significant Effect
		GH_ERC+10Cu	0.7019	Exact	1.0000	Non-Significant Effect
		CM_MC2+20Cu	1.0000	Exact	1.0000	Non-Significant Effect
		RG_MIDAG+15Cu	0.1874	Exact	1.0000	Non-Significant Effect
		EV_MC2+20Cu	0.2084	Exact	1.0000	Non-Significant Effect
		EV_HC1+20Cu	0.6526	Exact	1.0000	Non-Significant Effect
		LC_DCDS+20Cu	0.4554	Exact	1.0000	Non-Significant Effect
		LC_LC3+15Cu	0.4647	Exact	1.0000	Non-Significant Effect
		LC_LC5+15Cu	0.7227	Exact	1.0000	Non-Significant Effect
		LC_LCDSSLCC	0.6703	Exact	1.0000	Non-Significant Effect
		FR_FR4+15Cu	0.1454	Exact	1.0000	Non-Significant Effect
		FR_FRRD+15Cu	0.7829	Exact	1.0000	Non-Significant Effect
		FR_FR2+20Cu	0.7735	Exact	1.0000	Non-Significant Effect
		FR_MULTIPLATE	0.7354	Exact	1.0000	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	2.949	3.37	0.2489	No Outliers Detected

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Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 06-3715-4917 **Endpoint:** Proportion Normal **CETIS Version:** CETISv1.9.4
Analyzed: 02 Nov-21 14:29 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Data Summary

Sample	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
Lab Control FM		50	0	50	1	0	-2.27%
10Cu Control		48	1	49	0.9796	0.02041	-0.19%
15 Cu Control		40	1	41	0.9756	0.02439	0.22%
20 Cu Control		41	2	43	0.9535	0.04651	2.48%
FR_UFR1+15Cu		31	0	31	1	0	-2.27%
GH_ER2+15Cu	XC	44	1	45	0.9778	0.02222	0.0%
CM_MC1+15Cu		32	1	33	0.9697	0.0303	0.83%
LC_SLC+10Cu		47	1	48	0.9792	0.02083	-0.14%
FR_FRABCH+20Cu		41	0	41	1	0	-2.27%
FR_FRCP1+20Cu		44	2	46	0.9565	0.04348	2.17%
GH_FR1+20Cu		44	3	47	0.9362	0.06383	4.26%
GH_ERC+10Cu		36	1	37	0.973	0.02703	0.49%
CM_MC2+20Cu		40	0	40	1	0	-2.27%
RG_MIDAG+15Cu		42	4	46	0.913	0.08696	6.62%
EV_MC2+20Cu		45	4	49	0.9184	0.08163	6.08%
EV_HC1+20Cu		30	1	31	0.9677	0.03226	1.03%
LC_DCDS+20Cu		38	2	40	0.95	0.05	2.84%
LC_LC3+15Cu		39	2	41	0.9512	0.04878	2.72%
LC_LC5+15Cu		39	1	40	0.975	0.025	0.28%
LC_LCDSSLCC		32	1	33	0.9697	0.0303	0.83%
FR_FR4+15Cu		36	4	40	0.9	0.1	7.96%
FR_FRRD+15Cu		50	1	51	0.9804	0.01961	-0.27%
FR_FR2+20Cu		48	1	49	0.9796	0.02041	-0.19%
FR_MULTIPLATE		41	1	42	0.9762	0.02381	0.16%

Proportion Normal Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Lab Control FM		1.0000	1.0000	1.0000	1.0000
10Cu Control		1.0000	1.0000	1.0000	0.9231
15 Cu Control		1.0000	1.0000	1.0000	0.9286
20 Cu Control		1.0000	0.8750	1.0000	0.8889
FR_UFR1+15Cu		1.0000	1.0000	1.0000	1.0000
GH_ER2+15Cu	XC	0.9167	1.0000	1.0000	1.0000
CM_MC1+15Cu		1.0000	1.0000	1.0000	0.8000
LC_SLC+10Cu		0.9167	1.0000	1.0000	1.0000
FR_FRABCH+20Cu		1.0000	1.0000	1.0000	1.0000
FR_FRCP1+20Cu		0.9167	1.0000	0.8889	1.0000
GH_FR1+20Cu		1.0000	0.9167	0.8333	1.0000
GH_ERC+10Cu		1.0000	0.8889	1.0000	1.0000
CM_MC2+20Cu		1.0000	1.0000	1.0000	1.0000
RG_MIDAG+15Cu		0.8462	0.9000	1.0000	0.9000
EV_MC2+20Cu		0.8462	0.9231	0.9231	1.0000
EV_HC1+20Cu		1.0000	1.0000	1.0000	0.9333
LC_DCDS+20Cu		0.8571	1.0000	0.9091	1.0000
LC_LC3+15Cu		1.0000	1.0000	0.9167	0.9091
LC_LC5+15Cu		0.9231	1.0000	1.0000	1.0000
LC_LCDSSLCC		1.0000	1.0000	1.0000	0.9000
FR_FR4+15Cu		1.0000	0.7500	1.0000	0.9091
FR_FRRD+15Cu		1.0000	0.9167	1.0000	1.0000
FR_FR2+20Cu		1.0000	1.0000	1.0000	0.9286
FR_MULTIPLATE		0.9000	1.0000	1.0000	1.0000

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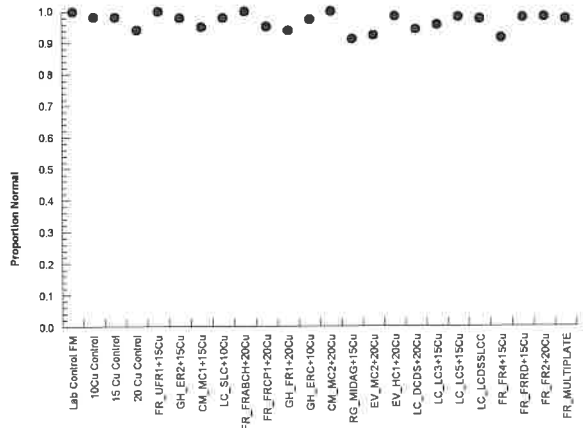
Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 06-3715-4917 **Endpoint:** Proportion Normal **CETIS Version:** CETISv1.9.4
Analyzed: 02 Nov-21 14:29 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Proportion Normal Binomials

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Lab Control FM		12/12	14/14	11/11	13/13
10Cu Control		12/12	12/12	12/12	12/13
15 Cu Control		11/11	8/8	8/8	13/14
20 Cu Control		12/12	7/8	14/14	8/9
FR_UFR1+15Cu		8/8	11/11	3/3	9/9
GH_ER2+15Cu	XC	11/12	13/13	8/8	12/12
CM_MC1+15Cu		8/8	9/9	11/11	4/5
LC_SLC+10Cu		11/12	11/11	12/12	13/13
FR_FRABCH+20Cu		9/9	9/9	11/11	12/12
FR_FRCP1+20Cu		11/12	14/14	8/9	11/11
GH_FR1+20Cu		12/12	11/12	10/12	11/11
GH_ERC+10Cu		9/9	8/9	11/11	8/8
CM_MC2+20Cu		7/7	15/15	11/11	7/7
RG_MIDAG+15Cu		11/13	9/10	13/13	9/10
EV_MC2+20Cu		11/13	12/13	12/13	10/10
EV_HC1+20Cu		4/4	8/8	4/4	14/15
LC_DCDS+20Cu		6/7	8/8	10/11	14/14
LC_LC3+15Cu		10/10	8/8	11/12	10/11
LC_LC5+15Cu		12/13	7/7	12/12	8/8
LC_LCDSSLCC		9/9	6/6	8/8	9/10
FR_FR4+15Cu		9/9	9/12	8/8	10/11
FR_FRRD+15Cu		13/13	11/12	13/13	13/13
FR_FR2+20Cu		14/14	10/10	11/11	13/14
FR_MULTIPLATE		9/10	6/6	13/13	13/13

Graphics



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NOV 09 2021

CETIS Analytical Report

Test Code/ID: FM Lab Control / 06-2855-8538

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID:	05-1168-2155	**Endpoint:**	Post Hatch Survival	**CETIS Version:**	CETISv1.9.4
Analyzed:	02 Nov-21 14:28	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1
Batch ID:	19-0275-1751	**Test Type:**	32 Day Fathead Minnow Test	**Analyst:**	Kayla Knol
Start Date:	13 Aug-21	**Protocol:**	ASTM E1241-05 (2013)	**Diluent:**	Dechlorinated Tap Water
Ending Date:	13 Sep-21	**Species:**	Pimephales promelas	**Brine:**	
Test Length:	31d 0h	**Taxon:**	Actinopterygii	**Source:**	Aquatox, AR **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
Lab Control FM	11-5032-4817	10 Aug-21	11 Aug-21	72h	Teck Coal Ltd	
10Cu Control	04-3348-8996	10 Aug-21	11 Aug-21	72h		
15 Cu Control	05-5139-9319	10 Aug-21	11 Aug-21	72h		
20 Cu Control	18-8853-3252	10 Aug-21	11 Aug-21	72h		
FR_UFR1+15Cu	13-9616-5903	10 Aug-21	11 Aug-21	72h (14.7 °C)		
GH_ER2+15Cu	19-5052-7846	10 Aug-21	11 Aug-21	72h (12.1 °C)		
CM_MC1+15Cu	15-1448-1664	10 Aug-21	11 Aug-21	72h (12.3 °C)		
LC_SLC+10Cu	10-0118-5065	10 Aug-21	11 Aug-21	72h (11.8 °C)		
FR_FRABCH+20Cu	12-2763-5905	10 Aug-21	11 Aug-21	72h (14.6 °C)		
FR_FRCP1+20Cu	05-5162-7629	10 Aug-21	11 Aug-21	72h (13.8 °C)		
GH_FR1+20Cu	18-3989-2491	10 Aug-21	11 Aug-21	72h (12 °C)		
GH_ERC+10Cu	14-6940-9296	10 Aug-21	11 Aug-21	72h (15.4 °C)		
CM_MC2+20Cu	17-0166-2336	10 Aug-21	11 Aug-21	72h (13.1 °C)		
RG_MIDAG+15Cu	18-0148-8949	10 Aug-21	11 Aug-21	72h (12.4 °C)		
EV_MC2+20Cu	08-5423-9441	10 Aug-21	11 Aug-21	72h (13.1 °C)		
EV_HC1+20Cu	19-8320-0922	10 Aug-21	11 Aug-21	72h (12.1 °C)		
LC_DCDS+20Cu	12-7443-1043	10 Aug-21	11 Aug-21	72h (12.3 °C)		
LC_LC3+15Cu	06-5017-0795	10 Aug-21	11 Aug-21	72h (12.4 °C)		
LC_LC5+15Cu	10-4683-7945	10 Aug-21	11 Aug-21	72h (15.1 °C)		
LC_LCDSSLCC	11-9856-2953	10 Aug-21	11 Aug-21	72h (10.8 °C)		
FR_FR4+15Cu	16-1388-5677	10 Aug-21	11 Aug-21	72h (14.1 °C)		
FR_FRRD+15Cu	18-8883-2370	10 Aug-21	11 Aug-21	72h (14.7 °C)		
FR_FR2+20Cu	20-1752-8591	10 Aug-21	11 Aug-21	72h (15.3 °C)		
FR_MULTIPLATE	15-0654-9876	10 Aug-21	11 Aug-21	72h (13.6 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
Lab Control FM	Ambient Sample	Teck Coal Ltd	Lab Control FM	
10Cu Control	Ambient Sample	Teck Coal Ltd	10 Cu Control	
15 Cu Control	Ambient Sample	Teck Coal Ltd	15 Cu Control	
20 Cu Control	Ambient Sample	Teck Coal Ltd	20 Cu Control	
FR_UFR1+15Cu	Ambient Sample	Teck Coal Ltd	FR_UFR1_MON_2021-08-0	
GH_ER2+15Cu	Ambient Sample	Teck Coal Ltd	GH_ER2_WS_2021-08-10_	
CM_MC1+15Cu	Ambient Sample	Teck Coal Ltd	CM_MC1_WS_2021-08-10	
LC_SLC+10Cu	Ambient Sample	Teck Coal Ltd	LC_SLC_WS_2021-08-10_	
FR_FRABCH+20Cu	Ambient Sample	Teck Coal Ltd	FR_FRABCH_MON_2021-	
FR_FRCP1+20Cu	Ambient Sample	Teck Coal Ltd	FR_FRCP1_MON_2021-08	
GH_FR1+20Cu	Ambient Sample	Teck Coal Ltd	GH_FR1_WS_2021-08-10_	
GH_ERC+10Cu	Ambient Sample	Teck Coal Ltd	GH_ERC_WS_2021-08-10	
CM_MC2+20Cu	Ambient Sample	Teck Coal Ltd	CM_MC2_WS_2021-08-10	
RG_MIDAG+15Cu	Ambient Sample	Teck Coal Ltd	RG_MIDAG_WS_2021-08-	
EV_MC2+20Cu	Ambient Sample	Teck Coal Ltd	EV_MC2_WS_2021_Q3_W	
EV_HC1+20Cu	Ambient Sample	Teck Coal Ltd	EV_HC1_WS_2021_Q3_W	
LC_DCDS+20Cu	Ambient Sample	Teck Coal Ltd	LC_DCDS_WS_2021-08-1	
LC_LC3+15Cu	Ambient Sample	Teck Coal Ltd	LC_LC3_WS_2021-08-10_	
LC_LC5+15Cu	Ambient Sample	Teck Coal Ltd	LC_LC5_WS_2021-08-10_	
LC_LCDSSLCC	Ambient Sample	Teck Coal Ltd	LC_LCDSSLCC_WS_2021-	
FR_FR4+15Cu	Ambient Sample	Teck Coal Ltd	FR_FR4_WS_2021-08-10_	
FR_FRRD+15Cu	Ambient Sample	Teck Coal Ltd	FR_FRRD_WS_2021-08-1	

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Analyst: KL QA: NOV 09 2021

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID:	05-1168-2155	**Endpoint:**	Post Hatch Survival	**CETIS Version:**	CETISv1.9.4
Analyzed:	02 Nov-21 14:28	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_FR2+20Cu	Ambient Sample	Teck Coal Ltd	FR_FR2_WS_2021-08-10_	
FR_MULTIPLATE	Ambient Sample	Teck Coal Ltd	FR_MULTIPLATE_WS_20	

Fisher Exact/Bonferroni Adj Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
Site Control		Lab Control FM	0.8536	Exact	1.0000	Non-Significant Effect
GHL ERZ		10Cu Control	0.7881	Exact	1.0000	Non-Significant Effect
		15 Cu Control	0.2107	Exact	1.0000	Non-Significant Effect
		20 Cu Control	0.4119	Exact	1.0000	Non-Significant Effect
		FR_UFR1+15Cu	0.0065	Exact	0.1490	Non-Significant Effect
		CM_MC1+15Cu	0.0430	Exact	0.9879	Non-Significant Effect
		LC_SLC+10Cu	0.8830	Exact	1.0000	Non-Significant Effect
		FR_FRABCH+20Cu	0.3715	Exact	1.0000	Non-Significant Effect
		FR_FRCP1+20Cu	0.6092	Exact	1.0000	Non-Significant Effect
		GH_FR1+20Cu	0.6957	Exact	1.0000	Non-Significant Effect
		GH_ERC+10Cu	0.0720	Exact	1.0000	Non-Significant Effect
		CM_MC2+20Cu	0.1256	Exact	1.0000	Non-Significant Effect
		RG_MIDAG+15Cu	0.6092	Exact	1.0000	Non-Significant Effect
		EV_MC2+20Cu	0.8436	Exact	1.0000	Non-Significant Effect
		EV_HC1+20Cu	0.0170	Exact	0.3917	Non-Significant Effect
		LC_DCDS+20Cu	0.0996	Exact	1.0000	Non-Significant Effect
		LC_LC3+15Cu	0.1376	Exact	1.0000	Non-Significant Effect
		LC_LC5+15Cu	0.1256	Exact	1.0000	Non-Significant Effect
		LC_LCDSSLCC	0.0095	Exact	0.2192	Non-Significant Effect
		FR_FR4+15Cu	0.1950	Exact	1.0000	Non-Significant Effect
		FR_FRRD+15Cu	0.9059	Exact	1.0000	Non-Significant Effect
		FR_FR2+20Cu	0.8436	Exact	1.0000	Non-Significant Effect
		FR_MULTIPLATE	0.6067	Exact	1.0000	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	3.147	3.37	0.1204	No Outliers Detected

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Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 05-1168-2155 **Endpoint:** Post Hatch Survival **CETIS Version:** CETISv1.9.4
Analyzed: 02 Nov-21 14:28 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Data Summary

Sample	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
Lab Control FM		50	9	59	0.8475	0.1525	-7.35%
10Cu Control		49	10	59	0.8305	0.1695	-5.2%
15 Cu Control		41	17	58	0.7069	0.2931	10.46%
20 Cu Control		43	14	57	0.7544	0.2456	4.44%
FR_UFR1+15Cu		31	25	56	0.5536	0.4464	29.88%
GH_ER2+15Cu	XC	45	12	57	0.7895	0.2105	0.0%
CM_MC1+15Cu		33	20	53	0.6226	0.3774	21.13%
LC_SLC+10Cu		48	8	56	0.8571	0.1429	-8.57%
FR_FRABCH+20Cu		41	14	55	0.7455	0.2545	5.58%
FR_FRCP1+20Cu		46	12	58	0.7931	0.2069	-0.46%
GH_FR1+20Cu		47	11	58	0.8103	0.1897	-2.64%
GH_ERC+10Cu		37	20	57	0.6491	0.3509	17.78%
CM_MC2+20Cu		40	19	59	0.678	0.322	14.12%
RG_MIDAG+15Cu		46	12	58	0.7931	0.2069	-0.46%
EV_MC2+20Cu		49	9	58	0.8448	0.1552	-7.01%
EV_HC1+20Cu		31	22	53	0.5849	0.4151	25.91%
LC_DCDS+20Cu		40	20	60	0.6667	0.3333	15.56%
LC_LC3+15Cu		41	19	60	0.6833	0.3167	13.44%
LC_LC5+15Cu		40	19	59	0.678	0.322	14.12%
LC_LCDSSLCC		33	25	58	0.569	0.431	27.93%
FR_FR4+15Cu		40	17	57	0.7018	0.2982	11.11%
FR_FRRD+15Cu		51	8	59	0.8644	0.1356	-9.49%
FR_FR2+20Cu		49	9	58	0.8448	0.1552	-7.01%
FR_MULTIPLATE		42	11	53	0.7925	0.2075	-0.38%

Post Hatch Survival Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Lab Control FM		0.8571	0.9333	0.7333	0.8667
10Cu Control		0.8000	0.8000	0.8571	0.8667
15 Cu Control		0.7333	0.5714	0.5333	1.0000
20 Cu Control		0.8571	0.5714	0.9333	0.6429
FR_UFR1+15Cu		0.5714	0.7333	0.2143	0.6923
GH_ER2+15Cu	XC	0.8000	0.9286	0.6154	0.8000
CM_MC1+15Cu		0.6154	0.6429	0.8462	0.3846
LC_SLC+10Cu		0.8571	0.7857	0.8571	0.9286
FR_FRABCH+20Cu		0.6923	0.6923	0.7333	0.8571
FR_FRCP1+20Cu		0.8000	1.0000	0.6429	0.7333
GH_FR1+20Cu		0.8000	0.8000	0.8000	0.8462
GH_ERC+10Cu		0.6429	0.6000	0.8462	0.5333
CM_MC2+20Cu		0.5000	1.0000	0.7333	0.4667
RG_MIDAG+15Cu		0.8667	0.6667	0.8667	0.7692
EV_MC2+20Cu		0.8667	0.8667	0.9286	0.7143
EV_HC1+20Cu		0.3077	0.6667	0.3077	1.0000
LC_DCDS+20Cu		0.4667	0.5333	0.7333	0.9333
LC_LC3+15Cu		0.6667	0.5333	0.8000	0.7333
LC_LC5+15Cu		0.8667	0.4667	0.8000	0.5714
LC_LCDSSLCC		0.6429	0.4000	0.5333	0.7143
FR_FR4+15Cu		0.6000	0.8000	0.5333	0.9167
FR_FRRD+15Cu		0.8667	0.8000	0.8667	0.9286
FR_FR2+20Cu		1.0000	0.6667	0.7333	1.0000
FR_MULTIPLATE		0.8333	0.5000	0.8667	0.9286

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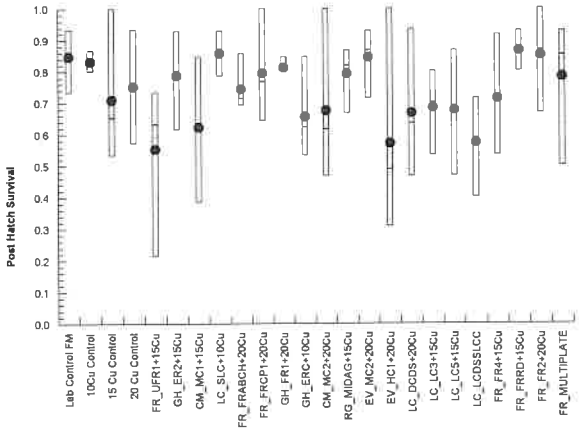
Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 05-1168-2155 **Endpoint:** Post Hatch Survival **CETIS Version:** CETISv1.9.4
Analyzed: 02 Nov-21 14:28 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Post Hatch Survival Binomials

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Lab Control FM		12/14	14/15	11/15	13/15
10Cu Control		12/15	12/15	12/14	13/15
15 Cu Control		11/15	8/14	8/15	14/14
20 Cu Control		12/14	8/14	14/15	9/14
FR_UFR1+15Cu		8/14	11/15	3/14	9/13
GH_ER2+15Cu	XC	12/15	13/14	8/13	12/15
CM_MC1+15Cu		8/13	9/14	11/13	5/13
LC_SLC+10Cu		12/14	11/14	12/14	13/14
FR_FRABCH+20Cu		9/13	9/13	11/15	12/14
FR_FRCP1+20Cu		12/15	14/14	9/14	11/15
GH_FR1+20Cu		12/15	12/15	12/15	11/13
GH_ERC+10Cu		9/14	9/15	11/13	8/15
CM_MC2+20Cu		7/14	15/15	11/15	7/15
RG_MIDAG+15Cu		13/15	10/15	13/15	10/13
EV_MC2+20Cu		13/15	13/15	13/14	10/14
EV_HC1+20Cu		4/13	8/12	4/13	15/15
LC_DCDS+20Cu		7/15	8/15	11/15	14/15
LC_LC3+15Cu		10/15	8/15	12/15	11/15
LC_LC5+15Cu		13/15	7/15	12/15	8/14
LC_LCDSSLCC		9/14	6/15	8/15	10/14
FR_FR4+15Cu		9/15	12/15	8/15	11/12
FR_FRRD+15Cu		13/15	12/15	13/15	13/14
FR_FR2+20Cu		14/14	10/15	11/15	14/14
FR_MULTIPLATE		10/12	6/12	13/15	13/14

Graphics



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NOV 09 2021

CETIS Analytical Report

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID:	18-2349-0741	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.9.4
Analyzed:	02 Nov-21 14:37	**Analysis:**	Nonparametric-Control vs Treatments	**Status Level:**	1
Batch ID:	19-0275-1751	**Test Type:**	32 Day Fathead Minnow Test	**Analyst:**	Kayla Knol
Start Date:	13 Aug-21	**Protocol:**	ASTM E1241-05 (2013)	**Diluent:**	Dechlorinated Tap Water
Ending Date:	13 Sep-21	**Species:**	Pimephales promelas	**Brine:**	
Test Length:	31d 0h	**Taxon:**	Actinopterygii	**Source:**	Aquatox, AR **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
Lab Control FM	11-5032-4817	10 Aug-21	11 Aug-21	72h	Teck Coal Ltd	
10Cu Control	04-3348-8996	10 Aug-21	11 Aug-21	72h		
15 Cu Control	05-5139-9319	10 Aug-21	11 Aug-21	72h		
20 Cu Control	18-8853-3252	10 Aug-21	11 Aug-21	72h		
FR_UFR1+15Cu	13-9616-5903	10 Aug-21	11 Aug-21	72h (14.7 °C)		
GH_ER2+15Cu	19-5052-7846	10 Aug-21	11 Aug-21	72h (12.1 °C)		
CM_MC1+15Cu	15-1448-1664	10 Aug-21	11 Aug-21	72h (12.3 °C)		
LC_SLC+10Cu	10-0118-5065	10 Aug-21	11 Aug-21	72h (11.8 °C)		
FR_FRABCH+20Cu	12-2763-5905	10 Aug-21	11 Aug-21	72h (14.6 °C)		
FR_FRCP1+20Cu	05-5162-7629	10 Aug-21	11 Aug-21	72h (13.8 °C)		
GH_FR1+20Cu	18-3989-2491	10 Aug-21	11 Aug-21	72h (12 °C)		
GH_ERC+10Cu	14-6940-9296	10 Aug-21	11 Aug-21	72h (15.4 °C)		
CM_MC2+20Cu	17-0166-2336	10 Aug-21	11 Aug-21	72h (13.1 °C)		
RG_MIDAG+15Cu	18-0148-8949	10 Aug-21	11 Aug-21	72h (12.4 °C)		
EV_MC2+20Cu	08-5423-9441	10 Aug-21	11 Aug-21	72h (13.1 °C)		
EV_HC1+20Cu	19-8320-0922	10 Aug-21	11 Aug-21	72h (12.1 °C)		
LC_DCDS+20Cu	12-7443-1043	10 Aug-21	11 Aug-21	72h (12.3 °C)		
LC_LC3+15Cu	06-5017-0795	10 Aug-21	11 Aug-21	72h (12.4 °C)		
LC_LC5+15Cu	10-4683-7945	10 Aug-21	11 Aug-21	72h (15.1 °C)		
LC_LCDSSLCC	11-9856-2953	10 Aug-21	11 Aug-21	72h (10.8 °C)		
FR_FR4+15Cu	16-1388-5677	10 Aug-21	11 Aug-21	72h (14.1 °C)		
FR_FRRD+15Cu	18-8883-2370	10 Aug-21	11 Aug-21	72h (14.7 °C)		
FR_FR2+20Cu	20-1752-8591	10 Aug-21	11 Aug-21	72h (15.3 °C)		
FR_MULTIPLATE	15-0654-9876	10 Aug-21	11 Aug-21	72h (13.6 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
Lab Control FM	Ambient Sample	Teck Coal Ltd	Lab Control FM	
10Cu Control	Ambient Sample	Teck Coal Ltd	10 Cu Control	
15 Cu Control	Ambient Sample	Teck Coal Ltd	15 Cu Control	
20 Cu Control	Ambient Sample	Teck Coal Ltd	20 Cu Control	
FR_UFR1+15Cu	Ambient Sample	Teck Coal Ltd	FR_UFR1_MON_2021-08-0	
GH_ER2+15Cu	Ambient Sample	Teck Coal Ltd	GH_ER2_WS_2021-08-10_	
CM_MC1+15Cu	Ambient Sample	Teck Coal Ltd	CM_MC1_WS_2021-08-10	
LC_SLC+10Cu	Ambient Sample	Teck Coal Ltd	LC_SLC_WS_2021-08-10_	
FR_FRABCH+20Cu	Ambient Sample	Teck Coal Ltd	FR_FRABCH_MON_2021-	
FR_FRCP1+20Cu	Ambient Sample	Teck Coal Ltd	FR_FRCP1_MON_2021-08	
GH_FR1+20Cu	Ambient Sample	Teck Coal Ltd	GH_FR1_WS_2021-08-10_	
GH_ERC+10Cu	Ambient Sample	Teck Coal Ltd	GH_ERC_WS_2021-08-10	
CM_MC2+20Cu	Ambient Sample	Teck Coal Ltd	CM_MC2_WS_2021-08-10	
RG_MIDAG+15Cu	Ambient Sample	Teck Coal Ltd	RG_MIDAG_WS_2021-08-	
EV_MC2+20Cu	Ambient Sample	Teck Coal Ltd	EV_MC2_WS_2021_Q3_W	
EV_HC1+20Cu	Ambient Sample	Teck Coal Ltd	EV_HC1_WS_2021_Q3_W	
LC_DCDS+20Cu	Ambient Sample	Teck Coal Ltd	LC_DCDS_WS_2021-08-1	
LC_LC3+15Cu	Ambient Sample	Teck Coal Ltd	LC_LC3_WS_2021-08-10_	
LC_LC5+15Cu	Ambient Sample	Teck Coal Ltd	LC_LC5_WS_2021-08-10_	
LC_LCDSSLCC	Ambient Sample	Teck Coal Ltd	LC_LCDSSLCC_WS_2021-	
FR_FR4+15Cu	Ambient Sample	Teck Coal Ltd	FR_FR4_WS_2021-08-10_	
FR_FRRD+15Cu	Ambient Sample	Teck Coal Ltd	FR_FRRD_WS_2021-08-1	

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Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID:	18-2349-0741	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.9.4
Analyzed:	02 Nov-21 14:37	**Analysis:**	Nonparametric-Control vs Treatments	**Status Level:**	1

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_FR2+20Cu	Ambient Sample	Teck Coal Ltd	FR_FR2_WS_2021-08-10_	
FR_MULTIPLATE	Ambient Sample	Teck Coal Ltd	FR_MULTIPLATE_WS_20	

Nemenyi-Damico-Wolfe Test

Sample I	vs	Sample II	Test Stat	Critical	Ties	P-Type	P-Value	Decision(α:5%)
Site Control		Lab Control FM	44	211.4	0	CDF	0.8449	Non-Significant Effect
LC-SLC		10Cu Control	-21	211.4	0	CDF	0.9810	Non-Significant Effect
		15 Cu Control	81	211.4	0	CDF	0.6616	Non-Significant Effect
		20 Cu Control	21	211.4	0	CDF	0.9176	Non-Significant Effect
		FR_UFR1+15Cu	112	211.4	0	CDF	0.4680	Non-Significant Effect
		GH_ER2+15Cu	55	211.4	0	CDF	0.7986	Non-Significant Effect
		CM_MC1+15Cu	185	211.4	0	CDF	0.1085	Non-Significant Effect
		FR_FRABCH+20Cu	14	211.4	0	CDF	0.9336	Non-Significant Effect
		FR_FRCP1+20Cu	71	211.4	0	CDF	0.7184	Non-Significant Effect
		GH_FR1+20Cu	67	211.4	0	CDF	0.7398	Non-Significant Effect
		GH_ERC+10Cu	30	211.4	0	CDF	0.8929	Non-Significant Effect
		CM_MC2+20Cu	153	211.4	0	CDF	0.2322	Non-Significant Effect
		RG_MIDAG+15Cu	104	211.4	0	CDF	0.5190	Non-Significant Effect
		EV_MC2+20Cu	26	211.4	0	CDF	0.9045	Non-Significant Effect
		EV_HC1+20Cu	194	211.4	0	CDF	0.0846	Non-Significant Effect
		LC_DCDS+20Cu	77	211.4	0	CDF	0.6848	Non-Significant Effect
		LC_LC3+15Cu	-10	211.4	0	CDF	0.9710	Non-Significant Effect
		LC_LC5+15Cu	45	211.4	0	CDF	0.8410	Non-Significant Effect
		LC_LCDSSLCC	125	211.4	0	CDF	0.3868	Non-Significant Effect
		FR_FR4+15Cu	113	211.4	0	CDF	0.4616	Non-Significant Effect
		FR_FRRD+15Cu	-45	211.4	0	CDF	0.9932	Non-Significant Effect
		FR_FR2+20Cu	-41	211.4	0	CDF	0.9919	Non-Significant Effect
		FR_MULTIPLATE	160	211.4	0	CDF	0.1998	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	4.104	3.37	0.0017	Outlier Detected
Treatment Effect	Fligner-Wolfe Omnibus Test	4527		0.1238	Non-Significant Overall Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	4.49634	0.195493	23	1.847	0.0258	Significant Effect
Error	7.61906	0.10582	72			
Total	12.1154		95			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Variances	Bartlett Equality of Variance Test	34.81	35.17	0.0544	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9596	0.9737	0.0048	Non-Normal Distribution

MG
NOV 09 2021

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 18-2349-0741 **Endpoint:** Mean Dry Biomass-mg **CETIS Version:** CETISv1.9.4
Analyzed: 02 Nov-21 14:37 **Analysis:** Nonparametric-Control vs Treatments **Status Level:** 1

Mean Dry Biomass-mg Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
Lab Control FM		4	2.627	1.997	3.257	2.488	2.333	3.199	0.1981	15.08%	0.00%
10Cu Control		4	2.768	2.171	3.366	2.828	2.278	3.139	0.1879	13.57%	-5.38%
15 Cu Control		4	2.439	1.994	2.885	2.546	2.026	2.64	0.14	11.47%	7.15%
20 Cu Control		4	2.611	2.495	2.728	2.64	2.504	2.661	0.03658	2.80%	0.60%
FR_UFR1+15Cu		4	2.163	0.8123	3.514	2.308	1.001	3.036	0.4244	39.24%	17.67%
GH_ER2+15Cu		4	2.484	1.959	3.01	2.601	1.999	2.737	0.1651	13.29%	5.44%
CM_MC1+15Cu		4	1.909	1.062	2.757	1.845	1.331	2.615	0.2664	27.90%	27.33%
LC_SLC+10Cu	XC	4	2.639	2.465	2.813	2.685	2.477	2.71	0.05459	4.14%	-0.45%
FR_FRABCH+20Cu		4	2.634	2.222	3.047	2.576	2.421	2.965	0.1297	9.85%	-0.27%
FR_FRCP1+20Cu		4	2.458	1.98	2.935	2.492	2.079	2.768	0.1501	12.22%	6.45%
GH_FR1+20Cu		4	2.511	2.25	2.772	2.55	2.279	2.665	0.082	6.53%	4.42%
GH_ERC+10Cu		4	2.58	2.29	2.87	2.593	2.364	2.771	0.09109	7.06%	1.78%
CM_MC2+20Cu		4	2.273	1.992	2.555	2.34	2.015	2.399	0.08836	7.77%	13.46%
RG_MIDAG+15Cu		4	2.406	2.053	2.76	2.353	2.206	2.713	0.1112	9.24%	8.41%
EV_MC2+20Cu		4	2.577	2.242	2.913	2.594	2.353	2.77	0.1054	8.18%	1.89%
EV_HC1+20Cu		4	2.065	1.635	2.495	1.986	1.851	2.437	0.1351	13.08%	21.39%
LC_DCDS+20Cu		4	2.457	2.005	2.909	2.438	2.143	2.808	0.142	11.56%	6.48%
LC_LC3+15Cu		4	2.663	2.343	2.982	2.695	2.412	2.847	0.1004	7.54%	-1.34%
LC_LC5+15Cu		4	2.538	2.182	2.894	2.624	2.215	2.689	0.1118	8.81%	3.39%
LC_LCDSSLCC		4	2.283	1.678	2.888	2.283	1.896	2.67	0.1902	16.66%	13.11%
FR_FR4+15Cu		4	2.356	1.645	3.067	2.276	1.901	2.971	0.2234	18.96%	10.31%
FR_FRRD+15Cu		4	2.735	2.532	2.938	2.771	2.555	2.843	0.06394	4.68%	-4.10%
FR_FR2+20Cu		4	2.748	2.405	3.091	2.77	2.465	2.988	0.1079	7.85%	-4.61%
FR_MULTIPLATE		4	2.233	1.92	2.546	2.205	2.041	2.482	0.09838	8.81%	14.99%

Mean Dry Biomass-mg Detail

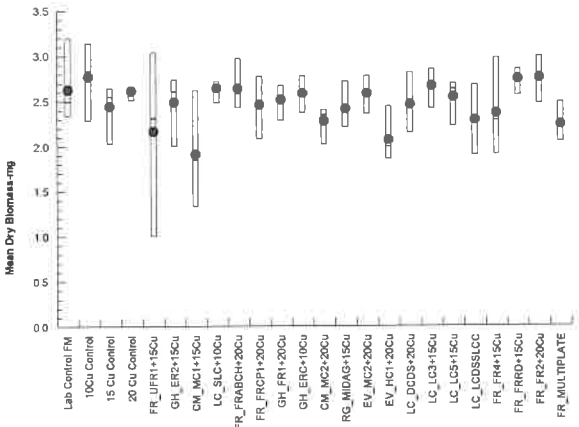
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Lab Control FM		2.583	2.333	2.393	3.199
10Cu Control		2.278	2.69	2.967	3.139
15 Cu Control		2.52	2.026	2.64	2.571
20 Cu Control		2.661	2.504	2.654	2.626
FR_UFR1+15Cu		2.25	2.365	1.001	3.036
GH_ER2+15Cu		2.613	2.588	1.999	2.737
CM_MC1+15Cu		1.769	1.921	2.615	1.331
LC_SLC+10Cu	XC	2.477	2.675	2.71	2.695
FR_FRABCH+20Cu		2.434	2.718	2.421	2.965
FR_FRCP1+20Cu		2.611	2.373	2.079	2.768
GH_FR1+20Cu		2.665	2.279	2.55	2.551
GH_ERC+10Cu		2.683	2.364	2.771	2.503
CM_MC2+20Cu		2.015	2.308	2.399	2.373
RG_MIDAG+15Cu		2.419	2.287	2.206	2.713
EV_MC2+20Cu		2.353	2.443	2.77	2.744
EV_HC1+20Cu		1.881	2.092	1.851	2.437
LC_DCDS+20Cu		2.143	2.339	2.808	2.537
LC_LC3+15Cu		2.591	2.8	2.412	2.847
LC_LC5+15Cu		2.689	2.215	2.561	2.687
LC_LCDSSLCC		2.542	1.896	2.023	2.67
FR_FR4+15Cu		2.257	2.295	1.901	2.971
FR_FRRD+15Cu		2.555	2.843	2.735	2.806
FR_FR2+20Cu		2.745	2.794	2.465	2.988
FR_MULTIPLATE		2.294	2.041	2.116	2.482

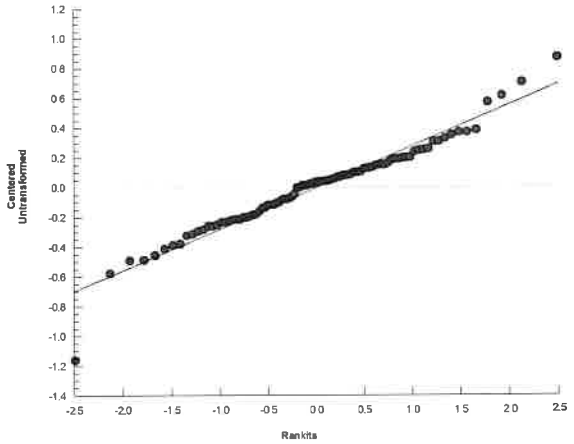
MG

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID:	18-2349-0741	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.9.4
Analyzed:	02 Nov-21 14:37	**Analysis:**	Nonparametric-Control vs Treatments	**Status Level:**	1

Graphics





Analyst: KK QA:

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Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID:	13-6946-3091	**Endpoint:**	Hatch Rate	**CETIS Version:**	CETISv1.9.4
Analyzed:	02 Nov-21 14:34	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1
Batch ID:	19-0275-1751	**Test Type:**	32 Day Fathead Minnow Test	**Analyst:**	Kayla Knol
Start Date:	13 Aug-21	**Protocol:**	ASTM E1241-05 (2013)	**Diluent:**	Dechlorinated Tap Water
Ending Date:	13 Sep-21	**Species:**	Pimephales promelas	**Brine:**	
Test Length:	31d 0h	**Taxon:**	Actinopterygii	**Source:**	Aquatox, AR **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
Lab Control FM	11-5032-4817	10 Aug-21	11 Aug-21	72h	Teck Coal Ltd	
10Cu Control	04-3348-8996	10 Aug-21	11 Aug-21	72h		
15 Cu Control	05-5139-9319	10 Aug-21	11 Aug-21	72h		
20 Cu Control	18-8853-3252	10 Aug-21	11 Aug-21	72h		
FR_UFR1+15Cu	13-9616-5903	10 Aug-21	11 Aug-21	72h (14.7 °C)		
GH_ER2+15Cu	19-5052-7846	10 Aug-21	11 Aug-21	72h (12.1 °C)		
CM_MC1+15Cu	15-1448-1664	10 Aug-21	11 Aug-21	72h (12.3 °C)		
LC_SLC+10Cu	10-0118-5065	10 Aug-21	11 Aug-21	72h (11.8 °C)		
FR_FRABCH+20Cu	12-2763-5905	10 Aug-21	11 Aug-21	72h (14.6 °C)		
FR_FRCP1+20Cu	05-5162-7629	10 Aug-21	11 Aug-21	72h (13.8 °C)		
GH_FR1+20Cu	18-3989-2491	10 Aug-21	11 Aug-21	72h (12 °C)		
GH_ERC+10Cu	14-6940-9296	10 Aug-21	11 Aug-21	72h (15.4 °C)		
CM_MC2+20Cu	17-0166-2336	10 Aug-21	11 Aug-21	72h (13.1 °C)		
RG_MIDAG+15Cu	18-0148-8949	10 Aug-21	11 Aug-21	72h (12.4 °C)		
EV_MC2+20Cu	08-5423-9441	10 Aug-21	11 Aug-21	72h (13.1 °C)		
EV_HC1+20Cu	19-8320-0922	10 Aug-21	11 Aug-21	72h (12.1 °C)		
LC_DCDS+20Cu	12-7443-1043	10 Aug-21	11 Aug-21	72h (12.3 °C)		
LC_LC3+15Cu	06-5017-0795	10 Aug-21	11 Aug-21	72h (12.4 °C)		
LC_LC5+15Cu	10-4683-7945	10 Aug-21	11 Aug-21	72h (15.1 °C)		
LC_LCDSSLCC	11-9856-2953	10 Aug-21	11 Aug-21	72h (10.8 °C)		
FR_FR4+15Cu	16-1388-5677	10 Aug-21	11 Aug-21	72h (14.1 °C)		
FR_FRRD+15Cu	18-8883-2370	10 Aug-21	11 Aug-21	72h (14.7 °C)		
FR_FR2+20Cu	20-1752-8591	10 Aug-21	11 Aug-21	72h (15.3 °C)		
FR_MULTIPLATE	15-0654-9876	10 Aug-21	11 Aug-21	72h (13.6 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
Lab Control FM	Ambient Sample	Teck Coal Ltd	Lab Control FM	
10Cu Control	Ambient Sample	Teck Coal Ltd	10 Cu Control	
15 Cu Control	Ambient Sample	Teck Coal Ltd	15 Cu Control	
20 Cu Control	Ambient Sample	Teck Coal Ltd	20 Cu Control	
FR_UFR1+15Cu	Ambient Sample	Teck Coal Ltd	FR_UFR1_MON_2021-08-0	
GH_ER2+15Cu	Ambient Sample	Teck Coal Ltd	GH_ER2_WS_2021-08-10_	
CM_MC1+15Cu	Ambient Sample	Teck Coal Ltd	CM_MC1_WS_2021-08-10	
LC_SLC+10Cu	Ambient Sample	Teck Coal Ltd	LC_SLC_WS_2021-08-10_	
FR_FRABCH+20Cu	Ambient Sample	Teck Coal Ltd	FR_FRABCH_MON_2021-	
FR_FRCP1+20Cu	Ambient Sample	Teck Coal Ltd	FR_FRCP1_MON_2021-08	
GH_FR1+20Cu	Ambient Sample	Teck Coal Ltd	GH_FR1_WS_2021-08-10_	
GH_ERC+10Cu	Ambient Sample	Teck Coal Ltd	GH_ERC_WS_2021-08-10	
CM_MC2+20Cu	Ambient Sample	Teck Coal Ltd	CM_MC2_WS_2021-08-10	
RG_MIDAG+15Cu	Ambient Sample	Teck Coal Ltd	RG_MIDAG_WS_2021-08-	
EV_MC2+20Cu	Ambient Sample	Teck Coal Ltd	EV_MC2_WS_2021_Q3_W	
EV_HC1+20Cu	Ambient Sample	Teck Coal Ltd	EV_HC1_WS_2021_Q3_W	
LC_DCDS+20Cu	Ambient Sample	Teck Coal Ltd	LC_DCDS_WS_2021-08-1	
LC_LC3+15Cu	Ambient Sample	Teck Coal Ltd	LC_LC3_WS_2021-08-10_	
LC_LC5+15Cu	Ambient Sample	Teck Coal Ltd	LC_LC5_WS_2021-08-10_	
LC_LCDSSLCC	Ambient Sample	Teck Coal Ltd	LC_LCDSSLCC_WS_2021-	
FR_FR4+15Cu	Ambient Sample	Teck Coal Ltd	FR_FR4_WS_2021-08-10_	
FR_FRRD+15Cu	Ambient Sample	Teck Coal Ltd	FR_FRRD_WS_2021-08-1	

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Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 13-6946-3091 **Endpoint:** Hatch Rate **CETIS Version:** CETISv1.9.4
Analyzed: 02 Nov-21 14:34 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_FR2+20Cu	Ambient Sample	Teck Coal Ltd	FR_FR2_WS_2021-08-10_	
FR_MULTIPLATE	Ambient Sample	Teck Coal Ltd	FR_MULTIPLATE_WS_20	

Fisher Exact/Bonferroni Adj Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
Site Control		Lab Control FM	0.9713	Exact	1.0000	Non-Significant Effect
LC_SLC		10Cu Control	0.9713	Exact	1.0000	Non-Significant Effect
		15 Cu Control	0.8966	Exact	1.0000	Non-Significant Effect
		20 Cu Control	0.7805	Exact	1.0000	Non-Significant Effect
		FR_UFR1+15Cu	0.6415	Exact	1.0000	Non-Significant Effect
		GH_ER2+15Cu	0.7805	Exact	1.0000	Non-Significant Effect
		CM_MC1+15Cu	0.2644	Exact	1.0000	Non-Significant Effect
		FR_FRABCH+20Cu	0.5000	Exact	1.0000	Non-Significant Effect
		FR_FRCP1+20Cu	0.8966	Exact	1.0000	Non-Significant Effect
		GH_FR1+20Cu	0.8966	Exact	1.0000	Non-Significant Effect
		GH_ERC+10Cu	0.7805	Exact	1.0000	Non-Significant Effect
		CM_MC2+20Cu	0.9713	Exact	1.0000	Non-Significant Effect
		RG_MIDAG+15Cu	0.8966	Exact	1.0000	Non-Significant Effect
		EV_MC2+20Cu	0.8966	Exact	1.0000	Non-Significant Effect
		EV_HC1+20Cu	0.2644	Exact	1.0000	Non-Significant Effect
		LC_DCDS+20Cu	1.0000	Exact	1.0000	Non-Significant Effect
		LC_LC3+15Cu	1.0000	Exact	1.0000	Non-Significant Effect
		LC_LC5+15Cu	0.9713	Exact	1.0000	Non-Significant Effect
		LC_LCDSSLCC	0.8966	Exact	1.0000	Non-Significant Effect
		FR_FR4+15Cu	0.7805	Exact	1.0000	Non-Significant Effect
		FR_FRRD+15Cu	0.9713	Exact	1.0000	Non-Significant Effect
		FR_FR2+20Cu	0.8966	Exact	1.0000	Non-Significant Effect
		FR_MULTIPLATE	0.2644	Exact	1.0000	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	3.044	3.37	0.1764	No Outliers Detected

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 13-6946-3091 **Endpoint:** Hatch Rate **CETIS Version:** CETISv1.9.4
Analyzed: 02 Nov-21 14:34 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Data Summary

Sample	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
Lab Control FM		59	1	60	0.9833	0.01667	-5.36%
10Cu Control		59	1	60	0.9833	0.01667	-5.36%
15 Cu Control		58	2	60	0.9667	0.03333	-3.57%
20 Cu Control		57	3	60	0.95	0.05	-1.79%
FR_UFR1+15Cu		56	4	60	0.9333	0.06667	0.0%
GH_ER2+15Cu		57	3	60	0.95	0.05	-1.79%
CM_MC1+15Cu		53	7	60	0.8833	0.1167	5.36%
LC_SLC+10Cu	XC	56	4	60	0.9333	0.06667	0.0%
FR_FRABCH+20Cu		55	5	60	0.9167	0.08333	1.79%
FR_FRCP1+20Cu		58	2	60	0.9667	0.03333	-3.57%
GH_FR1+20Cu		58	2	60	0.9667	0.03333	-3.57%
GH_ERC+10Cu		57	3	60	0.95	0.05	-1.79%
CM_MC2+20Cu		59	1	60	0.9833	0.01667	-5.36%
RG_MIDAG+15Cu		58	2	60	0.9667	0.03333	-3.57%
EV_MC2+20Cu		58	2	60	0.9667	0.03333	-3.57%
EV_HC1+20Cu		53	7	60	0.8833	0.1167	5.36%
LC_DCDS+20Cu		60	0	60	1	0	-7.14%
LC_LC3+15Cu		60	0	60	1	0	-7.14%
LC_LC5+15Cu		59	1	60	0.9833	0.01667	-5.36%
LC_LCDSSLCC		58	2	60	0.9667	0.03333	-3.57%
FR_FR4+15Cu		57	3	60	0.95	0.05	-1.79%
FR_FRRD+15Cu		59	1	60	0.9833	0.01667	-5.36%
FR_FR2+20Cu		58	2	60	0.9667	0.03333	-3.57%
FR_MULTIPLATE		53	7	60	0.8833	0.1167	5.36%

Hatch Rate Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Lab Control FM		0.9333	1.0000	1.0000	1.0000
10Cu Control		1.0000	1.0000	0.9333	1.0000
15 Cu Control		1.0000	0.9333	1.0000	0.9333
20 Cu Control		0.9333	0.9333	1.0000	0.9333
FR_UFR1+15Cu		0.9333	1.0000	0.9333	0.8667
GH_ER2+15Cu		1.0000	0.9333	0.8667	1.0000
CM_MC1+15Cu		0.8667	0.9333	0.8667	0.8667
LC_SLC+10Cu	XC	0.9333	0.9333	0.9333	0.9333
FR_FRABCH+20Cu		0.8667	0.8667	1.0000	0.9333
FR_FRCP1+20Cu		1.0000	0.9333	0.9333	1.0000
GH_FR1+20Cu		1.0000	1.0000	1.0000	0.8667
GH_ERC+10Cu		0.9333	1.0000	0.8667	1.0000
CM_MC2+20Cu		0.9333	1.0000	1.0000	1.0000
RG_MIDAG+15Cu		1.0000	1.0000	1.0000	0.8667
EV_MC2+20Cu		1.0000	1.0000	0.9333	0.9333
EV_HC1+20Cu		0.8667	0.8000	0.8667	1.0000
LC_DCDS+20Cu		1.0000	1.0000	1.0000	1.0000
LC_LC3+15Cu		1.0000	1.0000	1.0000	1.0000
LC_LC5+15Cu		1.0000	1.0000	1.0000	0.9333
LC_LCDSSLCC		0.9333	1.0000	1.0000	0.9333
FR_FR4+15Cu		1.0000	1.0000	1.0000	0.8000
FR_FRRD+15Cu		1.0000	1.0000	1.0000	0.9333
FR_FR2+20Cu		0.9333	1.0000	1.0000	0.9333
FR_MULTIPLATE		0.8000	0.8000	1.0000	0.9333

VG

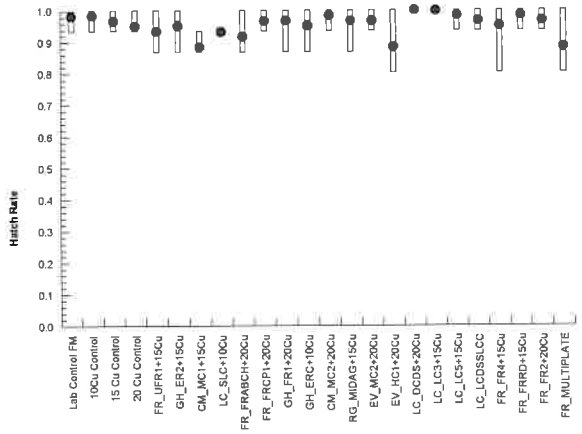
Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 13-6946-3091 **Endpoint:** Hatch Rate **CETIS Version:** CETISv1.9.4
Analyzed: 02 Nov-21 14:34 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Hatch Rate Binomials

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Lab Control FM		14/15	15/15	15/15	15/15
10Cu Control		15/15	15/15	14/15	15/15
15 Cu Control		15/15	14/15	15/15	14/15
20 Cu Control		14/15	14/15	15/15	14/15
FR_UFR1+15Cu		14/15	15/15	14/15	13/15
GH_ER2+15Cu		15/15	14/15	13/15	15/15
CM_MC1+15Cu		13/15	14/15	13/15	13/15
LC_SLC+10Cu	XC	14/15	14/15	14/15	14/15
FR_FRABCH+20Cu		13/15	13/15	15/15	14/15
FR_FRCP1+20Cu		15/15	14/15	14/15	15/15
GH_FR1+20Cu		15/15	15/15	15/15	13/15
GH_ERC+10Cu		14/15	15/15	13/15	15/15
CM_MC2+20Cu		14/15	15/15	15/15	15/15
RG_MIDAG+15Cu		15/15	15/15	15/15	13/15
EV_MC2+20Cu		15/15	15/15	14/15	14/15
EV_HC1+20Cu		13/15	12/15	13/15	15/15
LC_DCDS+20Cu		15/15	15/15	15/15	15/15
LC_LC3+15Cu		15/15	15/15	15/15	15/15
LC_LC5+15Cu		15/15	15/15	15/15	14/15
LC_LCDSSLCC		14/15	15/15	15/15	14/15
FR_FR4+15Cu		15/15	15/15	15/15	12/15
FR_FRRD+15Cu		15/15	15/15	15/15	14/15
FR_FR2+20Cu		14/15	15/15	15/15	14/15
FR_MULTIPLATE		12/15	12/15	15/15	14/15

Graphics



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Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID:	14-3674-3896	**Endpoint:**	Length	**CETIS Version:**	CETISv1.9.4
Analyzed:	02 Nov-21 14:35	**Analysis:**	Parametric-Control vs Treatments	**Status Level:**	1
Batch ID:	19-0275-1751	**Test Type:**	32 Day Fathead Minnow Test	**Analyst:**	Kayla Knol
Start Date:	13 Aug-21	**Protocol:**	ASTM E1241-05 (2013)	**Diluent:**	Dechlorinated Tap Water
Ending Date:	13 Sep-21	**Species:**	Pimephales promelas	**Brine:**	
Test Length:	31d 0h	**Taxon:**	Actinopterygii	**Source:**	Aquatox, AR **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
Lab Control FM	11-5032-4817	10 Aug-21	11 Aug-21	72h	Teck Coal Ltd	
10Cu Control	04-3348-8996	10 Aug-21	11 Aug-21	72h		
15 Cu Control	05-5139-9319	10 Aug-21	11 Aug-21	72h		
20 Cu Control	18-8853-3252	10 Aug-21	11 Aug-21	72h		
FR_UFR1+15Cu	13-9616-5903	10 Aug-21	11 Aug-21	72h (14.7 °C)		
GH_ER2+15Cu	19-5052-7846	10 Aug-21	11 Aug-21	72h (12.1 °C)		
CM_MC1+15Cu	15-1448-1664	10 Aug-21	11 Aug-21	72h (12.3 °C)		
LC_SLC+10Cu	10-0118-5065	10 Aug-21	11 Aug-21	72h (11.8 °C)		
FR_FRABCH+20Cu	12-2763-5905	10 Aug-21	11 Aug-21	72h (14.6 °C)		
FR_FRCP1+20Cu	05-5162-7629	10 Aug-21	11 Aug-21	72h (13.8 °C)		
GH_FR1+20Cu	18-3989-2491	10 Aug-21	11 Aug-21	72h (12 °C)		
GH_ERC+10Cu	14-6940-9296	10 Aug-21	11 Aug-21	72h (15.4 °C)		
CM_MC2+20Cu	17-0166-2336	10 Aug-21	11 Aug-21	72h (13.1 °C)		
RG_MIDAG+15Cu	18-0148-8949	10 Aug-21	11 Aug-21	72h (12.4 °C)		
EV_MC2+20Cu	08-5423-9441	10 Aug-21	11 Aug-21	72h (13.1 °C)		
EV_HC1+20Cu	19-8320-0922	10 Aug-21	11 Aug-21	72h (12.1 °C)		
LC_DCDS+20Cu	12-7443-1043	10 Aug-21	11 Aug-21	72h (12.3 °C)		
LC_LC3+15Cu	06-5017-0795	10 Aug-21	11 Aug-21	72h (12.4 °C)		
LC_LC5+15Cu	10-4683-7945	10 Aug-21	11 Aug-21	72h (15.1 °C)		
LC_LCDSSLCC	11-9856-2953	10 Aug-21	11 Aug-21	72h (10.8 °C)		
FR_FR4+15Cu	16-1388-5677	10 Aug-21	11 Aug-21	72h (14.1 °C)		
FR_FRRD+15Cu	18-8883-2370	10 Aug-21	11 Aug-21	72h (14.7 °C)		
FR_FR2+20Cu	20-1752-8591	10 Aug-21	11 Aug-21	72h (15.3 °C)		
FR_MULTIPLATE	15-0654-9876	10 Aug-21	11 Aug-21	72h (13.6 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
Lab Control FM	Ambient Sample	Teck Coal Ltd	Lab Control FM	
10Cu Control	Ambient Sample	Teck Coal Ltd	10 Cu Control	
15 Cu Control	Ambient Sample	Teck Coal Ltd	15 Cu Control	
20 Cu Control	Ambient Sample	Teck Coal Ltd	20 Cu Control	
FR_UFR1+15Cu	Ambient Sample	Teck Coal Ltd	FR_UFR1_MON_2021-08-0	
GH_ER2+15Cu	Ambient Sample	Teck Coal Ltd	GH_ER2_WS_2021-08-10_	
CM_MC1+15Cu	Ambient Sample	Teck Coal Ltd	CM_MC1_WS_2021-08-10	
LC_SLC+10Cu	Ambient Sample	Teck Coal Ltd	LC_SLC_WS_2021-08-10_	
FR_FRABCH+20Cu	Ambient Sample	Teck Coal Ltd	FR_FRABCH_MON_2021-	
FR_FRCP1+20Cu	Ambient Sample	Teck Coal Ltd	FR_FRCP1_MON_2021-08	
GH_FR1+20Cu	Ambient Sample	Teck Coal Ltd	GH_FR1_WS_2021-08-10_	
GH_ERC+10Cu	Ambient Sample	Teck Coal Ltd	GH_ERC_WS_2021-08-10	
CM_MC2+20Cu	Ambient Sample	Teck Coal Ltd	CM_MC2_WS_2021-08-10	
RG_MIDAG+15Cu	Ambient Sample	Teck Coal Ltd	RG_MIDAG_WS_2021-08-	
EV_MC2+20Cu	Ambient Sample	Teck Coal Ltd	EV_MC2_WS_2021_Q3_W	
EV_HC1+20Cu	Ambient Sample	Teck Coal Ltd	EV_HC1_WS_2021_Q3_W	
LC_DCDS+20Cu	Ambient Sample	Teck Coal Ltd	LC_DCDS_WS_2021-08-1	
LC_LC3+15Cu	Ambient Sample	Teck Coal Ltd	LC_LC3_WS_2021-08-10_	
LC_LC5+15Cu	Ambient Sample	Teck Coal Ltd	LC_LC5_WS_2021-08-10_	
LC_LCDSSLCC	Ambient Sample	Teck Coal Ltd	LC_LCDSSLCC_WS_2021-	
FR_FR4+15Cu	Ambient Sample	Teck Coal Ltd	FR_FR4_WS_2021-08-10_	
FR_FRRD+15Cu	Ambient Sample	Teck Coal Ltd	FR_FRRD_WS_2021-08-1	

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Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID:	14-3674-3896	**Endpoint:**	Length	**CETIS Version:**	CETISv1.9.4
Analyzed:	02 Nov-21 14:35	**Analysis:**	Parametric-Control vs Treatments	**Status Level:**	1

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_FR2+20Cu	Ambient Sample	Teck Coal Ltd	FR_FR2_WS_2021-08-10_	
FR_MULTIPLATE	Ambient Sample	Teck Coal Ltd	FR_MULTIPLATE_WS_20	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	Lab Control FM passed length	11.83%
		10Cu Control passed length	11.83%
		15 Cu Control passed length	11.83%
		20 Cu Control passed length	11.83%
		FR_UFR1+15Cu passed length	11.83%
		GH_ER2+15Cu passed length	11.83%
		CM_MC1+15Cu passed length	11.83%
		FR_FRABCH+20Cu passed length	11.83%
		FR_FRCP1+20Cu passed length	11.83%
		GH_FR1+20Cu passed length	11.83%
		GH_ERC+10Cu passed length	11.83%
		CM_MC2+20Cu passed length	11.83%
		RG_MIDAG+15Cu passed length	11.83%
		EV_MC2+20Cu passed length	11.83%
		EV_HC1+20Cu passed length	11.83%
		LC_DCDS+20Cu passed length	11.83%
		LC_LC3+15Cu passed length	11.83%
		LC_LC5+15Cu passed length	11.83%
		LC_LCDSSLCC passed length	11.83%
		FR_FR4+15Cu passed length	11.83%
		FR_FRRD+15Cu passed length	11.83%
		FR_FR2+20Cu passed length	11.83%
		FR_MULTIPLATE passed length	11.83%

Dunnett Multiple Comparison Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Site Control		Lab Control FM	0	2.744	1.408	6	CDF	0.9583	Non-Significant Effect
LC-SLC		10Cu Control	-1.023	2.744	1.408	6	CDF	0.9988	Non-Significant Effect
		15 Cu Control	-0.9257	2.744	1.408	6	CDF	0.9982	Non-Significant Effect
		20 Cu Control	-2.193	2.744	1.408	6	CDF	1.0000	Non-Significant Effect
		FR_UFR1+15Cu	0.3898	2.744	1.408	6	CDF	0.8909	Non-Significant Effect
		GH_ER2+15Cu	1.462	2.744	1.408	6	CDF	0.4511	Non-Significant Effect
		CM_MC1+15Cu	1.851	2.744	1.408	6	CDF	0.2743	Non-Significant Effect
		FR_FRABCH+20Cu	0.3898	2.744	1.408	6	CDF	0.8909	Non-Significant Effect
		FR_FRCP1+20Cu	2.241	2.744	1.408	6	CDF	0.1435	Non-Significant Effect
		GH_FR1+20Cu	1.851	2.744	1.408	6	CDF	0.2743	Non-Significant Effect
		GH_ERC+10Cu	-1.559	2.744	1.408	6	CDF	0.9999	Non-Significant Effect
		CM_MC2+20Cu	-1.072	2.744	1.408	6	CDF	0.9990	Non-Significant Effect
		RG_MIDAG+15Cu	1.608	2.744	1.408	6	CDF	0.3810	Non-Significant Effect
		EV_MC2+20Cu	2.144	2.744	1.408	6	CDF	0.1711	Non-Significant Effect
		EV_HC1+20Cu	-0.5359	2.744	1.408	6	CDF	0.9922	Non-Significant Effect
		LC_DCDS+20Cu	-0.8283	2.744	1.408	6	CDF	0.9974	Non-Significant Effect
		LC_LC3+15Cu	-0.5359	2.744	1.408	6	CDF	0.9922	Non-Significant Effect
		LC_LC5+15Cu	-1.413	2.744	1.408	6	CDF	0.9998	Non-Significant Effect
		LC_LCDSSLCC	-0.3411	2.744	1.408	6	CDF	0.9850	Non-Significant Effect
		FR_FR4+15Cu	1.316	2.744	1.408	6	CDF	0.5234	Non-Significant Effect
		FR_FRRD+15Cu	1.949	2.744	1.408	6	CDF	0.2366	Non-Significant Effect
		FR_FR2+20Cu	1.169	2.744	1.408	6	CDF	0.5953	Non-Significant Effect
		FR_MULTIPLATE	1.51	2.744	1.408	6	CDF	0.4274	Non-Significant Effect

Auxiliary Tests

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 14-3674-3896 **Endpoint:** Length **CETIS Version:** CETISv1.9.4
Analyzed: 02 Nov-21 14:35 **Analysis:** Parametric-Control vs Treatments **Status Level:** 1

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	3.285	3.37	0.0706	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	44.2591	1.92431	23	3.654	1.3E-05	Significant Effect
Error	37.9125	0.526563	72			
Total	82.1716		95			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Variances	Bartlett Equality of Variance Test	33.4	35.17	0.0744	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9854	0.9737	0.3692	Normal Distribution

Length Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
Lab Control FM		4	11.9	11.15	12.65	11.95	11.3	12.4	0.2345	3.94%	0.00%
10Cu Control		4	12.43	11.66	13.19	12.55	11.8	12.8	0.2394	3.85%	-4.41%
15 Cu Control		4	12.37	10.89	13.86	12.35	11.4	13.4	0.4661	7.53%	-3.99%
20 Cu Control		4	13.03	12.67	13.38	13	12.8	13.3	0.1109	1.70%	-9.45%
FR_UFR1+15Cu		4	11.7	10.85	12.55	11.95	10.9	12	0.2677	4.58%	1.68%
GH_ER2+15Cu		4	11.15	10.87	11.43	11.15	11	11.3	0.0866	1.55%	6.30%
CM_MC1+15Cu		4	10.95	10.06	11.84	11.05	10.2	11.5	0.2784	5.08%	7.98%
LC_SLC+10Cu	XC	4	11.9	11.12	12.68	11.8	11.5	12.5	0.2449	4.12%	0.00%
FR_FRABCH+20Cu		4	11.7	10.38	13.02	11.65	10.8	12.7	0.4143	7.08%	1.68%
FR_FRCP1+20Cu		4	10.75	9.243	12.26	11	9.4	11.6	0.4735	8.81%	9.66%
GH_FR1+20Cu		4	10.95	10.33	11.57	10.95	10.5	11.4	0.1936	3.54%	7.98%
GH_ERC+10Cu		4	12.7	12.15	13.25	12.7	12.4	13	0.1732	2.73%	-6.72%
CM_MC2+20Cu		4	12.45	11.06	13.84	12.55	11.3	13.4	0.4368	7.02%	-4.62%
RG_MIDAG+15Cu		4	11.08	10.09	12.06	10.9	10.6	11.9	0.3092	5.58%	6.93%
EV_MC2+20Cu		4	10.8	9.236	12.36	10.6	9.9	12.1	0.4916	9.10%	9.24%
EV_HC1+20Cu		4	12.18	9.553	14.8	12.55	10.1	13.5	0.824	13.54%	-2.31%
LC_DCDS+20Cu		4	12.33	11.45	13.2	12.45	11.6	12.8	0.275	4.46%	-3.57%
LC_LC3+15Cu		4	12.18	10.8	13.55	12.15	11.3	13.1	0.4308	7.08%	-2.31%
LC_LC5+15Cu		4	12.62	10.78	14.47	12.75	11.2	13.8	0.5808	9.20%	-6.09%
LC_LCDSSLCC		4	12.08	11.47	12.68	12.1	11.6	12.5	0.1887	3.13%	-1.47%
FR_FR4+15Cu		4	11.23	10.62	11.83	11.2	10.8	11.7	0.1887	3.36%	5.67%
FR_FRRD+15Cu		4	10.9	10.47	11.33	11	10.5	11.1	0.1354	2.48%	8.40%
FR_FR2+20Cu		4	11.3	10.58	12.02	11.2	10.9	11.9	0.2273	4.02%	5.04%
FR_MULTIPLATE		4	11.12	9.736	12.51	11	10.2	12.3	0.4366	7.85%	6.51%

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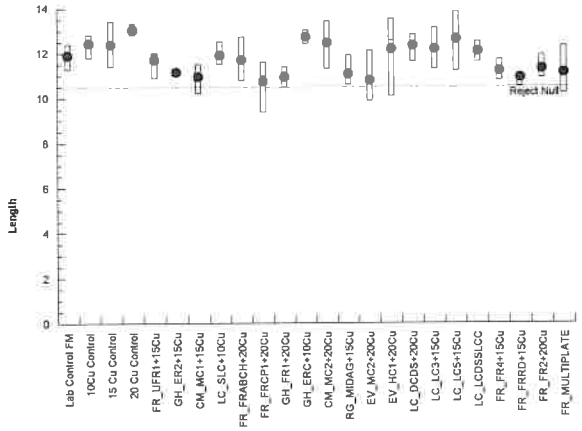
Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

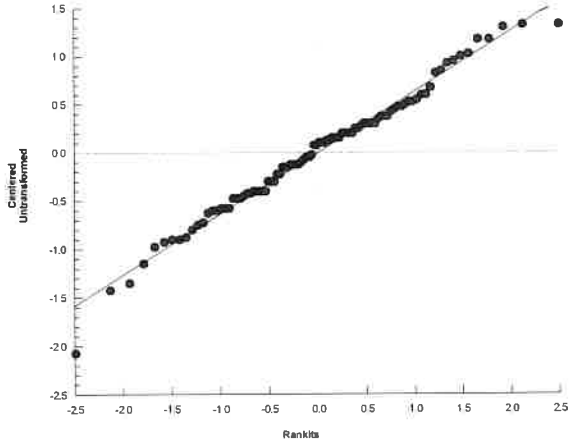
Analysis ID: 14-3674-3896 **Endpoint:** Length **CETIS Version:** CETISv1.9.4
Analyzed: 02 Nov-21 14:35 **Analysis:** Parametric-Control vs Treatments **Status Level:** 1

Length Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Lab Control FM		12.4	11.3	12.1	11.8
10Cu Control		11.8	12.3	12.8	12.8
15 Cu Control		12.9	11.8	13.4	11.4
20 Cu Control		13.3	12.9	12.8	13.1
FR_UFR1+15Cu		11.9	10.9	12	12
GH_ER2+15Cu		11.3	11.3	11	11
CM_MC1+15Cu		11.5	10.9	11.2	10.2
LC_SLC+10Cu	XC	11.5	12.5	12.1	11.5
FR_FRABCH+20Cu		12.7	12	10.8	11.3
FR_FRCP1+20Cu		11.1	10.9	9.4	11.6
GH_FR1+20Cu		11.1	10.5	10.8	11.4
GH_ERC+10Cu		13	12.4	12.4	13
CM_MC2+20Cu		12.7	11.3	12.4	13.4
RG_MIDAG+15Cu		10.6	10.6	11.2	11.9
EV_MC2+20Cu		9.9	10.2	11	12.1
EV_HC1+20Cu		13.5	11.6	13.5	10.1
LC_DCDS+20Cu		12.7	12.8	12.2	11.6
LC_LC3+15Cu		12.7	13.1	11.3	11.6
LC_LC5+15Cu		11.2	13.3	12.2	13.8
LC_LCDSSLCC		12.2	12	11.6	12.5
FR_FR4+15Cu		11.3	10.8	11.1	11.7
FR_FRRD+15Cu		10.5	11	11	11.1
FR_FR2+20Cu		11	11.9	11.4	10.9
FR_MULTIPLATE		11.1	12.3	10.2	10.9

Graphics





CETIS Analytical Report

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID:	11-5389-0525	**Endpoint:**	Proportion Normal	**CETIS Version:**	CETISv1.9.4
Analyzed:	02 Nov-21 14:38	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1
Batch ID:	19-0275-1751	**Test Type:**	32 Day Fathead Minnow Test	**Analyst:**	Kayla Knol
Start Date:	13 Aug-21	**Protocol:**	ASTM E1241-05 (2013)	**Diluent:**	Dechlorinated Tap Water
Ending Date:	13 Sep-21	**Species:**	Pimephales promelas	**Brine:**	
Test Length:	31d 0h	**Taxon:**	Actinopterygii	**Source:**	Aquatox, AR **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
Lab Control FM	11-5032-4817	10 Aug-21	11 Aug-21	72h	Teck Coal Ltd	
10Cu Control	04-3348-8996	10 Aug-21	11 Aug-21	72h		
15 Cu Control	05-5139-9319	10 Aug-21	11 Aug-21	72h		
20 Cu Control	18-8853-3252	10 Aug-21	11 Aug-21	72h		
FR_UFR1+15Cu	13-9616-5903	10 Aug-21	11 Aug-21	72h (14.7 °C)		
GH_ER2+15Cu	19-5052-7846	10 Aug-21	11 Aug-21	72h (12.1 °C)		
CM_MC1+15Cu	15-1448-1664	10 Aug-21	11 Aug-21	72h (12.3 °C)		
LC_SLC+10Cu	10-0118-5065	10 Aug-21	11 Aug-21	72h (11.8 °C)		
FR_FRABCH+20Cu	12-2763-5905	10 Aug-21	11 Aug-21	72h (14.6 °C)		
FR_FRCP1+20Cu	05-5162-7629	10 Aug-21	11 Aug-21	72h (13.8 °C)		
GH_FR1+20Cu	18-3989-2491	10 Aug-21	11 Aug-21	72h (12 °C)		
GH_ERC+10Cu	14-6940-9296	10 Aug-21	11 Aug-21	72h (15.4 °C)		
CM_MC2+20Cu	17-0166-2336	10 Aug-21	11 Aug-21	72h (13.1 °C)		
RG_MIDAG+15Cu	18-0148-8949	10 Aug-21	11 Aug-21	72h (12.4 °C)		
EV_MC2+20Cu	08-5423-9441	10 Aug-21	11 Aug-21	72h (13.1 °C)		
EV_HC1+20Cu	19-8320-0922	10 Aug-21	11 Aug-21	72h (12.1 °C)		
LC_DCDS+20Cu	12-7443-1043	10 Aug-21	11 Aug-21	72h (12.3 °C)		
LC_LC3+15Cu	06-5017-0795	10 Aug-21	11 Aug-21	72h (12.4 °C)		
LC_LC5+15Cu	10-4683-7945	10 Aug-21	11 Aug-21	72h (15.1 °C)		
LC_LCDSSLCC	11-9856-2953	10 Aug-21	11 Aug-21	72h (10.8 °C)		
FR_FR4+15Cu	16-1388-5677	10 Aug-21	11 Aug-21	72h (14.1 °C)		
FR_FRRD+15Cu	18-8883-2370	10 Aug-21	11 Aug-21	72h (14.7 °C)		
FR_FR2+20Cu	20-1752-8591	10 Aug-21	11 Aug-21	72h (15.3 °C)		
FR_MULTIPLATE	15-0654-9876	10 Aug-21	11 Aug-21	72h (13.6 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
Lab Control FM	Ambient Sample	Teck Coal Ltd	Lab Control FM	
10Cu Control	Ambient Sample	Teck Coal Ltd	10 Cu Control	
15 Cu Control	Ambient Sample	Teck Coal Ltd	15 Cu Control	
20 Cu Control	Ambient Sample	Teck Coal Ltd	20 Cu Control	
FR_UFR1+15Cu	Ambient Sample	Teck Coal Ltd	FR_UFR1_MON_2021-08-0	
GH_ER2+15Cu	Ambient Sample	Teck Coal Ltd	GH_ER2_WS_2021-08-10_	
CM_MC1+15Cu	Ambient Sample	Teck Coal Ltd	CM_MC1_WS_2021-08-10	
LC_SLC+10Cu	Ambient Sample	Teck Coal Ltd	LC_SLC_WS_2021-08-10_	
FR_FRABCH+20Cu	Ambient Sample	Teck Coal Ltd	FR_FRABCH_MON_2021-	
FR_FRCP1+20Cu	Ambient Sample	Teck Coal Ltd	FR_FRCP1_MON_2021-08	
GH_FR1+20Cu	Ambient Sample	Teck Coal Ltd	GH_FR1_WS_2021-08-10_	
GH_ERC+10Cu	Ambient Sample	Teck Coal Ltd	GH_ERC_WS_2021-08-10	
CM_MC2+20Cu	Ambient Sample	Teck Coal Ltd	CM_MC2_WS_2021-08-10	
RG_MIDAG+15Cu	Ambient Sample	Teck Coal Ltd	RG_MIDAG_WS_2021-08-	
EV_MC2+20Cu	Ambient Sample	Teck Coal Ltd	EV_MC2_WS_2021_Q3_W	
EV_HC1+20Cu	Ambient Sample	Teck Coal Ltd	EV_HC1_WS_2021_Q3_W	
LC_DCDS+20Cu	Ambient Sample	Teck Coal Ltd	LC_DCDS_WS_2021-08-1	
LC_LC3+15Cu	Ambient Sample	Teck Coal Ltd	LC_LC3_WS_2021-08-10_	
LC_LC5+15Cu	Ambient Sample	Teck Coal Ltd	LC_LC5_WS_2021-08-10_	
LC_LCDSSLCC	Ambient Sample	Teck Coal Ltd	LC_LCDSSLCC_WS_2021-	
FR_FR4+15Cu	Ambient Sample	Teck Coal Ltd	FR_FR4_WS_2021-08-10_	
FR_FRRD+15Cu	Ambient Sample	Teck Coal Ltd	FR_FRRD_WS_2021-08-1	

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Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID:	11-5389-0525	**Endpoint:**	Proportion Normal	**CETIS Version:**	CETISv1.9.4
Analyzed:	02 Nov-21 14:38	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_FR2+20Cu	Ambient Sample	Teck Coal Ltd	FR_FR2_WS_2021-08-10_	
FR_MULTIPLATE	Ambient Sample	Teck Coal Ltd	FR_MULTIPLATE_WS_20	

Fisher Exact/Bonferroni Adj Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
Site Control		Lab Control FM	1.0000	Exact	1.0000	Non-Significant Effect
LC - SLC		10Cu Control	0.7577	Exact	1.0000	Non-Significant Effect
		15 Cu Control	0.7120	Exact	1.0000	Non-Significant Effect
		20 Cu Control	0.4584	Exact	1.0000	Non-Significant Effect
		FR_UFR1+15Cu	1.0000	Exact	1.0000	Non-Significant Effect
		GH_ER2+15Cu	0.7363	Exact	1.0000	Non-Significant Effect
		CM_MC1+15Cu	0.6519	Exact	1.0000	Non-Significant Effect
		FR_FRABCH+20Cu	1.0000	Exact	1.0000	Non-Significant Effect
		FR_FRCP1+20Cu	0.4839	Exact	1.0000	Non-Significant Effect
		GH_FR1+20Cu	0.3005	Exact	1.0000	Non-Significant Effect
		GH_ERC+10Cu	0.6840	Exact	1.0000	Non-Significant Effect
		CM_MC2+20Cu	1.0000	Exact	1.0000	Non-Significant Effect
		RG_MIDAG+15Cu	0.1677	Exact	1.0000	Non-Significant Effect
		EV_MC2+20Cu	0.1874	Exact	1.0000	Non-Significant Effect
		EV_HC1+20Cu	0.6339	Exact	1.0000	Non-Significant Effect
		LC_DCDS+20Cu	0.4312	Exact	1.0000	Non-Significant Effect
		LC_LC3+15Cu	0.4405	Exact	1.0000	Non-Significant Effect
		LC_LC5+15Cu	0.7053	Exact	1.0000	Non-Significant Effect
		LC_LCDSSLCC	0.6519	Exact	1.0000	Non-Significant Effect
		FR_FR4+15Cu	0.1288	Exact	1.0000	Non-Significant Effect
		FR_FRRD+15Cu	0.7675	Exact	1.0000	Non-Significant Effect
		FR_FR2+20Cu	0.7577	Exact	1.0000	Non-Significant Effect
		FR_MULTIPLATE	0.7184	Exact	1.0000	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	2.949	3.37	0.2489	No Outliers Detected
Treatment Effect	Fligner-Wolfe Omnibus Test	0.3794	1.645	0.3522	Non-Significant Overall Effect

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Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 11-5389-0525 **Endpoint:** Proportion Normal **CETIS Version:** CETISv1.9.4
Analyzed: 02 Nov-21 14:38 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Data Summary

Sample	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
Lab Control FM		50	0	50	1	0	-2.13%
10Cu Control		48	1	49	0.9796	0.02041	-0.04%
15 Cu Control		40	1	41	0.9756	0.02439	0.36%
20 Cu Control		41	2	43	0.9535	0.04651	2.62%
FR_UFR1+15Cu		31	0	31	1	0	-2.13%
GH_ER2+15Cu		44	1	45	0.9778	0.02222	0.14%
CM_MC1+15Cu		32	1	33	0.9697	0.0303	0.97%
LC_SLC+10Cu	XC	47	1	48	0.9792	0.02083	0.0%
FR_FRABCH+20Cu		41	0	41	1	0	-2.13%
FR_FRCP1+20Cu		44	2	46	0.9565	0.04348	2.31%
GH_FR1+20Cu		44	3	47	0.9362	0.06383	4.39%
GH_ERC+10Cu		36	1	37	0.973	0.02703	0.63%
CM_MC2+20Cu		40	0	40	1	0	-2.13%
RG_MIDAG+15Cu		42	4	46	0.913	0.08696	6.75%
EV_MC2+20Cu		45	4	49	0.9184	0.08163	6.21%
EV_HC1+20Cu		30	1	31	0.9677	0.03226	1.17%
LC_DCDS+20Cu		38	2	40	0.95	0.05	2.98%
LC_LC3+15Cu		39	2	41	0.9512	0.04878	2.85%
LC_LC5+15Cu		39	1	40	0.975	0.025	0.43%
LC_LCDSSLCC		32	1	33	0.9697	0.0303	0.97%
FR_FR4+15Cu		36	4	40	0.9	0.1	8.09%
FR_FRRD+15Cu		50	1	51	0.9804	0.01961	-0.13%
FR_FR2+20Cu		48	1	49	0.9796	0.02041	-0.04%
FR_MULTIPLATE		41	1	42	0.9762	0.02381	0.3%

Proportion Normal Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Lab Control FM		1.0000	1.0000	1.0000	1.0000
10Cu Control		1.0000	1.0000	1.0000	0.9231
15 Cu Control		1.0000	1.0000	1.0000	0.9286
20 Cu Control		1.0000	0.8750	1.0000	0.8889
FR_UFR1+15Cu		1.0000	1.0000	1.0000	1.0000
GH_ER2+15Cu		0.9167	1.0000	1.0000	1.0000
CM_MC1+15Cu		1.0000	1.0000	1.0000	0.8000
LC_SLC+10Cu	XC	0.9167	1.0000	1.0000	1.0000
FR_FRABCH+20Cu		1.0000	1.0000	1.0000	1.0000
FR_FRCP1+20Cu		0.9167	1.0000	0.8889	1.0000
GH_FR1+20Cu		1.0000	0.9167	0.8333	1.0000
GH_ERC+10Cu		1.0000	0.8889	1.0000	1.0000
CM_MC2+20Cu		1.0000	1.0000	1.0000	1.0000
RG_MIDAG+15Cu		0.8462	0.9000	1.0000	0.9000
EV_MC2+20Cu		0.8462	0.9231	0.9231	1.0000
EV_HC1+20Cu		1.0000	1.0000	1.0000	0.9333
LC_DCDS+20Cu		0.8571	1.0000	0.9091	1.0000
LC_LC3+15Cu		1.0000	1.0000	0.9167	0.9091
LC_LC5+15Cu		0.9231	1.0000	1.0000	1.0000
LC_LCDSSLCC		1.0000	1.0000	1.0000	0.9000
FR_FR4+15Cu		1.0000	0.7500	1.0000	0.9091
FR_FRRD+15Cu		1.0000	0.9167	1.0000	1.0000
FR_FR2+20Cu		1.0000	1.0000	1.0000	0.9286
FR_MULTIPLATE		0.9000	1.0000	1.0000	1.0000

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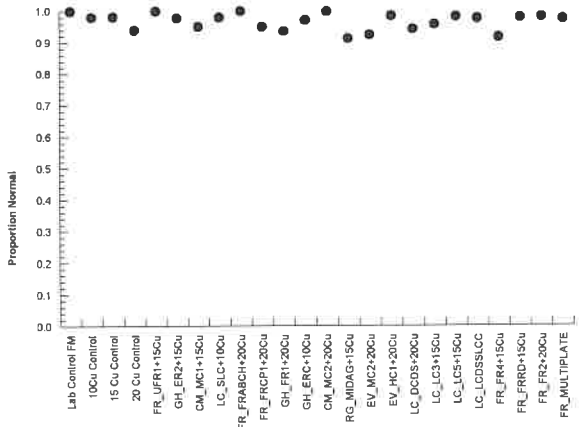
Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 11-5389-0525 **Endpoint:** Proportion Normal **CETIS Version:** CETISv1.9.4
Analyzed: 02 Nov-21 14:38 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Proportion Normal Binomials

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Lab Control FM		12/12	14/14	11/11	13/13
10Cu Control		12/12	12/12	12/12	12/13
15 Cu Control		11/11	8/8	8/8	13/14
20 Cu Control		12/12	7/8	14/14	8/9
FR_UFR1+15Cu		8/8	11/11	3/3	9/9
GH_ER2+15Cu		11/12	13/13	8/8	12/12
CM_MC1+15Cu		8/8	9/9	11/11	4/5
LC_SLC+10Cu	XC	11/12	11/11	12/12	13/13
FR_FRABCH+20Cu		9/9	9/9	11/11	12/12
FR_FRCP1+20Cu		11/12	14/14	8/9	11/11
GH_FR1+20Cu		12/12	11/12	10/12	11/11
GH_ERC+10Cu		9/9	8/9	11/11	8/8
CM_MC2+20Cu		7/7	15/15	11/11	7/7
RG_MIDAG+15Cu		11/13	9/10	13/13	9/10
EV_MC2+20Cu		11/13	12/13	12/13	10/10
EV_HC1+20Cu		4/4	8/8	4/4	14/15
LC_DCDS+20Cu		6/7	8/8	10/11	14/14
LC_LC3+15Cu		10/10	8/8	11/12	10/11
LC_LC5+15Cu		12/13	7/7	12/12	8/8
LC_LCDSSLCC		9/9	6/6	8/8	9/10
FR_FR4+15Cu		9/9	9/12	8/8	10/11
FR_FRRD+15Cu		13/13	11/12	13/13	13/13
FR_FR2+20Cu		14/14	10/10	11/11	13/14
FR_MULTIPLATE		9/10	6/6	13/13	13/13

Graphics



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NOV 09 2021

CETIS Analytical Report

Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID:	12-7578-9624	**Endpoint:**	Post Hatch Survival	**CETIS Version:**	CETISv1.9.4
Analyzed:	02 Nov-21 14:38	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1
Batch ID:	19-0275-1751	**Test Type:**	32 Day Fathead Minnow Test	**Analyst:**	Kayla Knol
Start Date:	13 Aug-21	**Protocol:**	ASTM E1241-05 (2013)	**Diluent:**	Dechlorinated Tap Water
Ending Date:	13 Sep-21	**Species:**	Pimephales promelas	**Brine:**	
Test Length:	31d 0h	**Taxon:**	Actinopterygii	**Source:**	Aquatox, AR **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
Lab Control FM	11-5032-4817	10 Aug-21	11 Aug-21	72h	Teck Coal Ltd	
10Cu Control	04-3348-8996	10 Aug-21	11 Aug-21	72h		
15 Cu Control	05-5139-9319	10 Aug-21	11 Aug-21	72h		
20 Cu Control	18-8853-3252	10 Aug-21	11 Aug-21	72h		
FR_UFR1+15Cu	13-9616-5903	10 Aug-21	11 Aug-21	72h (14.7 °C)		
GH_ER2+15Cu	19-5052-7846	10 Aug-21	11 Aug-21	72h (12.1 °C)		
CM_MC1+15Cu	15-1448-1664	10 Aug-21	11 Aug-21	72h (12.3 °C)		
LC_SLC+10Cu	10-0118-5065	10 Aug-21	11 Aug-21	72h (11.8 °C)		
FR_FRABCH+20Cu	12-2763-5905	10 Aug-21	11 Aug-21	72h (14.6 °C)		
FR_FRCP1+20Cu	05-5162-7629	10 Aug-21	11 Aug-21	72h (13.8 °C)		
GH_FR1+20Cu	18-3989-2491	10 Aug-21	11 Aug-21	72h (12 °C)		
GH_ERC+10Cu	14-6940-9296	10 Aug-21	11 Aug-21	72h (15.4 °C)		
CM_MC2+20Cu	17-0166-2336	10 Aug-21	11 Aug-21	72h (13.1 °C)		
RG_MIDAG+15Cu	18-0148-8949	10 Aug-21	11 Aug-21	72h (12.4 °C)		
EV_MC2+20Cu	08-5423-9441	10 Aug-21	11 Aug-21	72h (13.1 °C)		
EV_HC1+20Cu	19-8320-0922	10 Aug-21	11 Aug-21	72h (12.1 °C)		
LC_DCDS+20Cu	12-7443-1043	10 Aug-21	11 Aug-21	72h (12.3 °C)		
LC_LC3+15Cu	06-5017-0795	10 Aug-21	11 Aug-21	72h (12.4 °C)		
LC_LC5+15Cu	10-4683-7945	10 Aug-21	11 Aug-21	72h (15.1 °C)		
LC_LCDSSLCC	11-9856-2953	10 Aug-21	11 Aug-21	72h (10.8 °C)		
FR_FR4+15Cu	16-1388-5677	10 Aug-21	11 Aug-21	72h (14.1 °C)		
FR_FRRD+15Cu	18-8883-2370	10 Aug-21	11 Aug-21	72h (14.7 °C)		
FR_FR2+20Cu	20-1752-8591	10 Aug-21	11 Aug-21	72h (15.3 °C)		
FR_MULTIPLATE	15-0654-9876	10 Aug-21	11 Aug-21	72h (13.6 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
Lab Control FM	Ambient Sample	Teck Coal Ltd	Lab Control FM	
10Cu Control	Ambient Sample	Teck Coal Ltd	10 Cu Control	
15 Cu Control	Ambient Sample	Teck Coal Ltd	15 Cu Control	
20 Cu Control	Ambient Sample	Teck Coal Ltd	20 Cu Control	
FR_UFR1+15Cu	Ambient Sample	Teck Coal Ltd	FR_UFR1_MON_2021-08-0	
GH_ER2+15Cu	Ambient Sample	Teck Coal Ltd	GH_ER2_WS_2021-08-10_	
CM_MC1+15Cu	Ambient Sample	Teck Coal Ltd	CM_MC1_WS_2021-08-10	
LC_SLC+10Cu	Ambient Sample	Teck Coal Ltd	LC_SLC_WS_2021-08-10_	
FR_FRABCH+20Cu	Ambient Sample	Teck Coal Ltd	FR_FRABCH_MON_2021-	
FR_FRCP1+20Cu	Ambient Sample	Teck Coal Ltd	FR_FRCP1_MON_2021-08	
GH_FR1+20Cu	Ambient Sample	Teck Coal Ltd	GH_FR1_WS_2021-08-10_	
GH_ERC+10Cu	Ambient Sample	Teck Coal Ltd	GH_ERC_WS_2021-08-10	
CM_MC2+20Cu	Ambient Sample	Teck Coal Ltd	CM_MC2_WS_2021-08-10	
RG_MIDAG+15Cu	Ambient Sample	Teck Coal Ltd	RG_MIDAG_WS_2021-08-	
EV_MC2+20Cu	Ambient Sample	Teck Coal Ltd	EV_MC2_WS_2021_Q3_W	
EV_HC1+20Cu	Ambient Sample	Teck Coal Ltd	EV_HC1_WS_2021_Q3_W	
LC_DCDS+20Cu	Ambient Sample	Teck Coal Ltd	LC_DCDS_WS_2021-08-1	
LC_LC3+15Cu	Ambient Sample	Teck Coal Ltd	LC_LC3_WS_2021-08-10_	
LC_LC5+15Cu	Ambient Sample	Teck Coal Ltd	LC_LC5_WS_2021-08-10_	
LC_LCDSSLCC	Ambient Sample	Teck Coal Ltd	LC_LCDSSLCC_WS_2021-	
FR_FR4+15Cu	Ambient Sample	Teck Coal Ltd	FR_FR4_WS_2021-08-10_	
FR_FRRD+15Cu	Ambient Sample	Teck Coal Ltd	FR_FRRD_WS_2021-08-1	

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Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID:	12-7578-9624	**Endpoint:**	Post Hatch Survival	**CETIS Version:**	CETISv1.9.4
Analyzed:	02 Nov-21 14:38	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_FR2+20Cu	Ambient Sample	Teck Coal Ltd	FR_FR2_WS_2021-08-10_	
FR_MULTIPLATE	Ambient Sample	Teck Coal Ltd	FR_MULTIPLATE_WS_20	

Fisher Exact/Bonferroni Adj Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
Site Control		Lab Control FM	0.5469	Exact	1.0000	Non-Significant Effect
LC-SLC		10Cu Control	0.4466	Exact	1.0000	Non-Significant Effect
		15 Cu Control	0.0427	Exact	0.9822	Non-Significant Effect
		20 Cu Control	0.1266	Exact	1.0000	Non-Significant Effect
		FR_UFR1+15Cu*	0.0004	Exact	0.0088	Significant Effect
		GH_ER2+15Cu	0.2437	Exact	1.0000	Non-Significant Effect
		CM_MC1+15Cu	0.0046	Exact	0.1067	Non-Significant Effect
		FR_FRABCH+20Cu	0.1077	Exact	1.0000	Non-Significant Effect
		FR_FRCP1+20Cu	0.2576	Exact	1.0000	Non-Significant Effect
		GH_FR1+20Cu	0.3384	Exact	1.0000	Non-Significant Effect
		GH_ERC+10Cu	0.0090	Exact	0.2081	Non-Significant Effect
		CM_MC2+20Cu	0.0196	Exact	0.4513	Non-Significant Effect
		RG_MIDAG+15Cu	0.2576	Exact	1.0000	Non-Significant Effect
		EV_MC2+20Cu	0.5316	Exact	1.0000	Non-Significant Effect
		EV_HC1+20Cu*	0.0014	Exact	0.0314	Significant Effect
		LC_DCDS+20Cu	0.0139	Exact	0.3208	Non-Significant Effect
		LC_LC3+15Cu	0.0222	Exact	0.5117	Non-Significant Effect
		LC_LC5+15Cu	0.0196	Exact	0.4513	Non-Significant Effect
		LC_LCDSSLCC*	0.0006	Exact	0.0141	Significant Effect
		FR_FR4+15Cu	0.0382	Exact	0.8794	Non-Significant Effect
		FR_FRRD+15Cu	0.6488	Exact	1.0000	Non-Significant Effect
		FR_FR2+20Cu	0.5316	Exact	1.0000	Non-Significant Effect
		FR_MULTIPLATE	0.2621	Exact	1.0000	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	3.147	3.37	0.1204	No Outliers Detected
Treatment Effect	Fligner-Wolfe Omnibus Test	1.412	1.645	0.0790	Non-Significant Overall Effect

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Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID: 12-7578-9624 **Endpoint:** Post Hatch Survival **CETIS Version:** CETISv1.9.4
Analyzed: 02 Nov-21 14:38 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Data Summary

Sample	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
Lab Control FM		50	9	59	0.8475	0.1525	1.13%
10Cu Control		49	10	59	0.8305	0.1695	3.11%
15 Cu Control		41	17	58	0.7069	0.2931	17.53%
20 Cu Control		43	14	57	0.7544	0.2456	11.99%
FR_UFR1+15Cu		31	25	56	0.5536	0.4464	35.42%
GH_ER2+15Cu		45	12	57	0.7895	0.2105	7.9%
CM_MC1+15Cu		33	20	53	0.6226	0.3774	27.36%
LC_SLC+10Cu	XC	48	8	56	0.8571	0.1429	0.0%
FR_FRABCH+20Cu		41	14	55	0.7455	0.2545	13.03%
FR_FRCP1+20Cu		46	12	58	0.7931	0.2069	7.47%
GH_FR1+20Cu		47	11	58	0.8103	0.1897	5.46%
GH_ERC+10Cu		37	20	57	0.6491	0.3509	24.27%
CM_MC2+20Cu		40	19	59	0.678	0.322	20.9%
RG_MIDAG+15Cu		46	12	58	0.7931	0.2069	7.47%
EV_MC2+20Cu		49	9	58	0.8448	0.1552	1.44%
EV_HC1+20Cu		31	22	53	0.5849	0.4151	31.76%
LC_DCDS+20Cu		40	20	60	0.6667	0.3333	22.22%
LC_LC3+15Cu		41	19	60	0.6833	0.3167	20.28%
LC_LC5+15Cu		40	19	59	0.678	0.322	20.9%
LC_LCDSSLCC		33	25	58	0.569	0.431	33.62%
FR_FR4+15Cu		40	17	57	0.7018	0.2982	18.13%
FR_FRRD+15Cu		51	8	59	0.8644	0.1356	-0.85%
FR_FR2+20Cu		49	9	58	0.8448	0.1552	1.44%
FR_MULTIPLATE		42	11	53	0.7925	0.2075	7.55%

Post Hatch Survival Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Lab Control FM		0.8571	0.9333	0.7333	0.8667
10Cu Control		0.8000	0.8000	0.8571	0.8667
15 Cu Control		0.7333	0.5714	0.5333	1.0000
20 Cu Control		0.8571	0.5714	0.9333	0.6429
FR_UFR1+15Cu		0.5714	0.7333	0.2143	0.6923
GH_ER2+15Cu		0.8000	0.9286	0.6154	0.8000
CM_MC1+15Cu		0.6154	0.6429	0.8462	0.3846
LC_SLC+10Cu	XC	0.8571	0.7857	0.8571	0.9286
FR_FRABCH+20Cu		0.6923	0.6923	0.7333	0.8571
FR_FRCP1+20Cu		0.8000	1.0000	0.6429	0.7333
GH_FR1+20Cu		0.8000	0.8000	0.8000	0.8462
GH_ERC+10Cu		0.6429	0.6000	0.8462	0.5333
CM_MC2+20Cu		0.5000	1.0000	0.7333	0.4667
RG_MIDAG+15Cu		0.8667	0.6667	0.8667	0.7692
EV_MC2+20Cu		0.8667	0.8667	0.9286	0.7143
EV_HC1+20Cu		0.3077	0.6667	0.3077	1.0000
LC_DCDS+20Cu		0.4667	0.5333	0.7333	0.9333
LC_LC3+15Cu		0.6667	0.5333	0.8000	0.7333
LC_LC5+15Cu		0.8667	0.4667	0.8000	0.5714
LC_LCDSSLCC		0.6429	0.4000	0.5333	0.7143
FR_FR4+15Cu		0.6000	0.8000	0.5333	0.9167
FR_FRRD+15Cu		0.8667	0.8000	0.8667	0.9286
FR_FR2+20Cu		1.0000	0.6667	0.7333	1.0000
FR_MULTIPLATE		0.8333	0.5000	0.8667	0.9286

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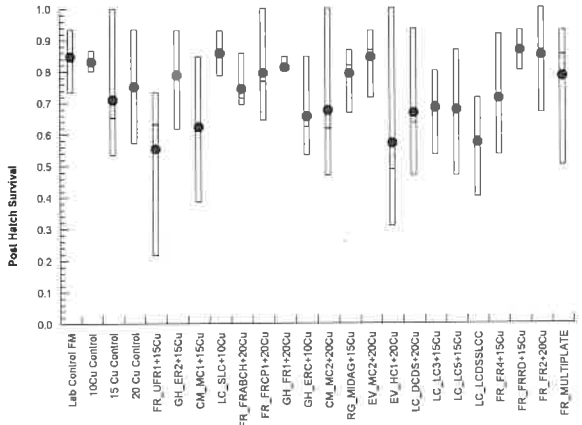
Fathead minnow 32-d (Pimephales promelas) survival and growth test — **Nautilus Environmental Calgary**

Analysis ID:	12-7578-9624	**Endpoint:**	Post Hatch Survival	**CETIS Version:**	CETISv1.9.4
Analyzed:	02 Nov-21 14:38	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1

Post Hatch Survival Binomials

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Lab Control FM		12/14	14/15	11/15	13/15
10Cu Control		12/15	12/15	12/14	13/15
15 Cu Control		11/15	8/14	8/15	14/14
20 Cu Control		12/14	8/14	14/15	9/14
FR_UFR1+15Cu		8/14	11/15	3/14	9/13
GH_ER2+15Cu		12/15	13/14	8/13	12/15
CM_MC1+15Cu		8/13	9/14	11/13	5/13
LC_SLC+10Cu	XC	12/14	11/14	12/14	13/14
FR_FRABCH+20Cu		9/13	9/13	11/15	12/14
FR_FRCP1+20Cu		12/15	14/14	9/14	11/15
GH_FR1+20Cu		12/15	12/15	12/15	11/13
GH_ERC+10Cu		9/14	9/15	11/13	8/15
CM_MC2+20Cu		7/14	15/15	11/15	7/15
RG_MIDAG+15Cu		13/15	10/15	13/15	10/13
EV_MC2+20Cu		13/15	13/15	13/14	10/14
EV_HC1+20Cu		4/13	8/12	4/13	15/15
LC_DCDS+20Cu		7/15	8/15	11/15	14/15
LC_LC3+15Cu		10/15	8/15	12/15	11/15
LC_LC5+15Cu		13/15	7/15	12/15	8/14
LC_LCDSSLCC		9/14	6/15	8/15	10/14
FR_FR4+15Cu		9/15	12/15	8/15	11/12
FR_FRRD+15Cu		13/15	12/15	13/15	13/14
FR_FR2+20Cu		14/14	10/15	11/15	14/14
FR_MULTIPLATE		10/12	6/12	13/15	13/14

Graphics



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APPENDIX D – *Hyalella azteca* Toxicity Test Data

Hyalella azteca ~~Sediment~~ Water-only Test Summary Sheet

Client: Teck
Work Order No.: 211568

Start Date: Aug. 12/21
Set up by: RZ | KJL

Sample Information:

Sample ID: Various - see below
Sample Date: Aug. 10, 17, 24, 31/21
Date Received: Aug. 11, 18, 25/21, Sept. 1/21
Sample Volume: 1x20L ; 2x20L

Test Organism Information:

Species: *Hyalella azteca*
Supplier: Aquatic Biosystems
Date received: Aug. 11/21
Age or size (Day 0): 7-8 days

* Indicates a significant difference compared to control.
α Indicates a significant difference compared to reference site FR-UFR1.
β Indicates a significant difference compared to reference site GH-ER2.
† Indicates a significant difference compared to reference site CM-MC1.
ε Indicates a significant difference compared to reference site LC-SLC.

NaCl Reference Toxicant Results:

Reference Toxicant ID: HA202
Stock Solution ID: n/a
Date Initiated: Aug. 12/21

96-h LC50 (95% CL): 6.9 (5.6-8.4) g/L NaCl

96-h LC50 Reference Toxicant Mean and Range: 6.2 (3.9-9.8) g/L NaCl CV (%): 23

Test Results:

Sample ID	Survival ± SD (%)	Average Dry Wt. ± SD (mg)
Control	96.0 ± 8.9	0.86 ± 0.15
FR-UFR1	94.0 ± 8.9	0.61 ± 0.12*
GH-ER2	98.0 ± 4.5	0.53 ± 0.11*†
CM-MC1	98.0 ± 4.5	0.77 ± 0.07
LC-SLC	94.0 ± 5.5	0.55 ± 0.05*†
FR-FRARCH	92.0 ± 11.0	0.47 ± 0.11*†
FR-FRCP1	98.0 ± 4.5	0.46 ± 0.14*†
GH-FR1	100.0 ± 0.0	0.49 ± 0.11*†

Reviewed by: [signature]
Date reviewed: NOV. 19, 2021

Hyalella azteca ~~Sediment~~ Water-only Test Summary Sheet

Client: Teck
Work Order No.: 211568

Start Date: Aug. 12/21
Set up by: RZS / KJL

Sample Information:

Sample ID: Various - See below
Sample Date: Aug. 10, 17, 24, 31/21
Date Received: Aug. 11, 18, 25/21, Sept. 1/21
Sample Volume: 1 x 20L ; 2 x 20L

Test Organism Information:

Species: *Hyalella azteca*
Supplier: Aquatic Bio Systems
Date received: Aug. 11/21
Age or size (Day 0): 7 to 8 days

NaCl Reference Toxicant Results:

Reference Toxicant ID: HA202
Stock Solution ID: n/a
Date Initiated: Aug. 12/21

96-h LC50 (95% CL): 6.9 (5.6-8.4) g/L NaCl

96-h LC50 Reference Toxicant Mean and Range: 6.2 (3.9-9.8) g/L NaCl CV (%): 23

* Indicates a significant difference compared to Control.
α Indicates a significant difference compared to reference site FR-UFR1.
β Indicates a significant difference compared to reference site GH-ER2.
† Indicates a significant difference compared to reference site CH-MC1.
ε Indicates a significant difference compared to reference site LC-SLC.

Test Results:

Sample ID	Survival ± SD (%)	Average Dry Wt. ± SD (mg)
GH-ERC	98.0 ± 4.5	0.50 ± 0.07 *†
CH-MC2	38.0 ± 31.9 *αβ†ε	0.32 ± 0.10 *αβ†ε
EV-MC2	94.0 ± 8.9	0.61 ± 0.09 *
EV-HC1	98.0 ± 4.5	0.75 ± 0.10
LC-DCDS	100.0 ± 0.0	0.58 ± 0.06 *†
LC-LC3	96.0 ± 5.5	0.51 ± 0.06 *†
LC-LC5	94.0 ± 5.5	0.48 ± 0.08 *†
LC-LCDSS LCC	94.0 ± 8.9	0.53 ± 0.07 *†

Reviewed by: [signature]
Date reviewed: Nov-19, 2021

Hyalella azteca ~~Sediment~~ Water-only Test Summary Sheet

Client: Teck
Work Order No.: 211568

Start Date: Aug. 12/21
Set up by: RZS / KJL

Sample Information:

Sample ID: Various - see below
Sample Date: Aug. 10, 17, 24, 31 / 21
Date Received: Aug. 11, 18, 25/21, Sept. 1/21
Sample Volume: 1 x 20L ; 2 x 20L

Test Organism Information:

Species: *Hyalella azteca*
Supplier: Aquatic Bio Systems
Date received: Aug. 11/21
Age or size (Day 0): 7 ~~8~~ day

NaCl Reference Toxicant Results:

Reference Toxicant ID: HA202
Stock Solution ID: n/a
Date Initiated: Aug. 12/21

96-h LC50 (95% CL): 6.9 (5.6 - 8.4) g/L NaCl

96-h LC50 Reference Toxicant Mean and Range: 6.2 (3.9 - 9.8) g/L NaCl CV (%): 23

* Indicates a significant difference compared to Control.

α Indicates a significant difference compared to reference site FR-UFR1.

β Indicates a significant difference compared to reference site GH-ER2

† Indicates a significant difference compared to reference site CM-MC1.

ε Indicates a significant difference compared to reference site LC-SLC.

Test Results:

Sample ID	Survival ± SD (%)	Average Dry Wt. ± SD (mg)
RG - MIDAG	94.0 ± 13.4	0.79 ± 0.07
FR - FR4	98.0 ± 4.5	0.47 ± 0.25 *†
FR - FRRD	100.0 ± 0.0	0.50 ± 0.13 *†
FR - FR2	86.0 ± 26.1	0.50 ± 0.12 *†
FR - MULTIPLATE	98.0 ± 4.5	0.32 ± 0.03 *αβ†ε
	±	±
	±	±
	±	±

Reviewed by: [signature]

Date reviewed: Nov. 19, 2021

Chronic *H. azteca* Water-Only Toxicity Test Data Sheet
Water Quality

Client: Teck
Work Order No.: 211568
Sample ID: Various- see below

Start Date: Aug. 12/21
Termination Date: Sept. 9/21
CER #: 6
Test Organism: *Hyalella azteca*

Temperature (°C)

Sample ID/Conc.	Day													
	0	1		2		3		4		5		6		7
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Control	22.0	22.5	22.5	23.0	23.0	23.0	22.5	23.0	22.5	23.0	23.0	23.0	22.5	23.0
FR-UFR1	22.0	22.5	22.5	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0
GH-ER2	23.0	22.5	22.5	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0
CM-MC1	23.0	22.5	22.5	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0
LC-SLC	23.0	22.5	22.5	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0
FR-FRABCH	23.0	22.5	22.5	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0
FR-FRCP1	22.5	22.5	22.5	23.0	23.0	23.0	23.5	23.0	23.0	23.0	23.5	23.0	23.0	23.0
GH-FR1	22.5	22.5	22.5	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.5	23.0	23.0	23.0
GH-ERC	22.5	22.5	22.5	23.0	23.0	23.0	23.0	23.0	23.5	23.0	23.5	23.0	23.0	23.0
CM-MC2	22.5	22.5	22.5	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.5	23.0	23.0	23.0
Technician Initials	RZS	KJL	KJL	JBL	JBL	RZS	RZS	RZS	RZS/MM	RZS	RZS	RZS	RZS	RZS

Thermometer: 6

Conductivity (µS)

Sample ID/Conc.	Day													
	0	1		2		3		4		5		6		7
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Control	422	436	42~~7~~	428	422	427	423	431	422	426	420	427	422	426
FR-UFR1	406	420	40~~8~~	413	408	413	409	414	410	414	409	415	410	414
GH-ER2	344	361	34~~6~~	349	346	348	346	351	342	349	341	348	341	345
CM-MC1	349	364	352	355	351	355	351	357	349	353	348	353	348	352
LC-SLC	411	427	412	413	412	416	412	419	411	430	412	418	411	416
FR-FRABCH	1156	1154	1150	1138	1139	1126	1128	1120	1143	1127	1129	1121	1115	1113
FR-FRCP1	~~8750~~	1086	1102	1090	1099	1084	1098	1094	1095	1096	1092	1090	1096	1099
GH-FR1	875	880	881	884	877	870	879	873	875	877	871	870	866	868
GH-ERC	364	387	365	377	365	368	364	370	363	368	363	367	363	369
CM-MC2	1010	1005	1045	1003	1003	998	1000	999	1000	996	994	991	992	983
Technician Initials	RZS	KJL	KJL	JBL	JBL	RZS	RZS	RZS	RZS/MM	RZS	RZS	RZS	RZS	RZS

Conductivity meter: 313

Comments: ① 1097

Reviewed by: [signature] Date Reviewed: Nov. 17, 2021

Chronic *H. azteca* Water-Only Toxicity Test Data Sheet
Water Quality

Client: Teck
Work Order No.: 211568
Sample ID: various- see below

Start Date: Aug. 12/21
Termination Date: Sept. 9/21
CER #: 6
Test Organism: *Hyalella azteca*

Temperature (°C)

Sample ID/Conc.	Day													
	0	1		2		3		4		5		6		7
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
EV-MC2	22.5	22.0	22.5	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.5	23.0	23.0	23.0
EV-HC1	22.5	22.0	22.5	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.5	23.0	23.0	23.0
LC-DCDS	23.0	22.5	22.5	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.5	23.0	23.0	23.0
LC-LC3	23.0	22.5	22.5	23.0	23.0	23.0	22.5	23.0	23.0	23.0	23.5	23.0	23.0	23.0
LC-LC5	22.5	22.5	22.5	23.0	23.0	23.0	22.5	23.0	23.0	23.0	23.5	23.0	23.0	23.0
LC-LCDSSLCC	22.5	22.5	22.5	23.0	23.0	23.0	22.5	23.0	23.0	23.0	23.5	23.0	23.0	23.0
RG-MIDAG	23.0	22.5	22.5	23.0	23.0	23.0	22.5	23.0	22.5	23.0	23.5	23.0	23.0	23.0
FR-FR4	23.0	22.5	22.5	23.0	23.0	23.0	22.5	23.0	23.0	23.0	23.5	23.0	23.0	23.0
FR-FRRD	22.5	22.5	22.5	23.0	22.5	23.0	22.5	23.0	22.5	23.0	22.5	23.0	22.5	23.0
FR-FR2	23.0	22.5	22.5	23.0	22.5	23.0	22.5	23.0	23.0	23.0	23.0	23.0	22.5	23.0
Technician Initials	RZS	KJV	KJV	JTL	JTL	RZJ	RZJ	RZJ	RZJ	RZJ	RZJ	RZJ	RZJ	RZJ

Thermometer: 6

Conductivity (µS)

Sample ID/Conc.	Day													
	0	1		2		3		4		5		6		7
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
EV-MC2	577	596	581	580	594	579	578	581	585	585	586	590	584	590
EV-HC1	702	708	732	704	707	710	723	716	701	704	701	700	703	715
LC-DCDS	935	930	941	933	943	935	943	941	936	937	937	939	940	940
LC-LC3	1070	1061	1065	1050	1063	1058	1062	1058	1067	1066	1065	1065	1064	1054
LC-LC5	811	833	818	846	810	809	810	810	809	811	807	808	801	800
LC-LCDSSLCC	872	867	873	869	870	865	869	868	875	876	874	870	869	870
RG-MIDAG	595	604	595	599	597	596	594	598	572	577	572	576	573	575
FR-FR4	1118	1106	1119	1118	1118	1112	1120	1115	1119	1118	1112	1111	1112	1105
FR-FRRD	1217	1200	1209	1165	1195	1173	1183	1171	1208	1183	1190	1181	1173	1155
FR-FR2	872	886	867	851	846	852	858	857	859	856	850	850	843	840
Technician Initials	RZJ	KJV	KJV	JTL	JTL	RZJ	RZJ	RZJ	RZJ	RZJ	RZJ	RZJ	RZJ	RZJ

Conductivity meter: 3/3

Comments: In Refresh Week 1 sample LC-DCDS, RZS ~~had~~ daphnia were found. The daphnia were picked out of the sample.

Reviewed by: [signature]

Date Reviewed: Nov. 17, 2021

Chronic *H. azteca* Water-Only Toxicity Test Data Sheet
Water Quality

Client: Teck
Work Order No.: 211568
Sample ID: various - see below

Start Date: Aug. 12/21
Termination Date: Sept. 9/21
CER #: 6
Test Organism: *Hyalella azteca*

Temperature (°C)

Sample ID/Conc.	Day													
	0	1		2		3		4		5		6		7
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
FR-MULTIPLATE	23.0	22.5	22.5	23.0	22.5	23.0	22.5	23.0	23.0	23.0	23.0	23.0	23.0	23.0
Technician Initials	RZJ	KSL	KSL	JBL	JBL	RZJ	RZJ	RZJ	RZJ	RZJ	RZJ	RZJ	RZJ	RZJ

Thermometer: 6

Conductivity (µS)

Sample ID/Conc.	Day													
	0	1		2		3		4		5		6		7
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
FR-MULTIPLATE	815	810	818	805	816	815	817	820	817	819	819	817	813	811
Technician Initials	RZJ	KSL	KSL	JBL	JBL	RZJ	RZJ	RZJ	RZJ	RZJ	RZJ	RZJ	RZJ	RZJ

Conductivity meter: 3/3

Comments:

Reviewed by: [signature] Date Reviewed: Nov. 17, 2021

Chronic *H. azteca* Water-Only Toxicity Test Data Sheet
Water Quality

Client: Teck
Work Order No.: 211568
Sample ID: Various - see below

Start Date: Aug. 12/21
Termination Date: Sept. 9/21
CER #: 6
Test Organism: *Hyalella azteca*

Temperature (°C)

Sample ID/Conc.	Day													
	0	1		2		3		4		5		6		7
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Control + EDTA	22.0	22.5	22.5	23.0	22.5	23.0	22.5	23.0	22.5	23.0	23.5	23.0	23.0	23.0
FR-FRCP1+EDTA	23.0	22.5	22.5	23.0	22.5	23.0	22.5	23.0	23.0	23.0	23.5	23.0	23.0	23.0
CM_MC2 + EDTA	23.0	22.5	22.5	23.0	22.5	23.0	22.5	23.0	23.0	23.0	23.5	23.0	23.0	23.0
RG_MIDAG+EDTA	23.0	22.5	22.5	23.0	22.5	23.0	22.5	23.0	23.0	23.0	23.5	23.0	23.0	23.0
Technician Initials	RZS	KJL	KJL	JEL	JEL	RZJ	RZJ	RZJ	RZJ	RZJ	RZJ	RZJ	RZJ	RZJ

Thermometer: 6

Conductivity (µS)

Sample ID/Conc.	Day													
	0	1		2		3		4		5		6		7
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Control + EDTA	422	435	425	422	424	427	422	427	422	424	423	425	424	427
FR-FRCP1+ EDTA	1099	1085	1098	1095	1085	1093	1094	1095	1095	1090	1095	1090	1094	1092
CM_MC2+EDTA	1014	1017	1014	1017	1010	1002	1006	1003	1010	1002	1008	997	997	986
RG_MIDAG+EDTA	598	607	600	601	600	604	602	607	594	597	594	596	593	591
Technician Initials	RZS	KJL	KJL	JEL	JEL	RZJ	RZJ	RZJ	RZJ	RZJ	RZJ	RZJ	RZJ	RZJ

Conductivity meter: 313

Comments:

Reviewed by: [signature] Date Reviewed: Nov. 17, 2021

Chronic *H. azteca* Water-Only Toxicity Test Data Sheet
Water Quality

Client: Teck
Work Order No.: 211568
Sample ID: Various - see below

Start Date: Aug. 12/21
Termination Date: 20th Sept. 9/21
Test Organism: *Hyalella azteca*

Dissolved Oxygen (mg/L)

Sample ID/Conc.	Day 0	1		2		3		4		5		6		7
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Control	8.6	7.3	8.5	6.8	8.4	6.1	8.4	6.1	8.5	5.9	8.4	6.0	8.4	5.6
FR_UFR1	8.7	7.1	8.6	6.7	7.8	5.8	8.0	6.0	8.5	5.8	8.0	5.8	7.8	4.9
GH_ER2	8.5	7.2	8.6	6.7	7.9	5.8	7.9	5.9	8.3	5.9	8.1	5.8	7.9	4.9
CM_MC1	8.5	7.3	8.6	6.8	8.0	6.0	7.9	5.9	8.2	5.9	8.1	6.5	7.7	5.7
LC_SLC	8.5	7.1	8.6	6.8	7.9	5.4	8.0	5.8	8.4	5.8	8.0	5.9	7.8	5.1
FR_FRABCH	8.5	7.4	8.6	6.8	7.9	5.8	8.0	5.9	8.0	5.9	8.0	6.1	7.8	5.3
FR_FRCP1	8.5	7.3	8.6	7.0	7.9	6.0	8.0	6.2	8.2	5.7	8.0	6.0	7.8	5.1
GH_FR1	8.5	7.2	8.6	6.9	8.0	6.0	7.9	6.1	8.1	5.9	8.0	6.1	8.0	4.9
GH_ERC	8.5	7.2	8.6	6.9	8.1	6.1	8.0	6.1	8.3	6.0	8.0	6.1	7.9	5.2
CM_MC2	8.5	7.2	8.6	6.9	8.0	5.8	7.9	6.0	8.4	6.0	8.1	6.5	8.0	5.8
Technician Initials	RZS	KL	KL	JZ	JZ	RZS	RZS	RZS	RZS	RZS	RZS	RZS	RZS	RZS

DO meter: 313

pH

Sample ID/Conc.	Day 0	1		2		3		4		5		6		7
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Control	7.8	7.2	7.7	7.2	7.7	7.1	7.8	7.0	7.8	7.0	7.8	7.3	7.8	7.0
FR_UFR1	7.9	7.5	7.8	7.5	7.9	7.6	7.9	7.6	7.9	7.5	7.9	7.7	7.9	7.4
GH_ER2	7.8	7.5	8.0	7.6	7.9	7.5	7.9	7.5	7.9	7.4	7.9	7.6	8.0	7.3
CM_MC1	7.8	7.5	8.0	7.6	7.9	7.6	7.9	7.5	8.0	7.5	7.9	7.8	7.9	7.5
LC_SLC	7.9	7.4	7.9	7.6	7.9	7.5	8.0	7.6	8.0	7.5	8.0	7.7	8.1	7.5
FR_FRABCH	7.9	7.9	7.9	7.8	7.9	7.9	7.9	7.9	8.0	7.9	7.9	8.0	7.9	7.8
FR_FRCP1	8.0	7.9	8.1	8.0	8.1	8.1	8.2	8.1	8.3	8.0	8.2	8.1	8.2	8.0
GH_FR1	8.0	7.9	8.0	8.0	8.1	8.0	8.1	7.9	8.1	8.0	8.1	8.0	8.0	7.8
GH_ERC	7.8	7.9	7.9	8.0	8.0	7.7	8.0	7.7	8.0	7.7	8.0	7.8	8.0	7.6
CM_MC2	8.1	7.9	8.0	7.9	8.1	7.9	8.0	7.9	8.1	7.9	8.1	8.1	8.0	7.9
Technician Initials	RZS	KL	KL	JZ	JZ	RZS	RZS	RZS	RZS	RZS	RZS	RZS	RZS	RZS

pH meter:

Light meter: Li-1
Light intensity (Lux): 450-950

Comments:

Reviewed by:
Date Reviewed: NOV. 17, 2021

Chronic *H. azteca* Water-Only Toxicity Test Data Sheet
Water Quality

Client: Teck
Work Order No.: 211568
Sample ID: various - see below

Start Date: Aug. 12/21
Termination Date: 20/6 Sept. 9/21
Test Organism: *Hyalella azteca*

Dissolved Oxygen (mg/L)

Sample ID/Conc.	Day													
	0	1		2		3		4		5		6		7
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
EV_MC2	8.5	7.3	8.6	6.6	7.9	5.9	7.9	5.9	8.3	5.9	8.1	6.1	7.9	5.0
EV-HC1	8.5	7.4	8.6	6.6	8.0	6.0	7.9	6.0	8.4	5.9	8.0	6.0	8.0	4.8
LC_DCDS	8.4	7.5	8.6	6.3	8.0	5.5	7.9	6.0	8.3	5.4	7.8	5.7	7.6	4.7
LC_LC3	8.5	7.4	8.6	6.4	7.9	6.1	8.0	5.7	8.3	5.8	8.0	5.8	8.0	5.2
LC_LC5	8.5	7.3	8.6	6.6	8.0	5.8	8.0	6.0	8.2	5.7	8.0	5.8	8.0	5.0
LC_LCDSSLCC	8.5	7.2	8.6	6.5	8.0	6.0	7.9	5.9	8.1	5.9	8.0	5.9	7.9	5.0
RG_MIDAG	8.5	7.3	8.6	6.5	7.8	5.9	8.0	6.0	8.2	6.2	8.0	6.0	8.0	5.3
FR_FR4	8.4	7.3	8.6	6.5	7.8	6.0	7.9	6.0	8.2	5.9	8.1	5.9	8.0	5.2
FR_FRRD	8.3	7.4	8.6	6.8	7.8	5.5	7.8	4.5	8.6	5.7	8.2	5.8	8.1	5.2
FR_FR2	8.5	7.3	8.6	6.8	8.0	6.0	8.0	6.1	8.5	6.1	8.2	6.1	8.1	5.4
Technician Initials	RZS	KL	KL	JZL	JZL	RZS	RZS	RZS	RZS	RZS	RZS	RZS	RZS	RZS

DO meter: 313

pH

Sample ID/Conc.	Day													
	0	1		2		3		4		5		6		7
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
EV_MC2	8.0	7.9	8.1	7.8	8.0	7.8	8.1	7.8	8.1	7.8	8.1	7.9	8.2	7.7
EV-HC1	8.0	8.0	8.0	8.0	8.0	7.9	8.2	7.9	8.2	7.9	8.2	8.0	8.3	7.8
LC_DCDS	8.1	7.9	8.0	7.4	7.9	7.6	8.0	7.5	8.1	7.5	8.1	7.5	8.1	7.4
LC_LC3	7.8	8.0	7.8	7.8	7.9	8.0	8.2	8.0	8.1	8.0	8.2	8.0	8.3	8.0
LC_LC5	8.2	8.0	8.0	8.0	8.1	7.9	8.2	7.9	7.9	7.9	8.2	8.0	8.2	7.8
LC_LCDSSLCC	8.1	7.9	8.1	8.0	8.1	8.0	8.2	8.0	8.2	8.0	8.2	8.0	8.3	7.9
RG_MIDAG	7.9	7.9	8.0	8.0	8.1	7.7	8.1	7.8	7.9	7.9	8.1	7.9	8.2	7.7
FR_FR4	8.1	8.0	8.1	8.0	8.1	8.1	8.3	8.1	8.3	8.1	8.3	8.1	8.3	8.1
FR_FRRD	7.8	8.0	7.9	8.0	7.9	7.8	7.8	7.7	7.8	7.9	7.8	8.0	7.8	7.9
FR_FR2	8.1	8.0	8.0	8.0	8.0	7.9	8.1	7.9	8.0	7.9	8.1	7.9	7.9	7.8
Technician Initials	RZS	KL	KL	JZL	JZL	RZS	RZS	RZS	RZS	RZS	RZS	RZS	RZS	RZS

pH meter: 313 (0) 8.0

Light meter: Lit-1

Light intensity (Lux): 450-950

Comments:

Reviewed by:

Date Reviewed: Nov 17, 2021

Chronic *H. azteca* Water-Only Toxicity Test Data Sheet
Water Quality

Client: Teck
Work Order No.: 211568
Sample ID: Various - See below

Start Date: Aug. 12/21
Termination Date: Sept. 9/21
Test Organism: *Hyalella azteca*

Dissolved Oxygen (mg/L)

Sample ID/Conc.	Day													
	0	1		2		3		4		5		6		7
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
FR-MULTIPLATE	8.4	7.2	8.6	6.8	7.9	~~6.7~~ 8.8	8.0	6.6	8.3	6.1	8.2	6.2	8.1	5.6
Technician Initials		KM	CL	JZ	JZ	RZJ	RZJ	RZJ	RZJ	RZJ	RZJ	RZJ	RZJ	RZJ

DO meter: 3/3

pH

Sample ID/Conc.	Day													
	0	1		2		3		4		5		6		7
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
FR_MULTIPLATE	8.0	7.9	8.0	7.8	8.1	7.8	8.0	8.0	8.1	7.9	8.2	7.9	8.2	7.9
Technician Initials	RZJ	CL	KM	JZ	JZ	RZJ	RZJ	RZJ	RZJ	RZJ	RZJ	RZJ	RZJ	RZJ

pH meter: 3/3

Light meter: Lit-1

Light intensity (Lux): 450-950

Comments:

Reviewed by: [signature]

Date Reviewed: Nov. 17, 2021

Chronic *H. azteca* Water-Only Toxicity Test Data Sheet
Water Quality

Client: Teck
Work Order No.: 211568
Sample ID: Various- see below

Start Date: Aug. 12/21
Termination Date: Sept. 9/21
Test Organism: *Hyalella azteca*

Dissolved Oxygen (mg/L)

Sample ID/Conc.	Day													
	0	1		2		3		4		5		6		7
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Control + EDTA	~~22.8~~ 8.6	7.3	8.6	6.5	8.0	5.6	8.4	6.3	8.3	6.1	8.0	5.8	7.9	5.5
FR_FRCP1 + EDTA	8.4	7.3	8.6	6.6	8.0	5.8	8.0	6.2	8.2	6.1	7.9	5.7	7.9	4.9
CM_MC2 + EDTA	8.5	7.1	8.6	6.7	7.8	6.0	8.0	6.1	8.2	6.0	7.9	6.0	8.6	5.6
RG_MIDAG + EDTA	8.5	7.2	8.6	6.7	7.8	6.2	8.0	6.3	8.2	6.3	8.0	6.4	7.9	5.8
Technician Initials	RZS	KJL	KJL	JBZ	JBZ	RZS	RZS	RZS	RZS/MOD	RZS	RZS	RZS	RZS	RZS

DO meter: 313

pH

Sample ID/Conc.	Day													
	0	1		2		3		4		5		6		7
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Control + EDTA	~~8.2~~ 7.6	7.6	7.6	7.4	7.5	7.2	7.7	7.3	7.8	7.3	7.7	7.4	7.8	7.3
FR_FRCP1 + EDTA	7.9	8.0	7.9	8.0	8.0	8.0	8.2	8.1	8.2	8.1	8.3	8.1	8.3	8.0
CM_MC2 + EDTA	8.1	8.0	8.1	8.0	8.1	8.0	8.1	8.0	8.1	8.0	8.1	8.0	8.1	8.0
RG_MIDAG + EDTA	7.9	7.9	7.8	7.9	8.0	7.8	8.1	7.8	8.0	7.9	8.1	7.9	8.2	7.8
Technician Initials	RZS	KJL	KJL	JBZ	JBZ	RZS	RZS	RZS/MOD	RZS/MOD	RZS	RZS	RZS	RZS	RZS

pH meter: 313

Light meter: LI-1

Light intensity (Lux): 450-950

Comments:

Reviewed by: [signature]

Date Reviewed: Nov. 17, 2021

Chronic *H. azteca* Water-Only Toxicity Test Data Sheet

Water Quality

Client: Teck
Work Order No.: 211568
Sample ID: Various - see below

Start Date: ~~Oct~~ Aug. 12/21
Termination Date: Sept. 9/21
CER #: 6
Test Organism: *Hyalella azteca*

Temperature (°C)

Sample ID/Conc.	Day													
	7	8		9		10		11		12		13		14
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Control	22.5	23.0	23.0	23.0	23.0	23.0	22.5	23.0	22.0	23.0	22.5	23.0	22.5	23.0
FR-UFR1	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0
GH-ER2	22.5	23.0	23.0	23.0	23.0	23.0	23.0	22.5	23.0	23.0	23.0	23.0	23.0	23.0
CM-MC1	22.5	23.0	23.0	23.0	23.0	23.0	23.0	22.5	23.0	23.0	23.0	23.0	23.0	23.0
LC-SLC	22.5	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0
FR-FRABCH	22.5	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0
FR-FRCP1	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0
GH-FR1	23.0	23.0	23.0	23.0	22.5	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0
GH-ERC	23.0	23.0	23.0	23.0	22.5	23.0	22.5	23.0	23.0	23.0	23.0	23.0	23.0	23.0
CM-MC2	23.0	23.0	23.0	23.0	22.5	23.0	22.5	23.0	23.0	23.0	23.0	23.0	23.0	23.0
Technician Initials	RZS					RZS	RZ	RZS	RZS	RZS	RZS	RZS	RZS	RZ

Thermometer: 6

Conductivity (µS)

Sample ID/Conc.	Day													
	7	8		9		10		11		12		13		14
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Control	423	427	423	428	423	428	422	431	422	427	422	429	425	430
FR-UFR1	388	398	390	393	389	395	389	400	411	412	416	416	411	418
GH-ER2	351	355	352	354	351	354	351	360	375	375	374	380	374	382
CM-MC1	343	348	345	348	347	347	343	352	365	367	365	368	365	371
LC-SLC	391	398	394	395	393	396	392	401	415	416	415	420	415	421
FR-FRABCH	1117	1116	1109	1109	1100	1081	1093	1080	~~1099~~ 1091	1088	1090	1083	1073	1070
FR-FRCP1	1106	1100	1105	1005	1106	1091	1100	1099	1119	1117	1119	1117	1114	1113
GH-FR1	902	892	904	894	897	896	897	900	923	919	920	926	920	916
GH-ERC	351	360	356	358	352	357	352	360	365	369	367	372	367	369
CM-MC2	1070	1064	1068	1056	1056	1045	1043	1035	1075	1070	1066	1060	1060	1059
Technician Initials	RZ					RZS	RZ	RZS	RZS	RZS	RZS	RZS	RZS	RZ

Conductivity meter: 313

Comments:

Reviewed by: [signature]

Date Reviewed: Nov. 17, 2021

Chronic *H. azteca* Water-Only Toxicity Test Data Sheet

Water Quality

Client: Teck
Work Order No.: 211568
Sample ID: various- see below

Start Date: Aug. 12/21
Termination Date: Sept. 9/21
CER #: 6
Test Organism: *Hyalella azteca*

Temperature (°C)

Sample ID/Conc.	Day 7	8		9		10		11		12		13		14
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
EV-MC2	22.5	23.0	23.0	23.0	22.5	23.0	22.5	23.0	23.0	23.0	22.5	23.0	23.0	23.0
EV-HC1	22.5	23.0	23.0	23.0	22.5	23.0	22.5	23.0	23.0	23.0	23.0	23.0	23.0	23.0
LC-DCDS	22.0	23.0	23.0	23.0	22.5	23.0	22.5	23.0	23.0	23.0	23.0	22.5	23.0	23.0
LC-LC3	22.0	23.0	22.5	23.0	22.5	23.0	22.5	22.5	22.5	22.5	22.5	23.0	22.5	23.0
LC-LC5	22.0	23.0	22.5	23.0	22.5	23.0	22.5	22.5	22.5	22.5	22.5	23.0	22.5	23.0
LC-LCDSSLCC	22.0	23.0	22.5	23.0	22.5	23.0	22.5	22.5	22.5	22.5	22.5	22.5	22.5	23.0
RG-MIDAG	22.0	23.0	22.5	23.0	22.5	23.0	22.5	22.5	22.5	22.5	22.5	23.0	22.5	23.0
FR-FR4	22.0	23.0	22.5	23.0	22.5	23.0	22.5	22.5	22.5	22.5	22.5	23.0	22.5	23.0
FR-FRRD	22.0	23.0	22.5	23.0	22.5	23.0	22.5	22.5	22.5	22.5	22.5	23.0	22.5	23.0
FR-FR2	22.0	23.0	22.5	23.0	22.5	23.0	22.5	22.5	22.5	23.0	22.5	23.0	22.5	23.0
Technician Initials	RZ					RZ	RZ	RZ	RZ	RZ	RZ	RZ	RZ	RZ

Thermometer: 6

Conductivity (µS)

Sample ID/Conc.	Day 7	8		9		10		11		12		13		14
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
EV-MC2	565	574	571	569	566	569	568	572	578	577	578	582	579	581
EV-HC1	670	680	677	678	672	673	672	673	694	721	694	699	715	713
LC-DCDS	1035	1037	1036	1037	1038	1031	1035	1025	1054	1046	1052	1050	1056	1050
LC-LC3	1075	1073	1074	1067	1076	1064	1072	1063	1074	1078	1087	1089	1088	1075
LC-LC5	714	732	714	742	715	710	712	722	731	737	739	742	737	746
LC-LCDSSLCC	813	830	818	815	816	809	812	813	815	822	826	831	829	830
RG-MIDAG	665	659	665	662	666	660	667	661	680	679	681	686	681	689
FR-FR4	1103	1107	1104	1102	1103	1098	1103	1092	1105	1112	1114	1115	1112	1113
FR-FRRD	1178	1164	1173	1154	1116	1137	1126	1118	1163	1149	1164	1150	1148	1141
FR-FR2	869	869	864	855	862	849	848	845	871	862	864	866	860	857
Technician Initials	RZ					RZ	RZ	RZ	RZ	RZ	RZ	RZ	RZ	RZ

Conductivity meter: 3/3

Comments:

Reviewed by: [signature] Date Reviewed: Nov. 17, 2021

Chronic *H. azteca* Water-Only Toxicity Test Data Sheet
Water Quality

Client: Teck
Work Order No.: 211568
Sample ID: various- see below

Start Date: Aug. 12/21
Termination Date: Sept. 9/21
CER #: 6
Test Organism: *Hyalella azteca*

Temperature (°C)

Sample ID/Conc.	Day													
	7	8		9		10		11		12		13		14
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
FR-MULTIPLATE	22.0	23.0	22.5	23.0	22.5	23.0	22.5	22.5	22.5	23.0	22.5	22.5	22.5	23.0
Technician Initials	RZJ	[illegible]	[illegible]	[illegible]	[illegible]	RZJ	RZJ	RZS	RZS	RZS	RZS	RZJ	RZJ	RZJ

Thermometer: 6

Conductivity (µS)

Sample ID/Conc.	Day													
	7	8		9		10		11		12		13		14
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
FR-MULTIPLATE	739	761	751	747	754	751	748	750	755	764	766	769	766	769
Technician Initials	RZJ	[illegible]	[illegible]	[illegible]	[illegible]	RZJ	RZJ	RZS	RZS	RZS	RZS	RZJ	RZJ	RZJ

Conductivity meter: 313

Comments:

Reviewed by: [signature]

Date Reviewed: Nov. 17, 2021

Chronic *H. azteca* Water-Only Toxicity Test Data Sheet
Water Quality

Client: Teck
Work Order No.: 211568
Sample ID: Various - see below

Start Date: Aug. 12/21
Termination Date: Sept. 9/21
CER #: 6
Test Organism: *Hyalella azteca*

Temperature (°C)

Sample ID/Conc.	Day													
	7	8		9		10		11		12		13		14
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Control + EDTA	22.5	23.0	23.0	23.0	23.0	23.0	23.0	22.5	23.0	22.5	23.0	22.5	23.0	23.0
FR-FRCP1+EDTA	23.0	23.0	23.0	23.0	22.5	23.0	22.5	22.5	23.0	22.5	23.0	22.5	23.0	23.0
CM_MC2 + EDTA	23.0	23.0	23.0	23.0	22.5	23.0	22.5	22.5	23.0	22.5	23.0	22.5	23.0	23.0
RG-MIDAG+EDTA	23.0	23.0	23.0	23.0	22.5	23.0	22.5	22.5	23.0	22.5	23.0	22.5	23.0	23.0
Technician Initials	RZJ					RZJ	RZJ	RZS	RZS	RZS	RZS	RZS	RZS	RZJ

Thermometer: 6

Conductivity (µS)

Sample ID/Conc.	Day													
	7	8		9		10		11		12		13		14
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Control + EDTA	423	429	424	427	426	426	425	428	423	425	424	429	425	430
FR-FRCP1+EDTA	1111	1121	1112	1111	1104	1091	1102	1094	1120	1118	1118	1115	1117	1121
CM_MC2+EDTA	1077	1063	1072	1061	1068	1055	1057	1044	1079	1060	1073	1065	1063	1058
RG-MIDAG+EDTA	668	667	673	659	670	666	670	672	685	683	683	683	683	686
Technician Initials	RZJ					RZS	RZJ	RZJ	RZS	RZS	RZS	RZS	RZS	RZ

Conductivity meter: 3/3

Comments:

Reviewed by: [signature]

Date Reviewed: NOV. 17, 2021

Chronic *H. azteca* Water-Only Toxicity Test Data Sheet
Water Quality

Client: Teck
Work Order No.: 211568
Sample ID: Various - see below

Start Date: Aug. 12/21
Termination Date: Sept. 9/21
Test Organism: *Hyalella azteca*

Dissolved Oxygen (mg/L)

Sample ID/Conc.	Day													
	7	8		9		10		11		12		13		14
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Control	8.5	5.3	8.2	5.5	8.4	5.7	8.3	6.1	8.5	6.3	8.4	6.3	8.5	5.8
FR_UFR1	8.4	5.5	7.6	5.5	7.6	5.0	8.0	5.8	8.0	6.2	7.9	6.1	7.9	5.0
GH_ER2	8.5	5.0	8.2	5.4	8.0	4.8	7.8	5.3	8.0	5.7	7.9	5.7	7.9	5.6
CM_MC1	8.5	5.4	8.0	5.8	8.0	5.7	7.8	5.8	8.0	5.9	8.0	5.7	7.9	5.9
LC_SLC	8.5	5.0	8.0	5.8	8.0	5.6	7.7	6.0	8.0	5.9	7.9	6.0	8.0	6.0
FR_FRABCH	8.5	5.5	8.3	5.4	8.2	5.6	7.8	6.3	7.9	6.3	7.9	5.9	7.8	5.4
FR_FRCP1	8.4	5.3	8.3	5.5	8.1	5.5	7.8	5.6	7.9	5.7	8.0	5.7	7.8	5.3
GH_FR1	8.5	5.5	8.0	5.2	7.6	5.2	7.7	5.7	8.0	5.9	7.9	5.9	7.8	5.5
GH_ERC	8.5	5.5	8.0	5.2	8.1	5.1	8.0	5.5	8.0	5.8	7.9	5.9	7.9	5.9
CM_MC2	8.5	5.5	8.0	5.5	8.1	5.7	7.9	6.0	7.8	6.5	7.9	6.4	7.8	6.3
Technician Initials	RZ					RZ	RZ	RZ	RZ	RZ	RZ	RZ	RZ	RZ

DO meter: 3/3

pH

Sample ID/Conc.	Day													
	7	8		9		10		11		12		13		14
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Control	7.8	7.0	7.8	7.0	7.8	7.0	7.8	7.1	7.8	7.2	7.8	7.1	7.8	7.0
FR_UFR1	7.8	7.4	7.8	7.4	7.8	7.4	7.9	7.5	7.8	7.6	7.9	7.5	7.9	7.4
GH_ER2	7.6	7.4	7.8	7.4	7.8	7.4	8.0	7.4	7.8	7.5	7.9	7.5	7.9	7.5
CM_MC1	7.8	7.7	7.8	7.6	7.8	7.5	8.0	7.5	7.9	7.5	8.0	7.5	8.0	7.4
LC_SLC	7.8	7.5	7.9	7.4	7.8	7.5	8.1	7.6	8.0	7.6	8.0	7.6	8.0	7.6
FR_FRABCH	7.9	7.9	8.0	8.0	7.9	7.9	7.9	8.0	7.8	8.0	7.8	7.9	7.9	7.8
FR_FRCP1	8.1	8.0	8.2	8.0	8.2	8.0	8.2	8.0	8.2	8.0	8.2	8.0	8.2	8.0
GH_FR1	8.0	8.0	8.2	7.9	8.2	7.9	8.0	8.0	8.2	8.0	8.2	8.0	8.2	7.9
GH_ERC	7.8	7.8	8.0	7.6	8.0	7.6	7.8	7.6	7.9	7.7	7.8	7.6	8.0	7.6
CM_MC2	8.0	8.1	8.0	8.0	8.1	8.0	8.0	8.0	7.9	8.0	7.9	8.0	7.9	8.0
Technician Initials	RZ					RZ	RZ	RZ	RZ	RZ	RZ	RZ	RZ	RZ

pH meter:

Light meter: Lit-1

Light intensity (Lux): 450 - 950

Comments:

Reviewed by:

Date Reviewed: Nov. 17, 2021

Chronic *H. azteca* Water-Only Toxicity Test Data Sheet
Water Quality

Client: Teck
Work Order No.: 211568
Sample ID: various - see below

Start Date: Aug. 12/21
Termination Date: 26 Sept. 9/21
Test Organism: *Hyalella azteca*

Dissolved Oxygen (mg/L)

Sample ID/Conc.	Day 7	8		9		10		11		12		13		14
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
EV-MC2	8.4	4.8	7.7	5.6	8.1	5.4	8.2	5.5	7.9	5.5	7.9	5.7	7.8	5.4
EV-HC1	8.3	5.1	8.1	5.5	8.0	5.6	8.0	5.6	7.9	5.6	7.9	5.4	7.8	4.8
LC-DCDS	8.4	4.8	8.2	5.4	7.8	5.1	8.2	5.5	8.0	5.2	7.9	5.5	7.8	5.2
LC-LC3	8.6	5.0	7.9	5.5	8.1	6.0	8.0	5.8	8.2	5.8	8.2	5.6	8.0	4.9
LC-LC5	8.7	5.3	8.0	5.4	8.1	5.1	7.8	5.5	8.1	5.7	8.0	5.7	7.9	5.3
LC-LCDSSLCC	8.6	5.4	8.0	4.9	8.2	5.3	7.7	5.7	8.1	5.9	8.0	6.1	8.0	5.5
RG-MIDAG	8.4	5.4	8.0	5.2	8.2	5.5	7.8	6.4	8.1	6.5	8.0	6.0	7.9	5.4
FR-FR4	8.7	5.5	8.0	5.5	8.0	5.2	7.7	5.7	8.2	6.0	8.1	5.9	7.9	5.7
FR-FRRD	8.5	5.4	8.1	5.2	8.0	4.6	7.7	5.7	8.0	5.8	7.9	5.9	8.0	5.6
FR-FR2	8.7	5.6	7.9	5.2	7.9	5.4	7.6	6.0	8.0	5.9	7.9	6.0	8.0	5.8
Technician Initials	RZ					RZS		RZS		RZS		RZS		RZS

DO meter: 313

pH

Sample ID/Conc.	Day 7	8		9		10		11		12		13		14
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
EV-MC2	8.0	7.7	8.1	7.6	8.1	7.7	8.1	7.8	8.1	7.8	8.1	7.8	8.2	7.8
EV-HC1	8.0	7.8	8.1	7.8	8.1	7.8	8.1	7.9	8.1	7.9	8.2	7.8	8.2	7.7
LC-DCDS	8.0	7.7	8.0	7.4	8.1	7.4	8.1	7.7	8.1	7.7	8.1	7.7	8.1	7.6
LC-LC3	7.8	7.9	8.0	7.9	8.1	8.0	8.2	8.1	8.2	8.0	8.2	8.0	8.2	8.0
LC-LC5	8.1	7.9	8.2	7.8	8.2	7.7	8.1	7.9	8.2	7.9	8.2	7.8	8.2	7.8
LC-LCDSSLCC	8.0	7.9	8.2	7.8	8.2	7.8	8.2	7.9	8.2	8.0	8.2	8.0	8.2	7.9
RG-MIDAG	8.0	7.9	8.1	7.8	8.1	7.7	8.1	7.9	8.1	8.0	8.2	7.9	8.2	7.8
FR-FR4	8.1	7.9	8.2	7.9	8.2	7.9	8.2	8.0	8.2	8.1	8.2	8.0	8.3	8.0
FR-FRRD	7.8	8.0	8.0	8.0	7.9	7.8	7.8	8.0	7.9	8.0	7.9	8.0	8.0	8.0
FR-FR2	8.0	8.0	8.1	7.9	8.0	7.9	8.0	8.0	7.9	7.9	8.0	7.9	7.9	7.9
Technician Initials	RZ					RZS		RZS		RZS		RZS		RZ

pH meter: 313

Light meter: Lit-1

Light intensity (Lux): 450-950

Comments:

Reviewed by:

Date Reviewed: Nov. 17, 2021

Chronic *H. azteca* Water-Only Toxicity Test Data Sheet
Water Quality

Client: Teck
Work Order No.: 211568
Sample ID: Various - See below

Start Date: Aug. 12/21
Termination Date: Sept. 9/21
Test Organism: *Hyalella azteca*

Dissolved Oxygen (mg/L)

Sample ID/Conc.	Day													
	7	8		9		10		11		12		13		14
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
FR_MULTIPLATE	8.4	5.7	8.0	5.4	8.0	5.4	7.6	6.2	8.0	6.2	8.0	5.8	7.9	5.1
Technician Initials	RZS	[illegible]	[illegible]	[illegible]	[illegible]	RZS	RZS	RZS	RZS	RZS	RZS	RZS	RZS	RZS

DO meter: 3/3

pH

Sample ID/Conc.	Day													
	7	8		9		10		11		12		13		14
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
FR_MULTIPLATE	8.0	7.9	8.1	7.9	8.1	7.8	8.1	8.0	8.1	7.9	8.2	7.8	8.2	7.8
Technician Initials	RZS	[illegible]	[illegible]	[illegible]	[illegible]	RZS	RZS	RZS	RZS	RZS	RZS	RZS	RZS	RZS

pH meter: 3/3

Light meter: Lit-1

Light intensity (Lux): 450-950

Comments:

Reviewed by: [signature]

Date Reviewed: Nov. 17, 2021

Chronic *H. azteca* Water-Only Toxicity Test Data Sheet
Water Quality

Client: Teck
Work Order No.: 211568
Sample ID: Various- see below

Start Date: Aug. 12/21
Termination Date: Sept. 9/21
Test Organism: *Hyalella azteca*

Dissolved Oxygen (mg/L)

Sample ID/Conc.	Day													
	7	8		9		10		11		12		13		14
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Control + EDTA	8.3	5.0	7.9	5.4	8.1	5.8	7.8	6.0	8.4	5.8	8.1	5.8	8.0	5.1
FR-FRCP1 + EDTA	8.3	5.4	7.9	5.6	8.0	5.3	7.6	5.9	7.8	6.1	7.9	6.3	7.9	5.5
CM_MC2 + EDTA	8.3	5.4	7.9	5.6	8.1	5.4	7.6	5.8	8.0	6.4	7.9	6.1	7.8	5.7
RG_MIDAG + EDTA	8.4	5.8	7.9	5.8	8.0	6.0	7.7	5.9	7.9	6.3	7.9	6.1	7.8	6.1
Technician Initials	RZ					RZ	RZ	RZ	RZ	RZ	RZ	RZ	RZ	RZ

DO meter: 313

pH

Sample ID/Conc.	Day													
	7	8		9		10		11		12		13		14
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Control + EDTA	7.6	6.8	7.7	6.9	7.7	7.2	7.7	7.4	7.6	7.3	7.7	7.3	7.8	7.2
FR-FRCP1 + EDTA	8.1	8.0	8.2	8.0	8.2	8.0	8.2	8.1	8.2	8.1	8.2	8.1	8.3	8.0
CM_MC2 + EDTA	8.1	8.0	8.1	8.0	8.1	7.9	8.1	8.0	8.0	8.1	8.0	8.0	8.0	7.9
RG_MIDAG + EDTA	7.9	7.9	8.1	7.9	8.1	7.9	8.1	8.0	8.1	7.9	8.1	7.9	8.2	8.0
Technician Initials	RZ					RZ	RZ	RZ	RZ	RZ	RZ	RZ	RZ	RZ

pH meter: 313

Light meter: Li-1

Light intensity (Lux): 450-950

Comments:

Reviewed by:

Date Reviewed: Nov. 17, 2021

Chronic *H. azteca* Water-Only Toxicity Test Data Sheet
Water Quality

Client: Teck
Work Order No.: 211568
Sample ID: Various - see below

Start Date: Aug. 12/21
Termination Date: ~~Aug 26~~ Sept. 9/21
CER #: 6
Test Organism: *Hyalella azteca*

Temperature (°C)

Sample ID/Conc.	Day													
	14	15		16		17		18		19		20		21
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Control	22.5	23.0	22.5	23.0	~~22.5~~	23.0	22.5	23.0	22.0	23.0	22.0	22.5	23.0	23.0
FR-UFR1	22.5	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	22.5	23.0	23.0
GH-ER2	22.5	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	22.5	23.0	23.0
CM-MC1	22.5	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	22.5	23.0	23.0
LC-SLC	22.5	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	22.5	23.0	23.0
FR-FRABCH	22.5	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	22.5	23.0	23.0
FR-FRCP1	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	22.5	23.0	23.0
GH-FR1	22.5	23.0	23.0	23.0	22.0	23.0	22.5	23.0	23.0	23.0	23.0	22.5	23.0	23.0
GH-ERC	22.5	23.0	23.0	23.0	22.0	23.0	22.5	23.0	23.0	23.0	23.0	22.5	23.0	23.0
CM-MC2	22.5	22.5	23.0	23.0	22.0	23.0	22.5	23.0	23.0	23.0	23.0	22.5	23.0	23.0
Technician Initials	RZJ	JZL	JZL	JZL	JZL	RZJ	RZJ	RZJ	RZJ	KJL	KJL	RZJ	RZJ	RZJ

Thermometer: 6

Conductivity (µS)

Sample ID/Conc.	Day													
	14	15		16		17		18		19		20		21
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Control	422	428	422	427	424	426	424	427	422	430	423	429	423	428
FR-UFR1	395	401	397	401	398	403	398	404	399	399	400	406	401	408
GH-ER2	344	348	345	348	346	346	344	350	345	354	346	349	346	348
CM-MC1	356	363	357	359	359	357	356	360	354	366	355	361	356	360
LC-SLC	375	381	379	379	376	378	377	381	378	386	376	385	380	384
FR-FRABCH	1062	1053	1045	1030	1032	1018	1022	1008	1039	1046	1042	1030	1016	1011
FR-FRCP1	900	903	901	895	894	887	889	881	898	901	899	897	888	886
GH-FR1	818	813	819	823	815	809	807	809	810	808	807	809	803	801
GH-ERC	363	367	364	368	363	362	359	374	367	377	368	374	370	372
CM-MC2	1120	1103	1112	1101	1108	1081	1088	1078	1103	1096	1110	1085	1087	1083
Technician Initials	RZJ	JZL	JZL	JZL	JZL	RZJ	RZJ	RZJ	RZJ	KJL	KJL	RZJ	RZJ	RZJ

Conductivity meter: 3/3

Comments:

Reviewed by: [signature] Date Reviewed: Nov. 17, 2021

Chronic *H. azteca* Water-Only Toxicity Test Data Sheet
Water Quality

Client: Teck
Work Order No.: 211568
Sample ID: Various - see below

Start Date: Aug. 12/21
Termination Date: Sept. 9/21
CER #: 6
Test Organism: *Hyalella azteca*

Temperature (°C)

Sample ID/Conc.	Day													
	14	15		16		17		18		19		20		21
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
EV-MC2	22.5	22.5	23.0	23.0	22.0	23.0	22.5	23.0	23.0	23.0	23.0	22.5	23.0	23.0
EV-HC1	22.5	23.0	23.0	22.0	22.0	23.0	22.5	23.0	23.0	23.0	23.0	22.5	23.0	23.0
LC-DCDS	23.0	22.5	23.0	22.5	22.0	23.0	22.5	23.0	23.0	23.0	23.0	22.5	23.0	22.5
LC-LC3	22.0	22.5	22.5	22.5	22.0	23.0	22.5	23.0	22.5	23.0	23.0	22.5	23.0	22.5
LC-LC5	22.0	22.5	22.5	22.5	22.0	23.0	22.5	23.0	22.5	23.0	23.0	22.5	22.0	22.5
LC-LCDSSLCC	22.0	23.0	22.0	22.5	22.0	23.0	22.5	23.0	22.5	23.0	23.0	22.5	22.0	22.5
RG-MIDAG	22.0	23.0	22.0	22.5	22.0	23.0	22.5	23.0	22.5	23.0	23.0	22.5	22.0	22.5
FR-FR4	22.0	23.0	22.5	22.5	22.0	23.0	22.5	23.0	22.5	23.0	23.0	22.5	22.0	22.5
FR-FRD	22.0	23.0	22.5	22.5	22.0	23.0	22.5	23.0	22.5	23.0	23.0	22.5	22.0	22.5
FR-FR2	22.0	23.0	22.0	22.5	22.0	23.0	22.5	23.0	22.5	23.0	23.0	22.5	22.0	22.5
Technician Initials	RZS	JZL	JZL	JZL	JZL	RZS	RZS	RZS	RZS	KJL	KJL	RZS	RZS	RZS

Thermometer: 6

Conductivity (µS)

Sample ID/Conc.	Day													
	14	15		16		17		18		19		20		21
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
EV-MC2	533	538	534	552	531	531	528	535	531	556	531	537	532	537
EV-HC1	731	732	731	766	738	719	718	719	729	724	727	728	731	732
LC-DCDS	1017	1016	1016	1016	1020	1008	1012	1012	1018	1017	1015	1011	1023	1023
LC-LC3	942	946	939	938	943	926	931	930	941	942	938	938	939	940
LC-LC5	762	761	761	761	785%	752	740	752	758	763	750	760	751	751
LC-LCDSSLCC	756	759	756	757	760	750	751	752	761	774	759	761	758	762
RG-MIDAG	519	526	519	519	524	518	517	520	517	526	516	519	517	521
FR-FR4	895	895	892	893	894	884	887	880	898	903	895	888	893	891
FR-FRD	1125	1112	1115	1090	1106	1074	1076	1064	1099	1097	1090	1081	1077	1065
FR-FR2	746	750	750	745	750	733	725	731	755	755	741	745	740	729
Technician Initials	RZS	JZL	JZL	JZL	JZL	RZS	RZS	RZS	RZS	KJL	KJL	RZS	RZS	RZS

Conductivity meter: 3/3

Comments:

Reviewed by: [signature]

Date Reviewed: Nov 17, 2021

Chronic *H. azteca* Water-Only Toxicity Test Data Sheet
Water Quality

Client: Teck
Work Order No.: 211568
Sample ID: Various - see below

Start Date: Aug. 12/21
Termination Date: Sept. 9/21
CER #: 6
Test Organism: *Hyalella azteca*

Temperature (°C)

Sample ID/Conc.	Day													
	14	15		16		17		18		19		20		21
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
FR-MULTIPLATE	22.0	23.0	22.0	22.5	22.0	23.0	22.5	23.0	22.5	23.0	23.0	~~23.0~~	22.0	22.5
Technician Initials	RZS	JBL	JBL	JBL	JBL	RZS	RZJ	RZS	RZS	KDL	KDL	RZJ	RZJ	RZJ

Thermometer: 6

Conductivity (µS)

Sample ID/Conc.	Day													
	14	15		16		17		18		19		20		21
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
FR-MULTIPLATE	668	669	669	672	667	~~667~~	663	666	670	674	670	671	670	675
Technician Initials	RZS	JBL	JBL	JBL	JBL	RZJ	RZJ	RZS	RZS	KDL	KDL	RZJ	RZJ	RZJ

Conductivity meter: 3/3

Comments:

Reviewed by: [signature]

Date Reviewed: Nov. 17, 2021

Chronic *H. azteca* Water-Only Toxicity Test Data Sheet
Water Quality

Client: Teck
Work Order No.: 211568
Sample ID: Various - see below

Start Date: Aug. 12/21
Termination Date: Sept. 9/21
CER #: 6
Test Organism: *Hyalella azteca*

Temperature (°C)

Sample ID/Conc.	Day													
	14	15		16		17		18		19		20		21
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Control+EDTA	22.5	22.5	23.0	22.5	22.5	23.0	23.0	23.0	22.5	23.0	23.0	22.5	23.0	22.5
FR-FRCP1+EDTA	23.0	22.5	23.0	23.0	22.0	22.5	22.5	23.0	23.0	23.0	23.0	22.5	23.0	22.5
CM-MC2+EDTA	23.0	22.5	22.5	23.0	22.0	22.5	22.5	23.0	23.0	23.0	23.0	22.5	23.0	22.5
RG-MIDAG+EDTA	23.0	23.0	23.0	23.0	22.0	22.5	22.5	23.0	23.0	23.0	23.0	22.5	23.0	22.5
Technician Initials	RZS	JZL	JZL	JZL	JZL	RZS	RZS	RZS	RZS	KJL	KJL	RZS	RZS	RZS

Thermometer: 6

Conductivity (µS)

Sample ID/Conc.	Day													
	14	15		16		17		18		19		20		21
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Control+EDTA	423	427	425	426	427	426	424	427	423	427	424	426	426	429
FR-FRCP1+EDTA	905	905	902	907	898	906	894	890	899	900	890	897	897	897
CM-MC2+EDTA	1121	1116	1114	1105	1106	1091	1091	1082	1116	1114	1090	1094	1093	1085
RG-MIDAG+EDTA	524	527	524	522	522	522	519	527	522	532	528	526	521	529
Technician Initials	RZS	JZL	JZL	JZL	JZL	RZS	RZS	RZS	RZS	KJL	KJL	RZS	RZS	RZS

Conductivity meter: 3/3

Comments:

Reviewed by: [signature]

Date Reviewed: Nov. 17, 2021

Chronic *H. azteca* Water-Only Toxicity Test Data Sheet
Water Quality

Client: Teck
Work Order No.: 211568
Sample ID: Various - see below

Start Date: Aug. 12/21
Termination Date: 6 days Sept. 9/21
Test Organism: *Hyalella azteca*

Dissolved Oxygen (mg/L)

Sample ID/Conc.	Day													
	14	15		16		17		18		19		20		21
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Control	8.5	6.1	8.5	6.0	8.5	6.0	8.4	5.3	8.4	6.3	8.4	5.8	8.3	5.9
FR-UFR1	8.5	6.1	8.2	5.9	7.8	5.7	8.1	5.2	8.5	6.4	7.8	5.8	8.0	5.6
GH-ER2	8.5	6.1	8.4	6.0	8.2	5.8	8.0	5.5	8.5	6.3	7.9	6.2	8.1	5.7
CM-MC1	8.4	6.1	8.4	6.0	8.2	5.8	8.0	5.3	8.5	6.4	7.8	5.8	8.1	5.5
LC-SLC	8.5	6.2	8.4	6.0	8.4	5.8	8.1	5.3	8.5	6.4	7.7	6.0	8.1	5.5
FR-FRABCH	8.3	6.1	8.4	6.1	8.4	6.1	8.1	6.1	8.5	6.2	7.7	5.9	8.0	5.6
FR-FRCP1	8.2	6.5	8.4	6.1	8.4	6.0	8.1	6.1	8.5	6.3	7.8	5.8	8.0	5.3
GH-FR1	8.3	6.5	8.5	6.0	8.4	5.6	8.1	5.7	8.5	6.2	7.8	5.9	8.1	5.5
GH-ERC	8.2	6.4	8.5	6.0	8.4	5.9	8.2	5.6	8.5	6.3	7.7	5.9	8.1	5.8
CM-MC2	8.4	6.6	8.4	6.0	8.4	6.1	8.2	6.4	8.5	6.3	7.6	5.8	8.1	5.5
Technician Initials	RZS	JZL	JZL	JZL	JZL	RZS	RZS	RZS	RZS	KJL	KJL	RZS	RZS	RZS

DO meter: 3/3

pH

Sample ID/Conc.	Day													
	14	15		16		17		18		19		20		21
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Control	7.8	7.1	7.8	7.2	7.8	6.9	7.8	6.9	7.8	6.9	7.8	6.9	7.8	7.1
FR-UFR1	7.9	7.7	8.1	7.7	8.0	7.5	8.1	7.4	7.9	7.3	8.1	7.3	7.9	7.6
GH-ER2	7.9	7.7	8.0	7.6	8.0	7.5	8.1	7.5	7.9	7.4	8.0	7.4	7.9	7.6
CM-MC1	7.9	7.7	8.1	7.7	8.1	7.5	8.1	7.5	7.9	7.4	8.0	7.5	8.0	7.6
LC-SLC	8.0	7.7	8.1	7.6	8.1	7.5	8.1	7.4	7.9	7.3	8.0	7.4	8.0	7.5
FR-FRABCH	8.0	8.1	8.0	8.0	8.0	8.0	7.9	8.0	7.8	7.7	7.8	7.8	7.8	7.9
FR-FRCP1	8.2	8.0	8.3	8.1	8.0	8.0	8.2	8.0	8.2	7.8	8.2	7.9	8.2	7.9
GH-FR1	8.0	8.1	8.2	8.0	8.2	7.9	8.2	7.9	8.1	7.6	7.8	7.8	8.1	7.9
GH-ERC	7.9	7.9	8.1	7.8	8.2	7.7	8.1	7.6	8.0	7.7	7.9	7.6	8.1	7.7
CM-MC2	8.0	8.1	8.0	8.0	8.0	8.0	8.0	8.0	7.9	7.8	7.7	7.8	7.9	7.9
Technician Initials	RZS	JZL	JZL	JZL	JZL	RZS	RZS	RZS	RZS	KJL	KJL	RZS	RZS	RZS

pH meter: 3/3

Light meter: Lit-1

Light intensity (Lux): 450-950

Comments:

Reviewed by: [signature]

Date Reviewed: Nov. 17, 2021

Chronic *H. azteca* Water-Only Toxicity Test Data Sheet
Water Quality

Client: Teck
Work Order No.: 211568
Sample ID: Various – see below
Start Date: Aug. 12/21
Termination Date: Sept. 9/21
Test Organism: *Hyalella azteca*

Dissolved Oxygen (mg/L)

Sample ID/Conc.	Day													
	14	15		16		17		18		19		20		21
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
EV-MC2	8.5	6.2	8.2	6.1	8.0	5.6	8.0	4.9	8.5	6.2	7.6	6.3	8.1	5.6
EV-MC1	8.4	6.3	8.5	6.0	8.1	5.8	8.2	5.2	8.5	6.1	7.7	5.9	8.1	5.7
LC-DCDS	8.4	5.7	8.5	6.0	8.4	5.6	8.2	5.3	8.5	6.1	7.8	5.4	8.1	5.6
LC-LC3	8.6	5.6	8.1	6.2	8.0	6.0	8.2	6.3	8.5	6.3	7.9	6.1	8.3	5.8
LC-LC5	8.6	6.1	8.5	6.1	8.4	6.1	8.3	6.2	8.5	6.2	7.8	5.9	8.3	5.9
LC-LCDSSLCC	8.7	6.3	8.5	6.2	8.5	6.0	8.2	6.2	8.5	6.3	7.9	5.9	8.3	5.8
RG-MIDAG	8.6	6.3	8.5	6.1	8.3	5.7	8.2	5.4	8.5	6.1	7.8	5.8	8.3	5.7
FR-FR4	8.7	6.7	8.5	6.2	8.5	6.2	8.2	5.9	8.5	6.1	7.8	6.1	8.3	6.0
FR-FRRD	8.7	6.4	8.6	6.1	8.6	5.5	8.2	5.1	8.5	6.2	7.9	6.3	8.4	5.8
FR-FR2	8.5	6.5	8.6	6.7	8.6	6.4	8.2	6.3	8.5	6.2	7.9	6.0	8.3	6.0
Technician Initials	RZS	JZL	JZL	JZL	JZL	RZS	RZS	RZS	RZS	KJL	KJL	RZS	RZS	RZS

DO meter: 3/3

pH

Sample ID/Conc.	Day													
	14	15		16		17		18		19		20		21
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
EV-MC2	8.1	7.9	8.2	7.9	8.2	7.8	8.2	7.6	8.1	7.7	8.0	7.9	8.2	7.8
EV-MC1	8.2	8.1	8.3	8.1	8.3	7.9	8.3	7.9	8.2	7.8	8.1	7.9	8.3	8.0
LC-DCDS	8.1	8.0	8.2	7.9	8.1	7.6	8.2	7.6	8.1	7.5	8.1	7.7	8.2	7.7
LC-LC3	7.82**	8.1	8.0	8.0	8.1	7.9	8.2	7.9	8.0	7.6	8.0	7.9	8.2	7.9
LC-LC5	8.2	8.2	8.2	8.0	8.2	7.9	8.2	7.9	8.1	7.6	8.1	7.8	8.1	7.9
LC-LCDSSLCC	8.1	8.1	8.2	8.0	8.3	7.9	8.3	7.9	8.2	7.7	8.2	7.9	8.3	7.9
RG-MIDAG	8.0	7.9	8.1	7.8	8.2	7.7	8.2	7.6	8.0	7.5	8.1	7.7	8.1	7.7
FR-FR4	8.2	8.0	8.3	8.1	8.3	8.0	8.3	8.0	8.1	7.8	8.2	8.0	8.3	8.1
FR-FRRD	7.9	8.0	8.0	8.0	8.0	7.9	7.8	7.8	8.2	7.9	7.7	8.0	7.8	7.9
FR-FR2	8.1	8.0	8.1	8.0	8.1	8.0	8.0	7.9	7.9	7.8	7.9	7.9	8.0	7.9
Technician Initials	RZS	JZL	JZL	JZL	JZL	RZS	RZS	RZS	RZS	KJL	KJL	RZS	RZS	RZS

pH meter: 3/3

Light meter: Lit-1
Light intensity (Lux): 450-950

Comments:

Reviewed by:
Date Reviewed: Nov. 17, 2021

Chronic *H. azteca* Water-Only Toxicity Test Data Sheet
Water Quality

Client: Teck
Work Order No.: 211568
Sample ID: Various - see below
Start Date: Aug. 12/21
Termination Date: Sept. 9/21
Test Organism: *Hyalella azteca*

Dissolved Oxygen (mg/L)

Sample ID/Conc.	Day													
	14	15		16		17		18		19		20		21
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
FR-MULTIPLATE	8.6	6.7	8.1	6.0	8.4	5.9	8.2	5.7	8.5	6.0	7.7	6.0	8.2	5.9
Technician Initials	RZJ	JZL	JZL	JZL	JZL	RZJ	RZJ	RZJ	RZJ	KJL	KJL	RZJ	RZJ	RZJ

DO meter: 3/3

pH

Sample ID/Conc.	Day													
	14	15		16		17		18		19		20		21
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
FR-MULTIPLATE	8.1	7.9	8.2	7.9	8.2	7.8	8.2	7.8	8.1	7.8	8.1	7.8	8.2	7.8
Technician Initials	RZJ	JZL	JZL	JZL	JZL	RZJ	RZJ	RZJ	RZJ	KJL	KJL	RZJ	RZJ	RZJ

pH meter: 3/3

Light meter: Lit-1
Light intensity (Lux): 450-950

Comments:

Reviewed by: [signature]
Date Reviewed: Nov. 17, 2021

Chronic *H. azteca* Water-Only Toxicity Test Data Sheet
Water Quality

Client: Teck
Work Order No.: 211568
Sample ID: Various – see below

Start Date: Aug. 12/21
Termination Date: Sept. 9/21
Test Organism: *Hyalella azteca*

Dissolved Oxygen (mg/L)

Sample ID/Conc.	Day													
	14	15		16		17		18		19		20		21
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Control + EDTA	8.1	6.7	8.0	5.7	8.1	5.8	8.0	6.3	8.3	6.2	8.0	6.0	8.1	5.9
FR-FRCP1+EDTA	8.3	6.7	8.1	6.0	8.4	5.9	8.1	5.8	8.4	6.1	7.8	6.2	8.1	6.0
CM-MC2 + EDTA	8.4	6.8	8.1	6.1	8.4	5.8	8.1	6.3	8.4	6.1	7.7	6.2	8.1	6.0
RG-MIDAG+EDTA	8.4	6.8	8.1	6.1	8.4	5.8	8.2	6.0	8.4	6.1	7.8	6.3	8.2	6.2
Technician Initials	RZJ	JZL	JZL	JZL	JZL	RZJ	RZJ	RZJ	RZJ	KCL	KCL	RZJ	RZJ	RZJ

DO meter: 3/3

pH

Sample ID/Conc.	Day													
	14	15		16		17		18		19		20		21
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Control + EDTA	7.7	7.4	7.8	7.3	7.8	7.2	7.8	7.3	7.6	7.4	7.8	7.1	7.8	7.3
FR-FRCP1 + EDTA	8.1	8.0	8.2	8.0	8.2	7.9	8.2	8.0	8.2	7.9	8.1	7.9	8.2	8.0
CM-MC2+EDTA	8.1	8.2	8.2	8.1	8.2	8.0	8.0	8.0	7.9	8.0	7.6	7.9	7.9	8.0
RG-MIDAG+EDTA	7.9	8.0	8.0	8.0	8.0	7.8	8.2	7.8	8.0	7.9	7.9	7.8	8.0	7.9
Technician Initials	RZJ	JZL	JZL	JZL	JZL	RZJ	KZJ	RZJ	RZJ	KCL	KCL	RZJ	RZJ	RZJ

pH meter: 3/3

Light meter: Lit-1

Light intensity (Lux): 450-950

Comments:

Reviewed by: [signature]

Date Reviewed: Nov. 17, 2021

Chronic *H. azteca* Water-Only Toxicity Test Data Sheet
Water Quality

Client: Teck
Work Order No.: 211568
Sample ID: Various - see below

Start Date: Aug. 12/21
Termination Date: ~~Aug~~ RZS Sept. 9/21
CER #: 6
Test Organism: *Hyalella azteca*

Temperature (°C)

Sample ID/Conc.	Day													
	21	22		23		24		25		26		27		28
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Control	22.0	22.5	23.0	22.0	22.0	23.0	22.5	23.0	22.5	23.0	22.5	22.5	22.5	23.0
FR-UFR1	22.5	23.0	23.0	22.5	22.5	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0
GH-ER2	22.5	23.0	23.0	22.5	22.5	23.0	23.0	23.0	23.0	23.0	23.0	22.5	23.0	23.0
CM-MC1	22.5	23.0	23.0	22.5	22.5	23.0	23.0	23.0	23.0	23.0	23.0	22.5	23.0	23.0
LC-SLC	22.5	23.0	23.0	22.5	22.5	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0
FR-FRABCH	22.5	23.0	23.0	22.5	22.5	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0
FR-FRCP1	22.5	23.0	23.0	22.5	22.5	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0
GH-FR1	22.5	23.0	23.0	22.5	22.0	23.0	22.5	23.0	23.0	23.0	23.0	23.0	23.0	23.0
GH-ERC	22.5	23.0	23.0	22.5	22.0	23.0	22.5	23.0	23.0	23.0	23.0	23.0	23.0	23.0
CM-MC2	22.5	23.0	23.0	22.5	22.0	23.0	22.5	23.0	23.0	23.0	23.0	23.0	23.0	23.0
Technician Initials	RZS	JTL	JTL	TL	TL	RZS	RZS	RZS	RZS	RZS	RZS	RZS	RZS	RZS

Thermometer: 6

Conductivity (µS)

Sample ID/Conc.	Day													
	21	22		23		24		25		26		27		28
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Control	422	428	422	433	422	428	421	427	423	431	421	429	423	427
FR-UFR1	407	412	406	417	408	413	407	412	405	412	405	415	406	413
GH-ER2	352	355	350	359	352	354	349	356	353	361	353	361	355	361
CM-MC1	362	365	362	370	366	366	362	365	363	370	363	~~418~~ ①	365	372
LC-SLC	398	401	396	406	400	404	399	404	403	410	403	418	405	411
FR-FRABCH	1123	1100	1105	1106	1100	1088	1081	1072	1106	1091	1098	1079	1072	1066
FR-FRCP1	1049	1033	1040	1041	1039	1023	1018	1014	1035	1034	1028	1027	1022	1022
GH-FR1	866	855	858	857	858	847	847	839	847	847	838	841	835	839
GH-ERC	373	374	373	376	378	374	370	377	371	379	370	383	375	388
CM-MC2	1225	1195	1204	1200	1207	1187	1185	1181	1206	1187	1192	1181	1183	1173
Technician Initials	RZS	JTL	JTL	TL	TL	RZS	RZS	RZS	RZS	RZS	RZS	RZS	RZS	RZS

Conductivity meter: 3/3

Comments: ①370

Reviewed by: [signature]

Date Reviewed: Nov. 17, 2021

Chronic *H. azteca* Water-Only Toxicity Test Data Sheet
Water Quality

Client: Teck
Work Order No.: 211568
Sample ID: Various - see below

Start Date: Aug. 12/21
Termination Date: Sept. 9/21
CER #: 6
Test Organism: *Hyalella azteca*

Temperature (°C)

Sample ID/Conc.	Day													
	21	22		23		24		25		26		27		28
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
EV-MC2	22.5	23.0	23.0	22.5	22.0	23.0	22.5	23.0	23.0	23.0	23.0	23.0	23.0	23.0
EV-HC1	22.5	23.0	23.0	22.5	22.0	23.0	22.5	23.0	23.0	23.0	23.0	23.0	23.0	23.0
LC-DCDS	23.0	23.0	22.0	22.5	22.0	23.0	22.5	23.0	23.0	23.0	23.0	23.0	23.0	23.0
LC-LC3	22.0	23.0	22.5	22.5	22.0	23.0	22.5	23.0	22.5	23.0	22.5	23.0	22.5	23.0
LC-LC5	22.0	23.0	22.5	22.5	22.0	23.0	22.5	23.0	22.5	22.5	22.5	23.0	22.5	23.0
LC-LCDSSLCC	22.0	23.0	22.5	22.5	22.0	23.0	22.5	23.0	22.5	22.5	22.5	23.0	22.5	23.0
RG-MIDAG	22.0	23.0	22.5	22.5	22.0	23.0	22.5	23.0	22.5	23.0	22.5	23.0	22.5	23.0
FR-FR4	22.0	23.0	22.5	22.5	22.0	23.0	22.5	23.0	22.5	22.5	22.5	23.0	22.5	23.0
FR-FRD	22.0	23.0	22.5	22.5	22.0	23.0	22.5	23.0	22.5	22.5	22.5	23.0	22.5	23.0
FR-FR2	22.0	23.0	22.5	22.5	22.0	23.0	22.5	23.0	22.5	22.5	22.5	23.0	22.5	23.0
Technician Initials	RZS	JZ	JZ	MZ	JZ	RZS	RZS	RZS	RZS	RZS	RZS	RZS	RZS	RZS

Thermometer: 6

Conductivity (µS)

Sample ID/Conc.	Day													
	21	22		23		24		25		26		27		28
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
EV-MC2	601	600	602	608	606	604	596	605	602	613	601	611	607	617
EV-HC1	739	740	740	745	742	738	737	742	737	743	736	729	725	765
LC-DCDS	1023	1028	1059	1059	1066	1051	1061	1052	1067	1065	1069	1068	1069	1069
LC-LC3	999	991	995	994	998	989	992	994	1007	1004	1009	1003	1000	1005
LC-LC5	795	795	789	789	790	782	780	779	783	787	778	783	775	778
LC-LCDSSLCC	818	813	818	820	824	814	814	814	810	822	816	821	816	821
RG-MIDAG	659	646	659	661	660	658	655	661	661	672	662	669	664	672
FR-FR4	1066	1054	1057	1068	1056	1041	1043	1034	1056	1056	1050	1051	1043	1045
FR-FRD	1174	1141	1156	1145	1140	1115	1116	1099	1147	1131	1133	1122	1119	1111
FR-FR2	869	854	855	853	850	838	833	834	847	851	838	840	835	831
Technician Initials	RZS	JZ	JZ	MZ	JZ	RZS	RZS	RZS	RZS	RZS	RZS	RZS	RZS	RZS

Conductivity meter: 3/3

Comments:

Reviewed by: [signature]

Date Reviewed: NH. 17, 2021

Chronic *H. azteca* Water-Only Toxicity Test Data Sheet
Water Quality

Client: Teck
Work Order No.: 211568
Sample ID: Various - see below

Start Date: Aug. 12/21
Termination Date: Sept. 9/21
CER #: 6
Test Organism: *Hyalella azteca*

Temperature (°C)

Sample ID/Conc.	Day													
	21	22		23		24		25		26		27		28
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
FR MULTIPLATE	22.0	23.0	22.5	22.5	22.0	23.0	22.5	23.0	22.5	23.0	22.5	23.0	22.5	23.0
Technician Initials	RZS	JZL	JZL	JZL	JZL	RZS	RZS	RZS	RZS	RZS	RZS	RZS	RZS	RZS

Thermometer: 6

Conductivity (µS)

Sample ID/Conc.	Day													
	21	22		23		24		25		26		27		28
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
FR-MULTIPLATE	793	781	790	791	800	785	783	787	789	796	786	789	785	791
Technician Initials	RZS	JZL	JZL	JZL	JZL	RZS	RZS	RZS	RZS	RZS	RZS	RZS	RZS	RZS

Conductivity meter: 3/3

Comments:

Reviewed by: [signature]

Date Reviewed: Nov 17, 2021

Chronic *H. azteca* Water-Only Toxicity Test Data Sheet
Water Quality

Client: Teck
Work Order No.: 211568
Sample ID: Various - see below

Start Date: Aug. 12/21
Termination Date: Sept. 9/21
CER #: 6
Test Organism: *Hyalella azteca*

Temperature (°C)

Sample ID/Conc.	Day													
	21	22		23		24		25		26		27		28
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Control+EDTA	22.5	23.0	23.0	22.5	22.5	23.0	23.0	23.0	22.5	22.5	23.0	23.0	23.0	22.5
FR-FRCP1+EDTA	22.5	23.0	23.0	22.0	23.0	23.0	23.0	23.0	23.0	22.5	23.0	23.0	23.0	22.5
CM-MC2+EDTA	22.5	23.0	23.0	22.0	23.0	23.0	23.0	23.0	23.0	22.5	23.0	23.0	23.0	22.5
RG-MIDAG+EDTA	22.5	23.0	23.0	22.0	23.0	23.0	23.0	23.0	23.0	22.5	23.0	23.0	23.0	23.0
Technician Initials	RZS	JZL	JZL	JZL	JZL	RZS	RZS	RZS	RZS	RZS	RZS	RZS	RZS	RZS

Thermometer: 6

Conductivity (µS)

Sample ID/Conc.	Day													
	21	22		23		24		25		26		27		28
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Control+EDTA	426	428	425	431	429	423	427	424	423	428	427	427	426	429
FR-FRCP1+EDTA	1057	1032	1047	1050	1048	1029	1029	1011	1050	1061	1054	1042	1047	1040
CM-MC2+EDTA	1227	1199	1240	1208	1244	1192	1193	1187	1215	1206	1199	1195	1188	1184
RG-MIDAG+EDTA	663	665	663	660	663	666	661	669	660	672	659	674	664	676
Technician Initials	RZS	JZL	JZL	JZL	JZL	RZS	RZS	RZS	RZS	RZS	RZS	RZS	RZS	RZS

Conductivity meter: 3/3

Comments:

Reviewed by: [signature]

Date Reviewed: NN-17, 2021

Chronic *H. azteca* Water-Only Toxicity Test Data Sheet
Water Quality

Client: Teck
Work Order No.: 211568
Sample ID: Various - see below

Start Date: Aug. 12/21
Termination Date: 6 d21 Sept. 9/21
Test Organism: *Hyalella azteca*

Dissolved Oxygen (mg/L)

Sample ID/Conc.	Day													
	21	22		23		24		25		26		27		28
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Control	8.5	5.9	8.5	4.7	8.5	4.7	8.5	5.3	8.4	5.0	8.3	5.1	8.4	5.5
FR-UFR1	8.4	6.1	8.5	4.3	8.0	4.3	7.4	4.9	7.8	5.0	7.8	5.2	7.8	5.0
GH-ER2	8.3	5.7	8.5	4.8	8.2	4.3	7.9	4.3	7.9	4.4	7.8	4.5	7.8	4.7
CM-MC1	8.5	5.6	8.5	3.9	8.1	3.8	7.5	5.5	7.9	5.2	7.8	4.8	7.8	5.4
LC-SLC	8.5	6.2	8.5	4.4	8.1	4.5	7.2	5.2	8.0	5.0	7.8	5.0	8.0	4.9
FR-FRABCH	8.4	6.1	8.4	4.7	7.9	4.9	8.0	5.5	7.9	5.9	7.9	5.4	7.7	5.1
FR-FRCP1	8.3	5.8	8.5	4.6	8.0	3.9	8.0	4.8	7.9	4.8	7.8	4.9	~~8.0~~ 7.7	4.9
GH-FR1	8.5	6.1	8.5	4.4	7.9	4.4	7.9	5.2	8.0	5.0	7.9	5.0	7.8	~~5.4~~ 4.9
GH-ERC	8.3	6.6	8.5	4.3	8.2	4.0	8.0	5.0	8.0	4.9	7.8	4.6	~~8.0~~ 7.6	5.1
CM-MC2	8.5	6.2	8.5	5.0	8.2	4.9	8.0	5.4	7.9	5.6	7.8	5.5	7.8	5.7
Technician Initials	RZS	JZ	JZ	JZ	JZ	RZS	RZS	RZS	RZS	RZS	RZS	RZS	RZS	RZS

DO meter: 3/3

pH

Sample ID/Conc.	Day													
	21	22		23		24		25		26		27		28
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Control	7.9	7.0	7.8	7.0	7.8	6.9	7.8	7.0	7.7	6.9	7.8	6.8	7.8	6.9
FR-UFR1	7.9	7.4	7.9	7.3	8.1	7.3	7.7	7.3	7.8	7.4	7.8	7.3	7.9	7.3
GH-ER2	7.9	7.4	7.9	7.3	8.1	7.3	7.9	7.3	7.7	7.4	7.8	7.2	7.9	7.3
CM-MC1	7.9	7.4	7.9	7.3	8.0	7.3	7.9	7.5	7.8	7.6	7.9	7.3	7.9	7.5
LC-SLC	8.0	7.6	8.0	7.4	8.0	7.3	7.8	7.4	7.8	7.5	7.9	7.3	8.0	7.3
FR-FRABCH	8.0	8.0	7.9	7.9	7.8	7.7	7.8	7.8	7.6	7.9	7.6	7.8	7.7	7.7
FR-FRCP1	8.2	8.0	8.2	7.9	8.0	7.7	7.9	7.7	7.9	7.9	8.0	7.8	8.0	7.8
GH-FR1	8.0	8.0	8.1	7.8	8.0	7.7	7.9	7.7	7.9	7.8	7.9	7.7	7.9	7.7
GH-ERC	~~7.9~~ 8.0	7.8	8.1	7.6	8.1	7.4	8.0	7.6	7.9	7.8	8.1	7.5	8.0	7.5
CM-MC2	8.0	8.0	8.0	7.9	8.0	7.9	7.9	7.9	7.9	8.0	7.8	7.9	7.9	7.9
Technician Initials	RZS	JZ	JZ	JZ	JZ	RZS	RZS	RZS	RZS	RZS	RZS	RZS	RZ	RZ

pH meter: 3/3

Light meter: Li-1

Light intensity (Lux): 450-950

Comments:

Reviewed by: [signature]

Date Reviewed: Nov. 17, 2021

Chronic *H. azteca* Water-Only Toxicity Test Data Sheet
Water Quality

Client: Teck
Work Order No.: 211568
Sample ID: Various – see below
Start Date: Aug. 12/21
Termination Date: Sept. 9/21
Test Organism: *Hyalella azteca*

Dissolved Oxygen (mg/L)

Sample ID/Conc.	Day													
	21	22		23		24		25		26		27		28
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
EV-MC2	8.5	5.5	8.4	4.5	8.2	3.9	8.1	4.8	8.0	5.0	7.9	4.7	7.7	4.8
EV-MC1	8.3	6.0	8.4	4.5	8.3	4.2	7.8	4.5	7.9	4.9	7.8	4.3	7.6	4.5
LC-DCDS	8.1	6.6	8.5	5.1	8.4	5.4	7.7	5.7	8.0	5.1	7.8	4.3	7.7	5.1
LC-LC3	8.7	6.3	8.6	4.1	8.3	5.2	7.9	5.8	8.0	5.3	8.0	5.4	7.7	5.8
LC-LC5	8.6	6.0	8.5	4.5	8.3	4.4	8.3	5.0	8.1	5.3	7.8	5.0	7.7	4.7
LC-LCDSSLCC	8.7	6.2	8.5	4.1	7.9	4.6	7.5	5.2	8.1	5.5	7.9	5.4	7.8	5.2
RG-MIDAG	8.5	5.6	8.5	3.7	8.1	3.7	8.0	4.4	8.2	4.3	8.1	4.4	7.8	4.6
FR-FR4	8.4	6.2	8.5	4.5	8.2	4.6	8.1	5.1	8.1	4.8	8.0	4.7	7.9	4.6
FR-FRD	8.5	6.0	8.5	5.0	8.3	5.0	8.2	5.8	8.2	5.8	8.0	5.3	7.9	5.2
FR-FR2	8.6	6.2	8.4	4.3	8.3	4.2	8.0	5.0	8.1	4.8	8.0	4.5	7.9	5.1
Technician Initials	RZS	JTZ	JTZ	JTZ	JTZ	RZS	RZS	RZS	RZS	RZS	RZS	RZS	RZS	RZS

DO meter: 3/3

pH

Sample ID/Conc.	Day													
	21	22		23		24		25		26		27		28
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
EV-MC2	8.2	7.9	8.2	7.6	8.2	7.6	8.2	7.7	7.7	7.8	8.2	7.8	8.2	7.7
EV-MC1	8.2	8.0	8.2	7.8	8.2	7.7	8.2	7.7	8.1	7.9	8.2	7.8	8.1	7.7
LC-DCDS	8.2	7.9	8.1	7.7	8.0	7.5	8.0	7.7	8.1	7.7	8.1	7.6	8.1	7.6
LC-LC3	8.0	8.0	8.1	7.9	8.1	7.8	8.1	7.9	8.0	8.0	8.1	7.9	7.9	7.9
LC-LC5	8.2	8.0	8.2	7.7	8.1	7.6	8.0	7.7	8.0	7.9	8.0	7.6	8.1	7.6
LC-LCDSSLCC	8.2	8.0	8.2	7.8	8.2	7.7	8.1	7.8	8.1	8.0	8.2	7.8	8.1	7.8
RG-MIDAG	8.1	7.8	8.2	7.6	8.2	7.5	8.2	7.7	8.1	7.8	8.2	7.6	8.2	7.6
FR-FR4	8.3	8.2	8.3	8.0	8.1	7.8	8.1	7.9	8.0	8.0	8.1	7.8	8.1	7.8
FR-FRD	8.0	8.1	7.9	8.0	7.9	7.8	7.8	7.9	7.6	8.1	7.8	7.9	7.8	7.9
FR-FR2	8.1	8.1	8.0	7.7	8.0	7.6	7.9	7.7	7.8	7.8	7.9	7.7	7.8	7.7
Technician Initials	RG	JTZ	JTZ	JTZ	JTZ	RZS	RZS	RZS	RZS	RZ	RZS	RZS	RZ	RZ

pH meter: 3/3

Light meter: lit-1
Light intensity (Lux): 450-950
Comments:
Reviewed by:
Date Reviewed: Nov. 17, 2021

Chronic *H. azteca* Water-Only Toxicity Test Data Sheet
Water Quality

Client: Teck
Work Order No.: 211568
Sample ID: Various - see below
Start Date: Aug. 12/21
Termination Date: Sept. 9/21
Test Organism: *Hyalella azteca*

Dissolved Oxygen (mg/L)

Sample ID/Conc.	Day													
	21	22		23		24		25		26		27		28
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
FR MULTIPLATE	8.6	6.4	8.4	4.6	8.3	4.3	8.0	4.3	8.1	4.2	7.9	4.0	7.8	4.1
Technician Initials	RZS	JSL	JSL	JSL	JSL	RZS	RZS	RZS	RZS	RZS	RZS	RZS	RZS	RZS

DO meter: 3/3

pH

Sample ID/Conc.	Day													
	21	22		23		24		25		26		27		28
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
FR-MULTIPLATE	8.2	8.0	8.2	7.7	8.1	7.6	8.1	7.6	8.0	7.7	8.1	7.6	8.0	7.6
Technician Initials	RZS	JSL	JSL	JSL	JSL	RZS	RZS	RZS	RZS	RZS	RZS	RZS	RZS	RZS

pH meter: 3/3

Light meter: Lit-1
Light intensity (Lux): 450-950
Comments:
Reviewed by: [signature]
Date Reviewed: NOV 17, 2021

Chronic *H. azteca* Water-Only Toxicity Test Data Sheet
Water Quality

Client: Teck
Work Order No.: 211568
Sample ID: Various - see below
Start Date: Aug. 12/21
Termination Date: Sept. 9/21
Test Organism: *Hyalella azteca*

Dissolved Oxygen (mg/L)

Sample ID/Conc.	Day													
	21	22		23		24		25		26		27		28
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Control + EDTA	8.3	6.1	8.2	4.6	8.0	5.4	7.6	5.4	8.3	5.1	8.0	5.0	7.5	4.4
FR-FRCP1+EDTA	8.3	6.5	8.4	5.0	8.3	4.9	8.0	5.9	8.3	5.4	8.1	5.3	7.6	4.8
CM-MC2 + EDTA	8.3	6.0	8.4	4.1	8.3	3.8	8.1	4.4	8.1	4.5	8.0	4.5	7.7	4.6
RG-MIDAG+EDTA	8.3	6.2	8.5	4.0	8.3	4.2	8.1	4.8	8.0	4.7	8.0	4.6	7.7	4.6
Technician Initials	RZS	[illegible]	[illegible]	[illegible]	[illegible]	RZS	RZJ	RZS	RZJ	RZJ	RZS	RZJ	RZJ	RZS

DO meter: 3/3

pH

Sample ID/Conc.	Day													
	21	22		23		24		25		26		27		28
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Control + EDTA	7.8	7.3	7.7	7.0	7.6	7.1	7.6	6.9	7.5	7.2	7.7	7.2	7.6	7.0
FR-FRCP1 + EDTA	8.2	8.1	8.2	8.0	8.0	7.9	8.0	7.9	8.0	8.1	8.0	8.0	8.1	7.9
CM-MC2+EDTA	8.1	8.1	8.1	7.8	7.8	7.7	7.9	7.7	7.8	7.9	8.1	7.8	7.9	7.8
RG-MIDAG+EDTA	8.1	8.0	8.0	7.7	8.1	7.6	8.2	7.7	8.0	7.8	8.2	7.7	8.1	7.7
Technician Initials	RZS	[illegible]	[illegible]	[illegible]	[illegible]	RZJ	RZS	RZS	RZJ	RZS	RZS	RZJ	RZJ	RZS

pH meter: 3/3

Light meter: lit-1
Light intensity (Lux): 450-950
Comments:
Reviewed by: [illegible]
Date Reviewed: NOV. 17, 2021

H. azteca Water-only Toxicity Test Data Sheet

~~14~~ 28-d Survival and Weight

Client: Teck
Work Order No: 271568
Sample ID: Various - See below

Start Date: Aug. 12/21
Termination Date: Sept 9/21
Test Organism: *Hyalella azteca*
Balance: 1

Sample ID	Pan No. (Q3 green)	Rep	No. alive	No. dead	No. missing	Initials	Pan weight (mg)	Pan + organism (mg)	No. weighed	Initials
Control	1	A	10	0	0	RZS	1009.62	1017.00	10	~~RZS~~ RZS
	2	B	8	0	2	↓	1008.55	1017.30	8	↓
	3	C	10	0	0	↓	1004.11	1012.66	10	↓
	4	D	↓	↓	↓	↓	1009.50	1018.48	10	↓
	5	E	↓	↓	↓	↓	1003.00	1010.32	10	↓
FR-UFR1	6	A	10	0	0	RZS	1008.22	1016.25	10	↓
	7	B	↓	↓	↓	↓	1012.95	1017.89	10	↓
	8	C	9	0	1	↓	999.52	RZS ~~1005~~ 1004.97	9	↓
	9	D	8	1	1	↓	1010.35	1014.95	8	↓
	10	E	10	0	0	↓	1003.99	1009.74	10	↓
GH-ER2	11	A	10	0	0	RZS	1005.73	1011.02	10	↓
	12	B	↓	↓	↓	↓	1000.76	1006.99	10	↓
	13	C	↓	↓	↓	↓	1007.87	1013.95	10	↓
	14	D	↓	↓	↓	↓	1003.19	1008.69	10	↓
	15	E	9①	↓	1	↓	1008.59	1011.62	9	↓
CM-MC1	16	A	10	0	0	RZS	1008.23	1015.61	10	↓
	17	B	↓	↓	↓	↓	1005.43	1013.16	10	↓
	18	C	9	0	1	↓	1009.76	1017.64	9	↓
	19	D	10	0	0	↓	1011.33	1018.78	10	↓
	20	E	↓	↓	↓	↓	1003.26	1010.30	10	↓

Date/time pan placed in oven: Sept. 7/21 @ 1000h
Date/time pan removed from oven: Sept. 8/21 @ 1000h

Date/time pan + organisms placed in oven: ~~Aug. 12/21~~ Sept. 9 @ 1500h
Date/time pan + organisms removed from oven: Sept. 30/21 @ 0730h

Comments: ① smaller compared to other reps
Reweigh pans: 5 - 1010.23 mg, 13 - 1013.78 mg

Reviewed by: [signature]

Date Reviewed: Nov. 17, 2021

H. azteca Water-only Toxicity Test Data Sheet

~~14~~ 28d Survival and Weight

Client: Teck
Work Order No: 211568
Sample ID: Various - see below

Start Date: Aug. 12/21
Termination Date: Sept 9/21
Test Organism: *Hyalella azteca*
Balance: 1

Sample ID	Pan No.	Rep	No. alive	No. dead	No. missing	Initials	Pan weight (mg)	Pan + organism (mg)	No. weighed	Initials
~~RZ) Control~~	21	A	10	0	0	RZS	1005.75	1011.50	10	RZS
LC-SLC	22	B	9	↓	1	↓	1007.74	1013.10	9	↓
	23	C	10		0		1007.51	1012.62	10	
	24	D	9		1		1015.59	1020.89	9	
	25	E	9	↓	1	↓	993.63	998.00	9	
FR-FRABCH	26	A	10①	0	0	RZS	1001.55	1005.01	10	
	27	B	8	↓	2	↓	998.07	1002.38	8	
	28	C	10		0		997.83	1003.30	10	
	29	D	↓		↓		994.51	1000.27	10	
	30	E	8	↓	2	↓	1006.02	1008.91	8	
FR-FRCP1	31	A	10	0	0	JEL	1002.01	1005.04	10	
	32	B	9	↓	1	↓	1010.94	1014.81	9	
	33	C	10		0		1017.07	1023.82	10	
	34	D	↓		↓		1008.29	1012.24	10	
	35	E	↓	↓	↓	↓	1009.32	1013.97	10	
GH-FR1	36	A	10	0	0	RZS	1005.08	1008.99	10	
	37	B	↓	↓	↓	↓	1005.48	1010.52	10	
	38	C					1008.40	1013.03	10	
	39	D					1007.66	1014.42	10	
	40	E	↓	↓	↓	↓	1003.48	1007.54	10	↓

Date/time pan placed in oven: Sept. 7/21 @ 1000h
Date/time pan removed from oven: Sept. 8/21 @ 1000h

Date/time pan + organisms placed in oven: SEPT. 9/21@1500h
Date/time pan + organisms removed from oven: Sept. 30/21 @ 0730h

Comments: ① 1 organism smaller than others
Reweigh pans: 26 - 1004.96 mg, 34 - 1012.07 mg, 33 - 1023.82 mg

Reviewed by: [signature]

Date Reviewed: NOV. 17, 2021

H. azteca Water-only Toxicity Test Data Sheet

~~14~~ 28-d Survival and Weight

Client: Teck
Work Order No: 211568
Sample ID: Various - see below

Start Date: Aug. 12/21
Termination Date: Sept 9/21
Test Organism: *Hyalella azteca*
Balance: 1

Sample ID	Pan No.	Rep	No. alive	No. dead	No. missing	Initials	Pan weight (mg)	Pan + organism (mg)	No. weighed	Initials
RZ ~~Control~~	41	A	10	0	0	SAK	1006.83	1012.61	10	RZS
GH-ERC	42	B	10	↓	↓	↓	1003.52	1008.55	10	↓
	43	C	10				1005.43	1010.05	10	
	44	D	9		1		1004.72	1009.57	9	
	45	E	10	↓	0	↓	1004.26	1008.34	10	
CM-MC2	46	A	2 ①	4	4	RZS	1010.62	1011.17	2	
	47	B	8	0	2		1005.96	1007.70	8	
	48	C	6	2	2		1012.91	1015.49	6	
	49	D	3	3	4		1018.11	1019.23	3	
	50	E	0 ①	5	5	↓	997.69	-	-	
EV-MC2	51	A	10	0	0	GH	1005.44	1010.73	10	
	52	B	8	1	1		1005.89	1009.90	8	
	53	C	10	0	0		1008.45	1015.22	10	
	54	D	10	0	0		998.94	1005.26	10	
	55	E	9	0	1	↓	1008.10	1014.57	9	
EV-HC1	56	A	10	0	0	JJZ	998.89	1007.66	10	
	57	B	↓	↓	↓	↓	1001.72	1009.43	10	
	58	C					998.90	1006.63	10	
	59	D	↓	↓	↓		1000.56	1007.98	10	
	60	E	9	0	1	↓	1009.24	1014.52	9	↓

Date/time pan placed in oven: Sept. 7/21 @ 1000h
Date/time pan removed from oven: Sept. 8/21 @ 1000h

Date/time pan + organisms placed in oven: Sept. 9/21 @ 1500h
Date/time pan + organisms removed from oven: Sept. 30/21 @ 0730h

Comments: ① checked by KJL
Reweigh pans: 47 - 1007.91 mg, 60 - 1014.35 mg

Reviewed by:

Date Reviewed: NN - 17, 2021

H. azteca Water-only Toxicity Test Data Sheet

~~14~~ 28-d Survival and Weight

Client: Teck
Work Order No: 211568
Sample ID: Varias - see below

Start Date: Aug. 12/21
Termination Date: Sept 9/21
Test Organism: *Hyalella azteca*
Balance: 1

Sample ID	Pan No.	Rep	No. alive	No. dead	No. missing	Initials	Pan weight (mg)	Pan + organism (mg)	No. weighed	Initials
~~Control~~	61	A	10	0	0	SAK	1006.30	1012.13	10	RZS
LC-DCDS	62	B	10	↓	↓	↓	1005.75	1012.40	10	↓
	63	C	10	↓	↓	↓	1008.94	1014.85	10	↓
	64	D	10	↓	↓	↓	1007.08	1012.51	10	↓
	65	E	10	↓	↓	↓	1003.28	1008.38	10	↓
LC-LC3	66	A	10	0	0	JZL	999.63	1004.13	10	↓
	67	B	10 ~~10~~ 9	↓	0	↓	993.86	999.39	10	↓
	68	C	9	↓	1	↓	1006.88	1012.04	9	↓
	69	D	10	↓	0	↓	1001.44	1006.71	10	↓
	70	E	9	↓	1	↓	1004.01	1008.01	9	↓
LC-LC5	71	A	10	0	0	SAK	998.75	1004.14	10	↓
	72	B	9	↓	1	↓	1006.10	1011.29	9	↓
	73	C	10	↓	0	↓	1000.65	1005.65	10	↓
	74	D	9	↓	↓	↓	1003.22	1007.18	9	↓
	75	E	9	↓	1	↓	1010.70	1014.01	9	↓
LC-LCDSSLCC	76	A	9	0	1	GJO	1003.27	1008.09	9	↓
	77	B	10	0	0	↓	1001.25	1006.65	10	↓
	78	C	↓	↓	↓	↓	1009.98	1016.42	10	↓
	79	D	↓	↓	↓	↓	1006.75	1011.40	10	↓
	80	E	8	0	2	↓	1012.18	1015.92	8	↓

Date/time pan placed in oven: Sept. 7/21 @ 1000h
Date/time pan removed from oven: Sept. 8/21 @ 1000h

Date/time pan + organisms placed in oven: Sept. 9/21 @ 1500h
Date/time pan + organisms removed from oven: Sept. 30/21 @ 0730h

Comments: Reweigh pans: 64 - 1012.33mg, 73 - 1005.49mg

Reviewed by: [signature]

Date Reviewed: Nov. 17, 2021

H. azteca Water-only Toxicity Test Data Sheet

14-d Survival and Weight
28

Client: Teck
Work Order No: 211568
Sample ID: Various - see below

Start Date: Aug. 12/21
Termination Date: Sept 9/21
Test Organism: *Hyalella azteca*
Balance: 1

Sample ID	Pan No.	Rep	No. alive	No. dead	No. missing	Initials	Pan weight (mg)	Pan + organism (mg)	No. weighed	Initials
~~RD Control~~	81	A	10	0	0	[illegible]	1000.66	1008.06	10	RG
RE-MIDAS	82	B	10	↓	0	↓	1003.14	1010.62	10	↓
	83	C	7		3		1004.13	1009.75	7	
	84	D	10		0		1007.27	1014.78	10	
	85	E	10	↓	0	↓	1012.97	1022.02	10	
FR-FR4	86	A	10	0	0	GM	1012.98	1019.46	10	
	87	B	↓	↓	↓	↓	1007.16	1015.05	10	
	88	C					1009.98	1014.40	10	
	89	D	↓		↓		1012.68	1014.86	10	
	90	E	9	↓	1	↓	1004.06	1006.13	9	
FR-FR3	91	A	10	0	0	RGJ	1007.75	1011.37	10	
	92	B	↓	↓	↓	↓	1002.53	1008.15	10	
	93	C					1008.55	1014.69	10	
	94	D					1004.44	1010.51	10	
	95	E	↓	↓	↓	↓	1003.66	1007.28	10	
FR-FR2	96	A	9	0	1	SAK	1012.83	1016.83	9	
	97	B	10	↓	0	↓	995.11	1002.18	10	
	98	C	10		0		1016.10	1020.25	10	
	99	D	4①	3	3		1006.59	1008.66	4	
	100	E	10	0	0	↓	1014.05	1018.31	10	↓

Date/time pan placed in oven: Sept. 7/21 @ 1000h
Date/time pan removed from oven: Sept. 8/21 @ 1000h

Date/time pan + organisms placed in oven: Sept. 9/21 @ 1500h
Date/time pan + organisms removed from oven: Sept. 30/21 @ 0730h

Comments: ① checked by KJL
Reweigh pans: 90 - 1006.00mg, 99 - 1008.61mg, 88 - 1014.22mg, 89 - ~~1014.86~~ 1014.78mg

Reviewed by: [signature]

Date Reviewed: Nov. 17, 2021

H. azteca Water-only Toxicity Test Data Sheet

~~14~~-d Survival and Weight
28

Client: Teck
Work Order No: 211568
Sample ID: Various - see below

Start Date: Aug. 12/21
Termination Date: Sept 9/21
Test Organism: *Hyalella azteca*
Balance: 1

Sample ID	Pan No.	Rep	No. alive	No. dead	No. missing	Initials	Pan weight (mg)	Pan + organism (mg)	No. weighed	Initials
RE) ~~Control~~	101	A	10	0	0	JZL	1007.82	1010.96	10	RH
FR-MULTIPLATE	102	B	↓	↓	↓	↓	1003.18	1005.87	10	↓
	103	C	↓	↓	↓	↓	1013.42	1016.57	10	↓
	104	D	↓	↓	↓	↓	1006.15	1009.61	10	↓
	105	E	9	↓	1	↓	1008.92	1012.00	9	↓
		A								
		B								
		C								
		D								
		E								
		A								
		B								
		C								
		D								
		E								
		A								
		B								
		C								
		D								
		E								

Date/time pan placed in oven: Sept. 7/21 @ 1000h
Date/time pan removed from oven: Sept. 8/21 @ 1000h

Date/time pan + organisms placed in oven: Sept. 9/21 @ 1500h
Date/time pan + organisms removed from oven: Sept. 30/21 @ 0730h

Comments: Reweigh pan#: 102 - 1005.71mg

Reviewed by:

Date Reviewed: Nov. 17, 2021

H. azteca Water-only Toxicity Test Data Sheet

~~14~~ 28 d Survival and Weight

Client: Teck
Work Order No: 211568
Sample ID: Various - see below

Start Date: Aug. 12/21
Termination Date: Sept 9/21
Test Organism: *Hyalella azteca*
Balance: 1

Sample ID	Pan No.	Rep	No. alive	No. dead	No. missing	Initials	Pan weight (mg)	Pan + organism (mg)	No. weighed	Initials
Control + EDTA	106	A	9	0	1	GM	1008.00	1011.92	9	RL
	107	B	10	0	0		1008.78	1012.84	10	
	108	C	↓	↓	↓		1012.88	1020.36	10	
	109	D	↓	↓	↓		1000.92	1006.07	10	
	110	E	8	0	2 GM	↓	1006.52	1009.02	8	
FR-FRCP1 + EDTA	111	A	10	0	0	RLS	1007.56	1012.34	10	
	112	B	↓	↓	↓	↓	1010.95	1015.23	10	
	113	C	↓	↓	↓	↓	1011.29	1014.50	10	
	114	D	↓	↓	↓	↓	1004.01	1006.62	10	
	115	E	9	↓	1	↓	1000.72	1003.00	9	
CM-MC2 + EDTA	116	A	10	0	0	RLS	1013.38	1016.12	10	
	117	B	7	↓	3	↓	1010.16	1012.25	7	
	118	C	9	↓	1	↓	1006.96	1007.66	9	
	119	D	10	↓	0	↓	1006.79	1010.33	10	
	120	E	8	↓	2	↓	1007.45	1009.21	8	
RG-MIDAS + EDTA	121	A	8	0	2	JBL	1001.68	1004.65	8	
	122	B	10	↓	0	↓	1008.81	1010.60	10	
	123	C	8	↓	2	↓	1008.38	1012.94	8	
	124	D	9	↓	1	↓	1009.80	1012.67	9	
	125	E	9	↓	1	↓	1001.10	1002.20	9	↓ ↓

Date/time pan placed in oven: Sept. 7/21 @ 1000h
Date/time pan removed from oven: Sept. 8/21 @ 1000h

Date/time pan + organisms placed in oven: Sept. 9/21 @ 1500h
Date/time pan + organisms removed from oven: Sept. 30/21 @ 0730h

Comments: Reweigh pans: 106 - 1011.76mg, 120 - 1009.12mg

Reviewed by:

Date Reviewed: NOV 17, 2021

Client: Teck

W.O.#: 211568

Hardness and Alkalinity Datasheet

~~Week 1~~ ↓

Day 0

	Alkalinity						Hardness			
Sample ID	Subsample Date	Date Measured	Sample Volume (mL)	(mL) 0.02N HCL/H_2SO_4 used to pH 4.5	(mL) of 0.02N HCL/H_2SO_4 used to pH 4.2	Total Alkalinity ($mg/L CaCO_3$)	Sample Volume (mL)	Volume of 0.01M EDTA Used (mL)	Total Hardness ($mg/L CaCO_3$)	Technician
Control	Aug. 17/21	Sept. 17/21	50	3.5	3.6	68	50 ~~50~~ [44]	6.7	134	RZS
FR-UFR1		Sept 17/21	50	7.8	8.0	152	50	9.0	180	RZS
GH_ER2		Sept 21/21	50	7.2	7.4	140	50	7.1	142	RZS
CM_MC1		Sept 21/21	50	7.2	7.5	138	50	7.1	142	RZS
LC-SLC		Sept 21/21	50	7.0	7.1	138	50 10 [1]	8.8	176	RZS
FR_FRABCH		Sept 21/21	10 ①	1.9	2.0	180	10 ①	5.6	~~560~~ [56] ~~H2~~	RZS
FR_FRCP1		Sept 21/21	10 ①	2.2	2.3	210	10 ①	5.2	520	RZS
GH_FR1		Sept 21/21	10 ①	1.8	2.0	160	10 ①	3.6	360	RZS
GH_ERC		Sept 21/21	50	7.2	7.4	140	50	7.9	158	RZS
CM_MC2		Sept 21/21	10 ①	2.1	2.2	200	10 ①	4.6	460	RZS
EV_MC2		Sept 22/21	10 ①	1.9	2.0	180	10 ①	2.8	280	RZS
EV_HC1		Sept 22/21	10 ①	2.0	2.2	180	10 ①	3.1	310	RZS
LC_LCDS		Sept 22/21	10 ①	1.6	1.8	140	10 ①	4.7	470	RZS
LC_LC3		Sept 22/21	10 ①	2.4	2.5	230	10 ①	5.6	560	RZS
LC_LC5		Sept 22/21	10 ①	2.2	2.4	200	10 ①	3.6	360	RZS
LC_LCDSSLCC		Sept 22/21	10 ①	2.0	2.1	190	10 ①	4.2	420	RZS
RG-MIDAG		Sept 22/21	10 ①	1.9	2.0	180	10 ①	2.6	260	RZS
FR_FR4		Sept 17/21	10 ①	2.0	2.1	190	10 ①	5.6	560	RZS
FR_FRRD		Sept 17/21	10 ①	2.0	2.1	190	10 ①	5.3	530	RZS
FR_FR2		Sept 17/21	10 ①	1.9	2.0 [RB]	180	10 ①	3.7	370	RZS
FR-MULTIPLATE		Sept 17/21	10 ①	1.9	2.0	180	10 ①	3.7	370	RZS

Notes:

① Diluted to 100 mL using DI water.

Reviewed by: [signature]

Date Reviewed: Nov. 17, 2021

Client: TECK

W.O.#: 211568

Hardness and Alkalinity Datasheet

Week 1 & 2 JW (BLACK)

Sample ID	Subsample Date	Date Measured	Sample Volume (mL)	(mL) 0.02N HCL/H_2SO_4 used to pH 4.5	(mL) of 0.02N HCL/H_2SO_4 used to pH 4.2	Total Alkalinity ($mg/LCaCO_3$)	Sample Volume (mL)	Volume of 0.01M EDTA Used (mL)	Total Hardness ($mg/L\ CaCO_3$)	Technician
				Alkalinity				Hardness		
Control	Aug. 18/21	Sept. 20/21	50	3.9	4.0	76	50	7.4	148	RG
FR-UFR1	Aug 18/21	Sept. 20/21	50	7.5	7.7	146	50	6.9	138	EC/KV
GH-ER2	Aug. 18/21	Sept 21/21	50	5.3	5.4	104	50	6.2	124	EC
CM-MC1	Aug 18/21	Sept. 22/21	50	7.2	7.4	140	50	5.9	118	EC
LC-SLC	Aug 18/21	Sept. 20/21	50	6.7	6.8	132	50	7.8	156	EC/KV
FR-FRABCH	Aug 18/21	Sept 22/21	10 ①	2.9 EC 4	2.6	220	10 ①	6.4	640	EC
FR-FRCP1	Aug 18/21	Sept 22/21	10 ①	2.7	2.9	250	10 ①	7.8	780	EC
GH-FR1	Aug 18/21	Sept. 20/21	10 ①	2.0	2.2	180	10 ①	4.3	430	EC/KV
GH-ERC	Aug 18/21	Sept 20/21	50	5.3	5.5	102	50	5.3	106	EC
CM-MC2	Aug 18/21	Sept 20/21	10 ①	2.4	2.5	230	10 ①	3.6	360	EC
EV-MC2	Aug 18/21	Sept. 20/21	10 ①	2.2	2.3	210	10 ①	2.5	250	EC/KV
EV-HC1	Aug 18/21	Sept. 21/21	10 ①	1.8	2.0	160	10 ①	3.1	310	EC
LCDCDS	Aug 18/21	Sept 21/21	10 ①	1.9	2.1	~~150~~ 170	10 ①	5.9	590	EC
LC-LC3	↓	Sept. 20/21	10 ①	2.7	2.8	260	10 ①	~~8.2~~ EC 7.8	780	EC/KV
LC-LC5		Sept 17/21	10 ①	1.9	2.1	170	10 ①	4.1	410	EC
LC-LCDSSLCC	✓	Sept 17/21	10 ①	1.7	1.9	150	10 ①	3.9	390	EC
RG-MIDAG	Aug 18/21	Sept 22/21	10 ①	2.2	2.4	200	10 ①	3.9	390	EC
FR-FR4	Aug 18/21	Sept 22/21	10 ①	2.5	2.7	250	10 ①	6.9	690	EC
FR-FRRD	Aug 18/21	Sept. 20/21	10 ①	4.3	4.4	420	10 ①	8.2	820	EC
FR-FR2	Aug 18/21	Sept 21/21	10 ①	13.8	~~14.0~~ 11.8 EC	1360	10 ①	9.2	920	EC
FR-MULTIPLATE	Aug 18/21	Sept 21/21	10 ①	11.6	11.8	1140	10 ①	4.9	490	EC

Notes:

① Diluted up to 100 ml w/ DI water

Reviewed by: [signature]

Date Reviewed: NOV-17, 2021

Client: TRCR

W.O.#: 211568

Hardness and Alkalinity Datasheet

Week 3

	Alkalinity						Hardness			
Sample ID	Subsample Date	Date Measured	Sample Volume (mL)	(mL) 0.02N HCL/H_2SO_4 used to pH 4.5	(mL) of 0.02N HCL/H_2SO_4 used to pH 4.2	Total Alkalinity ($mg/LCaCO_3$)	Sample Volume (mL)	Volume of 0.01M EDTA Used (mL)	Total Hardness ($mg/L\ CaCO_3$)	Technician
Control	Aug. 25/24	Oct. 1/24	50	4.0	4.1	78	~~50~~ 50	7.3	146	KV
FR_UFP1			50	7.7	7.8	~~158~~ 152	50	7.9	158	KV
GH_ER2			50	6.1	6.2	120	50	6.1	122	KV
CM_MC1			50	6.6	6.7	KV ~~130~~ 130	50	7.1	142	KV
LC_SLC			50	6.2	6.4	120	~~10~~ 50	8.3	166	KV
FR_FRABCH			10 ①	2.3	2.4	220	10 ①	5.1	510	KV
FR_FRCP1			10 ①	2.3	2.4	220	10 ①	4.4	440	KV
GH_FR1			10 ①	2.0	2.2	180	KV ~~50~~ 100	4.2	420	KV
GH_ER1			50	6.2	6.3	~~210~~ 212	10 ①	1.8	180	KV
CM_MC2			10 ①	2.2	2.3	240	10 ①	5.5	550	KV
EV_MC2			10 ①	1.6	1.7	150	10 ①	2.7	270	KV
EV_HC1			10 ①	2.0	2.1	190	10 ①	4.1	410	KV
LC_DCDS			10 ①	1.5	1.6	140	10 ①	4.7	470	KV
LC_LC3			10 ①	2.1	2.3	190	10 ①	KV ~~4.4~~ 4.5	450	KV
LC_LC5			10 ①	1.9	2.0	180	10 ①	4.2	420	KV
LC_LCDSSLCC			10 ①	2.0	2.1	190	10 ①	4.1	410	KV
RG_MIDAG1			10 ①	1.6	1.7	150	10 ①	3.2	320	KV
FR_FR4			10 ①	2.2	2.3	210	10 ①	4.5	450	KV
FR_FRBD			10 ①	2.5	2.7	230	10 ①	6.0	600	KV
FR_FR2			10 ①	2.3	2.4	220	10 ①	4.1	410	KV
FR_MULTIPLATE				2.0	2.1	190		3.4	340	KV

Notes:

① Diluted up to 100mL w/ DI water

Reviewed by: [signature]

Date Reviewed: NOV-17, 2024

Client: TRCR

W.O.#: 211568

Hardness and Alkalinity Datasheet

Week 4

	Alkalinity						Hardness			
Sample ID	Subsample Date	Date Measured	Sample Volume (mL)	(mL) 0.02N HCL/H_2SO_4 used to pH 4.5	(mL) of 0.02N HCL/H_2SO_4 used to pH 4.2	Total Alkalinity ($mg/LCaCO_3$)	Sample Volume (mL)	Volume of 0.01M EDTA Used (mL)	Total Hardness ($mg/L\ CaCO_3$)	Technician
Control	Sept 1/21	Sep 29/21	50	3.6	3.8	68	50	6.4	128	RLS
FR_UFR1		Sep 29/21	①10	1.8	1.9	170	10	2.1	210	
GH_ER2		Sep 29/21	①10	1.5	1.7	130	10	1.6	160	
CM_MC1		Sep 29/21	①10	1.9	2.0	180	10	1.6	160	
LC_SLC		Sep 29/21	①10	1.6	1.7	150	10	1.9	190	
FR_FRABCH		Sep 29/21	10①	2.4	2.6	220	10①	4.9	490	
FR_FRCP1		Sep 29/21	10①	2.8	2.9	270	10①	5.4	540	
GH_FR1		Sep 29/21	10①	2.1	2.2	200	10①	4.5	450	
GH_ERC		Sep 29/21	50	7.3	7.5	142	50	8.1	162	
CM_MC2		Sep 29/21	10①	1.8	2.0	160	10①	5.1	510	
EV_MC2		Sep 30/21	10①	2.3	2.4	220	10①	2.8	280	
EV_HC1		Sep 30/21	10①	2.0	2.1	190	10①	3.7	370	
LC_DCDS		Sep 30/21	10①	1.8	2.0	160	10①	4.7	470	
LC_LC3		Sep 30/21	10①	2.6	2.8	240	10①	5.0	500	
LC_LC5		Sep 30/21	10①	1.9	2.0	180	10①	3.4	340	
LC_LCDSSLCC		Sep 30/21	10①	2.2	2.3	210 ~~230~~	10①	4.3	430	
RG_MIDAG		Sep 30/21	10①	1.9	2.0	180	10①	3.4	340	
FR_FR4		Sep 30/21	10①	2.5	2.7	230	10①	5.7	570	
FR_FRD		Sep 30/21	10①	2.8	2.9	270	10①	5.3	530	
FR_FR2		Sep 30/21	10①	2.1	2.2	200	10①	4.2	420	
FR_MULTIPLATE				2.1	2.2	200	10①	3.9	390	

Notes: ①10 mL sample diluted to 100 mL

Reviewed by: [signature]

Date Reviewed: Nov 17, 2021

Client: Teck

W.O.#: 211568

Hardness and Alkalinity Datasheet

Day 28

Sample ID	Alkalinity: Subsample Date	Alkalinity: Date Measured	Alkalinity: Sample Volume (mL)	Alkalinity: (mL) 0.02N HCL/H_2SO_4 used to pH 4.5	Alkalinity: (mL) of 0.02N HCL/H_2SO_4 used to pH 4.2	Alkalinity: Total Alkalinity ($mg/LCaCO_3$)	Hardness: Sample Volume (mL)	Hardness: Volume of 0.01M EDTA Used (mL)	Hardness: Total Hardness ($mg/L\ CaCO_3$)	Technician
Control	Sept. 9/21	~~Oct 4/21~~ Nov. 15/21	50	3.9	4.0	146 76	50	7.1	142	RZS
FR_UFR1		~~Oct 4/21~~	50	7.5	7.7	~~396~~	50	8.8	176	RZS
GH_ER2		Oct 4/21	50	6.9	7.1	134	50	7.5	150	RZS
CM_MC1		Oct 4/21	50	7.5	7.7	146	50	7.7	154	RZS
LC_SLC		~~Oct 5~~/21	50	7.1	7.3	138	50	8.7	174	RZS
FR_FRABCH		~~Oct 5~~/21	10 ①	2.1	2.2	200	10 ①	5.5	550	RZS
FR_FRCP1		Oct 5/21	10 ①	2.3	2.5	210	10 ①	5.7	570	RZS
GH_FR1		Oct 5/21	10 ①	2.2	2.3	210	10 ①	4.5	450	RZS
GH_ERC		Oct 5/21	50	7.4	7.6	144	50	8.2	164	RZS
CM_MC2		Oct 5/21	10 ①	2.3	2.5	210	10 ①	6.0	600	RZS
EV_MC2		Oct 5/21	10 ①	2.0	2.2	180	10 ①	5.3	530	RZS
EV_HC1		Oct 5/21	10 ①	2.0	2.2	180	10 ①	4.0	400	RZS
LC_DCDS		Oct 5/21	10 ①	1.9	2.0	180	10 ①	5.2	520	RZS
LC_LC3		Oct 5/21	10 ①	2.3	2.4	220	10 ①	4.7	470	RZS
LC_LCS		Oct 5/21	10 ①	2.1	2.3	190	10 ①	4.0	400	RZS
LC_LCDSSLCC		Oct 5/21	10 ①	2.3	2.5	210	10 ①	3.8	380	RZS
RG_MIDAG1		Oct 5/21	10 ①	2.0	2.1	190	10 ①	3.1	310	RZS
FR_FR4		Oct 5/21	10 ①	2.1	2.2	200	10 ①	5.4	540	RZS
FR_FRR7		Oct 5/21	10 ①	2.6	2.7	250	10 ①	6.0	600	RZS
FR_FR2		Oct 5/21	10 ①	2.3	2.4	220	10 ①	4.2	420	RZS
FR_MIDPLATE	↓	Oct 5/21	10 ①	2.5	2.7	230	10 ①	4.0	400	RZS

Notes:

① Diluted up to 100mL w/ DI water.

Reviewed by: [signature]

Date Reviewed: Nov. 17, 2021

Hyalella 28-d Survival and Growth Sediment Test — **Nautilus Environmental**

Batch ID:	21-3868-4263	**Test Type:**	Survival-Growth	**Analyst:**	Rachel Sakurdeep
Start Date:	12 Aug-21	**Protocol:**	EPA/600/R-99/064 (2000)	**Diluent:**	Reconstituted Water
Ending Date:	09 Sep-21	**Species:**	Hyalella azteca	**Brine:**	
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	Aquatic Biosystems, CO **Age:** 7-8

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
Lab Control	00-3568-3085	12 Aug-21	12 Aug-21	n/a	Teck Coal	
FR_UFR1	01-9312-3340	10 Aug-21 08:54	11 Aug-21 11:15	39h (12.8 °C)		
GH_ER2	03-3301-7818	10 Aug-21 10:45	11 Aug-21 11:15	37h (15.8 °C)		
CM_MC1	20-0000-6898	10 Aug-21 11:04	11 Aug-21 11:15	37h (14 °C)		
LC_SLC	07-8534-5756	10 Aug-21 09:09	11 Aug-21 11:15	39h (11.2 °C)		
FR_FRABCH	12-3746-7337	10 Aug-21 09:35	11 Aug-21 11:15	38h (13.6 °C)		
FR_FRCP1	02-0987-3329	10 Aug-21 09:55	11 Aug-21 11:15	38h (12.1 °C)		
GH_FR1	00-2216-4794	10 Aug-21 09:30	11 Aug-21 11:15	38h (15.3 °C)		
GH_ERC	02-8768-9833	10 Aug-21 11:45	11 Aug-21 11:15	36h (16.4 °C)		
CM_MC2	08-6405-5477	10 Aug-21 12:07	11 Aug-21 11:15	36h (14.9 °C)		
EV_MC2	09-5920-8643	10 Aug-21 10:44	11 Aug-21 11:15	37h (12.8 °C)		
EV_HC1	05-3700-4202	10 Aug-21 09:46	11 Aug-21 11:15	38h (13 °C)		
LC_DCDS	10-8734-0222	10 Aug-21 10:10	11 Aug-21 11:15	38h (10.8 °C)		
LC_LC3	07-4841-6068	10 Aug-21 09:30	11 Aug-21 11:15	38h (9.8 °C)		
LC_LC5	18-0478-8867	10 Aug-21 12:00	11 Aug-21 11:15	36h (11.8 °C)		
LC_LCDSSLCC	17-9964-8023	10 Aug-21 10:40	11 Aug-21 11:15	37h (12.1 °C)		
RG_MIDAG	04-6323-4167	10 Aug-21 11:30	11 Aug-21 11:15	37h (14.3 °C)		
FR_FR4	04-5681-6105	10 Aug-21 10:00	11 Aug-21 11:15	38h (15.6 °C)		
FR_FRRD	03-6145-5105	10 Aug-21 08:25	11 Aug-21 11:15	40h (16.8 °C)		
FR_FR2	16-7096-5741	10 Aug-21 10:54	11 Aug-21 11:15	37h (15.9 °C)		
FR_MULTIPLATE	08-7549-1660	10 Aug-21 11:51	11 Aug-21 11:15	36h (16.9 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
Lab Control	Water Sample	Teck Coal	Lab Control	
FR_UFR1	Water Sample	Teck Coal	FR_UFR1_MON_2021-08-0	
GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-08-10_	
CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-08-10	
LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-08-10_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_MON_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_MON_2021-08	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-08-10_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-08-10	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-08-10	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2021_Q3_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2021_Q3_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-08-10	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-08-10_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-08-10_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	
RG_MIDAG	Water Sample	Teck Coal	RG_MIDAG_WS_2021-08-	
FR_FR4	Water Sample	Teck Coal	FR_FR4_WS_2021-08-10_	
FR_FRRD	Water Sample	Teck Coal	FR_FRRD_WS_2021-08-10	
FR_FR2	Water Sample	Teck Coal	FR_FR2_WS_2021-08-10_	
FR_MULTIPLATE	Water Sample	Teck Coal	FR_MULTIPLATE_WS_202	

SIngle Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.0037	LC_LCDSSLCC failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.0037	FR_FR2 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.0037	LC_SLC failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.0037	FR_FRRD failed mean dry weight-mg	1

Hyalella 28-d Survival and Growth Sediment Test **Nautilus Environmental**

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.0037	FR_FRABCH failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.0037	FR_FR4 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.0037	FR_FRCP1 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.0037	GH_FR1 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.0037	CM_MC1 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.0037	CM_MC2 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.0037	RG_MIDAG failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.0037	GH_ERC failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.0037	LC_LC5 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.0037	GH_ER2 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.0037	FR_MULTIPLATE failed mean dry weight-	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.0037	LC_LC3 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.0037	EV_MC2 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.0037	FR_UFR1 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.0037	Lab Control failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.0037	EV_HC1 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.0037	LC_DCDS failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	6.3E-05	FR_MULTIPLATE failed mean dry weight-	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	6.3E-05	LC_SLC failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	6.3E-05	FR_FRRD failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	6.3E-05	FR_UFR1 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	6.3E-05	FR_FRABCH failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	6.3E-05	FR_FR4 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	6.3E-05	LC_LCDSSLCC failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	6.3E-05	RG_MIDAG failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	6.3E-05	LC_DCDS failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	6.3E-05	EV_MC2 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	6.3E-05	GH_FR1 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	6.3E-05	FR_FR2 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	6.3E-05	LC_LC3 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	6.3E-05	GH_ERC failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	6.3E-05	LC_LC5 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	6.3E-05	Lab Control failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	6.3E-05	FR_FRCP1 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	6.3E-05	EV_HC1 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	6.3E-05	GH_ER2 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	6.3E-05	CM_MC1 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	6.3E-05	CM_MC2 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.4686	LC_LC5 passed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.4686	FR_FR4 passed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.4686	FR_FRCP1 passed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.4686	RG_MIDAG passed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.4686	CM_MC1 passed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.4686	GH_FR1 passed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.4686	FR_FR2 passed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.4686	LC_LCDSSLCC passed mean dry weight-	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.4686	FR_FRABCH passed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.4686	GH_ERC passed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.4686	Lab Control passed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.4686	LC_LC3 passed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.4686	EV_MC2 passed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.4686	LC_DCDS passed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.4686	FR_UFR1 passed mean dry weight-mg	1

Hyalella 28-d Survival and Growth Sediment Test **Nautilus Environmental**

SIngle Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.4686	GH_ER2 passed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.4686	FR_MULTIPLATE passed mean dry weight	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.4686	CM_MC2 passed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.4686	LC_SLC passed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.4686	FR_FRRD passed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.4686	EV_HC1 passed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	2.0E-04	LC_LC5 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	2.0E-04	CM_MC2 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	2.0E-04	CM_MC1 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	2.0E-04	LC_LCDSSLCC failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	2.0E-04	GH_ERC failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	2.0E-04	LC_LC3 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	2.0E-04	LC_SLC failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	2.0E-04	FR_FR4 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	2.0E-04	FR_FRCP1 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	2.0E-04	FR_UFR1 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	2.0E-04	Lab Control failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	2.0E-04	EV_MC2 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	2.0E-04	LC_DCDS failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	2.0E-04	GH_FR1 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	2.0E-04	EV_HC1 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	2.0E-04	FR_FRABCH failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	2.0E-04	RG_MIDAG failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	2.0E-04	GH_ER2 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	2.0E-04	FR_FRRD failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	2.0E-04	FR_MULTIPLATE failed mean dry weight-	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	2.0E-04	FR_FR2 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	3.5E-06	GH_FR1 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	3.5E-06	GH_ERC failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	3.5E-06	FR_FRRD failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	3.5E-06	LC_LCDSSLCC failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	3.5E-06	LC_LC5 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	3.5E-06	CM_MC2 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	3.5E-06	LC_SLC failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	3.5E-06	LC_LC3 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	3.5E-06	FR_UFR1 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	3.5E-06	LC_DCDS failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	3.5E-06	EV_MC2 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	3.5E-06	GH_ER2 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	3.5E-06	FR_FR2 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	3.5E-06	EV_HC1 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	3.5E-06	FR_MULTIPLATE failed mean dry weight-	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	3.5E-06	Lab Control failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	3.5E-06	FR_FRABCH failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	3.5E-06	FR_FRCP1 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	3.5E-06	FR_FR4 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	3.5E-06	RG_MIDAG failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	3.5E-06	CM_MC1 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.8E-06	FR_FRCP1 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.8E-06	LC_LC5 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.8E-06	CM_MC1 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.8E-06	CM_MC2 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.8E-06	EV_MC2 failed mean dry weight-mg	1

Hyalella 28-d Survival and Growth Sediment Test **Nautilus Environmental**

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.8E-06	FR_UFR1 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.8E-06	EV_HC1 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.8E-06	GH_ERC failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.8E-06	GH_ER2 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.8E-06	LC_LC3 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.8E-06	FR_FR2 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.8E-06	Lab Control failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.8E-06	FR_FR4 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.8E-06	LC_DCDS failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.8E-06	FR_FRABCH failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.8E-06	FR_MULTIPLATE failed mean dry weight-	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.8E-06	GH_FR1 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.8E-06	FR_FRRD failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.8E-06	LC_LCDSSLCC failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.8E-06	LC_SLC failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.8E-06	RG_MIDAG failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	6.8E-06	GH_ERC failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	6.8E-06	CM_MC1 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	6.8E-06	EV_MC2 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	6.8E-06	RG_MIDAG failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	6.8E-06	FR_UFR1 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	6.8E-06	FR_FRRD failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	6.8E-06	LC_LC3 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	6.8E-06	FR_MULTIPLATE failed mean dry weight-	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	6.8E-06	GH_FR1 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	6.8E-06	LC_LCDSSLCC failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	6.8E-06	EV_HC1 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	6.8E-06	LC_DCDS failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	6.8E-06	FR_FR4 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	6.8E-06	FR_FR2 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	6.8E-06	LC_SLC failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	6.8E-06	GH_ER2 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	6.8E-06	FR_FRABCH failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	6.8E-06	Lab Control failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	6.8E-06	LC_LC5 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	6.8E-06	CM_MC2 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	6.8E-06	FR_FRCP1 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.1E-05	Lab Control failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.1E-05	EV_HC1 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.1E-05	GH_ER2 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.1E-05	CM_MC1 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.1E-05	FR_FR4 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.1E-05	LC_LC5 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.1E-05	FR_FRCP1 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.1E-05	FR_FR2 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.1E-05	FR_UFR1 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.1E-05	LC_SLC failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.1E-05	CM_MC2 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.1E-05	FR_FRRD failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.1E-05	LC_LC3 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.1E-05	FR_MULTIPLATE failed mean dry weight-	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.1E-05	FR_FRABCH failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.1E-05	RG_MIDAG failed mean dry weight-mg	1

Hyalella 28-d Survival and Growth Sediment Test **Nautilus Environmental**

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.1E-05	LC_DCDS failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.1E-05	EV_MC2 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.1E-05	GH_ERC failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.1E-05	GH_FR1 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.1E-05	LC_LCDSSLCC failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.1E-06	FR_FR4 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.1E-06	FR_FR2 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.1E-06	LC_SLC failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.1E-06	CM_MC1 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.1E-06	EV_MC2 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.1E-06	LC_LC5 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.1E-06	FR_FRCP1 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.1E-06	LC_LCDSSLCC failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.1E-06	RG_MIDAG failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.1E-06	FR_FRRD failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.1E-06	GH_FR1 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.1E-06	EV_HC1 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.1E-06	FR_UFR1 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.1E-06	LC_DCDS failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.1E-06	GH_ERC failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.1E-06	CM_MC2 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.1E-06	GH_ER2 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.1E-06	Lab Control failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.1E-06	LC_LC3 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.1E-06	FR_FRABCH failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.1E-06	FR_MULTIPLATE failed mean dry weight-	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.0039	GH_FR1 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.0039	CM_MC1 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.0039	GH_ERC failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.0039	EV_MC2 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.0039	Lab Control failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.0039	FR_UFR1 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.0039	LC_SLC failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.0039	FR_FRCP1 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.0039	FR_FRABCH failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.0039	GH_ER2 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.0039	RG_MIDAG failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.0039	FR_MULTIPLATE failed mean dry weight-	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.0039	CM_MC2 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.0039	LC_LC3 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.0039	LC_LC5 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.0039	FR_FR4 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.0039	EV_HC1 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.0039	FR_FR2 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.0039	LC_DCDS failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.0039	FR_FRRD failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.0039	LC_LCDSSLCC failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.3507	FR_FR4 passed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.3507	FR_FRCP1 passed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.3507	LC_LCDSSLCC passed mean dry weight-	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.3507	RG_MIDAG passed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.3507	EV_HC1 passed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.3507	Lab Control passed mean dry weight-mg	1

Hyalella 28-d Survival and Growth Sediment Test **Nautilus Environmental**

SIngle Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.3507	FR_MULTIPLATE passed mean dry weight	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.3507	FR_UFR1 passed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.3507	LC_LC3 passed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.3507	GH_FR1 passed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.3507	FR_FRABCH passed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.3507	LC_SLC passed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.3507	FR_FRRD passed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.3507	EV_MC2 passed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.3507	CM_MC1 passed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.3507	FR_FR2 passed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.3507	LC_LC5 passed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.3507	GH_ER2 passed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.3507	CM_MC2 passed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.3507	GH_ERC passed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.3507	LC_DCDS passed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	8.1E-04	GH_FR1 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	8.1E-04	LC_LCDSSLCC failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	8.1E-04	LC_LC5 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	8.1E-04	FR_FRCP1 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	8.1E-04	EV_HC1 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	8.1E-04	RG_MIDAG failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	8.1E-04	GH_ERC failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	8.1E-04	FR_FRABCH failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	8.1E-04	FR_FR4 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	8.1E-04	LC_SLC failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	8.1E-04	FR_FRRD failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	8.1E-04	CM_MC1 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	8.1E-04	FR_FR2 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	8.1E-04	GH_ER2 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	8.1E-04	CM_MC2 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	8.1E-04	FR_UFR1 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	8.1E-04	Lab Control failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	8.1E-04	FR_MULTIPLATE failed mean dry weight-	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	8.1E-04	EV_MC2 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	8.1E-04	LC_DCDS failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	8.1E-04	LC_LC3 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	2.1E-05	FR_FR4 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	2.1E-05	FR_FRRD failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	2.1E-05	LC_SLC failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	2.1E-05	LC_DCDS failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	2.1E-05	FR_FRABCH failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	2.1E-05	GH_ERC failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	2.1E-05	CM_MC1 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	2.1E-05	EV_HC1 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	2.1E-05	LC_LCDSSLCC failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	2.1E-05	LC_LC3 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	2.1E-05	FR_FRCP1 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	2.1E-05	FR_UFR1 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	2.1E-05	GH_FR1 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	2.1E-05	EV_MC2 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	2.1E-05	LC_LC5 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	2.1E-05	RG_MIDAG failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	2.1E-05	FR_FR2 failed mean dry weight-mg	1

Hyalella 28-d Survival and Growth Sediment Test **Nautilus Environmental**

SIngle Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	2.1E-05	Lab Control failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	2.1E-05	GH_ER2 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	2.1E-05	FR_MULTIPLATE failed mean dry weight-	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	2.1E-05	CM_MC2 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	5.8E-06	FR_FRABCH failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	5.8E-06	Lab Control failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	5.8E-06	RG_MIDAG failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	5.8E-06	LC_DCDS failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	5.8E-06	FR_FR4 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	5.8E-06	LC_SLC failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	5.8E-06	FR_FRRD failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	5.8E-06	CM_MC1 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	5.8E-06	FR_MULTIPLATE failed mean dry weight-	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	5.8E-06	EV_MC2 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	5.8E-06	FR_FR2 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	5.8E-06	GH_ER2 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	5.8E-06	CM_MC2 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	5.8E-06	FR_UFR1 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	5.8E-06	EV_HC1 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	5.8E-06	GH_ERC failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	5.8E-06	FR_FRCP1 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	5.8E-06	GH_FR1 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	5.8E-06	LC_LCDSSLCC failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	5.8E-06	LC_LC3 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	5.8E-06	LC_LC5 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	6.7E-05	FR_MULTIPLATE failed mean dry weight-	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	6.7E-05	LC_LCDSSLCC failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	6.7E-05	CM_MC1 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	6.7E-05	LC_LC3 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	6.7E-05	LC_LC5 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	6.7E-05	FR_FR4 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	6.7E-05	LC_DCDS failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	6.7E-05	FR_UFR1 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	6.7E-05	GH_FR1 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	6.7E-05	LC_SLC failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	6.7E-05	FR_FRRD failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	6.7E-05	GH_ER2 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	6.7E-05	CM_MC2 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	6.7E-05	GH_ERC failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	6.7E-05	FR_FRCP1 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	6.7E-05	EV_HC1 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	6.7E-05	FR_FRABCH failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	6.7E-05	RG_MIDAG failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	6.7E-05	FR_FR2 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	6.7E-05	EV_MC2 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	6.7E-05	Lab Control failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.6260	GH_ER2 passed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.6260	FR_UFR1 passed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.6260	FR_FRRD passed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.6260	CM_MC1 passed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.6260	FR_FR2 passed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.6260	LC_LC5 passed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.6260	EV_HC1 passed mean dry weight-mg	1

Hyalella 28-d Survival and Growth Sediment Test — **Nautilus Environmental**

SIngle Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.6260	GH_FR1 passed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.6260	EV_MC2 passed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.6260	FR_MULTIPLATE passed mean dry weight	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.6260	GH_ERC passed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.6260	CM_MC2 passed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.6260	RG_MIDAG passed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.6260	FR_FRABCH passed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.6260	LC_SLC passed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.6260	LC_DCDS passed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.6260	FR_FRCP1 passed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.6260	LC_LC3 passed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.6260	FR_FR4 passed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.6260	Lab Control passed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.6260	LC_LCDSSLCC passed mean dry weight-	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	2.5E-06	GH_ERC failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	2.5E-06	FR_MULTIPLATE failed mean dry weight-	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	2.5E-06	LC_LCDSSLCC failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	2.5E-06	FR_FR2 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	2.5E-06	GH_ER2 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	2.5E-06	FR_FRCP1 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	2.5E-06	FR_FRABCH failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	2.5E-06	EV_MC2 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	2.5E-06	LC_LC3 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	2.5E-06	LC_DCDS failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	2.5E-06	CM_MC2 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	2.5E-06	EV_HC1 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	2.5E-06	FR_FR4 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	2.5E-06	GH_FR1 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	2.5E-06	Lab Control failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	2.5E-06	LC_SLC failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	2.5E-06	FR_UFR1 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	2.5E-06	FR_FRRD failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	2.5E-06	CM_MC1 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	2.5E-06	RG_MIDAG failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	2.5E-06	LC_LC5 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.4E-05	FR_MULTIPLATE failed mean dry weight-	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.4E-05	LC_DCDS failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.4E-05	FR_FRCP1 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.4E-05	LC_LC3 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.4E-05	EV_MC2 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.4E-05	EV_HC1 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.4E-05	LC_SLC failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.4E-05	CM_MC2 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.4E-05	FR_FR4 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.4E-05	GH_ERC failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.4E-05	LC_LCDSSLCC failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.4E-05	GH_ER2 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.4E-05	FR_UFR1 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.4E-05	FR_FR2 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.4E-05	RG_MIDAG failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.4E-05	CM_MC1 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.4E-05	FR_FRABCH failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.4E-05	Lab Control failed mean dry weight-mg	1

Hyalella 28-d Survival and Growth Sediment Test **Nautilus Environmental**

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.4E-05	GH_FR1 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.4E-05	FR_FRRD failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.4E-05	LC_LC5 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.4E-05	FR_UFR1 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.4E-05	EV_HC1 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.4E-05	GH_ERC failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.4E-05	LC_LCDSSLCC failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.4E-05	LC_LC3 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.4E-05	LC_DCDS failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.4E-05	RG_MIDAG failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.4E-05	FR_MULTIPLATE failed mean dry weight-	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.4E-05	FR_FR4 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.4E-05	EV_MC2 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.4E-05	Lab Control failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.4E-05	LC_LC5 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.4E-05	FR_FRRD failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.4E-05	CM_MC2 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.4E-05	GH_FR1 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.4E-05	FR_FR2 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.4E-05	FR_FRCP1 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.4E-05	FR_FRABCH failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.4E-05	LC_SLC failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.4E-05	CM_MC1 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.4E-05	GH_ER2 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.1E-06	FR_FR2 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.1E-06	FR_FR4 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.1E-06	CM_MC2 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.1E-06	RG_MIDAG failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.1E-06	EV_HC1 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.1E-06	LC_LCDSSLCC failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.1E-06	FR_UFR1 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.1E-06	FR_FRRD failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.1E-06	CM_MC1 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.1E-06	LC_LC5 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.1E-06	GH_ER2 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.1E-06	LC_SLC failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.1E-06	FR_FRABCH failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.1E-06	FR_FRCP1 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.1E-06	GH_FR1 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.1E-06	Lab Control failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.1E-06	EV_MC2 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.1E-06	FR_MULTIPLATE failed mean dry weight-	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.1E-06	LC_DCDS failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.1E-06	LC_LC3 failed mean dry weight-mg	1
07-2528-8944	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.1E-06	GH_ERC failed mean dry weight-mg	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed survival rate	1

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Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	RG_MIDAG passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Lab Control passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	RG_MIDAG passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Lab Control passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	RG_MIDAG passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Lab Control passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed survival rate	1

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SIngle Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Lab Control passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	RG_MIDAG passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Lab Control passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	RG_MIDAG passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed survival rate	1

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SIngle Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	RG_MIDAG passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Lab Control passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Lab Control passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	RG_MIDAG passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Lab Control passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	RG_MIDAG passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed survival rate	1

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Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	2.6E-09	LC_LCDSSLCC failed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	2.6E-09	FR_FR2 failed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	2.6E-09	EV_HC1 failed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	2.6E-09	RG_MIDAG failed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	2.6E-09	FR_MULTIPLATE failed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	2.6E-09	CM_MC1 failed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	2.6E-09	FR_FRCP1 failed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	2.6E-09	LC_SLC failed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	2.6E-09	FR_FRRD failed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	2.6E-09	EV_MC2 failed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	2.6E-09	FR_FR4 failed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	2.6E-09	LC_DCDS failed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	2.6E-09	FR_UFR1 failed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	2.6E-09	LC_LC5 failed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	2.6E-09	CM_MC2 failed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	2.6E-09	GH_ER2 failed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	2.6E-09	GH_ERC failed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	2.6E-09	FR_FRABCH failed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	2.6E-09	GH_FR1 failed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	2.6E-09	Lab Control failed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	2.6E-09	LC_LC3 failed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Lab Control passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	RG_MIDAG passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	RG_MIDAG passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Lab Control passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed survival rate	1

Hyalella 28-d Survival and Growth Sediment Test **Nautilus Environmental**

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	RG_MIDAG passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Lab Control passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	RG_MIDAG passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Lab Control passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed survival rate	1

Hyalella 28-d Survival and Growth Sediment Test **Nautilus Environmental**

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Lab Control passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	RG_MIDAG passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Lab Control passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	RG_MIDAG passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed survival rate	1

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Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	RG_MIDAG passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Lab Control passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Lab Control passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	RG_MIDAG passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	RG_MIDAG passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Lab Control passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed survival rate	1

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Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	RG_MIDAG passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Lab Control passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	RG_MIDAG passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Lab Control passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed survival rate	1
14-2222-7609	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed survival rate	1

Test Acceptability

Analysis ID	Endpoint	Attribute	Test Stat	TAC Limits Lower	TAC Limits Upper	Overlap	Decision
14-2222-7609	Survival Rate	Control Resp	0.96	0.8	>>	Yes	Passes Criteria

Hyalella 28-d Survival and Growth Sediment Test **Nautilus Environmental**

Mean Dry Weight-mg Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
Lab Control	N	5	0.8633	0.6799	1.047	0.732	1.094	0.06608	0.1477	17.11%	0.00%
FR_UFR1		5	0.6105	0.4674	0.7537	0.494	0.803	0.05156	0.1153	18.89%	29.29%
GH_ER2		5	0.5293	0.3871	0.6716	0.3367	0.623	0.05124	0.1146	21.65%	38.69%
CM_MC1		5	0.7671	0.6859	0.8483	0.704	0.8756	0.02925	0.06541	8.53%	11.15%
LC_SLC	RS	5	0.5512	0.4895	0.6129	0.4856	0.5956	0.02223	0.0497	9.02%	36.16%
FR_FRABCH		5	0.4738	0.3363	0.6113	0.346	0.576	0.04951	0.1107	23.37%	45.12%
FR_FRCP1		5	0.4536	0.2827	0.6245	0.303	0.675	0.06157	0.1377	30.35%	47.46%
GH_FR1		5	0.488	0.3459	0.6301	0.391	0.676	0.05117	0.1144	23.44%	43.48%
GH_ERC		5	0.498	0.4159	0.5801	0.408	0.578	0.02957	0.06613	13.28%	42.32%
CM_MC2		4	0.324	0.1718	0.4761	0.2175	0.43	0.0478	0.09559	29.51%	62.48%
EV_MC2		5	0.6116	0.4951	0.7281	0.5013	0.7189	0.04196	0.09381	15.34%	29.16%
EV_HC1		5	0.7499	0.6199	0.8799	0.5867	0.877	0.04682	0.1047	13.96%	13.14%
LC_DCDS		5	0.5784	0.506	0.6508	0.51	0.665	0.02609	0.05834	10.09%	33.01%
LC_LC3		5	0.5096	0.436	0.5831	0.4444	0.5733	0.0265	0.05926	11.63%	40.98%
LC_LC5		5	0.4847	0.3821	0.5873	0.3678	0.5767	0.03695	0.08263	17.05%	43.86%
LC_LCDSSLCC		5	0.5304	0.4399	0.6209	0.465	0.644	0.0326	0.0729	13.74%	38.56%
RG_MIDAG		5	0.7894	0.7034	0.8753	0.74	0.905	0.03096	0.06924	8.77%	8.57%
FR_FR4		5	0.4654	0.1518	0.779	0.218	0.789	0.113	0.2526	54.28%	46.09%
FR_FRRD		5	0.5014	0.3415	0.6613	0.362	0.614	0.0576	0.1288	25.69%	41.92%
FR_FR2		5	0.502	0.3513	0.6527	0.415	0.707	0.05428	0.1214	24.18%	41.86%
FR_MULTIPLATE		5	0.3162	0.2756	0.3569	0.264	0.346	0.01466	0.03277	10.36%	63.37%

Survival Rate Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
Lab Control	N	5	0.9600	0.8489	1.0000	0.8000	1.0000	0.0400	0.0894	9.32%	0.00%
FR_UFR1		5	0.9400	0.8289	1.0000	0.8000	1.0000	0.0400	0.0894	9.52%	2.08%
GH_ER2		5	0.9800	0.9245	1.0000	0.9000	1.0000	0.0200	0.0447	4.56%	-2.08%
CM_MC1		5	0.9800	0.9245	1.0000	0.9000	1.0000	0.0200	0.0447	4.56%	-2.08%
LC_SLC	RS	5	0.9400	0.8720	1.0000	0.9000	1.0000	0.0245	0.0548	5.83%	2.08%
FR_FRABCH		5	0.9200	0.7840	1.0000	0.8000	1.0000	0.0490	0.1095	11.91%	4.17%
FR_FRCP1		5	0.9800	0.9245	1.0000	0.9000	1.0000	0.0200	0.0447	4.56%	-2.08%
GH_FR1		5	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	-4.17%
GH_ERC		5	0.9800	0.9245	1.0000	0.9000	1.0000	0.0200	0.0447	4.56%	-2.08%
CM_MC2		5	0.3800	0.0000	0.7766	0.0000	0.8000	0.1428	0.3194	84.05%	60.42%
EV_MC2		5	0.9400	0.8289	1.0000	0.8000	1.0000	0.0400	0.0894	9.52%	2.08%
EV_HC1		5	0.9800	0.9245	1.0000	0.9000	1.0000	0.0200	0.0447	4.56%	-2.08%
LC_DCDS		5	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	-4.17%
LC_LC3		5	0.9600	0.8920	1.0000	0.9000	1.0000	0.0245	0.0548	5.71%	0.00%
LC_LC5		5	0.9400	0.8720	1.0000	0.9000	1.0000	0.0245	0.0548	5.83%	2.08%
LC_LCDSSLCC		5	0.9400	0.8289	1.0000	0.8000	1.0000	0.0400	0.0894	9.52%	2.08%
RG_MIDAG		5	0.9400	0.7734	1.0000	0.7000	1.0000	0.0600	0.1342	14.27%	2.08%
FR_FR4		5	0.9800	0.9245	1.0000	0.9000	1.0000	0.0200	0.0447	4.56%	-2.08%
FR_FRRD		5	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	-4.17%
FR_FR2		5	0.8600	0.5362	1.0000	0.4000	1.0000	0.1166	0.2608	30.32%	10.42%
FR_MULTIPLATE		5	0.9800	0.9245	1.0000	0.9000	1.0000	0.0200	0.0447	4.56%	-2.08%

Hyalella 28-d Survival and Growth Sediment Test **Nautilus Environmental**

Mean Dry Weight-mg Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
Lab Control	N	0.738	1.094	0.855	0.898	0.732
FR_UFR1		0.803	0.494	0.6056	0.575	0.575
GH_ER2		0.529	0.623	0.608	0.55	0.3367
CM_MC1		0.738	0.773	0.8756	0.745	0.704
LC_SLC	RS	0.575	0.5956	0.511	0.5889	0.4856
FR_FRABCH		0.346	0.5387	0.547	0.576	0.3612
FR_FRCP1		0.303	0.43	0.675	0.395	0.465
GH_FR1		0.391	0.504	0.463	0.676	0.406
GH_ERC		0.578	0.503	0.462	0.5389	0.408
CM_MC2		0.275	0.2175	0.43	0.3733	
EV_MC2		0.529	0.5013	0.677	0.632	0.7189
EV_HC1		0.877	0.771	0.773	0.742	0.5867
LC_DCDS		0.583	0.665	0.591	0.543	0.51
LC_LC3		0.45	0.553	0.5733	0.527	0.4444
LC_LC5		0.539	0.5767	0.5	0.44	0.3678
LC_LCDSSLCC		0.5356	0.54	0.644	0.465	0.4675
RG_MIDAG		0.74	0.748	0.8029	0.751	0.905
FR_FR4		0.648	0.789	0.442	0.218	0.23
FR_FRRD		0.362	0.562	0.614	0.607	0.362
FR_FR2		0.4444	0.707	0.415	0.5175	0.426
FR_MULTIPLATE		0.314	0.264	0.315	0.346	0.3422

Survival Rate Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
Lab Control	N	1.0000	0.8000	1.0000	1.0000	1.0000
FR_UFR1		1.0000	1.0000	0.9000	0.8000	1.0000
GH_ER2		1.0000	1.0000	1.0000	1.0000	0.9000
CM_MC1		1.0000	1.0000	0.9000	1.0000	1.0000
LC_SLC	RS	1.0000	0.9000	1.0000	0.9000	0.9000
FR_FRABCH		1.0000	0.8000	1.0000	1.0000	0.8000
FR_FRCP1		1.0000	0.9000	1.0000	1.0000	1.0000
GH_FR1		1.0000	1.0000	1.0000	1.0000	1.0000
GH_ERC		1.0000	1.0000	1.0000	0.9000	1.0000
CM_MC2		0.2000	0.8000	0.6000	0.3000	0.0000
EV_MC2		1.0000	0.8000	1.0000	1.0000	0.9000
EV_HC1		1.0000	1.0000	1.0000	1.0000	0.9000
LC_DCDS		1.0000	1.0000	1.0000	1.0000	1.0000
LC_LC3		1.0000	1.0000	0.9000	1.0000	0.9000
LC_LC5		1.0000	0.9000	1.0000	0.9000	0.9000
LC_LCDSSLCC		0.9000	1.0000	1.0000	1.0000	0.8000
RG_MIDAG		1.0000	1.0000	0.7000	1.0000	1.0000
FR_FR4		1.0000	1.0000	1.0000	1.0000	0.9000
FR_FRRD		1.0000	1.0000	1.0000	1.0000	1.0000
FR_FR2		0.9000	1.0000	1.0000	0.4000	1.0000
FR_MULTIPLATE		1.0000	1.0000	1.0000	1.0000	0.9000

Dry weights re-checked

Hyalella 28-d Survival and Growth Sediment Test **Nautilus Environmental**

Survival Rate Binomials

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
Lab Control	N	10/10	8/10	10/10	10/10	10/10
FR_UFR1		10/10	10/10	9/10	8/10	10/10
GH_ER2		10/10	10/10	10/10	10/10	9/10
CM_MC1		10/10	10/10	9/10	10/10	10/10
LC_SLC	RS	10/10	9/10	10/10	9/10	9/10
FR_FRABCH		10/10	8/10	10/10	10/10	8/10
FR_FRCP1		10/10	9/10	10/10	10/10	10/10
GH_FR1		10/10	10/10	10/10	10/10	10/10
GH_ERC		10/10	10/10	10/10	9/10	10/10
CM_MC2		2/10	8/10	6/10	3/10	0/10
EV_MC2		10/10	8/10	10/10	10/10	9/10
EV_HC1		10/10	10/10	10/10	10/10	9/10
LC_DCDS		10/10	10/10	10/10	10/10	10/10
LC_LC3		10/10	10/10	9/10	10/10	9/10
LC_LC5		10/10	9/10	10/10	9/10	9/10
LC_LCDSSLCC		9/10	10/10	10/10	10/10	8/10
RG_MIDAG		10/10	10/10	7/10	10/10	10/10
FR_FR4		10/10	10/10	10/10	10/10	9/10
FR_FRRD		10/10	10/10	10/10	10/10	10/10
FR_FR2		9/10	10/10	10/10	4/10	10/10
FR_MULTIPLATE		10/10	10/10	10/10	10/10	9/10

CETIS Analytical Report

Test Code/ID: 211568 / 08-5209-9141

Hyalella 28-d Survival and Growth Sediment Test — **Nautilus Environmental**

Analysis ID:	14-2222-7609	**Endpoint:**	Survival Rate	**CETIS Version:**	CETISv1.9.4
Analyzed:	09 Nov-21 16:01	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1
Batch ID:	21-3868-4263	**Test Type:**	Survival-Growth	**Analyst:**	Rachel Sakurdeep
Start Date:	12 Aug-21	**Protocol:**	EPA/600/R-99/064 (2000)	**Diluent:**	Reconstituted Water
Ending Date:	09 Sep-21	**Species:**	Hyalella azteca	**Brine:**	
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	Aquatic Biosystems, CO **Age:** 7-8

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
Lab Control	00-3568-3085	12 Aug-21	12 Aug-21	n/a	Teck Coal	
FR_UFR1	01-9312-3340	10 Aug-21 08:54	11 Aug-21 11:15	39h (12.8 °C)		
GH_ER2	03-3301-7818	10 Aug-21 10:45	11 Aug-21 11:15	37h (15.8 °C)		
CM_MC1	20-0000-6898	10 Aug-21 11:04	11 Aug-21 11:15	37h (14 °C)		
LC_SLC	07-8534-5756	10 Aug-21 09:09	11 Aug-21 11:15	39h (11.2 °C)		
FR_FRABCH	12-3746-7337	10 Aug-21 09:35	11 Aug-21 11:15	38h (13.6 °C)		
FR_FRCP1	02-0987-3329	10 Aug-21 09:55	11 Aug-21 11:15	38h (12.1 °C)		
GH_FR1	00-2216-4794	10 Aug-21 09:30	11 Aug-21 11:15	38h (15.3 °C)		
GH_ERC	02-8768-9833	10 Aug-21 11:45	11 Aug-21 11:15	36h (16.4 °C)		
CM_MC2	08-6405-5477	10 Aug-21 12:07	11 Aug-21 11:15	36h (14.9 °C)		
EV_MC2	09-5920-8643	10 Aug-21 10:44	11 Aug-21 11:15	37h (12.8 °C)		
EV_HC1	05-3700-4202	10 Aug-21 09:46	11 Aug-21 11:15	38h (13 °C)		
LC_DCDS	10-8734-0222	10 Aug-21 10:10	11 Aug-21 11:15	38h (10.8 °C)		
LC_LC3	07-4841-6068	10 Aug-21 09:30	11 Aug-21 11:15	38h (9.8 °C)		
LC_LC5	18-0478-8867	10 Aug-21 12:00	11 Aug-21 11:15	36h (11.8 °C)		
LC_LCDSSLCC	17-9964-8023	10 Aug-21 10:40	11 Aug-21 11:15	37h (12.1 °C)		
RG_MIDAG	04-6323-4167	10 Aug-21 11:30	11 Aug-21 11:15	37h (14.3 °C)		
FR_FR4	04-5681-6105	10 Aug-21 10:00	11 Aug-21 11:15	38h (15.6 °C)		
FR_FRRD	03-6145-5105	10 Aug-21 08:25	11 Aug-21 11:15	40h (16.8 °C)		
FR_FR2	16-7096-5741	10 Aug-21 10:54	11 Aug-21 11:15	37h (15.9 °C)		
FR_MULTIPLATE	08-7549-1660	10 Aug-21 11:51	11 Aug-21 11:15	36h (16.9 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
Lab Control	Water Sample	Teck Coal	Lab Control	
FR_UFR1	Water Sample	Teck Coal	FR_UFR1_MON_2021-08-0	
GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-08-10_	
CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-08-10	
LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-08-10_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_MON_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_MON_2021-08	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-08-10_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-08-10	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-08-10	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2021_Q3_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2021_Q3_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-08-10	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-08-10_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-08-10_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	
RG_MIDAG	Water Sample	Teck Coal	RG_MIDAG_WS_2021-08-	
FR_FR4	Water Sample	Teck Coal	FR_FR4_WS_2021-08-10_	
FR_FRRD	Water Sample	Teck Coal	FR_FRRD_WS_2021-08-10	
FR_FR2	Water Sample	Teck Coal	FR_FR2_WS_2021-08-10_	
FR_MULTIPLATE	Water Sample	Teck Coal	FR_MULTIPLATE_WS_202	

Fisher Exact/Bonferroni-Holm Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
Negative Control		FR_UFR1	0.5000	Exact	1.0000	Non-Significant Effect
		GH_ER2	0.8788	Exact	1.0000	Non-Significant Effect

Hyalella 28-d Survival and Growth Sediment Test — **Nautilus Environmental**

Analysis ID:	14-2222-7609	**Endpoint:**	Survival Rate	**CETIS Version:**	CETISv1.9.4
Analyzed:	09 Nov-21 16:01	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1

Fisher Exact/Bonferroni-Holm Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
		CM_MC1	0.8788	Exact	1.0000	Non-Significant Effect
		LC_SLC	0.5000	Exact	1.0000	Non-Significant Effect
		FR_FRABCH	0.3389	Exact	1.0000	Non-Significant Effect
		FR_FRCP1	0.8788	Exact	1.0000	Non-Significant Effect
		GH_FR1	1.0000	Exact	1.0000	Non-Significant Effect
		GH_ERC	0.8788	Exact	1.0000	Non-Significant Effect
		CM_MC2*	0.0000	Exact	2.6E-09	Significant Effect
		EV_MC2	0.5000	Exact	1.0000	Non-Significant Effect
		EV_HC1	0.8788	Exact	1.0000	Non-Significant Effect
		LC_DCDS	1.0000	Exact	1.0000	Non-Significant Effect
		LC_LC3	0.6913	Exact	1.0000	Non-Significant Effect
		LC_LC5	0.5000	Exact	1.0000	Non-Significant Effect
		LC_LCDSSLCC	0.5000	Exact	1.0000	Non-Significant Effect
		RG_MIDAG	0.5000	Exact	1.0000	Non-Significant Effect
		FR_FR4	0.8788	Exact	1.0000	Non-Significant Effect
		FR_FRRD	1.0000	Exact	1.0000	Non-Significant Effect
		FR_FR2	0.0798	Exact	1.0000	Non-Significant Effect
		FR_MULTIPLATE	0.8788	Exact	1.0000	Non-Significant Effect

Test Acceptability Criteria

		TAC Limits			
Attribute	**Test Stat**	**Lower**	**Upper**	**Overlap**	**Decision**
Control Resp	0.96	0.8	>>	Yes	Passes Criteria

Data Summary

Sample	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
Lab Control	N	48	2	50	0.96	0.04	4.0%
FR_UFR1		47	3	50	0.94	0.06	6.0%
GH_ER2		49	1	50	0.98	0.02	2.0%
CM_MC1		49	1	50	0.98	0.02	2.0%
LC_SLC		47	3	50	0.94	0.06	6.0%
FR_FRABCH		46	4	50	0.92	0.08	8.0%
FR_FRCP1		49	1	50	0.98	0.02	2.0%
GH_FR1		50	0	50	1	0	0.0%
GH_ERC		49	1	50	0.98	0.02	2.0%
CM_MC2		19	31	50	0.38	0.62	62.0%
EV_MC2		47	3	50	0.94	0.06	6.0%
EV_HC1		49	1	50	0.98	0.02	2.0%
LC_DCDS		50	0	50	1	0	0.0%
LC_LC3		48	2	50	0.96	0.04	4.0%
LC_LC5		47	3	50	0.94	0.06	6.0%
LC_LCDSSLCC		47	3	50	0.94	0.06	6.0%
RG_MIDAG		47	3	50	0.94	0.06	6.0%
FR_FR4		49	1	50	0.98	0.02	2.0%
FR_FRRD		50	0	50	1	0	0.0%
FR_FR2		43	7	50	0.86	0.14	14.0%
FR_MULTIPLATE		49	1	50	0.98	0.02	2.0%

Hyalella 28-d Survival and Growth Sediment Test — **Nautilus Environmental**

Analysis ID: 14-2222-7609 **Endpoint:** Survival Rate **CETIS Version:** CETISv1.9.4
Analyzed: 09 Nov-21 16:01 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Survival Rate Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
Lab Control	N	1.0000	0.8000	1.0000	1.0000	1.0000
FR_UFR1		1.0000	1.0000	0.9000	0.8000	1.0000
GH_ER2		1.0000	1.0000	1.0000	1.0000	0.9000
CM_MC1		1.0000	1.0000	0.9000	1.0000	1.0000
LC_SLC		1.0000	0.9000	1.0000	0.9000	0.9000
FR_FRABCH		1.0000	0.8000	1.0000	1.0000	0.8000
FR_FRCP1		1.0000	0.9000	1.0000	1.0000	1.0000
GH_FR1		1.0000	1.0000	1.0000	1.0000	1.0000
GH_ERC		1.0000	1.0000	1.0000	0.9000	1.0000
CM_MC2		0.2000	0.8000	0.6000	0.3000	0.0000
EV_MC2		1.0000	0.8000	1.0000	1.0000	0.9000
EV_HC1		1.0000	1.0000	1.0000	1.0000	0.9000
LC_DCDS		1.0000	1.0000	1.0000	1.0000	1.0000
LC_LC3		1.0000	1.0000	0.9000	1.0000	0.9000
LC_LC5		1.0000	0.9000	1.0000	0.9000	0.9000
LC_LCDSSLCC		0.9000	1.0000	1.0000	1.0000	0.8000
RG_MIDAG		1.0000	1.0000	0.7000	1.0000	1.0000
FR_FR4		1.0000	1.0000	1.0000	1.0000	0.9000
FR_FRRD		1.0000	1.0000	1.0000	1.0000	1.0000
FR_FR2		0.9000	1.0000	1.0000	0.4000	1.0000
FR_MULTIPLATE		1.0000	1.0000	1.0000	1.0000	0.9000

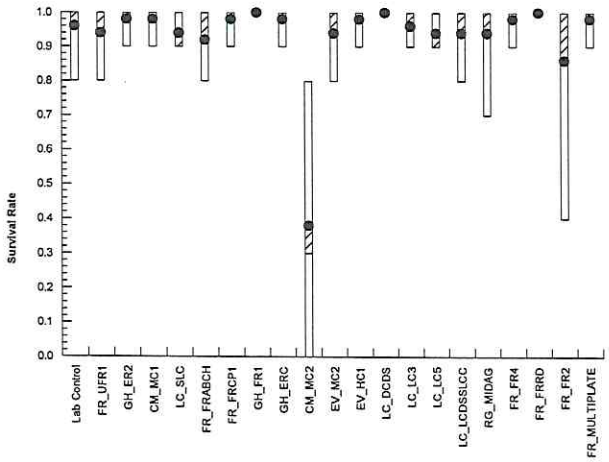
Survival Rate Binomials

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
Lab Control	N	10/10	8/10	10/10	10/10	10/10
FR_UFR1		10/10	10/10	9/10	8/10	10/10
GH_ER2		10/10	10/10	10/10	10/10	9/10
CM_MC1		10/10	10/10	9/10	10/10	10/10
LC_SLC		10/10	9/10	10/10	9/10	9/10
FR_FRABCH		10/10	8/10	10/10	10/10	8/10
FR_FRCP1		10/10	9/10	10/10	10/10	10/10
GH_FR1		10/10	10/10	10/10	10/10	10/10
GH_ERC		10/10	10/10	10/10	9/10	10/10
CM_MC2		2/10	8/10	6/10	3/10	
EV_MC2		10/10	8/10	10/10	10/10	9/10
EV_HC1		10/10	10/10	10/10	10/10	9/10
LC_DCDS		10/10	10/10	10/10	10/10	10/10
LC_LC3		10/10	10/10	9/10	10/10	9/10
LC_LC5		10/10	9/10	10/10	9/10	9/10
LC_LCDSSLCC		9/10	10/10	10/10	10/10	8/10
RG_MIDAG		10/10	10/10	7/10	10/10	10/10
FR_FR4		10/10	10/10	10/10	10/10	9/10
FR_FRRD		10/10	10/10	10/10	10/10	10/10
FR_FR2		9/10	10/10	10/10	4/10	10/10
FR_MULTIPLATE		10/10	10/10	10/10	10/10	9/10

Hyalella 28-d Survival and Growth Sediment Test — **Nautilus Environmental**

Analysis ID:	14-2222-7609	**Endpoint:**	Survival Rate	**CETIS Version:**	CETISv1.9.4
Analyzed:	09 Nov-21 16:01	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1

Graphics



Analyst: RD QA: NH 11/9/21

Hyalella 28-d Survival and Growth Sediment Test — **Nautilus Environmental**

Analysis ID:	07-2528-8944	**Endpoint:**	Mean Dry Weight-mg	**CETIS Version:**	CETISv1.9.4
Analyzed:	09 Nov-21 16:02	**Analysis:**	Parametric-Control vs Treatments	**Status Level:**	1
Batch ID:	21-3868-4263	**Test Type:**	Survival-Growth	**Analyst:**	Rachel Sakurdeep
Start Date:	12 Aug-21	**Protocol:**	EPA/600/R-99/064 (2000)	**Diluent:**	Reconstituted Water
Ending Date:	09 Sep-21	**Species:**	Hyalella azteca	**Brine:**	
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	Aquatic Biosystems, CO **Age:** 7-8

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
Lab Control	00-3568-3085	12 Aug-21	12 Aug-21	n/a	Teck Coal	
FR_UFR1	01-9312-3340	10 Aug-21 08:54	11 Aug-21 11:15	39h (12.8 °C)		
GH_ER2	03-3301-7818	10 Aug-21 10:45	11 Aug-21 11:15	37h (15.8 °C)		
CM_MC1	20-0000-6898	10 Aug-21 11:04	11 Aug-21 11:15	37h (14 °C)		
LC_SLC	07-8534-5756	10 Aug-21 09:09	11 Aug-21 11:15	39h (11.2 °C)		
FR_FRABCH	12-3746-7337	10 Aug-21 09:35	11 Aug-21 11:15	38h (13.6 °C)		
FR_FRCP1	02-0987-3329	10 Aug-21 09:55	11 Aug-21 11:15	38h (12.1 °C)		
GH_FR1	00-2216-4794	10 Aug-21 09:30	11 Aug-21 11:15	38h (15.3 °C)		
GH_ERC	02-8768-9833	10 Aug-21 11:45	11 Aug-21 11:15	36h (16.4 °C)		
CM_MC2	08-6405-5477	10 Aug-21 12:07	11 Aug-21 11:15	36h (14.9 °C)		
EV_MC2	09-5920-8643	10 Aug-21 10:44	11 Aug-21 11:15	37h (12.8 °C)		
EV_HC1	05-3700-4202	10 Aug-21 09:46	11 Aug-21 11:15	38h (13 °C)		
LC_DCDS	10-8734-0222	10 Aug-21 10:10	11 Aug-21 11:15	38h (10.8 °C)		
LC_LC3	07-4841-6068	10 Aug-21 09:30	11 Aug-21 11:15	38h (9.8 °C)		
LC_LC5	18-0478-8867	10 Aug-21 12:00	11 Aug-21 11:15	36h (11.8 °C)		
LC_LCDSSLCC	17-9964-8023	10 Aug-21 10:40	11 Aug-21 11:15	37h (12.1 °C)		
RG_MIDAG	04-6323-4167	10 Aug-21 11:30	11 Aug-21 11:15	37h (14.3 °C)		
FR_FR4	04-5681-6105	10 Aug-21 10:00	11 Aug-21 11:15	38h (15.6 °C)		
FR_FRRD	03-6145-5105	10 Aug-21 08:25	11 Aug-21 11:15	40h (16.8 °C)		
FR_FR2	16-7096-5741	10 Aug-21 10:54	11 Aug-21 11:15	37h (15.9 °C)		
FR_MULTIPLATE	08-7549-1660	10 Aug-21 11:51	11 Aug-21 11:15	36h (16.9 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
Lab Control	Water Sample	Teck Coal	Lab Control	
FR_UFR1	Water Sample	Teck Coal	FR_UFR1_MON_2021-08-0	
GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-08-10_	
CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-08-10	
LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-08-10_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_MON_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_MON_2021-08	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-08-10_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-08-10	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-08-10	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2021_Q3_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2021_Q3_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-08-10	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-08-10_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-08-10_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	
RG_MIDAG	Water Sample	Teck Coal	RG_MIDAG_WS_2021-08-	
FR_FR4	Water Sample	Teck Coal	FR_FR4_WS_2021-08-10_	
FR_FRRD	Water Sample	Teck Coal	FR_FRRD_WS_2021-08-10	
FR_FR2	Water Sample	Teck Coal	FR_FR2_WS_2021-08-10_	
FR_MULTIPLATE	Water Sample	Teck Coal	FR_MULTIPLATE_WS_202	

Hyalella 28-d Survival and Growth Sediment Test — **Nautilus Environmental**

Analysis ID: 07-2528-8944 **Endpoint:** Mean Dry Weight-mg **CETIS Version:** CETISv1.9.4
Analyzed: 09 Nov-21 16:02 **Analysis:** Parametric-Control vs Treatments **Status Level:** 1

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	FR_UFR1 failed mean dry weight-mg	21.71%
		GH_ER2 failed mean dry weight-mg	21.71%
		CM_MC1 passed mean dry weight-mg	21.71%
		LC_SLC failed mean dry weight-mg	21.71%
		FR_FRABCH failed mean dry weight-mg	21.71%
		FR_FRCP1 failed mean dry weight-mg	21.71%
		GH_FR1 failed mean dry weight-mg	21.71%
		GH_ERC failed mean dry weight-mg	21.71%
		CM_MC2 failed mean dry weight-mg	21.71%
		EV_MC2 failed mean dry weight-mg	21.71%
		EV_HC1 passed mean dry weight-mg	21.71%
		LC_DCDS failed mean dry weight-mg	21.71%
		LC_LC3 failed mean dry weight-mg	21.71%
		LC_LC5 failed mean dry weight-mg	21.71%
		LC_LCDSSLCC failed mean dry weight-mg	21.71%
		RG_MIDAG passed mean dry weight-mg	21.71%
		FR_FR4 failed mean dry weight-mg	21.71%
		FR_FRRD failed mean dry weight-mg	21.71%
		FR_FR2 failed mean dry weight-mg	21.71%
		FR_MULTIPLATE failed mean dry weight-mg	21.71%

Dunnett Multiple Comparison Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Negative Control		FR_UFR1*	3.64	2.698	0.187	8	CDF	0.0037	Significant Effect
		GH_ER2*	4.808	2.698	0.187	8	CDF	6.3E-05	Significant Effect
		CM_MC1	1.385	2.698	0.187	8	CDF	0.4686	Non-Significant Effect
		LC_SLC*	4.493	2.698	0.187	8	CDF	2.0E-04	Significant Effect
		FR_FRABCH*	5.608	2.698	0.187	8	CDF	3.5E-06	Significant Effect
		FR_FRCP1*	5.898	2.698	0.187	8	CDF	1.8E-06	Significant Effect
		GH_FR1*	5.403	2.698	0.187	8	CDF	6.8E-06	Significant Effect
		GH_ERC*	5.26	2.698	0.187	8	CDF	1.1E-05	Significant Effect
		CM_MC2*	7.321	2.698	0.199	7	CDF	1.1E-06	Significant Effect
		EV_MC2*	3.624	2.698	0.187	8	CDF	0.0039	Significant Effect
		EV_HC1	1.633	2.698	0.187	8	CDF	0.3507	Non-Significant Effect
		LC_DCDS*	4.102	2.698	0.187	8	CDF	8.1E-04	Significant Effect
		LC_LC3*	5.093	2.698	0.187	8	CDF	2.1E-05	Significant Effect
		LC_LC5*	5.451	2.698	0.187	8	CDF	5.8E-06	Significant Effect
		LC_LCDSSLCC*	4.793	2.698	0.187	8	CDF	6.7E-05	Significant Effect
		RG_MIDAG	1.065	2.698	0.187	8	CDF	0.6260	Non-Significant Effect
		FR_FR4*	5.728	2.698	0.187	8	CDF	2.5E-06	Significant Effect
		FR_FRRD*	5.21	2.698	0.187	8	CDF	1.4E-05	Significant Effect
		FR_FR2*	5.202	2.698	0.187	8	CDF	1.4E-05	Significant Effect
		FR_MULTIPLATE*	7.876	2.698	0.187	8	CDF	1.1E-06	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	1.93076	0.0965381	20	8.002	<1.0E-37	Significant Effect
Error	1.00136	0.0120646	83			
Total	2.93212		103			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance Test	29.32	37.57	0.0816	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9849	0.9666	0.2875	Normal Distribution

Hyalella 28-d Survival and Growth Sediment Test — Nautilus Environmental

Analysis ID: 07-2528-8944 Endpoint: Mean Dry Weight-mg CETIS Version: CETISv1.9.4
Analyzed: 09 Nov-21 16:02 Analysis: Parametric-Control vs Treatments Status Level: 1

Mean Dry Weight-mg Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
Lab Control	N	5	0.8633	0.6799	1.047	0.855	0.732	1.094	0.06608	17.11%	0.00%
FR_UFR1		5	0.6105	0.4674	0.7537	0.575	0.494	0.803	0.05156	18.89%	29.29%
GH_ER2		5	0.5293	0.3871	0.6716	0.55	0.3367	0.623	0.05124	21.65%	38.69%
CM_MC1		5	0.7671	0.6859	0.8483	0.745	0.704	0.8756	0.02925	8.53%	11.15%
LC_SLC		5	0.5512	0.4895	0.6129	0.575	0.4856	0.5956	0.02223	9.02%	36.16%
FR_FRABCH		5	0.4738	0.3363	0.6113	0.5387	0.346	0.576	0.04951	23.37%	45.12%
FR_FRCP1		5	0.4536	0.2827	0.6245	0.43	0.303	0.675	0.06157	30.35%	47.46%
GH_FR1		5	0.488	0.3459	0.6301	0.463	0.391	0.676	0.05117	23.44%	43.48%
GH_ERC		5	0.498	0.4159	0.5801	0.503	0.408	0.578	0.02957	13.28%	42.32%
CM_MC2		4	0.324	0.1718	0.4761	0.3242	0.2175	0.43	0.0478	29.51%	62.48%
EV_MC2		5	0.6116	0.4951	0.7281	0.632	0.5013	0.7189	0.04196	15.34%	29.16%
EV_HC1		5	0.7499	0.6199	0.8799	0.771	0.5867	0.877	0.04682	13.96%	13.14%
LC_DCDS		5	0.5784	0.506	0.6508	0.583	0.51	0.665	0.02609	10.09%	33.01%
LC_LC3		5	0.5096	0.436	0.5831	0.527	0.4444	0.5733	0.0265	11.63%	40.98%
LC_LC5		5	0.4847	0.3821	0.5873	0.5	0.3678	0.5767	0.03695	17.05%	43.86%
LC_LCDSSLCC		5	0.5304	0.4399	0.6209	0.5356	0.465	0.644	0.0326	13.74%	38.56%
RG_MIDAG		5	0.7894	0.7034	0.8753	0.751	0.74	0.905	0.03096	8.77%	8.57%
FR_FR4		5	0.4654	0.1518	0.779	0.442	0.218	0.789	0.113	54.28%	46.09%
FR_FRRD		5	0.5014	0.3415	0.6613	0.562	0.362	0.614	0.0576	25.69%	41.92%
FR_FR2		5	0.502	0.3513	0.6527	0.4444	0.415	0.707	0.05428	24.18%	41.86%
FR_MULTIPLATE		5	0.3162	0.2756	0.3569	0.315	0.264	0.346	0.01466	10.36%	63.37%

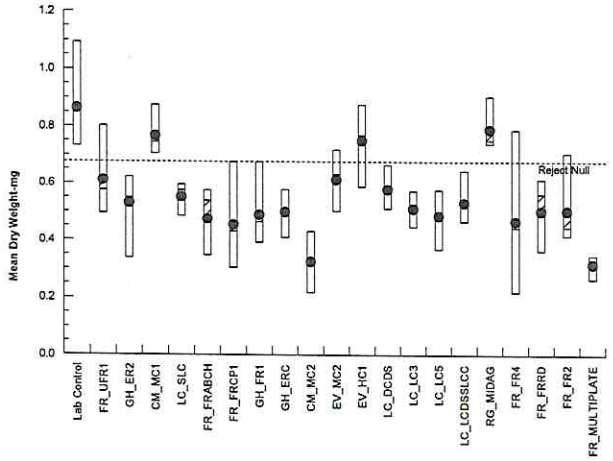
Mean Dry Weight-mg Detail

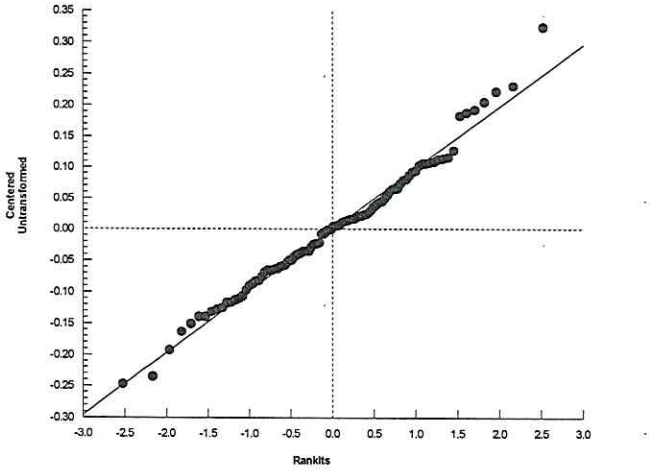
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
Lab Control	N	0.738	1.094	0.855	0.898	0.732
FR_UFR1		0.803	0.494	0.6056	0.575	0.575
GH_ER2		0.529	0.623	0.608	0.55	0.3367
CM_MC1		0.738	0.773	0.8756	0.745	0.704
LC_SLC		0.575	0.5956	0.511	0.5889	0.4856
FR_FRABCH		0.346	0.5387	0.547	0.576	0.3612
FR_FRCP1		0.303	0.43	0.675	0.395	0.465
GH_FR1		0.391	0.504	0.463	0.676	0.406
GH_ERC		0.578	0.503	0.462	0.5389	0.408
CM_MC2		0.275	0.2175	0.43	0.3733	
EV_MC2		0.529	0.5013	0.677	0.632	0.7189
EV_HC1		0.877	0.771	0.773	0.742	0.5867
LC_DCDS		0.583	0.665	0.591	0.543	0.51
LC_LC3		0.45	0.553	0.5733	0.527	0.4444
LC_LC5		0.539	0.5767	0.5	0.44	0.3678
LC_LCDSSLCC		0.5356	0.54	0.644	0.465	0.4675
RG_MIDAG		0.74	0.748	0.8029	0.751	0.905
FR_FR4		0.648	0.789	0.442	0.218	0.23
FR_FRRD		0.362	0.562	0.614	0.607	0.362
FR_FR2		0.4444	0.707	0.415	0.5175	0.426
FR_MULTIPLATE		0.314	0.264	0.315	0.346	0.3422

Hyalella 28-d Survival and Growth Sediment Test — **Nautilus Environmental**

Analysis ID:	07-2528-8944	**Endpoint:**	Mean Dry Weight-mg	**CETIS Version:**	CETISv1.9.4
Analyzed:	09 Nov-21 16:02	**Analysis:**	Parametric-Control vs Treatments	**Status Level:**	1

Graphics





Hyalella 28-d Survival and Growth Sediment Test

Nautilus Environmental

Analysis ID:	16-4300-3243	**Endpoint:**	Survival Rate	**CETIS Version:**	CETISv1.9.4
Analyzed:	09 Nov-21 16:05	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1
Batch ID:	21-3868-4263	**Test Type:**	Survival-Growth	**Analyst:**	Rachel Sakurdeep
Start Date:	12 Aug-21	**Protocol:**	EPA/600/R-99/064 (2000)	**Diluent:**	Reconstituted Water
Ending Date:	09 Sep-21	**Species:**	Hyalella azteca	**Brine:**	
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	Aquatic Biosystems, CO **Age:** 7-8

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
FR_UFR1	01-9312-3340	10 Aug-21 08:54	11 Aug-21 11:15	39h (12.8 °C)	Teck Coal	
GH_ER2	03-3301-7818	10 Aug-21 10:45	11 Aug-21 11:15	37h (15.8 °C)		
CM_MC1	20-0000-6898	10 Aug-21 11:04	11 Aug-21 11:15	37h (14 °C)		
LC_SLC	07-8534-5756	10 Aug-21 09:09	11 Aug-21 11:15	39h (11.2 °C)		
FR_FRABCH	12-3746-7337	10 Aug-21 09:35	11 Aug-21 11:15	38h (13.6 °C)		
FR_FRCP1	02-0987-3329	10 Aug-21 09:55	11 Aug-21 11:15	38h (12.1 °C)		
GH_FR1	00-2216-4794	10 Aug-21 09:30	11 Aug-21 11:15	38h (15.3 °C)		
GH_ERC	02-8768-9833	10 Aug-21 11:45	11 Aug-21 11:15	36h (16.4 °C)		
CM_MC2	08-6405-5477	10 Aug-21 12:07	11 Aug-21 11:15	36h (14.9 °C)		
EV_MC2	09-5920-8643	10 Aug-21 10:44	11 Aug-21 11:15	37h (12.8 °C)		
EV_HC1	05-3700-4202	10 Aug-21 09:46	11 Aug-21 11:15	38h (13 °C)		
LC_DCDS	10-8734-0222	10 Aug-21 10:10	11 Aug-21 11:15	38h (10.8 °C)		
LC_LC3	07-4841-6068	10 Aug-21 09:30	11 Aug-21 11:15	38h (9.8 °C)		
LC_LC5	18-0478-8867	10 Aug-21 12:00	11 Aug-21 11:15	36h (11.8 °C)		
LC_LCDSSLCC	17-9964-8023	10 Aug-21 10:40	11 Aug-21 11:15	37h (12.1 °C)		
RG_MIDAG	04-6323-4167	10 Aug-21 11:30	11 Aug-21 11:15	37h (14.3 °C)		
FR_FR4	04-5681-6105	10 Aug-21 10:00	11 Aug-21 11:15	38h (15.6 °C)		
FR_FRRD	03-6145-5105	10 Aug-21 08:25	11 Aug-21 11:15	40h (16.8 °C)		
FR_FR2	16-7096-5741	10 Aug-21 10:54	11 Aug-21 11:15	37h (15.9 °C)		
FR_MULTIPLATE	08-7549-1660	10 Aug-21 11:51	11 Aug-21 11:15	36h (16.9 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_UFR1	Water Sample	Teck Coal	FR_UFR1_MON_2021-08-0	
GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-08-10_	
CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-08-10	
LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-08-10_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_MON_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_MON_2021-08	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-08-10_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-08-10	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-08-10	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2021_Q3_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2021_Q3_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-08-10	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-08-10_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-08-10_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	
RG_MIDAG	Water Sample	Teck Coal	RG_MIDAG_WS_2021-08-	
FR_FR4	Water Sample	Teck Coal	FR_FR4_WS_2021-08-10_	
FR_FRRD	Water Sample	Teck Coal	FR_FRRD_WS_2021-08-10	
FR_FR2	Water Sample	Teck Coal	FR_FR2_WS_2021-08-10_	
FR_MULTIPLATE	Water Sample	Teck Coal	FR_MULTIPLATE_WS_202	

Fisher Exact/Bonferroni-Holm Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
Reference Sed		GH_ER2	0.9413	Exact	1.0000	Non-Significant Effect
		CM_MC1	0.9413	Exact	1.0000	Non-Significant Effect
		LC_SLC	0.6611	Exact	1.0000	Non-Significant Effect
		FR_FRABCH	0.5000	Exact	1.0000	Non-Significant Effect

Hyalella 28-d Survival and Growth Sediment Test **Nautilus Environmental**

Analysis ID: 16-4300-3243 **Endpoint:** Survival Rate **CETIS Version:** CETISv1.9.4
Analyzed: 09 Nov-21 16:05 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Fisher Exact/Bonferroni-Holm Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
		FR_FRCP1	0.9413	Exact	1.0000	Non-Significant Effect
		GH_FR1	1.0000	Exact	1.0000	Non-Significant Effect
		GH_ERC	0.9413	Exact	1.0000	Non-Significant Effect
		CM_MC2*	0.0000	Exact	2.0E-08	Significant Effect
		EV_MC2	0.6611	Exact	1.0000	Non-Significant Effect
		EV_HC1	0.9413	Exact	1.0000	Non-Significant Effect
		LC_DCDS	1.0000	Exact	1.0000	Non-Significant Effect
		LC_LC3	0.8189	Exact	1.0000	Non-Significant Effect
		LC_LC5	0.6611	Exact	1.0000	Non-Significant Effect
		LC_LCDSSLCC	0.6611	Exact	1.0000	Non-Significant Effect
		RG_MIDAG	0.6611	Exact	1.0000	Non-Significant Effect
		FR_FR4	0.9413	Exact	1.0000	Non-Significant Effect
		FR_FRRD	1.0000	Exact	1.0000	Non-Significant Effect
		FR_FR2	0.1589	Exact	1.0000	Non-Significant Effect
		FR_MULTIPLATE	0.9413	Exact	1.0000	Non-Significant Effect

Data Summary

Sample	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
FR_UFR1	RS	47	3	50	0.94	0.06	6.0%
GH_ER2		49	1	50	0.98	0.02	2.0%
CM_MC1		49	1	50	0.98	0.02	2.0%
LC_SLC		47	3	50	0.94	0.06	6.0%
FR_FRABCH		46	4	50	0.92	0.08	8.0%
FR_FRCP1		49	1	50	0.98	0.02	2.0%
GH_FR1		50	0	50	1	0	0.0%
GH_ERC		49	1	50	0.98	0.02	2.0%
CM_MC2		19	31	50	0.38	0.62	62.0%
EV_MC2		47	3	50	0.94	0.06	6.0%
EV_HC1		49	1	50	0.98	0.02	2.0%
LC_DCDS		50	0	50	1	0	0.0%
LC_LC3		48	2	50	0.96	0.04	4.0%
LC_LC5		47	3	50	0.94	0.06	6.0%
LC_LCDSSLCC		47	3	50	0.94	0.06	6.0%
RG_MIDAG		47	3	50	0.94	0.06	6.0%
FR_FR4		49	1	50	0.98	0.02	2.0%
FR_FRRD		50	0	50	1	0	0.0%
FR_FR2		43	7	50	0.86	0.14	14.0%
FR_MULTIPLATE		49	1	50	0.98	0.02	2.0%

Hyalella 28-d Survival and Growth Sediment Test — **Nautilus Environmental**

Analysis ID: 16-4300-3243 **Endpoint:** Survival Rate **CETIS Version:** CETISv1.9.4
Analyzed: 09 Nov-21 16:05 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Survival Rate Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
FR_UFR1	RS	1.0000	1.0000	0.9000	0.8000	1.0000
GH_ER2		1.0000	1.0000	1.0000	1.0000	0.9000
CM_MC1		1.0000	1.0000	0.9000	1.0000	1.0000
LC_SLC		1.0000	0.9000	1.0000	0.9000	0.9000
FR_FRABCH		1.0000	0.8000	1.0000	1.0000	0.8000
FR_FRCP1		1.0000	0.9000	1.0000	1.0000	1.0000
GH_FR1		1.0000	1.0000	1.0000	1.0000	1.0000
GH_ERC		1.0000	1.0000	1.0000	0.9000	1.0000
CM_MC2		0.2000	0.8000	0.6000	0.3000	0.0000
EV_MC2		1.0000	0.8000	1.0000	1.0000	0.9000
EV_HC1		1.0000	1.0000	1.0000	1.0000	0.9000
LC_DCDS		1.0000	1.0000	1.0000	1.0000	1.0000
LC_LC3		1.0000	1.0000	0.9000	1.0000	0.9000
LC_LC5		1.0000	0.9000	1.0000	0.9000	0.9000
LC_LCDSSLCC		0.9000	1.0000	1.0000	1.0000	0.8000
RG_MIDAG		1.0000	1.0000	0.7000	1.0000	1.0000
FR_FR4		1.0000	1.0000	1.0000	1.0000	0.9000
FR_FRRD		1.0000	1.0000	1.0000	1.0000	1.0000
FR_FR2		0.9000	1.0000	1.0000	0.4000	1.0000
FR_MULTIPLATE		1.0000	1.0000	1.0000	1.0000	0.9000

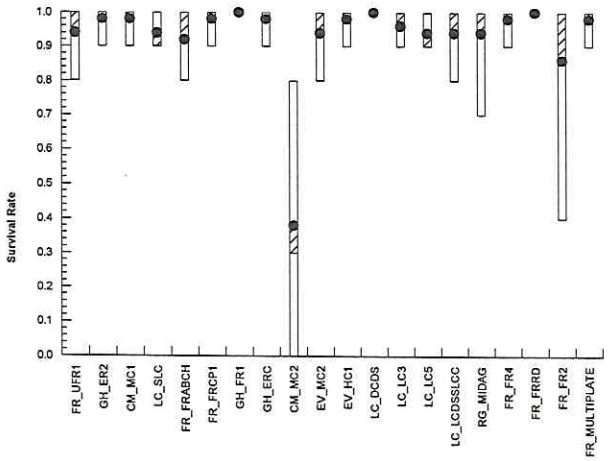
Survival Rate Binomials

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
GH_ER2		10/10	10/10	10/10	10/10	9/10
CM_MC1		10/10	10/10	9/10	10/10	10/10
LC_SLC		10/10	9/10	10/10	9/10	9/10
FR_FRABCH		10/10	8/10	10/10	10/10	8/10
FR_FRCP1		10/10	9/10	10/10	10/10	10/10
GH_FR1		10/10	10/10	10/10	10/10	10/10
GH_ERC		10/10	10/10	10/10	9/10	10/10
CM_MC2		2/10	8/10	6/10	3/10	
EV_MC2		10/10	8/10	10/10	10/10	9/10
EV_HC1		10/10	10/10	10/10	10/10	9/10
LC_DCDS		10/10	10/10	10/10	10/10	10/10
LC_LC3		10/10	10/10	9/10	10/10	9/10
LC_LC5		10/10	9/10	10/10	9/10	9/10
LC_LCDSSLCC		9/10	10/10	10/10	10/10	8/10
RG_MIDAG		10/10	10/10	7/10	10/10	10/10
FR_FR4		10/10	10/10	10/10	10/10	9/10
FR_FRRD		10/10	10/10	10/10	10/10	10/10
FR_FR2		9/10	10/10	10/10	4/10	10/10
FR_MULTIPLATE		10/10	10/10	10/10	10/10	9/10

Hyalella 28-d Survival and Growth Sediment Test — **Nautilus Environmental**

Analysis ID:	16-4300-3243	**Endpoint:**	Survival Rate	**CETIS Version:**	CETISv1.9.4
Analyzed:	09 Nov-21 16:05	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1

Graphics



Analyst: RZZ QA: NN 19/21

Hyalella 28-d Survival and Growth Sediment Test

Nautilus Environmental

Analysis ID:	07-3253-9746	**Endpoint:**	Mean Dry Weight-mg	**CETIS Version:**	CETISv1.9.4
Analyzed:	09 Nov-21 16:05	**Analysis:**	Parametric-Control vs Treatments	**Status Level:**	1
Batch ID:	21-3868-4263	**Test Type:**	Survival-Growth	**Analyst:**	Rachel Sakurdeep
Start Date:	12 Aug-21	**Protocol:**	EPA/600/R-99/064 (2000)	**Diluent:**	Reconstituted Water
Ending Date:	09 Sep-21	**Species:**	Hyalella azteca	**Brine:**	
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	Aquatic Biosystems, CO **Age:** 7-8

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
FR_UFR1	01-9312-3340	10 Aug-21 08:54	11 Aug-21 11:15	39h (12.8 °C)	Teck Coal	
GH_ER2	03-3301-7818	10 Aug-21 10:45	11 Aug-21 11:15	37h (15.8 °C)		
CM_MC1	20-0000-6898	10 Aug-21 11:04	11 Aug-21 11:15	37h (14 °C)		
LC_SLC	07-8534-5756	10 Aug-21 09:09	11 Aug-21 11:15	39h (11.2 °C)		
FR_FRABCH	12-3746-7337	10 Aug-21 09:35	11 Aug-21 11:15	38h (13.6 °C)		
FR_FRCP1	02-0987-3329	10 Aug-21 09:55	11 Aug-21 11:15	38h (12.1 °C)		
GH_FR1	00-2216-4794	10 Aug-21 09:30	11 Aug-21 11:15	38h (15.3 °C)		
GH_ERC	02-8768-9833	10 Aug-21 11:45	11 Aug-21 11:15	36h (16.4 °C)		
CM_MC2	08-6405-5477	10 Aug-21 12:07	11 Aug-21 11:15	36h (14.9 °C)		
EV_MC2	09-5920-8643	10 Aug-21 10:44	11 Aug-21 11:15	37h (12.8 °C)		
EV_HC1	05-3700-4202	10 Aug-21 09:46	11 Aug-21 11:15	38h (13 °C)		
LC_DCDS	10-8734-0222	10 Aug-21 10:10	11 Aug-21 11:15	38h (10.8 °C)		
LC_LC3	07-4841-6068	10 Aug-21 09:30	11 Aug-21 11:15	38h (9.8 °C)		
LC_LC5	18-0478-8867	10 Aug-21 12:00	11 Aug-21 11:15	36h (11.8 °C)		
LC_LCDSSLCC	17-9964-8023	10 Aug-21 10:40	11 Aug-21 11:15	37h (12.1 °C)		
RG_MIDAG	04-6323-4167	10 Aug-21 11:30	11 Aug-21 11:15	37h (14.3 °C)		
FR_FR4	04-5681-6105	10 Aug-21 10:00	11 Aug-21 11:15	38h (15.6 °C)		
FR_FRRD	03-6145-5105	10 Aug-21 08:25	11 Aug-21 11:15	40h (16.8 °C)		
FR_FR2	16-7096-5741	10 Aug-21 10:54	11 Aug-21 11:15	37h (15.9 °C)		
FR_MULTIPLATE	08-7549-1660	10 Aug-21 11:51	11 Aug-21 11:15	36h (16.9 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_UFR1	Water Sample	Teck Coal	FR_UFR1_MON_2021-08-0	
GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-08-10_	
CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-08-10	
LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-08-10_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_MON_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_MON_2021-08	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-08-10_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-08-10	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-08-10	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2021_Q3_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2021_Q3_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-08-10	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-08-10_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-08-10_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	
RG_MIDAG	Water Sample	Teck Coal	RG_MIDAG_WS_2021-08-	
FR_FR4	Water Sample	Teck Coal	FR_FR4_WS_2021-08-10_	
FR_FRRD	Water Sample	Teck Coal	FR_FRRD_WS_2021-08-10	
FR_FR2	Water Sample	Teck Coal	FR_FR2_WS_2021-08-10_	
FR_MULTIPLATE	Water Sample	Teck Coal	FR_MULTIPLATE_WS_202	

Hyalella 28-d Survival and Growth Sediment Test — **Nautilus Environmental**

Analysis ID:	07-3253-9746	**Endpoint:**	Mean Dry Weight-mg	**CETIS Version:**	CETISv1.9.4
Analyzed:	09 Nov-21 16:05	**Analysis:**	Parametric-Control vs Treatments	**Status Level:**	1

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	GH_ER2 passed mean dry weight-mg	29.93%
		CM_MC1 passed mean dry weight-mg	29.93%
		LC_SLC passed mean dry weight-mg	29.93%
		FR_FRABCH passed mean dry weight-mg	29.93%
		FR_FRCP1 passed mean dry weight-mg	29.93%
		GH_FR1 passed mean dry weight-mg	29.93%
		GH_ERC passed mean dry weight-mg	29.93%
		CM_MC2 failed mean dry weight-mg	29.93%
		EV_MC2 passed mean dry weight-mg	29.93%
		EV_HC1 passed mean dry weight-mg	29.93%
		LC_DCDS passed mean dry weight-mg	29.93%
		LC_LC3 passed mean dry weight-mg	29.93%
		LC_LC5 passed mean dry weight-mg	29.93%
		LC_LCDSSLCC passed mean dry weight-mg	29.93%
		RG_MIDAG passed mean dry weight-mg	29.93%
		FR_FR4 passed mean dry weight-mg	29.93%
		FR_FRRD passed mean dry weight-mg	29.93%
		FR_FR2 passed mean dry weight-mg	29.93%
		FR_MULTIPLATE failed mean dry weight-mg	29.93%

Dunnett Multiple Comparison Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Reference Sed		GH_ER2	1.193	2.686	0.183	8	CDF	0.5557	Non-Significant Effect
(FR-UFR1)		CM_MC1	-2.302	2.686	0.183	8	CDF	1.0000	Non-Significant Effect
		LC_SLC	0.8719	2.686	0.183	8	CDF	0.7065	Non-Significant Effect
		FR_FRABCH	2.01	2.686	0.183	8	CDF	0.1957	Non-Significant Effect
		FR_FRCP1	2.307	2.686	0.183	8	CDF	0.1136	Non-Significant Effect
		GH_FR1	1.801	2.686	0.183	8	CDF	0.2721	Non-Significant Effect
		GH_ERC	1.654	2.686	0.183	8	CDF	0.3342	Non-Significant Effect
		CM_MC2*	3.971	2.686	0.194	7	CDF	0.0012	Significant Effect
		EV_MC2	-0.0164	2.686	0.183	8	CDF	0.9530	Non-Significant Effect
		EV_HC1	-2.049	2.686	0.183	8	CDF	1.0000	Non-Significant Effect
		LC_DCDS	0.472	2.686	0.183	8	CDF	0.8532	Non-Significant Effect
		LC_LC3	1.484	2.686	0.183	8	CDF	0.4129	Non-Significant Effect
		LC_LC5	1.85	2.686	0.183	8	CDF	0.2530	Non-Significant Effect
		LC_LCDSSLCC	1.177	2.686	0.183	8	CDF	0.5635	Non-Significant Effect
		RG_MIDAG	-2.629	2.686	0.183	8	CDF	1.0000	Non-Significant Effect
		FR_FR4	2.133	2.686	0.183	8	CDF	0.1578	Non-Significant Effect
		FR_FRRD	1.604	2.686	0.183	8	CDF	0.3568	Non-Significant Effect
		FR_FR2	1.595	2.686	0.183	8	CDF	0.3607	Non-Significant Effect
		FR_MULTIPLATE*	4.326	2.686	0.183	8	CDF	3.7E-04	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	1.42965	0.0752448	19	6.503	<1.0E-37	Significant Effect
Error	0.914043	0.0115702	79			
Total	2.34369		98			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance Test	28.46	36.19	0.0750	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9852	0.9651	0.3348	Normal Distribution

Hyalella 28-d Survival and Growth Sediment Test — **Nautilus Environmental**

Analysis ID: 07-3253-9746 **Endpoint:** Mean Dry Weight-mg **CETIS Version:** CETISv1.9.4
Analyzed: 09 Nov-21 16:05 **Analysis:** Parametric-Control vs Treatments **Status Level:** 1

Mean Dry Weight-mg Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
FR_UFR1	RS	5	0.6105	0.4674	0.7537	0.575	0.494	0.803	0.05156	18.89%	0.00%
GH_ER2		5	0.5293	0.3871	0.6716	0.55	0.3367	0.623	0.05124	21.65%	13.30%
CM_MC1		5	0.7671	0.6859	0.8483	0.745	0.704	0.8756	0.02925	8.53%	-25.65%
LC_SLC		5	0.5512	0.4895	0.6129	0.575	0.4856	0.5956	0.02223	9.02%	9.72%
FR_FRABCH		5	0.4738	0.3363	0.6113	0.5387	0.346	0.576	0.04951	23.37%	22.39%
FR_FRCP1		5	0.4536	0.2827	0.6245	0.43	0.303	0.675	0.06157	30.35%	25.70%
GH_FR1		5	0.488	0.3459	0.6301	0.463	0.391	0.676	0.05117	23.44%	20.07%
GH_ERC		5	0.498	0.4159	0.5801	0.503	0.408	0.578	0.02957	13.28%	18.43%
CM_MC2		4	0.324	0.1718	0.4761	0.3242	0.2175	0.43	0.0478	29.51%	46.94%
EV_MC2		5	0.6116	0.4951	0.7281	0.632	0.5013	0.7189	0.04196	15.34%	-0.18%
EV_HC1		5	0.7499	0.6199	0.8799	0.771	0.5867	0.877	0.04682	13.96%	-22.84%
LC_DCDS		5	0.5784	0.506	0.6508	0.583	0.51	0.665	0.02609	10.09%	5.26%
LC_LC3		5	0.5096	0.436	0.5831	0.527	0.4444	0.5733	0.0265	11.63%	16.54%
LC_LC5		5	0.4847	0.3821	0.5873	0.5	0.3678	0.5767	0.03695	17.05%	20.61%
LC_LCDSSLCC		5	0.5304	0.4399	0.6209	0.5356	0.465	0.644	0.0326	13.74%	13.12%
RG_MIDAG		5	0.7894	0.7034	0.8753	0.751	0.74	0.905	0.03096	8.77%	-29.30%
FR_FR4		5	0.4654	0.1518	0.779	0.442	0.218	0.789	0.113	54.28%	23.77%
FR_FRRD		5	0.5014	0.3415	0.6613	0.562	0.362	0.614	0.0576	25.69%	17.87%
FR_FR2		5	0.502	0.3513	0.6527	0.4444	0.415	0.707	0.05428	24.18%	17.78%
FR_MULTIPLATE		5	0.3162	0.2756	0.3569	0.315	0.264	0.346	0.01466	10.36%	48.20%

Mean Dry Weight-mg Detail

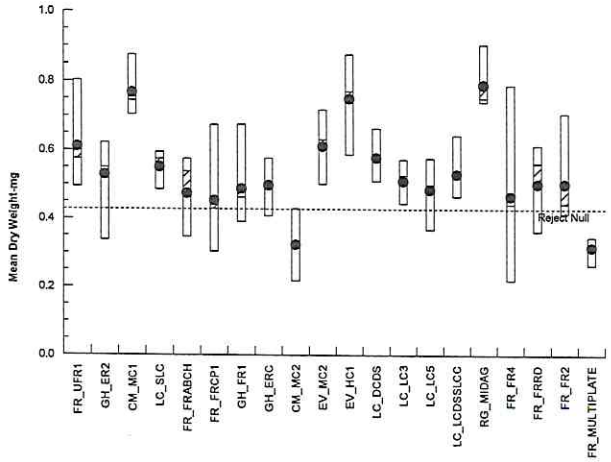
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
FR_UFR1	RS	0.803	0.494	0.6056	0.575	0.575
GH_ER2		0.529	0.623	0.608	0.55	0.3367
CM_MC1		0.738	0.773	0.8756	0.745	0.704
LC_SLC		0.575	0.5956	0.511	0.5889	0.4856
FR_FRABCH		0.346	0.5387	0.547	0.576	0.3612
FR_FRCP1		0.303	0.43	0.675	0.395	0.465
GH_FR1		0.391	0.504	0.463	0.676	0.406
GH_ERC		0.578	0.503	0.462	0.5389	0.408
CM_MC2		0.275	0.2175	0.43	0.3733	
EV_MC2		0.529	0.5013	0.677	0.632	0.7189
EV_HC1		0.877	0.771	0.773	0.742	0.5867
LC_DCDS		0.583	0.665	0.591	0.543	0.51
LC_LC3		0.45	0.553	0.5733	0.527	0.4444
LC_LC5		0.539	0.5767	0.5	0.44	0.3678
LC_LCDSSLCC		0.5356	0.54	0.644	0.465	0.4675
RG_MIDAG		0.74	0.748	0.8029	0.751	0.905
FR_FR4		0.648	0.789	0.442	0.218	0.23
FR_FRRD		0.362	0.562	0.614	0.607	0.362
FR_FR2		0.4444	0.707	0.415	0.5175	0.426
FR_MULTIPLATE		0.314	0.264	0.315	0.346	0.3422

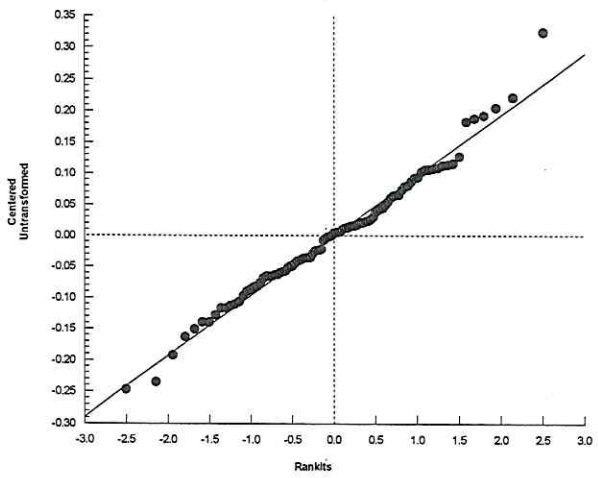
Analyst: RZ QA: Nov 19/21

Hyalella 28-d Survival and Growth Sediment Test — **Nautilus Environmental**

Analysis ID:	07-3253-9746	**Endpoint:**	Mean Dry Weight-mg	**CETIS Version:**	CETISv1.9.4
Analyzed:	09 Nov-21 16:05	**Analysis:**	Parametric-Control vs Treatments	**Status Level:**	1

Graphics





Hyalella 28-d Survival and Growth Sediment Test — Nautilus Environmental

Analysis ID:	08-0422-1066	Endpoint:	Survival Rate	CETIS Version:	CETISv1.9.4
Analyzed:	09 Nov-21 16:12	Analysis:	STP 2xK Contingency Tables	Status Level:	1
Batch ID:	21-3868-4263	Test Type:	Survival-Growth	Analyst:	Rachel Sakurdeep
Start Date:	12 Aug-21	Protocol:	EPA/600/R-99/064 (2000)	Diluent:	Reconstituted Water
Ending Date:	09 Sep-21	Species:	Hyalella azteca	Brine:	
Test Length:	28d 0h	Taxon:	Malacostraca	Source:	Aquatic Biosystems, CO Age: 7-8

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
FR_UFR1	01-9312-3340	10 Aug-21 08:54	11 Aug-21 11:15	39h (12.8 °C)	Teck Coal	
GH_ER2	03-3301-7818	10 Aug-21 10:45	11 Aug-21 11:15	37h (15.8 °C)		
CM_MC1	20-0000-6898	10 Aug-21 11:04	11 Aug-21 11:15	37h (14 °C)		
LC_SLC	07-8534-5756	10 Aug-21 09:09	11 Aug-21 11:15	39h (11.2 °C)		
FR_FRABCH	12-3746-7337	10 Aug-21 09:35	11 Aug-21 11:15	38h (13.6 °C)		
FR_FRCP1	02-0987-3329	10 Aug-21 09:55	11 Aug-21 11:15	38h (12.1 °C)		
GH_FR1	00-2216-4794	10 Aug-21 09:30	11 Aug-21 11:15	38h (15.3 °C)		
GH_ERC	02-8768-9833	10 Aug-21 11:45	11 Aug-21 11:15	36h (16.4 °C)		
CM_MC2	08-6405-5477	10 Aug-21 12:07	11 Aug-21 11:15	36h (14.9 °C)		
EV_MC2	09-5920-8643	10 Aug-21 10:44	11 Aug-21 11:15	37h (12.8 °C)		
EV_HC1	05-3700-4202	10 Aug-21 09:46	11 Aug-21 11:15	38h (13 °C)		
LC_DCDS	10-8734-0222	10 Aug-21 10:10	11 Aug-21 11:15	38h (10.8 °C)		
LC_LC3	07-4841-6068	10 Aug-21 09:30	11 Aug-21 11:15	38h (9.8 °C)		
LC_LC5	18-0478-8867	10 Aug-21 12:00	11 Aug-21 11:15	36h (11.8 °C)		
LC_LCDSSLCC	17-9964-8023	10 Aug-21 10:40	11 Aug-21 11:15	37h (12.1 °C)		
RG_MIDAG	04-6323-4167	10 Aug-21 11:30	11 Aug-21 11:15	37h (14.3 °C)		
FR_FR4	04-5681-6105	10 Aug-21 10:00	11 Aug-21 11:15	38h (15.6 °C)		
FR_FRRD	03-6145-5105	10 Aug-21 08:25	11 Aug-21 11:15	40h (16.8 °C)		
FR_FR2	16-7096-5741	10 Aug-21 10:54	11 Aug-21 11:15	37h (15.9 °C)		
FR_MULTIPLATE	08-7549-1660	10 Aug-21 11:51	11 Aug-21 11:15	36h (16.9 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_UFR1	Water Sample	Teck Coal	FR_UFR1_MON_2021-08-0	
GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-08-10_	
CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-08-10	
LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-08-10_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_MON_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_MON_2021-08	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-08-10_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-08-10	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-08-10	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2021_Q3_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2021_Q3_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-08-10	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-08-10_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-08-10_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	
RG_MIDAG	Water Sample	Teck Coal	RG_MIDAG_WS_2021-08-	
FR_FR4	Water Sample	Teck Coal	FR_FR4_WS_2021-08-10_	
FR_FRRD	Water Sample	Teck Coal	FR_FRRD_WS_2021-08-10	
FR_FR2	Water Sample	Teck Coal	FR_FR2_WS_2021-08-10_	
FR_MULTIPLATE	Water Sample	Teck Coal	FR_MULTIPLATE_WS_202	

Fisher Exact/Bonferroni-Holm Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
Reference Sed		FR_UFR1	0.3087	Exact	1.0000	Non-Significant Effect
		CM_MC1	0.7525	Exact	1.0000	Non-Significant Effect
		LC_SLC	0.3087	Exact	1.0000	Non-Significant Effect
		FR_FRABCH	0.1811	Exact	1.0000	Non-Significant Effect

Analyst: KJC QA: NN-19/21

Hyalella 28-d Survival and Growth Sediment Test — Nautilus Environmental

Analysis ID: 08-0422-1066 Endpoint: Survival Rate CETIS Version: CETISv1.9.4
Analyzed: 09 Nov-21 16:12 Analysis: STP 2xK Contingency Tables Status Level: 1

Fisher Exact/Bonferroni-Holm Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
		FR_FRCP1	0.7525	Exact	1.0000	Non-Significant Effect
		GH_FR1	1.0000	Exact	1.0000	Non-Significant Effect
		GH_ERC	0.7525	Exact	1.0000	Non-Significant Effect
		CM_MC2*	0.0000	Exact	2.0E-10	Significant Effect
		EV_MC2	0.3087	Exact	1.0000	Non-Significant Effect
		EV_HC1	0.7525	Exact	1.0000	Non-Significant Effect
		LC_DCDS	1.0000	Exact	1.0000	Non-Significant Effect
		LC_LC3	0.5000	Exact	1.0000	Non-Significant Effect
		LC_LC5	0.3087	Exact	1.0000	Non-Significant Effect
		LC_LCDSSLCC	0.3087	Exact	1.0000	Non-Significant Effect
		RG_MIDAG	0.3087	Exact	1.0000	Non-Significant Effect
		FR_FR4	0.7525	Exact	1.0000	Non-Significant Effect
		FR_FRRD	1.0000	Exact	1.0000	Non-Significant Effect
		FR_FR2	0.0297	Exact	0.5350	Non-Significant Effect
		FR_MULTIPLATE	0.7525	Exact	1.0000	Non-Significant Effect

Data Summary

Sample	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
FR_UFR1		47	3	50	0.94	0.06	6.0%
GH_ER2	RS	49	1	50	0.98	0.02	2.0%
CM_MC1		49	1	50	0.98	0.02	2.0%
LC_SLC		47	3	50	0.94	0.06	6.0%
FR_FRABCH		46	4	50	0.92	0.08	8.0%
FR_FRCP1		49	1	50	0.98	0.02	2.0%
GH_FR1		50	0	50	1	0	0.0%
GH_ERC		49	1	50	0.98	0.02	2.0%
CM_MC2		19	31	50	0.38	0.62	62.0%
EV_MC2		47	3	50	0.94	0.06	6.0%
EV_HC1		49	1	50	0.98	0.02	2.0%
LC_DCDS		50	0	50	1	0	0.0%
LC_LC3		48	2	50	0.96	0.04	4.0%
LC_LC5		47	3	50	0.94	0.06	6.0%
LC_LCDSSLCC		47	3	50	0.94	0.06	6.0%
RG_MIDAG		47	3	50	0.94	0.06	6.0%
FR_FR4		49	1	50	0.98	0.02	2.0%
FR_FRRD		50	0	50	1	0	0.0%
FR_FR2		43	7	50	0.86	0.14	14.0%
FR_MULTIPLATE		49	1	50	0.98	0.02	2.0%

Hyalella 28-d Survival and Growth Sediment Test — Nautilus Environmental

Analysis ID: 08-0422-1066 Endpoint: Survival Rate CETIS Version: CETISv1.9.4
Analyzed: 09 Nov-21 16:12 Analysis: STP 2xK Contingency Tables Status Level: 1

Survival Rate Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
FR_UFR1		1.0000	1.0000	0.9000	0.8000	1.0000
GH_ER2	RS	1.0000	1.0000	1.0000	1.0000	0.9000
CM_MC1		1.0000	1.0000	0.9000	1.0000	1.0000
LC_SLC		1.0000	0.9000	1.0000	0.9000	0.9000
FR_FRABCH		1.0000	0.8000	1.0000	1.0000	0.8000
FR_FRCP1		1.0000	0.9000	1.0000	1.0000	1.0000
GH_FR1		1.0000	1.0000	1.0000	1.0000	1.0000
GH_ERC		1.0000	1.0000	1.0000	0.9000	1.0000
CM_MC2		0.2000	0.8000	0.6000	0.3000	0.0000
EV_MC2		1.0000	0.8000	1.0000	1.0000	0.9000
EV_HC1		1.0000	1.0000	1.0000	1.0000	0.9000
LC_DCDS		1.0000	1.0000	1.0000	1.0000	1.0000
LC_LC3		1.0000	1.0000	0.9000	1.0000	0.9000
LC_LC5		1.0000	0.9000	1.0000	0.9000	0.9000
LC_LCDSSLCC		0.9000	1.0000	1.0000	1.0000	0.8000
RG_MIDAG		1.0000	1.0000	0.7000	1.0000	1.0000
FR_FR4		1.0000	1.0000	1.0000	1.0000	0.9000
FR_FRRD		1.0000	1.0000	1.0000	1.0000	1.0000
FR_FR2		0.9000	1.0000	1.0000	0.4000	1.0000
FR_MULTIPLATE		1.0000	1.0000	1.0000	1.0000	0.9000

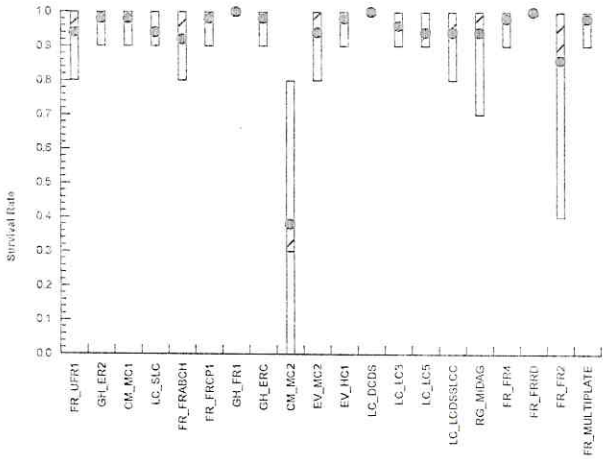
Survival Rate Binomials

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
FR_UFR1		10/10	10/10	9/10	8/10	10/10
CM_MC1		10/10	10/10	9/10	10/10	10/10
LC_SLC		10/10	9/10	10/10	9/10	9/10
FR_FRABCH		10/10	8/10	10/10	10/10	8/10
FR_FRCP1		10/10	9/10	10/10	10/10	10/10
GH_FR1		10/10	10/10	10/10	10/10	10/10
GH_ERC		10/10	10/10	10/10	9/10	10/10
CM_MC2		2/10	8/10	6/10	3/10	
EV_MC2		10/10	8/10	10/10	10/10	9/10
EV_HC1		10/10	10/10	10/10	10/10	9/10
LC_DCDS		10/10	10/10	10/10	10/10	10/10
LC_LC3		10/10	10/10	9/10	10/10	9/10
LC_LC5		10/10	9/10	10/10	9/10	9/10
LC_LCDSSLCC		9/10	10/10	10/10	10/10	8/10
RG_MIDAG		10/10	10/10	7/10	10/10	10/10
FR_FR4		10/10	10/10	10/10	10/10	9/10
FR_FRRD		10/10	10/10	10/10	10/10	10/10
FR_FR2		9/10	10/10	10/10	4/10	10/10
FR_MULTIPLATE		10/10	10/10	10/10	10/10	9/10

Hyalella 28-d Survival and Growth Sediment Test — Nautilus Environmental

Analysis ID:	08-0422-1066	Endpoint:	Survival Rate	CETIS Version:	CETISv1.9.4
Analyzed:	09 Nov-21 16:12	Analysis:	STP 2xK Contingency Tables	Status Level:	1

Graphics



Analyst: [illegible] QA: NN 19/21

Hyalella 28-d Survival and Growth Sediment Test

Nautilus Environmental

Analysis ID:	11-7865-1104	**Endpoint:**	Mean Dry Weight-mg	**CETIS Version:**	CETISv1.9.4
Analyzed:	09 Nov-21 16:12	**Analysis:**	Parametric-Control vs Treatments	**Status Level:**	1
Batch ID:	21-3868-4263	**Test Type:**	Survival-Growth	**Analyst:**	Rachel Sakurdeep
Start Date:	12 Aug-21	**Protocol:**	EPA/600/R-99/064 (2000)	**Diluent:**	Reconstituted Water
Ending Date:	09 Sep-21	**Species:**	Hyalella azteca	**Brine:**	
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	Aquatic Biosystems, CO **Age:** 7-8

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
FR_UFR1	01-9312-3340	10 Aug-21 08:54	11 Aug-21 11:15	39h (12.8 °C)	Teck Coal	
GH_ER2	03-3301-7818	10 Aug-21 10:45	11 Aug-21 11:15	37h (15.8 °C)		
CM_MC1	20-0000-6898	10 Aug-21 11:04	11 Aug-21 11:15	37h (14 °C)		
LC_SLC	07-8534-5756	10 Aug-21 09:09	11 Aug-21 11:15	39h (11.2 °C)		
FR_FRABCH	12-3746-7337	10 Aug-21 09:35	11 Aug-21 11:15	38h (13.6 °C)		
FR_FRCP1	02-0987-3329	10 Aug-21 09:55	11 Aug-21 11:15	38h (12.1 °C)		
GH_FR1	00-2216-4794	10 Aug-21 09:30	11 Aug-21 11:15	38h (15.3 °C)		
GH_ERC	02-8768-9833	10 Aug-21 11:45	11 Aug-21 11:15	36h (16.4 °C)		
CM_MC2	08-6405-5477	10 Aug-21 12:07	11 Aug-21 11:15	36h (14.9 °C)		
EV_MC2	09-5920-8643	10 Aug-21 10:44	11 Aug-21 11:15	37h (12.8 °C)		
EV_HC1	05-3700-4202	10 Aug-21 09:46	11 Aug-21 11:15	38h (13 °C)		
LC_DCDS	10-8734-0222	10 Aug-21 10:10	11 Aug-21 11:15	38h (10.8 °C)		
LC_LC3	07-4841-6068	10 Aug-21 09:30	11 Aug-21 11:15	38h (9.8 °C)		
LC_LC5	18-0478-8867	10 Aug-21 12:00	11 Aug-21 11:15	36h (11.8 °C)		
LC_LCDSSLCC	17-9964-8023	10 Aug-21 10:40	11 Aug-21 11:15	37h (12.1 °C)		
RG_MIDAG	04-6323-4167	10 Aug-21 11:30	11 Aug-21 11:15	37h (14.3 °C)		
FR_FR4	04-5681-6105	10 Aug-21 10:00	11 Aug-21 11:15	38h (15.6 °C)		
FR_FRRD	03-6145-5105	10 Aug-21 08:25	11 Aug-21 11:15	40h (16.8 °C)		
FR_FR2	16-7096-5741	10 Aug-21 10:54	11 Aug-21 11:15	37h (15.9 °C)		
FR_MULTIPLATE	08-7549-1660	10 Aug-21 11:51	11 Aug-21 11:15	36h (16.9 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_UFR1	Water Sample	Teck Coal	FR_UFR1_MON_2021-08-0	
GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-08-10_	
CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-08-10	
LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-08-10_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_MON_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_MON_2021-08	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-08-10_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-08-10	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-08-10	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2021_Q3_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2021_Q3_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-08-10	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-08-10_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-08-10_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	
RG_MIDAG	Water Sample	Teck Coal	RG_MIDAG_WS_2021-08-	
FR_FR4	Water Sample	Teck Coal	FR_FR4_WS_2021-08-10_	
FR_FRRD	Water Sample	Teck Coal	FR_FRRD_WS_2021-08-10	
FR_FR2	Water Sample	Teck Coal	FR_FR2_WS_2021-08-10_	
FR_MULTIPLATE	Water Sample	Teck Coal	FR_MULTIPLATE_WS_202	

Hyalella 28-d Survival and Growth Sediment Test — **Nautilus Environmental**

Analysis ID: 11-7865-1104 **Endpoint:** Mean Dry Weight-mg **CETIS Version:** CETISv1.9.4
Analyzed: 09 Nov-21 16:12 **Analysis:** Parametric-Control vs Treatments **Status Level:** 1

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	FR_UFR1 passed mean dry weight-mg	34.52%
		CM_MC1 passed mean dry weight-mg	34.52%
		LC_SLC passed mean dry weight-mg	34.52%
		FR_FRABCH passed mean dry weight-mg	34.52%
		FR_FRCP1 passed mean dry weight-mg	34.52%
		GH_FR1 passed mean dry weight-mg	34.52%
		GH_ERC passed mean dry weight-mg	34.52%
		CM_MC2 failed mean dry weight-mg	34.52%
		EV_MC2 passed mean dry weight-mg	34.52%
		EV_HC1 passed mean dry weight-mg	34.52%
		LC_DCDS passed mean dry weight-mg	34.52%
		LC_LC3 passed mean dry weight-mg	34.52%
		LC_LC5 passed mean dry weight-mg	34.52%
		LC_LCDSSLCC passed mean dry weight-mg	34.52%
		RG_MIDAG passed mean dry weight-mg	34.52%
		FR_FR4 passed mean dry weight-mg	34.52%
		FR_FRRD passed mean dry weight-mg	34.52%
		FR_FR2 passed mean dry weight-mg	34.52%
		FR_MULTIPLATE failed mean dry weight-mg	34.52%

Dunnett Multiple Comparison Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Reference Sed (GH-ER2)		FR_UFR1	-1.193	2.686	0.183	8	CDF	0.9992	Non-Significant Effect
		CM_MC1	-3.495	2.686	0.183	8	CDF	1.0000	Non-Significant Effect
		LC_SLC	-0.3214	2.686	0.183	8	CDF	0.9805	Non-Significant Effect
		FR_FRABCH	0.8163	2.686	0.183	8	CDF	0.7302	Non-Significant Effect
		FR_FRCP1	1.113	2.686	0.183	8	CDF	0.5948	Non-Significant Effect
		GH_FR1	0.6076	2.686	0.183	8	CDF	0.8100	Non-Significant Effect
		GH_ERC	0.4609	2.686	0.183	8	CDF	0.8565	Non-Significant Effect
		CM_MC2*	2.846	2.686	0.194	7	CDF	0.0340	Significant Effect
		EV_MC2	-1.21	2.686	0.183	8	CDF	0.9993	Non-Significant Effect
		EV_HC1	-3.243	2.686	0.183	8	CDF	1.0000	Non-Significant Effect
		LC_DCDS	-0.7212	2.686	0.183	8	CDF	0.9950	Non-Significant Effect
		LC_LC3	0.2907	2.686	0.183	8	CDF	0.9000	Non-Significant Effect
		LC_LC5	0.6562	2.686	0.183	8	CDF	0.7928	Non-Significant Effect
		LC_LCDSSLCC	-0.01586	2.686	0.183	8	CDF	0.9529	Non-Significant Effect
		RG_MIDAG	-3.822	2.686	0.183	8	CDF	1.0000	Non-Significant Effect
		FR_FR4	0.9398	2.686	0.183	8	CDF	0.6764	Non-Significant Effect
		FR_FRRD	0.4106	2.686	0.183	8	CDF	0.8705	Non-Significant Effect
		FR_FR2	0.402	2.686	0.183	8	CDF	0.8728	Non-Significant Effect
		FR_MULTIPLATE*	3.132	2.686	0.183	8	CDF	0.0161	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	1.42965	0.0752448	19	6.503	<1.0E-37	Significant Effect
Error	0.914043	0.0115702	79			
Total	2.34369		98			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance Test	28.46	36.19	0.0750	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9852	0.9651	0.3348	Normal Distribution

Hyalella 28-d Survival and Growth Sediment Test — **Nautilus Environmental**

Analysis ID:	11-7865-1104	**Endpoint:**	Mean Dry Weight-mg	**CETIS Version:**	CETISv1.9.4
Analyzed:	09 Nov-21 16:12	**Analysis:**	Parametric-Control vs Treatments	**Status Level:**	1

Mean Dry Weight-mg Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
FR_UFR1		5	0.6105	0.4674	0.7537	0.575	0.494	0.803	0.05156	18.89%	0.00%
GH_ER2	RS	5	0.5293	0.3871	0.6716	0.55	0.3367	0.623	0.05124	21.65%	13.30%
CM_MC1		5	0.7671	0.6859	0.8483	0.745	0.704	0.8756	0.02925	8.53%	-25.65%
LC_SLC		5	0.5512	0.4895	0.6129	0.575	0.4856	0.5956	0.02223	9.02%	9.72%
FR_FRABCH		5	0.4738	0.3363	0.6113	0.5387	0.346	0.576	0.04951	23.37%	22.39%
FR_FRCP1		5	0.4536	0.2827	0.6245	0.43	0.303	0.675	0.06157	30.35%	25.70%
GH_FR1		5	0.488	0.3459	0.6301	0.463	0.391	0.676	0.05117	23.44%	20.07%
GH_ERC		5	0.498	0.4159	0.5801	0.503	0.408	0.578	0.02957	13.28%	18.43%
CM_MC2		4	0.324	0.1718	0.4761	0.3242	0.2175	0.43	0.0478	29.51%	46.94%
EV_MC2		5	0.6116	0.4951	0.7281	0.632	0.5013	0.7189	0.04196	15.34%	-0.18%
EV_HC1		5	0.7499	0.6199	0.8799	0.771	0.5867	0.877	0.04682	13.96%	-22.84%
LC_DCDS		5	0.5784	0.506	0.6508	0.583	0.51	0.665	0.02609	10.09%	5.26%
LC_LC3		5	0.5096	0.436	0.5831	0.527	0.4444	0.5733	0.0265	11.63%	16.54%
LC_LC5		5	0.4847	0.3821	0.5873	0.5	0.3678	0.5767	0.03695	17.05%	20.61%
LC_LCDSSLCC		5	0.5304	0.4399	0.6209	0.5356	0.465	0.644	0.0326	13.74%	13.12%
RG_MIDAG		5	0.7894	0.7034	0.8753	0.751	0.74	0.905	0.03096	8.77%	-29.30%
FR_FR4		5	0.4654	0.1518	0.779	0.442	0.218	0.789	0.113	54.28%	23.77%
FR_FRRD		5	0.5014	0.3415	0.6613	0.562	0.362	0.614	0.0576	25.69%	17.87%
FR_FR2		5	0.502	0.3513	0.6527	0.4444	0.415	0.707	0.05428	24.18%	17.78%
FR_MULTIPLATE		5	0.3162	0.2756	0.3569	0.315	0.264	0.346	0.01466	10.36%	48.20%

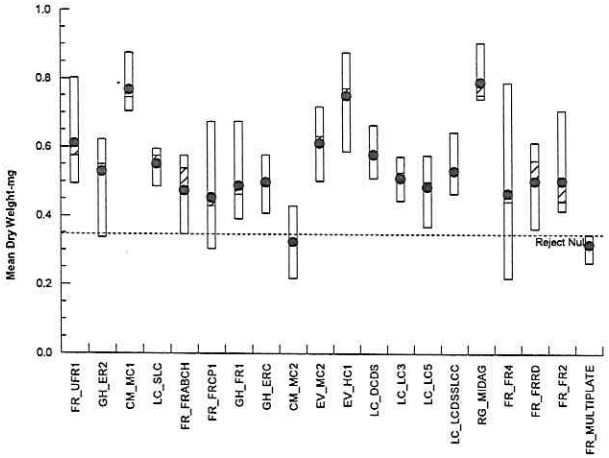
Mean Dry Weight-mg Detail

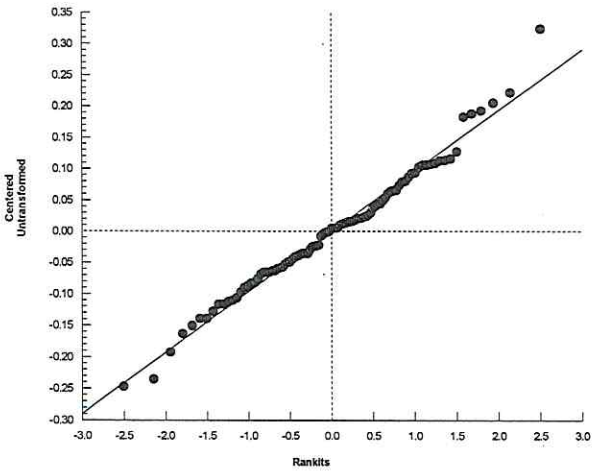
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
FR_UFR1		0.803	0.494	0.6056	0.575	0.575
GH_ER2	RS	0.529	0.623	0.608	0.55	0.3367
CM_MC1		0.738	0.773	0.8756	0.745	0.704
LC_SLC		0.575	0.5956	0.511	0.5889	0.4856
FR_FRABCH		0.346	0.5387	0.547	0.576	0.3612
FR_FRCP1		0.303	0.43	0.675	0.395	0.465
GH_FR1		0.391	0.504	0.463	0.676	0.406
GH_ERC		0.578	0.503	0.462	0.5389	0.408
CM_MC2		0.275	0.2175	0.43	0.3733	
EV_MC2		0.529	0.5013	0.677	0.632	0.7189
EV_HC1		0.877	0.771	0.773	0.742	0.5867
LC_DCDS		0.583	0.665	0.591	0.543	0.51
LC_LC3		0.45	0.553	0.5733	0.527	0.4444
LC_LC5		0.539	0.5767	0.5	0.44	0.3678
LC_LCDSSLCC		0.5356	0.54	0.644	0.465	0.4675
RG_MIDAG		0.74	0.748	0.8029	0.751	0.905
FR_FR4		0.648	0.789	0.442	0.218	0.23
FR_FRRD		0.362	0.562	0.614	0.607	0.362
FR_FR2		0.4444	0.707	0.415	0.5175	0.426
FR_MULTIPLATE		0.314	0.264	0.315	0.346	0.3422

Hyalella 28-d Survival and Growth Sediment Test **Nautilus Environmental**

Analysis ID:	11-7865-1104	**Endpoint:**	Mean Dry Weight-mg	**CETIS Version:**	CETISv1.9.4
Analyzed:	09 Nov-21 16:12	**Analysis:**	Parametric-Control vs Treatments	**Status Level:**	1

Graphics





Hyalella 28-d Survival and Growth Sediment Test

Nautilus Environmental

Analysis ID:	10-7567-4225	**Endpoint:**	Survival Rate	**CETIS Version:**	CETISv1.9.4
Analyzed:	09 Nov-21 16:13	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1
Batch ID:	21-3868-4263	**Test Type:**	Survival-Growth	**Analyst:**	Rachel Sakurdeep
Start Date:	12 Aug-21	**Protocol:**	EPA/600/R-99/064 (2000)	**Diluent:**	Reconstituted Water
Ending Date:	09 Sep-21	**Species:**	Hyalella azteca	**Brine:**	
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	Aquatic Biosystems, CO **Age:** 7-8

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
FR_UFR1	01-9312-3340	10 Aug-21 08:54	11 Aug-21 11:15	39h (12.8 °C)	Teck Coal	
GH_ER2	03-3301-7818	10 Aug-21 10:45	11 Aug-21 11:15	37h (15.8 °C)		
CM_MC1	20-0000-6898	10 Aug-21 11:04	11 Aug-21 11:15	37h (14 °C)		
LC_SLC	07-8534-5756	10 Aug-21 09:09	11 Aug-21 11:15	39h (11.2 °C)		
FR_FRABCH	12-3746-7337	10 Aug-21 09:35	11 Aug-21 11:15	38h (13.6 °C)		
FR_FRCP1	02-0987-3329	10 Aug-21 09:55	11 Aug-21 11:15	38h (12.1 °C)		
GH_FR1	00-2216-4794	10 Aug-21 09:30	11 Aug-21 11:15	38h (15.3 °C)		
GH_ERC	02-8768-9833	10 Aug-21 11:45	11 Aug-21 11:15	36h (16.4 °C)		
CM_MC2	08-6405-5477	10 Aug-21 12:07	11 Aug-21 11:15	36h (14.9 °C)		
EV_MC2	09-5920-8643	10 Aug-21 10:44	11 Aug-21 11:15	37h (12.8 °C)		
EV_HC1	05-3700-4202	10 Aug-21 09:46	11 Aug-21 11:15	38h (13 °C)		
LC_DCDS	10-8734-0222	10 Aug-21 10:10	11 Aug-21 11:15	38h (10.8 °C)		
LC_LC3	07-4841-6068	10 Aug-21 09:30	11 Aug-21 11:15	38h (9.8 °C)		
LC_LC5	18-0478-8867	10 Aug-21 12:00	11 Aug-21 11:15	36h (11.8 °C)		
LC_LCDSSLCC	17-9964-8023	10 Aug-21 10:40	11 Aug-21 11:15	37h (12.1 °C)		
RG_MIDAG	04-6323-4167	10 Aug-21 11:30	11 Aug-21 11:15	37h (14.3 °C)		
FR_FR4	04-5681-6105	10 Aug-21 10:00	11 Aug-21 11:15	38h (15.6 °C)		
FR_FRRD	03-6145-5105	10 Aug-21 08:25	11 Aug-21 11:15	40h (16.8 °C)		
FR_FR2	16-7096-5741	10 Aug-21 10:54	11 Aug-21 11:15	37h (15.9 °C)		
FR_MULTIPLATE	08-7549-1660	10 Aug-21 11:51	11 Aug-21 11:15	36h (16.9 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_UFR1	Water Sample	Teck Coal	FR_UFR1_MON_2021-08-0	
GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-08-10_	
CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-08-10	
LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-08-10_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_MON_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_MON_2021-08	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-08-10_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-08-10	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-08-10	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2021_Q3_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2021_Q3_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-08-10	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-08-10_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-08-10_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	
RG_MIDAG	Water Sample	Teck Coal	RG_MIDAG_WS_2021-08-	
FR_FR4	Water Sample	Teck Coal	FR_FR4_WS_2021-08-10_	
FR_FRRD	Water Sample	Teck Coal	FR_FRRD_WS_2021-08-10	
FR_FR2	Water Sample	Teck Coal	FR_FR2_WS_2021-08-10_	
FR_MULTIPLATE	Water Sample	Teck Coal	FR_MULTIPLATE_WS_202	

Fisher Exact/Bonferroni-Holm Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
Reference Sed		FR_UFR1	0.3087	Exact	1.0000	Non-Significant Effect
		GH_ER2	0.7525	Exact	1.0000	Non-Significant Effect
		LC_SLC	0.3087	Exact	1.0000	Non-Significant Effect
		FR_FRABCH	0.1811	Exact	1.0000	Non-Significant Effect

Hyalella 28-d Survival and Growth Sediment Test — **Nautilus Environmental**

Analysis ID: 10-7567-4225 **Endpoint:** Survival Rate **CETIS Version:** CETISv1.9.4
Analyzed: 09 Nov-21 16:13 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Fisher Exact/Bonferroni-Holm Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
		FR_FRCP1	0.7525	Exact	1.0000	Non-Significant Effect
		GH_FR1	1.0000	Exact	1.0000	Non-Significant Effect
		GH_ERC	0.7525	Exact	1.0000	Non-Significant Effect
		CM_MC2*	0.0000	Exact	2.0E-10	Significant Effect
		EV_MC2	0.3087	Exact	1.0000	Non-Significant Effect
		EV_HC1	0.7525	Exact	1.0000	Non-Significant Effect
		LC_DCDS	1.0000	Exact	1.0000	Non-Significant Effect
		LC_LC3	0.5000	Exact	1.0000	Non-Significant Effect
		LC_LC5	0.3087	Exact	1.0000	Non-Significant Effect
		LC_LCDSSLCC	0.3087	Exact	1.0000	Non-Significant Effect
		RG_MIDAG	0.3087	Exact	1.0000	Non-Significant Effect
		FR_FR4	0.7525	Exact	1.0000	Non-Significant Effect
		FR_FRRD	1.0000	Exact	1.0000	Non-Significant Effect
		FR_FR2	0.0297	Exact	0.5350	Non-Significant Effect
		FR_MULTIPLATE	0.7525	Exact	1.0000	Non-Significant Effect

Data Summary

Sample	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
FR_UFR1		47	3	50	0.94	0.06	6.0%
GH_ER2		49	1	50	0.98	0.02	2.0%
CM_MC1	RS	49	1	50	0.98	0.02	2.0%
LC_SLC		47	3	50	0.94	0.06	6.0%
FR_FRABCH		46	4	50	0.92	0.08	8.0%
FR_FRCP1		49	1	50	0.98	0.02	2.0%
GH_FR1		50	0	50	1	0	0.0%
GH_ERC		49	1	50	0.98	0.02	2.0%
CM_MC2		19	31	50	0.38	0.62	62.0%
EV_MC2		47	3	50	0.94	0.06	6.0%
EV_HC1		49	1	50	0.98	0.02	2.0%
LC_DCDS		50	0	50	1	0	0.0%
LC_LC3		48	2	50	0.96	0.04	4.0%
LC_LC5		47	3	50	0.94	0.06	6.0%
LC_LCDSSLCC		47	3	50	0.94	0.06	6.0%
RG_MIDAG		47	3	50	0.94	0.06	6.0%
FR_FR4		49	1	50	0.98	0.02	2.0%
FR_FRRD		50	0	50	1	0	0.0%
FR_FR2		43	7	50	0.86	0.14	14.0%
FR_MULTIPLATE		49	1	50	0.98	0.02	2.0%

Hyalella 28-d Survival and Growth Sediment Test — **Nautilus Environmental**

Analysis ID: 10-7567-4225 **Endpoint:** Survival Rate **CETIS Version:** CETISv1.9.4
Analyzed: 09 Nov-21 16:13 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Survival Rate Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
FR_UFR1		1.0000	1.0000	0.9000	0.8000	1.0000
GH_ER2		1.0000	1.0000	1.0000	1.0000	0.9000
CM_MC1	RS	1.0000	1.0000	0.9000	1.0000	1.0000
LC_SLC		1.0000	0.9000	1.0000	0.9000	0.9000
FR_FRABCH		1.0000	0.8000	1.0000	1.0000	0.8000
FR_FRCP1		1.0000	0.9000	1.0000	1.0000	1.0000
GH_FR1		1.0000	1.0000	1.0000	1.0000	1.0000
GH_ERC		1.0000	1.0000	1.0000	0.9000	1.0000
CM_MC2		0.2000	0.8000	0.6000	0.3000	0.0000
EV_MC2		1.0000	0.8000	1.0000	1.0000	0.9000
EV_HC1		1.0000	1.0000	1.0000	1.0000	0.9000
LC_DCDS		1.0000	1.0000	1.0000	1.0000	1.0000
LC_LC3		1.0000	1.0000	0.9000	1.0000	0.9000
LC_LC5		1.0000	0.9000	1.0000	0.9000	0.9000
LC_LCDSSLCC		0.9000	1.0000	1.0000	1.0000	0.8000
RG_MIDAG		1.0000	1.0000	0.7000	1.0000	1.0000
FR_FR4		1.0000	1.0000	1.0000	1.0000	0.9000
FR_FRRD		1.0000	1.0000	1.0000	1.0000	1.0000
FR_FR2		0.9000	1.0000	1.0000	0.4000	1.0000
FR_MULTIPLATE		1.0000	1.0000	1.0000	1.0000	0.9000

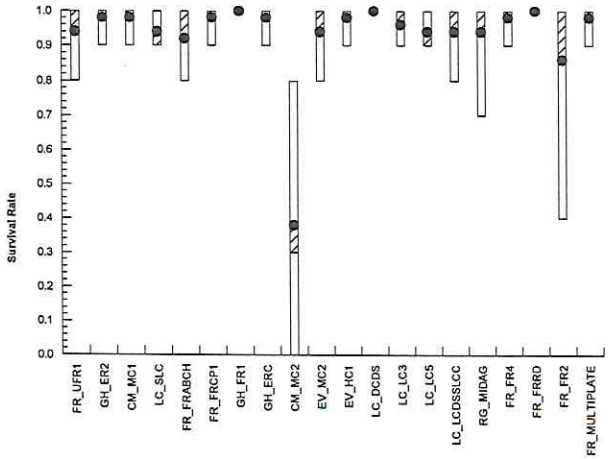
Survival Rate Binomials

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
FR_UFR1		10/10	10/10	9/10	8/10	10/10
GH_ER2		10/10	10/10	10/10	10/10	9/10
LC_SLC		10/10	9/10	10/10	9/10	9/10
FR_FRABCH		10/10	8/10	10/10	10/10	8/10
FR_FRCP1		10/10	9/10	10/10	10/10	10/10
GH_FR1		10/10	10/10	10/10	10/10	10/10
GH_ERC		10/10	10/10	10/10	9/10	10/10
CM_MC2		2/10	8/10	6/10	3/10	
EV_MC2		10/10	8/10	10/10	10/10	9/10
EV_HC1		10/10	10/10	10/10	10/10	9/10
LC_DCDS		10/10	10/10	10/10	10/10	10/10
LC_LC3		10/10	10/10	9/10	10/10	9/10
LC_LC5		10/10	9/10	10/10	9/10	9/10
LC_LCDSSLCC		9/10	10/10	10/10	10/10	8/10
RG_MIDAG		10/10	10/10	7/10	10/10	10/10
FR_FR4		10/10	10/10	10/10	10/10	9/10
FR_FRRD		10/10	10/10	10/10	10/10	10/10
FR_FR2		9/10	10/10	10/10	4/10	10/10
FR_MULTIPLATE		10/10	10/10	10/10	10/10	9/10

Hyalella 28-d Survival and Growth Sediment Test **Nautilus Environmental**

Analysis ID:	10-7567-4225	**Endpoint:**	Survival Rate	**CETIS Version:**	CETISv1.9.4
Analyzed:	09 Nov-21 16:13	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1

Graphics



 Analyst: RT QA: Nov 19/21

Hyalella 28-d Survival and Growth Sediment Test

Nautilus Environmental

Analysis ID:	13-2325-2507	**Endpoint:**	Mean Dry Weight-mg	**CETIS Version:**	CETISv1.9.4
Analyzed:	09 Nov-21 16:13	**Analysis:**	Parametric-Control vs Treatments	**Status Level:**	1
Batch ID:	21-3868-4263	**Test Type:**	Survival-Growth	**Analyst:**	Rachel Sakurdeep
Start Date:	12 Aug-21	**Protocol:**	EPA/600/R-99/064 (2000)	**Diluent:**	Reconstituted Water
Ending Date:	09 Sep-21	**Species:**	Hyalella azteca	**Brine:**	
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	Aquatic Biosystems, CO **Age:** 7-8

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
FR_UFR1	01-9312-3340	10 Aug-21 08:54	11 Aug-21 11:15	39h (12.8 °C)	Teck Coal	
GH_ER2	03-3301-7818	10 Aug-21 10:45	11 Aug-21 11:15	37h (15.8 °C)		
CM_MC1	20-0000-6898	10 Aug-21 11:04	11 Aug-21 11:15	37h (14 °C)		
LC_SLC	07-8534-5756	10 Aug-21 09:09	11 Aug-21 11:15	39h (11.2 °C)		
FR_FRABCH	12-3746-7337	10 Aug-21 09:35	11 Aug-21 11:15	38h (13.6 °C)		
FR_FRCP1	02-0987-3329	10 Aug-21 09:55	11 Aug-21 11:15	38h (12.1 °C)		
GH_FR1	00-2216-4794	10 Aug-21 09:30	11 Aug-21 11:15	38h (15.3 °C)		
GH_ERC	02-8768-9833	10 Aug-21 11:45	11 Aug-21 11:15	36h (16.4 °C)		
CM_MC2	08-6405-5477	10 Aug-21 12:07	11 Aug-21 11:15	36h (14.9 °C)		
EV_MC2	09-5920-8643	10 Aug-21 10:44	11 Aug-21 11:15	37h (12.8 °C)		
EV_HC1	05-3700-4202	10 Aug-21 09:46	11 Aug-21 11:15	38h (13 °C)		
LC_DCDS	10-8734-0222	10 Aug-21 10:10	11 Aug-21 11:15	38h (10.8 °C)		
LC_LC3	07-4841-6068	10 Aug-21 09:30	11 Aug-21 11:15	38h (9.8 °C)		
LC_LC5	18-0478-8867	10 Aug-21 12:00	11 Aug-21 11:15	36h (11.8 °C)		
LC_LCDSSLCC	17-9964-8023	10 Aug-21 10:40	11 Aug-21 11:15	37h (12.1 °C)		
RG_MIDAG	04-6323-4167	10 Aug-21 11:30	11 Aug-21 11:15	37h (14.3 °C)		
FR_FR4	04-5681-6105	10 Aug-21 10:00	11 Aug-21 11:15	38h (15.6 °C)		
FR_FRRD	03-6145-5105	10 Aug-21 08:25	11 Aug-21 11:15	40h (16.8 °C)		
FR_FR2	16-7096-5741	10 Aug-21 10:54	11 Aug-21 11:15	37h (15.9 °C)		
FR_MULTIPLATE	08-7549-1660	10 Aug-21 11:51	11 Aug-21 11:15	36h (16.9 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_UFR1	Water Sample	Teck Coal	FR_UFR1_MON_2021-08-0	
GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-08-10_	
CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-08-10	
LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-08-10_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_MON_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_MON_2021-08	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-08-10_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-08-10	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-08-10	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2021_Q3_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2021_Q3_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-08-10	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-08-10_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-08-10_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	
RG_MIDAG	Water Sample	Teck Coal	RG_MIDAG_WS_2021-08-	
FR_FR4	Water Sample	Teck Coal	FR_FR4_WS_2021-08-10_	
FR_FRRD	Water Sample	Teck Coal	FR_FRRD_WS_2021-08-10	
FR_FR2	Water Sample	Teck Coal	FR_FR2_WS_2021-08-10_	
FR_MULTIPLATE	Water Sample	Teck Coal	FR_MULTIPLATE_WS_202	

Hyalella 28-d Survival and Growth Sediment Test — **Nautilus Environmental**

Analysis ID: 13-2325-2507 **Endpoint:** Mean Dry Weight-mg **CETIS Version:** CETISv1.9.4
Analyzed: 09 Nov-21 16:13 **Analysis:** Parametric-Control vs Treatments **Status Level:** 1

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	FR_UFR1 passed mean dry weight-mg	23.82%
		GH_ER2 failed mean dry weight-mg	23.82%
		LC_SLC failed mean dry weight-mg	23.82%
		FR_FRABCH failed mean dry weight-mg	23.82%
		FR_FRCP1 failed mean dry weight-mg	23.82%
		GH_FR1 failed mean dry weight-mg	23.82%
		GH_ERC failed mean dry weight-mg	23.82%
		CM_MC2 failed mean dry weight-mg	23.82%
		EV_MC2 passed mean dry weight-mg	23.82%
		EV_HC1 passed mean dry weight-mg	23.82%
		LC_DCDS failed mean dry weight-mg	23.82%
		LC_LC3 failed mean dry weight-mg	23.82%
		LC_LC5 failed mean dry weight-mg	23.82%
		LC_LCDSSLCC failed mean dry weight-mg	23.82%
		RG_MIDAG passed mean dry weight-mg	23.82%
		FR_FR4 failed mean dry weight-mg	23.82%
		FR_FRRD failed mean dry weight-mg	23.82%
		FR_FR2 failed mean dry weight-mg	23.82%
		FR_MULTIPLATE failed mean dry weight-mg	23.82%

Dunnett Multiple Comparison Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Reference Sed (CM-MC2)		FR_UFR1	2.302	2.686	0.183	8	CDF	0.1147	Non-Significant Effect
		GH_ER2*	3.495	2.686	0.183	8	CDF	0.0057	Significant Effect
		LC_SLC*	3.174	2.686	0.183	8	CDF	0.0144	Significant Effect
		FR_FRABCH*	4.312	2.686	0.183	8	CDF	3.9E-04	Significant Effect
		FR_FRCP1*	4.608	2.686	0.183	8	CDF	1.3E-04	Significant Effect
		GH_FR1*	4.103	2.686	0.183	8	CDF	8.0E-04	Significant Effect
		GH_ERC*	3.956	2.686	0.183	8	CDF	0.0013	Significant Effect
		CM_MC2*	6.142	2.686	0.194	7	CDF	1.3E-06	Significant Effect
		EV_MC2	2.286	2.686	0.183	8	CDF	0.1184	Non-Significant Effect
		EV_HC1	0.2525	2.686	0.183	8	CDF	0.9083	Non-Significant Effect
		LC_DCDS*	2.774	2.686	0.183	8	CDF	0.0406	Significant Effect
		LC_LC3*	3.786	2.686	0.183	8	CDF	0.0023	Significant Effect
		LC_LC5*	4.151	2.686	0.183	8	CDF	6.8E-04	Significant Effect
		LC_LCDSSLCC*	3.479	2.686	0.183	8	CDF	0.0060	Significant Effect
		RG_MIDAG	-0.3272	2.686	0.183	8	CDF	0.9809	Non-Significant Effect
		FR_FR4*	4.435	2.686	0.183	8	CDF	2.5E-04	Significant Effect
		FR_FRRD*	3.906	2.686	0.183	8	CDF	0.0016	Significant Effect
		FR_FR2*	3.897	2.686	0.183	8	CDF	0.0016	Significant Effect
		FR_MULTIPLATE*	6.627	2.686	0.183	8	CDF	1.1E-06	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	1.42965	0.0752448	19	6.503	<1.0E-37	Significant Effect
Error	0.914043	0.0115702	79			
Total	2.34369		98			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance Test	28.46	36.19	0.0750	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9852	0.9651	0.3348	Normal Distribution

Hyalella 28-d Survival and Growth Sediment Test **Nautilus Environmental**

Analysis ID: 13-2325-2507 **Endpoint:** Mean Dry Weight-mg **CETIS Version:** CETISv1.9.4
Analyzed: 09 Nov-21 16:13 **Analysis:** Parametric-Control vs Treatments **Status Level:** 1

Mean Dry Weight-mg Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
FR_UFR1		5	0.6105	0.4674	0.7537	0.575	0.494	0.803	0.05156	18.89%	0.00%
GH_ER2		5	0.5293	0.3871	0.6716	0.55	0.3367	0.623	0.05124	21.65%	13.30%
CM_MC1	RS	5	0.7671	0.6859	0.8483	0.745	0.704	0.8756	0.02925	8.53%	-25.65%
LC_SLC		5	0.5512	0.4895	0.6129	0.575	0.4856	0.5956	0.02223	9.02%	9.72%
FR_FRABCH		5	0.4738	0.3363	0.6113	0.5387	0.346	0.576	0.04951	23.37%	22.39%
FR_FRCP1		5	0.4536	0.2827	0.6245	0.43	0.303	0.675	0.06157	30.35%	25.70%
GH_FR1		5	0.488	0.3459	0.6301	0.463	0.391	0.676	0.05117	23.44%	20.07%
GH_ERC		5	0.498	0.4159	0.5801	0.503	0.408	0.578	0.02957	13.28%	18.43%
CM_MC2		4	0.324	0.1718	0.4761	0.3242	0.2175	0.43	0.0478	29.51%	46.94%
EV_MC2		5	0.6116	0.4951	0.7281	0.632	0.5013	0.7189	0.04196	15.34%	-0.18%
EV_HC1		5	0.7499	0.6199	0.8799	0.771	0.5867	0.877	0.04682	13.96%	-22.84%
LC_DCDS		5	0.5784	0.506	0.6508	0.583	0.51	0.665	0.02609	10.09%	5.26%
LC_LC3		5	0.5096	0.436	0.5831	0.527	0.4444	0.5733	0.0265	11.63%	16.54%
LC_LC5		5	0.4847	0.3821	0.5873	0.5	0.3678	0.5767	0.03695	17.05%	20.61%
LC_LCDSSLCC		5	0.5304	0.4399	0.6209	0.5356	0.465	0.644	0.0326	13.74%	13.12%
RG_MIDAG		5	0.7894	0.7034	0.8753	0.751	0.74	0.905	0.03096	8.77%	-29.30%
FR_FR4		5	0.4654	0.1518	0.779	0.442	0.218	0.789	0.113	54.28%	23.77%
FR_FRRD		5	0.5014	0.3415	0.6613	0.562	0.362	0.614	0.0576	25.69%	17.87%
FR_FR2		5	0.502	0.3513	0.6527	0.4444	0.415	0.707	0.05428	24.18%	17.78%
FR_MULTIPLATE		5	0.3162	0.2756	0.3569	0.315	0.264	0.346	0.01466	10.36%	48.20%

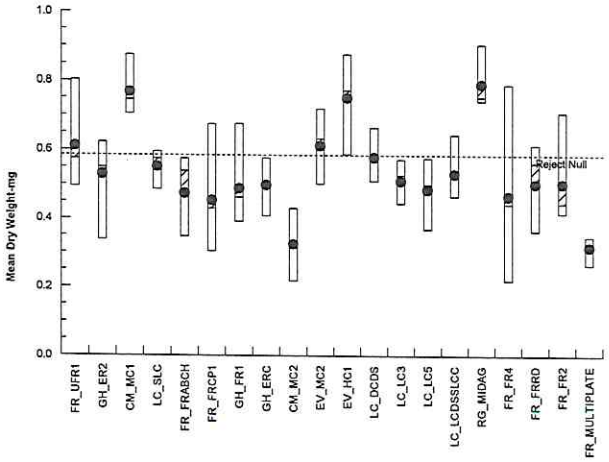
Mean Dry Weight-mg Detail

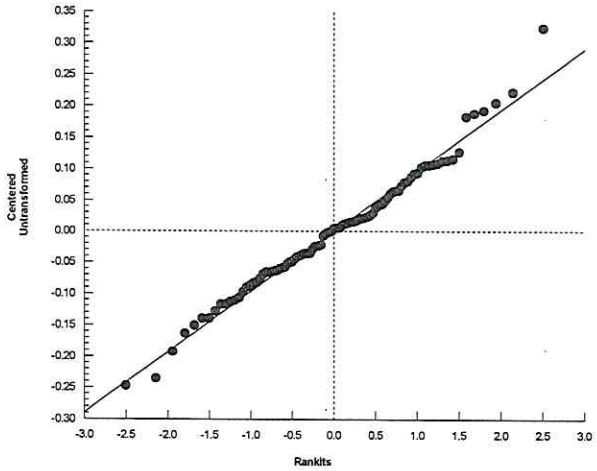
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
FR_UFR1		0.803	0.494	0.6056	0.575	0.575
GH_ER2		0.529	0.623	0.608	0.55	0.3367
CM_MC1	RS	0.738	0.773	0.8756	0.745	0.704
LC_SLC		0.575	0.5956	0.511	0.5889	0.4856
FR_FRABCH		0.346	0.5387	0.547	0.576	0.3612
FR_FRCP1		0.303	0.43	0.675	0.395	0.465
GH_FR1		0.391	0.504	0.463	0.676	0.406
GH_ERC		0.578	0.503	0.462	0.5389	0.408
CM_MC2		0.275	0.2175	0.43	0.3733	
EV_MC2		0.529	0.5013	0.677	0.632	0.7189
EV_HC1		0.877	0.771	0.773	0.742	0.5867
LC_DCDS		0.583	0.665	0.591	0.543	0.51
LC_LC3		0.45	0.553	0.5733	0.527	0.4444
LC_LC5		0.539	0.5767	0.5	0.44	0.3678
LC_LCDSSLCC		0.5356	0.54	0.644	0.465	0.4675
RG_MIDAG		0.74	0.748	0.8029	0.751	0.905
FR_FR4		0.648	0.789	0.442	0.218	0.23
FR_FRRD		0.362	0.562	0.614	0.607	0.362
FR_FR2		0.4444	0.707	0.415	0.5175	0.426
FR_MULTIPLATE		0.314	0.264	0.315	0.346	0.3422

Hyalella 28-d Survival and Growth Sediment Test — **Nautilus Environmental**

Analysis ID:	13-2325-2507	**Endpoint:**	Mean Dry Weight-mg	**CETIS Version:**	CETISv1.9.4
Analyzed:	09 Nov-21 16:13	**Analysis:**	Parametric-Control vs Treatments	**Status Level:**	1

Graphics





CETIS Analytical Report

Hyalella 28-d Survival and Growth Sediment Test — **Nautilus Environmental**

Analysis ID:	15-3155-2361	**Endpoint:**	Survival Rate	**CETIS Version:**	CETISv1.9.4
Analyzed:	09 Nov-21 16:14	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1
Batch ID:	21-3868-4263	**Test Type:**	Survival-Growth	**Analyst:**	Rachel Sakurdeep
Start Date:	12 Aug-21	**Protocol:**	EPA/600/R-99/064 (2000)	**Diluent:**	Reconstituted Water
Ending Date:	09 Sep-21	**Species:**	Hyalella azteca	**Brine:**	
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	Aquatic Biosystems, CO **Age:** 7-8

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
FR_UFR1	01-9312-3340	10 Aug-21 08:54	11 Aug-21 11:15	39h (12.8 °C)	Teck Coal	
GH_ER2	03-3301-7818	10 Aug-21 10:45	11 Aug-21 11:15	37h (15.8 °C)		
CM_MC1	20-0000-6898	10 Aug-21 11:04	11 Aug-21 11:15	37h (14 °C)		
LC_SLC	07-8534-5756	10 Aug-21 09:09	11 Aug-21 11:15	39h (11.2 °C)		
FR_FRABCH	12-3746-7337	10 Aug-21 09:35	11 Aug-21 11:15	38h (13.6 °C)		
FR_FRCP1	02-0987-3329	10 Aug-21 09:55	11 Aug-21 11:15	38h (12.1 °C)		
GH_FR1	00-2216-4794	10 Aug-21 09:30	11 Aug-21 11:15	38h (15.3 °C)		
GH_ERC	02-8768-9833	10 Aug-21 11:45	11 Aug-21 11:15	36h (16.4 °C)		
CM_MC2	08-6405-5477	10 Aug-21 12:07	11 Aug-21 11:15	36h (14.9 °C)		
EV_MC2	09-5920-8643	10 Aug-21 10:44	11 Aug-21 11:15	37h (12.8 °C)		
EV_HC1	05-3700-4202	10 Aug-21 09:46	11 Aug-21 11:15	38h (13 °C)		
LC_DCDS	10-8734-0222	10 Aug-21 10:10	11 Aug-21 11:15	38h (10.8 °C)		
LC_LC3	07-4841-6068	10 Aug-21 09:30	11 Aug-21 11:15	38h (9.8 °C)		
LC_LC5	18-0478-8867	10 Aug-21 12:00	11 Aug-21 11:15	36h (11.8 °C)		
LC_LCDSSLCC	17-9964-8023	10 Aug-21 10:40	11 Aug-21 11:15	37h (12.1 °C)		
RG_MIDAG	04-6323-4167	10 Aug-21 11:30	11 Aug-21 11:15	37h (14.3 °C)		
FR_FR4	04-5681-6105	10 Aug-21 10:00	11 Aug-21 11:15	38h (15.6 °C)		
FR_FRRD	03-6145-5105	10 Aug-21 08:25	11 Aug-21 11:15	40h (16.8 °C)		
FR_FR2	16-7096-5741	10 Aug-21 10:54	11 Aug-21 11:15	37h (15.9 °C)		
FR_MULTIPLATE	08-7549-1660	10 Aug-21 11:51	11 Aug-21 11:15	36h (16.9 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_UFR1	Water Sample	Teck Coal	FR_UFR1_MON_2021-08-0	
GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-08-10_	
CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-08-10	
LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-08-10_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_MON_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_MON_2021-08	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-08-10_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-08-10	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-08-10	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2021_Q3_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2021_Q3_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-08-10	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-08-10_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-08-10_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	
RG_MIDAG	Water Sample	Teck Coal	RG_MIDAG_WS_2021-08-	
FR_FR4	Water Sample	Teck Coal	FR_FR4_WS_2021-08-10_	
FR_FRRD	Water Sample	Teck Coal	FR_FRRD_WS_2021-08-10	
FR_FR2	Water Sample	Teck Coal	FR_FR2_WS_2021-08-10_	
FR_MULTIPLATE	Water Sample	Teck Coal	FR_MULTIPLATE_WS_202	

Fisher Exact/Bonferroni-Holm Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
Reference Sed (LC-SLC)		FR_UFR1	0.6611	Exact	1.0000	Non-Significant Effect
		GH_ER2	0.9413	Exact	1.0000	Non-Significant Effect
		CM_MC1	0.9413	Exact	1.0000	Non-Significant Effect
		FR_FRABCH	0.5000	Exact	1.0000	Non-Significant Effect

Hyalella 28-d Survival and Growth Sediment Test **Nautilus Environmental**

Analysis ID: 15-3155-2361 **Endpoint:** Survival Rate **CETIS Version:** CETISv1.9.4
Analyzed: 09 Nov-21 16:14 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Fisher Exact/Bonferroni-Holm Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
		FR_FRCP1	0.9413	Exact	1.0000	Non-Significant Effect
		GH_FR1	1.0000	Exact	1.0000	Non-Significant Effect
		GH_ERC	0.9413	Exact	1.0000	Non-Significant Effect
		CM_MC2*	0.0000	Exact	2.0E-08	Significant Effect
		EV_MC2	0.6611	Exact	1.0000	Non-Significant Effect
		EV_HC1	0.9413	Exact	1.0000	Non-Significant Effect
		LC_DCDS	1.0000	Exact	1.0000	Non-Significant Effect
		LC_LC3	0.8189	Exact	1.0000	Non-Significant Effect
		LC_LC5	0.6611	Exact	1.0000	Non-Significant Effect
		LC_LCDSSLCC	0.6611	Exact	1.0000	Non-Significant Effect
		RG_MIDAG	0.6611	Exact	1.0000	Non-Significant Effect
		FR_FR4	0.9413	Exact	1.0000	Non-Significant Effect
		FR_FRRD	1.0000	Exact	1.0000	Non-Significant Effect
		FR_FR2	0.1589	Exact	1.0000	Non-Significant Effect
		FR_MULTIPLATE	0.9413	Exact	1.0000	Non-Significant Effect

Data Summary

Sample	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
FR_UFR1		47	3	50	0.94	0.06	6.0%
GH_ER2		49	1	50	0.98	0.02	2.0%
CM_MC1		49	1	50	0.98	0.02	2.0%
LC_SLC	RS	47	3	50	0.94	0.06	6.0%
FR_FRABCH		46	4	50	0.92	0.08	8.0%
FR_FRCP1		49	1	50	0.98	0.02	2.0%
GH_FR1		50	0	50	1	0	0.0%
GH_ERC		49	1	50	0.98	0.02	2.0%
CM_MC2		19	31	50	0.38	0.62	62.0%
EV_MC2		47	3	50	0.94	0.06	6.0%
EV_HC1		49	1	50	0.98	0.02	2.0%
LC_DCDS		50	0	50	1	0	0.0%
LC_LC3		48	2	50	0.96	0.04	4.0%
LC_LC5		47	3	50	0.94	0.06	6.0%
LC_LCDSSLCC		47	3	50	0.94	0.06	6.0%
RG_MIDAG		47	3	50	0.94	0.06	6.0%
FR_FR4		49	1	50	0.98	0.02	2.0%
FR_FRRD		50	0	50	1	0	0.0%
FR_FR2		43	7	50	0.86	0.14	14.0%
FR_MULTIPLATE		49	1	50	0.98	0.02	2.0%

Hyalella 28-d Survival and Growth Sediment Test — **Nautilus Environmental**

Analysis ID: 15-3155-2361 **Endpoint:** Survival Rate **CETIS Version:** CETISv1.9.4
Analyzed: 09 Nov-21 16:14 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Survival Rate Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
FR_UFR1		1.0000	1.0000	0.9000	0.8000	1.0000
GH_ER2		1.0000	1.0000	1.0000	1.0000	0.9000
CM_MC1		1.0000	1.0000	0.9000	1.0000	1.0000
LC_SLC	RS	1.0000	0.9000	1.0000	0.9000	0.9000
FR_FRABCH		1.0000	0.8000	1.0000	1.0000	0.8000
FR_FRCP1		1.0000	0.9000	1.0000	1.0000	1.0000
GH_FR1		1.0000	1.0000	1.0000	1.0000	1.0000
GH_ERC		1.0000	1.0000	1.0000	0.9000	1.0000
CM_MC2		0.2000	0.8000	0.6000	0.3000	0.0000
EV_MC2		1.0000	0.8000	1.0000	1.0000	0.9000
EV_HC1		1.0000	1.0000	1.0000	1.0000	0.9000
LC_DCDS		1.0000	1.0000	1.0000	1.0000	1.0000
LC_LC3		1.0000	1.0000	0.9000	1.0000	0.9000
LC_LC5		1.0000	0.9000	1.0000	0.9000	0.9000
LC_LCDSSLCC		0.9000	1.0000	1.0000	1.0000	0.8000
RG_MIDAG		1.0000	1.0000	0.7000	1.0000	1.0000
FR_FR4		1.0000	1.0000	1.0000	1.0000	0.9000
FR_FRRD		1.0000	1.0000	1.0000	1.0000	1.0000
FR_FR2		0.9000	1.0000	1.0000	0.4000	1.0000
FR_MULTIPLATE		1.0000	1.0000	1.0000	1.0000	0.9000

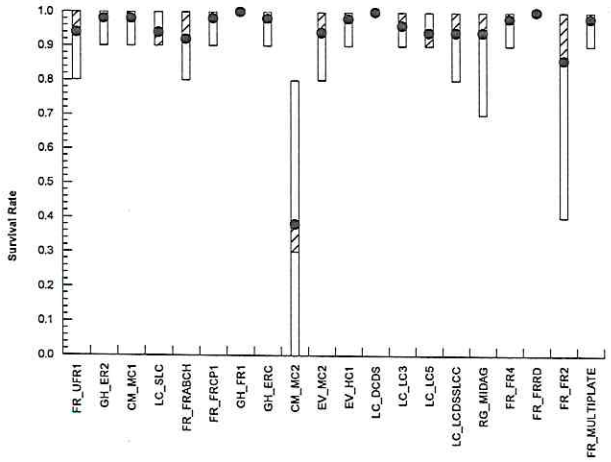
Survival Rate Binomials

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
FR_UFR1		10/10	10/10	9/10	8/10	10/10
GH_ER2		10/10	10/10	10/10	10/10	9/10
CM_MC1		10/10	10/10	9/10	10/10	10/10
LC_SLC	RS	10/10	9/10	10/10	9/10	9/10
FR_FRABCH		10/10	8/10	10/10	10/10	8/10
FR_FRCP1		10/10	9/10	10/10	10/10	10/10
GH_FR1		10/10	10/10	10/10	10/10	10/10
GH_ERC		10/10	10/10	10/10	9/10	10/10
CM_MC2		2/10	8/10	6/10	3/10	0/10
EV_MC2		10/10	8/10	10/10	10/10	9/10
EV_HC1		10/10	10/10	10/10	10/10	9/10
LC_DCDS		10/10	10/10	10/10	10/10	10/10
LC_LC3		10/10	10/10	9/10	10/10	9/10
LC_LC5		10/10	9/10	10/10	9/10	9/10
LC_LCDSSLCC		9/10	10/10	10/10	10/10	8/10
RG_MIDAG		10/10	10/10	7/10	10/10	10/10
FR_FR4		10/10	10/10	10/10	10/10	9/10
FR_FRRD		10/10	10/10	10/10	10/10	10/10
FR_FR2		9/10	10/10	10/10	4/10	10/10
FR_MULTIPLATE		10/10	10/10	10/10	10/10	9/10

Hyalella 28-d Survival and Growth Sediment Test — **Nautilus Environmental**

Analysis ID:	15-3155-2361	**Endpoint:**	Survival Rate	**CETIS Version:**	CETISv1.9.4
Analyzed:	09 Nov-21 16:14	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1

Graphics



Analyst: _____ QA: NN 11/8/21

CETIS Analytical Report

Hyalella 28-d Survival and Growth Sediment Test — **Nautilus Environmental**

Analysis ID:	09-8621-4417	**Endpoint:**	Mean Dry Weight-mg	**CETIS Version:**	CETISv1.9.4
Analyzed:	09 Nov-21 16:14	**Analysis:**	Parametric-Control vs Treatments	**Status Level:**	1
Batch ID:	21-3868-4263	**Test Type:**	Survival-Growth	**Analyst:**	Rachel Sakurdeep
Start Date:	12 Aug-21	**Protocol:**	EPA/600/R-99/064 (2000)	**Diluent:**	Reconstituted Water
Ending Date:	09 Sep-21	**Species:**	Hyalella azteca	**Brine:**	
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	Aquatic Biosystems, CO **Age:** 7-8

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
FR_UFR1	01-9312-3340	10 Aug-21 08:54	11 Aug-21 11:15	39h (12.8 °C)	Teck Coal	
GH_ER2	03-3301-7818	10 Aug-21 10:45	11 Aug-21 11:15	37h (15.8 °C)		
CM_MC1	20-0000-6898	10 Aug-21 11:04	11 Aug-21 11:15	37h (14 °C)		
LC_SLC	07-8534-5756	10 Aug-21 09:09	11 Aug-21 11:15	39h (11.2 °C)		
FR_FRABCH	12-3746-7337	10 Aug-21 09:35	11 Aug-21 11:15	38h (13.6 °C)		
FR_FRCP1	02-0987-3329	10 Aug-21 09:55	11 Aug-21 11:15	38h (12.1 °C)		
GH_FR1	00-2216-4794	10 Aug-21 09:30	11 Aug-21 11:15	38h (15.3 °C)		
GH_ERC	02-8768-9833	10 Aug-21 11:45	11 Aug-21 11:15	36h (16.4 °C)		
CM_MC2	08-6405-5477	10 Aug-21 12:07	11 Aug-21 11:15	36h (14.9 °C)		
EV_MC2	09-5920-8643	10 Aug-21 10:44	11 Aug-21 11:15	37h (12.8 °C)		
EV_HC1	05-3700-4202	10 Aug-21 09:46	11 Aug-21 11:15	38h (13 °C)		
LC_DCDS	10-8734-0222	10 Aug-21 10:10	11 Aug-21 11:15	38h (10.8 °C)		
LC_LC3	07-4841-6068	10 Aug-21 09:30	11 Aug-21 11:15	38h (9.8 °C)		
LC_LC5	18-0478-8867	10 Aug-21 12:00	11 Aug-21 11:15	36h (11.8 °C)		
LC_LCDSSLCC	17-9964-8023	10 Aug-21 10:40	11 Aug-21 11:15	37h (12.1 °C)		
RG_MIDAG	04-6323-4167	10 Aug-21 11:30	11 Aug-21 11:15	37h (14.3 °C)		
FR_FR4	04-5681-6105	10 Aug-21 10:00	11 Aug-21 11:15	38h (15.6 °C)		
FR_FRRD	03-6145-5105	10 Aug-21 08:25	11 Aug-21 11:15	40h (16.8 °C)		
FR_FR2	16-7096-5741	10 Aug-21 10:54	11 Aug-21 11:15	37h (15.9 °C)		
FR_MULTIPLATE	08-7549-1660	10 Aug-21 11:51	11 Aug-21 11:15	36h (16.9 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_UFR1	Water Sample	Teck Coal	FR_UFR1_MON_2021-08-0	
GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-08-10_	
CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-08-10	
LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-08-10_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_MON_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_MON_2021-08	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-08-10_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-08-10	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-08-10	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2021_Q3_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2021_Q3_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-08-10	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-08-10_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-08-10_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	
RG_MIDAG	Water Sample	Teck Coal	RG_MIDAG_WS_2021-08-	
FR_FR4	Water Sample	Teck Coal	FR_FR4_WS_2021-08-10_	
FR_FRRD	Water Sample	Teck Coal	FR_FRRD_WS_2021-08-10	
FR_FR2	Water Sample	Teck Coal	FR_FR2_WS_2021-08-10_	
FR_MULTIPLATE	Water Sample	Teck Coal	FR_MULTIPLATE_WS_202	

Analyst: RD QA: NN 11/9/21

Hyalella 28-d Survival and Growth Sediment Test — **Nautilus Environmental**

Analysis ID:	09-8621-4417	**Endpoint:**	Mean Dry Weight-mg	**CETIS Version:**	CETISv1.9.4
Analyzed:	09 Nov-21 16:14	**Analysis:**	Parametric-Control vs Treatments	**Status Level:**	1

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	FR_UFR1 passed mean dry weight-mg	33.15%
		GH_ER2 passed mean dry weight-mg	33.15%
		CM_MC1 passed mean dry weight-mg	33.15%
		FR_FRABCH passed mean dry weight-mg	33.15%
		FR_FRCP1 passed mean dry weight-mg	33.15%
		GH_FR1 passed mean dry weight-mg	33.15%
		GH_ERC passed mean dry weight-mg	33.15%
		CM_MC2 failed mean dry weight-mg	33.15%
		EV_MC2 passed mean dry weight-mg	33.15%
		EV_HC1 passed mean dry weight-mg	33.15%
		LC_DCDS passed mean dry weight-mg	33.15%
		LC_LC3 passed mean dry weight-mg	33.15%
		LC_LC5 passed mean dry weight-mg	33.15%
		LC_LCDSSLCC passed mean dry weight-mg	33.15%
		RG_MIDAG passed mean dry weight-mg	33.15%
		FR_FR4 passed mean dry weight-mg	33.15%
		FR_FRRD passed mean dry weight-mg	33.15%
		FR_FR2 passed mean dry weight-mg	33.15%
		FR_MULTIPLATE failed mean dry weight-mg	33.15%

Dunnett Multiple Comparison Test

Sample I vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Reference Sed (LC-SLC)	FR_UFR1	-0.8719	2.686	0.183	8	CDF	0.9971	Non-Significant Effect
	GH_ER2	0.3214	2.686	0.183	8	CDF	0.8930	Non-Significant Effect
	CM_MC1	-3.174	2.686	0.183	8	CDF	1.0000	Non-Significant Effect
	FR_FRABCH	1.138	2.686	0.183	8	CDF	0.5829	Non-Significant Effect
	FR_FRCP1	1.435	2.686	0.183	8	CDF	0.4367	Non-Significant Effect
	GH_FR1	0.929	2.686	0.183	8	CDF	0.6813	Non-Significant Effect
	GH_ERC	0.7823	2.686	0.183	8	CDF	0.7442	Non-Significant Effect
	CM_MC2*	3.149	2.686	0.194	7	CDF	0.0154	Significant Effect
	EV_MC2	-0.8883	2.686	0.183	8	CDF	0.9973	Non-Significant Effect
	EV_HC1	-2.921	2.686	0.183	8	CDF	1.0000	Non-Significant Effect
	LC_DCDS	-0.3998	2.686	0.183	8	CDF	0.9848	Non-Significant Effect
	LC_LC3	0.6121	2.686	0.183	8	CDF	0.8084	Non-Significant Effect
	LC_LC5	0.9776	2.686	0.183	8	CDF	0.6591	Non-Significant Effect
	LC_LCDSSLCC	0.3056	2.686	0.183	8	CDF	0.8967	Non-Significant Effect
	RG_MIDAG	-3.501	2.686	0.183	8	CDF	1.0000	Non-Significant Effect
	FR_FR4	1.261	2.686	0.183	8	CDF	0.5221	Non-Significant Effect
	FR_FRRD	0.732	2.686	0.183	8	CDF	0.7643	Non-Significant Effect
	FR_FR2	0.7234	2.686	0.183	8	CDF	0.7676	Non-Significant Effect
	FR_MULTIPLATE*	3.454	2.686	0.183	8	CDF	0.0064	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	1.42965	0.0752448	19	6.503	<1.0E-37	Significant Effect
Error	0.914043	0.0115702	79			
Total	2.34369		98			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance Test	28.46	36.19	0.0750	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9852	0.9651	0.3348	Normal Distribution

Hyalella 28-d Survival and Growth Sediment Test — **Nautilus Environmental**

Analysis ID:	09-8621-4417	**Endpoint:**	Mean Dry Weight-mg	**CETIS Version:**	CETISv1.9.4
Analyzed:	09 Nov-21 16:14	**Analysis:**	Parametric-Control vs Treatments	**Status Level:**	1

Mean Dry Weight-mg Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
FR_UFR1		5	0.6105	0.4674	0.7537	0.575	0.494	0.803	0.05156	18.89%	0.00%
GH_ER2		5	0.5293	0.3871	0.6716	0.55	0.3367	0.623	0.05124	21.65%	13.30%
CM_MC1		5	0.7671	0.6859	0.8483	0.745	0.704	0.8756	0.02925	8.53%	-25.65%
LC_SLC	RS	5	0.5512	0.4895	0.6129	0.575	0.4856	0.5956	0.02223	9.02%	9.72%
FR_FRABCH		5	0.4738	0.3363	0.6113	0.5387	0.346	0.576	0.04951	23.37%	22.39%
FR_FRCP1		5	0.4536	0.2827	0.6245	0.43	0.303	0.675	0.06157	30.35%	25.70%
GH_FR1		5	0.488	0.3459	0.6301	0.463	0.391	0.676	0.05117	23.44%	20.07%
GH_ERC		5	0.498	0.4159	0.5801	0.503	0.408	0.578	0.02957	13.28%	18.43%
CM_MC2		4	0.324	0.1718	0.4761	0.3242	0.2175	0.43	0.0478	29.51%	46.94%
EV_MC2		5	0.6116	0.4951	0.7281	0.632	0.5013	0.7189	0.04196	15.34%	-0.18%
EV_HC1		5	0.7499	0.6199	0.8799	0.771	0.5867	0.877	0.04682	13.96%	-22.84%
LC_DCDS		5	0.5784	0.506	0.6508	0.583	0.51	0.665	0.02609	10.09%	5.26%
LC_LC3		5	0.5096	0.436	0.5831	0.527	0.4444	0.5733	0.0265	11.63%	16.54%
LC_LC5		5	0.4847	0.3821	0.5873	0.5	0.3678	0.5767	0.03695	17.05%	20.61%
LC_LCDSSLCC		5	0.5304	0.4399	0.6209	0.5356	0.465	0.644	0.0326	13.74%	13.12%
RG_MIDAG		5	0.7894	0.7034	0.8753	0.751	0.74	0.905	0.03096	8.77%	-29.30%
FR_FR4		5	0.4654	0.1518	0.779	0.442	0.218	0.789	0.113	54.28%	23.77%
FR_FRRD		5	0.5014	0.3415	0.6613	0.562	0.362	0.614	0.0576	25.69%	17.87%
FR_FR2		5	0.502	0.3513	0.6527	0.4444	0.415	0.707	0.05428	24.18%	17.78%
FR_MULTIPLATE		5	0.3162	0.2756	0.3569	0.315	0.264	0.346	0.01466	10.36%	48.20%

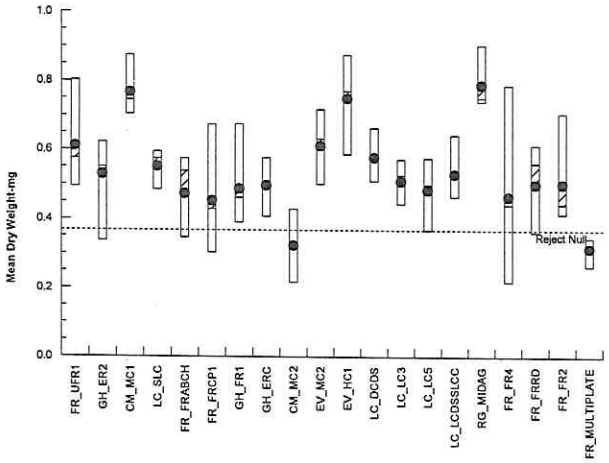
Mean Dry Weight-mg Detail

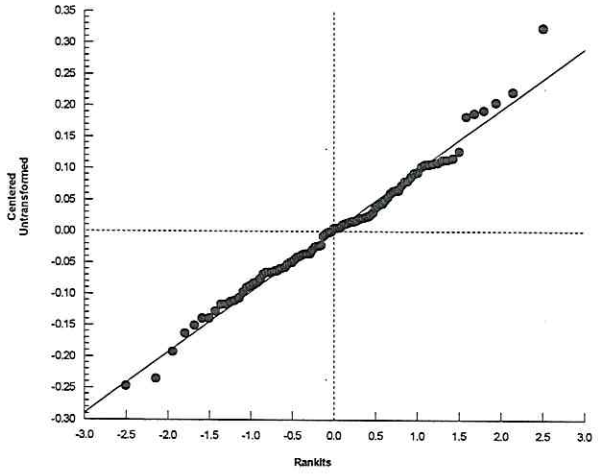
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
FR_UFR1		0.803	0.494	0.6056	0.575	0.575
GH_ER2		0.529	0.623	0.608	0.55	0.3367
CM_MC1		0.738	0.773	0.8756	0.745	0.704
LC_SLC	RS	0.575	0.5956	0.511	0.5889	0.4856
FR_FRABCH		0.346	0.5387	0.547	0.576	0.3612
FR_FRCP1		0.303	0.43	0.675	0.395	0.465
GH_FR1		0.391	0.504	0.463	0.676	0.406
GH_ERC		0.578	0.503	0.462	0.5389	0.408
CM_MC2		0.275	0.2175	0.43	0.3733	
EV_MC2		0.529	0.5013	0.677	0.632	0.7189
EV_HC1		0.877	0.771	0.773	0.742	0.5867
LC_DCDS		0.583	0.665	0.591	0.543	0.51
LC_LC3		0.45	0.553	0.5733	0.527	0.4444
LC_LC5		0.539	0.5767	0.5	0.44	0.3678
LC_LCDSSLCC		0.5356	0.54	0.644	0.465	0.4675
RG_MIDAG		0.74	0.748	0.8029	0.751	0.905
FR_FR4		0.648	0.789	0.442	0.218	0.23
FR_FRRD		0.362	0.562	0.614	0.607	0.362
FR_FR2		0.4444	0.707	0.415	0.5175	0.426
FR_MULTIPLATE		0.314	0.264	0.315	0.346	0.3422

Hyalella 28-d Survival and Growth Sediment Test — **Nautilus Environmental**

Analysis ID:	09-8621-4417	**Endpoint:**	Mean Dry Weight-mg	**CETIS Version:**	CETISv1.9.4
Analyzed:	09 Nov-21 16:14	**Analysis:**	Parametric-Control vs Treatments	**Status Level:**	1

Graphics





Analyst: DAS QA: NH 11/9/21

APPENDIX E – Chain-of-Custody Forms

Teck

COC ID:	8/10/2021	TURNAROUND TIME:		RUSH:	

PROJECT/CLIENT INFO				LABORATORY				OTHER INFO				
Facility Name / Job#	Fording River Operation			Lab Name	HydroQual Laboratories Ltd.			Report Format / Distribution		Excel	PDF	EDD
Project Manager	Scott Roughead			Lab Contact				Email 1:	david.burroughs@teck.com	X	X	X
Email	Scott.Roughead@teck.com			Email	ABinfo@nautilusenvironmental.ca			Email 2:	britt.anderson@teck.com	X	X	X
Address	PO Box 100			Address	#4, 6125 12 Street SE			Email 3:	scott.roughead@teck.com	X	X	X
								Email 4:	teckcoal@equisonline.com			X
City	Elkford	Province	BC	City	Calgary	Province	AB	Email 5:	cruz.canlas@teck.com	X	X	X
Postal Code	V0B 1H0	Country	Canada	Postal Code	?T2H 2K1	Country	Canada	Email 6:	jamie.walsh@teck.com	X	X	X
Phone Number	1-250-865-5195			Phone Number	403-253-7121			PO:	VPO00741382			

SAMPLE DETAILS

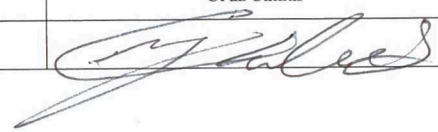
2021/08/11
14:00
Bear Paw
SC/SA
9x20L carboys
No3/No5
Good Condition
Week 1

ANALYSIS REQUESTED — Filtered - F: Field, L: Lab, FL: Field & Lab, N: None

Sample ID	Sample Location (sys_loc_code)	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	Filt.	PRESERV.	ANALYSIS: 30-d fathead minnow P/F		
								N	NONE			
FR_FRCP1_MON_2021-08-09_N 2021-1872	FR_FRCP1	WS	NO	8/10/2021	9:55	G	3			x	13.6°C	
FR_FRABCH_MON_2021-08-09_N 2021-1874	FR_FRABCH	WS	NO	8/10/2021	10:35	G	3			x	14.6°C	
FR_UFR1_MON_2021-08-09_N 2021-1873	FR_UFR1	WS	NO	8/10/2021	8:54	G	3			x	14.7°C	

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
	Cruz Canlas	August 10, 2021		

SERVICE REQUEST (rush - subject to availability)	
Regular (default)	X
Priority (2-3 business days) - 50% surcharge	
Emergency (1 Business Day) - 100% surcharge	
For Emergency <1 Day, ASAP or Weekend - Contact ALS	

Sampler's Name	Cruz Canlas	Mobile #	250 433 6166
Sampler's Signature		Date/Time	August 10, 2021

Teck

CAL-G.

COC ID: 8/10/2021 | TURNAROUND TIME: | RUSH:

PROJECT/CLIENT INFO				LABORATORY				OTHER INFO			
Facility Name / Job#	Fording River Operation			Lab Name	Nautilus Environmental Labs Calgary			Report Format / Distribution		Excel	PDF	EDD
Project Manager	Scott Roughead			Lab Contact				Email 1:	david.burroughs@teck.com	X	X	X
Email	Scott.Roughead@teck.com			Email	ABinfo@nautilusenvironmental.ca			Email 2:	cruz.canlas@teck.com	X	X	X
Address	PO Box 100			Address	#4, 6125 12 Street SE			Email 3:	scott.roughead@teck.com	X	X	X
								Email 4:	teckcoal@equisonline.com			X
City	Elkford	Province	BC	City	Calgary	Province	AB	Email 5:	jessica.ritz@teck.com	X	X	X
Postal Code	V0B 1H0	Country	Canada	Postal Code	T2H 2K1	Country	Canada	Email 6:	cait.good@teck.com	X	X	X
Phone Number	1-250-865-5195			Phone Number	403-253-7121			Email 7:	jamie.walsh@teck.com	X	X	X

SAMPLE DETAILS

2021/08/11
14:00
Bear Paw
JC/SA
12x 20L carboys
N68/W63
Good Condition
Week 1

ANALYSIS REQUESTED

Filtered - F: Field, L: Lab, FL: Field & Lab, N: None

Sample ID	Sample Location (sys loc code)	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	FIL.	PRESERV.	ANALYSIS: 30-d fathead minnow P/F	
								N	NONE		
FR_FR4_WS_2021-08-10_N 2021-1875	FR_FR4	WS	NO	10-Aug-21	10:00	G	3			X	14.1°C
FR_FRRD_WS_2021-08-10_N 2021-1876	FR_FRRD	WS	NO	10-Aug-21	8:25	G	3			X	14.7°C
FR_FR2_WS_2021-08-10_N 2021-1876	FR_FR2	WS	NO	10-Aug-21	10:54	G	3			X	15.3°C
FR_MULTIPLATE_WS_2021-08-10_NP 2021-1877	FR_MULTIPLATE	WS	NO	10-Aug-21	11:51	G	3			X	13.6°C

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME

SERVICE REQUEST (rush - subject to availability)

Regular (default)	X
Priority (2-3 business days) - 50% surcharge	
Emergency (1 Business Day) - 100% surcharge	
For Emergency <1 Day, ASAP or Weekend - Contact ALS	

Sampler's Name	Tyler Fortin	Mobile #	
Sampler's Signature		Date/Time	2021.08.10

Teck

COC ID:	2021-08-10-Chronic-Tox	Phone Number		RUSH:	NO

PROJECT/CLIENT INFO				LABORATORY				OTHER INFO				
Facility Name / Job#	Greenhills Operation			Lab Name	Hydroqual Laboratories Ltd			Report Format / Distribution		Excel	PDF	EDD
Project Manager	Jeremy Enns			Lab Contact	Jacklyn Pool			Email 1:				
Email	jeremy.enns@teck.com			Email				Email 2:				
Address	P.O. BOX 5000			Address	#4, 6125 - 12th Street S.E.			Email 3:	teckcoal@equisonline.com			X
								Email 4:				
City	Elkford	Province	BC	City	Calgary	Province	AB	Email 5:				
Postal Code	V0B1H0	Country	Canada	Postal Code	T2H 2K1	Country	Can	Email 6:	DL-Equis-GHO-Field@teck.com	X	X	X
Phone Number	250-865-3048			Phone Number	403-253-7121			Email 7:				
								PO number	740426			

2021/08/11
14:00
Bear Paw
DC/SA
9x20L carboys
N06/N06
Good Condition
Week 1

Sample ID		Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	Filt.	PRESERV.	ANALYSIS 7-d C.dubia P/F	72-hr P. subcapitata P/F	30-d fathead minnow P/F	
GH_FR1_WS_2021-08-10_N 2021-1879	GH_FR1	WS	N	2021/08/10	09:30	G	3					X	12.0°C
GH_ERC_WS_2021-08-10_N 2021-1880	GH_ERC	WS	N	2021/08/10	11:45	G	3					X	15.4°C
GH_ER2_WS_2021-08-10_N 2021-1881	GH_ER2	WS	N	2021/08/10	10:45	G	3					X	12.1°C

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME

SERVICE REQUEST (rush - subject to availability)					
Regular (default)	X	Sampler's Name	JM/EO/IDY	Mobile #	
Priority (2-3 business days) - 50% surcharge					
Emergency (1 Business Day) - 100% surcharge		Sampler's Signature		Date/Time	AUG 10 2021
For Emergency <1 Day, ASAP or Weekend - Contact ALS					

Teck

COC ID: 20210810CRN3C | TURNAROUND TIME: | RUSH:

PROJECT/CLIENT INFO

Facility Name / Job#	Elkview Operations
Job Description	Q3 Chronic Toxicity Sampling
Project Manager	Jennifer Dane
Email	jennifer.dane@teck.com
Address	RR#1 HWY# 3
City	Sparwood
Province	BC
Postal Code	V1C 4C3
Country	Canada
Phone Number	1-250-425-8137

LABORATORY

Lab Name	Nautilus Environmental
Lab Contact	Jacklyn Poole
Email	Jacklyn@nautilusenvironmental.ca
Address	6125 12st SE
City	Calgary
Province	AB
Postal Code	T2H 2K1
Country	Canada
Phone Number	403-253-7121

OTHER INFO

Report Format / Distribution		Excel	PDF	EDD
Email 1:	kennedy.allen@teck.com	X	X	X
Email 2:	teckcoal@equisonline.com			X
Email 3:	chris.emslie@teck.com	X	X	X
Email 4:	Teck.Lab.Results@teck.com	X	X	X
Email 5:	jennifer.dane@teck.com	X	X	X
Email 6:	colby.bracken@teck.com	X	X	X
PO number	VPO00678876			

SAMPLE DETAILS / ANALYSIS REQUESTED

Filtered - F: Field, L: Lab, FL: Field & Lab, N: None

Sample ID	Sample Location	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	7-d C.dubia P/F	72-hr P. subcapitata P/F	30-d embryo EA P/F	30-d fathead minnow P/F
								FILTERED	No	No	No	No
								PRESERVED	No	No	No	No
								ANALYSIS				
2021-1882												
EV_HC1_WS_2021_Q3_WK1_N	EV_HC1	WS	N	8/10/2021	9:46	G	3		12.1°C		1	
EV_MC2_WS_2021_Q3_WK1_N	EV_MC2	WS	N	8/10/2021	10:44	G	3		13.1°C		1	
2021/08/11 14:00												
2021-1883												
Bear Paw DC/SA												
6x 20L carboys												
NOS/NOT												
Good Condition												
Week 1												
					Total		6					

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS

Toxicity 96-Hr/48-HR = 96 Hr Rainbow Trout pass/fail & 48 Hr Daphnia pass/fail (Daphinia testing to occur at 20 degrees)

RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
C. Emslie/S. Hansen	10-Aug-21		

NB OF BOTTLES RETURNED/DESCRIPTION

Regular (default)	X
Priority (2-3 business days) - 50% surcharge	
Emergency (1 Business Day) - 100% surcharge	
For Emergency <1 Day, ASAP or Weekend - Contact ALS	

Sampler's Name	C. Emslie/S. Hansen	Mobile #	1-250-423-0826
Sampler's Signature		Date/Time	August 10, 2021

Teck

COC ID:	Q3_CHRONIC_08102021_CAL	TURNAROUND TIME:	Regular	RUSH:	NO

PROJECT/CLIENT INFO				LABORATORY				OTHER INFO				
Facility Name / Job#	Coal Mountain Operations			Lab Name	Hydroqual Laboratories			Report Format / Distribution		Excel	PDF	EDD
Project Manager	Jay Jones			Lab Contact	Jacklyn Poole			Email 1:	Victoria.Sharpe@teck.com	X	X	X
Email	Jay.Jones@teck.com				Tamara			Email 2:	teckcoal@equisonline.com			X
				Email	jacklyn@nautilusenvironmental.ca			Email 3:	Jay.jones@teck.com	X	X	X
					tamara@nautilusenvironmental.ca			Email 4	Don.Sacino@teck.com	X	X	X
Address	PO Box 3000			Address	#4, 6125-12th Street S.E.			Email 5:	Shelby.Holden@teck.com	X	X	X
City	Sparwood	Province	BC	City	Calgary	Province	AB	PO number				
Postal Code	V0B 2G0	Country	Canada	Postal Code	T2H 2K1	Country	Canada					
Phone Number	1-250-425-7321			Phone Number	403-253-7121							

2021/08/11
14:00
Bear Paw
JC/SA
9x20L carboys
N06/N05
Good Condition

SAMPLE DETAILS								ANALYSIS REQUESTED											Filtered - F: Field, L: Lab, FL: Field & Lab, N: None
								Filt.											
								PRESERV.											
								ANALYSIS	30-d fathead minnow P/F										
Sample ID	Sample Location	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.												
CM_MC2_WS_2021-08-10_N 2021-1884	CM_MC2	WS	No	2021/08/10	12:07	G	3		X	13.1°C									
CM_MC1_WS_2021-08-10_N 2021-1885	CM_MC1	WS	No	2021/08/10	11:04	G	3		X	12.3°C									
RG_MIDAG_WS_2021-08-10_N 2021-1886	RG_MIDAG	WS	NO	2021/08/10	11:30	G	3		X	12.4°C									

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME

NB OF BOTTLES RETURNED/DESCRIPTION					
Regular (default)	X	Sampler's Name	SH/KS/DS	Mobile #	250 425 7522
Priority (2-3 business days) - 50% surcharge					
Emergency (1 Business Day) - 100% surcharge		Sampler's Signature		Date/Time	August 10, 2021
For Emergency <1 Day, ASAP or Weekend - Contact ALS					

Teck

COC ID: 20210810 Chronic Tox Calg | **TURNAROUND TIME:** | **RUSH:**

PROJECT/CLIENT INFO				LABORATORY				OTHER INFO				
Facility Name / Job#	Line Creek Operation			Lab Name	Nautilus Environmental			Report Format / Distribution		Excel	PDF	EDD
Project Manager	Tom Jeffery			Lab Contact	Jeslin Wijaya			Email 1:	tom.jeffery@teck.com	x	x	
Email	tom.jeffery@teck.com			Email	jeslin@nautilusenvironmental.ca			Email 2:	teckcoal@equisonline.com			x
Address	Box 2003			Address	6125 12 St NE			Email 3:	drake.tymstra@teck.com	x	x	
	15km North Hwy 43							Email 4:	shanise.fossen@teck.com	x	x	
								Email 5:	tanya.dick@teck.com	x	x	
City	Sparwood	Province	BC	City	Calgary	Province	AB	PO number	VPO00741384			
Postal Code	V0B 2G0	Country	Canada	Postal Code	T2H 2K1	Country	Canada					
Phone Number	250-425-6111			Phone Number	403-253-7121							

SAMPLE DETAILS

2021/08/11
14:00
Bear Paw
SC/SA
15x20L carboys
NoS/NoE
Good Condition
Week 1

ANALYSIS REQUESTED — Filtered - F: Field, L: Lab, FL: Field & Lab, N: None

Sample ID	Sample Location	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	Filt.	PRESERV.	ANALYSIS: 7-d C.dubia P/F	72-hr P. subcapitata P/F	30-d fathead minnow P/F	
								N	N	N	N	N	
LC_DCDS_WS_2021-08-10_N 2021-1890	LC_DCDS	WS	No	10-Aug-21	10:10	G	3					x	12.3°C
LC_LC3_WS_2021-08-10_N 2021-1888	LC_LC3	WS	No	10-Aug-21	09:30	G	3					x	12.4°C
LC_SLC_WS_2021-08-10_N 2021-1889	LC_SLC	WS	No	10-Aug-21	09:09	G	3					x	11.8°C
LC_LC5_WS_2021-08-10_N 2021-1891	LC_LC5	WS	No	10-Aug-21	12:00	G	3					x	13.1°C
LC_LCDSSLCC_WS_2021-08-10_N 2021-1887	LC_LCDSSLCC	WS	No	10-Aug-21	10:40	G	3					x	10.8°C

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
Please provide prelimnary update as results are available	S.Fossen	2021/08/10		

NB OF BOTTLES RETURNED/DESCRIPTION	
Regular (default)	X
Priority (2-3 business days) - 50% surcharge	
Emergency (1 Business Day) - 100% surcharge	
For Emergency <1 Day, ASAP or Weekend - Contact ALS	

Sampler's Name	S.Fossen	Mobile #	O: 250-425-3196 / C: 780-223-8222
Sampler's Signature	S Fossen	Date/Time	August 10, 2021

Teck

COC ID: **2021-08-10 CHRONIC TOX** | TURNAROUND TIME: regular | RUSH:

CLIENT/CLIENT INFO				LABORATORY				OTHER INFO				
Facility Name	Greenhills Operations			Lab Name	Nautilus Environmental			EDD delivery:				
Project Manager	Jeremy Enns			Lab Contact	Armando			Email 1:				
Email	jeremy.enns@teck.com			Email				Email 2:				
Address	PO Box 5000			Address	8664 Commerce Court			Email 3:	teckcoal@equisonline.com	x	x	X
								Email 4:				
City	Elkford	Province	BC	City	Burnaby	Province	BC	Email 5:				
Postal Code	V0B 1H0	Country	Canada	Postal Code	V5A 4N7	Country	Can	Email 6:	DL-Equis-GHO-Field@teck.com	X	X	X
Phone Number	250 865 3274			Phone Number	403.253.7121			PO number	610307			

SAMPLE DETAILS

ANALYSIS REQUESTED

Please indicate below Filtered, Perserved or both (F, P, F/P)

Sample ID	Sample Location	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	ANALYSIS	#N/A 7-d C.dubia P/F 211567	#N/A 72-hr P. subcapitata P/F 211566	#N/A 30-d embryo EA P/F	#N/A 28-d Hyalella P/F 211568	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
GH_ER2_WS_2021-08-10_N	GH_ER2	WS	N	10-Aug	10:45	G	1		X	X		X								15.8
GH_ERC_WS_2021-08-10_N	GH_ERC	WS	N	10-Aug	11:45	G	1		X	X		X								16.4
GH_FR1_WS_2021-08-10_N	GH_FR1	WS	N	10-Aug	9:30	G	1		X	X		X								15.3

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	Date	Time	Accepted By/Affiliation	Date	Time
				Tyson Hamilton	Aug. 11/21	0:11:15
				Nautilus - Burnaby	Q3-W1	

SERVICE REQUEST (rush - subject to availability)

Regular (default)	X	Sampler's Name	JM/EO/IDY	Mobile #	
Priority (2-3 business days) - 50% surcharge		Sampler's Signature		Date/Time	AUG 10 2021
Emergency (1 Business Day) - 100% surcharge					
For Emergency <1 Day, ASAP or Weekend - Contact ALS					

Teck

COC ID:	Q3_CHRONIC_08102021_Burn	TURNAROUND TIME:	Regular	RUSH:	No

PROJECT/CLIENT INFO				LABORATORY				OTHER INFO				
Facility Name / Job#	Coal Mountain Operations			Lab Name	Nautilus Environmental			Report Format / Distribution		Excel	PDF	EDD
Project Manager	Victoria Sharpe			Lab Contact	Armando Tang			Email 1:	Jay.jones@teck.com	X	X	X
Email	Victoria.Sharpe@teck.com			Email	armando@nautilusenvironmental.ca			Email 2:	teckcoal@equisonline.com			X
								Email 3:	Victoria.Sharpe@teck.com	X	X	X
								Email 4	Don.Sacino@teck.com	X	X	X
Address	PO Box 3000			Address	8664 commerce Court			Email 5:	Shelby.Holden@teck.com	X	X	X
City	Sparwood	Province	BC	City	Burnaby	Province	BC	PO number				
Postal Code	V0B 2G0	Country	Canada	Postal Code	V5A 4N7	Country	Canada					
Phone Number	1-250-425-7522			Phone Number	604-420-8773							

SAMPLE DETAILS								ANALYSIS REQUESTED												Filtered - F: Field, L: Lab, FL: Field & Lab, N: None					
								Filt.																	
								PRESERV.	211567	211564	211566		211568	211565											
Sample ID	Sample Location	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	ANALYSIS	7-d C.dubia P/F	7-d C.dubia P/F (EDTA)	72-hr P. subcapitata P/F	30-d embryo EA P/F	28-d Hyalella P/F	28-d Hyalella P/F (EDTA)											
CM_MC2_WS_2021-08-10_N	CM_MC2	WS	No	8/10/2021	12:07	G	2		x	x	x		x	x									14.9	15.2	
CM_MC1_WS_2021-08-10_N	CM_MC1	WS	No	8/10/2021	11:04	G	1		x		x		x												14.0
RG_MIDAG_WS_2021-08-10_N	RG_MIDAG	WS	No	8/10/2021	11:30	G	2		x	x			x	x									14.3	14.6	

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
			Tyson Hamilton	Aug. 11/21 @ 11:18
			Nautilus - Burnaby	Q3-W1

NB OF BOTTLES RETURNED/DESCRIPTION					
Regular (default)	X	Sampler's Name	SH/DS/KS	Mobile #	250 425 7522
Priority (2-3 business days) - 50% surcharge					
Emergency (1 Business Day) - 100% surcharge		Sampler's Signature		Date/Time	August 10, 2021
For Emergency <1 Day, ASAP or Weekend - Contact ALS					

Teck

COC ID:	20210810CRN3B	TURNAROUND TIME:		RUSH:	

PROJECT/CLIENT INFO				LABORATORY				OTHER INFO				
Facility Name / Job#	Elkview Operations			Lab Name	Nautilus Environmental			Report Format / Distribution		Excel	PDF	EDD
Job Description	Q3 Chronic Toxicity Sampling			Lab Contact	Jeslin Wijaya			Email 1:	kennedy.allen@teck.com	X	X	X
Project Manager	Jennifer Dane			Email	[illegible]			Email 2:	teckcoal@equisonline.com			X
Email	Jennifer.dane@teck.com			Address	8664 Commerce Court			Email 3:	chris.emslie@teck.com	X	X	X
Address	RR#1 HWY# 3				Imperial Square Lake City			Email 4:	Teck.Lab.Results@teck.com	X	X	X
								Email 5:	jennifer.dane@teck.com	X	X	X
City	Sparwood	Province	BC	City	Burnaby	Province	BC	Email 6:	colby.bracken@teck.com	X	X	X
Postal Code	V1C 4C3	Country	Canada	Postal Code	V5A 4N7	Country	Canada	PO number	VPO00678876			
Phone Number	1-250-425-8137			Phone Number	604-420-8773							

SAMPLE DETAILS / **ANALYSIS REQUESTED**

Filtered : F: Field, L: Lab, FL: Field & Lab, N: None

Sample ID	Sample Location	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	ANALYSIS	7-d C.dubia P/F	72-hr P. subcapitata P/F	28-d Hyalella P/F	30-d fathead minnow P/F						
FILTERED									No	No	No	No						
PRESERVED									No	No	No	No						
EV_HC1_WS_2021_Q3_WK1_N	EV_HC1	WS	N	8/10/2021	9:46	G	1		1	1	1							13.0
EV_MC2_WS_2021_Q3_WK1_N	EV_MC2	WS	N	8/10/2021	10:44	G	1		1	1	1							12.8
									211567	211568	211568							
									211567	211568	211568							
					Total		2		211567	211568	211568							

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
Toxicity 96-Hr/48-HR = 96 Hr Rainbow Trout pass/fail & 48 Hr Daphnia pass/fail (Daphinia testing to occur at 20 degrees)	C. Emslie/S. Hansen	10-Aug-21	Tyrone Hamilton Nautilus - Burnaby	Aug. 11/21 @11:15 Q3-W1

NB OF BOTTLES RETURNED/DESCRIPTION					
Regular (default)	X	Sampler's Name	C. Emslie/S. Hansen	Mobile #	1-250-423-0826
Priority (2-3 business days) - 50% surcharge		Sampler's Signature		Date/Time	August 10, 2021
Emergency (1 Business Day) - 100% surcharge					
For Emergency <1 Day, ASAP or Weekend - Contact ALS					

Teck

COC ID: 8/10/2021 | TURNAROUND TIME: | RUSH:

PROJECT/CLIENT INFO				LABORATORY				OTHER INFO			
Facility Name / Job#	Fording River Operation			Lab Name	Nautilus Environmental - BC			Report Format / Distribution		Excel	PDF	EDD
Project Manager	Scott Roughead			Lab Contact				Email 1:	david.burroughs@teck.com	X	X	X
Email	scott.roughead@teck.com			Email	BCinfo@nautilusenvironmental.ca			Email 2:	britt.anderson@teck.com	X	X	X
Address				Address	8664 Commerce Court			Email 3:	scott.roughead@teck.com	X	X	X
								Email 4:	cruz.canlas@teck.com	X	X	X
City	Elkford	Province	BC	City	Burnaby	Province	BC	Email 5:	jamie.walsh@teck.com	X	X	X
Postal Code		Country	Canada	Postal Code	V5A 4N7	Country	Canada	Email 6:	teckcoal@equisonline.com			X
Phone Number	1-250-433-6976			Phone Number	604-420-8773			VPO00741382				

SAMPLE DETAILS / ANALYSIS REQUESTED (Filtered - F: Field, L: Lab, FL: Field & Lab, N: None)

Sample ID	Sample Location (sys_loc_code)	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	Filt.	PRESERV.	ANALYSIS: 7-d C.dubia P/F	7-d C.dubia P/F (EDTA)	72-hr P. subcapitata P/F	30-d embryo EA P/F	28-d Hyalella P/F	28-d Hyalella P/F (EDTA)						
								NO	NO												
FR_FRCP1_MON_2021-08-09_N	FR_FRCP1	WS	NO	8/10/2021	9:55	G	2			X	X	X		X	X					12.1	12.4
FR_FRABCH_MON_2021-08-09_N	FR_FRABCH	WS	NO	8/10/2021	10:35	G	1			X		X		X							13.6
FR_UFR1_MON_2021-08-09_N	FR_UFR1	WS	NO	8/10/2021	8:54	G	1			X		X		X							12.8
										211567	211564	211566		211568	211565						

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
2 COOLERS TOTAL	Cruz Canlas	August 10, 2021	~~Avg~~. Tyme Hamilton	Aug. 11/21 @ 11:13
			Nautilus - Burnaby	Q3-W1

SERVICE REQUEST (rush - subject to availability)					
Regular (default)	X	Sampler's Name	Cruz Canlas	Mobile #	250 433 6166
Priority (2-3 business days) - 50% surcharge		Sampler's Signature		Date/Time	August 10, 2021
Emergency (1 Business Day) - 100% surcharge					
For Emergency <1 Day, ASAP or Weekend - Contact ALS					

Teck

Page 1 of 1

BORN

COC ID:	8/10/2021	TURNAROUND TIME:		RUSH:	

PROJECT/CLIENT INFO				LABORATORY				OTHER INFO				
Facility Name / Job#	Fording River Operation			Lab Name	Nautilus Environmental - BC			Report Format / Distribution		Excel	PDF	EDD
Project Manager	Scott Roughead			Lab Contact				Email 1:	david.burroughs@teck.com	X	X	X
Email	scott.roughead@teck.com			Email	BCinfo@nautilusenvironmental.ca			Email 2:	cruz.canlas@teck.com	X	X	X
Address				Address	8664 Commerce Court			Email 3:	scott.roughead@teck.com	X	X	X
								Email 4:	teckcoal@equisonline.com			X
City	Elkford	Province	BC	City	Burnaby	Province	BC	Email 5:	jessica.ritz@teck.com	X	X	X
Postal Code		Country	Canada	Postal Code	V5A 4N7	Country	Canada	Email 6:	cait.good@teck.com	X	X	X
Phone Number	1-250-433-6976			Phone Number	604-420-8773			Email 7:	jamie.walsh@teck.com	X	X	X

SAMPLE DETAILS / ANALYSIS REQUESTED (Filtered - F: Field, L: Lab, FL: Field & Lab, N: None)

Sample ID	Sample Location (sys loc code)	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	FIL	PRESERV	ANALYSIS: 7-d C.dubia P/F	7-d C.dubia P/F (EDTA)	72-hr P. subcapitata P/F	30-d embryo EA P/F	28-d Hyalella P/F	28-d Hyalella P/F (EDTA)					
FR_FR4_WS_2021-08-10_N	FR_FR4	WS	NO	8/10/2021	10:00	G	1			X				X						15.6
FR_FRRD_WS_2021-08-10_N	FR_FRRD	WS	NO	8/10/2021	8:25	G	1			X				X						16.8
FR_FR2_WS_2021-08-10_N	FR_FR2	WS	NO	8/10/2021	10:54	G	1			X				X						15.9
FR_MULTIPLATE_WS_2021-08-10_NP	FR_MULTIPLATE	WS	NO	8/10/2021	11:57	G	1			X				X						16.9
										21 1567				21 1568						

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
			Tyrone Hamilton	Aug. 11/21 @ 11:15
			Nautilus - Burnaby	Q3-41

SERVICE REQUEST (rush - subject to availability)					
Regular (default)	X	Sampler's Name	Tyler Foltin	Mobile #	
Priority (2-3 business days) - 50% surcharge		Sampler's Signature		Date/Time	2021-08-10
Emergency (1 Business Day) - 100% surcharge					
For Emergency <1 Day, ASAP or Weekend - Contact ALS					

Teck

COC ID:	20210810 Chronic Tox Burn	TURNAROUND TIME:		RUSH:	

PROJECT/CLIENT INFO				LABORATORY				OTHER INFO				
Facility Name / Job#	Line Creek Operation			Lab Name	Nautilus Environmental			Report Format / Distribution		Excel	PDF	EDD
Project Manager	Tom Jeffery			Lab Contact	Armando Tang			Email 1:	tom.jeffery@teck.com	x	x	
Email	tom.jeffery@teck.com			Email	armando@nautilusenvironmental.com			Email 2:	teckcoal@equisonline.com			x
Address	Box 2003			Address	8664 Commerce Crt			Email 3:	drake.tymstra@teck.com	x	x	
	15km North Hwy 43							Email 4:	shanise.fossen@teck.com	x	x	
								Email 5:	tanya.dick@teck.com	x	x	
City	Sparwood	Province	BC	City	Burnaby	Province	BC	PO number	VPO00741384			
Postal Code	V0B 2G0	Country	Canada	Postal Code	V5A 4N7	Country	Canada					
Phone Number	250-425-6111			Phone Number	604-420-8773							

SAMPLE DETAILS								ANALYSIS REQUESTED											Filtered - F: Field, L: Lab, FL: Field & Lab, N: None
								FIL	N	N	N								
								PRESERV.	N	N	N								
Sample ID	Sample Location	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	ANALYSIS	7-d C.dubia P/F 211567	72-hr P. subcapitata P/F 211566	28-d Hyalella P/F 211568								
LC_DCDS_WS_2021-08-10_N	LC_DCDS	WS	No	10-Aug-21	10:10	G	1		x	x	x								10.8
LC_LC3_WS_2021-08-10_N	LC_LC3	WS	No	10-Aug-21	9:30	G	1		x	x	x								9.8
LC_SLC_WS_2021-08-10_N	LC_SLC	WS	No	10-Aug-21	9:09	G	1		x	x	x								11.2
LC_LC5_WS_2021-08-10_N	LC_LC5	WS	No	10-Aug-21	12:00	G	1		x	x	x								11.8
LC_LCDSSLCC_WS_2021-08-10_N	LC_LCDSSLCC	WS	No	10-Aug-21	10:40	G	1		x	x	x								12.1

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
Please provide prelimnary update as results are available	S.Fossen	8/10/2021	Tyrone Hamilton	Aug. 11/21 @ 11:15
			Nautilus - Burnaby	Q3-41

NB OF BOTTLES RETURNED/DESCRIPTION						
Regular (default)	X	Sampler's Name	S.Fossen	Mobile #	O: 250-425-3196 / C: 780-223-8222	
Priority (2-3 business days) - 50% surcharge						
Emergency (1 Business Day) - 100% surcharge		Sampler's Signature	S Fossen	Date/Time	August 10, 2021	
For Emergency <1 Day, ASAP or Weekend - Contact ALS						

Teck

COC ID:	8/17/2021	TURNAROUND TIME:		RUSH:	

PROJECT/CLIENT INFO				LABORATORY				OTHER INFO				
Facility Name / Job#	Fording River Operation			Lab Name	HydroQual Laboratories Ltd.			Report Format / Distribution		Excel	PDF	EDD
Project Manager	Scott Roughead			Lab Contact				Email 1:	david.burroughs@teck.com	X	X	X
Email	Scott.Roughead@teck.com			Email	ABinfo@nautilusenvironmental.ca			Email 2:	britt.anderson@teck.com	X	X	X
Address	PO Box 100			Address	#4, 6125 12 Street SE			Email 3:	scott.roughead@teck.com	X	X	X
								Email 4:	teckcoal@equisonline.com			X
City	Elkford	Province	BC	City	Calgary	Province	AB	Email 5:	cruz.canlas@teck.com	X	X	X
Postal Code	V0B 1H0	Country	Canada	Postal Code	?T2H 2K1	Country	Canada	Email 6:	jamie.walsh@teck.com	X	X	X
Phone Number	1-250-865-5195			Phone Number	403-253-7121			PO:	VPO00741382			

SAMPLE DETAILS

2021/08/18
14:40
Bear Paw
JC/AE
6x20L carboys
N05/N06
Good Condition
Week 2

ANALYSIS REQUESTED — Filtered - F: Field, L: Lab, FL: Field & Lab, N: None

Sample ID	Sample Location (sys_loc_code)	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	30-d fathead minnow P/F		
								Filt.	N	N	N
								PRESERV.	NONE	NONE	NONE
FR_FRCP1_WEK_2021-08-16_N 2021-1872	FR_FRCP1	WS	NO	8/17/2021	9:53	G	2	x	11.5°C	
FR_FRABCH_WS_2021-08-16_N 2021-1874	FR_FRABCH	WS	NO	8/17/2021	9:12	G	2	x	9.8°C	
FR_UFR1_WEK_2021-08-16_N 2021-1873	FR_UFR1	WS	NO	8/17/2021	10:43	G	2	x	10.9°C	

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
	Cruz Canlas	August 17, 2021		

SERVICE REQUEST (rush - subject to availability)

Regular (default)	X
Priority (2-3 business days) - 50% surcharge	
Emergency (1 Business Day) - 100% surcharge	
For Emergency <1 Day, ASAP or Weekend - Contact ALS	

Sampler's Name	Cruz Canlas	Mobile #	250 433 6166
Sampler's Signature	[signature]	Date/Time	August 17, 2021

Teck

COC ID: 8/17/2021 | TURNAROUND TIME: | RUSH:

PROJECT/CLIENT INFO				LABORATORY				OTHER INFO			
Facility Name / Job#	Fording River Operation			Lab Name	Nautilus Environmental Labs Calgary			Report Format / Distribution		Excel	PDF	EDD
Project Manager	Scott Roughead			Lab Contact				Email 1:	david.burroughs@teck.com	X	X	X
Email	Scott.Roughead@teck.com			Email	ABinfo@nautilusenvironmental.ca			Email 2:	cruz.canlas@teck.com	X	X	X
Address	PO Box 100			Address	#4, 6125 12 Street SE			Email 3:	scott.roughead@teck.com	X	X	X
								Email 4:	teckcoal@equisonline.com			X
City	Elkford	Province	BC	City	Calgary	Province	AB	Email 5:	jessica.ritz@teck.com	X	X	X
Postal Code	V0B 1H0	Country	Canada	Postal Code	?T2H 2K1	Country	Canada	Email 6:	cait.good@teck.com	X	X	X
Phone Number	1-250-865-5195			Phone Number	403-253-7121			Email 7:	jamie.walsh@teck.com	X	X	X

2021/08/18
14:40
Bear Paw
2c/AE
8x20L carboys
NOS/NPI
Good condition
Week 2

SAMPLE DETAILS | ANALYSIS REQUESTED (Filtered - F: Field, L: Lab, FL: Field & Lab, N: None)

Sample ID	Sample Location (sys_loc_code)	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	Filt.	PRESERV.	ANALYSIS: 30-d fathead minnow P/F											
								N	N	N	N										
								NONE	NONE	NONE	NONE										
FR_FR4_WS_2021-08-17_N / 2021-1875	FR_FR4	WS	NO	17-Aug-21	10:15	G	2			X	9.4°C										
FR_FRRD_WS_2021-08-17_N / 2021-1878	FR_FRRD	WS	NO	17-Aug-21	8:40	G	2			X	7.6°C										
FR_FR2_WS_2021-08-17_N / 2021-1876	FR_FR2	WS	NO	17-Aug-21	11:20	G	2			X	9.4°C										
FR_MULTIPLATE_WS_2021-08-17_NP / 2021-1877	FR_MULTIPLATE	WS	NO	17-Aug-21	12:55	G	2			X	9.3°C										

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME

SERVICE REQUEST (rush - subject to availability)

Regular (default)	X
Priority (2-3 business days) - 50% surcharge	
Emergency (1 Business Day) - 100% surcharge	
For Emergency <1 Day, ASAP or Weekend - Contact ALS	

Sampler's Name	Daniel Wiens	Mobile #	
Sampler's Signature		Date/Time	Aug 17/21 13:45

Teck

Page 1 of 1

COC ID:	2021-08-17-Chronic-Tox	Phone Number		RUSH:	NO

PROJECT/CLIENT INFO				LABORATORY				OTHER INFO			
Facility Name / Job#	Greenhills Operation			Lab Name	Hydrocoral Laboratories Ltd			Format / Distribution	Excel	PDF	EDD
Project Manager	Jeremy Enns			Lab Contact	Jacki [illegible]			Email 1:			
Email	jeremy.enns@teck.com			Email				Email 2:			
Address	P.O. BOX 5000			Address	#4, 6125 - 12th Street S.E.			Email 3:	teckcoal@equisonline.com			X
								Email 4:			
City	Elkford	Province	BC	City	Calgary	Province	AB	Email 5:			
Postal Code	V0B1H0	Country	Canada	Postal Code	T2H 2K1	Country	Can	Email 6:	DL-Equis-GHO-Field@teck.com	X	X	X
Phone Number	250-865-3048			Phone Number	403-253-7121			Email 7:			
								PO number	740426		

2021/08/16
14:40
Bear Pond
JC/AE
6x20L ~~20~~ carboys
NoS/NGT
Good Condition
Week 2

Sample ID			Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	Filt.	PRESERV.	ANALYSIS: 7-d C.dubia P/F	72-hr P. subcapitata P/F	30-d fathead minnow P/F	
GH_FR1_WS_2021-08-17_N	2021-1879	GH_FR1	WS	N	8/17/2021	13:00	G	2					X	6.6°C
GH_ERC_WS_2021-08-17_N	2021-1880	GH_ERC	WS	N	8/17/2021	12:15	G	2					X	9.1°C
GH_ER2_WS_2021-08-17_N	2021-1881	GH_ER2	WS	N	8/17/2021	10:20	G	2					X	7.8°C

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME

SERVICE REQUEST (rush - subject to availability)					
Regular (default)	X	Sampler's Name	JM/HS/IDY	Mobile #	
Priority (2-3 business days) - 50% surcharge					
Emergency (1 Business Day) - 100% surcharge		Sampler's Signature		Date/Time	AUG 17 2021
For Emergency <1 Day, ASAP or Weekend - Contact ALS					

Teck

COC ID: 20210817CRN3C | TURNAROUND TIME: | RUSH:

PROJECT/CLIENT INFO

Facility Name / Job#	Elkview Operations
Job Description	Q3 Chronic Toxicity Sampling
Project Manager	Jennifer Dane
Email	jennifer.dane@teck.com
Address	RR#1 HWY# 3
City	Sparwood
Province	BC
Postal Code	V1C 4C3
Country	Canada
Phone Number	1-250-425-8137

LABORATORY

Lab Name	Nautilus Environmental
Lab Contact	Jacklyn Poole
Email	Jacklyn@nautilusenvironmental.ca
Address	6125 12st SE
City	Calgary
Province	AB
Postal Code	T2H 2K1
Country	Canada
Phone Number	403-253-7121

OTHER INFO

Report Format / Distribution		Excel	PDF	EDD
Email 1:	kennedy.allen@teck.com	X	X	X
Email 2:	teckcoal@equisonline.com			X
Email 3:	chris.emslie@teck.com	X	X	X
Email 4:	Teck.Lab.Results@teck.com	X	X	X
Email 5:	jennifer.dane@teck.com	X	X	X
Email 6:	colby.bracken@teck.com	X	X	X
PO number	VPO00678876			

SAMPLE DETAILS | **ANALYSIS REQUESTED** (Filtered - F: Field, L: Lab, FL: Field & Lab, N: None)

Sample ID	Sample Location	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	ANALYSIS	7-d C.dubia P/F	72-hr P. subcapitata P/F	30-d embryo EA P/F	30-d fathead minnow P/F
								FILTERED	No	No	No	No
								PRESERVED	No	No	No	No
2021-1882												
EV_HC1_WS_2021_Q3_WK2_N	EV_HC1	WS	N	8/17/2021	12:30	G	2		9.9C			1
EV_MC2_WS_2021_Q3_WK2_N	EV_MC2	WS	N	8/17/2021	13:17	G	2		9.9C			1
2021-1883												
2021/08/18 14:40 Bear Paw SC/AF 4x20L carboys N68/N67 Good Condition Week 2												
					Total		4					

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
Toxicity 96-Hr/48-HR = 96 Hr Rainbow Trout pass/fail & 48 Hr Daphnia pass/fail (Daphinia testing to occur at 20 degrees)	C. Emslie/S. Hansen	17-Aug-21		

NB OF BOTTLES RETURNED/DESCRIPTION

Regular (default)	X
Priority (2-3 business days) - 50% surcharge	
Emergency (1 Business Day) - 100% surcharge	
For Emergency <1 Day, ASAP or Weekend - Contact ALS	

Sampler's Name	C. Emslie/S. Hansen	Mobile #	1-250-423-0826
Sampler's Signature		Date/Time	August 17, 2021

Teck

COC ID:	Q3_CHRONIC_08172021_CAL	TURNAROUND TIME:	Regular	RUSH:	NO

PROJECT/CLIENT INFO

Facility Name / Job#	Coal Mountain Operations		
Project Manager	Jay Jones		
Email	Jay.Jones@teck.com		
Address	PO Box 3000		
City	Sparwood	Province	BC
Postal Code	V0B 2G0	Country	Canada
Phone Number	1-250-425-7321		

LABORATORY

Lab Name	Hydroqual Laboratories		
Lab Contact	Jacklyn Poole		
	Tamara		
Email	jacklyn@nautilusenvironmental.ca		
	tamara@nautilusenvironmental.ca		
Address	#4, 6125-12th Street S.E.		
City	Calgary	Province	AB
Postal Code	T2H 2K1	Country	Canada
Phone Number	403-253-7121		

OTHER INFO

Report Format / Distribution		Excel	PDF	EDD
Email 1:	Victoria.Sharpe@teck.com	X	X	X
Email 2:	teckcoal@equisonline.com			X
Email 3:	Jay.jones@teck.com	X	X	X
Email 4	Don.Sacino@teck.com	X	X	X
Email 5:	Shelby.Holden@teck.com	X	X	X
PO number				

SAMPLE DETAILS

2021/08/18
14:40
Bear Paw
3C/1F
6x20L carboys
NoS/NoI
Good Condition
Week 2

ANALYSIS REQUESTED

Filtered - F: Field, L: Lab, FL: Field & Lab, N: None

Sample ID		Sample Location	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	Filt.	PRESERV.	ANALYSIS: 30-d fathead minnow P/F											
CM_MC2_WS_2021-08-17_N	2021-1884	CM_MC2	WS	No	8/17/2021		G	2			X			6.6°C								
CM_MC1_WS_2021-08-17_N	2021-1885	CM_MC1	WS	No	8/17/2021		G	2			X			8.9°C								
RG_MIDAG_WS_2021-08-17_N	2021-1886	RG_MIDAG	WS	No	8/17/2021		G	2			X			8.9°C								

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME

NB OF BOTTLES RETURNED/DESCRIPTION

Regular (default)	X
Priority (2-3 business days) - 50% surcharge	
Emergency (1 Business Day) - 100% surcharge	
For Emergency <1 Day, ASAP or Weekend - Contact ALS	

Sampler's Name	KS/DS	Mobile #	250 425 7522
Sampler's Signature		Date/Time	August 17, 2021

Teck

COC ID: 20210817 Chronic Tox Calg

TURNAROUND TIME:

RUSH:

PROJECT/CLIENT INFO

Facility Name / Job#	Line Creek Operation		
Project Manager	Tom Jeffery		
Email	tom.jeffery@teck.com		
Address	Box 2003		
	15km North Hwy 43		
City	Sparwood	Province	BC
Postal Code	V0B 2G0	Country	Canada
Phone Number	250-425-6111		

LABORATORY

Lab Name	Nautilus Environmental		
Lab Contact	Jeslin Wijaya		
Email	jeslin@nautilusenvironmental.ca		
Address	6125 12 St NE		
City	Calgary	Province	AB
Postal Code	T2H 2K1	Country	Canada
Phone Number	403-253-7121		

OTHER INFO

Report Format / Distribution		Excel	PDF	EDD
Email 1:	tom.jeffery@teck.com	x	x	
Email 2:	teckcoal@equisonline.com			x
Email 3:	drake.tymstra@teck.com	x	x	
Email 4:	shanise.fossen@teck.com	x	x	
Email 5:	tanya.dick@teck.com	x	x	
PO number	VPO00741384			

SAMPLE DETAILS

2021/08/18
14:40
Bear Paw
BC/AE
10x20L carboys
NoS/NeT
Good Condition

ANALYSIS REQUESTED

Filtered - F: Field, L: Lab, FL: Field & Lab, N: None

Sample ID	Sample Location	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	FIL.	PRESERV.	ANALYSIS: 7-d C.dubia P/F	72-hr P. subcapitata P/F	30-d fathead minnow P/F	
								N	N	N	N	N	
LC_DCDS_WS_2021-08-17_N	2021-1890 LC_DCDS	WS	No	17-Aug-21	11:00	G	2					x	6.4°C
LC_LC3_WS_2021-08-17_N	~~2021-1890~~ 1888 LC_LC3	WS	No	17-Aug-21		G	2					x	7.6°C
LC_SLC_WS_2021-08-17_N	2021-1889 LC_SLC	WS	No	17-Aug-21		G	2					x	5.6°C
LC_LC5_WS_2021-08-17_N	2021-1891 LC_LC5	WS	No	17-Aug-21	8:25	G	2					x	6.8°C
LC_LCDSSLCC_WS_2021-08-17_N	2021-1887 LC_LCDSSLCC	WS	No	17-Aug-21		G	2					x	5.7°C

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
Please provide prelimnary update as results are available	T. Dick	8/17/2021		

NB OF BOTTLES RETURNED/DESCRIPTION

Regular (default)	X
Priority (2-3 business days) - 50% surcharge	
Emergency (1 Business Day) - 100% surcharge	
For Emergency <1 Day, ASAP or Weekend - Contact ALS	

Sampler's Name	T. Dick	Mobile #	O: 250-425-3196 / C: 780-223-8222
Sampler's Signature	T Dick	Date/Time	August 17, 2021

Teck

COC ID:	Q3_CHRONIC_08172021_Burn	TURNAROUND TIME:	Regular	RUSH:	No

PROJECT/CLIENT INFO				LABORATORY				OTHER INFO				
Facility Name / Job#	Coal Mountain Operations			Lab Name	Nautilus Environmental			Report Format / Distribution		Excel	PDF	EDD
Project Manager	Victoria Sharpe			Lab Contact	Armando Tang			Email 1:	Jay.jones@teck.com	X	X	X
Email	Victoria.Sharpe@teck.com			Email	armando@nautilusenvironmental.ca			Email 2:	teckcoal@equisonline.com			X
								Email 3:	Victoria.Sharpe@teck.com	X	X	X
								Email 4	Don.Sacino@teck.com	X	X	X
Address	PO Box 3000			Address	8664 commerce Court			Email 5:	Shelby.Holden@teck.com	X	X	X
City	Sparwood	Province	BC	City	Burnaby	Province	BC	PO number				
Postal Code	V0B 2G0	Country	Canada	Postal Code	V5A 4N7	Country	Canada					
Phone Number	1-250-425-7522			Phone Number	604-420-8773							

SAMPLE DETAILS								ANALYSIS REQUESTED											Filtered - F: Field, L: Lab, FL: Field & Lab, N: None	
								Filt.												
								PRESERV.						211568	211565					
Sample ID	Sample Location	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	ANALYSIS	7-d C.dubia P/F	7-d C.dubia P/F (EDTA)	72-hr P. subcapitata P/F	30-d embryo EA P/F	28-d Hyalella P/F	28-d Hyalella P/F (EDTA)						
CM_MC2_WS_2021-08-17_N	CM_MC2	WS	No	8/17/2021		G	2						x	x					8.9	9.4
CM_MC1_WS_2021-08-17_N	CM_MC1	WS	No	8/17/2021		G	1						x							8.7
RG_MIDAG_WS_2021-08-17_N	RG_MIDAG	WS	No	8/17/2021		G	2						x	x					9.3	9.4

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
			Tyrone Hamilton	Aug. 18/21 @ 11:27
			Nautilus - Burnaby	Q3-W2

NB OF BOTTLES RETURNED/DESCRIPTION	
Regular (default)	X
Priority (2-3 business days) - 50% surcharge	
Emergency (1 Business Day) - 100% surcharge	
For Emergency <1 Day, ASAP or Weekend - Contact ALS	

Sampler's Name	DS/KS	Mobile #	250 425 7522
Sampler's Signature		Date/Time	August 17, 2021

Teck

COC ID: 20210817CRN3B | TURNAROUND TIME: | RUSH:

PROJECT/CLIENT INFO				LABORATORY				OTHER INFO				
Facility Name / Job#	Elkview Operations			Lab Name	Nautilus Environmental			Report Format / Distribution		Excel	PDF	EDD
Job Description	Q3 Chronic Toxicity Sampling			Lab Contact	Jeslin Wijaya			Email 1:	kennedy.allen@teck.com	X	X	X
Project Manager	Jennifer Dane			Email	[illegible]			Email 2:	teckcoal@equisonline.com			X
Email	jennifer.dane@teck.com			Address	8664 Commerce Court			Email 3:	chris.emslie@teck.com	X	X	X
Address	RR#1 HWY# 3				Imperial Square Lake City			Email 4:	Teck.Lab.Results@teck.com	X	X	X
								Email 5:	jennifer.dane@teck.com	X	X	X
City	Sparwood	Province	BC	City	Burnaby	Province	BC	Email 6:	colby.bracken@teck.com	X	X	X
Postal Code	V1C 4C3	Country	Canada	Postal Code	V5A 4N7	Country	Canada	PO number	VPO00678876			
Phone Number	1-250-425-8137			Phone Number	604-420-8773							

SAMPLE DETAILS / ANALYSIS REQUESTED (Filtered - F: Field, L: Lab, FL: Field & Lab, N: None)

Sample ID	Sample Location	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	ANALYSIS	7-d C.dubia P/F	72-hr P. subcapiiata P/F	28-d Hyalella P/F	30-d fathead minnow P/F						
FILTERED									No	No	No	No						
PRESERVED									No	No	No	No						
EV_HC1_WS_2021_Q3_WK2_N	EV_HC1	WS	N	8/17/2021	12:30	G	1				1							7.6
EV_MC2_WS_2021_Q3_WK2_N	EV_MC2	WS	N	8/17/2021	13:17	G	1				1							7.4
											21568							
					Total		2				21							

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
Toxicity 96-Hr/48-HR = 96 Hr Rainbow Trout pass/fail & 48 Hr Daphnia pass/fail (Daphinia testing to occur at 20 degrees)	C. Emslie/S. Hansen	17-Aug-21	Tyrone Hamilton Nautilus - Burnaby	Aug. 18/21 @ 11:27 Q3-W2

NB OF BOTTLES RETURNED/DESCRIPTION					
Regular (default)	X	Sampler's Name	C. Emslie/S. Hansen	Mobile #	1-250-423-0826
Priority (2-3 business days) - 50% surcharge		Sampler's Signature		Date/Time	August 17, 2021
Emergency (1 Business Day) - 100% surcharge					
For Emergency <1 Day, ASAP or Weekend - Contact ALS					

Teck

COC ID: 8/17/2021 | TURNAROUND TIME: | RUSH:

PROJECT/CLIENT INFO

Facility Name / Job#	Fording River Operation		
Project Manager	Scott Roughead		
Email	scott.roughead@teck.com		
Address			
City	Elkford	Province	BC
Postal Code		Country	Canada
Phone Number	1-250-433-6976		

LABORATORY

Lab Name	Nautilus Environmental - BC		
Lab Contact			
Email	BCinfo@nautilusenvironmental.ca		
Address	8664 Commerce Court		
City	Burnaby	Province	BC
Postal Code	V5A 4N7	Country	Canada
Phone Number	604-420-8773		

OTHER INFO

Report Format / Distribution		Excel	PDF	EDD
Email 1:	david.burroughs@teck.com	X	X	X
Email 2:	britt.anderson@teck.com	X	X	X
Email 3:	scott.roughead@teck.com	X	X	X
Email 4:	cruz.canlas@teck.com	X	X	X
Email 5:	jamie.walsh@teck.com	X	X	X
Email 6:	teckcoal@equisonline.com			X

VPO00741382

SAMPLE DETAILS / ANALYSIS REQUESTED

Filtered - F: Field, L: Lab, FL: Field & Lab, N: None

Sample ID	Sample Location (sys loc code)	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	FIL	PRESERV.	ANALYSIS: 7-d C.dubia P/F	7-d C.dubia P/F (EDTA)	72-hr P. subcapitata P/F	30-d embryo EA P/F	28-d Hyalella P/F	28-d Hyalella P/F (EDTA)						
								NO	NO	NO	NO	NO	NO	NO	NO						
FR_FRCP1_WEK_2021-08-16_N	FR_FRCP1	WS	NO	8/17/2021	9:53	G	2							x	x					5.3-5.4	
FR_FRABCH_WS_2021-08-16_N	FR_FRABCH	WS	NO	8/17/2021	9:12	G	1							x							3.6
FR_UFR1_WEK_2021-08-16_N	FR_UFR1	WS	NO	8/17/2021	10:43	G	1							x							2.9
														21568	21565						

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS

2 COOLERS TOTAL

RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
Cruz Canlas	August 17, 2021	Tyrone Hamilton	Aug. 18/21 @ 4:~~30~~ 11:27 PM
		Nautilus - Burnaby	@ 3-C/2

SERVICE REQUEST (rush - subject to availability)

Regular (default)	X
Priority (2-3 business days) - 50% surcharge	
Emergency (1 Business Day) - 100% surcharge	
For Emergency <1 Day, ASAP or Weekend - Contact ALS	

Sampler's Name	Cruz Canlas	Mobile #	250 433 6166
Sampler's Signature		Date/Time	August 17, 2021

Teck

COC ID:	8/17/2021	TURNAROUND TIME:		RUSH:	

PROJECT/CLIENT INFO				LABORATORY				OTHER INFO				
Facility Name / Job#	Fording River Operation			Lab Name	Nautilus Environmental - BC			Report Format / Distribution		Excel	PDF	EDD
Project Manager	Scott Roughead			Lab Contact				Email 1:	david.burroughs@teck.com	X	X	X
Email	scott.roughead@teck.com			Email	BCinfo@nautilusenvironmental.ca			Email 2:	cruz.canlas@teck.com	X	X	X
Address				Address	8664 Commerce Court			Email 3:	scott.roughead@teck.com	X	X	X
								Email 4:	teckcoal@equisonline.com			X
City	Elkford	Province	BC	City	Burnaby	Province	BC	Email 5:	jessica.ritz@teck,com	X	X	X
Postal Code		Country	Canada	Postal Code	V5A 4N7	Country	Canada	Email 6:	cait.good@teck.com	X	X	X
Phone Number	1-250-433-6976			Phone Number	604-420-8773			Email 7:	jamie.walsh@teck.com	X	X	X

SAMPLE DETAILS / ANALYSIS REQUESTED

Filtered - F: Field, L: Lab, FL: Field & Lab, N: None

Sample ID	Sample Location (sys loc code)	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	7-d C.dubia P/F	7-d C.dubia P/F (EDTA)	72-hr P. subcapitata P/F	30-d embryo EA P/F	28-d Hyalella P/F	28-d Hyalella P/F (EDTA)						
FR_FR4_WS_2021-08-17_N	FR_FR4	WS	NO	8/17/2021	10:15	G	1	X				X							5.8
FR_FRRD_WS_2021-08-17_N	FR_FRRD	WS	NO	8/17/2021	8:40	G	1	X				X							4.9
FR_FR2_WS_2021-08-17_N	FR_FR2	WS	NO	8/17/2021	11:20	G	1	X				X							5.1
FR_MULTIPLATE_WS_2021-08-17_NP	FR_MULTIPLATE	WS	NO	8/17/2021	12:55	G	1	X				X							4.7
								21567				21568							

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
			Tyrone Nomilton	Aug-18/21 @ 11:27
			Nautilus - Burnaby	Q3-W2

SERVICE REQUEST (rush - subject to availability)					
Regular (default)	X	Sampler's Name	Daniel Nicol	Mobile #	
Priority (2-3 business days) - 50% surcharge					
Emergency (1 Business Day) - 100% surcharge		Sampler's Signature	[signature]	Date/Time	Aug 17/21 13:45
For Emergency <1 Day, ASAP or Weekend - Contact ALS					

Teck

COC ID: **2021-08-17 CHRONIC TOX** | TURNAROUND TIME: regular | RUSH:

PROJECT/CLIENT INFO

Facility Name	Greenhills Operations		
Project Manager	Jeremy Enns		
Email	jeremy.enns@teck.com		
Address	PO Box 5000		
City	Elkford	Province	BC
Postal Code	V0B 1H0	Country	Canada
Phone Number	250 865 3274		

LABORATORY

Lab Name	Nautilus Environmental		
Lab Contact	Armando		
Email			
Address	8664 Commerce Court		
City	Burnaby	Province	BC
Postal Code	V5A 4N7	Country	Can
Phone Number	403.253.7121		

OTHER INFO

EDD delivery:

Email 1:				
Email 2:				
Email 3:	teckcoal@equisonline.com	x	x	x
Email 4:				
Email 5:				
Email 6:	DL-Equis GHO-Field@teck.com	x	x	x

PO number: 610307

SAMPLE DETAILS

ANALYSIS REQUESTED

Please indicate below Filtered, Perserved or both (F, P, F/P)

Sample ID	Sample Location	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	ANALYSIS: 7-d C.dubia P/F	72-hr P. subcapitata P/F	30-d embryo EA P/F	28-d Hyalella P/F 211568								
								#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
GH_ER2_WS_2021-08-17_N	GH_ER2	WS	N	17-Aug	10:20	G	1				X								6.5
GH_ERC_WS_2021-08-17_N	GH_ERC	WS	N	17-Aug	12:15	G	1				X								8.9
GH_FR1_WS_2021-08-17_N	GH_FR1	WS	N	17-Aug	13:00	G	1				X								7.3

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	Date	Time	Accepted By/Affiliation	Date	Time
				Tyrone Hamilton, Nautilus - Burnaby	Aug-18/21 @11:27 Q3-W2	

SERVICE REQUEST (rush - subject to availability)

Regular (default)	X
Priority (2-3 business days) - 50% surcharge	
Emergency (1 Business Day) - 100% surcharge	
For Emergency <1 Day, ASAP or Weekend - Contact ALS	

Sampler's Name	JM/HS/IDY	Mobile #	
Sampler's Signature		Date/Time	AUG 17 2021

Teck

COC ID: 20210817 Chronic Tox Burn | TURNAROUND TIME: | RUSH:

PROJECT/CLIENT INFO				LABORATORY				OTHER INFO				
Facility Name / Job#	Line Creek Operation			Lab Name	Nautilus Environmental			Report Format / Distribution		Excel	PDF	EDD
Project Manager	Tom Jeffery			Lab Contact	Armando Tang			Email 1:	tom.jeffery@teck.com	x	x	
Email	tom.jeffery@teck.com			Email	armando@nautilusenvironmental.com			Email 2:	teckcoal@equisonline.com			x
Address	Box 2003			Address	8664 Commerce Crt			Email 3:	drake.tymstra@teck.com	x	x	
	15km North Hwy 43							Email 4:	shanise.fossen@teck.com	x	x	
								Email 5:	tanya.dick@teck.com	x	x	
City	Sparwood	Province	BC	City	Burnaby	Province	BC	PO number	VPO00741384			
Postal Code	V0B 2G0	Country	Canada	Postal Code	V5A 4N7	Country	Canada					
Phone Number	250-425-6111			Phone Number	604-420-8773							

SAMPLE DETAILS								ANALYSIS REQUESTED											Filtered - F: Field, L: Lab, FL: Field & Lab, N: None
								Filt.	N	N	N								
								PRESERV.	N	N	N								
								ANALYSIS	7-d C.dubia P/F	72-hr P. subcapitata P/F	28-d Hyalella P/F 211568								
Sample ID	Sample Location	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.												
LC_DCDS_WS_2021-08-17_N	LC_DCDS	WS	No	17-Aug-21	11:00	G	1				x								7.4
LC_LC3_WS_2021-08-17_N	LC_LC3	WS	No	17-Aug-21	9:26	G	1				x								8.5
LC_SLC_WS_2021-08-17_N	LC_SLC	WS	No	17-Aug-21	8:50	G	1				x								8.1
LC_LC5_WS_2021-08-17_N	LC_LC5	WS	No	17-Aug-21	8:25	G	1				x								9.4
LC_LCDSSLCC_WS_2021-08-17_N	LC_LCDSSLCC	WS	No	17-Aug-21	9:55	G	1				x								8.1

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
Please provide prelimnary update as results are available	T. Dick	8/17/2021	Tyrone Hamilton	Aug. 18/21 @ 11:27
			Nautilus - Burnaby	Q3-W2

NB OF BOTTLES RETURNED/DESCRIPTION	
Regular (default)	X
Priority (2-3 business days) - 50% surcharge	
Emergency (1 Business Day) - 100% surcharge	
For Emergency <1 Day, ASAP or Weekend - Contact ALS	

Sampler's Name	T. Dick	Mobile #	O: 250-425-3196 / C: 780-223-8222
Sampler's Signature	T Dick	Date/Time	August 17, 2021

Teck

Page 1 of 1

COC ID:	8/24/2021	TURNAROUND TIME:		RUSH:	

PROJECT/CLIENT INFO				LABORATORY				OTHER INFO				
Facility Name / Job#	Fording River Operation			Lab Name	HydroQual Laboratories Ltd.			Report Format / Distribution		Excel	PDF	EDD
Project Manager	Scott Roughead			Lab Contact				Email 1:	david.burroughs@teck.com	X	X	X
Email	Scott.Roughead@teck.com			Email	ABinfo@nautilusenvironmental.ca			Email 2:	britt.anderson@teck.com	X	X	X
Address	PO Box 100			Address	#4, 6125 12 Street SE			Email 3:	scott.roughead@teck.com	X	X	X
								Email 4:	teckcoal@equisonline.com			X
City	Elkford	Province	BC	City	Calgary	Province	AB	Email 5:	cruz.canlas@teck.com	X	X	X
Postal Code	V0B 1H0	Country	Canada	Postal Code	?T2H 2K1	Country	Canada	Email 6:	jamie.walsh@teck.com	X	X	X
Phone Number	1-250-865-5195			Phone Number	403-253-7121			PO:	VPO00741382			

2021/08/25
13:00
Bear Pond
JC/SA/SCC
6x20L carboys
No5/No6
Good condition
Week 3

SAMPLE DETAILS								ANALYSIS REQUESTED													Filtered - F: Field, L: Lab, FL: Field & Lab, N: None
								Filt.	N	N	N										
								PRESERV.	NONE	NONE	NONE										
								ANALYSIS	30-d fathead minnow P/F												
Sample ID	Sample Location (sys_loc_code)	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.														
FR_FRCP1_WEK_2021-08-23_N 15.8	FR_FRCP1	WS	NO	8/24/2021		G	2		x	2021-1872											
FR_FRABCH_WS_2021-08-23_N 7.2	FR_FRABCH	WS	NO	8/24/2021		G	2		x	2021-1874											
FR_UFR1_WEK_2021-08-23_N 10.7	FR_UFR1	WS	NO	8/24/2021		G	2		x	2021-1873											

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
	Cruz Canlas	August 24, 2021		

SERVICE REQUEST (rush - subject to availability)					
Regular (default)	X	Sampler's Name	Cruz Canlas	Mobile #	250 433 6166
Priority (2-3 business days) - 50% surcharge					
Emergency (1 Business Day) - 100% surcharge		Sampler's Signature		Date/Time	August 24, 2021
For Emergency <1 Day, ASAP or Weekend - Contact ALS					

Teck

COC ID:	8/24/2021	TURNAROUND TIME:		RUSH:	

PROJECT/CLIENT INFO

Facility Name / Job#	Fording River Operation
Project Manager	Scott Roughead
Email	Scott.Roughead@teck.com
Address	PO Box 100
City	Elkford
Province	BC
Postal Code	V0B 1H0
Country	Canada
Phone Number	1-250-865-5195

LABORATORY

Lab Name	HydroQual Laboratories Ltd.
Lab Contact	
Email	ABinfo@nautilusenvironmental.ca
Address	#4, 6125 12 Street SE
City	Calgary
Province	AB
Postal Code	?T2H 2K1
Country	Canada
Phone Number	403-253-7121

OTHER INFO

Report Format / Distribution		Excel	PDF	EDD
Email 1:	david.burroughs@teck.com	X	X	X
Email 2:	cruz.canlas@teck.com	X	X	X
Email 3:	scott.roughead@teck.com	X	X	X
Email 4:	teckcoal@equisonline.com			X
Email 5:	jessica.ritz@teck.com	X	X	X
Email 6:	cait.good@teck.com	X	X	X
Email 7:	jamie.walsh@teck.com	X	X	X

SAMPLE DETAILS / **ANALYSIS REQUESTED**

Filtered - F: Field, L: Lab, FL: Field & Lab, N: None

2021/08/25
13:00
Bear Paw
JO/SA/JCC
8x20L carboys
NoS/NoI
Good Condition
Week 3

Sample ID	Sample Location (sys loc code)	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	30-d fathead minnow P/F (Filt.: N; Preserv.: NONE)	(Filt.: N; Preserv.: NONE)	(Filt.: N; Preserv.: NONE)	(Filt.: N; Preserv.: NONE)
FR_FR4_WS_2021-08-17_N 4.6	FR_FR4	WS	NO	24-Aug-21	9:20	G	2	X	2021-1875		
FR_FRRD_WS_2021-08-17_N 5.2	FR_FRRD	WS	NO	24-Aug-21	8:42	G	2	X	~~2021-1877~~	2021-1878	
FR_FR2_WS_2021-08-17_N 5.6	FR_FR2	WS	NO	24-Aug-21	10:02	G	2	X	2021-1876		
FR_MULTIPLATE_WS_2021-08-17_NP 5.0	FR_MULTIPLATE	WS	NO	24-Aug-21	10:30	G	2	X	2021-1877		

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME

SERVICE REQUEST (rush - subject to availability)

Regular (default)	X
Priority (2-3 business days) - 50% surcharge	
Emergency (1 Business Day) - 100% surcharge	
For Emergency <1 Day, ASAP or Weekend - Contact ALS	

Sampler's Name	Tyler Fortin	Mobile #	
Sampler's Signature	[signature]	Date/Time	8/24/2021

Teck

COC ID:	2021-08-24-Chronic-Tox	Phone Number		RUSH:	NO

PROJECT/CLIENT INFO				LABORATORY				OTHER INFO				
Facility Name / Job#	Greenhills Operation			Lab Name	Hydroqual Laboratories Ltd			Report Format / Distribution		Excel	PDF	EDD
Project Manager	Jeremy Enns			Lab Contact	Jacklyn Pool			Email 1:				
Email	jeremy.enns@teck.com			Email				Email 2:				
Address	P.O. BOX 5000			Address	#4, 6125 - 12th Street S.E.			Email 3:	teckcoal@equisonline.com			X
								Email 4:				
City	Elkford	Province	BC	City	Calgary	Province	AB	Email 5:				
Postal Code	V0B1H0	Country	Canada	Postal Code	T2H 2K1	Country	Can	Email 6:	DL-Equis-GHO-Field@teck.com	X	X	X
Phone Number	250-865-3048			Phone Number	403-253-7121			Email 7:				
								PO number	740426			

2021/08/25
13:00
Bear Pav
JC/SA/JCC
6x20L carboys
NoS/NoI
Good Condition
Week 3

Sample ID		Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	ANALYSIS / PRESERV. / Filt.	7-d C.dubia P/F	72-hr P. subcapitata P/F	30-d fathead minnow P/F	
GH_FR1_WS_2021-08-24_N 5.6	GH_FR1	WS	N	8/24/2021	9:20	G	2				X	2021-1879
GH_ERC_WS_2021-08-24_N 6.1	GH_ERC	WS	N	8/24/2021	11:25	G	2				X	2021-1880
GH_ER2_WS_2021-08-24_N 5.4	GH_ER2	WS	N	8/24/2021	10:30	G	2				X	2021-1881

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME

SERVICE REQUEST (rush - subject to availability)					
Regular (default)	X	Sampler's Name	JM/EO/IDY	Mobile #	
Priority (2-3 business days) - 50% surcharge					
Emergency (1 Business Day) - 100% surcharge		Sampler's Signature		Date/Time	AUG 24 2021
For Emergency <1 Day, ASAP or Weekend - Contact ALS					

Teck

COC ID:	20210824CRN3C	TURNAROUND TIME:		RUSH:	

PROJECT/CLIENT INFO			
Facility Name / Job#	Elkview Operations		
Job Description	Q3 Chronic Toxicity Sampling		
Project Manager	Jennifer Dane		
Email	jennifer.dane@teck.com		
Address	RR#1 HWY# 3		
City	Sparwood	Province	BC
Postal Code	V1C 4C3	Country	Canada
Phone Number	1-250-425-8137		

LABORATORY			
Lab Name	Nautilus Environmental		
Lab Contact	Jacklyn Poole		
Email	Jacklyn@nautilusenvironmental.ca		
Address	6125 12st SE		
City	Calgary	Province	AB
Postal Code	T2H 2K1	Country	Canada
Phone Number	403-253-7121		

OTHER INFO				
Report Format / Distribution		Excel	PDF	EDD
Email 1:	kennedy.allen@teck.com	X	X	X
Email 2:	teckcoal@equisonline.com			X
Email 3:	chris.emslie@teck.com	X	X	X
Email 4:	Teck.Lab.Results@teck.com	X	X	X
Email 5:	jennifer.dane@teck.com	X	X	X
Email 6:	colby.bracken@teck.com	X	X	X
PO number	VPO00678876			

SAMPLE DETAILS / **ANALYSIS REQUESTED**

Filtered - F: Field, L: Lab, FL: Field & Lab, N: None

Sample ID	Sample Location	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	ANALYSIS	7-d C.dubia P/F	72-hr P. subcapitata P/F	30-d embryo EA P/F	30-d fathead minnow P/F
								FILTERED	No	No	No	No
								PRESERVED	No	No	No	No
2021-1882												
EV_HC1_WS_2021_Q3_WK3_N 5.2	EV_HC1	WS	N	8/24/2021	9:51	G	2					1
EV_MC2_WS_2021_Q3_WK3_N 5.4	EV_MC2	WS	N	8/24/2021	11:07	G	2					1
2021-1883												
2021/08/25 13:00 Bear Paw SC/SA/SCC 4x20L carboys NoS/NoI Good Condition Week 3												
					Total		4					

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
Toxicity 96-Hr/48-HR = 96 Hr Rainbow Trout pass/fail & 48 Hr Daphnia pass/fail (Daphinia testing to occur at 20 degrees)	C. Emslie/J. Batstone	24-Aug-21		

NB OF BOTTLES RETURNED/DESCRIPTION	
Regular (default)	X
Priority (2-3 business days) - 50% surcharge	
Emergency (1 Business Day) - 100% surcharge	
For Emergency <1 Day, ASAP or Weekend - Contact ALS	

Sampler's Name	C. Emslie/J. Batstone	Mobile #	1-250-423-0826
Sampler's Signature		Date/Time	August 24, 2021

Teck

COC ID:	Q3_CHRONIC_08242021_CAL	TURNAROUND TIME:	Regular	RUSH:	NO

PROJECT/CLIENT INFO			
Facility Name / Job#	Coal Mountain Operations		
Project Manager	Jay Jones		
Email	Jay.Jones@teck.com		
Address	PO Box 3000		
City	Sparwood	Province	BC
Postal Code	V0B 2G0	Country	Canada
Phone Number	1-250-425-7321		

LABORATORY			
Lab Name	Hydroqual Laboratories		
Lab Contact	Jacklyn Poole		
	Tamara		
Email	jacklyn@nautilusenvironmental.ca		
	tamara@nautilusenvironmental.ca		
Address	#4, 6125-12th Street S.E.		
City	Calgary	Province	AB
Postal Code	T2H 2K1	Country	Canada
Phone Number	403-253-7121		

OTHER INFO				
Report Format / Distribution		Excel	PDF	EDD
Email 1:	Victoria.Sharpe@teck.com	X	X	X
Email 2:	teckcoal@equisonline.com			X
Email 3:	Jay.jones@teck.com	X	X	X
Email 4	Don.Sacino@teck.com	X	X	X
Email 5:	Shelby.Holden@teck.com	X	X	X
PO number				

SAMPLE DETAILS / **ANALYSIS REQUESTED**

Filtered - F: Field, L: Lab, FL: Field & Lab, N: None

2021/08/25
13:00
Bear Paw
SC/SC/SCC
6x20L carboys
No5/No5
Good Condition
Week3

Sample ID		Sample Location	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	Filt.	PRESERV.	ANALYSIS: 30-d fathead minnow P/F	
CM_MC2_WS_2021-08-24_N	10.6	CM_MC2	WS	No	8/24/2021		G	2			X	2021-1884
CM_MC1_WS_2021-08-24_N	10.4	CM_MC1	WS	No	8/24/2021		G	2			X	2021-1885
RG_MIDAG_WS_2021-08-24_N	10.1	RG_MIDAG	WS	No	8/24/2021		G	2			X	2021-1886

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME

NB OF BOTTLES RETURNED/DESCRIPTION	
Regular (default)	X
Priority (2-3 business days) - 50% surcharge	
Emergency (1 Business Day) - 100% surcharge	
For Emergency <1 Day, ASAP or Weekend - Contact ALS	

Sampler's Name	KS/DS	Mobile #	250 425 7522
Sampler's Signature		Date/Time	August 24, 2021

Teck

COC ID: 20210824 Chronic Tox Calg

TURNAROUND TIME:

RUSH:

PROJECT/CLIENT INFO				LABORATORY				OTHER INFO			
Facility Name / Job#	Line Creek Operation			Lab Name	Nautilus Environmental			Report Format / Distribution	Excel	PDF	EDD
Project Manager	Tom Jeffery			Lab Contact	Jeslin Wijaya			Email 1: tom.jeffery@teck.com	x	x	
Email	tom.jeffery@teck.com			Email	jeslin@nautilusenvironmental.ca			Email 2: teckcoal@equisonline.com			x
Address	Box 2003			Address	6125 12 St NE			Email 3: drake.tymstra@teck.com	x	x	
	15km North Hwy 43							Email 4: shanise.fossen@teck.com	x	x	
								Email 5: tanya.dick@teck.com	x	x	
City	Sparwood	Province	BC	City	Calgary	Province	AB	PO number	VPO0741384		
Postal Code	V0B 2G0	Country	Canada	Postal Code	T2H 2K1	Country	Canada				
Phone Number	250-425-6111			Phone Number	403-253-7121						

SAMPLE DETAILS

2021/08/25
13:00
Bear Paw
DC/SA/SCC
10x20L carboys
Nos/Nob
Good Condition
Wet ice

ANALYSIS REQUESTED

Filtered - F: Field, L: Lab, FL: Field & Lab, N: None

Sample ID	Sample Location	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	Filt.			
								PRESERV.	N	N	N
								ANALYSIS	7-d C.dubia P/F	72-hr P. subcapitata P/F	30-d fathead minnow P/F
LC_DCDS_WS_2021-08-25_N 6.4	LC_DCDS	WS	No	24-Aug-21	10:05	G	2				x 2021-1890
LC_LC3_WS_2021-08-24_N 3.7	LC_LC3	WS	No	24-Aug-21		G	2				x 2021-1888
LC_SLC_WS_2021-08-24_N 6.0	LC_SLC	WS	No	24-Aug-21		G	2				x 2021-1889
LC_LC5_WS_2021-08-24_N 3.5	LC_LC5	WS	No	24-Aug-21	8:30	G	2				x 2021-1891
LC_LCDSSLCC_WS_2021-08-24_N 6.3	LC_LCDSSLCC	WS	No	24-Aug-21		G	2				x 2021-1887

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
Please provide prelimnary update as results are available	T. Dick	8/24/2021		

NB OF BOTTLES RETURNED/DESCRIPTION	
Regular (default)	X
Priority (2-3 business days) - 50% surcharge	
Emergency (1 Business Day) - 100% surcharge	
For Emergency <1 Day, ASAP or Weekend - Contact ALS	

Sampler's Name	T. Dick	Mobile #	O: 250-425-3196 / C: 780-223-8222
Sampler's Signature	T Dick	Date/Time	August 24, 2021

Teck

COC ID:	Q3_CHRONIC_08242021_Burn	TURNAROUND TIME:	Regular	RUSH:	No

PROJECT/CLIENT INFO				LABORATORY				OTHER INFO				
Facility Name / Job#	Coal Mountain Operations			Lab Name	Nautilus Environmental			Report Format / Distribution		Excel	PDF	EDD
Project Manager	Victoria Sharpe			Lab Contact	Armando Tang			Email 1:	Jay.jones@teck.com	X	X	X
Email	Victoria.Sharpe@teck.com			Email	armando@nautilusenvironmental.ca			Email 2:	teckcoal@equisonline.com			X
								Email 3:	Victoria.Sharpe@teck.com	X	X	X
								Email 4	Don.Sacino@teck.com	X	X	X
Address	PO Box 3000			Address	8664 commerce Court			Email 5:	Shelby.Holden@teck.com	X	X	X
City	Sparwood	Province	BC	City	Burnaby	Province	BC	PO number				
Postal Code	V0B 2G0	Country	Canada	Postal Code	V5A 4N7	Country	Canada					
Phone Number	1-250-425-7522			Phone Number	604-420-8773							

SAMPLE DETAILS								ANALYSIS REQUESTED												Filtered - F: Field, L: Lab, FL: Field & Lab, N: None	
							Filt.														
							PRESERV.							211568	211565						
Sample ID	Sample Location	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	ANALYSIS 7-d C.dubia P/F	7-d C.dubia P/F (EDTA)	72-hr P. subcapitata P/F	30-d embryo EA P/F	28-d Hyalella P/F	28-d Hyalella P/F (EDTA)								
CM_MC2_WS_2021-08-24_N	CM_MC2	WS	No	8/24/2021		G	2					X	X							7.2	7.1
CM_MC1_WS_2021-08-24_N	CM_MC1	WS	No	8/24/2021		G	1					X									7.4
RG_MIDAG_WS_2021-08-24_N	RG_MIDAG	WS	No	8/24/2021		G	2					X	X							6.9	7.3

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
			Tyrone Hamilton	Aug. 25/21 @ 10:00
			Nautilus - Burnaby	Q3-W3

NB OF BOTTLES RETURNED/DESCRIPTION	
Regular (default)	X
Priority (2-3 business days) - 50% surcharge	
Emergency (1 Business Day) - 100% surcharge	
For Emergency <1 Day, ASAP or Weekend - Contact ALS	

Sampler's Name	DS/KS	Mobile #	250 425 7522
Sampler's Signature		Date/Time	August 24, 2021

Teck

COC ID:	20210824CRN3B	TURNAROUND TIME:		RUSH:	

PROJECT/CLIENT INFO

Facility Name / Job#	Elkview Operations		
Job Description	Q3 Chronic Toxicity Sampling		
Project Manager	Jennifer Dane		
Email	jennifer.dane@teck.com		
Address	RR#1 HWY# 3		
City	Sparwood	Province	BC
Postal Code	V1C 4C3	Country	Canada
Phone Number	1-250-425-8137		

LABORATORY

Lab Name	Nautilus Environmental		
Lab Contact	Jeslin Wijaya		
Email	[illegible]		
Address	8664 Commerce Court		
	Imperial Square Lake City		
City	Burnaby	Province	BC
Postal Code	V5A 4N7	Country	Canada
Phone Number	604-420-8773		

OTHER INFO

Report Format / Distribution		Excel	PDF	EDD
Email 1:	kennedy.allen@teck.com	X	X	X
Email 2:	teckcoal@equisonline.com			X
Email 3:	chris.emslie@teck.com	X	X	X
Email 4:	Teck.Lab.Results@teck.com	X	X	X
Email 5:	jennifer.dane@teck.com	X	X	X
Email 6:	colby.bracken@teck.com	X	X	X
PO number	VPO00678876			

SAMPLE DETAILS / **ANALYSIS REQUESTED**

Filtered - F: Field, L: Lab, FL: Field & Lab, N: None

Sample ID	Sample Location	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	ANALYSIS	7-d C dubia P/F	72-hr P. subcapitata P/F	28-d Hyalella P/F	30-d fathead minnow P/F						
FILTERED									No	No	No	No						
PRESERVED									No	No	No	No						
EV_HC1_WS_2021_Q3_WK3_N	EV_HC1	WS	N	8/24/2021	9:51	G	1				1							10.9
EV_MC2_WS_2021_Q3_WK3_N	EV_MC2	WS	N	8/24/2021	11:07	G	1				1							11.2
											211568							
					Total		2											

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
Toxicity 96-Hr/48-HR = 96 Hr Rainbow Trout pass/fail & 48 Hr Daphnia pass/fail (Daphinia testing to occur at 20 degrees)	C. Emslie/J. Batstone	24-Aug-21	Tyme Hamilton Nautilus - Burnaby	Q3-W3 Aug. 25/21 @ 11:00

NB OF BOTTLES RETURNED/DESCRIPTION

Regular (default)	X
Priority (2-3 business days) - 50% surcharge	
Emergency (1 Business Day) - 100% surcharge	
For Emergency <1 Day, ASAP or Weekend - Contact ALS	

Sampler's Name	C. Emslie/J. Batstone	Mobile #	1-250-423-0826
Sampler's Signature		Date/Time	August 24, 2021

Teck

COC ID: 8/24/2021 | **TURNAROUND TIME:** | **RUSH:**

PROJECT/CLIENT INFO				LABORATORY				OTHER INFO			
Facility Name / Job#	Fording River Operation			Lab Name	Nautilus Environmental - BC			Report Format / Distribution		Excel	PDF	EDD
Project Manager	Scott Roughead			Lab Contact				Email 1:	david.burroughs@teck.com	X	X	X
Email	scott.roughead@teck.com			Email	BCinfo@nautilusenvironmental.ca			Email 2:	britt.anderson@teck.com	X	X	X
Address				Address	8664 Commerce Court			Email 3:	scott.roughead@teck.com	X	X	X
								Email 4:	cruz.canlas@teck.com	X	X	X
City	Elkford	Province	BC	City	Burnaby	Province	BC	Email 5:	jamie.walsh@teck.com	X	X	X
Postal Code		Country	Canada	Postal Code	V5A 4N7	Country	Canada	Email 6:	teckcoal@equisonline.com			X
Phone Number	1-250-433-6976			Phone Number	604-420-8773			VPO00741382				

SAMPLE DETAILS | **ANALYSIS REQUESTED** (Filtered - F: Field, L: Lab, FL: Field & Lab, N: None)

Sample ID	Sample Location (sys_loc_code)	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	FIL.	PRESERV.	ANALYSIS: 7-d C.dubia P/F	7-d C.dubia P/F (EDTA)	72-hr P. subcapitata P/F	30-d embryo EA P/F	28-d Hyalella P/F 211568	28-d Hyalella P/F (EDTA) 211565					
								NO	NO	NO	NO	NO	NO	NO	NO					
FR_FRCP1_WEK_2021-08-23_N	FR_FRCP1	WS	NO	8/24/2021		G	2							x	x				9.0-9.2	
FR_FRABCH_WS_2021-08-23_N	FR_FRABCH	WS	NO	8/24/2021		G	1							x						8.9
FR_UFR1_WEK_2021-08-23_N	FR_UFR1	WS	NO	8/24/2021		G	1							x						7.9

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
2 COOLERS TOTAL	Cruz Canlas	August 24, 2021	Tyrone Hamilton New Gate - Burnaby	Aug. 25/21 @ 11:00 Q3-W3

SERVICE REQUEST (rush - subject to availability)

Regular (default)	X
Priority (2-3 business days) - 50% surcharge	
Emergency (1 Business Day) - 100% surcharge	
For Emergency <1 Day, ASAP or Weekend - Contact ALS	

Sampler's Name	Cruz Canlas	Mobile #	250 433 6166
Sampler's Signature		Date/Time	August 24, 2021

Teck

COC ID: 8/24/2021 | TURNAROUND TIME: | RUSH:

PROJECT/CLIENT INFO				LABORATORY				OTHER INFO				
Facility Name / Job#	Fording River Operation			Lab Name	Nautilus Environmental - BC			Report Format / Distribution		Excel	PDF	EDD
Project Manager	Scott Roughead			Lab Contact				Email 1:	david.burroughs@teck.com	X	X	X
Email	scott.roughead@teck.com			Email	BCinfo@nautilusenvironmental.ca			Email 2:	cruz.canlas@teck.com	X	X	X
Address				Address	8664 Commerce Court			Email 3:	scott.roughead@teck.com	X	X	X
								Email 4:	teckcoal@equisonline.com			X
City	Elkford	Province	BC	City	Burnaby	Province	BC	Email 5:	jessica.ritz@teck,com	X	X	X
Postal Code		Country	Canada	Postal Code	V5A 4N7	Country	Canada	Email 6:	cait.good@teck.com	X	X	X
Phone Number	1-250-433-6976			Phone Number	604-420-8773			Email 7:	jamie.walsh@teck.com	X	X	X

SAMPLE DETAILS | ANALYSIS REQUESTED (Filtered – F: Field, L: Lab, FL: Field & Lab, N: None)

Sample ID	Sample Location (sys loc code)	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	FIL.	PRESERV.	ANALYSIS: 211567 7-d C.dubia P/F	7-d C.dubia P/F (EDTA)	72-hr P. subcapitata P/F	30-d embryo EA P/F	211568 28-d Hyalella P/F	28-d Hyalella P/F (EDTA)						
FR_FR4_WS_2021-08-24_N	FR_FR4	WS	NO	8/24/2021	9:20	G	1			X				X							8.4
FR_FRRD_WS_2021-08-24_N	FR_FRRD	WS	NO	8/24/2021	8:42	G	1			X				X							9.1
FR_FR2_WS_2021-08-24_N	FR_FR2	WS	NO	8/24/2021	10:02	G	1			X				X							8.4
FR_MULTIPLATE_WS_2021-08-24_NP	FR_MULTIPLATE	WS	NO	8/24/2021	10:30	G	1			X				X							9.2

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
			Tyrone Hamilton Nautilus - Burnaby	Aug. 25/21 @ 11:00 Q3-W3

SERVICE REQUEST (rush - subject to availability)

Regular (default)	X
Priority (2-3 business days) - 50% surcharge	
Emergency (1 Business Day) - 100% surcharge	
For Emergency <1 Day, ASAP or Weekend - Contact ALS	

Sampler's Name	Tyler Forkin	Mobile #	
Sampler's Signature		Date/Time	8/24/2021

Teck

COC ID:	2021-08-24 CHRONIC TOX	TURNAROUND TIME:	regular	RUSH:	

PROJECT/CLIENT INFO

Facility Name	Greenhills Operations		
Project Manager	Jeremy Enns		
Email	jeremy.enns@teck.com		
Address	PO Box 5000		
City	Elkford	Province	BC
Postal Code	V0B 1H0	Country	Canada
Phone Number	250 865 3274		

LABORATORY

Lab Name	Nautilus Environmental		
Lab Contact	Armando		
Email			
Address	8664 Commerce Court		
City	Burnaby	Province	BC
Postal Code	V5A 4N7	Country	Can
Phone Number	403.253.7121		

OTHER INFO

EDD delivery:

Email 1:				
Email 2:				
Email 3:	teckcoal@equisonline.com	x	x	x
Email 4:				
Email 5:				
Email 6:	DL-Equis-GHO-Field@teck.com	x	x	x

PO number: 610307

SAMPLE DETAILS

ANALYSIS REQUESTED

Please indicate below Filtered, Perserved or both (F, P, F/P)

Sample ID	Sample Location	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	ANALYSIS: 7-d C.dubia P/F	72-hr P. subcapitata P/F	30-d embryo EA P/F	28-d Hyalella P/F 211568	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
GH_ER2_WS_2021-08-24_N	GH_ER2	WS	N	24-Aug	10:30	G	1				X								11,8
GH_ERC_WS_2021-08-24_N	GH_ERC	WS	N	24-Aug	11:25	G	1				X								7.9
GH_FR1_WS_2021-08-24_N	GH_FR1	WS	N	24-Aug	9:20	G	1				X								7.9

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	Date	Time	Accepted By/Affiliation	Date	Time
				Tyrone Hamilton	Aug. 25/21	@11:00
				Nautilus - Burnaby	Q3-6/3	

SERVICE REQUEST (rush - subject to availability)

Regular (default)	X
Priority (2-3 business days) - 50% surcharge	
Emergency (1 Business Day) - 100% surcharge	
For Emergency <1 Day, ASAP or Weekend - Contact ALS	

Sampler's Name	JM/EO/IDY	Mobile #	
Sampler's Signature		Date/Time	AUG 24 2021

Teck

COC ID: 20210824 Chronic Tox Burn | TURNAROUND TIME: | RUSH:

PROJECT/CLIENT INFO				LABORATORY				OTHER INFO				
Facility Name / Job#	Line Creek Operation			Lab Name	Nautilus Environmental			Report Format / Distribution		Excel	PDF	EDD
Project Manager	Tom Jeffery			Lab Contact	Armando Tang			Email 1:	tom.jeffery@teck.com	x	x	
Email	tom.jeffery@teck.com			Email	armando@nautilusenvironmental.com			Email 2:	teckcoal@equisonline.com			x
Address	Box 2003			Address	8664 Commerce Crt			Email 3:	drake.tymstra@teck.com	x	x	
	15km North Hwy 43							Email 4:	shanise.fossen@teck.com	x	x	
								Email 5:	tanya.dick@teck.com	x	x	
City	Sparwood	Province	BC	City	Burnaby	Province	BC	PO number	VPO00741384			
Postal Code	V0B 2G0	Country	Canada	Postal Code	V5A 4N7	Country	Canada					
Phone Number	250-425-6111			Phone Number	604-420-8773							

SAMPLE DETAILS | ANALYSIS REQUESTED (Filtered - F: Field, L: Lab, FL: Field & Lab, N: None)

Sample ID	Sample Location	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	Filt.	N	N	N									
								PRESERV.	N	N	N									
								ANALYSIS	7-d C.dubia P/F	72-hr P. subcapitata P/F	28-d Hyalella P/F									
LC_DCDS_WS_2021-08-24_N	LC_DCDS	WS	No	24-Aug-21	10:05	G	1				x									8.8
LC_LC3_WS_2021-08-24_N	LC_LC3	WS	No	24-Aug-21	9:25	G	1				x									9.2
LC_SLC_WS_2021-08-24_N	LC_SLC	WS	No	24-Aug-21	8:00	G	1				x									6.9
LC_LC5_WS_2021-08-24_N	LC_LC5	WS	No	24-Aug-21	8:30	G	1				x									8.5
LC_LCDSSLCC_WS_2021-08-24_N	LC_LCDSSLCC	WS	No	24-Aug-21	10:10	G	1				x									9.9

211568

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
Please provide prelimnary update as results are available	T. Dick	8/24/2021	Tyrone Hamilton	Aug. 25/21 @ 11:00
			Nautilus - Burnaby	R3-W3

NB OF BOTTLES RETURNED/DESCRIPTION					
Regular (default)	X	Sampler's Name	T. Dick	Mobile #	O: 250-425-3196 / C: 780-223-8222
Priority (2-3 business days) - 50% surcharge		Sampler's Signature	T Dick	Date/Time	August 24, 2021
Emergency (1 Business Day) - 100% surcharge					
For Emergency <1 Day, ASAP or Weekend - Contact ALS					

Teck

COC ID: 8/31/2021

TURNAROUND TIME:

RUSH:

PROJECT/CLIENT INFO

Facility Name / Job#	Fording River Operation		
Project Manager	Scott Roughead		
Email	Scott.Roughead@teck.com		
Address	PO Box 100		
City	Elkford	Province	BC
Postal Code	V0B 1H0	Country	Canada
Phone Number	1-250-865-5195		

LABORATORY

Lab Name	HydroQual Laboratories Ltd.		
Lab Contact			
Email	ABinfo@nautilusenvironmental.ca		
Address	#4, 6125 12 Street SE		
City	Calgary	Province	AB
Postal Code	?T2H 2K1	Country	Canada
Phone Number	403-253-7121		

OTHER INFO

Report Format / Distribution		Excel	PDF	EDD
Email 1:	david.burroughs@teck.com	X	X	X
Email 2:	britt.anderson@teck.com	X	X	X
Email 3:	scott.roughead@teck.com	X	X	X
Email 4:	teckcoal@equisonline.com			X
Email 5:	cruz.canlas@teck.com	X	X	X
Email 6:	jamie.walsh@teck.com	X	X	X

PO: VPO00741382

SAMPLE DETAILS

2021/08/01
8:20
Bear Paw
5c/5cc
6x20L carboys
No5/No5
Good Condition
Week 4

ANALYSIS REQUESTED

Filtered - F: Field, L: Lab, FL: Field & Lab, N: None

Sample ID	Sample Location (sys_loc_code)	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	Filt.	PRESERV.	ANALYSIS: 30-d fathead minnow P/F	
								N	NONE		
								N	NONE		
								N	NONE		
FR_FRCP1_WEK_2021-08-30_N 2021-1872	FR_FRCP1	WS	NO	8/31/2021		G	2			x	8.3°C
FR_FRABCH_WS_2021-08-30_N 2021-1874	FR_FRABCH	WS	NO	8/31/2021		G	2			x	6.8°C
FR_UFR1_WEK_2021-08-30_N 2021-1873	FR_UFR1	WS	NO	8/31/2021		G	2			x	6.2°C

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS

RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
Cruz Canlas	August 31, 2021		

SERVICE REQUEST (rush - subject to availability)

Regular (default)	X
Priority (2-3 business days) - 50% surcharge	
Emergency (1 Business Day) - 100% surcharge	
For Emergency <1 Day, ASAP or Weekend - Contact ALS	

Sampler's Name	Cruz Canlas	Mobile #	250 433 6166
Sampler's Signature		Date/Time	August 31, 2021

Teck

COC ID: 8/31/2021

TURNAROUND TIME:

RUSH:

PROJECT/CLIENT INFO			
Facility Name / Job#	Fording River Operation		
Project Manager	Scott Roughead		
Email	Scott.Roughead@teck.com		
Address	PO Box 100		
City	Elkford	Province	BC
Postal Code	V0B 1H0	Country	Canada
Phone Number	1-250-865-5195		

LABORATORY			
Lab Name	HydroQual Laboratories Ltd.		
Lab Contact			
Email	ABinfo@nautilusenvironmental.ca		
Address	#4, 6125 12 Street SE		
City	Calgary	Province	AB
Postal Code	?T2H 2K1	Country	Canada
Phone Number	403-253-7121		

OTHER INFO				
Report Format / Distribution		Excel	PDF	EDD
Email 1:	david.burroughs@teck.com	X	X	X
Email 2:	cruz.canlas@teck.com	X	X	X
Email 3:	scott.roughead@teck.com	X	X	X
Email 4:	teckcoal@equisonline.com			X
Email 5:	jessica.ritz@teck.com	X	X	X
Email 6:	cait.good@teck.com	X	X	X
Email 7:	jamie.walsh@teck.com	X	X	X

SAMPLE DETAILS

2021V009/01
13:20
Bear Paw
SC/SCC
8x20L carboys
Yes/Yes
Good Condition
Week 4

ANALYSIS REQUESTED

Filtered - F: Field, L: Lab, FL: Field & Lab, N: None

Sample ID	Sample Location (sys loc code)	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	Filt.	PRESRV.	ANALYSIS: 30-d fathead minnow P/F												
								N	NONE		N	NONE	N	NONE	N	NONE							
FR_FR4_WS_2021-08-31_N 2021-1875	FR_FR4	WS	NO	31-Aug-21	9:11	G	2			X	7.4°C											
FR_FRRD_WS_2021-08-31_N 2021-1878	FR_FRRD	WS	NO	31-Aug-21	8:31	G	2			X	9.1°C											
FR_FR2_WS_2021-08-31_N 2021-1876	FR_FR2	WS	NO	31-Aug-21	10:29	G	2			X	10.2°C											
FR_MULTIPLATE_WS_2021-08-31_NP	FR_MULTIPLATE	WS	NO	31-Aug-21	11:15	G	2			X	12.2°C											
2021-1877																						

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME

SERVICE REQUEST (rush - subject to availability)

Regular (default)	X
Priority (2-3 business days) - 50% surcharge	
Emergency (1 Business Day) - 100% surcharge	
For Emergency <1 Day, ASAP or Weekend - Contact ALS	

Sampler's Name	Tyler/Dan	Mobile #	
Sampler's Signature		Date/Time	August 31, 2021

Teck

COC ID: 2021-08-31-Chronic-Tox | **Phone Number** | **RUSH:** NO

PROJECT/CLIENT INFO				LABORATORY				OTHER INFO			
Facility Name / Job#	Greenhills Operation			Lab Name	Hydroqual Laboratories Ltd			Report Format / Distribution	Excel	PDF	EDD
Project Manager	Jeremy Enns			Lab Contact	Jacklyn Pool			Email 1:			
Email	jeremy.enns@teck.com			Email				Email 2:			
Address	P.O. BOX 5000			Address	#4, 6125 - 12th Street S.E.			Email 3: teckcoal@equisonline.com			X
								Email 4:			
City	Elkford	Province	BC	City	Calgary	Province	AB	Email 5:			
Postal Code	V0B1H0	Country	Canada	Postal Code	T2H 2K1	Country	Can	Email 6: DL-Equis-GHO-Field@teck.com	X	X	X
Phone Number	250-865-3048			Phone Number	403-253-7121			Email 7:			
								PO number 740426			

2021/09/01
15:20
Bear Paw
JC/SCC
6x20L carboys
Nos/Nob
Good Condition
Week 4

Sample ID		Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	Filt.	PRESERV.	ANALYSIS 7-d C.dubia P/F	72-hr P. subcapitata P/F	30-d fathead minnow P/F										
GH_FR1_WS_2021-08-31_N	2021-1879 GH_FR1	WS	N	8/31/2021		G	2					X	7.6°C									
GH_ERC_WS_2021-08-31_N	2021-1880 GH_ERC	WS	N	8/31/2021		G	2					X	7.1°C									
GH_ER2_WS_2021-08-31_N	2021-1881 GH_ER2	WS	N	8/31/2021		G	2					X	7.3°C									

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME

SERVICE REQUEST (rush - subject to availability)	
Regular (default)	X
Priority (2-3 business days) - 50% surcharge	
Emergency (1 Business Day) - 100% surcharge	
For Emergency <1 Day, ASAP or Weekend - Contact ALS	

Sampler's Name		Mobile #	
Sampler's Signature		Date/Time	AUG 31 2021

Teck

COC ID:	20210831CRN3C	TURNAROUND TIME:		RUSH:	

PROJECT/CLIENT INFO

Facility Name / Job#	Elkview Operations		
Job Description	Q3 Chronic Toxicity Sampling		
Project Manager	Jennifer Dane		
Email	jennifer.dane@teck.com		
Address	RR#1 HWY# 3		
City	Sparwood	Province	BC
Postal Code	V1C 4C3	Country	Canada
Phone Number	1-250-425-8137		

LABORATORY

Lab Name	Nautilus Environmental		
Lab Contact	Jacklyn Poole		
Email	Jacklyn@nautilusenvironmental.ca		
Address	6125 12st SE		
City	Calgary	Province	AB
Postal Code	T2H 2K1	Country	Canada
Phone Number	403-253-7121		

OTHER INFO

Report Format / Distribution		Excel	PDF	EDD
Email 1:	kennedy.allen@teck.com	X	X	X
Email 2:	teckcoal@equisonline.com			X
Email 3:	chris.emslie@teck.com	X	X	X
Email 4:	Teck.Lab.Results@teck.com	X	X	X
Email 5:	jennifer.dane@teck.com	X	X	X
Email 6:	colby.bracken@teck.com	X	X	X
PO number	VPO00678876			

SAMPLE DETAILS

2021/09/01 13:20 Bear Paw JC/TCC 4x20L carboys NOS/NOB — Good Condition Week 4 — 2021-1882

ANALYSIS REQUESTED

Filtered - F: Field, L: Lab, FL: Field & Lab, N: None

Sample ID	Sample Location	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	ANALYSIS	7-d C.dubia P/F	72-hr P. subcapitata P/F	30-d embryo EA P/F	30-d fathead minnow P/F
								FILTERED	No	No	No	No
								PRESERVED	No	No	No	No
EV_HC1_WS_2021_Q3_WK4_N	EV_HC1	WS	N	8/31/2021	10:49	G	2		5.5°C			1
EV_MC2_WS_2021_Q3_WK4_N	EV_MC2	WS	N	8/31/2021	11:58	G	2		6.9°C			1
2021-1883												
					Total		4					

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS

Toxicity 96-Hr/48-HR = 96 Hr Rainbow Trout pass/fail & 48 Hr Daphnia pass/fail
(Daphinia testing to occur at 20 degrees)

RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
C. Emslie/J. Batstone	31-Aug-21		

NB OF BOTTLES RETURNED/DESCRIPTION

Regular (default)	X
Priority (2-3 business days) - 50% surcharge	
Emergency (1 Business Day) - 100% surcharge	
For Emergency <1 Day, ASAP or Weekend - Contact ALS	

Sampler's Name	C. Emslie/J. Batstone	Mobile #	1-250-423-0826
Sampler's Signature		Date/Time	August 31, 2021

Teck

COC ID:	Q3_CHRONIC_08312021_CAL	TURNAROUND TIME:	Regular	RUSH:	NO

PROJECT/CLIENT INFO				LABORATORY				OTHER INFO				
Facility Name / Job#	Coal Mountain Operations			Lab Name	Hydroqual Laboratories			Report Format / Distribution		Excel	PDF	EDD
Project Manager	Jay Jones			Lab Contact	Jacklyn Poole			Email 1:	Victoria.Sharpe@teck.com	X	X	X
Email	Jay.Jones@teck.com				Tamara			Email 2:	teckcoal@equisonline.com			X
				Email	jacklyn@nautilusenvironmental.ca			Email 3:	Jay.jones@teck.com	X	X	X
					tamara@nautilusenvironmental.ca			Email 4	Don.Sacino@teck.com	X	X	X
Address	PO Box 3000			Address	#4, 6125-12th Street S.E.			Email 5:	Shelby.Holden@teck.com	X	X	X
City	Sparwood	Province	BC	City	Calgary	Province	AB	PO number				
Postal Code	V0B 2G0	Country	Canada	Postal Code	T2H 2K1	Country	Canada					
Phone Number	1-250-425-7321			Phone Number	403-253-7121							

SAMPLE DETAILS

2021/09/01
13:20
Bear Rav
JE
6x20L carboys
Nas/Not
Good Condition
Week 4

ANALYSIS REQUESTED — Filtered - F: Field, L: Lab, FL: Field & Lab, N: None

Sample ID	Sample Location	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	Filt.	PRESERV.	ANALYSIS: 30-d fathead minnow P/F	
CM_MC2_WS_2021-08-31_N 2021-1884	CM_MC2	WS	No	8/31/2021		G	2			X	10.8°C
CM_MC1_WS_2021-08-31_N 2021-1885	CM_MC1	WS	No	8/31/2021		G	2			X	10.2°C
RG_MIDAG_WS_2021-08-31_N 2021-1886	RG_MIDAG	WS	No	8/31/2021		G	2			X	10.6°C

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME

NB OF BOTTLES RETURNED/DESCRIPTION	
Regular (default)	X
Priority (2-3 business days) - 50% surcharge	
Emergency (1 Business Day) - 100% surcharge	
For Emergency <1 Day, ASAP or Weekend - Contact ALS	

Sampler's Name	KS/DS	Mobile #	250 425 7522
Sampler's Signature		Date/Time	August 31, 2021

Teck

COC ID: 20210831 Chronic Tox Calg

TURNAROUND TIME:

RUSH:

PROJECT/CLIENT INFO

Facility Name / Job#	Line Creek Operation
Project Manager	Tom Jeffery
Email	tom.jeffery@teck.com
Address	Box 2003
	15km North Hwy 43
City	Sparwood
Province	BC
Postal Code	V0B 2G0
Country	Canada
Phone Number	250-425-6111

LABORATORY

Lab Name	Nautilus Environmental
Lab Contact	Jeslin Wijaya
Email	jeslin@nautilusenvironmental.ca
Address	6125 12 St NE
City	Calgary
Province	AB
Postal Code	T2H 2K1
Country	Canada
Phone Number	403-253-7121

OTHER INFO

Report Format / Distribution		Excel	PDF	EDD
Email 1:	tom.jeffery@teck.com	x	x	
Email 2:	teckcoal@equisonline.com			x
Email 3:	drake.tymstra@teck.com	x	x	
Email 4:	shanise.fossen@teck.com	x	x	
Email 5:	tanya.dick@teck.com	x	x	
PO number	VPO00741384			

SAMPLE DETAILS

2021/09/01
13:20
Bear Paw
JC/JCC
11x20L carboys
NOS/NOS
Good Condition, 1 extra LCDS carboy present in shipment
Week 4

ANALYSIS REQUESTED

Filtered - F: Field, L: Lab, FL: Field & Lab, N: None

Sample ID	Sample Location	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	Filt.	PRESERV.	ANALYSIS: 7-d C.dubia P/F	ANALYSIS: 72-hr P. subcapitata P/F	ANALYSIS: 30-d fathead minnow P/F
								N	N			N
LC_DCDS_WS_2021-08-31_N 2021-1890	LC_DCDS	WS	No	31-Aug-21		G	2			3.1°C		x
LC_LC3_WS_2021-08-31_N 2021-1888	LC_LC3	WS	No	31-Aug-21		G	2			3.2°C		x
LC_SLC_WS_2021-08-31_N 2021-1889	LC_SLC	WS	No	31-Aug-21		G	2			4.6°C		x
LC_LC5_WS_2021-08-31_N 2021-1891	LC_LC5	WS	No	31-Aug-21		G	2			5.1°C		x
LC_LCDSSLCC_WS_2021-08-31_N 2021-1887	LC_LCDSSLCC	WS	No	31-Aug-21		G	2			2.8°C		x

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS

Please provide prelimnary update as results are available

RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
T. Dick	8/31/2021		

NB OF BOTTLES RETURNED/DESCRIPTION

Regular (default)	X
Priority (2-3 business days) - 50% surcharge	
Emergency (1 Business Day) - 100% surcharge	
For Emergency <1 Day, ASAP or Weekend - Contact ALS	

Sampler's Name	T. Dick	Mobile #	O: 250-425-3196 / C: 780-223-8222
Sampler's Signature	T Dick	Date/Time	August 31, 2021

Teck

COC ID:	Q3_CHRONIC_08312021_Burn	TURNAROUND TIME:	Regular	RUSH:	No

PROJECT/CLIENT INFO				LABORATORY				OTHER INFO				
Facility Name / Job#	Coal Mountain Operations			Lab Name	Nautilus Environmental			Report Format / Distribution		Excel	PDF	EDD
Project Manager	Victoria Sharpe			Lab Contact	Armando Tang			Email 1:	Jay.jones@teck.com	X	X	X
Email	Victoria.Sharpe@teck.com			Email	armando@nautilusenvironmental.ca			Email 2:	teckcoal@equisonline.com			X
								Email 3:	Victoria.Sharpe@teck.com	X	X	X
								Email 4	Don.Sacino@teck.com	X	X	X
Address	PO Box 3000			Address	8664 commerce Court			Email 5:	Shelby.Holden@teck.com	X	X	X
City	Sparwood	Province	BC	City	Burnaby	Province	BC	PO number				
Postal Code	V0B 2G0	Country	Canada	Postal Code	V5A 4N7	Country	Canada					
Phone Number	1-250-425-7522			Phone Number	604-420-8773							

SAMPLE DETAILS								ANALYSIS REQUESTED												Filtered - F: Field, L: Lab, FL: Field & Lab, N: None
							Filt.													
							PRESERV.													
							ANALYSIS	7-d C.dubia P/F	7-d C.dubia P/F (EDTA)	72-hr P. subcapitata P/F	30-d embryo EA P/F	28-d Hyalella P/F	28-d Hyalella P/F (EDTA)						
Sample ID	Sample Location	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.													
CM_MC2_WS_2021-08-31_N	CM_MC2	WS	No	8/31/2021		G	2					x	x							8.1°C
CM_MC1_WS_2021-08-31_N	CM_MC1	WS	No	8/31/2021		G	1					x								8.1°C
RG_MIDAG_WS_2021-08-31_N	RG_MIDAG	WS	No	8/31/2021		G	2					x	x							8.1-10.1°C

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME

NB OF BOTTLES RETURNED/DESCRIPTION					
Regular (default)	X	Sampler's Name	DS/KS	Mobile #	250 425 7522
Priority (2-3 business days) - 50% surcharge					
Emergency (1 Business Day) - 100% surcharge		Sampler's Signature		Date/Time	August 31, 2021
For Emergency <1 Day, ASAP or Weekend - Contact ALS					

Teck

COC ID:	20210831CRN3B	TURNAROUND TIME:		RUSH:	

PROJECT/CLIENT INFO				LABORATORY				OTHER INFO				
Facility Name / Job#	Elkview Operations			Lab Name	Nautilus Environmental			Report Format / Distribution		Excel	PDF	EDD
Job Description	Q3 Chronic Toxicity Sampling			Lab Contact	Jeslin Wijaya			Email 1:	kennedy.allen@teck.com	X	X	X
Project Manager	Jennifer Dane			Email	[illegible]			Email 2:	teckcoal@equisonline.com			X
Email	jennifer.dane@teck.com			Address	8664 Commerce Court			Email 3:	chris.emslie@teck.com	X	X	X
Address	RR#1 HWY# 3				Imperial Square Lake City			Email 4:	Teck.Lab.Results@teck.com	X	X	X
								Email 5:	jennifer.dane@teck.com	X	X	X
City	Sparwood	Province	BC	City	Burnaby	Province	BC	Email 6:	colby.bracken@teck.com	X	X	X
Postal Code	V1C 4C3	Country	Canada	Postal Code	V5A 4N7	Country	Canada	PO number	VPO00678876			
Phone Number	1-250-425-8137			Phone Number	604-420-8773							

SAMPLE DETAILS / **ANALYSIS REQUESTED** (Filtered - F: Field, L: Lab, FL: Field & Lab, N: None)

Sample ID	Sample Location	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	ANALYSIS:	7-d C.dubia P/F	72-hr P. subcapitata P/F	28-d Hyalella P/F	30-d fathead minnow P/F						
								FILTERED	No	No	No	No						
								PRESERVED	No	No	No	No						
EV_HC1_WS_2021_Q3_WK4_N	EV_HC1	WS	N	8/31/2021	10:49	G	1				1							8.6 °C
EV_MC2_WS_2021_Q3_WK4_N	EV_MC2	WS	N	8/31/2021	11:58	G	1				1							8.5 °C
					Total		2											

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
Toxicity 96-Hr/48-HR = 96 Hr Rainbow Trout pass/fail & 48 Hr Daphnia pass/fail (Daphinia testing to occur at 20 degrees)	C. Emslie/J. Batstone	31-Aug-21		

NB OF BOTTLES RETURNED/DESCRIPTION					
Regular (default)	X	Sampler's Name	C. Emslie/J. Batstone	Mobile #	1-250-423-0826
Priority (2-3 business days) - 50% surcharge		Sampler's Signature		Date/Time	August 31, 2021
Emergency (1 Business Day) - 100% surcharge					
For Emergency <1 Day, ASAP or Weekend - Contact ALS					

Teck

COC ID:	8/31/2021	TURNAROUND TIME:		RUSH:	

PROJECT/CLIENT INFO			
Facility Name / Job#	Fording River Operation		
Project Manager	Scott Roughead		
Email	scott.roughead@teck.com		
Address			
City	Elkford	Province	BC
Postal Code		Country	Canada
Phone Number	1-250-433-6976		

LABORATORY			
Lab Name	Nautilus Environmental - BC		
Lab Contact			
Email	BCinfo@nautilusenvironmental.ca		
Address	8664 Commerce Court		
City	Burnaby	Province	BC
Postal Code	V5A 4N7	Country	Canada
Phone Number	604-420-8773		

OTHER INFO				
Report Format / Distribution		Excel	PDF	EDD
Email 1:	david.burroughs@teck.com	X	X	X
Email 2:	britt.anderson@teck.com	X	X	X
Email 3:	scott.roughead@teck.com	X	X	X
Email 4:	cruz.canlas@teck.com	X	X	X
Email 5:	jamie.walsh@teck.com	X	X	X
Email 6:	teckcoal@equisonline.com			X

VPO00741382

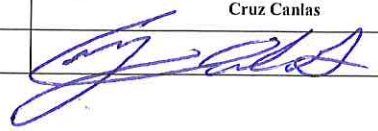
SAMPLE DETAILS / ANALYSIS REQUESTED

Filtered - F; Field, L: Lab, FL: Field & Lab, N: None

Sample ID	Sample Location (sys_loc_code)	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	Filt.	PRESERV.	ANALYSIS: 7-d C.dubia P/F	7-d C.dubia P/F (EDTA)	72-hr P. subcapitata P/F	30-d embryo EA P/F	28-d Hyalella P/F	28-d Hyalella P/F (EDTA)						
								NO	NO	NO	NO	NO	NO	NO	NO						
FR_FRCP1_WEK_2021-08-30_N	FR_FRCP1	WS	NO	8/31/2021		G	2							x	x						10.3°C
FR_FRABCH_WS_2021-08-30_N	FR_FRABCH	WS	NO	8/31/2021		G	1							x							9.8°C
FR_UFR1_WEK_2021-08-30_N	FR_UFR1	WS	NO	8/31/2021		G	1							x							9.8°C

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
2 COOLERS TOTAL	Cruz Canlas	August 31, 2021		

SERVICE REQUEST (rush - subject to availability)	
Regular (default)	X
Priority (2-3 business days) - 50% surcharge	
Emergency (1 Business Day) - 100% surcharge	
For Emergency <1 Day, ASAP or Weekend - Contact ALS	

Sampler's Name	Cruz Canlas	Mobile #	250 433 6166
Sampler's Signature		Date/Time	August 31, 2021

Teck

COC ID: 8/31/2021 | TURNAROUND TIME: | RUSH:

PROJECT/CLIENT INFO				LABORATORY				OTHER INFO				
Facility Name / Job#	Fording River Operation			Lab Name	Nautilus Environmental - BC			Report Format / Distribution		Excel	PDF	EDD
Project Manager	Scott Roughead			Lab Contact				Email 1:	david.burroughs@teck.com	X	X	X
Email	scott.roughead@teck.com			Email	BCinfo@nautilusenvironmental.ca			Email 2:	cruz.canlas@teck.com	X	X	X
Address				Address	8664 Commerce Court			Email 3:	scott.roughead@teck.com	X	X	X
								Email 4:	teckcoal@equisonline.com			X
City	Elkford	Province	BC	City	Burnaby	Province	BC	Email 5:	jessica.ritz@teck.com	X	X	X
Postal Code		Country	Canada	Postal Code	V5A 4N7	Country	Canada	Email 6:	cait.good@teck.com	X	X	X
Phone Number	1-250-433-6976			Phone Number	604-420-8773			Email 7:	jamie.walsh@teck.com	X	X	X

SAMPLE DETAILS / ANALYSIS REQUESTED (Filtered - F: Field, L: Lab, FL: Field & Lab, N: None)

Sample ID	Sample Location (sys loc code)	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	7-d C.dubia P/F	7-d C.dubia P/F (EDTA)	72-hr P. subcapitata P/F	30-d embryo EA P/F	28-d Hyalella P/F	28-d Hyalella P/F (EDTA)						
FR_FR4_WS_2021-08-31_N	FR_FR4	WS	NO	8/31/2021	9:11	G	1	X				X							11.0°C
FR_FRRD_WS_2021-08-31_N	FR_FRRD	WS	NO	8/31/2021	8:31	G	1	X				X							8.0°C
FR_FR2_WS_2021-08-31_N	FR_FR2	WS	NO	8/31/2021	10:29	G	1	X				X							10.3°C
FR_MULTIPLATE_WS_2021-08-31_NP	FR_MULTIPLATE	WS	NO	8/31/2021	11:15	G	1	X				X							11.0°C

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME

SERVICE REQUEST (rush - subject to availability)

Regular (default)	X
Priority (2-3 business days) - 50% surcharge	
Emergency (1 Business Day) - 100% surcharge	
For Emergency <1 Day, ASAP or Weekend - Contact ALS	

Sampler's Name	Tyler/Dan	Mobile #	
Sampler's Signature		Date/Time	August 31, 2021

Teck

COC ID:	2021-08-31 CHRONIC TOX	TURNAROUND TIME:	regular	RUSH:	

PROJECT/CLIENT INFO

Facility Name	Greenhills Operations		
Project Manager	Jeremy Enns		
Email	jeremy.enns@teck.com		
Address	PO Box 5000		
City	Elkford	Province	BC
Postal Code	V0B 1H0	Country	Canada
Phone Number	250 865 3274		

LABORATORY

Lab Name	Nautilus Environmental		
Lab Contact	Armando		
Email			
Address	8664 Commerce Court		
City	Burnaby	Province	BC
Postal Code	V5A 4N7	Country	Can
Phone Number	403.253.7121		

OTHER INFO

EDD delivery:

Email 1:				
Email 2:				
Email 3:	teckcoal@equisonline.com	x	x	X
Email 4:				
Email 5:				
Email 6:	DL-Equis-GHO-Field@teck.com	X	X	X

PO number: 610307

SAMPLE DETAILS / **ANALYSIS REQUESTED**

Please indicate below Filtered, Perserved or both (F, P, F/P)

Sample ID	Sample Location	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	7-d C.dubia P/F	72-hr P. subcapitata P/F	30-d embryo EA P/F	28-d Hyalella P/F									
								#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
GH_ER2_WS_2021-08-31_N	GH_ER2	WS	N	31-Aug		G	1				X									10.8 °C
GH_ERC_WS_2021-08-31_N	GH_ERC	WS	N	31-Aug		G	1				X									10.5 °C
GH_FR1_WS_2021-08-31_N	GH_FR1	WS	N	31-Aug		G	1				X									10.9 °C

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS

RELINQUISHED BY/AFFILIATION	Date	Time	Accepted By/Affiliation	Date	Time

SERVICE REQUEST (rush - subject to availability)

Regular (default)	X
Priority (2-3 business days) - 50% surcharge	
Emergency (1 Business Day) - 100% surcharge	
For Emergency <1 Day, ASAP or Weekend - Contact ALS	

Sampler's Name		Mobile #	
Sampler's Signature		Date/Time	AUG 31 2021

Teck

COC ID: 20210831 Chronic Tox Burn

TURNAROUND TIME:

RUSH:

PROJECT/CLIENT INFO				LABORATORY				OTHER INFO			
Facility Name / Job#	Line Creek Operation			Lab Name	Nautilus Environmental			Report Format / Distribution		Excel	PDF	EDD
Project Manager	Tom Jeffery			Lab Contact	Armando Tang			Email 1:	tom.jeffery@teck.com	x	x	
Email	tom.jeffery@teck.com			Email	armando@nautilusenvironmental.com			Email 2:	teckcoal@equisonline.com			x
Address	Box 2003			Address	8664 Commerce Crt			Email 3:	drake.tymstra@teck.com	x	x	
	15km North Hwy 43							Email 4:	shanise.fossen@teck.com	x	x	
								Email 5:	tanya.dick@teck.com	x	x	
City	Sparwood	Province	BC	City	Burnaby	Province	BC	PO number	VPO00741384			
Postal Code	V0B 2G0	Country	Canada	Postal Code	V5A 4N7	Country	Canada					
Phone Number	250-425-6111			Phone Number	604-420-8773							

SAMPLE DETAILS / ANALYSIS REQUESTED (Filtered - F: Field, L: Lab, FL: Field & Lab, N: None)

Sample ID	Sample Location	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	FIL.	N	N	N									
								PRESERV.	N	N	N									
								ANALYSIS	7-d C.dubia P/F	72-hr P. subcapitata P/F	28-d Hyalella P/F									
LC_DCDS_WS_2021-08-31_N	LC_DCDS	WS	No	31-Aug-21	9:00	G	1				x									
LC_LC3_WS_2021-08-31_N	LC_LC3	WS	No	31-Aug-21	10:00	G	1				x									8.2°C
LC_SLC_WS_2021-08-31_N	LC_SLC	WS	No	31-Aug-21	9:20	G	1				x									8.3°C
LC_LC5_WS_2021-08-31_N	LC_LC5	WS	No	31-Aug-21	12:20	G	1				x									9.0°C
LC_LCDSSLCC_WS_2021-08-31_N	LC_LCDSSLCC	WS	No	31-Aug-21	11:30	G	1				x									10.3°C

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
Please provide prelimnary update as results are available	T. Dick	8/31/2021		

NB OF BOTTLES RETURNED/DESCRIPTION					
Regular (default)	X	Sampler's Name	T. Dick	Mobile #	O: 250-425-3196 / C: 780-223-8222
Priority (2-3 business days) - 50% surcharge					
Emergency (1 Business Day) - 100% surcharge		Sampler's Signature	T Dick	Date/Time	August 31, 2021
For Emergency <1 Day, ASAP or Weekend - Contact ALS					

Teck

COC ID: 2021/09/07 | **TURNAROUND TIME:** | **RUSH:**

PROJECT/CLIENT INFO

Facility Name / Job#	Fording River Operation		
Project Manager	Scott Roughead		
Email	Scott.Roughead@teck.com		
Address	PO Box 100		
City	Elkford	Province	BC
Postal Code	V0B 1H0	Country	Canada
Phone Number	1-250-865-5195		

LABORATORY

Lab Name	HydroQual Laboratories Ltd.		
Lab Contact			
Email	ABinfo@nautilusenvironmental.ca		
Address	#4, 6125 12 Street SE		
City	Calgary	Province	AB
Postal Code	?T2H 2K1	Country	Canada
Phone Number	403-253-7121		

OTHER INFO

Report Format / Distribution		Excel	PDF	EDD
Email 1:	david.burroughs@teck.com	X	X	X
Email 2:	britt.anderson@teck.com	X	X	X
Email 3:	scott.roughead@teck.com	X	X	X
Email 4:	teckcoal@equisonline.com			X
Email 5:	cruz.canlas@teck.com	X	X	X
Email 6:	jamie.walsh@teck.com	X	X	X

PO: VPO00741382

SAMPLE DETAILS

2021/09/08
13:00
Bear Paw
JC
6x20L carboys
NoS/NoI
Good Condition
Wee 105

ANALYSIS REQUESTED

Filtered - F: Field, L: Lab, FL: Field & Lab, N: None

Sample ID	Sample Location (sys_loc_code)	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	Filt.	PRESERV.	ANALYSIS: 30-d fathead minnow P/F	
								N	NONE		
FR_FRCP1_MON_2021-09-06_N 2021-1872	FR_FRCP1	WS	NO	2021/09/07	10:49	G	2			x	14.1°C
FR_FRABCH_MON_2021-09-06_N 2021-1874	FR_FRABCH	WS	NO	2021/09/07	10:24	G	2			x	14.2°C
FR_UFR1_MON_2021-09-06_N ~~2021-1874~~	FR_UFR1	WS	NO	2021/09/07	9:30	G	2			x	14.1°C

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
2021-1873	Jamie Walsh	September 7, 2021		

SERVICE REQUEST (rush - subject to availability)

Regular (default)	X
Priority (2-3 business days) - 50% surcharge	
Emergency (1 Business Day) - 100% surcharge	
For Emergency <1 Day, ASAP or Weekend - Contact ALS	

Sampler's Name	Jamie Walsh	Mobile #	250 433 6166
Sampler's Signature		Date/Time	September 7, 2021

Teck

COC ID: 9/7/2021

TURNAROUND TIME:

RUSH:

PROJECT/CLIENT INFO

Facility Name / Job#	Fording River Operation		
Project Manager	Scott Roughead		
Email	Scott.Roughead@teck.com		
Address	PO Box 100		
City	Elkford	Province	BC
Postal Code	V0B 1H0	Country	Canada
Phone Number	1-250-865-5195		

LABORATORY

Lab Name	HydroQual Laboratories Ltd.		
Lab Contact			
Email	ABinfo@nautilusenvironmental.ca		
Address	#4, 6125 12 Street SE		
City	Calgary	Province	AB
Postal Code	?T2H 2K1	Country	Canada
Phone Number	403-253-7121		

OTHER INFO

Report Format / Distribution		Excel	PDF	EDD
Email 1:	david.burroughs@teck.com	X	X	X
Email 2:	cruz.canlas@teck.com	X	X	X
Email 3:	scott.roughead@teck.com	X	X	X
Email 4:	teckcoal@equisonline.com			X
Email 5:	jessica.ritz@teck.com	X	X	X
Email 6:	cait.good@teck.com	X	X	X
Email 7:	jamie.walsh@teck.com	X	X	X

SAMPLE DETAILS

2021/09/08
13:00
Bear Paw
BC
6x20L carboys
NoS/NaB
Good Condition
Week5

ANALYSIS REQUESTED

Filtered - F: Field, L: Lab, FL: Field & Lab, N: None

Sample ID	Sample Location (sys loc code)	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	Filt.	PRESERV.	ANALYSIS: 30-d fathead minnow P/F	
								N	NONE		
FR_FR4_WS_2021-09-07_N 2021-1875	FR_FR4	WS	NO	7-Sep-21	10:50	G	2			X	14.0°C
FR_FRRD_WS_2021-09-07_N 2021-1878	FR_FRRD	WS	NO	7-Sep-21	9:05	G	2			X	14.6°C
FR_FR2_WS_2021-09-07_N 2021-1876	FR_FR2	WS	NO	7-Sep-21	11:30	G	2			X	14.8°C
FR_MULTIPLATE_WS_2021-09-07_NP	FR_MULTIPLATE	WS	NO	7-Sep-21	10:00	G	2			X	14.1°C
2021-1877											

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME

SERVICE REQUEST (rush - subject to availability)

Regular (default)	X
Priority (2-3 business days) - 50% surcharge	
Emergency (1 Business Day) - 100% surcharge	
For Emergency <1 Day, ASAP or Weekend - Contact ALS	

Sampler's Name	Matt/Shelby	Mobile #	
Sampler's Signature		Date/Time	September 7 2021

Teck

COC ID: 2021-09-07-Chronic-Tox

Phone Number:

RUSH: NO

PROJECT/CLIENT INFO

Facility Name / Job#	Greenhills Operation
Project Manager	Jeremy Enns
Email	jeremy.enns@teck.com
Address	P.O. BOX 5000
City	Elkford
Province	BC
Postal Code	V0B1H0
Country	Canada
Phone Number	250-865-3048

LABORATORY

Lab Name	Hydroqual Laboratories Ltd
Lab Contact	Jacklyn Pool
Email	
Address	#4, 6125 - 12th Street S.E.
City	Calgary
Province	AB
Postal Code	T2H 2K1
Country	Can
Phone Number	403-253-7121

OTHER INFO

Report Format / Distribution		Excel	PDF	EDD
Email 1:				
Email 2:				
Email 3:	teckcoal@equisonline.com			X
Email 4:				
Email 5:				
Email 6:	DL-Equis-GHO-Field@teck.com	X	X	X
Email 7:				
PO number	740426			

2021/09/08
13:00
Bear Paw
BC
6x20L carboys
Nos/Noz
Good Condition
Week 5

Sample ID		Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	Filt.	PRESERV.	ANALYSIS: 7-d C.dubia P/F	72-hr P. subcapitata P/F	30-d fathead minnow P/F	
GH_FR1_WS_2021-09-07_N	2021-1879	GH_FR1	WS	N	9/7/2021	1325	G	2				X	14.6°C
GH_ERC_WS_2021-09-07_N	2021-1880	GH_ERC	WS	N	9/7/2021	1210	G	2				X	13.9°C
GH_ER2_WS_2021-09-07_N	2021-1881	GH_ER2	WS	N	9/7/2021	1105	G	2				X	13.8°C

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME

SERVICE REQUEST (rush - subject to availability)

Regular (default)	X
Priority (2-3 business days) - 50% surcharge	
Emergency (1 Business Day) - 100% surcharge	
For Emergency <1 Day, ASAP or Weekend - Contact ALS	

Sampler's Name	RG/SS	Mobile #	
Sampler's Signature		Date/Time	September 7th, 2021

Teck

COC ID: 20210907CRN3C | **TURNAROUND TIME:** | **RUSH:**

PROJECT/CLIENT INFO

Facility Name / Job#	Elkview Operations
Job Description	Q3 Chronic Toxicity Sampling
Project Manager	Jennifer Dane
Email	jennifer.dane@teck.com
Address	RR#1 HWY# 3
City	Sparwood
Province	BC
Postal Code	V1C 4C3
Country	Canada
Phone Number	1-250-425-8137

LABORATORY

Lab Name	Nautilus Environmental
Lab Contact	Jacklyn Poole
Email	Jacklyn@nautilusenvironmental.ca
Address	6125 12st SE
City	Calgary
Province	AB
Postal Code	T2H 2K1
Country	Canada
Phone Number	403-253-7121

OTHER INFO

Report Format / Distribution		Excel	PDF	EDD
Email 1:	kennedy.allen@teck.com	X	X	X
Email 2:	teckcoal@equisonline.com			X
Email 3:	chris.emslie@teck.com	X	X	X
Email 4:	Teck.Lab.Results@teck.com	X	X	X
Email 5:	jennifer.dane@teck.com	X	X	X
Email 6:	colby.bracken@teck.com	X	X	X
PO number	VPO00678876			

SAMPLE DETAILS

2021/09/08 13:00 Bear Paw JC 4x20L carboys NaS/NaT — Good Condition Week 5 — 2021-1882

Sample ID	Sample Location	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.
EV_HC1_WS_2021_Q3_WK5_N	EV_HC1	WS	N	9/7/2021	10:40	G	2
EV_MC2_WS_2021_Q3_WK5_N	EV_MC2	WS	N	9/7/2021	12:24	G	2
2021-1883							
					Total		4

ANALYSIS REQUESTED

Filtered - F: Field, L: Lab, FL: Field & Lab, N: None

	ANALYSIS	7-d C.dubia P/F	72-hr P. subcapitata P/F	30-d embryo EA P/F	30-d fathead minnow P/F	
FILTERED		No	No	No	No	
PRESERVED		No	No	No	No	
EV_HC1_WS_2021_Q3_WK5_N					1	13.8°C
EV_MC2_WS_2021_Q3_WK5_N					1	12.3°C

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS

Toxicity 96-Hr/48-HR = 96 Hr Rainbow Trout pass/fail & 48 Hr Daphnia pass/fail (Daphinia testing to occur at 20 degrees)

RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
C. Bracken/ J. Dane	7-Sep-21		

NB OF BOTTLES RETURNED/DESCRIPTION

Regular (default)	X
Priority (2-3 business days) - 50% surcharge	
Emergency (1 Business Day) - 100% surcharge	
For Emergency <1 Day, ASAP or Weekend - Contact ALS	

Sampler's Signature	C. Bracken/ J. Dane	Mobile #	1-250-423-0826
		Date/Time	September 7, 2021

Teck

COC ID: Q3_CHRONIC_09072021_CAL

TURNAROUND TIME: Regular

RUSH: NO

PROJECT/CLIENT INFO				LABORATORY				OTHER INFO				
Facility Name / Job#	Coal Mountain Operations			Lab Name	Hydroqual Laboratories			Report Format / Distribution		Excel	PDF	EDD
Project Manager	Jay Jones			Lab Contact	Jacklyn Poole			Email 1:	Victoria.Sharpe@teck.com	X	X	X
Email	Jay.Jones@teck.com				Tamara			Email 2:	teckcoal@equisonline.com			X
				Email	jacklyn@nautilusenvironmental.ca			Email 3:	Jay.jones@teck.com	X	X	X
					tamara@nautilusenvironmental.ca			Email 4	Don.Sacino@teck.com	X	X	X
Address	PO Box 3000			Address	#4, 6125-12th Street S.E.			Email 5:	Shelby.Holden@teck.com	X	X	X
City	Sparwood	Province	BC	City	Calgary	Province	AB	PO number				
Postal Code	V0B 2G0	Country	Canada	Postal Code	T2H 2K1	Country	Canada					
Phone Number	1-250-425-7321			Phone Number	403-253-7121							

SAMPLE DETAILS

2021/09/08
13:00
Bear Paw
SC
6x20L carboys
N05/N05
Good Condition

ANALYSIS REQUESTED

Filtered - F: Field, L: Lab, FL: Field & Lab, N: None

Sample ID	Sample Location	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	ANALYSIS: 30-d fathead minnow P/F	Filt.	PRESERV.												
CM_MC2_WS_2021-09-07_N 2021-1884	CM_MC2	WS	No	9/7/2021	10:07	G	2	X			12.4°C											
CM_MC1_WS_2021-09-07_N 2021-1885	CM_MC1	WS	No	9/7/2021	8:40	G	2	X			13.3°C											
RG_MIDAG_WS_2021-09-07_N 2021-1886	RG_MIDAG	WS	No	9/7/2021	9:35	G	2	X			12.6°C											

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME

NB OF BOTTLES RETURNED/DESCRIPTION

Regular (default)	X
Priority (2-3 business days) - 50% surcharge	
Emergency (1 Business Day) - 100% surcharge	
For Emergency <1 Day, ASAP or Weekend - Contact ALS	

Sampler's Name	KS/DS	Mobile #	250 425 7522
Sampler's Signature	Kristy Stewart	Date/Time	September 7, 2021

Teck

COC ID: 20210907 Chronic Tox Calg

TURNAROUND TIME:

RUSH:

PROJECT/CLIENT INFO

Facility Name / Job#	Line Creek Operation
Project Manager	Tom Jeffery
Email	tom.jeffery@teck.com
Address	Box 2003
	15km North Hwy 43
City	Sparwood
Province	BC
Postal Code	V0B 2G0
Country	Canada
Phone Number	250-425-6111

LABORATORY

Lab Name	Nautilus Environmental
Lab Contact	Jeslin Wijaya
Email	jeslin@nautilusenvironmental.ca
Address	6125 12 St NE
City	Calgary
Province	AB
Postal Code	T2H 2K1
Country	Canada
Phone Number	403-253-7121

OTHER INFO

Report Format / Distribution		Excel	PDF	EDD
Email 1:	tom.jeffery@teck.com	x	x	
Email 2:	teckcoal@equisonline.com			x
Email 3:	drake.tymstra@teck.com	x	x	
Email 4:	shanise.fossen@teck.com	x	x	
Email 5:	tanya.dick@teck.com	x	x	

PO number: VPO00741384

SAMPLE DETAILS

2021/09/08
13:00
Bear Paw
JC
10x20L carboys
NoS/NoB
Good Condition
Week 5

Sample ID	Sample Location	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	Filt.	PRESERV.	ANALYSIS: 7-d C.dubia P/F	ANALYSIS: 72-hr P. subcapitata P/F	ANALYSIS: 30-d fathead minnow P/F	
								N	N			N	
LC_DCDS_WS_2021-09-07_N 2021-1890	LC_DCDS	WS	No	7-Sep-21		G	2					x	12.1°C
LC_LC3_WS_2021-09-07_N 2021-1888	LC_LC3	WS	No	7-Sep-21	12:10	G	2					x	11.4°C
LC_SLC_WS_2021-09-07_N 2021-1889	LC_SLC	WS	No	7-Sep-21	11:30	G	2					x	9.8°C
LC_LC5_WS_2021-09-07_N 2021-1891	LC_LC5	WS	No	7-Sep-21		G	2					x	9.8°C
LC_LCDSSLCC_WS_2021-09-07_N 2021-1887	LC_LCDSSLCC	WS	No	7-Sep-21	12:50	G	2					x	12.1°C

Filtered - F: Field, L: Lab, FL: Field & Lab, N: None

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS

Please provide prelimnary update as results are available

RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
T. Dick	9/7/2021		

NB OF BOTTLES RETURNED/DESCRIPTION

Regular (default)	X
Priority (2-3 business days) - 50% surcharge	
Emergency (1 Business Day) - 100% surcharge	
For Emergency <1 Day, ASAP or Weekend - Contact ALS	

Sampler's Name	T. Dick	Mobile #	O: 250-425-3196 / C: 780-223-8222
Sampler's Signature	T Dick	Date/Time	September 7, 2021

END OF REPORT

Toxicity testing on Elk Valley Samples with *Ceriodaphnia dubia*, *Pseudokirchneriella subcapitata*, *Hyalella azteca* and *Oncorhynchus mykiss*

Fourth Quarter 2021

Revision 1 – June 21, 2022

Final Report

February 9, 2022

Submitted to: **Teck Coal Ltd.**
Sparwood, BC

10823 27 Street SE, Calgary, AB T2Z 3V9

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APPENDIX D – *Oncorhynchus mykiss* Toxicity Test Data
APPENDIX E – Chain-of-Custody Forms

SIGNATURE PAGE

Report By:
Émilie Viczko, M.Sc.
Project Biologist

Reviewed By:
Melanie Gallant, Ph.D.
Environmental Toxicologist

This report has been prepared by Nautilus Environmental Company Inc. based on data and/or samples provided by our client and the results of this study are for their sole benefit. Any reliance on the data by a third party is at the sole and exclusive risk of that party. The results presented here relate only to the samples tested.

1.0 INTRODUCTION

Nautilus Environmental conducted toxicity tests for Teck Coal Ltd. (Teck) on water samples collected from various locations in the Elk Valley as part of a quarterly toxicity testing program required under the BC Ministry of Environment and Climate Change Strategy permit number 107517.

Stations sampled in the fourth quarter of 2021 are shown in Figure 1; stations shown as green symbols align with the integrated chronic toxicity testing program, which was designed to eliminate redundancy between Permit 107517 and Permit 106970 toxicity testing programs. The integrated program was approved by BC Ministry of Environment and Climate Change Strategy on March 4, 2019 (BC ENV 2019). Species requiring quarterly testing include a cladoceran (*Ceriodaphnia dubia*) and a unicellular green alga (*Pseudokirchneriella subcapitata*). On a semi-annual basis, tests using rainbow trout (*Oncorhynchus mykiss*; Q2 and Q4), an amphipod (*Hyalella azteca*; Q2 and Q4), and fathead minnows (*Pimephales promelas*; Q1 and Q3) are also required. Figure 1 stations shown as orange symbols align with the upper Fording River chronic toxicity testing program, which is a supplemental study for 2021 to satisfy Section 4D2.5 of Permit 107517. The upper Fording River program includes the same test species and testing frequency as the regional program, except that green alga is not tested.

Water samples used for testing were transported in 20-L plastic containers in coolers containing ice packs. Samples were received at temperatures ranging from 0.0 to 9.6°C and were stored in the dark at 4 ± 2°C prior to testing. Table 1 summarizes the toxicity tests that were conducted on each sample as well as sample collection dates. Samples were collected weekly on the dates shown in Table 1 for the duration of the *H. azteca* and *O. mykiss* tests. All tests were conducted at the Nautilus Environmental laboratory in Burnaby, BC.

This report presents the results of the toxicity tests. Copies of laboratory data sheets and printouts of statistical analyses are provided in Appendices A through D. The chain-of-custody forms are provided in Appendix E. Results of analytical chemistry that was performed on the samples tested in this program are uploaded by Teck to the Environmental Management System database. Analytical chemistry water samples were collected by Teck personnel at the same time the water samples were collected for toxicity testing.

Figure 1. Chronic toxicity monitoring locations.

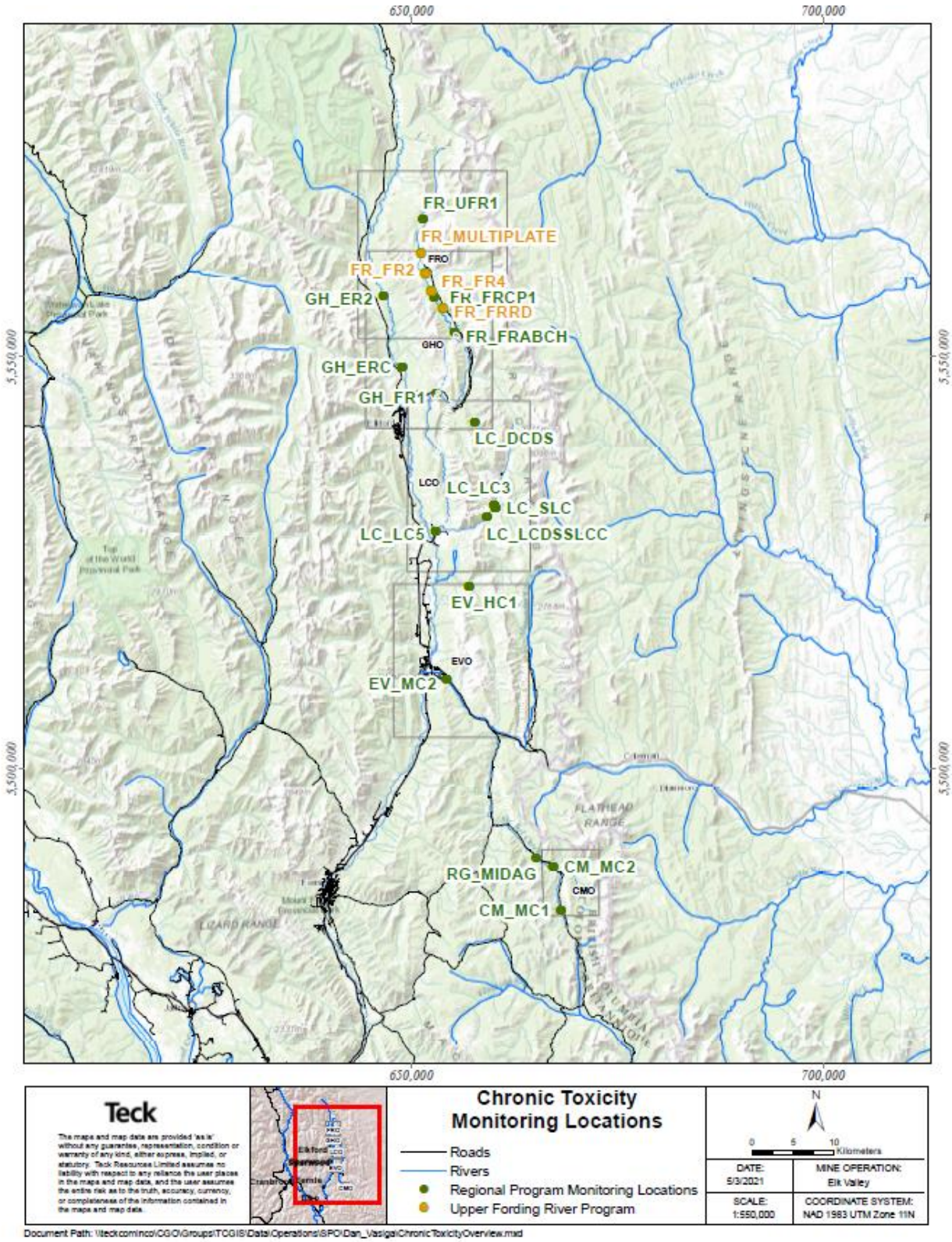

Table 1. Summary of toxicity testing program.

Sample ID	EMS Location ID	Species Tested	Sample Collection Dates‡
FR_UFR1 *	E300071	*C. dubia*, *P. subcapitata*, *H. azteca* and *O. mykiss*	October 12, 19, 26, and November 2, 9; 2021
GH_ER2 *	E300090	*C. dubia*, *P. subcapitata*, *H. azteca* and *O. mykiss*	October 12, 19, 26, and November 2, 9; 2021
CM_MC1 *	E258937	*C. dubia*, *P. subcapitata*, *H. azteca* and *O. mykiss*	October 12, 19, 26, and November 2, 9; 2021
LC_SLC *	E282149	*C. dubia*, *P. subcapitata*, *H. azteca* and *O. mykiss*	October 12, 19, 26, and November 2, 9; 2021
FR_FRABCH	E223753	*C. dubia*, *P. subcapitata*, *H. azteca* and *O. mykiss*	October 12, 19, 26, and November 2, 9; 2021
FR_FRCP1	E299272	*C. dubia*, *P. subcapitata*, *H. azteca* and *O. mykiss*	October 12, 19, 26, and November 2, 9; 2021
GH_FR1	E200028	*C. dubia*, *P. subcapitata*, *H. azteca* and *O. mykiss*	October 12, 19, 26, and November 2, 9; 2021
GH_ERC	E258175	*C. dubia*, *P. subcapitata*, *H. azteca* and *O. mykiss*	October 12, 19, 26, and November 2, 9; 2021
CM_MC2	E300091	*C. dubia*, *P. subcapitata*, *H. azteca* and *O. mykiss*	October 12, 19, 26, and November 2, 9; 2021
RG_MIDAG†	--	*C. dubia* and *H. azteca*	October 12, 19, 26, and November 2, 9; 2021
EV_MC2	E102682	*C. dubia*, *P. subcapitata*, *H. azteca* and *O. mykiss*	October 12, 19, 26, and November 2, 9; 2021
EV_HC1	E299270	*C. dubia*, *P. subcapitata*, *H. azteca* and *O. mykiss*	October 12, 19, 26, and November 2, 9; 2021
LC_DCDS	E291569	*C. dubia*, *P. subcapitata*, *H. azteca* and *O. mykiss*	October 12, 19, 26, and November 2, 9; 2021
LC_LC3	E297110	*C. dubia*, *P. subcapitata*, *H. azteca* and *O. mykiss*	October 12, 19, 26, and November 2, 9; 2021
LC_LC5	0200389	*C. dubia*, *P. subcapitata*, *H. azteca* and *O. mykiss*	October 12, 19, 26, and November 2, 9; 2021
LC_LCDSSLCC	E282149	*C. dubia*, *P. subcapitata*, *H. azteca* and *O. mykiss*	October 12, 19, 26, and November 2, 9; 2021
FR_FR4 #	0200311	*C. dubia*, *H. azteca* and *O. mykiss*	October 12, 19, 26, and November 2, 9; 2021
FR_FR2 #	200201	*C. dubia*, *H. azteca* and *O. mykiss*	October 12, 19, 26, and November 2, 9; 2021
FR_MULTIPLATE #	--	*C. dubia*, *H. azteca* and *O. mykiss*	October 12, 19, 26, and November 2, 9; 2021
FR_FRRD #	E300097	*C. dubia*, *H. azteca* and *O. mykiss*	October 12, 19, 26, and November 2, 9; 2021

* Site water controls

Upper Fording River samples from the supplemental study for 2021

† Testing of the station RG_MIDAG is not a permit requirement but was added to characterize the spatial extent of effects observed in CM_MC2

‡ Testing with *C. dubia* and *P. subcapitata* was conducted with water collected on October 12th; testing with *H. azteca* and *O. mykiss* was conducted with water collected on October 12th to November 9th.

2.0 METHODS

Methods for the toxicity tests using *C. dubia*, *P. subcapitata, H. azteca*, and *O. mykiss* are summarized in Tables 2 to 5. Laboratory control water was prepared using deionized water with 20% Perrier for *C. dubia*; deionized water with supplemented nutrients for *P. subcapitata*; reconstituted water prepared by addition of reagent grade salts to dechlorinated Metro Vancouver municipal tap water for *H. azteca* according to a recipe provided in Environment Canada (2013); and dechlorinated Metro Vancouver municipal tap water for *O. mykiss*.

For *C. dubia*, the test protocol specifies that test duration must be 7 ± 1 day, with the test being terminated on the day that at least 60% of control organisms have produced three broods. To provide additional information on reproduction patterns in the samples, and as requested by Teck, the tests were extended to 8 days, regardless of when 60% of controls had produced three broods. The results reported below were calculated based on the specifications of the test method, which in this case was based on the reproduction that had been observed up to Day 6 of exposure. The additional information on reproduction up to Day 8 of exposure is available in Appendix A.

For the *H. azteca* tests, all site waters were supplemented with 25 mg/L chloride and 0.02 mg/L bromide using NaCl and NaBr, respectively, in accordance with recommendations by the Hyalella Advisory Group (chaired by Chris Ingersoll, USGS; Norberg-King *et al.*, 2014). Insufficient concentrations of these halides are known to impair growth of this species. The laboratory control water contained approximately 75 mg/L chloride and 0.8 mg/L bromide.

As requested by Teck, all waters used in tests with *O. mykiss* were amended with 20 µg/L copper to reduce potential for confounding effects from microbial growth (Nautilus 2020). Rainbow trout embryo-alevin tests were performed using a blocked design (*i.e.*, eggs from one fish were used for replicate A of each test concentration, eggs from the second fish for replicate B, and so on). The blocked design approach was a planned deviation from the Environment Canada test method, which indicates that the eggs should be pooled prior to testing. However, this modification is considered appropriate because it reduces the risk of non-viable eggs from a single fish affecting the results of the entire test.

Statistical analyses were performed using CETIS (Tidepool Scientific Software, 2013), and involved comparison of results to both the laboratory and site water controls.

Table 2. Test conditions: *Ceriodaphnia dubia* survival and reproduction test.

Test species	*Ceriodaphnia dubia*
Organism source	In-house culture
Organism age	<24-hour old neonates, produced within a 12-hour window
Test type	Static-renewal
Test duration	8 days[1]
Test vessel	20-mL glass test tube
Test volume	15 mL
Test solution depth	10 cm
Test concentrations	100% (undiluted) sample, plus laboratory control
Test replicates	10 per treatment
Number of organisms	1 per replicate
Control water	20% Perrier water and 80% deionized water + 5 µg/L Se and 2 µg/L vitamin B12
Test solution renewal	Daily (100% renewal)
Test temperature	25 ± 1°C
Feeding	Daily with *Pseudokirchneriella subcapitata* and TCC[2] (3:1 ratio)
Light intensity	100 to 600 lux at water surface
Photoperiod	16 hours light / 8 hours dark
Aeration	None
Test measurements	Temperature, dissolved oxygen, pH and conductivity measured daily; hardness and alkalinity of undiluted sample measured at test initiation; survival and reproduction checked daily
Test protocol	Environment Canada (2007a), EPS 1/RM/21
Statistical software	CETIS Version 1.9.4
Test endpoints	Survival and reproduction
Test acceptability criteria for controls	≥80% survival; ≥15 young per surviving control producing three broods; ≥60% of controls producing three or more broods; no ephippia present
Reference toxicant	Sodium chloride (NaCl)

[1] Test duration was extended to 8 days to provide additional information on patterns of reproduction. Summarized data and calculated endpoints are based on results from Day 6, according to the standard test procedure; however, all the data through 8 days are provided in Appendix A.

[2] TCC = Trout Chow + cerophyl

Table 3. Test conditions: *Pseudokirchneriella subcapitata* growth inhibition test.

Test species	*Pseudokirchneriella subcapitata*, strain CPCC# 37
Organism source	In-house axenic culture, obtained from Canadian Phycological Culture Center, and originally isolated from Nivelta River, Norway.
Organism age	3-to 7-day old culture in logarithmic growth phase
Test type	Static
Test duration	72 hours
Test vessel	Microplate
Test volume	220 µL
Test concentrations	Full strength sample diluted to 95.2% (v/v) by addition of nutrients, plus laboratory control
Test replicates	4 per treatment; 8 for laboratory control and site controls
Number of organisms	10,000 cells/mL
Control water	Deionized water supplemented with nutrients
Test solution renewal	None
Test temperature	24 ± 2°C
Feeding	None
Light intensity	3600 to 4400 lux
Photoperiod	24 hours light
Aeration	None
Test measurements	Test area temperature measured daily; temperature and pH measured at test initiation; pH of two control wells measured at test termination
Test protocol	Environment Canada (2007b), EPS 1/RM/25
Statistical software	CETIS Version 1.9.4
Test endpoints	Algal cell growth inhibition
Test acceptability criteria for controls	>16-fold increase in number of algal cells; CV ≤ 20%; no trend when analyzed using Mann-Kendall test
Reference toxicant	Zinc (added as $ZnSO_4$)

Table 4. Test conditions: *Hyalella azteca* survival and growth test.

Test species	*Hyalella azteca*
Organism source	Aquatic Biosystems, CO
Organism age	7- to 8-days old
Test type	Static-renewal
Test duration	28 days
Test vessel	375-mL glass container
Test volume	300 mL
Test concentrations	100% (undiluted) samples amended with 25 mg/L Cl and 0.02 mg/L Br, plus laboratory control
Test replicates	5 per treatment
Number of organisms	10 per replicate
Control water	Reconstituted water containing ~75 mg/L Cl and 0.8 mg/L Br (Environment Canada 2013). Samples were supplemented with 25 mg/L Cl and 0.02 mg/L Br.
Test solution renewal	Twice daily (~80% renewal)
Test temperature	23 ± 1°C
Feeding	1 mL of YCT daily to each container. Tetramin daily, with amounts increasing weekly; Week 1: 0.25 mg, Week 2: 0.5 mg, Week 3: 1 mg, Week 4: 1.5 mg in each test container.
Light intensity	500 to 1000 lux at water surface
Photoperiod	16 hours light / 8 hours dark
Aeration	None
Test measurements	Temperature, dissolved oxygen, pH and conductivity measured daily; hardness and alkalinity measured upon arrival; hardness and alkalinity measured at test termination; total ammonia measured at test initiation and termination
Test protocol	Modified from US EPA (2000), as described in Norberg-King et al. (2014)
Statistical software	CETIS Version 1.9.4
Test endpoints	Survival and dry weight
Test acceptability criteria for controls	Mean control survival of ≥80%, dry weight ≥0.10 mg
Reference toxicant	Sodium chloride (NaCl)

Table 5. Test conditions: *Oncorhynchus mykiss* embryo-alevin development test.

Test species	*Oncorhynchus mykiss*
Organism source	Lyndon Fish Hatcheries, ON
Gamete quality	Small amount of water added to milt on a dry glass slide; verification of vigorous sperm motility using a compound microscope (100 X magnification)
Organism age	<30 minutes post fertilization, <24-hour old gametes
Test type	Static-renewal
Test duration	Test terminated 7 days after ≥50% of controls hatch
Test vessel	4-L plastic containers
Test volume	2 L
Test solution depth	17 cm
Test concentrations	100% (undiluted sample) amended with 20 µg/L Cu, plus laboratory control
Test replicates	4 per treatment
Number of organisms	30 per replicate
Control water	Dechlorinated Metro Vancouver municipal tap water
Test solution renewal	Daily (80% renewal)
Test temperature	14 ± 1°C
Feeding	None
Light intensity	Dark
Photoperiod	24 hours dark; low intensity light used during solution renewals
Aeration	Continuous gentle aeration
Test measurements	Temperature, dissolved oxygen, pH and conductivity measured daily; hardness and alkalinity of undiluted sample measured upon arrival; survival checked daily
Test protocol	Environment Canada (1998), EPS 1/RM/28
Statistical software	CETIS Version 1.9.4
Test endpoint	Survival, viability (which assesses incidence of deformities), length, wet weight
Test acceptability criteria for controls	≥65% normally developed hatched fish
Reference toxicant	Sodium dodecyl sulphate (SDS)

3.0 RESULTS

3.1 *Ceriodaphnia dubia*

Results of the toxicity tests using *C. dubia* are provided in Table 6. The site water control samples from FR_UFR1, GH_ER2, CM_MC1 and LC_SLC performed similarly to the laboratory control, indicating that there were no adverse effects associated with the upstream stations.

There were no adverse effects on survival in any of the samples tested; survival ranged between 90 and 100%. Significantly lower reproduction relative to one or more controls was observed in FR_FRCP1, CM_MC2, RG_MIDAG, EV_HC1, LC_DCDS, LC_LC3, FR_FR4, FR_FR2, FR_MULTIPLATE, and FR_FRRD.

3.2 *Pseudokirchneriella subcapitata*

Results of the toxicity tests using *P. subcapitata* are provided in Table 7. The cell yield in site controls FR_UFR1, GH_ER2, CM_MC1 and LC_SLC was 4.5- to 4.7-fold greater than the laboratory control. This finding is not unusual, since the higher ionic strength associated with the site water controls would be expected to stimulate cell growth of this species relative to the very low ionic strength associated with the laboratory control water.

Significantly lower cell yield relative to one or more site controls was observed in all samples tested, except FR_FRCP1. Significant growth stimulation was observed in all samples tested compared to the laboratory control. Percent stimulation ranged between 214.7 and 372.0%.

3.3 *Hyalella azteca*

Results of the toxicity tests using *H. azteca* are provided in Table 8. Survival and dry weight among site controls FR_UFR1, GH_ER2, CM_MC1 and LC_SLC was similar to the laboratory control indicating there were no adverse effects associated with the upstream stations.

Significantly lower survival relative to FR_UFR1 was observed in LC_DCDS. Significantly lower dry weight relative to one or more controls was observed in GH_ERC, LC_DCDS, FR_FR4, and FR_FRRD.

3.4 *Oncorhynchus mykiss*

Results of the toxicity tests using *O. mykiss* are provided in Table 9. The site water controls FR_UFR1, CM_MC1, GH_ER2 and LC_SLC performed similarly to the laboratory control for all

endpoints (survival, viability, length, and wet weight), indicating that there were no adverse effects associated with the upstream site waters.

Adverse effects on survival and embryo viability were observed in FR_FRCP1 and GH_FR1 when compared to one or more controls. Survival ranged between 69.3 and 94.1% and embryo viability ranged between 68.4 and 89.9% across all samples. No adverse effects on length or wet weight were observed in any of the samples tested.

There were no observations of unusual behavior observed in fish exposed to any of the samples. Microbial growth was observed following hatch in one or more replicates of each of the following samples: GH_ER2, LC_SLC, FR_FRABCH, FR_FRCP1, GH_FR1, GH_ERC LC_DCDS, LC_LCDSSLCC, FR_FR2, FR_MULTIPLATE, and FR_FRRD. Instances of microbial growth were observed during a timeframe spanning day 16 to day 27 of testing.

Table 6. Results: *Ceriodaphnia dubia* survival and reproduction test.

Sample ID	Survival (%)	Reproduction (Mean ± SD)
Laboratory Control	100	23.0 ± 3.3
FR_UFR1 (Site Control)	100	22.9 ± 4.9
GH_ER2 (Site Control)	100	23.2 ± 5.9
CM_MC1 (Site Control)	90	21.8 ± 9.0
LC_SLC (Site Control)	100	22.2 ± 4.8
FR_FRABCH	100	20.0 ± 5.1
FR_FRCP1	100	15.8 ± 4.4 *#†‡§
GH_FR1	100	20.9 ± 7.8
GH_ERC	100	24.7 ± 2.1
CM_MC2	100	14.5 ± 7.6 *#†‡§
RG_MIDAG	100	18.4 ± 5.9 *#†
EV_MC2	100	25.2 ± 1.9
EV_HC1	100	18.7 ± 3.7 *#†§
LC_DCDS	100	13.3 ± 3.6 *#†‡§
LC_LC3	90	17.2 ± 6.5 *#†§
LC_LC5	100	22.1 ± 5.2
LC_LCDSSLCC	100	21.3 ± 4.8
FR_FR4	100	13.6 ± 4.6 *#†‡§
FR_FR2	90	17.2 ± 7.2 *#†§
FR_MULTIPLATE	100	15.0 ± 5.2 *#†‡§
FR_FRRD	100	17.2 ± 5.4 *#†§

SD = Standard Deviation
* Result was significantly lower than the laboratory control
# Result was significantly lower than the FR_UFR1 site control
† Result was significantly lower than the GH_ER2 site control
‡ Result was significantly lower than the CM_MC1 site control
§ Result was significantly lower than the LC_SLC site control

Table 7. Results: *Pseudokirchneriella subcapitata* growth inhibition test.

Sample ID	Cell Yield (x 10^4 cells/mL) (Mean ± SD)	Stimulation relative to laboratory control (%)
Laboratory Control	18.8 ± 0.7	--
FR_UFR1 (Site Control)	86.8 ± 5.0	362.7
GH_ER2 (Site Control)	88.5 ± 4.6	372.0
CM_MC1 (Site Control)	84.1 ± 5.6	348.7
LC_SLC (Site Control)	86.0 ± 5.8	358.7
FR_FRABCH	73.2 ± 3.0 # † ‡ §	290.7
FR_FRCP1	73.0 ± 7.0	289.3
GH_FR1	71.2 ± 5.9 # † ‡ §	280.0
GH_ERC	65.2 ± 7.8 # † ‡ §	248.0
CM_MC2	59.0 ± 9.2 # † ‡ §	214.7
EV_MC2	65.2 ± 8.5 # † ‡ §	248.0
EV_HC1	68.5 ± 5.1 # † ‡ §	265.3
LC_DCDS	74.5 ± 4.9 # †	297.3
LC_LC3	75.0 ± 3.4 # †	300.0
LC_LC5	68.8 ± 5.9 # † ‡ §	266.7
LC_LCDSSLCC	61.5 ± 7.6 # † ‡ §	228.0

SD = Standard Deviation
* Result was significantly lower than the laboratory control
# Result was significantly lower than the FR_UFR1 site control
† Result was significantly lower than the GH_ER2 site control
‡ Result was significantly lower than the CM_MC1 site control
§ Result was significantly lower than the LC_SLC site control

Table 8. Results: *Hyalella azteca* survival and growth test.

Sample ID	(Mean ± SD)	
	Survival (%)	Dry weight (mg)
Laboratory Control	92.0 ± 8.4	0.43 ± 0.06
FR_UFR1 (Site Control)	98.0 ± 4.5	0.49 ± 0.06
GH_ER2 (Site Control)	96.0 ± 5.5	0.56 ± 0.12
CM_MC1 (Site Control)	90.0 ± 17.3	0.56 ± 0.06
LC_SLC (Site Control)	96.0 ± 5.5	0.49 ± 0.13
FR_FRABCH	96.0 ± 5.5	0.62 ± 0.11
FR_FRCP1	98.0 ± 4.5	0.53 ± 0.07
GH_FR1	92.0 ± 8.4	0.44 ± 0.15
GH_ERC	90.0 ± 10.0	0.41 ± 0.02 †
CM_MC2	98.0 ± 4.5	0.57 ± 0.09
RG_MIDAG	100.0 ± 0.0	0.50 ± 0.09
EV_MC2	96.0 ± 5.5	0.42 ± 0.06
EV_HC1	94.0 ± 8.9	0.57 ± 0.13
LC_DCDS	76.0 ± 32.9 #	0.39 ± 0.08 †‡
LC_LC3	94.0 ± 8.9	0.52 ± 0.04
LC_LC5	96.0 ± 5.5	0.54 ± 0.04
LC_LCDSSLCC	98.0 ± 4.5	0.49 ± 0.08
FR_FR4	94.0 ± 8.9	0.40 ± 0.07 †‡
FR_FR2	92.0 ± 4.5	0.46 ± 0.06
FR_MULTIPLATE	86.0 ± 11.4	0.46 ± 0.04
FR_FRRD	98.0 ± 4.5	0.35 ± 0.03 †‡

SD = Standard Deviation
* Result was significantly lower than the laboratory control
# Result was significantly lower than the FR_UFR1 site control
† Result was significantly lower than the GH_ER2 site control
‡ Result was significantly lower than the CM_MC1 site control
§ Result was significantly lower than the LC_SLC site control

Table 9. Results: *Oncorhynchus mykiss* embryo-alevin development test.

Sample ID	(Mean ± SD)			
	Survival (%)	Viability (%)	Length (mm)	Wet Weight (mg)
Laboratory Control	83.5 ± 11.3	81.9 ± 11.6	18.7 ± 1.8	85.7 ± 9.1
Laboratory Control + 20 µg/L Cu	86.4 ± 7.4	79.6 ± 13.2	17.5 ± 1.0	80.8 ± 6.8
FR_UFR1 (Site Control)	85.8 ± 10.6	83.2 ± 13.6	18.6 ± 0.8	85.3 ± 11.1
GH_ER2 (Site Control) [M]	89.2 ± 5.7	87.5 ± 3.2	19.5 ± 0.3	88.0 ± 9.3
CM_MC1 (Site Control)	90.0 ± 6.1	88.4 ± 6.4	18.9 ± 0.5	85.8 ± 5.7
LC_SLC (Site Control) [M]	85.7 ± 5.1	79.0 ± 6.8	18.0 ± 0.4	82.0 ± 8.5
FR_FRABCH[M]	84.3 ± 1.7	80.2 ± 2.6	19.8 ± 0.9	93.5 ± 12.1
FR_FRCP1[M]	69.3 ± 11.6 [c # † ‡ §]	68.4 ± 9.9 [† ‡]	19.6 ± 1.1	93.9 ± 11.1
GH_FR1[M]	76.0 ± 12.5 [‡]	73.6 ± 15.6 [‡]	20.1 ± 0.8	102.0 ± 17.4
GH_ERC[M]	85.7 ± 9.3	81.4 ± 10.6	19.9 ± 0.9	98.0 ± 7.3
CM_MC2	82.4 ± 12.5	82.4 ± 12.5	20.1 ± 0.5	96.2 ± 12.2
EV_MC2	78.9 ± 11.2	74.6 ± 10.2	18.6 ± 0.7	86.7 ± 9.3
EV_HC1	83.2 ± 9.8	75.5 ± 14.0	19.2 ± 1.0	92.8 ± 10.8
LC_DCDS[M]	87.4 ± 3.2	84.0 ± 5.7	19.7 ± 1.0	91.9 ± 8.4
LC_LC3	94.1 ± 3.2	89.9 ± 3.8	19.8 ± 0.8	89.3 ± 7.7
LC_LC5	84.4 ± 8.7	77.8 ± 10.9	19.2 ± 1.3	85.9 ± 11.0
LC_LCDSSLCC[M]	84.1 ± 10.2	81.6 ± 11.3	20.3 ± 0.9	91.6 ± 10.3
FR_FR4	76.6 ± 12.0	74.1 ± 12.2	19.6 ± 0.6	92.5 ± 5.9
FR_FR2[M]	76.7 ± 9.4	75.0 ± 10.4	19.8 ± 1.1	90.5 ± 10.7
FR_MULTIPLATE[M]	82.3 ± 13.8	78.1 ± 12.4	19.4 ± 1.0	93.5 ± 12.4
FR_FRRD[M¤]	83.8 ± 4.9	81.6 ± 6.1	19.1 ± 0.4	85.2 ± 9.8

Note: All site waters and samples were amended with 20 µg/L Cu
SD = Standard Deviation; M = microbial growth
¤ Continuous aeration failed for a single FR_FRRD replicate on day 25 of the test resulting in mortality of all remaining alevins – this replicate was excluded from final analyses.
* Result was significantly lower than the laboratory control
c Result was significantly lower than the laboratory control +20 µg/L Cu
Result was significantly lower than the FR_UFR1 site control
† Result was significantly lower than the GH_ER2 site control
‡ Result was significantly lower than the CM_MC1 site control
§ Result was significantly lower than the LC_SLC site control

4.0 QA/QC

The health histories of the test organisms used in the exposures were acceptable and met the requirements of the test protocols. Tests met all control acceptability criteria and water quality parameters remained within ranges specified in the protocol throughout the tests. Uncertainty associated with the test is best described by the standard deviation around the mean.

Protocol deviations, beyond the planned modifications described in Section 2.0, occurred in the *C. dubia*, *H. azteca* and *O. mykiss* tests. On day 7 of the *C. dubia* test, no water replenishment or water quality was performed due to insufficient sample. Neonates were still removed and the test tubes were fed a 3:1 ratio of algae:TCC. Upon arrival of the *H. azteca* organisms, the temperature of the holding water measured between 20.0 to 20.5°C (a change of greater than 3°C during transport) and the dissolved oxygen measured less than 80%. The organisms and holding water were acclimated overnight to increase the temperature and dissolved oxygen percentage. These deviations are not anticipated to influence results of the tests. In the *O. mykiss* test, continuous aeration failed for a single FR_FRRD replicate on day 25 of the test resulting in mortality of all remaining alevins. This replicate alone was removed from the final analysis.

Results of the reference toxicant tests conducted during the testing program are summarized in Table 10. All endpoints fell within the acceptable range for organism performance of two standard deviations around the mean, based on historical results obtained by the laboratory with these tests. Thus, the sensitivity of the organisms used in these tests was appropriate. The reference toxicant tests were performed under the same conditions as those used for the samples.

Table 10. Reference toxicant test results.

Test species	Endpoint	Historical mean (2 SD Range)	CV (%)	Test date
C. dubia	Survival (LC50): 2.0 g/L NaCl	2.0 (1.8 – 2.2)	5	October 5, 2021
	Reproduction (IC50): 1.7 g/L NaCl	1.8 (1.4 – 2.2)	12	
P. subcapitata	Growth (IC50): 35.2 µg/L Zn	31.9 (26.6 – 38.3)	9	October 28, 2021
H. azteca	Survival (LC50): 6.9 g/L NaCl	6.2 (4.2 – 9.2)	20	October 14, 2021
O. mykiss	Viability (EC50): 5.0 mg/L SDS	5.0 (2.4 – 10.3)	38	October 13, 2021

SD = Standard Deviation, CV = Coefficient of Variation, LC = Lethal Concentration, IC = Inhibition Concentration

REVISION 1 UPDATES

Previously missing temperature and conductivity data (Day 0), as well as dissolved oxygen and pH data (Day 28) for sample FR_FRRD in the *H. azteca* tests has been added to the appendix.

5.0 REFERENCES

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APPENDIX A – *Ceriodaphnia dubia* Toxicity Test Data

Ceriodaphnia dubia Summary Sheet

Client: TECK
Work Order No.: 212108

Start Date/Time: Oct. 13/21 @ 1300h
Set up by: SAK / JZL

Sample Information:

Sample ID: Various - see below
Sample Date: Oct. 12/21
Date Received: Oct. 13/21
Sample Volume: Various

Test Validity Criteria:

1) Mean survival of first generation controls is ≥80 %
2) At least 60% of controls have produced three broods within 8 days
3) An average of ≥15 live young produced per surviving female in the control solutions during the first three broods.
4) Invalid if ephippia observed in any control solution at any time.

WQ Ranges:

T (°C) = 25 ± 1; DO (mg/L) = 3.3 to 8.4 ; pH = 6.0 to 8.5

Test Organism Information:

Broodstock No.: BBi100721A ~~#2-9, 12-14~~ SAK ; BBi100121A
Age of young (Day 0): <24-h (within 12-h)
Avg No. young in first 3 broods of previous 7 d: 27
Mortality (%) in previous 7 d: 10.7
Individual female # used ≥8 young on test day: #2-9, 12-14, 16-18, 21-27 ; #5, 13, 17, 18, 20

NaCl Reference Toxicant Results:

Reference Toxicant ID: cd293
Stock Solution ID: 21Na02
Date Initiated: Oct. 5/21

7-d LC50 (95% CL): 2.0 (1.7-2.3) g/L NaCl
7-d IC50 (95% CL): 1.7 (1.3-1.9) g/L NaCl

7-d LC50 Reference Toxicant Mean and Historical Range: 2.0 (1.8-2.2) g/L NaCl CV (%): 5
7-d IC50 Reference Toxicant Mean and Historical Range: 1.8 (1.4-2.2) g/L NaCl CV (%): 12

Test Results:

	Survival (%)	Reproduction (Mean ± SD)
Negative Control	100	23.0 ± 3.3
FR_UFR1	100	22.9 ~~23.0~~ SAK ± 4.9
GH_ER2	100	23.2 ± 5.9
CM_MC1	90	21.8 ± 9.0
LC_SLC	100	22.2 ± 4.8
FR_FRABCH	100	20.0 ± 5.1
FR_FRCP1	100	15.8 ± 4.4 a,b,c,d,e
GH_FR1	100	20.9 ± 7.8
GH_ERC	100	24.7 ± 2.1

Results that are significantly lower than:
a = Negative control
b = FR_UFR1
c = GH_ER2
~~d = CM_MC1~~
d & e = LC_SLC
e = CM_MC1

Reviewed by: [signature]

Date reviewed: Dec. 2, 2021

Ceriodaphnia dubia Summary Sheet

Client: TECK
Work Order No.: 212108

Start Date/Time: Oct. 13/21 @ 1300h
Set up by: SAK / JZL

Sample Information:

Sample ID: Various - see below
Sample Date: Oct. 12/21
Date Received: Oct. 13/21
Sample Volume: Various

Test Validity Criteria:

1) Mean survival of first generation controls is ≥80 %
2) At least 60% of controls have produced three broods within 8 days
3) An average of ≥15 live young produced per surviving female in the control solutions during the first three broods.
4) Invalid if ephippia observed in any control solution at any time.

WQ Ranges:

T (°C) = 25 ± 1; DO (mg/L) = 3.3 to 8.4 ; pH = 6.0 to 8.5

Test Organism Information:

Broodstock No.: BB100721A+B ~~#2-9, 12-1~~ SAK ; BB100121A
Age of young (Day 0): <24-h (within 12-h)
Avg No. young in first 3 broods of previous 7 d: 27
Mortality (%) in previous 7 d: 1.7
Individual female # used ≥8 young on test day #2-9, 12-14, 16-18, 21-27 ; #5, 13, 17, 18, 20

NaCl Reference Toxicant Results:

Reference Toxicant ID: Cd293
Stock Solution ID: 21Na02
Date Initiated: Oct. 5/21

7-d LC50 (95% CL): 2.0 (1.7-2.3) g/L NaCL
7-d IC50 (95% CL): 1.7 (1.3-1.9) g/L NaCL

7-d LC50 Reference Toxicant Mean and Historical Range: 2.0 (1.8-2.2) g/L NaCL CV (%): 5
7-d IC50 Reference Toxicant Mean and Historical Range: 1.8 (1.4-2.2) g/L NaCL CV (%): 12

Test Results:

	Survival (%)	Reproduction (Mean ± SD)
Negative Control	100	23.0 ± 3.3
CM-MC2	100	14.5 ± 7.6 a, b, c, e, d
EV-MC2	100	25.2 ± 1.9
EV-HCl	100	18.7 ± 3.7 a, b, c, d
LC-DCDS	100	13.3 ± 3.6 a, b, c, d, e
LC-LC3	90	17.2 ± 6.5 a, b, c, d
LC-LC5	100	22.1 ± 5.2
LC-LCDSSLCC	100	21.3 ± 4.8
RG-MIDAG	100	18.4 ± 5.9 a, b, c

Results that are significantly lower than:
a = Negative Control
b = FR-UFR1
c = GH-ER2
d = LC-SLC
e = CM-MC1

Reviewed by: [signature]

Date reviewed: Dec. 2, 2021

Ceriodaphnia dubia Summary Sheet

Client: TECK
Work Order No.: 212108

Start Date/Time: Oct. 13/21 @ 1300h
Set up by: SAK / JZL

Sample Information:

Sample ID: Various - see below
Sample Date: Oct. 12/21
Date Received: Oct. 13/21
Sample Volume: Various

Test Validity Criteria:

1) Mean survival of first generation controls is ≥80 %
2) At least 60% of controls have produced three broods within 8 days
3) An average of ≥15 live young produced per surviving female in the control solutions during the first three broods.
4) Invalid if ephippia observed in any control solution at any time.

WQ Ranges:

T (°C) = 25 ± 1; DO (mg/L) = 3.3 to 8.4 ; pH = 6.0 to 8.5

Test Organism Information:

Broodstock No.: BBi007121A #~~2-9, 12-14~~ SAK ; BBi001121A
Age of young (Day 0): <24-h (within 12-h)
Avg No. young in first 3 broods of previous 7 d: 27
Mortality (%) in previous 7 d: 10.7
Individual female # used ≥8 young on test day: #2-9, 12-14, 16-18, 21-27 ; #5, 13, 17, 18, 20

NaCl Reference Toxicant Results:

Reference Toxicant ID: Cd293
Stock Solution ID: 21NaO2
Date Initiated: Oct. 5/21

7-d LC50 (95% CL): 2.0 (1.7-2.3) g/L NaCL
7-d IC50 (95% CL): 1.7 (1.3-1.9) g/L NaCL

7-d LC50 Reference Toxicant Mean and Historical Range: 2.0 (1.8-2.2) g/L NaCL CV (%): 5
7-d IC50 Reference Toxicant Mean and Historical Range: 1.8 (1.4-2.2) g/L NaCL CV (%): 12

Test Results:

	Survival (%)	Reproduction (Mean ± SD)
Negative Control	100	23.0 ± 3.3
FR-FR4	100	13.6 ± 4.6 [a,b,c,d,e]
FR-FR2	90	17.2 ± 7.2 [a,b,c,d]
FR_MULTIPLATE	100	15.0 ± 5.2 [a,b,c,d,e]
FR-FRID	100	17.2 ± 5.4 [a,b,c,d]
		±
		±
		±
		±

Results that are significantly lower than:
a = Negative control
b = FR_UFRI
c = GH_ER2
d = LL_SLC
e = CM_MCI

Reviewed by: [signature]
Date reviewed: Dec. 2, 2021

CORRECTIVE ACTION FORM

Entry No.: 2021-221
Date: ~~Jan Dec 9/21~~ Oct 20/21
Identified By: SAK

Nature of the problem:

- ☐ Reference Toxicant outlier
- ☐ Test / Reference Toxicant Failure
- ☐ Organism Health Problem
- ☑ Policy / Procedure Non Conformance
- ☐ Preventive Action
- ☐ Instrument Problem
- ☐ PT Failure
- ☐ Audit Finding
- ☐ Complaint
- ☐ Failed/Canceled Tests

Risk Level:	None/ Low →	Medium	High

Affected Test IDs: TECK-QA-212108

Problem Description: ~~Sample was not changed~~ NO water change was preformed on day 7 due to insufficient sample. Due to this no water quality was measured either.

Immediate Action Taken:
Young were counted and removed ~~by~~ test tubes were fed a 3:1 ratio of ~~TCL~~ Algae : TCL. ~~Supervisor was contacted~~ Project mangers were consulted.

Action Taken by: SAK Date: Oct. 20/21

Attempt at Resolution and Root Cause Identification:
Sample was thrown away prematurely. Due to controls having already passed and tear down the next day, it was determined not changing them was best course of action.

Evaluation of CAR Significance and Impact Analysis:
Communication failure. This could have impacted / compromised the test if it happened to other samples in the middle of testing. Should implement a system to prevent this from happening again.

Action Taken by: [signature] Date: Dec 2/21

Corrective Action Results:

Further Follow-Up Action (based on risk level) Required ? Y N
If yes, explain what action will be taken: This is a deviation from the project plan. Note in the final report.

Action Taken by: _____ Date: _____

Item needs to be reviewed at Internal Audit ? Y (N)
Date all action completed: Dec. 9/21

Approved by QA Manager: JOh

Chronic Freshwater Toxicity Test
Initial and Final Water Quality Measurements

Client: Teck
Sample ID: Various
Work Order #: 212103

Start Date & Time: Oct. 13/21 @ 1300h
Stop Date & Time: Oct. 21/21 @ 1030h
CER #: 4
Test Species: *Ceriodaphnia dubia*

Concentration: Control	Days															
	0	1		2		3		4		5		6		7		8
	init.	old	new	old	new	old	new	old	new	old	new	old	new	old final	new	final
Temperature (°C)	24.0	24.0	25.0	24.0	25.0	24.0	25.0	25.0	25.0	25.0	25.0	24.0	25.0			24.0
DO (mg/L)	8.0	7.0	8.0	7.2	8.0	7.6	8.1	7.1	8.1	7.3	8.2	7.4	8.2			7.5
pH	8.0	7.6	8.1	7.6	8.1	7.7	8.1	7.7	8.1	7.8	8.1	7.6	8.1			7.5
Cond. (µS/cm)	208	208		207		207		207		208		209				211
Initials	JZL	JZL		JZL		JZL		RZS		SAK		SAK				JZL

① Concentration: FR_UFR1	Days															
	0	1		2		3		4		5		6		7		8
	init.	old	new	old	new	old	new	old	new	old	new	old	new	old final	new	final
Temperature (°C)	24.0	24.0	24.0	24.5	24.0	24.0	24.0	24.5	24.5	24.0	24.0	24.0	24.0			24.0
DO (mg/L)	7.6	7.2	8.2	7.6	8.1	7.7	8.1	7.2	8.1	7.2	7.8	7.4	8.2			6.9
pH	8.1	8.3	8.2	8.0	8.3	8.0	8.1	7.9	8.3	8.1	8.4	7.9	8.2			7.7
Cond. (µS/cm)	360	363		361		363		360		360		362				359
Initials	JZL	JZL		JZL		JZL		RZS		SAK		GJU				JZL

② Concentration: GH_ER2	Days															
	0	1		2		3		4		5		6		7		8
	init.	old	new	old	new	old	new	old	new	old	new	old	new	old final	new	final
Temperature (°C)	24.5	24.0	24.5	24.5	24.0	24.0	24.0	24.5	24.0	24.0	24.0	24.0	24.0			24.0
DO (mg/L)	7.8	7.3	8.1	7.6	8.3	7.7	8.2	7.2	8.1	7.3	7.9	7.4	8.2			7.2
pH	8.0	8.2	8.1	8.0	8.2	8.0	8.1	7.9	8.2	8.1	8.3	7.9	8.1			7.8
Cond. (µS/cm)	306	309		306		307		306		308		308				306
Initials	JZL	JZL		JZL		JZL		RZS		SAK		GJU				JZL

③ Concentration: CM_MC1	Days															
	0	1		2		3		4		5		6		7		8
	init.	old	new	old	new	old	new	old	new	old	new	old	new	old final	new	final
Temperature (°C)	25.0	24.0	24.5	24.5	24.0	24.0	24.0	24.5	24.0	24.0	24.0	24.0	24.0			24.0
DO (mg/L)	7.8	7.2	8.1	7.5	8.4	7.7	8.3	7.3	8.0	7.3	8.0	7.4	8.2			7.1
pH	8.1	8.2	8.1	8.0	8.2	8.1	8.0	8.0	8.2	8.1	8.3	8.0	8.1			7.8
Cond. (µS/cm)	304	306		303		306		305		306		306				306
Initials	JZL	JZL		JZL		JZL		RZS		SAK		GJU				JZL

Thermometer: CER #4 DO meter/probe: 1 / 1 pH meter/probe: 1 / 1 Conductivity meter/probe: 1 / 1

	Control	FR_UFR1	GH_ER2	CM_MC1
Hardness*	100	186	160	160
Alkalinity*	95	156	148	158

* mg/L as CaCO3

Analysts: SAK, JZL, RZS, GJU
Reviewed by:
Date reviewed: Dec. 2, 2021

Sample Description: refer to COC

Comments: Broodboard Used: BR100721A #2-9, 12-14, 16-18, 21-27; BB100121A #5, 13, 17, 18, 20

Chronic Freshwater Toxicity Test
Initial and Final Water Quality Measurements

Client: TECK
Sample ID: Various
Work Order #: 212108

Start Date & Time: Oct. 13/21 @ 1300 h
Stop Date & Time: Oct. 21/21 @ 1030 h
CER #: 4
Test Species: *Ceriodaphnia dubia*

④ Concentration LC_SLC

	Days																
	0	1		2		3		4		5		6		7		8	
	init.	old	new	old	new	old	new	old	new	old	new	old	new	old final	new	final	
Temperature (°C)	25.0	24.0	24.5	24.5	24.0	24.0	24.0	25.0	24.5	24.0	24.0	24.0	24.0			24.0	
DO (mg/L)	7.8	7.2	8.1	7.4	8.3	7.7	8.1	7.2	8.1	7.3	8.0	7.4	8.2			7.3	
pH	8.1	8.2	8.2	8.0	8.2	8.0	8.0	7.9	8.2	8.1	8.4	7.9	8.1			7.8	
Cond. (µS/cm)	382	385		383		384		382		383		384				380	
Initials	JZL	JZL		JZL		JZL		RZS		SAM		GJU				JZL	

⑤ Concentration FR_FRABCH

	Days																
	0	1		2		3		4		5		6		7		8	
	init.	old	new	old	new	old	new	old	new	old	new	old	new	old final	new	final	
Temperature (°C)	24.5	24.0	24.0	24.5	24.0	24.0	24.0	25.0	24.0	24.0	24.0	24.0	24.0			24.0	
DO (mg/L)	7.8	7.3	8.2	7.5	8.4	7.7	8.3	7.2	8.3	7.2	8.0	7.3	8.1			7.3	
pH	8.1	8.3	8.2	8.1	8.0	8.1	7.9	8.0	7.9	8.3	8.0	8.1	8.0			7.9	
Cond. (µS/cm)	1185	1187		1177		1180		1161		1156		1168				1111	
Initials	JZL	JZL		JZL		JZL		RZS		SAM		GJU				JZL	

⑥ Concentration FR_FRCP1

	Days																
	0	1		2		3		4		5		6		7		8	
	init.	old	new	old	new	old	new	old	new	old	new	old	new	old final	new	final	
Temperature (°C)	24.5	24.0	24.0	24.0	24.0	24.0	24.0	25.0	24.0	24.0	24.0	24.0	24.0			24.0	
DO (mg/L)	7.8	7.4	8.4	7.5	8.4	7.7	8.2	7.3	8.2	7.3	8.0	7.3	8.2			7.3	
pH	8.3	8.4	8.4	8.3	8.4	8.3	8.3	8.3	8.3	8.4	8.5	8.3	8.3			8.0	
Cond. (µS/cm)	1246	1256		1258		1257		1247		1253		1254				1208	
Initials	JZL	JZL		JZL		JZL		PM		SAM		GJU				JZL	

⑦ Concentration GH_FR1

	Days																
	0	1		2		3		4		5		6		7		8	
	init.	old	new	old	new	old	new	old	new	old	new	old	new	old final	new	final	
Temperature (°C)	25.0	24.0	24.0	24.0	24.0	24.0	24.0	25.0	24.0	24.0	24.0	24.0	24.0			24.0	
DO (mg/L)	7.8	7.4	8.2	7.6	8.3	7.7	8.3	7.3	8.1	7.3	8.0	7.3	8.2			7.2	
pH	8.3	8.4	8.4	8.3	8.3	8.3	8.2	8.3	8.2	8.4	8.4	8.3	8.3			8.0	
Cond. (µS/cm)	897	900		901		901		900		893		896				870	
Initials	JZL	JZL		JZL		JZL		PM		SAM		GJU				JZL	

Thermometer: CER #4 DO meter/probe: 1 / 1 pH meter/probe: 1 / 1 Conductivity meter/probe: 1 / 1

	~~Control~~ LC-SLC	FR-FRABCH	FR-FRCP1	GH-FR1
Hardness*	202	680	660	480
Alkalinity*	122	270	250	240

* mg/L as CaCO3

Analysts: SAM, JZL, RZS, GJU
Reviewed by:
Date reviewed: Dec. 2, 2021

Sample Description: See pg. 1

Comments: Broodboard Used: See pg. 1

Chronic Freshwater Toxicity Test
Initial and Final Water Quality Measurements

Client: TEUK
Sample ID: various
Work Order #: 212108

Start Date & Time: Oct. 13/21 @ 1300 h
Stop Date & Time: Oct. 21/21 @ 1030h
CER #: 4
Test Species: *Ceriodaphnia dubia*

(8) Concentration GH-ERC	Days																
	0	1		2		3		4		5		6		7		8	
	init.	old	new	old	new	old	new	old	new	old	new	old	new	old final	new	final
Temperature (°C)	25.0	24.0	24.0	24.0	24.0	24.0	24.0	25.0	24.0	24.0	24.0	24.0	24.0			24.0
DO (mg/L)	7.9	7.2	8.4	7.4	8.2	7.7	8.3	7.2	8.2	7.0	8.0	7.3	8.2			7.1
pH	8.1	8.3	8.2	8.3	8.3	8.2	8.1	8.2	8.1	8.3	8.4	8.2	8.2			8.0
Cond. (µS/cm)	330	332		332		331		332		331		331				336
Initials	JZL	JZL		JZL		JZL		RZS		SAM		GM				JZL

(9) Concentration CM-MC2	Days																
	0	1		2		3		4		5		6		7		8	
	init.	old	new	old	new	old	new	old	new	old	new	old	new	old final	new	final
Temperature (°C)	25.0	24.0	24.0	24.0	24.0	24.0	24.5	24.5	24.0	24.0	24.0	24.0	24.0			24.0
DO (mg/L)	7.9	7.6	8.2	7.6	8.3	7.7	8.1	7.2	8.1	7.3	8.0	7.4	8.1			6.9
pH	8.3	8.4	8.3	8.3	8.2	8.3	8.1	8.2 ~~8.38~~		8.4	8.2	8.2	8.1			8.0
Cond. (µS/cm)	1230	1234		1227		1230		1217 ~~1237~~ RZS		1207		1226				1180
Initials	JZL	JZL		JZL		JZL		RZS		SAM		GM				RZS

(10) Concentration EV-MC2	Days																
	0	1		2		3		4		5		6		7		8	
	init.	old	new	old	new	old	new	old	new	old	new	old	new	old final	new	final
Temperature (°C)	25.0	24.0	24.0	24.0	24.0	24.0	24.0	24.5	24.5	24.0	24.0	24.0	24.0			24.0
DO (mg/L)	8.0	7.6	8.2	7.6	8.4	7.7	8.1	7.3	8.1	7.3	8.0	7.4	8.2			7.1
pH	8.2	8.4	8.2	8.3	8.3	8.3	8.2	8.2	8.3	8.4	8.4	8.2	8.3			7.9
Cond. (µS/cm)	628	613		618		619		616		616		616				606
Initials	JZL	JZL		JZL		JZL		RZS		SAM		GM				RZS

(11) Concentration EV-HCl	Days																
	0	1		2		3		4		5		6		7		8	
	init.	old	new	old	new	old	new	old	new	old	new	old	new	old final	new	final
Temperature (°C)	25.0	24.0	24.0	24.0	24.0	24.0	24.0	24.5	24.5	24.0	24.0	24.0	24.0			24.0
DO (mg/L)	8.1	7.6	8.3	7.5	8.3	7.8	8.2	7.2	8.2	7.3	8.0	7.3	8.1			7.1
pH	8.2	8.4	8.4	8.3	8.4	8.3	8.3	8.3	8.4	8.4	8.5	8.2	8.4			8.0
Cond. (µS/cm)	728	728		728		725		729		726		725				713
Initials	JZL	JZL		JZL		JZL		RZS		SAM		GM				RZS

Thermometer: CER #4 DO meter/probe: 1 / 1 pH meter/probe: 1 / 1 Conductivity meter/probe: 1 / 1
GH-ERC

	~~Control~~ GH-ERC	CM-MC2	EV-MC2	EV-HCl
Hardness*	166	650	330	480
Alkalinity*	140	280	230	210

* mg/L as CaCO3

Analysts: SAM, JZL, RZS, GM
Reviewed by:
Date reviewed: Dec 2, 2021

Sample Description: see pg. 1

Comments: Broodboard Used: see pg. 1

Chronic Freshwater Toxicity Test
Initial and Final Water Quality Measurements

Client: TEUK
Sample ID: Various
Work Order #: 212108

Start Date & Time: Oct. 13/21 @ 1300h
Stop Date & Time: Oct. 21/21 @ 1030h
CER #: 4
Test Species: *Ceriodaphnia dubia*

(12) Concentration LC_DCDS

	Days																
	0	1		2		3		4		5		6		7		8	
	init.	old	new	old	new	old	new	old	new	old	new	old	new	~~old final~~	new	final	
Temperature (°C)	24.0	24.0	24.0	24.0	24.0	24.0	24.5	24.5	24.5	24.0	24.0	24.0	24.0			24.0	
DO (mg/L)	8.1	7.2	8.2	7.5	8.4	7.8	8.1	7.4	8.1	7.3	8.1	7.2	8.1			7.1	
pH	8.2	8.3	8.2	8.2	8.3	8.2	8.2	8.1	8.2	8.3	8.4	8.1	8.2			7.9	
Cond. (µS/cm)	1162	1167		1170		1154		1169		1164		1164				1128	
Initials	JZL	JZL		JZL		JZL		RZS		SAK		GJU				RZS	

(13) Concentration LC_LC3

	Days																
	0	1		2		3		4		5		6		7		8	
	init.	old	new	old	new	old	new	old	new	old	new	old	new	~~old final~~	new	final	
Temperature (°C)	25.0	24.0	24.0	24.0	24.0	24.0	24.0	24.5	24.5	24.0	24.0	24.0	24.0			24.0	
DO (mg/L)	7.6	7.3	8.3	7.5	8.4	7.8	8.3	7.4	8.1	7.3	8.0	7.2	8.2			7.2	
pH	8.1	8.3	8.2	8.3	8.3	8.3	8.3	8.3	8.4	8.5	8.4	8.3	8.4			8.1	
Cond. (µS/cm)	1152	1159		1156		1163		1160		1163		1155				1119	
Initials	JZL	JZL		JZL		JZL		RZS		SAK		GJU				RZS	

(14) Concentration LC_LC5

	Days																
	0	1		2		3		4		5		6		7		8	
	init.	old	new	old	new	old	new	old	new	old	new	old	new	~~old final~~	new	final	
Temperature (°C)	25.5	24.0	24.0	24.0	24.0	24.0	24.0	25.0	24.5	24.0	24.0	24.0	24.0			24.0	
DO (mg/L)	7.8	7.4	8.3	7.5	8.3	7.8	8.3	7.3	8.2	7.3	8.1	7.1	8.2			7.2	
pH	8.4	8.4	8.4	8.3	8.4	8.3	8.3	8.3	8.3	8.3	8.4	8.2	8.3			8.0	
Cond. (µS/cm)	825	830		825		814		829		822		824				806	
Initials	JZL	JZL		JZL		JZL		RZS		SAK		GJU				RZS	

(15) Concentration LC_LCDSSLCC

	Days																
	0	1		2		3		4		5		6		7		8	
	init.	old	new	old	new	old	new	old	new	old	new	old	new	~~old final~~	new	final	
Temperature (°C)	25.0	24.0	24.0	24.0	24.0	24.0	24.0	25.0	24.5	24.0	24.0	24.0	24.0			24.0	
DO (mg/L)	7.8	7.4	8.2	7.6	8.4	7.8	8.1	7.4	8.4	7.2	8.0	7.1	8.2			7.0	
pH	8.3	8.4	8.4	8.3	8.4	8.4	8.3	8.4	8.3	8.4	8.5	8.3	8.4			8.0	
Cond. (µS/cm)	920	925		926		928		923		918		926				898	
Initials	JZL	JZL		JZL		JZL		RZS		SAK		GJU				RZS	

Thermometer: CER #4 DO meter/probe: 1 / 1 pH meter/probe: 1 / 1 Conductivity meter/probe: 1 / 1

	~~Control~~ LC_DCDS	LC_LC3	LC_LC5	LC_LCDSSLCC
Hardness*	530	600	460	550
Alkalinity*	150	250	220	230

* mg/L as CaCO3

Analysts: SAK, JZL, RZS, GJU
Reviewed by: [signature]
Date reviewed: Dec. 2, 2021

Sample Description: See pg. 1

Comments: Broodboard Used: See pg. 1

Chronic Freshwater Toxicity Test
Initial and Final Water Quality Measurements

Client: TECK
Sample ID: 212108
Work Order #: Various

Start Date & Time: Oct. 13/21 @ 1300h
Stop Date & Time: Oct. 21/21 @ 1030h
CER #: 4
Test Species: *Ceriodaphnia dubia*

(16) Concentration RG_MIDAG

	Days																
	0	1		2		3		4		5		6		7		8	
	init.	old	new	old	new	old	new	old	new	old	new	old	new	~~old~~ final	new	final	
Temperature (°C)	25.0	24.0	24.0	24.0	24.0	24.0	24.0	25.0	24.0	24.0	24.0	24.0	24.0			24.0	
DO (mg/L)	7.8	7.2	8.1	7.3	8.3	7.8	8.0	7.7	8.0	7.2	8.1	6.9	8.2			7.1	
pH	8.2	8.3	8.3	8.3	8.3	8.4	8.3	8.3	8.3	8.4	8.4	8.2	8.4			8.0	
Cond. (µS/cm)	699	702		703		699		701		699		702				687	
Initials	JZ	JZ		JZ		JZ		RZ		SAK		GM				RZ	

(17) Concentration FR_FR4

	Days																
	0	1		2		3		4		5		6		7		8	
	init.	old	new	old	new	old	new	old	new	old	new	old	new	~~old~~ final	new	final	
Temperature (°C)	25.0	24.0	24.0	24.0	24.0	24.0	24.0	25.0	24.0	24.0	24.0	24.0	24.0			24.5	
DO (mg/L)	8.0	7.4	8.1	7.4	8.3	7.8	8.3	7.3	8.1	7.2	8.1	6.9	8.1			7.2	
pH	8.3	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.5	8.4	8.4	8.4			8.1	
Cond. (µS/cm)	1254	1253		1260		~~1259~~ 1259		1262		1253		1260				1207	
Initials	JZ	JZ		JZ		JZ		RZ		SAK		GM				RZ	

(18) Concentration FR_FR2

	Days																
	0	1		2		3		4		5		6		7		8	
	init.	old	new	old	new	old	new	old	new	old	new	old	new	~~old~~ final	new	final	
Temperature (°C)	25.0	24.0	24.0	24.0	24.0	24.0	24.0	24.5	24.5	24.0	24.0	24.0	24.0			24.5	
DO (mg/L)	7.7	7.4	8.1	7.6	8.1	7.8	8.3	7.1	8.1	7.4	8.0	7.2	8.2			7.1	
pH	8.3	8.4	8.4	8.4	8.2	8.3	8.2	8.1	8.2	8.4	8.3	8.2	8.2			8.0	
Cond. (µS/cm)	950	952		950		945		945		936		939				913	
Initials	JZ	JZ		JZ		JZ		RZ		SAK		GM				RZ	

(19) Concentration FR_MULTIPLATE

	Days																
	0	1		2		3		4		5		6		7		8	
	init.	old	new	old	new	old	new	old	new	old	new	old	new	~~old~~ final	new	final	
Temperature (°C)	24.5	24.0	24.0	24.0	24.0	24.0	24.0	25.0	24.5	24.0	24.0	24.0	24.0			24.5	
DO (mg/L)	8.2	7.5	8.3	7.6	8.3	7.8	8.4	7.1	8.1	7.4	8.1	7.1	8.2			7.2	
pH	8.2	8.3	8.3	8.3	8.2	8.3	8.2	8.2	8.3	8.4	8.4	8.2	8.3			8.0	
Cond. (µS/cm)	939	944		946		945		945		939		939				914	
Initials	JZ	JZ		JZ		JZ		RZ		SAK		GM				RZ	

Thermometer: CER #4 DO meter/probe: 1 / 1 RG-MIDAG pH meter/probe: 1 / 1 Conductivity meter/probe: 1 / 1

	~~Control~~	FR-FR4	FR-FR2	FR-MULTIPLATE
Hardness*	360	680	560	500
Alkalinity*	200	270	200	230

* mg/L as $CaCO_3$

Analysts: SAK, JZ, RZS, GM
Reviewed by:
Date reviewed: Dec. 2, 2021

Sample Description: see pg. 1

Comments: Broodboard Used: see pg. 1

Chronic Freshwater Toxicity Test
Initial and Final Water Quality Measurements

Client: TEck
Sample ID: various
Work Order #: 212108

Start Date & Time: Oct. 13/21 @ 1300h
Stop Date & Time: Oct. 21/21 @ 1030h
CER #: 4
Test Species: *Ceriodaphnia dubia*

(20) Concentration FR_FRRD	Days																
	0	1		2		3		4		5		6		7		8	
	init.	old	new	old	new	old	new	old	new	old	new	old	new	~~old~~ final	new	final	
Temperature (°C)	25.0	24.0	24.0	24.0	24.0	24.0	24.0	25.0	24.5	24.0	24.0	24.0	24.0			24.5	
DO (mg/L)	8.1	7.0	8.3	7.5	8.4	7.8	8.1	7.2	7.9	7.4	8.2	6.7	8.2			7.2	
pH	8.1	8.4	8.2	8.3	8.1	8.3	8.0	8.1	8.0	8.3	7.9	8.2	8.0			8.1	
Cond. (µS/cm)	1263	1257		1245		1246		1236		1237		1235				1179	
Initials	JZL	JZL		JZL		JZL		RZS		SAH		GJV				RZS	

Concentration	Days																
	0	1		2		3		4		5		6		7		8	
	init.	old	new	old	new	old	new	old	new	old	new	old	new	~~old~~ final	new	final	
Temperature (°C)																	
DO (mg/L)																	
pH																	
Cond. (µS/cm)																	
Initials																	

Concentration	Days																
	0	1		2		3		4		5		6		7		8	
	init.	old	new	old	new	old	new	old	new	old	new	old	new	~~old~~ final	new	final	
Temperature (°C)																	
DO (mg/L)																	
pH																	
Cond. (µS/cm)																	
Initials																	

Concentration	Days																
	0	1		2		3		4		5		6		7		8	
	init.	old	new	old	new	old	new	old	new	old	new	old	new	~~old~~ final	new	final	
Temperature (°C)																	
DO (mg/L)																	
pH																	
Cond. (µS/cm)																	
Initials																	

Thermometer: CER #4 DO meter/probe: 1 / 1 pH meter/probe: 1 / 1 Conductivity meter/probe: 1 / 1

	Control	FR_FRRD		
Hardness*	100	640		
Alkalinity*	95	320		

* mg/L as CaCO3

Analysts: SAH, GJV, JZL, RZS
Reviewed by:
Date reviewed: Dec. 2, 2021

Sample Description: See pg. 1

Comments: Broodboard Used: See pg. 1

Chronic Freshwater Toxicity Test
Initial and Final Water Quality Measurements

Client: Teck (EDTA)
Sample ID: various
Work Order #: 212111

Start Date & Time: Oct. 13/21 @ 1300h
Stop Date & Time: Oct. 21/21 @ 1130h
CER #: 4
Test Species: *Ceriodaphnia dubia*

(21) Concentration: EDTA Control

	Days																
	0	1		2		3		4		5		6		7		8	
	init.	old	new	old	new	old	new	old	new	old	new	old	new	~~final~~ old	new	final	
Temperature (°C)	24.0	24.0	24.5	24.5	24.0	24.0	25.0	25.0	24.5	25.0	24.0	25.0	24.0	24.0	25.0	24.5	
DO (mg/L)	7.8	7.3	7.7	7.3	7.7	7.8	7.6	7.2	7.6	7.1	7.6	7.0	8.1	6.9	7.5	6.8	
pH	8.1	8.3	8.1	8.2	8.2	8.2	8.2	7.8	8.2	7.8	8.3	7.7	8.1	7.6	7.9	7.7	
Cond. (µS/cm)	207	207		207		209		208		209		213			215	219	
Initials	JZL	JZL		JZL		JZL		RZS		SAK		GM		JZL	JZL	RZS	

(22) Concentration: FR_FRCP1 + EDTA

	Days																
	0	1		2		3		4		5		6		7		8	
	init.	old	new	old	new	old	new	old	new	old	new	old	new	~~final~~ old	new	final	
Temperature (°C)	24.0	24.0	25.0	24.5	24.5	24.0	25.0	25.0	24.5	25.0	24.0	24.0	24.0	24.0	25.0	25.0	
DO (mg/L)	8.0	7.3	7.9	7.3	7.7	7.8	7.8	7.3	7.7	7.1	7.7	6.8	8.0	6.7	7.5	6.8	
pH	8.3	8.4	8.4	8.4	8.5	8.4	8.5	~~8.2~~ 8.3	8.4	8.5	8.4	8.3	8.2	8.0	8.1	7.9	
Cond. (µS/cm)	1226	1256		1257		1258		1239		1214		1208			1181	1136	
Initials	JZL	JZL		JZL		JZL		RZS		SAK		GM		JZL	JZL	RZS	

(23) Concentration: CM_MC2 + EDTA

	Days																
	0	1		2		3		4		5		6		7		8	
	init.	old	new	old	new	old	new	old	new	old	new	old	new	~~final~~ old	new	final	
Temperature (°C)	25.0	24.0	24.5	24.5	24.0	24.0	25.0	25.0	24.0	25.0	24.0	24.0	24.0	24.0	25.0	25.0	
DO (mg/L)	8.0	7.3	7.9	7.3	7.8	7.8	7.9	7.3	7.7	7.2	7.8	7.0	8.0	6.7	7.8	6.5	
pH	8.3	8.4	8.4	8.4	8.3	8.4	8.2	~~8.3~~ 8.2	8.3	8.3	8.3	8.1	~~8.2~~	7.9	8.1	7.8	
Cond. (µS/cm)	1223	1236		1227		1204		1184		1178		1165			1167	1129	
Initials	JZL	JZL		JZL		JZL		RZS		SAK		GM		JZL	JZL	RZS	

(24) Concentration: RG_MIDAG + EDTA

	Days																
	0	1		2		3		4		5		6		7		8	
	init.	old	new	old	new	old	new	old	new	old	new	old	new	~~final~~ old	new	final	
Temperature (°C)	25.0	24.0	24.5	24.5	24.0	24.0	25.0	25.0	24.5	25.0	24.0	24.0	24.0	24.0	25.0	25.0	
DO (mg/L)	8.0	7.4	8.0	7.3	8.0	7.8	8.0	6.5	7.4	7.1	7.8	6.9	8.0	6.8	7.9	6.5	
pH	8.2	8.4	8.3	8.3	8.5	8.3	8.5	8.1	8.4	8.2	8.4	8.1	8.3	7.9	8.7	7.8	
Cond. (µS/cm)	690	709		709		712		710		696		687			686	666	
Initials	JZL	JZL		JZL		JZL		RZS		SAK		GM		JZL	JZL	RZS	

Thermometer: CER #4 DO meter/probe: 1 / 1 pH meter/probe: 1 / 1 Conductivity meter/probe: 1 / 1

	Control			
Hardness*				
Alkalinity*				

* mg/L as $CaCO_3$

Analysts: SAK, JZL, RZS, GJV
Reviewed by:
Date reviewed: Dec. 2, 2021

Sample Description: refer to COC

Comments: Broodboard Used: BB100721A #B 2-9, 12-14, 16-18, 21-27 ; BB100121 #5, 13, 17, 18, 20

Chronic Freshwater Toxicity Test
C. dubia Reproduction Data

Client: Teck
Sample ID: various
Work Order: 212108

Start Date & Time: Oct. 13/21 @ 1300h
Stop Date & Time: Oct. 21/21 @ 1030h
Set up by: SAK / JTL

Concentration: Control

Days	A	B	C	D	E	F	G	H	I	J	Init
1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	JTL
2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	JTL
3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	JTL
4	3	3	4	2	5	3	2	4	2	4	PM
5	8	5	6	8	6	7	9	7	8	9	SAK
6	13	6	15	14	11	14	13	13	13	13	GM
7	✓	✓	✓	2	✓	✓	✓	✓	✓	✓	JTL
8	9	6	11	10	14	10	14	11	11	12	JTL
Total	24	14	25	24	22	24	24	24	23	26	SAK

Concentration: ① FR-UFR1

Days	A	B	C	D	E	F	G	H	I	J	Init
1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	JTL
2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	JTL
3	✓	4	✓	✓	✓	✓	✓	✓	✓	✓	JTL
4	2	✓	4	3	4	2	3	5	4	2	PM
5	12	8	9	9	8	3	8	11	5	9	SAK
6	✓	14	15	13	14	11	12	12	10	13	GM
7	15	✓	✓	✓	✓	11	✓	✓	✓	✓	JTL
8	9	7	10	10	10	✓	10	8	9	10	JTL
Total	14	26	28	25	26	16	23	28	19	24	SAK

Concentration: ② GH-ER2

Days	A	B	C	D	E	F	G	H	I	J	Init
1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	JTL
2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	JTL
3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	JTL
4	4	3	3	5	3	3	3	6	3	4	PM
5	9	8	7	7	10	8	7	9	12	9	SAK
6	11	✓	15	14	15	14	12	✓	15	13	GM
7	✓	16	✓	✓	✓	✓	✓	19	✓	✓	JTL
8	9	12	11	7	14	13	10	3	11	8	JTL
Total	24	11	25	26	28	25	22	15	30	26	SAK

Concentration: ③ CM-MC1

Days	A	B	C	D	E	F	G	H	I	J	Init
1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	JTL
2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	JTL
3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	JTL
4	2	5	4	3	3	2	4	2	2	2	PM
5	11	9	10	10	7	7	4X	9	9	8	SAK
6	16	15	13	17	16	–	|	14	15	–	GM
7	✓	✓	✓	✓	✓	16	|	✓	✓	15	JTL
8	10	8	10	10	12	12	↓	12	11	10	JTL
Total	29	29	27	29	26	9	8X	25	26	10	SAK

Concentration: ④ LC-SLC

Days	A	B	C	D	E	F	G	H	I	J	Init
1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	JTL
2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	JTL
3	✓	4	✓	✓	✓	✓	✓	✓	✓	✓	JTL
4	5	✓	4	5	3	3	5	2	5	2	PM
5	9	6	6	✓	7	7	8	8	8	8	SAK
6	15	17	12	11	12	12	✓	14	12	12	GM
7	✓	✓	✓	18	18	✓	14	14	✓	✓	JTL
8	10	10	11	14	10	12	11	14	12	8	JTL
Total	29	27	22	16	22	22	13	24	25	22	SAK

Concentration: ⑤ FR-FRABCH

Days	A	B	C	D	E	F	G	H	I	J	Init
1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	JTL
2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	JTL
3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	JTL
4	4	4	3	2	4	4	2	3	2	4	PM
5	7	7	6	8	9	9	2	8	8	6	SAK
6	8	✓	10	10	11	15	8	10	12	11	GM
7	✓	11	14	✓	✓	✓	✓	✓	✓	✓	JTL
8	7	10	9	6	3	10	✓	8	10	8	JTL
Total	19	11	22	20	24	28	12	21	22	21	SAK

Concentration: ⑥ FR-FRCP1

Days	A	B	C	D	E	F	G	H	I	J	Init
1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	JTL
2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	JTL
3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	JTL
4	4	3	4	3	2	2	4	3	2	3	PM
5	8	8	7	6	8	6	6	8	8	8	SAK
6	✓	9	✓	10	11	12	–	✓	6	7	GM
7	14	14	10	✓	✓	✓	12	12	✓	✓	JTL
8	9	10	5	8	5	14	14	6	6	11	JTL
Total	12	20	11	19	21	20	10	11	16	18	SAK

Concentration: ⑦ GH-FR1

Days	A	B	C	D	E	F	G	H	I	J	Init
1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	JTL
2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	JTL
3	✓	5	✓	✓	✓	✓	✓	✓	✓	✓	JTL
4	4	2	✓	6	4	✓	2	4	3	3	PM
5	10	8	✓	7	9	4	9	9	9	11	SAK
6	12	15	34	14	14	9	13	9	12	13	GM
7	✓	✓	✓	✓	✓	10	✓	✓	✓	✓	JTL
8	10	8	8	10	10	✓	11	11	11	10	JTL
Total	26	15	4	27	27	13	24	22	24	27	SAK

Concentration: ⑧ GH-ERC

Days	A	B	C	D	E	F	G	H	I	J	Init
1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	JTL
2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	JTL
3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	JTL
4	4	✓	3	3	✓	4	3	4	5	3	PM
5	10	10	10	7	9	10	7	8	9	10	SAK
6	9	13	14	13	13	11	15	13	15	12	GM
7	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	JTL
8	10	10	8	8	10	12	10	11	11	12	JTL
Total	23	23	27	23	22	25	25	25	29	25	SAK

Notes: X = mortality.

Comments: 1. Total # Young only based on the first 3 Broods. Fourth and subsequent broods not included in total count.

2. Ephippia present in Controls (Y), (N)?

Reviewed by: [signature]

Date reviewed: Dec. 2, 2021

Chronic Freshwater Toxicity Test
C. dubia Reproduction Data

Client: TECK
Sample ID: Various
Work Order: 212108

Start Date & Time: Oct. 13/21 @1300h
Stop Date & Time: Oct. 21/21 @1030h
Set up by: SAM/JZL

(9) CM-MC2

Days	Concentration: A	B	C	D	E	F	G	H	I	J	Init
1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	JZL
2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	JZL
3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	GM
4	4	✓	5	4	2	4	✓	4	5	5	RZ
5	8	✓	✓	7	6	8	7	7	9	9	SAM
6	9	✓	10	11	✓	✓	8	✓	13	✓	SAM
7	✓	✓	10	✓	13	10	✓	10	✓	7	JZL
8	5	✓	✓	5	7	5	8	8	9	✓	JZL
Total	21	0	15	22	8	12	15	11	27	14	SAM

(10) EV-MC2

Days	Concentration: A	B	C	D	E	F	G	H	I	J	Init
1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	JZL
2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	JZL
3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	GM
4	4	3	4	4	4	5	4	5	2	4	RZ
5	11	10	8	9	10	9	10	11	10	10	SAM
6	12	13	15	10	10	11	10	12	14	8	SAM
7	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	JZL
8	7	8	10	9	8	8	9	11	11	10	JZL
Total	27	26	27	23	24	25	24	28	26	22	SAM

(11) EV-HCl

Days	Concentration: A	B	C	D	E	F	G	H	I	J	Init
1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	JZL
2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	JZL
3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	GM
4	✓	5	3	3	5	2	3	✓	5	3	RZ
5	5	8	9	6	8	8	10	10	8	6	SAM
6	11	✓	10	9	✓	11	10	8	9	NZ	SAM
7	14	14	✓	✓	13	✓	✓	✓	✓	✓	JZL
8	✓	5	10	10	9	9	9	9	13	10	JZL
Total	16	13	22	18	13	21	23	18	22	21	SAM

(12) LC-DCDS

Days	Concentration: A	B	C	D	E	F	G	H	I	J	Init
1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	JZL
2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	JZL
3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	GM
4	2	4	4	✓	4	✓	2	4	3	6	RZ
5	8	7	8	8	7	8	8	4	8	7	SAM
6	9	✓	✓	✓	4	8	8	2	✓	✓	SAM
7	✓	8	3	8	✓	✓	✓	✓	5	9	JZL
8	✓	6	✓	✓	2	6	✓	✓	2	✓	JZL
Total	19	11	12	8	15	16	18	10	11	13	SAM

(13) LC-LC3

Days	Concentration: A	B	C	D	E	F	G	H	I	J	Init
1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	JZL
2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	JZL
3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	GM
4	5	✓	4	3	6	5	4	4	4	4	RZ
5	9	7	7	8	X	9	9	8	8	9	SAM
6	10	8	8	9	↓	✓	10	✓	✓	14	SAM
7	✓	✓	✓	✓	↓	10	✓	12	14	✓	JZL
8	5	3	5	✓	6X	4	✓	7	10	5	JZL
Total	24	15	19	20	6X	14	23	12	12	27	SAM

(14) LC-LC5

Days	Concentration: A	B	C	D	E	F	G	H	I	J	Init
1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	JZL
2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	JZL
3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	GM
4	2	2	3	5	4	2	3	3	3	2	RZ
5	6	8	6	4	7	8	10	8	8	7	SAM
6	11	11	✓	15	12	14	15	14	14	14	SAM
7	✓	✓	14	✓	✓	✓	✓	✓	✓	✓	JZL
8	5	6	✓	5	8	9	9	8	9	9	JZL
Total	19	21	9	24	23	24	28	25	25	23	SAM

(15) LC-LCDSSLCC

Days	Concentration: A	B	C	D	E	F	G	H	I	J	Init
1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	JZL
2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	JZL
3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	GM
4	3	3	3	4	5	4	3	4	2	3	RZ
5	11	8	10	8	12	12	10	10	7	7	SAM
6	MO	13	15	9	10	✓	12	11	9	10	SAM
7	11	✓	✓	✓	✓	12	✓	✓	✓	✓	JZL
8	2	3	7	7	9	8	9	8	10	10	JZL
Total	14	19	28	21	27	16	25	25	18	20	SAM

(16) RG-MIDAG

Days	Concentration: A	B	C	D	E	F	G	H	I	J	Init
1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	JZL
2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	JZL
3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	GM
4	4	4	4	✓	2	✓	4	4	4	4	RZ
5	10	7	7	9	9	10	9	10	12	7	SAM
6	✓	12	8	14	✓	9	✓	9	12	✓	SAM
7	14	✓	✓	✓	11	✓	12	✓	✓	14	JZL
8	11	8	10	9	11	8	10	9	7	12	JZL
Total	14	23	19	23	11	19	13	23	28	11	SAM

(17) FR-FR4

Days	Concentration: A	B	C	D	E	F	G	H	I	J	Init
1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	JZL
2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	JZL
3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	GM
4	4	4	2	4	✓	3	3	4	✓	2	RZ
5	6	8	6	7	5	6	8	5	6	8	SAM
6	12	✓	✓	8	8	8	4	✓	5	✓	SAM
7	✓	9	7	✓	✓	2	✓	8	✓	10	JZL
8	6	9	10	6	4	✓	6	6	7	10	JZL
Total	22	12	8	19	13	17	15	9	11	10	SAM

Notes: X = mortality.

Comments: 1. Total # Young only based on the first 3 Broods. Fourth and subsequent broods not included in total count.

2. Ephippia present in Controls (Y), (N)?

Reviewed by: [signature]

Date reviewed: Dec. 2, 2021

Chronic Freshwater Toxicity Test
C. dubia Reproduction Data

Client: TEAM
Sample ID: ~~212108~~ various
Work Order: 212108

Start Date & Time: Oct. 13/21 @1300h
Stop Date & Time: Oct. 21/21 @1030h
Set up by: SAM/JZL

Concentration: (18) FR-FR2

Days	A	B	C	D	E	F	G	H	I	J	Init
1	/	/	/	/	/	/	/	/	/	/	JZL
2	/	/	/	/	/	/	/	/	/	/	JZL
3	/	/	/	/	/	/	/	/	/	/	GM
4	3	4	5	4	4	5	2	4	3	6	AM
5	7	8	/	7	/	10	X	7	9	/	SAM
6	10	12	12	7	5	11	↓	10	9	10	SAM
7	14	/	11	/	/	/	↓	/	/	15	JZL
8	/	2	/	9	8	/	↓	10	10	2	JZL
Total	20	24	17	16	9	26	2X	21	21	16	SAM

Concentration: (19) FR-MULTIPLATE

Days	A	B	C	D	E	F	G	H	I	J	Init
1	/	/	/	/	/	/	/	/	/	/	JZL
2	/	/	/	/	/	/	/	/	/	/	JZL
3	/	/	/	/	/	/	/	/	/	/	GM
4	4	5	3	4	3	2	/	3	2	2	AM
5	10	4	7	8	8	6	6	7	2	7	SAM
6	8	10	/	9	4	8	5	8	2	3	SAM
7	/	/	13	/	/	/	/	/	/	/	JZL
8	8	5	8	/	2	10	/	/	/	X	JZL
Total	22	19	10	21	15	16	11	18	6	12X	SAM

Concentration: (20) FR-FRRD

Days	A	B	C	D	E	F	G	H	I	J	Init
1	/	/	/	/	/	/	/	/	/	/	JZL
2	/	/	/	/	/	/	/	/	/	/	JZL
3	/	/	/	/	/	/	/	/	/	/	GM
4	2	/	2	3	/	4	2	3	3	4	AM
5	6	3	6	9	2	10	8	10	9	8	SAM
6	8	10	8	/	7	2	8	12	12	11	SAM
7	/	/	/	3	/	4	/	/	/	/	JZL
8	/	6	4	2	6	3	3	6	9	10	JZL
Total	16	13	16	12	9	16	18	25	24	23	SAM

Concentration:

Days	A	B	C	D	E	F	G	H	I	J	Init
1											
2											
3											
4											
5											
6											
7											
8											
Total											

Concentration:

Days	A	B	C	D	E	F	G	H	I	J	Init
1											
2											
3											
4											
5											
6											
7											
8											
Total											

Concentration:

Days	A	B	C	D	E	F	G	H	I	J	Init
1											
2											
3											
4.											
5											
6											
7											
8											
Total											

Notes: X = mortality.

Comments: 1. Total # Young only based on the first 3 Broods. Fourth and subsequent broods not included in total count.

2. Ephippia present in Controls (Y), (N) ?

Reviewed by: [signature]

Date reviewed: Dec. 2, 2021

Chronic Freshwater Toxicity Test
C. dubia Reproduction Data

Client: Teck (EDTA)
Sample ID: various
Work Order: 212111

Start Date & Time: Oct. 13/21 @ 1300h
Stop Date & Time: Oct. 21/21 @ 1130h
Set up by: SAK/JTL

Concentration: (21) EDTA Control

Days	A	B	C	D	E	F	G	H	I	J	Init
1	/	/	/	/	/	/	/	/	/	/	JTL
2	/	/	/	/	/	/	/	/	/	/	JTL
3	/	/	/	/	/	/	/	/	/	/	JTL
4	X	2	4	2	3	4	3	5	4	3	RJS
5	↓	3	8	4	8	/	7	10	9	8	SAK
6		9	10	/	13	12	10	10	10	14	SAK
7		/	/	2	/	14	/	/	/	/	JTL
8		/	/	/	/	/	9	12	11	8	JTL
Total	0X	14	22	6	24	16	20	25	23	25	SAK

Concentration: (22) FR_FRCP1 + EDTA

Days	A	B	C	D	E	F	G	H	I	J	Init
1	/	/	/	/	/	/	/	/	/	/	JTL
2	/	/	/	/	/	/	/	/	/	/	JTL
3	/	/	/	/	/	/	/	/	/	/	JTL
4	3	/	2	–	/	/	/	–	–	–	RJS
5	2	8	8	7	7	6	8	8	2	/	SAK
6	11	12	10	/	/	8	6	8	/	4	SAK
7	/	/	/	6	/	/	/	/	/	/	JTL
8	/	/	12	2	2	2	/	13	/	2	JTL
Total	16	20	20	7	7	14	14	16	2	4	SAK

Concentration: (23) CM_MC2 + EDTA

Days	A	B	C	D	E	F	G	H	I	J	Init
1	/	/	/	/	/	/	/	/	/	/	JTL
2	/	/	/	/	/	/	/	/	/	/	JTL
3	/	/	/	/	/	/	/	/	/	/	JTL
4	6	3	4	4	2	5	4	4	4	3	LB
5	9	6	8	7	8	5	/	5	6	12	SAK
6	/	6	/	3	10	10	10	9	10	10	SAK
7	9	/	10	/	/	/	10	/	/	/	JTL
8	10	12	14 12	8	8	8	/	10	9	9	JTL
Total	15	14		14	20	20	14	18	20	25	SAK

Concentration: (24) RG_MIDAG + EDTA

Days	A	B	C	D	E	F	G	H	I	J	Init
1	/	/	/	/	/	/	/	/	/	/	JTL
2	/	/	/	/	/	/	/	/	/	/	JTL
3	/	/	/	/	/	/	/	/	/	/	JTL
4	4	4	3	3	4	4	3	4	4	4	RJS
5	9	9	10	7	7	9	6	9	8	8	SAK
6	12	13	9	11	13	10	12	7	8	2	SAK
7	/	/	/	/	/	/	/	/	/	12	JTL
8	/	3	8	8	8	7	3	/	/	7	JTL
Total	25	26	22	21	24	23	21	20	20	14	SAK

Concentration:

Days	A	B	C	D	E	F	G	H	I	J	Init
1											JTL
2											
3											
4											
5											
6											
7											
8											
Total											

Concentration:

Days	A	B	C	D	E	F	G	H	I	J	Init
1											
2											
3											
4											
5											
6											
7											
8											
Total											

Notes: X = mortality.

Comments: 1. Total # Young only based on the first 3 Broods. Fourth and subsequent broods not included in total count.

2. Ephippia present in Controls (Y), (N) ?

Reviewed by:

Date reviewed: Dec 2, 2021

Ceriodaphnia 7-d Survival and Reproduction Test — **Nautilus Environmental**

Batch ID:	02-8546-0621	**Test Type:**	Reproduction-Survival (7d)	**Analyst:**	Sierra Klueppel
Start Date:	13 Oct-21 13:00	**Protocol:**	EC/EPS 1/RM/21	**Diluent:**	20% Perrier Water
Ending Date:	21 Oct-21 10:30	**Species:**	Ceriodaphnia dubia	**Brine:**	
Test Length:	7d 22h	**Taxon:**	Branchiopoda	**Source:**	In-House Culture **Age:** <24

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
Lab Control	17-4877-3231	13 Oct-21	13 Oct-21 06:00	13h	Teck Coal	
FR_UFR1	19-8746-8946	12 Oct-21 11:07	13 Oct-21 11:53	26h (0 °C)		
GH_ER2	20-2628-4137	12 Oct-21 10:50	13 Oct-21 11:30	26h (0 °C)		
CM_MC1	18-3559-2852	12 Oct-21 13:20	13 Oct-21 11:30	24h (0.1 °C)		
LC_SLC	08-7937-3726	12 Oct-21 11:00	13 Oct-21 11:30	26h (2.9 °C)		
FR_FRABCH	18-7592-7020	12 Oct-21 11:20	13 Oct-21 11:53	26h (0 °C)		
FR_FRCP1	10-3969-8000	12 Oct-21 11:48	13 Oct-21 11:53	25h (1.3 °C)		
GH_FR1	11-8224-4576	12 Oct-21 10:00	13 Oct-21 11:30	27h (0 °C)		
GH_ERC	00-1276-7572	12 Oct-21 11:50	13 Oct-21 11:30	25h (0 °C)		
CM_MC2	03-9569-8600	12 Oct-21 12:47	13 Oct-21 11:30	24h (1.3 °C)		
EV_MC2	13-1923-7722	12 Oct-21 11:38	13 Oct-21 11:30	25h (0.2 °C)		
EV_HC1	18-6648-8827	12 Oct-21 10:33	13 Oct-21 11:30	26h (0 °C)		
LC_DCDS	17-4710-4100	12 Oct-21	13 Oct-21 11:30	37h (1.7 °C)		
LC_LC3	20-0894-5906	12 Oct-21 12:00	13 Oct-21 11:30	25h (8.8 °C)		
LC_LC5	14-5637-1032	12 Oct-21 13:30	13 Oct-21 11:30	23h (2.6 °C)		
LC_LCDSSLCC	06-4184-4349	12 Oct-21 12:30	13 Oct-21 11:30	24h (4.7 °C)		
RG_MIDAG	02-5873-2402	12 Oct-21 12:24	13 Oct-21 11:30	25h (3.9 °C)		
FR_FR4	16-7272-1140	12 Oct-21 11:05	13 Oct-21 11:30	26h (0 °C)		
FR_FR2	09-1936-7906	12 Oct-21 10:25	13 Oct-21 11:30	27h (0 °C)		
FR_MULTIPLATE	07-2028-3040	12 Oct-21 09:45	13 Oct-21 11:30	27h (0 °C)		
FR_FRRD	04-7874-3326	12 Oct-21 11:45	13 Oct-21 11:30	25h (0 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
Lab Control	Water Sample	Teck Coal	Lab Control	
FR_UFR1	Water Sample	Teck Coal	FR_UFR1_WEK_2021-09-1	
GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-10-12_	
CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-10-12	
LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-10-19_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_WEK_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_WEK_2021-09	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-10-12_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-10-12	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-10-12	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2021_Q4_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2021_Q4_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-10-19	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-10-19_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-10-19_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	
RG_MIDAG	Water Sample	Teck Coal	RG_MIDAG_WS_2021-10-	
FR_FR4	Water Sample	Teck Coal	FR_FR4_WS_2021-10-12_	
FR_FR2	Water Sample	Teck Coal	FR_FR2_WS_2021-10-12_	
FR_MULTIPLATE	Water Sample	Teck Coal	FR_MULTIPLATE_WS_202	
FR_FRRD	Water Sample	Teck Coal	FR_FRRD_WS_2021-10-12	

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Lab Control passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed 7d survival rate	3

Ceriodaphnia 7-d Survival and Reproduction Test **Nautilus Environmental**

SIngle Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	RG_MIDAG passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Lab Control passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	RG_MIDAG passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	RG_MIDAG passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed 7d survival rate	3

SIngle Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Lab Control passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	RG_MIDAG passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Lab Control passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Lab Control passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	RG_MIDAG passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Lab Control passed 7d survival rate	3

Ceriodaphnia 7-d Survival and Reproduction Test **Nautilus Environmental**

SIngle Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	RG_MIDAG passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Lab Control passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	RG_MIDAG passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Lab Control passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed 7d survival rate	3

Ceriodaphnia 7-d Survival and Reproduction Test **Nautilus Environmental**

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	RG_MIDAG passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	RG_MIDAG passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Lab Control passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	RG_MIDAG passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Lab Control passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed 7d survival rate	3

Ceriodaphnia 7-d Survival and Reproduction Test **Nautilus Environmental**

SIngle Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	RG_MIDAG passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Lab Control passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Lab Control passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	RG_MIDAG passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	RG_MIDAG passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Lab Control passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed 7d survival rate	3

Ceriodaphnia 7-d Survival and Reproduction Test **Nautilus Environmental**

SIngle Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	RG_MIDAG passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Lab Control passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	RG_MIDAG passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Lab Control passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	RG_MIDAG passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed 7d survival rate	3

Ceriodaphnia 7-d Survival and Reproduction Test **Nautilus Environmental**

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Lab Control passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Lab Control passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	RG_MIDAG passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	RG_MIDAG passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Lab Control passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed 7d survival rate	3

Ceriodaphnia 7-d Survival and Reproduction Test **Nautilus Environmental**

SIngle Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Lab Control passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	RG_MIDAG passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Lab Control passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	RG_MIDAG passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed 7d survival rate	3
05-2377-2664	7d Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed 7d survival rate	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.4792	GH_FR1 passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.4792	CM_MC2 passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.4792	Lab Control passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.4792	LC_LC3 passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.4792	GH_ER2 passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.4792	LC_LC5 passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.4792	FR_FRABCH passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.4792	FR_UFR1 passed reproduction	3

Ceriodaphnia 7-d Survival and Reproduction Test **Nautilus Environmental**

SIngle Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.4792	CM_MC1 passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.4792	GH_ERC passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.4792	LC_LCDSSLCC passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.4792	FR_FR2 passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.4792	FR_FRCP1 passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.4792	RG_MIDAG passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.4792	LC_SLC passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.4792	FR_FRRD passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.4792	FR_FR4 passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.4792	FR_MULTIPLATE passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.4792	EV_HC1 passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.4792	EV_MC2 passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.4792	LC_DCDS passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.5367	FR_FRRD passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.5367	LC_LC5 passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.5367	FR_MULTIPLATE passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.5367	CM_MC1 passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.5367	EV_MC2 passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.5367	GH_ERC passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.5367	LC_LCDSSLCC passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.5367	GH_ER2 passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.5367	FR_FR2 passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.5367	FR_FRCP1 passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.5367	GH_FR1 passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.5367	RG_MIDAG passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.5367	LC_DCDS passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.5367	LC_SLC passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.5367	Lab Control passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.5367	CM_MC2 passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.5367	FR_FRABCH passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.5367	FR_UFR1 passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.5367	EV_HC1 passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.5367	LC_LC3 passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.5367	FR_FR4 passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.3494	FR_FR2 passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.3494	GH_FR1 passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.3494	CM_MC1 passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.3494	FR_FR4 passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.3494	FR_FRRD passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.3494	LC_LCDSSLCC passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.3494	EV_HC1 passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.3494	RG_MIDAG passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.3494	LC_SLC passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.3494	FR_FRCP1 passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.3494	CM_MC2 passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.3494	FR_FRABCH passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.3494	GH_ERC passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.3494	FR_UFR1 passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.3494	LC_LC5 passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.3494	FR_MULTIPLATE passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.3494	GH_ER2 passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.3494	EV_MC2 passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.3494	LC_LC3 passed reproduction	3

SIngle Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.3494	LC_DCDS passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.3494	Lab Control passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.3345	GH_FR1 passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.3345	LC_LC3 passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.3345	EV_HC1 passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.3345	FR_MULTIPLATE passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.3345	Lab Control passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.3345	FR_FRCP1 passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.3345	FR_FRABCH passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.3345	FR_FR4 passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.3345	LC_DCDS passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.3345	FR_UFR1 passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.3345	CM_MC2 passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.3345	LC_SLC passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.3345	CM_MC1 passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.3345	LC_LC5 passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.3345	FR_FRRD passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.3345	EV_MC2 passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.3345	LC_LCDSSLCC passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.3345	GH_ER2 passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.3345	GH_ERC passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.3345	FR_FR2 passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.3345	RG_MIDAG passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.0707	GH_FR1 passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.0707	EV_MC2 passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.0707	LC_DCDS passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.0707	FR_FRABCH passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.0707	GH_ERC passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.0707	Lab Control passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.0707	LC_LC5 passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.0707	FR_FRRD passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.0707	LC_LCDSSLCC passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.0707	LC_LC3 passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.0707	FR_FRCP1 passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.0707	RG_MIDAG passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.0707	GH_ER2 passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.0707	FR_FR4 passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.0707	LC_SLC passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.0707	CM_MC1 passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.0707	FR_MULTIPLATE passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.0707	CM_MC2 passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.0707	FR_UFR1 passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.0707	EV_HC1 passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.0707	FR_FR2 passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	3.8E-04	EV_MC2 failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	3.8E-04	FR_FRCP1 failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	3.8E-04	FR_MULTIPLATE failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	3.8E-04	LC_LC5 failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	3.8E-04	GH_FR1 failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	3.8E-04	LC_LCDSSLCC failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	3.8E-04	GH_ERC failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	3.8E-04	FR_FR2 failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	3.8E-04	CM_MC1 failed reproduction	3

Ceriodaphnia 7-d Survival and Reproduction Test **Nautilus Environmental**

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	3.8E-04	LC_LC3 failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	3.8E-04	GH_ER2 failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	3.8E-04	Lab Control failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	3.8E-04	FR_FR4 failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	3.8E-04	LC_SLC failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	3.8E-04	RG_MIDAG failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	3.8E-04	CM_MC2 failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	3.8E-04	FR_UFR1 failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	3.8E-04	FR_FRABCH failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	3.8E-04	LC_DCDS failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	3.8E-04	FR_FRRD failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	3.8E-04	EV_HC1 failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.2233	LC_DCDS passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.2233	Lab Control passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.2233	FR_FR2 passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.2233	GH_FR1 passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.2233	EV_MC2 passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.2233	LC_LC5 passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.2233	LC_LC3 passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.2233	GH_ER2 passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.2233	FR_MULTIPLATE passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.2233	GH_ERC passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.2233	CM_MC2 passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.2233	FR_UFR1 passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.2233	LC_SLC passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.2233	RG_MIDAG passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.2233	CM_MC1 passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.2233	EV_HC1 passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.2233	FR_FRABCH passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.2233	LC_LCDSSLCC passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.2233	FR_FR4 passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.2233	FR_FRCP1 passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.2233	FR_FRRD passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.9034	FR_FRRD passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.9034	FR_FR4 passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.9034	FR_FR2 passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.9034	GH_ERC passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.9034	LC_LC3 passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.9034	LC_LCDSSLCC passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.9034	EV_HC1 passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.9034	FR_FRABCH passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.9034	LC_SLC passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.9034	FR_UFR1 passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.9034	Lab Control passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.9034	RG_MIDAG passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.9034	FR_MULTIPLATE passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.9034	CM_MC1 passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.9034	CM_MC2 passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.9034	GH_ER2 passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.9034	LC_LC5 passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.9034	GH_FR1 passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.9034	EV_MC2 passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.9034	LC_DCDS passed reproduction	3

Ceriodaphnia 7-d Survival and Reproduction Test **Nautilus Environmental**

SIngle Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.9034	FR_FRCP1 passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.0037	CM_MC1 failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.0037	FR_UFR1 failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.0037	FR_FRABCH failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.0037	LC_LC3 failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.0037	FR_MULTIPLATE failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.0037	EV_MC2 failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.0037	Lab Control failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.0037	LC_DCDS failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.0037	LC_SLC failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.0037	FR_FR4 failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.0037	GH_FR1 failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.0037	FR_FRRD failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.0037	FR_FRCP1 failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.0037	LC_LCDSSLCC failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.0037	FR_FR2 failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.0037	GH_ERC failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.0037	GH_ER2 failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.0037	RG_MIDAG failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.0037	LC_LC5 failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.0037	CM_MC2 failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.0037	EV_HC1 failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.9537	EV_HC1 passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.9537	CM_MC2 passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.9537	FR_FRRD passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.9537	FR_FR2 passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.9537	RG_MIDAG passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.9537	LC_SLC passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.9537	EV_MC2 passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.9537	LC_LCDSSLCC passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.9537	FR_FR4 passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.9537	FR_FRCP1 passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.9537	CM_MC1 passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.9537	GH_FR1 passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.9537	Lab Control passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.9537	GH_ERC passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.9537	FR_UFR1 passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.9537	LC_DCDS passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.9537	LC_LC5 passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.9537	FR_MULTIPLATE passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.9537	GH_ER2 passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.9537	FR_FRABCH passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.9537	LC_LC3 passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.0072	LC_LC5 failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.0072	FR_FRRD failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.0072	LC_LC3 failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.0072	LC_DCDS failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.0072	LC_LCDSSLCC failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.0072	FR_FR2 failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.0072	FR_MULTIPLATE failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.0072	RG_MIDAG failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.0072	CM_MC2 failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.0072	FR_FR4 failed reproduction	3

Ceriodaphnia 7-d Survival and Reproduction Test **Nautilus Environmental**

SIngle Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.0072	CM_MC1 failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.0072	FR_FRCP1 failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.0072	GH_FR1 failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.0072	EV_HC1 failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.0072	GH_ERC failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.0072	LC_SLC failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.0072	EV_MC2 failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.0072	FR_UFR1 failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.0072	FR_FRABCH failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.0072	GH_ER2 failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.0072	Lab Control failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	4.3E-06	FR_FR4 failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	4.3E-06	LC_SLC failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	4.3E-06	Lab Control failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	4.3E-06	FR_UFR1 failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	4.3E-06	LC_DCDS failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	4.3E-06	FR_MULTIPLATE failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	4.3E-06	LC_LC3 failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	4.3E-06	FR_FR2 failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	4.3E-06	GH_ERC failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	4.3E-06	GH_ER2 failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	4.3E-06	EV_HC1 failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	4.3E-06	FR_FRCP1 failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	4.3E-06	LC_LCDSSLCC failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	4.3E-06	RG_MIDAG failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	4.3E-06	LC_LC5 failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	4.3E-06	CM_MC2 failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	4.3E-06	FR_FRABCH failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	4.3E-06	FR_FRRD failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	4.3E-06	CM_MC1 failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	4.3E-06	GH_FR1 failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	4.3E-06	EV_MC2 failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.0131	FR_FRCP1 failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.0131	GH_ERC failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.0131	LC_LCDSSLCC failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.0131	FR_FR4 failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.0131	FR_FRABCH failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.0131	LC_LC5 failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.0131	RG_MIDAG failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.0131	LC_SLC failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.0131	GH_FR1 failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.0131	CM_MC1 failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.0131	LC_LC3 failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.0131	EV_HC1 failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.0131	FR_MULTIPLATE failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.0131	Lab Control failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.0131	FR_FRRD failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.0131	FR_UFR1 failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.0131	EV_MC2 failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.0131	CM_MC2 failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.0131	FR_FR2 failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.0131	GH_ER2 failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.0131	LC_DCDS failed reproduction	3

Ceriodaphnia 7-d Survival and Reproduction Test **Nautilus Environmental**

SIngle Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.3257	EV_MC2 passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.3257	LC_LCDSSLCC passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.3257	GH_FR1 passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.3257	LC_LC5 passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.3257	FR_FRRD passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.3257	FR_FRCP1 passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.3257	EV_HC1 passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.3257	FR_MULTIPLATE passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.3257	CM_MC2 passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.3257	GH_ERC passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.3257	CM_MC1 passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.3257	GH_ER2 passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.3257	FR_FR4 passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.3257	FR_FR2 passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.3257	FR_UFR1 passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.3257	LC_LC3 passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.3257	FR_FRABCH passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.3257	Lab Control passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.3257	LC_SLC passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.3257	RG_MIDAG passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.3257	LC_DCDS passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.1844	EV_HC1 passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.1844	CM_MC1 passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.1844	LC_SLC passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.1844	FR_MULTIPLATE passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.1844	FR_UFR1 passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.1844	FR_FR2 passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.1844	FR_FRABCH passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.1844	LC_LCDSSLCC passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.1844	RG_MIDAG passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.1844	FR_FR4 passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.1844	GH_ER2 passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.1844	CM_MC2 passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.1844	LC_DCDS passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.1844	GH_ERC passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.1844	LC_LC5 passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.1844	FR_FRCP1 passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.1844	LC_LC3 passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.1844	Lab Control passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.1844	EV_MC2 passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.1844	GH_FR1 passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.1844	FR_FRRD passed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.0250	CM_MC1 failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.0250	EV_MC2 failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.0250	GH_FR1 failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.0250	FR_MULTIPLATE failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.0250	LC_DCDS failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.0250	LC_SLC failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.0250	EV_HC1 failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.0250	LC_LC3 failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.0250	GH_ER2 failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.0250	FR_FR4 failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.0250	GH_ERC failed reproduction	3

Ceriodaphnia 7-d Survival and Reproduction Test **Nautilus Environmental**

SIngle Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.0250	FR_FRRD failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.0250	FR_UFR1 failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.0250	RG_MIDAG failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.0250	FR_FRABCH failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.0250	LC_LC5 failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.0250	FR_FRCP1 failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.0250	Lab Control failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.0250	CM_MC2 failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.0250	FR_FR2 failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.0250	LC_LCDSSLCC failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	4.0E-05	FR_MULTIPLATE failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	4.0E-05	CM_MC1 failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	4.0E-05	CM_MC2 failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	4.0E-05	LC_LCDSSLCC failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	4.0E-05	FR_FRRD failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	4.0E-05	FR_FRABCH failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	4.0E-05	FR_FR4 failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	4.0E-05	LC_LC3 failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	4.0E-05	GH_ER2 failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	4.0E-05	EV_HC1 failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	4.0E-05	GH_ERC failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	4.0E-05	GH_FR1 failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	4.0E-05	Lab Control failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	4.0E-05	RG_MIDAG failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	4.0E-05	LC_LC5 failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	4.0E-05	FR_UFR1 failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	4.0E-05	FR_FRCP1 failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	4.0E-05	FR_FR2 failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	4.0E-05	EV_MC2 failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	4.0E-05	LC_SLC failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	4.0E-05	LC_DCDS failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.0193	GH_ER2 failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.0193	GH_ERC failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.0193	LC_DCDS failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.0193	FR_FR2 failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.0193	EV_HC1 failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.0193	Lab Control failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.0193	LC_LC3 failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.0193	FR_FRABCH failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.0193	CM_MC2 failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.0193	LC_LCDSSLCC failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.0193	LC_LC5 failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.0193	EV_MC2 failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.0193	LC_SLC failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.0193	RG_MIDAG failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.0193	FR_FRRD failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.0193	CM_MC1 failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.0193	FR_UFR1 failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.0193	GH_FR1 failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.0193	FR_FR4 failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.0193	FR_MULTIPLATE failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.0193	FR_FRCP1 failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	4.7E-04	EV_HC1 failed reproduction	3

Ceriodaphnia 7-d Survival and Reproduction Test **Nautilus Environmental**

SIngle Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	4.7E-04	Lab Control failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	4.7E-04	FR_MULTIPLATE failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	4.7E-04	EV_MC2 failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	4.7E-04	FR_FRRD failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	4.7E-04	CM_MC2 failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	4.7E-04	GH_ER2 failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	4.7E-04	LC_LC3 failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	4.7E-04	RG_MIDAG failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	4.7E-04	FR_UFR1 failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	4.7E-04	GH_FR1 failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	4.7E-04	FR_FR4 failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	4.7E-04	LC_SLC failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	4.7E-04	CM_MC1 failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	4.7E-04	LC_LCDSSLCC failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	4.7E-04	LC_DCDS failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	4.7E-04	FR_FR2 failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	4.7E-04	LC_LC5 failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	4.7E-04	GH_ERC failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	4.7E-04	FR_FRABCH failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	4.7E-04	FR_FRCP1 failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.0054	EV_MC2 failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.0054	LC_SLC failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.0054	RG_MIDAG failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.0054	FR_FRCP1 failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.0054	CM_MC2 failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.0054	Lab Control failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.0054	LC_LC5 failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.0054	LC_LC3 failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.0054	GH_ER2 failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.0054	EV_HC1 failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.0054	FR_MULTIPLATE failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.0054	GH_FR1 failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.0054	FR_FR4 failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.0054	FR_FRABCH failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.0054	LC_LCDSSLCC failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.0054	FR_FRRD failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.0054	LC_DCDS failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.0054	FR_FR2 failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.0054	GH_ERC failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.0054	FR_UFR1 failed reproduction	3
20-1978-4095	Reproduction	Unequal Variance t Two-Sample Test	0.0054	CM_MC1 failed reproduction	3

Ceriodaphnia 7-d Survival and Reproduction Test **Nautilus Environmental**

7d Survival Rate Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
Lab Control	N	10	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
FR_UFR1		10	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
GH_ER2		10	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
CM_MC1		10	0.9000	0.6738	1.0000	0.0000	1.0000	0.1000	0.3162	35.14%	10.00%
LC_SLC		10	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
FR_FRABCH		10	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
FR_FRCP1		10	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
GH_FR1		10	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
GH_ERC		10	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
CM_MC2		10	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
EV_MC2		10	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
EV_HC1		10	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
LC_DCDS		10	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
LC_LC3		10	0.9000	0.6738	1.0000	0.0000	1.0000	0.1000	0.3162	35.14%	10.00%
LC_LC5		10	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
LC_LCDSSLCC		10	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
RG_MIDAG		10	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
FR_FR4		10	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
FR_FR2		10	0.9000	0.6738	1.0000	0.0000	1.0000	0.1000	0.3162	35.14%	10.00%
FR_MULTIPLATE		10	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
FR_FRRD		10	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%

Reproduction Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
Lab Control	N	10	23	20.62	25.38	14	26	1.054	3.333	14.49%	0.00%
FR_UFR1		10	22.9	19.37	26.43	14	28	1.56	4.932	21.54%	0.43%
GH_ER2		10	23.2	19	27.4	11	30	1.855	5.865	25.28%	-0.87%
CM_MC1		10	21.8	15.39	28.21	8	29	2.832	8.954	41.07%	5.22%
LC_SLC		10	22.2	18.8	25.6	13	29	1.504	4.756	21.42%	3.48%
FR_FRABCH		10	20	16.34	23.66	11	28	1.619	5.121	25.60%	13.04%
FR_FRCP1		10	15.8	12.68	18.92	10	21	1.381	4.367	27.64%	31.30%
GH_FR1		10	20.9	15.35	26.45	4	27	2.452	7.752	37.09%	9.13%
GH_ERC		10	24.7	23.19	26.21	22	29	0.6675	2.111	8.55%	-7.39%
CM_MC2		10	14.5	9.029	19.97	0	27	2.419	7.649	52.75%	36.96%
EV_MC2		10	25.2	23.82	26.58	22	28	0.611	1.932	7.67%	-9.57%
EV_HC1		10	18.7	16.04	21.36	13	23	1.174	3.713	19.86%	18.70%
LC_DCDS		10	13.3	10.73	15.87	8	19	1.136	3.592	27.00%	42.17%
LC_LC3		10	17.2	12.54	21.86	6	27	2.059	6.512	37.86%	25.22%
LC_LC5		10	22.1	18.38	25.82	9	28	1.643	5.195	23.51%	3.91%
LC_LCDSSLCC		10	21.3	17.89	24.71	14	28	1.506	4.762	22.36%	7.39%
RG_MIDAG		10	18.4	14.17	22.63	11	28	1.869	5.91	32.12%	20.00%
FR_FR4		10	13.6	10.33	16.87	8	22	1.447	4.575	33.64%	40.87%
FR_FR2		10	17.2	12.08	22.32	2	26	2.265	7.162	41.64%	25.22%
FR_MULTIPLATE		10	15	11.29	18.71	6	22	1.64	5.185	34.57%	34.78%
FR_FRRD		10	17.2	13.37	21.03	9	25	1.692	5.35	31.10%	25.22%

Ceriodaphnia 7-d Survival and Reproduction Test **Nautilus Environmental**

7d Survival Rate Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
Lab Control	N	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
FR_UFR1		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
GH_ER2		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
CM_MC1		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	1.0000	1.0000	1.0000
LC_SLC		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
FR_FRABCH		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
FR_FRCP1		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
GH_FR1		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
GH_ERC		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
CM_MC2		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
EV_MC2		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
EV_HC1		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
LC_DCDS		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
LC_LC3		1.0000	1.0000	1.0000	1.0000	0.0000	1.0000	1.0000	1.0000	1.0000	1.0000
LC_LC5		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
LC_LCDSSLCC		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
RG_MIDAG		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
FR_FR4		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
FR_FR2		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	1.0000	1.0000	1.0000
FR_MULTIPLATE		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
FR_FRRD		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

Reproduction Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
Lab Control	N	24	14	25	24	22	24	24	24	23	26
FR_UFR1		14	26	28	25	26	16	23	28	19	24
GH_ER2		24	11	25	26	28	25	22	15	30	26
CM_MC1		29	29	27	29	26	9	8	25	26	10
LC_SLC		29	27	22	16	22	22	13	24	25	22
FR_FRABCH		19	11	22	20	24	28	12	21	22	21
FR_FRCP1		12	20	11	19	21	20	10	11	16	18
GH_FR1		26	15	4	27	27	13	24	22	24	27
GH_ERC		23	23	27	23	22	25	25	25	29	25
CM_MC2		21	0	15	22	8	12	15	11	27	14
EV_MC2		27	26	27	23	24	25	24	28	26	22
EV_HC1		16	13	22	18	13	21	23	18	22	21
LC_DCDS		19	11	12	8	15	16	18	10	11	13
LC_LC3		24	15	19	20	6	14	23	12	12	27
LC_LC5		19	21	9	24	23	24	28	25	25	23
LC_LCDSSLCC		14	19	28	21	27	16	25	25	18	20
RG_MIDAG		14	23	19	23	11	19	13	23	28	11
FR_FR4		22	12	8	19	13	17	15	9	11	10
FR_FR2		20	24	17	16	9	26	2	21	21	16
FR_MULTIPLATE		22	19	10	21	15	16	11	18	6	12
FR_FRRD		16	13	16	12	9	16	18	25	24	23

Ceriodaphnia 7-d Survival and Reproduction Test **Nautilus Environmental**

7d Survival Rate Binomials

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
Lab Control	N	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
FR_UFR1		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
GH_ER2		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
CM_MC1		1/1	1/1	1/1	1/1	1/1	1/1	0/1	1/1	1/1	1/1
LC_SLC		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
FR_FRABCH		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
FR_FRCP1		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
GH_FR1		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
GH_ERC		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
CM_MC2		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
EV_MC2		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
EV_HC1		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
LC_DCDS		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
LC_LC3		1/1	1/1	1/1	1/1	0/1	1/1	1/1	1/1	1/1	1/1
LC_LC5		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
LC_LCDSSLCC		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
RG_MIDAG		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
FR_FR4		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
FR_FR2		1/1	1/1	1/1	1/1	1/1	1/1	0/1	1/1	1/1	1/1
FR_MULTIPLATE		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
FR_FRRD		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1

Ceriodaphnia 7-d Survival and Reproduction Test

Nautilus Environmental

Analysis ID:	05-2377-2664	**Endpoint:**	7d Survival Rate	**CETIS Version:**	CETISv1.9.4
Analyzed:	26 Nov-21 15:24	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1
Batch ID:	02-8546-0621	**Test Type:**	Reproduction-Survival (7d)	**Analyst:**	Sierra Klueppel
Start Date:	13 Oct-21 13:00	**Protocol:**	EC/EPS 1/RM/21	**Diluent:**	20% Perrier Water
Ending Date:	21 Oct-21 10:30	**Species:**	Ceriodaphnia dubia	**Brine:**	
Test Length:	7d 22h	**Taxon:**	Branchiopoda	**Source:**	In-House Culture **Age:** <24

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
Lab Control	17-4877-3231	13 Oct-21	13 Oct-21 06:00	13h	Teck Coal	
FR_UFR1	19-8746-8946	12 Oct-21 11:07	13 Oct-21 11:53	26h (0 °C)		
GH_ER2	20-2628-4137	12 Oct-21 10:50	13 Oct-21 11:30	26h (0 °C)		
CM_MC1	18-3559-2852	12 Oct-21 13:20	13 Oct-21 11:30	24h (0.1 °C)		
LC_SLC	08-7937-3726	12 Oct-21 11:00	13 Oct-21 11:30	26h (2.9 °C)		
FR_FRABCH	18-7592-7020	12 Oct-21 11:20	13 Oct-21 11:53	26h (0 °C)		
FR_FRCP1	10-3969-8000	12 Oct-21 11:48	13 Oct-21 11:53	25h (1.3 °C)		
GH_FR1	11-8224-4576	12 Oct-21 10:00	13 Oct-21 11:30	27h (0 °C)		
GH_ERC	00-1276-7572	12 Oct-21 11:50	13 Oct-21 11:30	25h (0 °C)		
CM_MC2	03-9569-8600	12 Oct-21 12:47	13 Oct-21 11:30	24h (1.3 °C)		
EV_MC2	13-1923-7722	12 Oct-21 11:38	13 Oct-21 11:30	25h (0.2 °C)		
EV_HC1	18-6648-8827	12 Oct-21 10:33	13 Oct-21 11:30	26h (0 °C)		
LC_DCDS	17-4710-4100	12 Oct-21	13 Oct-21 11:30	37h (1.7 °C)		
LC_LC3	20-0894-5906	12 Oct-21 12:00	13 Oct-21 11:30	25h (8.8 °C)		
LC_LC5	14-5637-1032	12 Oct-21 13:30	13 Oct-21 11:30	23h (2.6 °C)		
LC_LCDSSLCC	06-4184-4349	12 Oct-21 12:30	13 Oct-21 11:30	24h (4.7 °C)		
RG_MIDAG	02-5873-2402	12 Oct-21 12:24	13 Oct-21 11:30	25h (3.9 °C)		
FR_FR4	16-7272-1140	12 Oct-21 11:05	13 Oct-21 11:30	26h (0 °C)		
FR_FR2	09-1936-7906	12 Oct-21 10:25	13 Oct-21 11:30	27h (0 °C)		
FR_MULTIPLATE	07-2028-3040	12 Oct-21 09:45	13 Oct-21 11:30	27h (0 °C)		
FR_FRRD	04-7874-3326	12 Oct-21 11:45	13 Oct-21 11:30	25h (0 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
Lab Control	Water Sample	Teck Coal	Lab Control	
FR_UFR1	Water Sample	Teck Coal	FR_UFR1_WEK_2021-09-1	
GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-10-12_	
CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-10-12	
LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-10-19_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_WEK_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_WEK_2021-09	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-10-12_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-10-12	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-10-12	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2021_Q4_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2021_Q4_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-10-19	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-10-19_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-10-19_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	
RG_MIDAG	Water Sample	Teck Coal	RG_MIDAG_WS_2021-10-	
FR_FR4	Water Sample	Teck Coal	FR_FR4_WS_2021-10-12_	
FR_FR2	Water Sample	Teck Coal	FR_FR2_WS_2021-10-12_	
FR_MULTIPLATE	Water Sample	Teck Coal	FR_MULTIPLATE_WS_202	
FR_FRRD	Water Sample	Teck Coal	FR_FRRD_WS_2021-10-12	

Fisher Exact/Bonferroni-Holm Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
Negative Control		FR_UFR1	1.0000	Exact	1.0000	Non-Significant Effect
		GH_ER2	1.0000	Exact	1.0000	Non-Significant Effect

Analysis ID: 05-2377-2664 **Endpoint:** 7d Survival Rate **CETIS Version:** CETISv1.9.4
Analyzed: 26 Nov-21 15:24 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Fisher Exact/Bonferroni-Holm Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
		CM_MC1	0.5000	Exact	1.0000	Non-Significant Effect
		LC_SLC	1.0000	Exact	1.0000	Non-Significant Effect
		FR_FRABCH	1.0000	Exact	1.0000	Non-Significant Effect
		FR_FRCP1	1.0000	Exact	1.0000	Non-Significant Effect
		GH_FR1	1.0000	Exact	1.0000	Non-Significant Effect
		GH_ERC	1.0000	Exact	1.0000	Non-Significant Effect
		CM_MC2	1.0000	Exact	1.0000	Non-Significant Effect
		EV_MC2	1.0000	Exact	1.0000	Non-Significant Effect
		EV_HC1	1.0000	Exact	1.0000	Non-Significant Effect
		LC_DCDS	1.0000	Exact	1.0000	Non-Significant Effect
		LC_LC3	0.5000	Exact	1.0000	Non-Significant Effect
		LC_LC5	1.0000	Exact	1.0000	Non-Significant Effect
		LC_LCDSSLCC	1.0000	Exact	1.0000	Non-Significant Effect
		RG_MIDAG	1.0000	Exact	1.0000	Non-Significant Effect
		FR_FR4	1.0000	Exact	1.0000	Non-Significant Effect
		FR_FR2	0.5000	Exact	1.0000	Non-Significant Effect
		FR_MULTIPLATE	1.0000	Exact	1.0000	Non-Significant Effect
		FR_FRRD	1.0000	Exact	1.0000	Non-Significant Effect

Data Summary

Sample	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
Lab Control	N	10	0	10	1	0	0.0%
FR_UFR1		10	0	10	1	0	0.0%
GH_ER2		10	0	10	1	0	0.0%
CM_MC1		9	1	10	0.9	0.1	10.0%
LC_SLC		10	0	10	1	0	0.0%
FR_FRABCH		10	0	10	1	0	0.0%
FR_FRCP1		10	0	10	1	0	0.0%
GH_FR1		10	0	10	1	0	0.0%
GH_ERC		10	0	10	1	0	0.0%
CM_MC2		10	0	10	1	0	0.0%
EV_MC2		10	0	10	1	0	0.0%
EV_HC1		10	0	10	1	0	0.0%
LC_DCDS		10	0	10	1	0	0.0%
LC_LC3		9	1	10	0.9	0.1	10.0%
LC_LC5		10	0	10	1	0	0.0%
LC_LCDSSLCC		10	0	10	1	0	0.0%
RG_MIDAG		10	0	10	1	0	0.0%
FR_FR4		10	0	10	1	0	0.0%
FR_FR2		9	1	10	0.9	0.1	10.0%
FR_MULTIPLATE		10	0	10	1	0	0.0%
FR_FRRD		10	0	10	1	0	0.0%

Ceriodaphnia 7-d Survival and Reproduction Test **Nautilus Environmental**

Analysis ID: 05-2377-2664 **Endpoint:** 7d Survival Rate **CETIS Version:** CETISv1.9.4
Analyzed: 26 Nov-21 15:24 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

7d Survival Rate Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
Lab Control	N	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
FR_UFR1		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
GH_ER2		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
CM_MC1		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	1.0000	1.0000	1.0000
LC_SLC		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
FR_FRABCH		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
FR_FRCP1		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
GH_FR1		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
GH_ERC		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
CM_MC2		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
EV_MC2		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
EV_HC1		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
LC_DCDS		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
LC_LC3		1.0000	1.0000	1.0000	1.0000	0.0000	1.0000	1.0000	1.0000	1.0000	1.0000
LC_LC5		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
LC_LCDSSLCC		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
RG_MIDAG		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
FR_FR4		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
FR_FR2		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	1.0000	1.0000	1.0000
FR_MULTIPLATE		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
FR_FRRD		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

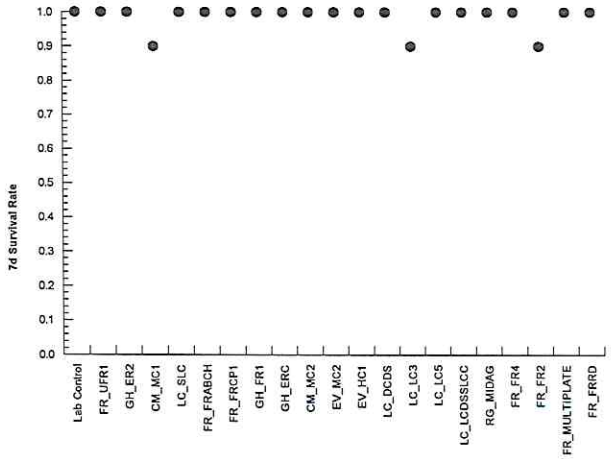
7d Survival Rate Binomials

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
Lab Control	N	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
FR_UFR1		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
GH_ER2		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
CM_MC1		1/1	1/1	1/1	1/1	1/1	1/1	0/1	1/1	1/1	1/1
LC_SLC		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
FR_FRABCH		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
FR_FRCP1		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
GH_FR1		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
GH_ERC		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
CM_MC2		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
EV_MC2		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
EV_HC1		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
LC_DCDS		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
LC_LC3		1/1	1/1	1/1	1/1	0/1	1/1	1/1	1/1	1/1	1/1
LC_LC5		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
LC_LCDSSLCC		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
RG_MIDAG		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
FR_FR4		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
FR_FR2		1/1	1/1	1/1	1/1	1/1	1/1	0/1	1/1	1/1	1/1
FR_MULTIPLATE		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
FR_FRRD		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1

Ceriodaphnia 7-d Survival and Reproduction Test **Nautilus Environmental**

Analysis ID:	05-2377-2664	**Endpoint:**	7d Survival Rate	**CETIS Version:**	CETISv1.9.4
Analyzed:	26 Nov-21 15:24	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1

Graphics



Analyst: SM QA: Dec-3/21

Ceriodaphnia 7-d Survival and Reproduction Test — **Nautilus Environmental**

Analysis ID:	11-1307-6855	**Endpoint:**	7d Survival Rate	**CETIS Version:**	CETISv1.9.4
Analyzed:	26 Nov-21 12:59	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1
Batch ID:	02-8546-0621	**Test Type:**	Reproduction-Survival (7d)	**Analyst:**	Sierra Klueppel
Start Date:	13 Oct-21 13:00	**Protocol:**	EC/EPS 1/RM/21	**Diluent:**	20% Perrier Water
Ending Date:	21 Oct-21 10:30	**Species:**	Ceriodaphnia dubia	**Brine:**	
Test Length:	7d 22h	**Taxon:**	Branchiopoda	**Source:**	In-House Culture **Age:** <24

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
FR_UFR1	19-8746-8946	12 Oct-21 11:07	13 Oct-21 11:53	26h (0 °C)	Teck Coal	
GH_ER2	20-2628-4137	12 Oct-21 10:50	13 Oct-21 11:30	26h (0 °C)		
CM_MC1	18-3559-2852	12 Oct-21 13:20	13 Oct-21 11:30	24h (0.1 °C)		
LC_SLC	08-7937-3726	12 Oct-21 11:00	13 Oct-21 11:30	26h (2.9 °C)		
FR_FRABCH	18-7592-7020	12 Oct-21 11:20	13 Oct-21 11:53	26h (0 °C)		
FR_FRCP1	10-3969-8000	12 Oct-21 11:48	13 Oct-21 11:53	25h (1.3 °C)		
GH_FR1	11-8224-4576	12 Oct-21 10:00	13 Oct-21 11:30	27h (0 °C)		
GH_ERC	00-1276-7572	12 Oct-21 11:50	13 Oct-21 11:30	25h (0 °C)		
CM_MC2	03-9569-8600	12 Oct-21 12:47	13 Oct-21 11:30	24h (1.3 °C)		
EV_MC2	13-1923-7722	12 Oct-21 11:38	13 Oct-21 11:30	25h (0.2 °C)		
EV_HC1	18-6648-8827	12 Oct-21 10:33	13 Oct-21 11:30	26h (0 °C)		
LC_DCDS	17-4710-4100	12 Oct-21	13 Oct-21 11:30	37h (1.7 °C)		
LC_LC3	20-0894-5906	12 Oct-21 12:00	13 Oct-21 11:30	25h (8.8 °C)		
LC_LC5	14-5637-1032	12 Oct-21 13:30	13 Oct-21 11:30	23h (2.6 °C)		
LC_LCDSSLCC	06-4184-4349	12 Oct-21 12:30	13 Oct-21 11:30	24h (4.7 °C)		
RG_MIDAG	02-5873-2402	12 Oct-21 12:24	13 Oct-21 11:30	25h (3.9 °C)		
FR_FR4	16-7272-1140	12 Oct-21 11:05	13 Oct-21 11:30	26h (0 °C)		
FR_FR2	09-1936-7906	12 Oct-21 10:25	13 Oct-21 11:30	27h (0 °C)		
FR_MULTIPLATE	07-2028-3040	12 Oct-21 09:45	13 Oct-21 11:30	27h (0 °C)		
FR_FRRD	04-7874-3326	12 Oct-21 11:45	13 Oct-21 11:30	25h (0 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_UFR1	Water Sample	Teck Coal	FR_UFR1_WEK_2021-09-1	
GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-10-12_	
CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-10-12	
LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-10-19_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_WEK_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_WEK_2021-09	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-10-12_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-10-12	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-10-12	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2021_Q4_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2021_Q4_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-10-19	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-10-19_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-10-19_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	
RG_MIDAG	Water Sample	Teck Coal	RG_MIDAG_WS_2021-10-	
FR_FR4	Water Sample	Teck Coal	FR_FR4_WS_2021-10-12_	
FR_FR2	Water Sample	Teck Coal	FR_FR2_WS_2021-10-12_	
FR_MULTIPLATE	Water Sample	Teck Coal	FR_MULTIPLATE_WS_202	
FR_FRRD	Water Sample	Teck Coal	FR_FRRD_WS_2021-10-12	

Fisher Exact/Bonferroni-Holm Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
Site Control (FR_UFR1)		GH_ER2	1.0000	Exact	1.0000	Non-Significant Effect
		CM_MC1	0.5000	Exact	1.0000	Non-Significant Effect
		LC_SLC	1.0000	Exact	1.0000	Non-Significant Effect
		FR_FRABCH	1.0000	Exact	1.0000	Non-Significant Effect

Ceriodaphnia 7-d Survival and Reproduction Test — **Nautilus Environmental**

Analysis ID: 11-1307-6855 **Endpoint:** 7d Survival Rate **CETIS Version:** CETISv1.9.4
Analyzed: 26 Nov-21 12:59 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Fisher Exact/Bonferroni-Holm Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
		FR_FRCP1	1.0000	Exact	1.0000	Non-Significant Effect
		GH_FR1	1.0000	Exact	1.0000	Non-Significant Effect
		GH_ERC	1.0000	Exact	1.0000	Non-Significant Effect
		CM_MC2	1.0000	Exact	1.0000	Non-Significant Effect
		EV_MC2	1.0000	Exact	1.0000	Non-Significant Effect
		EV_HC1	1.0000	Exact	1.0000	Non-Significant Effect
		LC_DCDS	1.0000	Exact	1.0000	Non-Significant Effect
		LC_LC3	0.5000	Exact	1.0000	Non-Significant Effect
		LC_LC5	1.0000	Exact	1.0000	Non-Significant Effect
		LC_LCDSSLCC	1.0000	Exact	1.0000	Non-Significant Effect
		RG_MIDAG	1.0000	Exact	1.0000	Non-Significant Effect
		FR_FR4	1.0000	Exact	1.0000	Non-Significant Effect
		FR_FR2	0.5000	Exact	1.0000	Non-Significant Effect
		FR_MULTIPLATE	1.0000	Exact	1.0000	Non-Significant Effect
		FR_FRRD	1.0000	Exact	1.0000	Non-Significant Effect

Data Summary

Sample	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
FR_UFR1	XC	10	0	10	1	0	0.0%
GH_ER2		10	0	10	1	0	0.0%
CM_MC1		9	1	10	0.9	0.1	10.0%
LC_SLC		10	0	10	1	0	0.0%
FR_FRABCH		10	0	10	1	0	0.0%
FR_FRCP1		10	0	10	1	0	0.0%
GH_FR1		10	0	10	1	0	0.0%
GH_ERC		10	0	10	1	0	0.0%
CM_MC2		10	0	10	1	0	0.0%
EV_MC2		10	0	10	1	0	0.0%
EV_HC1		10	0	10	1	0	0.0%
LC_DCDS		10	0	10	1	0	0.0%
LC_LC3		9	1	10	0.9	0.1	10.0%
LC_LC5		10	0	10	1	0	0.0%
LC_LCDSSLCC		10	0	10	1	0	0.0%
RG_MIDAG		10	0	10	1	0	0.0%
FR_FR4		10	0	10	1	0	0.0%
FR_FR2		9	1	10	0.9	0.1	10.0%
FR_MULTIPLATE		10	0	10	1	0	0.0%
FR_FRRD		10	0	10	1	0	0.0%

Ceriodaphnia 7-d Survival and Reproduction Test — **Nautilus Environmental**

Analysis ID: 11-1307-6855 **Endpoint:** 7d Survival Rate **CETIS Version:** CETISv1.9.4
Analyzed: 26 Nov-21 12:59 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

7d Survival Rate Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
FR_UFR1	XC	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
GH_ER2		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
CM_MC1		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	1.0000	1.0000	1.0000
LC_SLC		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
FR_FRABCH		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
FR_FRCP1		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
GH_FR1		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
GH_ERC		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
CM_MC2		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
EV_MC2		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
EV_HC1		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
LC_DCDS		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
LC_LC3		1.0000	1.0000	1.0000	1.0000	0.0000	1.0000	1.0000	1.0000	1.0000	1.0000
LC_LC5		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
LC_LCDSSLCC		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
RG_MIDAG		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
FR_FR4		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
FR_FR2		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	1.0000	1.0000	1.0000
FR_MULTIPLATE		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
FR_FRRD		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

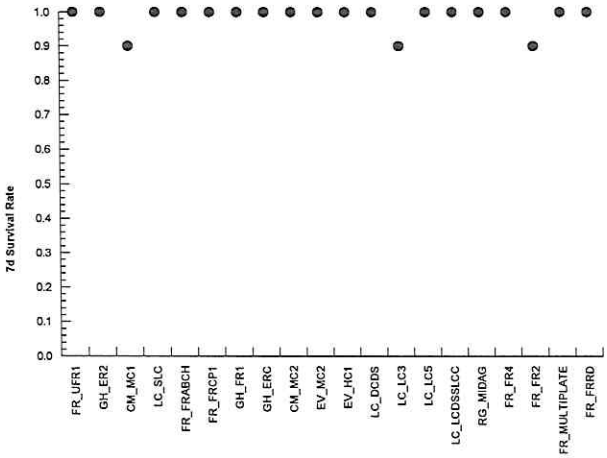
7d Survival Rate Binomials

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
GH_ER2		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
CM_MC1		1/1	1/1	1/1	1/1	1/1	1/1	0/1	1/1	1/1	1/1
LC_SLC		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
FR_FRABCH		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
FR_FRCP1		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
GH_FR1		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
GH_ERC		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
CM_MC2		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
EV_MC2		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
EV_HC1		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
LC_DCDS		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
LC_LC3		1/1	1/1	1/1	1/1	0/1	1/1	1/1	1/1	1/1	1/1
LC_LC5		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
LC_LCDSSLCC		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
RG_MIDAG		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
FR_FR4		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
FR_FR2		1/1	1/1	1/1	1/1	1/1	1/1	0/1	1/1	1/1	1/1
FR_MULTIPLATE		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
FR_FRRD		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1

Ceriodaphnia 7-d Survival and Reproduction Test **Nautilus Environmental**

Analysis ID:	11-1307-6855	**Endpoint:**	7d Survival Rate	**CETIS Version:**	CETISv1.9.4
Analyzed:	26 Nov-21 12:59	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1

Graphics



Ceriodaphnia 7-d Survival and Reproduction Test — **Nautilus Environmental**

Analysis ID:	17-6429-2927	**Endpoint:**	7d Survival Rate	**CETIS Version:**	CETISv1.9.4
Analyzed:	26 Nov-21 14:03	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1
Batch ID:	02-8546-0621	**Test Type:**	Reproduction-Survival (7d)	**Analyst:**	Sierra Klueppel
Start Date:	13 Oct-21 13:00	**Protocol:**	EC/EPS 1/RM/21	**Diluent:**	20% Perrier Water
Ending Date:	21 Oct-21 10:30	**Species:**	Ceriodaphnia dubia	**Brine:**	
Test Length:	7d 22h	**Taxon:**	Branchiopoda	**Source:**	In-House Culture **Age:** <24

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
FR_UFR1	19-8746-8946	12 Oct-21 11:07	13 Oct-21 11:53	26h (0 °C)	Teck Coal	
GH_ER2	20-2628-4137	12 Oct-21 10:50	13 Oct-21 11:30	26h (0 °C)		
CM_MC1	18-3559-2852	12 Oct-21 13:20	13 Oct-21 11:30	24h (0.1 °C)		
LC_SLC	08-7937-3726	12 Oct-21 11:00	13 Oct-21 11:30	26h (2.9 °C)		
FR_FRABCH	18-7592-7020	12 Oct-21 11:20	13 Oct-21 11:53	26h (0 °C)		
FR_FRCP1	10-3969-8000	12 Oct-21 11:48	13 Oct-21 11:53	25h (1.3 °C)		
GH_FR1	11-8224-4576	12 Oct-21 10:00	13 Oct-21 11:30	27h (0 °C)		
GH_ERC	00-1276-7572	12 Oct-21 11:50	13 Oct-21 11:30	25h (0 °C)		
CM_MC2	03-9569-8600	12 Oct-21 12:47	13 Oct-21 11:30	24h (1.3 °C)		
EV_MC2	13-1923-7722	12 Oct-21 11:38	13 Oct-21 11:30	25h (0.2 °C)		
EV_HC1	18-6648-8827	12 Oct-21 10:33	13 Oct-21 11:30	26h (0 °C)		
LC_DCDS	17-4710-4100	12 Oct-21	13 Oct-21 11:30	37h (1.7 °C)		
LC_LC3	20-0894-5906	12 Oct-21 12:00	13 Oct-21 11:30	25h (8.8 °C)		
LC_LC5	14-5637-1032	12 Oct-21 13:30	13 Oct-21 11:30	23h (2.6 °C)		
LC_LCDSSLCC	06-4184-4349	12 Oct-21 12:30	13 Oct-21 11:30	24h (4.7 °C)		
RG_MIDAG	02-5873-2402	12 Oct-21 12:24	13 Oct-21 11:30	25h (3.9 °C)		
FR_FR4	16-7272-1140	12 Oct-21 11:05	13 Oct-21 11:30	26h (0 °C)		
FR_FR2	09-1936-7906	12 Oct-21 10:25	13 Oct-21 11:30	27h (0 °C)		
FR_MULTIPLATE	07-2028-3040	12 Oct-21 09:45	13 Oct-21 11:30	27h (0 °C)		
FR_FRRD	04-7874-3326	12 Oct-21 11:45	13 Oct-21 11:30	25h (0 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_UFR1	Water Sample	Teck Coal	FR_UFR1_WEK_2021-09-1	
GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-10-12_	
CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-10-12	
LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-10-19_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_WEK_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_WEK_2021-09	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-10-12_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-10-12	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-10-12	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2021_Q4_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2021_Q4_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-10-19	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-10-19_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-10-19_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	
RG_MIDAG	Water Sample	Teck Coal	RG_MIDAG_WS_2021-10-	
FR_FR4	Water Sample	Teck Coal	FR_FR4_WS_2021-10-12_	
FR_FR2	Water Sample	Teck Coal	FR_FR2_WS_2021-10-12_	
FR_MULTIPLATE	Water Sample	Teck Coal	FR_MULTIPLATE_WS_202	
FR_FRRD	Water Sample	Teck Coal	FR_FRRD_WS_2021-10-12	

Fisher Exact/Bonferroni-Holm Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
Site Control (SM-ER2)		FR_UFR1	1.0000	Exact	1.0000	Non-Significant Effect
		CM_MC1	0.5000	Exact	1.0000	Non-Significant Effect
		LC_SLC	1.0000	Exact	1.0000	Non-Significant Effect
		FR_FRABCH	1.0000	Exact	1.0000	Non-Significant Effect

Ceriodaphnia 7-d Survival and Reproduction Test — **Nautilus Environmental**

Analysis ID: 17-6429-2927 **Endpoint:** 7d Survival Rate **CETIS Version:** CETISv1.9.4
Analyzed: 26 Nov-21 14:03 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Fisher Exact/Bonferroni-Holm Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
		FR_FRCP1	1.0000	Exact	1.0000	Non-Significant Effect
		GH_FR1	1.0000	Exact	1.0000	Non-Significant Effect
		GH_ERC	1.0000	Exact	1.0000	Non-Significant Effect
		CM_MC2	1.0000	Exact	1.0000	Non-Significant Effect
		EV_MC2	1.0000	Exact	1.0000	Non-Significant Effect
		EV_HC1	1.0000	Exact	1.0000	Non-Significant Effect
		LC_DCDS	1.0000	Exact	1.0000	Non-Significant Effect
		LC_LC3	0.5000	Exact	1.0000	Non-Significant Effect
		LC_LC5	1.0000	Exact	1.0000	Non-Significant Effect
		LC_LCDSSLCC	1.0000	Exact	1.0000	Non-Significant Effect
		RG_MIDAG	1.0000	Exact	1.0000	Non-Significant Effect
		FR_FR4	1.0000	Exact	1.0000	Non-Significant Effect
		FR_FR2	0.5000	Exact	1.0000	Non-Significant Effect
		FR_MULTIPLATE	1.0000	Exact	1.0000	Non-Significant Effect
		FR_FRRD	1.0000	Exact	1.0000	Non-Significant Effect

Data Summary

Sample	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
FR_UFR1		10	0	10	1	0	0.0%
GH_ER2	XC	10	0	10	1	0	0.0%
CM_MC1		9	1	10	0.9	0.1	10.0%
LC_SLC		10	0	10	1	0	0.0%
FR_FRABCH		10	0	10	1	0	0.0%
FR_FRCP1		10	0	10	1	0	0.0%
GH_FR1		10	0	10	1	0	0.0%
GH_ERC		10	0	10	1	0	0.0%
CM_MC2		10	0	10	1	0	0.0%
EV_MC2		10	0	10	1	0	0.0%
EV_HC1		10	0	10	1	0	0.0%
LC_DCDS		10	0	10	1	0	0.0%
LC_LC3		9	1	10	0.9	0.1	10.0%
LC_LC5		10	0	10	1	0	0.0%
LC_LCDSSLCC		10	0	10	1	0	0.0%
RG_MIDAG		10	0	10	1	0	0.0%
FR_FR4		10	0	10	1	0	0.0%
FR_FR2		9	1	10	0.9	0.1	10.0%
FR_MULTIPLATE		10	0	10	1	0	0.0%
FR_FRRD		10	0	10	1	0	0.0%

Ceriodaphnia 7-d Survival and Reproduction Test — **Nautilus Environmental**

Analysis ID: 17-6429-2927 **Endpoint:** 7d Survival Rate **CETIS Version:** CETISv1.9.4
Analyzed: 26 Nov-21 14:03 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

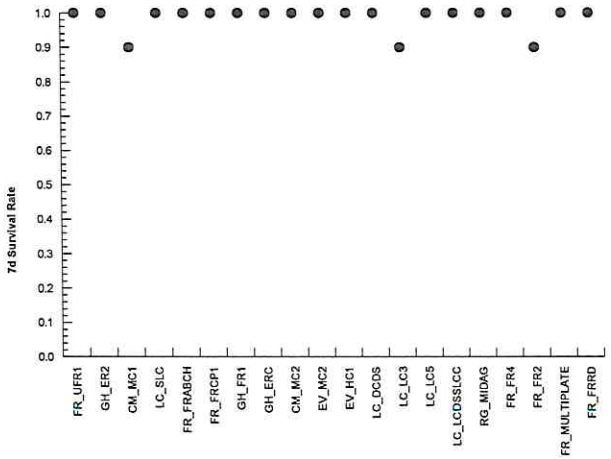
7d Survival Rate Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
FR_UFR1		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
GH_ER2	XC	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
CM_MC1		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	1.0000	1.0000	1.0000
LC_SLC		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
FR_FRABCH		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
FR_FRCP1		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
GH_FR1		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
GH_ERC		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
CM_MC2		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
EV_MC2		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
EV_HC1		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
LC_DCDS		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
LC_LC3		1.0000	1.0000	1.0000	1.0000	0.0000	1.0000	1.0000	1.0000	1.0000	1.0000
LC_LC5		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
LC_LCDSSLCC		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
RG_MIDAG		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
FR_FR4		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
FR_FR2		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	1.0000	1.0000	1.0000
FR_MULTIPLATE		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
FR_FRRD		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

7d Survival Rate Binomials

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
FR_UFR1		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
CM_MC1		1/1	1/1	1/1	1/1	1/1	1/1	0/1	1/1	1/1	1/1
LC_SLC		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
FR_FRABCH		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
FR_FRCP1		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
GH_FR1		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
GH_ERC		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
CM_MC2		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
EV_MC2		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
EV_HC1		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
LC_DCDS		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
LC_LC3		1/1	1/1	1/1	1/1	0/1	1/1	1/1	1/1	1/1	1/1
LC_LC5		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
LC_LCDSSLCC		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
RG_MIDAG		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
FR_FR4		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
FR_FR2		1/1	1/1	1/1	1/1	1/1	1/1	0/1	1/1	1/1	1/1
FR_MULTIPLATE		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
FR_FRRD		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1

Graphics


7d Survival Rate
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
FR_UFR1
GH_ER2
CM_MC1
LC_SLC
FR_FRABCH
FR_FRCP1
GH_FR1
GH_ERC
CM_MC2
EV_MC2
EV_HC1
LC_DCDS
LC_LC3
LC_LC5
LC_LCDSSLCC
RG_MIDAG
FR_FR4
FR_FR2
FR_MULTIPLATE
FR_FRRD

Ceriodaphnia 7-d Survival and Reproduction Test

Nautilus Environmental

Analysis ID:	05-6452-4989	**Endpoint:**	7d Survival Rate	**CETIS Version:**	CETISv1.9.4
Analyzed:	26 Nov-21 14:06	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1
Batch ID:	02-8546-0621	**Test Type:**	Reproduction-Survival (7d)	**Analyst:**	Sierra Klueppel
Start Date:	13 Oct-21 13:00	**Protocol:**	EC/EPS 1/RM/21	**Diluent:**	20% Perrier Water
Ending Date:	21 Oct-21 10:30	**Species:**	Ceriodaphnia dubia	**Brine:**	
Test Length:	7d 22h	**Taxon:**	Branchiopoda	**Source:**	In-House Culture **Age:** <24

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
FR_UFR1	19-8746-8946	12 Oct-21 11:07	13 Oct-21 11:53	26h (0 °C)	Teck Coal	
GH_ER2	20-2628-4137	12 Oct-21 10:50	13 Oct-21 11:30	26h (0 °C)		
CM_MC1	18-3559-2852	12 Oct-21 13:20	13 Oct-21 11:30	24h (0.1 °C)		
LC_SLC	08-7937-3726	12 Oct-21 11:00	13 Oct-21 11:30	26h (2.9 °C)		
FR_FRABCH	18-7592-7020	12 Oct-21 11:20	13 Oct-21 11:53	26h (0 °C)		
FR_FRCP1	10-3969-8000	12 Oct-21 11:48	13 Oct-21 11:53	25h (1.3 °C)		
GH_FR1	11-8224-4576	12 Oct-21 10:00	13 Oct-21 11:30	27h (0 °C)		
GH_ERC	00-1276-7572	12 Oct-21 11:50	13 Oct-21 11:30	25h (0 °C)		
CM_MC2	03-9569-8600	12 Oct-21 12:47	13 Oct-21 11:30	24h (1.3 °C)		
EV_MC2	13-1923-7722	12 Oct-21 11:38	13 Oct-21 11:30	25h (0.2 °C)		
EV_HC1	18-6648-8827	12 Oct-21 10:33	13 Oct-21 11:30	26h (0 °C)		
LC_DCDS	17-4710-4100	12 Oct-21	13 Oct-21 11:30	37h (1.7 °C)		
LC_LC3	20-0894-5906	12 Oct-21 12:00	13 Oct-21 11:30	25h (8.8 °C)		
LC_LC5	14-5637-1032	12 Oct-21 13:30	13 Oct-21 11:30	23h (2.6 °C)		
LC_LCDSSLCC	06-4184-4349	12 Oct-21 12:30	13 Oct-21 11:30	24h (4.7 °C)		
RG_MIDAG	02-5873-2402	12 Oct-21 12:24	13 Oct-21 11:30	25h (3.9 °C)		
FR_FR4	16-7272-1140	12 Oct-21 11:05	13 Oct-21 11:30	26h (0 °C)		
FR_FR2	09-1936-7906	12 Oct-21 10:25	13 Oct-21 11:30	27h (0 °C)		
FR_MULTIPLATE	07-2028-3040	12 Oct-21 09:45	13 Oct-21 11:30	27h (0 °C)		
FR_FRRD	04-7874-3326	12 Oct-21 11:45	13 Oct-21 11:30	25h (0 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_UFR1	Water Sample	Teck Coal	FR_UFR1_WEK_2021-09-1	
GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-10-12_	
CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-10-12	
LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-10-19_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_WEK_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_WEK_2021-09	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-10-12_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-10-12	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-10-12	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2021_Q4_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2021_Q4_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-10-19	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-10-19_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-10-19_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	
RG_MIDAG	Water Sample	Teck Coal	RG_MIDAG_WS_2021-10-	
FR_FR4	Water Sample	Teck Coal	FR_FR4_WS_2021-10-12_	
FR_FR2	Water Sample	Teck Coal	FR_FR2_WS_2021-10-12_	
FR_MULTIPLATE	Water Sample	Teck Coal	FR_MULTIPLATE_WS_202	
FR_FRRD	Water Sample	Teck Coal	FR_FRRD_WS_2021-10-12	

Fisher Exact/Bonferroni-Holm Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
Site Control		FR_UFR1	1.0000	Exact	1.0000	Non-Significant Effect
(CM_MC1)		GH_ER2	1.0000	Exact	1.0000	Non-Significant Effect
		LC_SLC	1.0000	Exact	1.0000	Non-Significant Effect
		FR_FRABCH	1.0000	Exact	1.0000	Non-Significant Effect

Ceriodaphnia 7-d Survival and Reproduction Test — **Nautilus Environmental**

Analysis ID: 05-6452-4989 **Endpoint:** 7d Survival Rate **CETIS Version:** CETISv1.9.4
Analyzed: 26 Nov-21 14:06 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Fisher Exact/Bonferroni-Holm Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
		FR_FRCP1	1.0000	Exact	1.0000	Non-Significant Effect
		GH_FR1	1.0000	Exact	1.0000	Non-Significant Effect
		GH_ERC	1.0000	Exact	1.0000	Non-Significant Effect
		CM_MC2	1.0000	Exact	1.0000	Non-Significant Effect
		EV_MC2	1.0000	Exact	1.0000	Non-Significant Effect
		EV_HC1	1.0000	Exact	1.0000	Non-Significant Effect
		LC_DCDS	1.0000	Exact	1.0000	Non-Significant Effect
		LC_LC3	0.7632	Exact	1.0000	Non-Significant Effect
		LC_LC5	1.0000	Exact	1.0000	Non-Significant Effect
		LC_LCDSSLCC	1.0000	Exact	1.0000	Non-Significant Effect
		RG_MIDAG	1.0000	Exact	1.0000	Non-Significant Effect
		FR_FR4	1.0000	Exact	1.0000	Non-Significant Effect
		FR_FR2	0.7632	Exact	1.0000	Non-Significant Effect
		FR_MULTIPLATE	1.0000	Exact	1.0000	Non-Significant Effect
		FR_FRRD	1.0000	Exact	1.0000	Non-Significant Effect

Data Summary

Sample	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
FR_UFR1		10	0	10	1	0	0.0%
GH_ER2		10	0	10	1	0	0.0%
CM_MC1	XC	9	1	10	0.9	0.1	10.0%
LC_SLC		10	0	10	1	0	0.0%
FR_FRABCH		10	0	10	1	0	0.0%
FR_FRCP1		10	0	10	1	0	0.0%
GH_FR1		10	0	10	1	0	0.0%
GH_ERC		10	0	10	1	0	0.0%
CM_MC2		10	0	10	1	0	0.0%
EV_MC2		10	0	10	1	0	0.0%
EV_HC1		10	0	10	1	0	0.0%
LC_DCDS		10	0	10	1	0	0.0%
LC_LC3		9	1	10	0.9	0.1	10.0%
LC_LC5		10	0	10	1	0	0.0%
LC_LCDSSLCC		10	0	10	1	0	0.0%
RG_MIDAG		10	0	10	1	0	0.0%
FR_FR4		10	0	10	1	0	0.0%
FR_FR2		9	1	10	0.9	0.1	10.0%
FR_MULTIPLATE		10	0	10	1	0	0.0%
FR_FRRD		10	0	10	1	0	0.0%

Ceriodaphnia 7-d Survival and Reproduction Test — **Nautilus Environmental**

Analysis ID: 05-6452-4989 **Endpoint:** 7d Survival Rate **CETIS Version:** CETISv1.9.4
Analyzed: 26 Nov-21 14:06 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

7d Survival Rate Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
FR_UFR1		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
GH_ER2		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
CM_MC1	XC	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	1.0000	1.0000	1.0000
LC_SLC		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
FR_FRABCH		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
FR_FRCP1		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
GH_FR1		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
GH_ERC		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
CM_MC2		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
EV_MC2		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
EV_HC1		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
LC_DCDS		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
LC_LC3		1.0000	1.0000	1.0000	1.0000	0.0000	1.0000	1.0000	1.0000	1.0000	1.0000
LC_LC5		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
LC_LCDSSLCC		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
RG_MIDAG		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
FR_FR4		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
FR_FR2		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	1.0000	1.0000	1.0000
FR_MULTIPLATE		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
FR_FRRD		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

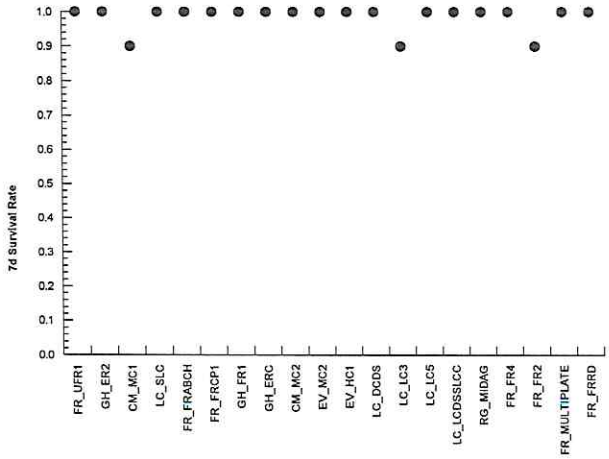
7d Survival Rate Binomials

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
FR_UFR1		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
GH_ER2		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
LC_SLC		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
FR_FRABCH		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
FR_FRCP1		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
GH_FR1		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
GH_ERC		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
CM_MC2		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
EV_MC2		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
EV_HC1		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
LC_DCDS		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
LC_LC3		1/1	1/1	1/1	1/1	0/1	1/1	1/1	1/1	1/1	1/1
LC_LC5		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
LC_LCDSSLCC		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
RG_MIDAG		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
FR_FR4		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
FR_FR2		1/1	1/1	1/1	1/1	1/1	1/1	0/1	1/1	1/1	1/1
FR_MULTIPLATE		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
FR_FRRD		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1

Ceriodaphnia 7-d Survival and Reproduction Test **Nautilus Environmental**

Analysis ID:	05-6452-4989	**Endpoint:**	7d Survival Rate	**CETIS Version:**	CETISv1.9.4
Analyzed:	26 Nov-21 14:06	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1

Graphics



Ceriodaphnia 7-d Survival and Reproduction Test — **Nautilus Environmental**

Analysis ID:	15-3400-0219	**Endpoint:**	7d Survival Rate	**CETIS Version:**	CETISv1.9.4
Analyzed:	26 Nov-21 14:07	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1
Batch ID:	02-8546-0621	**Test Type:**	Reproduction-Survival (7d)	**Analyst:**	Sierra Klueppel
Start Date:	13 Oct-21 13:00	**Protocol:**	EC/EPS 1/RM/21	**Diluent:**	20% Perrier Water
Ending Date:	21 Oct-21 10:30	**Species:**	Ceriodaphnia dubia	**Brine:**	
Test Length:	7d 22h	**Taxon:**	Branchiopoda	**Source:**	In-House Culture **Age:** <24

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
FR_UFR1	19-8746-8946	12 Oct-21 11:07	13 Oct-21 11:53	26h (0 °C)	Teck Coal	
GH_ER2	20-2628-4137	12 Oct-21 10:50	13 Oct-21 11:30	26h (0 °C)		
CM_MC1	18-3559-2852	12 Oct-21 13:20	13 Oct-21 11:30	24h (0.1 °C)		
LC_SLC	08-7937-3726	12 Oct-21 11:00	13 Oct-21 11:30	26h (2.9 °C)		
FR_FRABCH	18-7592-7020	12 Oct-21 11:20	13 Oct-21 11:53	26h (0 °C)		
FR_FRCP1	10-3969-8000	12 Oct-21 11:48	13 Oct-21 11:53	25h (1.3 °C)		
GH_FR1	11-8224-4576	12 Oct-21 10:00	13 Oct-21 11:30	27h (0 °C)		
GH_ERC	00-1276-7572	12 Oct-21 11:50	13 Oct-21 11:30	25h (0 °C)		
CM_MC2	03-9569-8600	12 Oct-21 12:47	13 Oct-21 11:30	24h (1.3 °C)		
EV_MC2	13-1923-7722	12 Oct-21 11:38	13 Oct-21 11:30	25h (0.2 °C)		
EV_HC1	18-6648-8827	12 Oct-21 10:33	13 Oct-21 11:30	26h (0 °C)		
LC_DCDS	17-4710-4100	12 Oct-21	13 Oct-21 11:30	37h (1.7 °C)		
LC_LC3	20-0894-5906	12 Oct-21 12:00	13 Oct-21 11:30	25h (8.8 °C)		
LC_LC5	14-5637-1032	12 Oct-21 13:30	13 Oct-21 11:30	23h (2.6 °C)		
LC_LCDSSLCC	06-4184-4349	12 Oct-21 12:30	13 Oct-21 11:30	24h (4.7 °C)		
RG_MIDAG	02-5873-2402	12 Oct-21 12:24	13 Oct-21 11:30	25h (3.9 °C)		
FR_FR4	16-7272-1140	12 Oct-21 11:05	13 Oct-21 11:30	26h (0 °C)		
FR_FR2	09-1936-7906	12 Oct-21 10:25	13 Oct-21 11:30	27h (0 °C)		
FR_MULTIPLATE	07-2028-3040	12 Oct-21 09:45	13 Oct-21 11:30	27h (0 °C)		
FR_FRRD	04-7874-3326	12 Oct-21 11:45	13 Oct-21 11:30	25h (0 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_UFR1	Water Sample	Teck Coal	FR_UFR1_WEK_2021-09-1	
GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-10-12_	
CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-10-12	
LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-10-19_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_WEK_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_WEK_2021-09	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-10-12_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-10-12	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-10-12	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2021_Q4_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2021_Q4_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-10-19	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-10-19_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-10-19_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	
RG_MIDAG	Water Sample	Teck Coal	RG_MIDAG_WS_2021-10-	
FR_FR4	Water Sample	Teck Coal	FR_FR4_WS_2021-10-12_	
FR_FR2	Water Sample	Teck Coal	FR_FR2_WS_2021-10-12_	
FR_MULTIPLATE	Water Sample	Teck Coal	FR_MULTIPLATE_WS_202	
FR_FRRD	Water Sample	Teck Coal	FR_FRRD_WS_2021-10-12	

Fisher Exact/Bonferroni-Holm Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
Site Control (LC_SLC)		FR_UFR1	1.0000	Exact	1.0000	Non-Significant Effect
		GH_ER2	1.0000	Exact	1.0000	Non-Significant Effect
		CM_MC1	0.5000	Exact	1.0000	Non-Significant Effect
		FR_FRABCH	1.0000	Exact	1.0000	Non-Significant Effect

Ceriodaphnia 7-d Survival and Reproduction Test **Nautilus Environmental**

Analysis ID: 15-3400-0219 **Endpoint:** 7d Survival Rate **CETIS Version:** CETISv1.9.4
Analyzed: 26 Nov-21 14:07 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Fisher Exact/Bonferroni-Holm Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
		FR_FRCP1	1.0000	Exact	1.0000	Non-Significant Effect
		GH_FR1	1.0000	Exact	1.0000	Non-Significant Effect
		GH_ERC	1.0000	Exact	1.0000	Non-Significant Effect
		CM_MC2	1.0000	Exact	1.0000	Non-Significant Effect
		EV_MC2	1.0000	Exact	1.0000	Non-Significant Effect
		EV_HC1	1.0000	Exact	1.0000	Non-Significant Effect
		LC_DCDS	1.0000	Exact	1.0000	Non-Significant Effect
		LC_LC3	0.5000	Exact	1.0000	Non-Significant Effect
		LC_LC5	1.0000	Exact	1.0000	Non-Significant Effect
		LC_LCDSSLCC	1.0000	Exact	1.0000	Non-Significant Effect
		RG_MIDAG	1.0000	Exact	1.0000	Non-Significant Effect
		FR_FR4	1.0000	Exact	1.0000	Non-Significant Effect
		FR_FR2	0.5000	Exact	1.0000	Non-Significant Effect
		FR_MULTIPLATE	1.0000	Exact	1.0000	Non-Significant Effect
		FR_FRRD	1.0000	Exact	1.0000	Non-Significant Effect

Data Summary

Sample	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
FR_UFR1		10	0	10	1	0	0.0%
GH_ER2		10	0	10	1	0	0.0%
CM_MC1		9	1	10	0.9	0.1	10.0%
LC_SLC	XC	10	0	10	1	0	0.0%
FR_FRABCH		10	0	10	1	0	0.0%
FR_FRCP1		10	0	10	1	0	0.0%
GH_FR1		10	0	10	1	0	0.0%
GH_ERC		10	0	10	1	0	0.0%
CM_MC2		10	0	10	1	0	0.0%
EV_MC2		10	0	10	1	0	0.0%
EV_HC1		10	0	10	1	0	0.0%
LC_DCDS		10	0	10	1	0	0.0%
LC_LC3		9	1	10	0.9	0.1	10.0%
LC_LC5		10	0	10	1	0	0.0%
LC_LCDSSLCC		10	0	10	1	0	0.0%
RG_MIDAG		10	0	10	1	0	0.0%
FR_FR4		10	0	10	1	0	0.0%
FR_FR2		9	1	10	0.9	0.1	10.0%
FR_MULTIPLATE		10	0	10	1	0	0.0%
FR_FRRD		10	0	10	1	0	0.0%

Ceriodaphnia 7-d Survival and Reproduction Test **Nautilus Environmental**

Analysis ID: 15-3400-0219 **Endpoint:** 7d Survival Rate **CETIS Version:** CETISv1.9.4
Analyzed: 26 Nov-21 14:07 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

7d Survival Rate Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
FR_UFR1		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
GH_ER2		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
CM_MC1		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	1.0000	1.0000	1.0000
LC_SLC	XC	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
FR_FRABCH		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
FR_FRCP1		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
GH_FR1		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
GH_ERC		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
CM_MC2		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
EV_MC2		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
EV_HC1		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
LC_DCDS		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
LC_LC3		1.0000	1.0000	1.0000	1.0000	0.0000	1.0000	1.0000	1.0000	1.0000	1.0000
LC_LC5		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
LC_LCDSSLCC		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
RG_MIDAG		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
FR_FR4		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
FR_FR2		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	1.0000	1.0000	1.0000
FR_MULTIPLATE		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
FR_FRRD		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

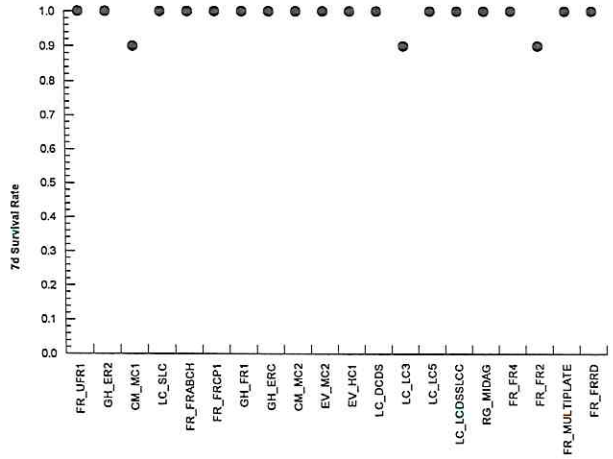
7d Survival Rate Binomials

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
FR_UFR1		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
GH_ER2		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
CM_MC1		1/1	1/1	1/1	1/1	1/1	1/1	0/1	1/1	1/1	1/1
FR_FRABCH		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
FR_FRCP1		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
GH_FR1		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
GH_ERC		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
CM_MC2		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
EV_MC2		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
EV_HC1		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
LC_DCDS		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
LC_LC3		1/1	1/1	1/1	1/1	0/1	1/1	1/1	1/1	1/1	1/1
LC_LC5		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
LC_LCDSSLCC		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
RG_MIDAG		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
FR_FR4		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
FR_FR2		1/1	1/1	1/1	1/1	1/1	1/1	0/1	1/1	1/1	1/1
FR_MULTIPLATE		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
FR_FRRD		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1

Ceriodaphnia 7-d Survival and Reproduction Test **Nautilus Environmental**

Analysis ID:	15-3400-0219	**Endpoint:**	7d Survival Rate	**CETIS Version:**	CETISv1.9.4
Analyzed:	26 Nov-21 14:07	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1

Graphics



Analyst: _____ QA: _____ Dec-3/21

Ceriodaphnia 7-d Survival and Reproduction Test

Nautilus Environmental

Analysis ID:	20-1978-4095	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.9.4
Analyzed:	06 Dec-21 15:53	**Analysis:**	Parametric-Two Sample	**Status Level:**	2
Batch ID:	02-8546-0621	**Test Type:**	Reproduction-Survival (7d)	**Analyst:**	Sierra Klueppel
Start Date:	13 Oct-21 13:00	**Protocol:**	EC/EPS 1/RM/21	**Diluent:**	20% Perrier Water
Ending Date:	21 Oct-21 10:30	**Species:**	Ceriodaphnia dubia	**Brine:**	
Test Length:	7d 22h	**Taxon:**	Branchiopoda	**Source:**	In-House Culture **Age:** <24

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
Lab Control	17-4877-3231	13 Oct-21	13 Oct-21 06:00	13h	Teck Coal	
FR_UFR1	19-8746-8946	12 Oct-21 11:07	13 Oct-21 11:53	26h (0 °C)		
GH_ER2	20-2628-4137	12 Oct-21 10:50	13 Oct-21 11:30	26h (0 °C)		
CM_MC1	18-3559-2852	12 Oct-21 13:20	13 Oct-21 11:30	24h (0.1 °C)		
LC_SLC	08-7937-3726	12 Oct-21 11:00	13 Oct-21 11:30	26h (2.9 °C)		
FR_FRABCH	18-7592-7020	12 Oct-21 11:20	13 Oct-21 11:53	26h (0 °C)		
FR_FRCP1	10-3969-8000	12 Oct-21 11:48	13 Oct-21 11:53	25h (1.3 °C)		
GH_FR1	11-8224-4576	12 Oct-21 10:00	13 Oct-21 11:30	27h (0 °C)		
GH_ERC	00-1276-7572	12 Oct-21 11:50	13 Oct-21 11:30	25h (0 °C)		
CM_MC2	03-9569-8600	12 Oct-21 12:47	13 Oct-21 11:30	24h (1.3 °C)		
EV_MC2	13-1923-7722	12 Oct-21 11:38	13 Oct-21 11:30	25h (0.2 °C)		
EV_HC1	18-6648-8827	12 Oct-21 10:33	13 Oct-21 11:30	26h (0 °C)		
LC_DCDS	17-4710-4100	12 Oct-21	13 Oct-21 11:30	37h (1.7 °C)		
LC_LC3	20-0894-5906	12 Oct-21 12:00	13 Oct-21 11:30	25h (8.8 °C)		
LC_LC5	14-5637-1032	12 Oct-21 13:30	13 Oct-21 11:30	23h (2.6 °C)		
LC_LCDSSLCC	06-4184-4349	12 Oct-21 12:30	13 Oct-21 11:30	24h (4.7 °C)		
RG_MIDAG	02-5873-2402	12 Oct-21 12:24	13 Oct-21 11:30	25h (3.9 °C)		
FR_FR4	16-7272-1140	12 Oct-21 11:05	13 Oct-21 11:30	26h (0 °C)		
FR_FR2	09-1936-7906	12 Oct-21 10:25	13 Oct-21 11:30	27h (0 °C)		
FR_MULTIPLATE	07-2028-3040	12 Oct-21 09:45	13 Oct-21 11:30	27h (0 °C)		
FR_FRRD	04-7874-3326	12 Oct-21 11:45	13 Oct-21 11:30	25h (0 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
Lab Control	Water Sample	Teck Coal	Lab Control	
FR_UFR1	Water Sample	Teck Coal	FR_UFR1_WEK_2021-09-1	
GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-10-12_	
CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-10-12	
LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-10-19_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_WEK_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_WEK_2021-09	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-10-12_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-10-12	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-10-12	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2021_Q4_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2021_Q4_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-10-19	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-10-19_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-10-19_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	
RG_MIDAG	Water Sample	Teck Coal	RG_MIDAG_WS_2021-10-	
FR_FR4	Water Sample	Teck Coal	FR_FR4_WS_2021-10-12_	
FR_FR2	Water Sample	Teck Coal	FR_FR2_WS_2021-10-12_	
FR_MULTIPLATE	Water Sample	Teck Coal	FR_MULTIPLATE_WS_202	
FR_FRRD	Water Sample	Teck Coal	FR_FRRD_WS_2021-10-12	

Ceriodaphnia 7-d Survival and Reproduction Test — **Nautilus Environmental**

Analysis ID: 20-1978-4095 **Endpoint:** Reproduction **CETIS Version:** CETISv1.9.4
Analyzed: 06 Dec-21 15:53 **Analysis:** Parametric-Two Sample **Status Level:** 2

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	FR_UFR1 passed reproduction	15.19%
		GH_ER2 passed reproduction	15.19%
		CM_MC1 passed reproduction	15.19%
		LC_SLC passed reproduction	15.19%
		FR_FRABCH passed reproduction	15.19%
		FR_FRCP1 failed reproduction	15.19%
		GH_FR1 passed reproduction	15.19%
		GH_ERC passed reproduction	15.19%
		CM_MC2 failed reproduction	15.19%
		EV_MC2 passed reproduction	15.19%
		EV_HC1 failed reproduction	15.19%
		LC_DCDS failed reproduction	15.19%
		LC_LC3 failed reproduction	15.19%
		LC_LC5 passed reproduction	15.19%
		LC_LCDSSLCC passed reproduction	15.19%
		RG_MIDAG failed reproduction	15.19%
		FR_FR4 failed reproduction	15.19%
		FR_FR2 failed reproduction	15.19%
		FR_MULTIPLATE failed reproduction	15.19%
		FR_FRRD failed reproduction	15.19%

Unequal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Negative Control		FR_UFR1	0.05312	1.753	3.3	15	CDF	0.4792	Non-Significant Effect
		GH_ER2	-0.09375	1.761	3.757	14	CDF	0.5367	Non-Significant Effect
		CM_MC1	0.3972	1.796	5.426	11	CDF	0.3494	Non-Significant Effect
		LC_SLC	0.4356	1.746	3.207	16	CDF	0.3345	Non-Significant Effect
		FR_FRABCH	1.553	1.753	3.387	15	CDF	0.0707	Non-Significant Effect
		FR_FRCP1*	4.145	1.746	3.033	16	CDF	3.8E-04	Significant Effect
		GH_FR1	0.7869	1.782	4.756	12	CDF	0.2233	Non-Significant Effect
		GH_ERC	-1.363	1.753	2.187	15	CDF	0.9034	Non-Significant Effect
		CM_MC2*	3.222	1.782	4.702	12	CDF	0.0037	Significant Effect
		EV_MC2	-1.806	1.761	2.146	14	CDF	0.9537	Non-Significant Effect
		EV_HC1*	2.725	1.74	2.745	17	CDF	0.0072	Significant Effect
		LC_DCDS*	6.26	1.74	2.696	17	CDF	4.3E-06	Significant Effect
		LC_LC3*	2.507	1.771	4.097	13	CDF	0.0131	Significant Effect
		LC_LC5	0.4611	1.753	3.422	15	CDF	0.3257	Non-Significant Effect
		LC_LCDSSLCC	0.9248	1.746	3.209	16	CDF	0.1844	Non-Significant Effect
		RG_MIDAG*	2.144	1.761	3.779	14	CDF	0.0250	Significant Effect
		FR_FR4*	5.251	1.746	3.125	16	CDF	4.0E-05	Significant Effect
		FR_FR2*	2.322	1.782	4.452	12	CDF	0.0193	Significant Effect
		FR_MULTIPLATE*	4.104	1.753	3.417	15	CDF	4.7E-04	Significant Effect
		FR_FRRD*	2.91	1.753	3.494	15	CDF	0.0054	Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	3.255	3.62	0.2079	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	2716.5	135.825	20	4.555	<1.0E-37	Significant Effect
Error	5635.2	29.8159	189			
Total	8351.7		209			

Distributional Tests

Ceriodaphnia 7-d Survival and Reproduction Test — **Nautilus Environmental**

Analysis ID: 20-1978-4095 **Endpoint:** Reproduction **CETIS Version:** CETISv1.9.4
Analyzed: 06 Dec-21 15:53 **Analysis:** Parametric-Two Sample **Status Level:** 2

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance Test	42.81	37.57	0.0022	Unequal Variances
Distribution	Shapiro-Wilk W Normality Test	0.97	0.9824	1.9E-04	Non-Normal Distribution

Reproduction Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
Lab Control	N	10	23	20.62	25.38	24	14	26	1.054	14.49%	0.00%
FR_UFR1		10	22.9	19.37	26.43	24.5	14	28	1.56	21.54%	0.43%
GH_ER2		10	23.2	19	27.4	25	11	30	1.855	25.28%	-0.87%
CM_MC1		10	21.8	15.39	28.21	26	8	29	2.832	41.07%	5.22%
LC_SLC		10	22.2	18.8	25.6	22	13	29	1.504	21.42%	3.48%
FR_FRABCH		10	20	16.34	23.66	21	11	28	1.619	25.60%	13.04%
FR_FRCP1		10	15.8	12.68	18.92	17	10	21	1.381	27.64%	31.30%
GH_FR1		10	20.9	15.35	26.45	24	4	27	2.452	37.09%	9.13%
GH_ERC		10	24.7	23.19	26.21	25	22	29	0.6675	8.55%	-7.39%
CM_MC2		10	14.5	9.029	19.97	14.5	0	27	2.419	52.75%	36.96%
EV_MC2		10	25.2	23.82	26.58	25.5	22	28	0.611	7.67%	-9.57%
EV_HC1		10	18.7	16.04	21.36	19.5	13	23	1.174	19.86%	18.70%
LC_DCDS		10	13.3	10.73	15.87	12.5	8	19	1.136	27.00%	42.17%
LC_LC3		10	17.2	12.54	21.86	17	6	27	2.059	37.86%	25.22%
LC_LC5		10	22.1	18.38	25.82	23.5	9	28	1.643	23.51%	3.91%
LC_LCDSSLCC		10	21.3	17.89	24.71	20.5	14	28	1.506	22.36%	7.39%
RG_MIDAG		10	18.4	14.17	22.63	19	11	28	1.869	32.12%	20.00%
FR_FR4		10	13.6	10.33	16.87	12.5	8	22	1.447	33.64%	40.87%
FR_FR2		10	17.2	12.08	22.32	18.5	2	26	2.265	41.64%	25.22%
FR_MULTIPLATE		10	15	11.29	18.71	15.5	6	22	1.64	34.57%	34.78%
FR_FRRD		10	17.2	13.37	21.03	16	9	25	1.692	31.10%	25.22%

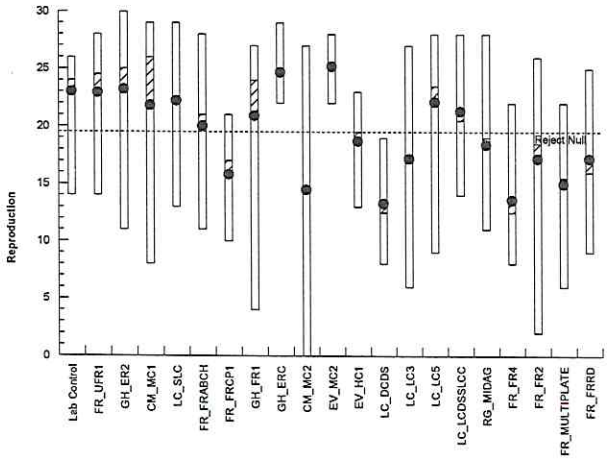
Reproduction Detail

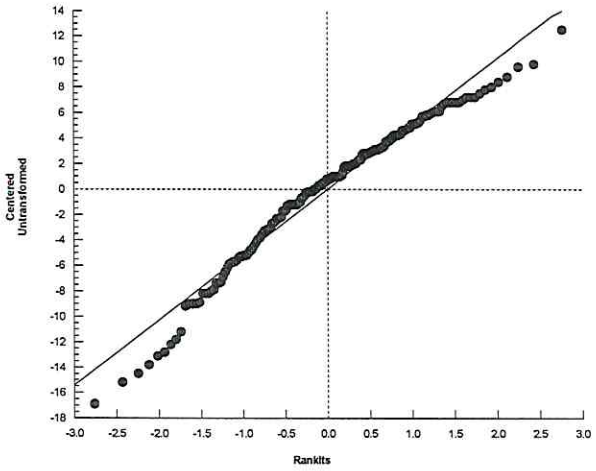
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
Lab Control	N	24	14	25	24	22	24	24	24	23	26
FR_UFR1		14	26	28	25	26	16	23	28	19	24
GH_ER2		24	11	25	26	28	25	22	15	30	26
CM_MC1		29	29	27	29	26	9	8	25	26	10
LC_SLC		29	27	22	16	22	22	13	24	25	22
FR_FRABCH		19	11	22	20	24	28	12	21	22	21
FR_FRCP1		12	20	11	19	21	20	10	11	16	18
GH_FR1		26	15	4	27	27	13	24	22	24	27
GH_ERC		23	23	27	23	22	25	25	25	29	25
CM_MC2		21	0	15	22	8	12	15	11	27	14
EV_MC2		27	26	27	23	24	25	24	28	26	22
EV_HC1		16	13	22	18	13	21	23	18	22	21
LC_DCDS		19	11	12	8	15	16	18	10	11	13
LC_LC3		24	15	19	20	6	14	23	12	12	27
LC_LC5		19	21	9	24	23	24	28	25	25	23
LC_LCDSSLCC		14	19	28	21	27	16	25	25	18	20
RG_MIDAG		14	23	19	23	11	19	13	23	28	11
FR_FR4		22	12	8	19	13	17	15	9	11	10
FR_FR2		20	24	17	16	9	26	2	21	21	16
FR_MULTIPLATE		22	19	10	21	15	16	11	18	6	12
FR_FRRD		16	13	16	12	9	16	18	25	24	23

Ceriodaphnia 7-d Survival and Reproduction Test **Nautilus Environmental**

Analysis ID:	20-1978-4095	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.9.4
Analyzed:	06 Dec-21 15:53	**Analysis:**	Parametric-Two Sample	**Status Level:**	2

Graphics





Ceriodaphnia 7-d Survival and Reproduction Test — **Nautilus Environmental**

Analysis ID:	14-0687-9537	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.9.4
Analyzed:	06 Dec-21 15:53	**Analysis:**	Parametric-Two Sample	**Status Level:**	2
Batch ID:	02-8546-0621	**Test Type:**	Reproduction-Survival (7d)	**Analyst:**	Sierra Klueppel
Start Date:	13 Oct-21 13:00	**Protocol:**	EC/EPS 1/RM/21	**Diluent:**	20% Perrier Water
Ending Date:	21 Oct-21 10:30	**Species:**	Ceriodaphnia dubia	**Brine:**	
Test Length:	7d 22h	**Taxon:**	Branchiopoda	**Source:**	In-House Culture **Age:** <24

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
FR_UFR1	19-8746-8946	12 Oct-21 11:07	13 Oct-21 11:53	26h (0 °C)	Teck Coal	
GH_ER2	20-2628-4137	12 Oct-21 10:50	13 Oct-21 11:30	26h (0 °C)		
CM_MC1	18-3559-2852	12 Oct-21 13:20	13 Oct-21 11:30	24h (0.1 °C)		
LC_SLC	08-7937-3726	12 Oct-21 11:00	13 Oct-21 11:30	26h (2.9 °C)		
FR_FRABCH	18-7592-7020	12 Oct-21 11:20	13 Oct-21 11:53	26h (0 °C)		
FR_FRCP1	10-3969-8000	12 Oct-21 11:48	13 Oct-21 11:53	25h (1.3 °C)		
GH_FR1	11-8224-4576	12 Oct-21 10:00	13 Oct-21 11:30	27h (0 °C)		
GH_ERC	00-1276-7572	12 Oct-21 11:50	13 Oct-21 11:30	25h (0 °C)		
CM_MC2	03-9569-8600	12 Oct-21 12:47	13 Oct-21 11:30	24h (1.3 °C)		
EV_MC2	13-1923-7722	12 Oct-21 11:38	13 Oct-21 11:30	25h (0.2 °C)		
EV_HC1	18-6648-8827	12 Oct-21 10:33	13 Oct-21 11:30	26h (0 °C)		
LC_DCDS	17-4710-4100	12 Oct-21	13 Oct-21 11:30	37h (1.7 °C)		
LC_LC3	20-0894-5906	12 Oct-21 12:00	13 Oct-21 11:30	25h (8.8 °C)		
LC_LC5	14-5637-1032	12 Oct-21 13:30	13 Oct-21 11:30	23h (2.6 °C)		
LC_LCDSSLCC	06-4184-4349	12 Oct-21 12:30	13 Oct-21 11:30	24h (4.7 °C)		
RG_MIDAG	02-5873-2402	12 Oct-21 12:24	13 Oct-21 11:30	25h (3.9 °C)		
FR_FR4	16-7272-1140	12 Oct-21 11:05	13 Oct-21 11:30	26h (0 °C)		
FR_FR2	09-1936-7906	12 Oct-21 10:25	13 Oct-21 11:30	27h (0 °C)		
FR_MULTIPLATE	07-2028-3040	12 Oct-21 09:45	13 Oct-21 11:30	27h (0 °C)		
FR_FRRD	04-7874-3326	12 Oct-21 11:45	13 Oct-21 11:30	25h (0 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_UFR1	Water Sample	Teck Coal	FR_UFR1_WEK_2021-09-1	
GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-10-12_	
CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-10-12	
LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-10-19_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_WEK_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_WEK_2021-09	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-10-12_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-10-12	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-10-12	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2021_Q4_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2021_Q4_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-10-19	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-10-19_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-10-19_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	
RG_MIDAG	Water Sample	Teck Coal	RG_MIDAG_WS_2021-10-	
FR_FR4	Water Sample	Teck Coal	FR_FR4_WS_2021-10-12_	
FR_FR2	Water Sample	Teck Coal	FR_FR2_WS_2021-10-12_	
FR_MULTIPLATE	Water Sample	Teck Coal	FR_MULTIPLATE_WS_202	
FR_FRRD	Water Sample	Teck Coal	FR_FRRD_WS_2021-10-12	

Ceriodaphnia 7-d Survival and Reproduction Test — **Nautilus Environmental**

Analysis ID: 14-0687-9537 **Endpoint:** Reproduction **CETIS Version:** CETISv1.9.4
Analyzed: 06 Dec-21 15:53 **Analysis:** Parametric-Two Sample **Status Level:** 2

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	GH_ER2 passed reproduction	17.48%
		CM_MC1 passed reproduction	17.48%
		LC_SLC passed reproduction	17.48%
		FR_FRABCH passed reproduction	17.48%
		FR_FRCP1 failed reproduction	17.48%
		GH_FR1 passed reproduction	17.48%
		GH_ERC passed reproduction	17.48%
		CM_MC2 failed reproduction	17.48%
		EV_MC2 passed reproduction	17.48%
		EV_HC1 failed reproduction	17.48%
		LC_DCDS failed reproduction	17.48%
		LC_LC3 failed reproduction	17.48%
		LC_LC5 passed reproduction	17.48%
		LC_LCDSSLCC passed reproduction	17.48%
		RG_MIDAG failed reproduction	17.48%
		FR_FR4 failed reproduction	17.48%
		FR_FR2 failed reproduction	17.48%
		FR_MULTIPLATE failed reproduction	17.48%
		FR_FRRD failed reproduction	17.48%

Unequal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Site Control (FR-UFRI)		GH_ER2	-0.1238	1.74	4.216	17	CDF	0.5485	Non-Significant Effect
		CM_MC1	0.3403	1.761	5.694	14	CDF	0.3693	Non-Significant Effect
		LC_SLC	0.3231	1.74	3.769	17	CDF	0.3753	Non-Significant Effect
		FR_FRABCH	1.29	1.74	3.911	17	CDF	0.1072	Non-Significant Effect
		FR_FRCP1*	3.409	1.74	3.624	17	CDF	0.0017	Significant Effect
		GH_FR1	0.6883	1.753	5.094	15	CDF	0.2509	Non-Significant Effect
		GH_ERC	-1.061	1.782	3.023	12	CDF	0.8452	Non-Significant Effect
		CM_MC2*	2.919	1.753	5.045	15	CDF	0.0053	Significant Effect
		EV_MC2	-1.373	1.796	3.008	11	CDF	0.9015	Non-Significant Effect
		EV_HC1*	2.151	1.746	3.408	16	CDF	0.0235	Significant Effect
		LC_DCDS*	4.976	1.746	3.368	16	CDF	6.9E-05	Significant Effect
		LC_LC3*	2.207	1.746	4.51	16	CDF	0.0211	Significant Effect
		LC_LC5	0.3532	1.74	3.941	17	CDF	0.3642	Non-Significant Effect
		LC_LCDSSLCC	0.738	1.74	3.771	17	CDF	0.2353	Non-Significant Effect
		RG_MIDAG*	1.849	1.74	4.235	17	CDF	0.0410	Significant Effect
		FR_FR4*	4.372	1.74	3.701	17	CDF	2.1E-04	Significant Effect
		FR_FR2*	2.073	1.753	4.82	15	CDF	0.0279	Significant Effect
		FR_MULTIPLATE*	3.491	1.74	3.937	17	CDF	0.0014	Significant Effect
		FR_FRRD*	2.477	1.74	4.003	17	CDF	0.0120	Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	3.204	3.606	0.2365	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	2583.28	135.962	19	4.421	<1.0E-37	Significant Effect
Error	5535.2	30.7511	180			
Total	8118.48		199			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance Test	39.6	36.19	0.0037	Unequal Variances

Ceriodaphnia 7-d Survival and Reproduction Test **Nautilus Environmental**

Analysis ID: 14-0687-9537 **Endpoint:** Reproduction **CETIS Version:** CETISv1.9.4
Analyzed: 06 Dec-21 15:53 **Analysis:** Parametric-Two Sample **Status Level:** 2

Distribution					
Shapiro-Wilk W Normality Test	0.9716	0.9816	4.5E-04	Non-Normal Distribution	

Reproduction Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
FR_UFR1	XC	10	22.9	19.37	26.43	24.5	14	28	1.56	21.54%	0.00%
GH_ER2		10	23.2	19	27.4	25	11	30	1.855	25.28%	-1.31%
CM_MC1		10	21.8	15.39	28.21	26	8	29	2.832	41.07%	4.80%
LC_SLC		10	22.2	18.8	25.6	22	13	29	1.504	21.42%	3.06%
FR_FRABCH		10	20	16.34	23.66	21	11	28	1.619	25.60%	12.66%
FR_FRCP1		10	15.8	12.68	18.92	17	10	21	1.381	27.64%	31.00%
GH_FR1		10	20.9	15.35	26.45	24	4	27	2.452	37.09%	8.73%
GH_ERC		10	24.7	23.19	26.21	25	22	29	0.6675	8.55%	-7.86%
CM_MC2		10	14.5	9.029	19.97	14.5	0	27	2.419	52.75%	36.68%
EV_MC2		10	25.2	23.82	26.58	25.5	22	28	0.611	7.67%	-10.04%
EV_HC1		10	18.7	16.04	21.36	19.5	13	23	1.174	19.86%	18.34%
LC_DCDS		10	13.3	10.73	15.87	12.5	8	19	1.136	27.00%	41.92%
LC_LC3		10	17.2	12.54	21.86	17	6	27	2.059	37.86%	24.89%
LC_LC5		10	22.1	18.38	25.82	23.5	9	28	1.643	23.51%	3.49%
LC_LCDSSLCC		10	21.3	17.89	24.71	20.5	14	28	1.506	22.36%	6.99%
RG_MIDAG		10	18.4	14.17	22.63	19	11	28	1.869	32.12%	19.65%
FR_FR4		10	13.6	10.33	16.87	12.5	8	22	1.447	33.64%	40.61%
FR_FR2		10	17.2	12.08	22.32	18.5	2	26	2.265	41.64%	24.89%
FR_MULTIPLATE		10	15	11.29	18.71	15.5	6	22	1.64	34.57%	34.50%
FR_FRRD		10	17.2	13.37	21.03	16	9	25	1.692	31.10%	24.89%

Reproduction Detail

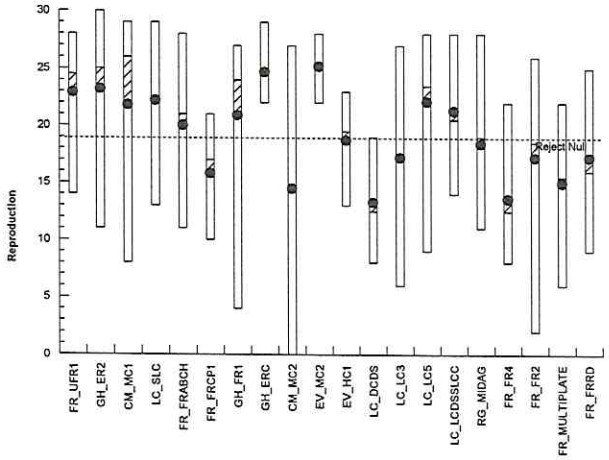
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
FR_UFR1	XC	14	26	28	25	26	16	23	28	19	24
GH_ER2		24	11	25	26	28	25	22	15	30	26
CM_MC1		29	29	27	29	26	9	8	25	26	10
LC_SLC		29	27	22	16	22	22	13	24	25	22
FR_FRABCH		19	11	22	20	24	28	12	21	22	21
FR_FRCP1		12	20	11	19	21	20	10	11	16	18
GH_FR1		26	15	4	27	27	13	24	22	24	27
GH_ERC		23	23	27	23	22	25	25	25	29	25
CM_MC2		21	0	15	22	8	12	15	11	27	14
EV_MC2		27	26	27	23	24	25	24	28	26	22
EV_HC1		16	13	22	18	13	21	23	18	22	21
LC_DCDS		19	11	12	8	15	16	18	10	11	13
LC_LC3		24	15	19	20	6	14	23	12	12	27
LC_LC5		19	21	9	24	23	24	28	25	25	23
LC_LCDSSLCC		14	19	28	21	27	16	25	25	18	20
RG_MIDAG		14	23	19	23	11	19	13	23	28	11
FR_FR4		22	12	8	19	13	17	15	9	11	10
FR_FR2		20	24	17	16	9	26	2	21	21	16
FR_MULTIPLATE		22	19	10	21	15	16	11	18	6	12
FR_FRRD		16	13	16	12	9	16	18	25	24	23

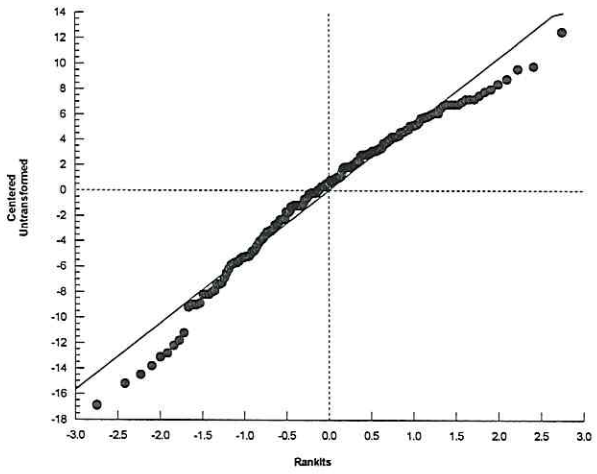
Ceriodaphnia 7-d Survival and Reproduction Test

Nautilus Environmental

Analysis ID:	14-0687-9537	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.9.4
Analyzed:	06 Dec-21 15:53	**Analysis:**	Parametric-Two Sample	**Status Level:**	2

Graphics





Analyst: SMM QA: Dec-7/21

Ceriodaphnia 7-d Survival and Reproduction Test

Nautilus Environmental

Analysis ID:	15-9743-6655	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.9.4
Analyzed:	06 Dec-21 16:22	**Analysis:**	Parametric-Two Sample	**Status Level:**	2
Batch ID:	02-8546-0621	**Test Type:**	Reproduction-Survival (7d)	**Analyst:**	Sierra Klueppel
Start Date:	13 Oct-21 13:00	**Protocol:**	EC/EPS 1/RM/21	**Diluent:**	20% Perrier Water
Ending Date:	21 Oct-21 10:30	**Species:**	Ceriodaphnia dubia	**Brine:**	
Test Length:	7d 22h	**Taxon:**	Branchiopoda	**Source:**	In-House Culture **Age:** <24

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
FR_UFR1	19-8746-8946	12 Oct-21 11:07	13 Oct-21 11:53	26h (0 °C)	Teck Coal	
GH_ER2	20-2628-4137	12 Oct-21 10:50	13 Oct-21 11:30	26h (0 °C)		
CM_MC1	18-3559-2852	12 Oct-21 13:20	13 Oct-21 11:30	24h (0.1 °C)		
LC_SLC	08-7937-3726	12 Oct-21 11:00	13 Oct-21 11:30	26h (2.9 °C)		
FR_FRABCH	18-7592-7020	12 Oct-21 11:20	13 Oct-21 11:53	26h (0 °C)		
FR_FRCP1	10-3969-8000	12 Oct-21 11:48	13 Oct-21 11:53	25h (1.3 °C)		
GH_FR1	11-8224-4576	12 Oct-21 10:00	13 Oct-21 11:30	27h (0 °C)		
GH_ERC	00-1276-7572	12 Oct-21 11:50	13 Oct-21 11:30	25h (0 °C)		
CM_MC2	03-9569-8600	12 Oct-21 12:47	13 Oct-21 11:30	24h (1.3 °C)		
EV_MC2	13-1923-7722	12 Oct-21 11:38	13 Oct-21 11:30	25h (0.2 °C)		
EV_HC1	18-6648-8827	12 Oct-21 10:33	13 Oct-21 11:30	26h (0 °C)		
LC_DCDS	17-4710-4100	12 Oct-21	13 Oct-21 11:30	37h (1.7 °C)		
LC_LC3	20-0894-5906	12 Oct-21 12:00	13 Oct-21 11:30	25h (8.8 °C)		
LC_LC5	14-5637-1032	12 Oct-21 13:30	13 Oct-21 11:30	23h (2.6 °C)		
LC_LCDSSLCC	06-4184-4349	12 Oct-21 12:30	13 Oct-21 11:30	24h (4.7 °C)		
RG_MIDAG	02-5873-2402	12 Oct-21 12:24	13 Oct-21 11:30	25h (3.9 °C)		
FR_FR4	16-7272-1140	12 Oct-21 11:05	13 Oct-21 11:30	26h (0 °C)		
FR_FR2	09-1936-7906	12 Oct-21 10:25	13 Oct-21 11:30	27h (0 °C)		
FR_MULTIPLATE	07-2028-3040	12 Oct-21 09:45	13 Oct-21 11:30	27h (0 °C)		
FR_FRRD	04-7874-3326	12 Oct-21 11:45	13 Oct-21 11:30	25h (0 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_UFR1	Water Sample	Teck Coal	FR_UFR1_WEK_2021-09-1	
GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-10-12_	
CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-10-12	
LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-10-19_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_WEK_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_WEK_2021-09	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-10-12_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-10-12	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-10-12	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2021_Q4_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2021_Q4_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-10-19	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-10-19_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-10-19_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	
RG_MIDAG	Water Sample	Teck Coal	RG_MIDAG_WS_2021-10-	
FR_FR4	Water Sample	Teck Coal	FR_FR4_WS_2021-10-12_	
FR_FR2	Water Sample	Teck Coal	FR_FR2_WS_2021-10-12_	
FR_MULTIPLATE	Water Sample	Teck Coal	FR_MULTIPLATE_WS_202	
FR_FRRD	Water Sample	Teck Coal	FR_FRRD_WS_2021-10-12	

Ceriodaphnia 7-d Survival and Reproduction Test — **Nautilus Environmental**

Analysis ID: 15-9743-6655 **Endpoint:** Reproduction **CETIS Version:** CETISv1.9.4
Analyzed: 06 Dec-21 16:22 **Analysis:** Parametric-Two Sample **Status Level:** 2

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	FR_UFR1 passed reproduction	18.82%
		CM_MC1 passed reproduction	18.82%
		LC_SLC passed reproduction	18.82%
		FR_FRABCH passed reproduction	18.82%
		FR_FRCP1 failed reproduction	18.82%
		GH_FR1 passed reproduction	18.82%
		GH_ERC passed reproduction	18.82%
		CM_MC2 failed reproduction	18.82%
		EV_MC2 passed reproduction	18.82%
		EV_HC1 failed reproduction	18.82%
		LC_DCDS failed reproduction	18.82%
		LC_LC3 failed reproduction	18.82%
		LC_LC5 passed reproduction	18.82%
		LC_LCDSSLCC passed reproduction	18.82%
		RG_MIDAG failed reproduction	18.82%
		FR_FR4 failed reproduction	18.82%
		FR_FR2 failed reproduction	18.82%
		FR_MULTIPLATE failed reproduction	18.82%
		FR_FRRD failed reproduction	18.82%

Unequal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Site Control		FR_UFR1	0.1238	1.74	4.216	17	CDF	0.4515	Non-Significant Effect
(GH-ER2)		CM_MC1	0.4136	1.753	5.934	15	CDF	0.3425	Non-Significant Effect
		LC_SLC	0.4188	1.74	4.154	17	CDF	0.3403	Non-Significant Effect
		FR_FRABCH	1.3	1.74	4.283	17	CDF	0.1055	Non-Significant Effect
		FR_FRCP1*	3.2	1.746	4.037	16	CDF	0.0028	Significant Effect
		GH_FR1	0.7482	1.746	5.367	16	CDF	0.2326	Non-Significant Effect
		GH_ERC	-0.761	1.796	3.54	11	CDF	0.7687	Non-Significant Effect
		CM_MC2*	2.854	1.746	5.321	16	CDF	0.0057	Significant Effect
		EV_MC2	-1.024	1.812	3.539	10	CDF	0.8351	Non-Significant Effect
		EV_HC1*	2.05	1.753	3.848	15	CDF	0.0291	Significant Effect
		LC_DCDS*	4.552	1.761	3.831	14	CDF	2.3E-04	Significant Effect
		LC_LC3*	2.165	1.74	4.821	17	CDF	0.0224	Significant Effect
		LC_LC5	0.444	1.74	4.31	17	CDF	0.3313	Non-Significant Effect
		LC_LCDSSLCC	0.7953	1.74	4.156	17	CDF	0.2187	Non-Significant Effect
		RG_MIDAG*	1.823	1.74	4.581	17	CDF	0.0430	Significant Effect
		FR_FR4*	4.081	1.746	4.107	16	CDF	4.4E-04	Significant Effect
		FR_FR2*	2.05	1.74	5.092	17	CDF	0.0281	Significant Effect
		FR_MULTIPLATE*	3.312	1.74	4.307	17	CDF	0.0021	Significant Effect
		FR_FRRD*	2.39	1.74	4.367	17	CDF	0.0143	Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	3.204	3.606	0.2365	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	2583.28	135.962	19	4.421	<1.0E-37	Significant Effect
Error	5535.2	30.7511	180			
Total	8118.48		199			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance Test	39.6	36.19	0.0037	Unequal Variances

Ceriodaphnia 7-d Survival and Reproduction Test **Nautilus Environmental**

Analysis ID: 15-9743-6655 **Endpoint:** Reproduction **CETIS Version:** CETISv1.9.4
Analyzed: 06 Dec-21 16:22 **Analysis:** Parametric-Two Sample **Status Level:** 2

Distribution					
	Shapiro-Wilk W Normality Test	0.9716	0.9816	4.5E-04	Non-Normal Distribution

Reproduction Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
FR_UFR1		10	22.9	19.37	26.43	24.5	14	28	1.56	21.54%	0.00%
GH_ER2	XC	10	23.2	19	27.4	25	11	30	1.855	25.28%	-1.31%
CM_MC1		10	21.8	15.39	28.21	26	8	29	2.832	41.07%	4.80%
LC_SLC		10	22.2	18.8	25.6	22	13	29	1.504	21.42%	3.06%
FR_FRABCH		10	20	16.34	23.66	21	11	28	1.619	25.60%	12.66%
FR_FRCP1		10	15.8	12.68	18.92	17	10	21	1.381	27.64%	31.00%
GH_FR1		10	20.9	15.35	26.45	24	4	27	2.452	37.09%	8.73%
GH_ERC		10	24.7	23.19	26.21	25	22	29	0.6675	8.55%	-7.86%
CM_MC2		10	14.5	9.029	19.97	14.5	0	27	2.419	52.75%	36.68%
EV_MC2		10	25.2	23.82	26.58	25.5	22	28	0.611	7.67%	-10.04%
EV_HC1		10	18.7	16.04	21.36	19.5	13	23	1.174	19.86%	18.34%
LC_DCDS		10	13.3	10.73	15.87	12.5	8	19	1.136	27.00%	41.92%
LC_LC3		10	17.2	12.54	21.86	17	6	27	2.059	37.86%	24.89%
LC_LC5		10	22.1	18.38	25.82	23.5	9	28	1.643	23.51%	3.49%
LC_LCDSSLCC		10	21.3	17.89	24.71	20.5	14	28	1.506	22.36%	6.99%
RG_MIDAG		10	18.4	14.17	22.63	19	11	28	1.869	32.12%	19.65%
FR_FR4		10	13.6	10.33	16.87	12.5	8	22	1.447	33.64%	40.61%
FR_FR2		10	17.2	12.08	22.32	18.5	2	26	2.265	41.64%	24.89%
FR_MULTIPLATE		10	15	11.29	18.71	15.5	6	22	1.64	34.57%	34.50%
FR_FRRD		10	17.2	13.37	21.03	16	9	25	1.692	31.10%	24.89%

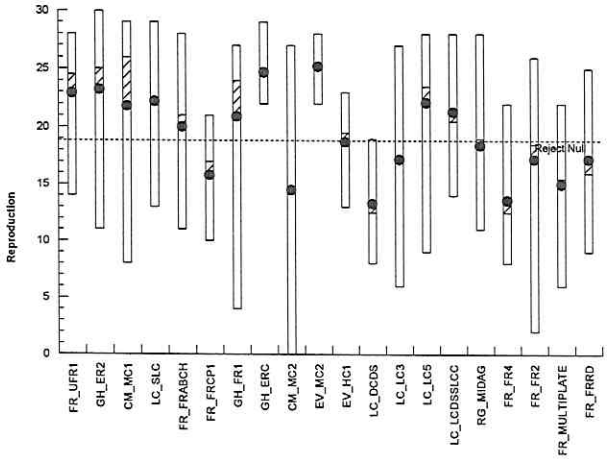
Reproduction Detail

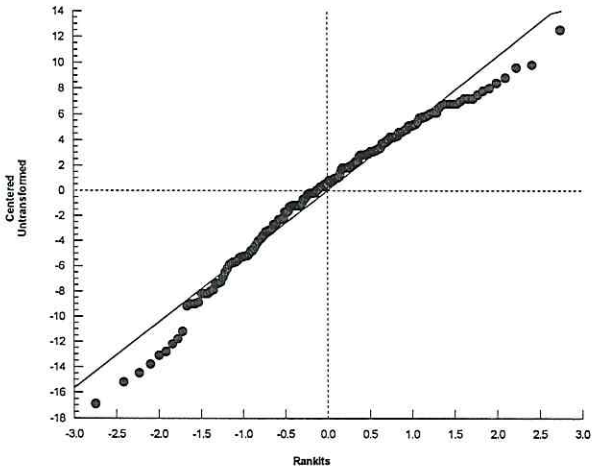
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
FR_UFR1		14	26	28	25	26	16	23	28	19	24
GH_ER2	XC	24	11	25	26	28	25	22	15	30	26
CM_MC1		29	29	27	29	26	9	8	25	26	10
LC_SLC		29	27	22	16	22	22	13	24	25	22
FR_FRABCH		19	11	22	20	24	28	12	21	22	21
FR_FRCP1		12	20	11	19	21	20	10	11	16	18
GH_FR1		26	15	4	27	27	13	24	22	24	27
GH_ERC		23	23	27	23	22	25	25	25	29	25
CM_MC2		21	0	15	22	8	12	15	11	27	14
EV_MC2		27	26	27	23	24	25	24	28	26	22
EV_HC1		16	13	22	18	13	21	23	18	22	21
LC_DCDS		19	11	12	8	15	16	18	10	11	13
LC_LC3		24	15	19	20	6	14	23	12	12	27
LC_LC5		19	21	9	24	23	24	28	25	25	23
LC_LCDSSLCC		14	19	28	21	27	16	25	25	18	20
RG_MIDAG		14	23	19	23	11	19	13	23	28	11
FR_FR4		22	12	8	19	13	17	15	9	11	10
FR_FR2		20	24	17	16	9	26	2	21	21	16
FR_MULTIPLATE		22	19	10	21	15	16	11	18	6	12
FR_FRRD		16	13	16	12	9	16	18	25	24	23

Ceriodaphnia 7-d Survival and Reproduction Test **Nautilus Environmental**

Analysis ID:	15-9743-6655	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.9.4
Analyzed:	06 Dec-21 16:22	**Analysis:**	Parametric-Two Sample	**Status Level:**	2

Graphics





Analyst: SM QA: Dec-7/21

Ceriodaphnia 7-d Survival and Reproduction Test — **Nautilus Environmental**

Analysis ID:	00-3968-3955	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.9.4
Analyzed:	06 Dec-21 15:57	**Analysis:**	Parametric-Two Sample	**Status Level:**	2
Batch ID:	02-8546-0621	**Test Type:**	Reproduction-Survival (7d)	**Analyst:**	Sierra Klueppel
Start Date:	13 Oct-21 13:00	**Protocol:**	EC/EPS 1/RM/21	**Diluent:**	20% Perrier Water
Ending Date:	21 Oct-21 10:30	**Species:**	Ceriodaphnia dubia	**Brine:**	
Test Length:	7d 22h	**Taxon:**	Branchiopoda	**Source:**	In-House Culture **Age:** <24

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
FR_UFR1	19-8746-8946	12 Oct-21 11:07	13 Oct-21 11:53	26h (0 °C)	Teck Coal	
GH_ER2	20-2628-4137	12 Oct-21 10:50	13 Oct-21 11:30	26h (0 °C)		
CM_MC1	18-3559-2852	12 Oct-21 13:20	13 Oct-21 11:30	24h (0.1 °C)		
LC_SLC	08-7937-3726	12 Oct-21 11:00	13 Oct-21 11:30	26h (2.9 °C)		
FR_FRABCH	18-7592-7020	12 Oct-21 11:20	13 Oct-21 11:53	26h (0 °C)		
FR_FRCP1	10-3969-8000	12 Oct-21 11:48	13 Oct-21 11:53	25h (1.3 °C)		
GH_FR1	11-8224-4576	12 Oct-21 10:00	13 Oct-21 11:30	27h (0 °C)		
GH_ERC	00-1276-7572	12 Oct-21 11:50	13 Oct-21 11:30	25h (0 °C)		
CM_MC2	03-9569-8600	12 Oct-21 12:47	13 Oct-21 11:30	24h (1.3 °C)		
EV_MC2	13-1923-7722	12 Oct-21 11:38	13 Oct-21 11:30	25h (0.2 °C)		
EV_HC1	18-6648-8827	12 Oct-21 10:33	13 Oct-21 11:30	26h (0 °C)		
LC_DCDS	17-4710-4100	12 Oct-21	13 Oct-21 11:30	37h (1.7 °C)		
LC_LC3	20-0894-5906	12 Oct-21 12:00	13 Oct-21 11:30	25h (8.8 °C)		
LC_LC5	14-5637-1032	12 Oct-21 13:30	13 Oct-21 11:30	23h (2.6 °C)		
LC_LCDSSLCC	06-4184-4349	12 Oct-21 12:30	13 Oct-21 11:30	24h (4.7 °C)		
RG_MIDAG	02-5873-2402	12 Oct-21 12:24	13 Oct-21 11:30	25h (3.9 °C)		
FR_FR4	16-7272-1140	12 Oct-21 11:05	13 Oct-21 11:30	26h (0 °C)		
FR_FR2	09-1936-7906	12 Oct-21 10:25	13 Oct-21 11:30	27h (0 °C)		
FR_MULTIPLATE	07-2028-3040	12 Oct-21 09:45	13 Oct-21 11:30	27h (0 °C)		
FR_FRRD	04-7874-3326	12 Oct-21 11:45	13 Oct-21 11:30	25h (0 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_UFR1	Water Sample	Teck Coal	FR_UFR1_WEK_2021-09-1	
GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-10-12_	
CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-10-12	
LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-10-19_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_WEK_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_WEK_2021-09	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-10-12_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-10-12	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-10-12	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2021_Q4_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2021_Q4_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-10-19	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-10-19_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-10-19_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	
RG_MIDAG	Water Sample	Teck Coal	RG_MIDAG_WS_2021-10-	
FR_FR4	Water Sample	Teck Coal	FR_FR4_WS_2021-10-12_	
FR_FR2	Water Sample	Teck Coal	FR_FR2_WS_2021-10-12_	
FR_MULTIPLATE	Water Sample	Teck Coal	FR_MULTIPLATE_WS_202	
FR_FRRD	Water Sample	Teck Coal	FR_FRRD_WS_2021-10-12	

Ceriodaphnia 7-d Survival and Reproduction Test — **Nautilus Environmental**

Analysis ID: 00-3968-3955 **Endpoint:** Reproduction **CETIS Version:** CETISv1.9.4
Analyzed: 06 Dec-21 15:57 **Analysis:** Parametric-Two Sample **Status Level:** 2

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	FR_UFR1 passed reproduction	26.65%
		GH_ER2 passed reproduction	26.65%
		LC_SLC passed reproduction	26.65%
		FR_FRABCH passed reproduction	26.65%
		FR_FRCP1 failed reproduction	26.65%
		GH_FR1 passed reproduction	26.65%
		GH_ERC passed reproduction	26.65%
		CM_MC2 failed reproduction	26.65%
		EV_MC2 passed reproduction	26.65%
		EV_HC1 passed reproduction	26.65%
		LC_DCDS failed reproduction	26.65%
		LC_LC3 passed reproduction	26.65%
		LC_LC5 passed reproduction	26.65%
		LC_LCDSSLCC passed reproduction	26.65%
		RG_MIDAG passed reproduction	26.65%
		FR_FR4 failed reproduction	26.65%
		FR_FR2 passed reproduction	26.65%
		FR_MULTIPLATE failed reproduction	26.65%
		FR_FRRD passed reproduction	26.65%

Unequal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Site Control		FR_UFR1	-0.3403	1.761	5.694	14	CDF	0.6307	Non-Significant Effect
(CM-MC1)		GH_ER2	-0.4136	1.753	5.934	15	CDF	0.6575	Non-Significant Effect
		LC_SLC	-0.1248	1.771	5.678	13	CDF	0.5487	Non-Significant Effect
		FR_FRABCH	0.5518	1.761	5.745	14	CDF	0.2949	Non-Significant Effect
		FR_FRCP1*	1.905	1.771	5.579	13	CDF	0.0396	Significant Effect
		GH_FR1	0.2403	1.74	6.515	17	CDF	0.4065	Non-Significant Effect
		GH_ERC	-0.9968	1.833	5.333	9	CDF	0.8276	Non-Significant Effect
		CM_MC2*	1.96	1.74	6.478	17	CDF	0.0333	Significant Effect
		EV_MC2	-1.174	1.833	5.31	9	CDF	0.8647	Non-Significant Effect
		EV_HC1	1.011	1.782	5.463	12	CDF	0.1659	Non-Significant Effect
		LC_DCDS*	2.786	1.796	5.479	11	CDF	0.0089	Significant Effect
		LC_LC3	1.314	1.746	6.113	16	CDF	0.1037	Non-Significant Effect
		LC_LC5	-0.09164	1.761	5.766	14	CDF	0.5359	Non-Significant Effect
		LC_LCDSSLCC	0.1559	1.771	5.68	13	CDF	0.4393	Non-Significant Effect
		RG_MIDAG	1.002	1.753	5.948	15	CDF	0.1661	Non-Significant Effect
		FR_FR4*	2.579	1.771	5.631	13	CDF	0.0115	Significant Effect
		FR_FR2	1.269	1.74	6.308	17	CDF	0.1108	Non-Significant Effect
		FR_MULTIPLATE*	2.078	1.761	5.763	14	CDF	0.0283	Significant Effect
		FR_FRRD	1.395	1.761	5.81	14	CDF	0.0924	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	3.204	3.606	0.2365	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	2583.28	135.962	19	4.421	<1.0E-37	Significant Effect
Error	5535.2	30.7511	180			
Total	8118.48		199			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance Test	39.6	36.19	0.0037	Unequal Variances

Ceriodaphnia 7-d Survival and Reproduction Test **Nautilus Environmental**

Analysis ID: 00-3968-3955 **Endpoint:** Reproduction **CETIS Version:** CETISv1.9.4
Analyzed: 06 Dec-21 15:57 **Analysis:** Parametric-Two Sample **Status Level:** 2

Distribution					
	Shapiro-Wilk W Normality Test	0.9716	0.9816	4.5E-04	Non-Normal Distribution

Reproduction Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
FR_UFR1		10	22.9	19.37	26.43	24.5	14	28	1.56	21.54%	0.00%
GH_ER2		10	23.2	19	27.4	25	11	30	1.855	25.28%	-1.31%
CM_MC1	XC	10	21.8	15.39	28.21	26	8	29	2.832	41.07%	4.80%
LC_SLC		10	22.2	18.8	25.6	22	13	29	1.504	21.42%	3.06%
FR_FRABCH		10	20	16.34	23.66	21	11	28	1.619	25.60%	12.66%
FR_FRCP1		10	15.8	12.68	18.92	17	10	21	1.381	27.64%	31.00%
GH_FR1		10	20.9	15.35	26.45	24	4	27	2.452	37.09%	8.73%
GH_ERC		10	24.7	23.19	26.21	25	22	29	0.6675	8.55%	-7.86%
CM_MC2		10	14.5	9.029	19.97	14.5	0	27	2.419	52.75%	36.68%
EV_MC2		10	25.2	23.82	26.58	25.5	22	28	0.611	7.67%	-10.04%
EV_HC1		10	18.7	16.04	21.36	19.5	13	23	1.174	19.86%	18.34%
LC_DCDS		10	13.3	10.73	15.87	12.5	8	19	1.136	27.00%	41.92%
LC_LC3		10	17.2	12.54	21.86	17	6	27	2.059	37.86%	24.89%
LC_LC5		10	22.1	18.38	25.82	23.5	9	28	1.643	23.51%	3.49%
LC_LCDSSLCC		10	21.3	17.89	24.71	20.5	14	28	1.506	22.36%	6.99%
RG_MIDAG		10	18.4	14.17	22.63	19	11	28	1.869	32.12%	19.65%
FR_FR4		10	13.6	10.33	16.87	12.5	8	22	1.447	33.64%	40.61%
FR_FR2		10	17.2	12.08	22.32	18.5	2	26	2.265	41.64%	24.89%
FR_MULTIPLATE		10	15	11.29	18.71	15.5	6	22	1.64	34.57%	34.50%
FR_FRRD		10	17.2	13.37	21.03	16	9	25	1.692	31.10%	24.89%

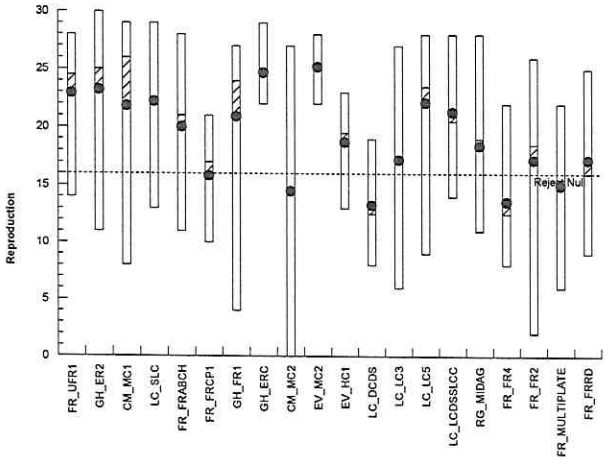
Reproduction Detail

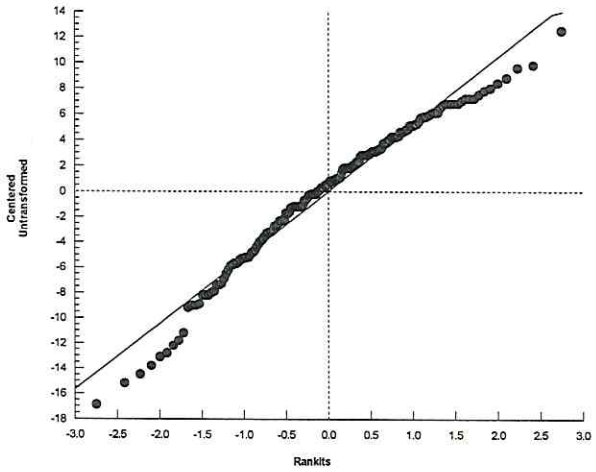
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
FR_UFR1		14	26	28	25	26	16	23	28	19	24
GH_ER2		24	11	25	26	28	25	22	15	30	26
CM_MC1	XC	29	29	27	29	26	9	8	25	26	10
LC_SLC		29	27	22	16	22	22	13	24	25	22
FR_FRABCH		19	11	22	20	24	28	12	21	22	21
FR_FRCP1		12	20	11	19	21	20	10	11	16	18
GH_FR1		26	15	4	27	27	13	24	22	24	27
GH_ERC		23	23	27	23	22	25	25	25	29	25
CM_MC2		21	0	15	22	8	12	15	11	27	14
EV_MC2		27	26	27	23	24	25	24	28	26	22
EV_HC1		16	13	22	18	13	21	23	18	22	21
LC_DCDS		19	11	12	8	15	16	18	10	11	13
LC_LC3		24	15	19	20	6	14	23	12	12	27
LC_LC5		19	21	9	24	23	24	28	25	25	23
LC_LCDSSLCC		14	19	28	21	27	16	25	25	18	20
RG_MIDAG		14	23	19	23	11	19	13	23	28	11
FR_FR4		22	12	8	19	13	17	15	9	11	10
FR_FR2		20	24	17	16	9	26	2	21	21	16
FR_MULTIPLATE		22	19	10	21	15	16	11	18	6	12
FR_FRRD		16	13	16	12	9	16	18	25	24	23

Ceriodaphnia 7-d Survival and Reproduction Test — **Nautilus Environmental**

Analysis ID:	00-3968-3955	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.9.4
Analyzed:	06 Dec-21 15:57	**Analysis:**	Parametric-Two Sample	**Status Level:**	2

Graphics





Ceriodaphnia 7-d Survival and Reproduction Test

Nautilus Environmental

Analysis ID:	11-3341-9193	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.9.4
Analyzed:	06 Dec-21 15:59	**Analysis:**	Parametric-Two Sample	**Status Level:**	2
Batch ID:	02-8546-0621	**Test Type:**	Reproduction-Survival (7d)	**Analyst:**	Sierra Klueppel
Start Date:	13 Oct-21 13:00	**Protocol:**	EC/EPS 1/RM/21	**Diluent:**	20% Perrier Water
Ending Date:	21 Oct-21 10:30	**Species:**	Ceriodaphnia dubia	**Brine:**	
Test Length:	7d 22h	**Taxon:**	Branchiopoda	**Source:**	In-House Culture **Age:** <24

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
FR_UFR1	19-8746-8946	12 Oct-21 11:07	13 Oct-21 11:53	26h (0 °C)	Teck Coal	
GH_ER2	20-2628-4137	12 Oct-21 10:50	13 Oct-21 11:30	26h (0 °C)		
CM_MC1	18-3559-2852	12 Oct-21 13:20	13 Oct-21 11:30	24h (0.1 °C)		
LC_SLC	08-7937-3726	12 Oct-21 11:00	13 Oct-21 11:30	26h (2.9 °C)		
FR_FRABCH	18-7592-7020	12 Oct-21 11:20	13 Oct-21 11:53	26h (0 °C)		
FR_FRCP1	10-3969-8000	12 Oct-21 11:48	13 Oct-21 11:53	25h (1.3 °C)		
GH_FR1	11-8224-4576	12 Oct-21 10:00	13 Oct-21 11:30	27h (0 °C)		
GH_ERC	00-1276-7572	12 Oct-21 11:50	13 Oct-21 11:30	25h (0 °C)		
CM_MC2	03-9569-8600	12 Oct-21 12:47	13 Oct-21 11:30	24h (1.3 °C)		
EV_MC2	13-1923-7722	12 Oct-21 11:38	13 Oct-21 11:30	25h (0.2 °C)		
EV_HC1	18-6648-8827	12 Oct-21 10:33	13 Oct-21 11:30	26h (0 °C)		
LC_DCDS	17-4710-4100	12 Oct-21	13 Oct-21 11:30	37h (1.7 °C)		
LC_LC3	20-0894-5906	12 Oct-21 12:00	13 Oct-21 11:30	25h (8.8 °C)		
LC_LC5	14-5637-1032	12 Oct-21 13:30	13 Oct-21 11:30	23h (2.6 °C)		
LC_LCDSSLCC	06-4184-4349	12 Oct-21 12:30	13 Oct-21 11:30	24h (4.7 °C)		
RG_MIDAG	02-5873-2402	12 Oct-21 12:24	13 Oct-21 11:30	25h (3.9 °C)		
FR_FR4	16-7272-1140	12 Oct-21 11:05	13 Oct-21 11:30	26h (0 °C)		
FR_FR2	09-1936-7906	12 Oct-21 10:25	13 Oct-21 11:30	27h (0 °C)		
FR_MULTIPLATE	07-2028-3040	12 Oct-21 09:45	13 Oct-21 11:30	27h (0 °C)		
FR_FRRD	04-7874-3326	12 Oct-21 11:45	13 Oct-21 11:30	25h (0 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_UFR1	Water Sample	Teck Coal	FR_UFR1_WEK_2021-09-1	
GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-10-12_	
CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-10-12	
LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-10-19_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_WEK_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_WEK_2021-09	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-10-12_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-10-12	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-10-12	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2021_Q4_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2021_Q4_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-10-19	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-10-19_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-10-19_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	
RG_MIDAG	Water Sample	Teck Coal	RG_MIDAG_WS_2021-10-	
FR_FR4	Water Sample	Teck Coal	FR_FR4_WS_2021-10-12_	
FR_FR2	Water Sample	Teck Coal	FR_FR2_WS_2021-10-12_	
FR_MULTIPLATE	Water Sample	Teck Coal	FR_MULTIPLATE_WS_202	
FR_FRRD	Water Sample	Teck Coal	FR_FRRD_WS_2021-10-12	

Ceriodaphnia 7-d Survival and Reproduction Test — **Nautilus Environmental**

Analysis ID: 11-3341-9193 **Endpoint:** Reproduction **CETIS Version:** CETISv1.9.4
Analyzed: 06 Dec-21 15:59 **Analysis:** Parametric-Two Sample **Status Level:** 2

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	FR_UFR1 passed reproduction	17.74%
		GH_ER2 passed reproduction	17.74%
		CM_MC1 passed reproduction	17.74%
		FR_FRABCH passed reproduction	17.74%
		FR_FRCP1 failed reproduction	17.74%
		GH_FR1 passed reproduction	17.74%
		GH_ERC passed reproduction	17.74%
		CM_MC2 failed reproduction	17.74%
		EV_MC2 passed reproduction	17.74%
		EV_HC1 failed reproduction	17.74%
		LC_DCDS failed reproduction	17.74%
		LC_LC3 failed reproduction	17.74%
		LC_LC5 passed reproduction	17.74%
		LC_LCDSSLCC passed reproduction	17.74%
		RG_MIDAG passed reproduction	17.74%
		FR_FR4 failed reproduction	17.74%
		FR_FR2 failed reproduction	17.74%
		FR_MULTIPLATE failed reproduction	17.74%
		FR_FRRD failed reproduction	17.74%

Unequal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Site Control (LC-SLC)		FR_UFR1	-0.3231	1.74	3.769	17	CDF	0.6247	Non-Significant Effect
		GH_ER2	-0.4188	1.74	4.154	17	CDF	0.6597	Non-Significant Effect
		CM_MC1	0.1248	1.771	5.678	13	CDF	0.4513	Non-Significant Effect
		FR_FRABCH	0.9954	1.74	3.845	17	CDF	0.1667	Non-Significant Effect
		FR_FRCP1*	3.135	1.74	3.552	17	CDF	0.0030	Significant Effect
		GH_FR1	0.452	1.761	5.066	14	CDF	0.3291	Non-Significant Effect
		GH_ERC	-1.519	1.782	2.933	12	CDF	0.9227	Non-Significant Effect
		CM_MC2*	2.703	1.753	4.993	15	CDF	0.0082	Significant Effect
		EV_MC2	-1.848	1.796	2.916	11	CDF	0.9542	Non-Significant Effect
		EV_HC1*	1.834	1.746	3.331	16	CDF	0.0426	Significant Effect
		LC_DCDS*	4.722	1.746	3.291	16	CDF	1.2E-04	Significant Effect
		LC_LC3*	1.961	1.746	4.452	16	CDF	0.0338	Significant Effect
		LC_LC5	0.0449	1.74	3.875	17	CDF	0.4824	Non-Significant Effect
		LC_LCDSSLCC	0.4229	1.74	3.703	17	CDF	0.3389	Non-Significant Effect
		RG_MIDAG	1.584	1.74	4.173	17	CDF	0.0658	Non-Significant Effect
		FR_FR4*	4.121	1.74	3.631	17	CDF	3.6E-04	Significant Effect
		FR_FR2*	1.839	1.753	4.766	15	CDF	0.0429	Significant Effect
		FR_MULTIPLATE*	3.236	1.74	3.871	17	CDF	0.0024	Significant Effect
		FR_FRRD*	2.209	1.74	3.938	17	CDF	0.0206	Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	3.204	3.606	0.2365	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	2583.28	135.962	19	4.421	<1.0E-37	Significant Effect
Error	5535.2	30.7511	180			
Total	8118.48		199			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance Test	39.6	36.19	0.0037	Unequal Variances

Ceriodaphnia 7-d Survival and Reproduction Test — **Nautilus Environmental**

Analysis ID: 11-3341-9193 **Endpoint:** Reproduction **CETIS Version:** CETISv1.9.4
Analyzed: 06 Dec-21 15:59 **Analysis:** Parametric-Two Sample **Status Level:** 2

Distribution					
Shapiro-Wilk W Normality Test	0.9716	0.9816	4.5E-04	Non-Normal Distribution	

Reproduction Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
FR_UFR1		10	22.9	19.37	26.43	24.5	14	28	1.56	21.54%	0.00%
GH_ER2		10	23.2	19	27.4	25	11	30	1.855	25.28%	-1.31%
CM_MC1		10	21.8	15.39	28.21	26	8	29	2.832	41.07%	4.80%
LC_SLC	XC	10	22.2	18.8	25.6	22	13	29	1.504	21.42%	3.06%
FR_FRABCH		10	20	16.34	23.66	21	11	28	1.619	25.60%	12.66%
FR_FRCP1		10	15.8	12.68	18.92	17	10	21	1.381	27.64%	31.00%
GH_FR1		10	20.9	15.35	26.45	24	4	27	2.452	37.09%	8.73%
GH_ERC		10	24.7	23.19	26.21	25	22	29	0.6675	8.55%	-7.86%
CM_MC2		10	14.5	9.029	19.97	14.5	0	27	2.419	52.75%	36.68%
EV_MC2		10	25.2	23.82	26.58	25.5	22	28	0.611	7.67%	-10.04%
EV_HC1		10	18.7	16.04	21.36	19.5	13	23	1.174	19.86%	18.34%
LC_DCDS		10	13.3	10.73	15.87	12.5	8	19	1.136	27.00%	41.92%
LC_LC3		10	17.2	12.54	21.86	17	6	27	2.059	37.86%	24.89%
LC_LC5		10	22.1	18.38	25.82	23.5	9	28	1.643	23.51%	3.49%
LC_LCDSSLCC		10	21.3	17.89	24.71	20.5	14	28	1.506	22.36%	6.99%
RG_MIDAG		10	18.4	14.17	22.63	19	11	28	1.869	32.12%	19.65%
FR_FR4		10	13.6	10.33	16.87	12.5	8	22	1.447	33.64%	40.61%
FR_FR2		10	17.2	12.08	22.32	18.5	2	26	2.265	41.64%	24.89%
FR_MULTIPLATE		10	15	11.29	18.71	15.5	6	22	1.64	34.57%	34.50%
FR_FRRD		10	17.2	13.37	21.03	16	9	25	1.692	31.10%	24.89%

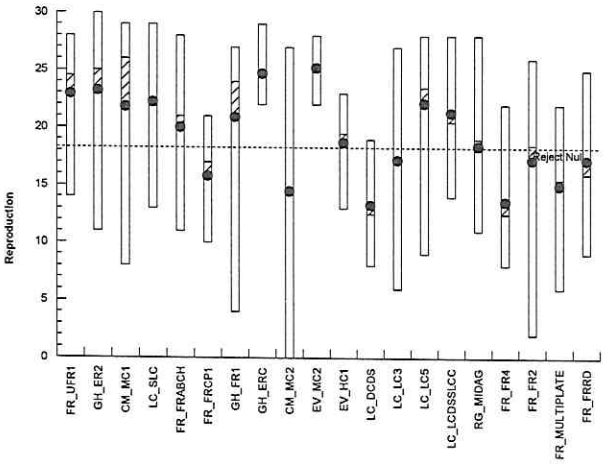
Reproduction Detail

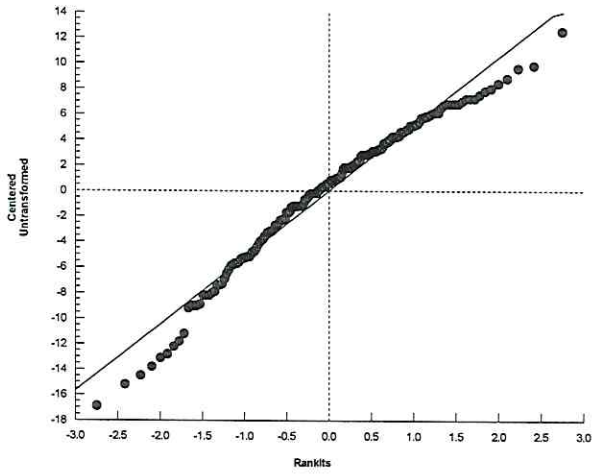
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
FR_UFR1		14	26	28	25	26	16	23	28	19	24
GH_ER2		24	11	25	26	28	25	22	15	30	26
CM_MC1		29	29	27	29	26	9	8	25	26	10
LC_SLC	XC	29	27	22	16	22	22	13	24	25	22
FR_FRABCH		19	11	22	20	24	28	12	21	22	21
FR_FRCP1		12	20	11	19	21	20	10	11	16	18
GH_FR1		26	15	4	27	27	13	24	22	24	27
GH_ERC		23	23	27	23	22	25	25	25	29	25
CM_MC2		21	0	15	22	8	12	15	11	27	14
EV_MC2		27	26	27	23	24	25	24	28	26	22
EV_HC1		16	13	22	18	13	21	23	18	22	21
LC_DCDS		19	11	12	8	15	16	18	10	11	13
LC_LC3		24	15	19	20	6	14	23	12	12	27
LC_LC5		19	21	9	24	23	24	28	25	25	23
LC_LCDSSLCC		14	19	28	21	27	16	25	25	18	20
RG_MIDAG		14	23	19	23	11	19	13	23	28	11
FR_FR4		22	12	8	19	13	17	15	9	11	10
FR_FR2		20	24	17	16	9	26	2	21	21	16
FR_MULTIPLATE		22	19	10	21	15	16	11	18	6	12
FR_FRRD		16	13	16	12	9	16	18	25	24	23

Analyst: SMM QA: Dec 7/21

Analysis ID:	11-3341-9193	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.9.4
Analyzed:	06 Dec-21 15:59	**Analysis:**	Parametric-Two Sample	**Status Level:**	2

Graphics





Analyst: SAV QA: Dec-7/21

APPENDIX B – *Pseudokirchneriella subcapitata* Toxicity Test Data

Pseudokirchneriella subcapitata Summary Sheet

Client: TECK
Work Order No.: 212107

Start Date: Oct. 14/21
Set up by: SAK

Sample Information:

Sample ID: Various-see below
Sample Date: Oct. 12/21
Date Received: Oct. 13/21
Sample Volume: Various

Test Organism Information:

Culture Date: Oct. 8/21
Age of culture (Day 0): 6d

Zinc Reference Toxicant Results:

Reference Toxicant ID: SC221
Stock Solution ID: 21Zn01
Date Initiated: Oct. 28/21

72-h IC50 (95% CL): 35.2 (27.9 - 41.5) µg/L Zn

72-h IC50 Reference Toxicant Mean and Range: 31.9 (26.6 - 38.3) µg/L Zn CV (%): 9

Test Results:

All samples are significantly greater than the lab control.

Results that are significantly lower than:
a = FR-UFR1
b = GH-ER2
c = CM-MC1
d = LC-SLC

	Cell Yield (Mean± SD)
Negative Control	18.8 ± 0.7
FR-UFR1	86.8 ± 5.0
GH-ER2	88.5 ± 4.6
CM-MC1	84.1 ± 5.6
LC-SLC	86.0 ± 5.8
FR-FRABCH	73.2 ± 3.0 a,b,c,d
FR-FRCP1	73.0 ± 7.0
GH-FR1	71.2 ± 5.9 a,b,c,d
GH-ERC	65.2 ± 7.8 a,b,c,d

Reviewed by: [signature]

Date reviewed: Dec. 3, 2021

Pseudokirchneriella subcapitata Summary Sheet

Client: TECK
Work Order No.: 212107

Start Date: Oct. 14/21
Set up by: SAK

Sample Information:

Sample ID: Various-see below
Sample Date: Oct. 12/21
Date Received: Oct. 13/21
Sample Volume: Various

Test Organism Information:

Culture Date: Oct. 8/21
Age of culture (Day 0): 6d

Zinc Reference Toxicant Results:

Reference Toxicant ID: SC221
Stock Solution ID: 21Zn01
Date Initiated: Oct. 28/21

72-h IC50 (95% CL): 35.2 (27.9 – 41.5) µg/L Zn

72-h IC50 Reference Toxicant Mean and Range: 31.9 (26.6 – 38.3) µg/L Zn CV (%): 9

Test Results:

All samples are significantly greater than the lab control.
Results that are significantly lower than:
a = FR-UFR1
b = GH-EP2
c = CM-MC1
d = LC-SLC

	Cell Yield (Mean± SD)
Negative Control	18.8 ± 0.7
CM-MC2	59.0 ± 9.2 a,b,c,d
~~EV-HCl~~ EV-MC2	65.2 ± 8.5 a,b,c,d
~~LC-DCDS~~ EV-HCl	68.5 ± 5.1 a,b,c,d
~~LC-LC3~~ LC-DCDS	74.5 ± 4.9 a,b
~~LC-LC5~~ LC-LC3	75.0 ± 3.4 a,b
~~LC-LCDSSLCC~~ LC-LC5	68.8 ± 5.9 a,b,c,d
LC-LCDSSLCC	61.5 ± 7.6 a,b,c,d
	±

Reviewed by: [signature]

Date reviewed: Dec 3, 2021

72-h Algal Growth Inhibition Toxicity Test
Water Quality Measurements

Client: TEML | Setup by: SAH

Sample ID: Various | Test Date/Time: Oct.14/21@1700h

Work Order No.: 212107 | CER #: 4

Test Species: *Pseudokirchneriella subcapitata*

Culture Date: 100821 | Age of Culture: 6d | Culture Health: Good

Culture Count: 1 265 2 250 | Average: 257.5 | Culture Cell Density (c1): 257.5 $\times 10^4$ cells/mL

v1 = 220,000 cells/ml x 60 ml / (c1) ~~25~~ 257.5$\times 10^4$ cells/ml = 5.1 mL

Time Zero Counts: 1 21 2 21 | Average: 21

No. of Cells/mL: 21 $\times 10^4$ cells/mL | Initial Density: # cells/mL ÷ 220 µL x 10 µL = 9545 cells/mL

Concentration %(v/v)	Water Quality		Incubator Temperature (°C)				Microplates rotated 2X per day?			
	pH	Temp (°C)								
	0 h	0 h	0 h	24 h	48 h	72 h	0 h	24 h	48 h	72 h
Control	6.9	23.0	24.0	24.0	25.0	25.0	✓	✓	✓	✓
FR_UFR1	8.3	22.0	↓	↓	↓	↓	↓	↓	↓	↓
GH_ER2	8.2	↓	↓	↓	↓	↓	↓	↓	↓	↓
CM_MC1	8.1	↓	↓	↓	↓	↓	↓	↓	↓	↓
LC_SLC	8.2	↓	↓	↓	↓	↓	↓	↓	↓	↓
FR_FRABCH	8.2	↓	↓	↓	↓	↓	↓	↓	↓	↓
FR_FRCP1	8.4	↓	↓	↓	↓	↓	↓	↓	↓	↓
GH_FR1	8.4	↓	↓	↓	↓	↓	↓	↓	↓	↓
GH_ERL	8.3	↓	↓	↓	↓	↓	↓	↓	↓	↓
CM_MC2	8.4	↓	↓	↓	↓	↓	↓	↓	↓	↓
Initials	SAH	SAH	SAH	SAH	TM	RZ	SAH	SAH	TM	RZ

Initial control pH: Well 1: 6.8 | Well 2: 6.8

Final control pH: Well 1: 6.9 | Well 2: 6.9

Light intensity (lux): 4290 | Date measured: Oct.14/21

Thermometer: 1 | Light meter: 1 | pH meter/probe: 1/1

Sample Description: refer to COC

Comments:

Reviewed: [signature] | Date reviewed: Dec.3, 2021

72-h Algal Growth Inhibition Toxicity Test
Water Quality Measurements

Client: TECK | Setup by: SAM

Sample ID: various | Test Date/Time: Oct. 14/21 @ 1700h

Work Order No.: 212107 | CER #: A

Test Species: *Pseudokirchneriella subcapitata*

Culture Date: 10 08 21 | Age of Culture: 6d | Culture Health: Good

Culture Count: 1 265 2 250 | Average: 257.5 | Culture Cell Density (c1): 257.5×10^4 cells/mL

v1 = (220,000 cells/ml x 60 ml) / (c1) 257.5×10^4 cells/ml = 5.1 mL

Time Zero Counts: 1 21 2 21 | Average: 21

No. of Cells/mL: 21×10^4 cells/mL | Initial Density: # cells/mL ÷ 220 µL x 10 µL = 9545 cells/mL

Concentration %(v/v)	Water Quality		Incubator Temperature (°C)				Microplates rotated 2X per day?			
	pH	Temp (°C)								
	0 h	0 h	0 h	24 h	48 h	72 h	0 h	24 h	48 h	72 h
Control	6.9	23.0	24.0	24.0	25.0	25.0	✓	✓	✓	✓
EV_MC2	8.3	22.0	↓	↓	↓	↓	↓	↓	↓	↓
EV_HCl	8.3	↓	↓	↓	↓	↓	↓	↓	↓	↓
LC_DCDS	8.2	↓	↓	↓	↓	↓	↓	↓	↓	↓
LC_LC3	8.2	↓	↓	↓	↓	↓	↓	↓	↓	↓
LC_LC5	8.4	↓	↓	↓	↓	↓	↓	↓	↓	↓
LC_LCDSSLEC	8.3	↓	↓	↓	↓	↓	↓	↓	↓	↓
Initials	SAM	SAM	SAM	SAM	JM	KZ	SAM	SAM	JM	KZ

Initial control pH: Well 1: 6.8 | Well 2: 6.8

Final control pH: Well 1: 6.9 | Well 2: 6.9

Light intensity (lux): 4290 | Date measured: Oct. 14/21

Thermometer: 1 | Light meter: 1 | pH meter/probe: 1 / 1

Sample Description: refer to COC

Comments:

Reviewed: [signature] | Date reviewed: Dec. 3, 2021

Pseudokirchneriella subcapitata Toxicity Test Data Sheet
72-h Algal Cell Counts

Client: TECK
Start Date/Time: Oct. 14/21 @ 1700h
Work Order #: 212107
Termination Date: Oct. 17/21 @ 1700h
Sample ID: various
Test set up by: SAH
%(v/v)

Concentration	Rep	Count 1	Count 2	Count 3	Count 4	Comments	Initials
Control	A	20					SAH
	B	19					
	C	21					
	D	19					
	E	19					
	F	20					
	G	20					
	H	20					
FRB_UFR1 SAH	A	85					
	B	93					
	C	83					
	D	87					
	A	84					
	B	84					
	C	89					
	D	97					
GH_ER2	A	84					
	B	96					
	C	92					
	D	84					
	A	87					
	B	95					
	C	90					
	D	88					
CM_MCl	A	91					
	B	82					
	C	81					
	D	80					
	A	82					
	B	90					
	C	94					
	D	81					
	A						
	B						
	C						
	D						

Comments:

Reviewed by: [signature] Date Reviewed: Dec. 3, 2021

Pseudokirchneriella subcapitata Toxicity Test Data Sheet
72-h Algal Cell Counts

Client: TECK
Start Date/Time: Oct. 14/21 @ 1700h
Work Order #: 212107
Termination Date: Oct. 17/21 @ 1700h
Sample ID: various
Test set up by: SAM
%(v/v)

Concentration	Rep	Count 1	Count 2	Count 3	Count 4	Comments	Initials
~~Control~~ LC_SLC	A	82					SAM
	B	88					
	C	92					
	D	98					
	E	81					
	F	87					
	G	82					
	H	86					
FR_FRABCH	A	75					
	B	75					
	C	70					
	D	77					
FR_FRCP1	A	71					
	B	68					
	C	73					
	D	84					
GH_FR1	A	65					
	B	74					
	C	71					
	D	79					
GH_ERC	A	62					
	B	62					
	C	63					
	D	78					
CM_MC2	A	52					
	B	52					
	C	68					
	D	68					
EV_MC2	A	58					
	B	60					
	C	75					
	D	72					
	A						
	B						
	C						
	D						

Comments:

Reviewed by: [signature] Date Reviewed: Dec. 3, 2021

Pseudokirchneriella subcapitata Toxicity Test Data Sheet
72-h Algal Cell Counts

Client: TECK
Start Date/Time: Oct. 14/21 @ 1700h
Work Order #: 212107
Termination Date: Oct. 17/21 @ 1700h
Sample ID: Various
Test set up by: SAM
%(v/v)

Concentration	Rep	Count 1	Count 2	Count 3	Count 4	Comments	Initials
Control	A						
	B						
	C						
	D						
	E						
	F						
	G						
	H						
EV_HCl	A	67					SAM
	B	66					
	C	68					
	D	77					
LC_DCDS	A	75					
	B	70					
	C	75					
	D	82					
LC_LC3	A	75					
	B	74					
	C	81					
	D	74					
LC_LC5	A	65					
	B	72					
	C	77					
	D	65					
LC_LCDSSCCC	A	55					
	B	57					
	C	70					
	D	68					↓
	A						
	B						
	C						
	D						
	A						
	B						
	C						
	D						

Comments:

Reviewed by: [signature] Date Reviewed: Dec 3, 2021

Pseudokirchneriella subcapitata Algal Counts

Client: TECK
WO#: 212107
Sample ID: various

Start Date/Time: 14-Oct-21 @1700h
Termination Date/Time: 17-Oct-21 @1700h

Initial Cell Density: 9545 cell/mL

									210000
									0.22
									0.01
Concentration %(v/v)	Rep	Count 1 (x 10^4)	Count 2 (x 10^4)	Count 3 (x 10^4)	Count 4 (x 10^4)	Mean (x 10^4)	Cell Yield (x 10^4) cell/mL		9545.455
Control	A	20				20	19.0	mean	18.8
	B	19				19	18.0	SD	0.707107
	C	21				21	20.0	CV	3.762116
	D	19				19	18.0		
	E	19				19	18.0		
	F	20				20	19.0		
	G	20				20	19.0		
	H	20				20	19.0		
FR_UFR1	A	85				85	84.0		
	B	93				93	92.0		
	C	83				83	82.0		
	D	87				87	86.0		
	E	84				84	83.0		
	F	84				84	83.0		
	G	89				89	88.0		
	H	97				97	96.0		
GH_ER2	A	84				84	83.0		
	B	96				96	95.0		
	C	92				92	91.0		
	D	84				84	83.0		
	E	87				87	86.0		
	F	95				95	94.0		
	G	90				90	89.0		
	H	88				88	87.0		
CM_MC1	A	91				91	90.0		
	B	82				82	81.0		
	C	81				81	80.0		
	D	80				80	79.0		
	E	82				82	81.0		
	F	90				90	89.0		
	G	94				94	93.0		
	H	81				81	80.0		
	A					#DIV/0!	#DIV/0!		
	B					#DIV/0!	#DIV/0!		
	C					#DIV/0!	#DIV/0!		
	D					#DIV/0!	#DIV/0!		

Reviewed by: _____

Date reviewed: Dec. 3, 2021

Pseudokirchneriella subcapitata Algal Counts

Client: TECK
WO#: 212107
Sample ID: various

Start Date/Time: 14-Oct-21 @1700h
Termination Date/Time: 17-Oct-21 @1700h

Initial Cell Density: 9545 cell/mL

									210000
									0.22
									0.01
Concentration	Rep	Count 1 ($\times 10^4$)	Count 2 ($\times 10^4$)	Count 3 ($\times 10^4$)	Count 4 ($\times 10^4$)	Mean ($\times 10^4$)	Cell Yield ($\times 10^4$) cell/mL		9545.455
LC_SLC	A	82				82	81.0	mean	86.0
	B	88				88	87.0	SD	5.781745
	C	92				92	91.0	CV	6.719407
	D	98				98	97.0		
	E	81				81	80.0		
	F	87				87	86.0		
	G	82				82	81.0		
	H	86				86	85.0		
FR_FRABCH	A	75				75	74.0		
	B	75				75	74.0		
	C	70				70	69.0		
	D	77				77	76.0		
FR_FRCP1	A	71				71	70.0		
	B	68				68	67.0		
	C	73				73	72.0		
	D	84				84	83.0		
GH-FR1	A	65				65	64.0		
	B	74				74	73.0		
	C	71				71	70.0		
	D	79				79	78.0		
GH_ERC	A	62				62	61.0		
	B	62				62	61.0		
	C	63				63	62.0		
	D	78				78	77.0		
CM_MC2	A	52				52	51.0		
	B	52				52	51.0		
	C	68				68	67.0		
	D	68				68	67.0		
EV_MC2	A	58				58	57.0		
	B	60				60	59.0		
	C	75				75	74.0		
	D	72				72	71.0		
EV__HC1	A	67				67	66.0		
	B	66				66	65.0		
	C	68				68	67.0		
	D	77				77	76.0		

Reviewed by: _____

Date reviewed: Dec 3, 2021

Pseudokirchneriella subcapitata Algal Counts

Client: TECK
WO#: 212107
Sample ID: various

Start Date/Time: 14-Oct-21 @1700h
Termination Date/Time: 17-Oct-21 @1700h

pg3

Initial Cell Density: 9545 cell/mL

210000
0.22
0.01
9545.455

Concentration	Rep	Count 1 (x 10^4)	Count 2 (x 10^4)	Count 3 (x 10^4)	Count 4 (x 10^4)	Mean (x 10^4)	Cell Yield (x 10^4) cell/mL		
	A					#DIV/0!	#DIV/0!	mean	#DIV/0!
	B					#DIV/0!	#DIV/0!	SD	#DIV/0!
	C					#DIV/0!	#DIV/0!	CV	#DIV/0!
	D					#DIV/0!	#DIV/0!		
	E					#DIV/0!	#DIV/0!		
	F					#DIV/0!	#DIV/0!		
	G					#DIV/0!	#DIV/0!		
	H					#DIV/0!	#DIV/0!		
LC_DCDS	A	75				75	74.0		
	B	70				70	69.0		
	C	75				75	74.0		
	D	82				82	81.0		
LC_LC3	A	75				75	74.0		
	B	74				74	73.0		
	C	81				81	80.0		
	D	74				74	73.0		
LC_LC5	A	65				65	64.0		
	B	72				72	71.0		
	C	77				77	76.0		
	D	65				65	64.0		
LC_LCDSSLC	A	55				55	54.0		
	B	57				57	56.0		
	C	70				70	69.0		
	D	68				68	67.0		
	A					#DIV/0!	#DIV/0!		
	B					#DIV/0!	#DIV/0!		
	C					#DIV/0!	#DIV/0!		
	D					#DIV/0!	#DIV/0!		
	A					#DIV/0!	#DIV/0!		
	B					#DIV/0!	#DIV/0!		
	C					#DIV/0!	#DIV/0!		
	D					#DIV/0!	#DIV/0!		
	A					#DIV/0!	#DIV/0!		
	B					#DIV/0!	#DIV/0!		
	C					#DIV/0!	#DIV/0!		
	D					#DIV/0!	#DIV/0!		

Reviewed by: _____

Date reviewed: Dec 3, 2021

EC Alga Growth Inhibition Test — **Nautilus Environmental**

Batch ID:	05-1185-6587	**Test Type:**	Cell Growth	**Analyst:**	Sierra Klueppel
Start Date:	14 Oct-21 17:00	**Protocol:**	EC/EPS 1/RM/25	**Diluent:**	Deionized Water + nutrients
Ending Date:	17 Oct-21 17:00	**Species:**	Pseudokirchneriella subcapitata	**Brine:**	
Test Length:	72h	**Taxon:**	Chlorophyta	**Source:**	In-House Culture **Age:** 6d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
Lab Control	11-0298-3780	14 Oct-21	14 Oct-21 06:00	17h	Teck Coal	
FR_UFR1	19-8746-8946	12 Oct-21 11:07	13 Oct-21 11:53	54h (0 °C)		
GH_ER2	20-2628-4137	12 Oct-21 10:50	13 Oct-21 11:30	54h (0 °C)		
CM_MC1	18-3559-2852	12 Oct-21 13:20	13 Oct-21 11:30	52h (0.1 °C)		
LC_SLC	08-7937-3726	12 Oct-21 11:00	13 Oct-21 11:30	54h (2.9 °C)		
FR_FRABCH	18-7592-7020	12 Oct-21 11:20	13 Oct-21 11:53	54h (0 °C)		
FR_FRCP1	10-3969-8000	12 Oct-21 11:48	13 Oct-21 11:53	53h (1.3 °C)		
GH_FR1	11-8224-4576	12 Oct-21 10:00	13 Oct-21 11:30	55h (0 °C)		
GH_ERC	00-1276-7572	12 Oct-21 11:50	13 Oct-21 11:30	53h (0 °C)		
CM_MC2	03-9569-8600	12 Oct-21 12:47	13 Oct-21 11:30	52h (1.3 °C)		
EV_MC2	13-1923-7722	12 Oct-21 11:38	13 Oct-21 11:30	53h (0.2 °C)		
EV_HC1	18-6648-8827	12 Oct-21 10:33	13 Oct-21 11:30	54h (0 °C)		
LC_DCDS	17-4710-4100	12 Oct-21	13 Oct-21 11:30	65h (1.7 °C)		
LC_LC3	20-0894-5906	12 Oct-21 12:00	13 Oct-21 11:30	53h (8.8 °C)		
LC_LC5	14-5637-1032	12 Oct-21 13:30	13 Oct-21 11:30	52h (2.6 °C)		
LC_LCDSSLCC	06-4184-4349	12 Oct-21 12:30	13 Oct-21 11:30	52h (4.7 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
Lab Control	Water Sample	Teck Coal	Lab Control	
FR_UFR1	Water Sample	Teck Coal	FR_UFR1_WEK_2021-09-1	
GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-10-12_	
CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-10-12	
LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-10-19_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_WEK_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_WEK_2021-09	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-10-12_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-10-12	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-10-12	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2021_Q4_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2021_Q4_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-10-19	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-10-19_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-10-19_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	

SIngle Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0012	CM_MC2 failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0012	CM_MC1 failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0012	LC_SLC failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0012	FR_FRABCH failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0012	Lab Control failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0012	GH_FR1 failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0012	GH_ERC failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0012	GH_ER2 failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0012	FR_UFR1 failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0012	LC_LCDSSLCC failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0012	EV_MC2 failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0012	EV_HC1 failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0012	LC_DCDS failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0012	LC_LC3 failed cell yield	1

EC Alga Growth Inhibition Test **Nautilus Environmental**

SIngle Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0012	LC_LC5 failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0012	FR_FRCP1 failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0012	LC_LC3 failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0012	FR_FRCP1 failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0012	CM_MC2 failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0012	CM_MC1 failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0012	GH_ERC failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0012	LC_DCDS failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0012	FR_UFR1 failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0012	FR_FRABCH failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0012	LC_SLC failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0012	EV_HC1 failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0012	GH_ER2 failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0012	LC_LC5 failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0012	EV_MC2 failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0012	LC_LCDSSLCC failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0012	GH_FR1 failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0012	Lab Control failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0012	LC_LC3 failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0012	FR_FRCP1 failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0012	EV_HC1 failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0012	GH_FR1 failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0012	LC_DCDS failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0012	CM_MC2 failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0012	LC_SLC failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0012	Lab Control failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0012	FR_FRABCH failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0012	EV_MC2 failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0012	LC_LCDSSLCC failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0012	CM_MC1 failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0012	GH_ER2 failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0012	GH_ERC failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0012	LC_LC5 failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0012	FR_UFR1 failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0012	GH_FR1 failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0012	LC_LC3 failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0012	LC_LC5 failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0012	LC_SLC failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0012	EV_HC1 failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0012	FR_FRCP1 failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0012	GH_ER2 failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0012	Lab Control failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0012	GH_ERC failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0012	EV_MC2 failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0012	LC_LCDSSLCC failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0012	FR_UFR1 failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0012	LC_DCDS failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0012	CM_MC2 failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0012	CM_MC1 failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0012	FR_FRABCH failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	LC_SLC failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	LC_LC3 failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	Lab Control failed cell yield	1

EC Alga Growth Inhibition Test **Nautilus Environmental**

SIngle Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	GH_FR1 failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	GH_ER2 failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	FR_FRCP1 failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	FR_FRABCH failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	EV_MC2 failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	GH_ERC failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	EV_HC1 failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	FR_UFR1 failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	LC_LCDSSLCC failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	LC_LC5 failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	LC_DCDS failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	CM_MC2 failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	CM_MC1 failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	FR_UFR1 failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	Lab Control failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	LC_LCDSSLCC failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	FR_FRCP1 failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	GH_FR1 failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	CM_MC2 failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	LC_LC3 failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	EV_MC2 failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	LC_SLC failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	CM_MC1 failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	EV_HC1 failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	LC_DCDS failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	GH_ERC failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	LC_LC5 failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	GH_ER2 failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	FR_FRABCH failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	LC_LC3 failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	CM_MC1 failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	GH_FR1 failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	GH_ERC failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	LC_LC5 failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	FR_FRCP1 failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	GH_ER2 failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	FR_FRABCH failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	LC_DCDS failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	LC_SLC failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	CM_MC2 failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	EV_MC2 failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	LC_LCDSSLCC failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	FR_UFR1 failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	EV_HC1 failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	Lab Control failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	FR_UFR1 failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	FR_FRABCH failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	CM_MC1 failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	Lab Control failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	GH_FR1 failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	LC_SLC failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	GH_ER2 failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	LC_DCDS failed cell yield	1

EC Alga Growth Inhibition Test **Nautilus Environmental**

SIngle Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	LC_LC5 failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	CM_MC2 failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	FR_FRCP1 failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	LC_LC3 failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	GH_ERC failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	LC_LCDSSLCC failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	EV_HC1 failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	EV_MC2 failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	CM_MC1 failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	CM_MC2 failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	GH_ERC failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	LC_SLC failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	GH_ER2 failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	EV_MC2 failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	LC_LC3 failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	FR_UFR1 failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	FR_FRABCH failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	Lab Control failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	LC_LC5 failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	GH_FR1 failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	LC_LCDSSLCC failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	LC_DCDS failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	EV_HC1 failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	FR_FRCP1 failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	FR_UFR1 failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	CM_MC1 failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	EV_HC1 failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	FR_FRABCH failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	EV_MC2 failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	LC_SLC failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	Lab Control failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	LC_LC3 failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	GH_ERC failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	GH_ER2 failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	FR_FRCP1 failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	CM_MC2 failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	LC_LC5 failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	GH_FR1 failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	LC_DCDS failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	LC_LCDSSLCC failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	LC_SLC failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	LC_DCDS failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	CM_MC1 failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	GH_ER2 failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	LC_LC5 failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	GH_FR1 failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	LC_LCDSSLCC failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	CM_MC2 failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	LC_LC3 failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	Lab Control failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	EV_HC1 failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	EV_MC2 failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	FR_FRCP1 failed cell yield	1

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	FR_UFR1 failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	FR_FRABCH failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	GH_ERC failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	LC_LC3 failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	LC_DCDS failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	LC_LC5 failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	CM_MC1 failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	GH_ER2 failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	GH_ERC failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	Lab Control failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	FR_FRCP1 failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	FR_UFR1 failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	EV_MC2 failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	FR_FRABCH failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	EV_HC1 failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	LC_LCDSSLCC failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	LC_SLC failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	GH_FR1 failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	CM_MC2 failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	LC_LCDSSLCC failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	GH_ERC failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	CM_MC2 failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	LC_LC3 failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	Lab Control failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	GH_FR1 failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	LC_LC5 failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	GH_ER2 failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	FR_UFR1 failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	EV_MC2 failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	FR_FRABCH failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	LC_DCDS failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	LC_SLC failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	EV_HC1 failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	FR_FRCP1 failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	CM_MC1 failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	GH_ERC failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	FR_UFR1 failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	Lab Control failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	EV_HC1 failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	LC_DCDS failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	LC_LCDSSLCC failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	GH_FR1 failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	EV_MC2 failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	LC_LC3 failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	CM_MC2 failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	FR_FRABCH failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	LC_LC5 failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	LC_SLC failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	CM_MC1 failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	FR_FRCP1 failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	GH_ER2 failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	LC_LC5 failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	LC_DCDS failed cell yield	1

EC Alga Growth Inhibition Test — **Nautilus Environmental**

SIngle Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	EV_HC1 failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	EV_MC2 failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	LC_LC3 failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	CM_MC2 failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	GH_FR1 failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	LC_LCDSSLCC failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	FR_UFR1 failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	FR_FRCP1 failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	Lab Control failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	FR_FRABCH failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	LC_SLC failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	CM_MC1 failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	GH_ER2 failed cell yield	1
06-4407-9786	Cell Yield	Wilcoxon/Bonferroni Adj Test	0.0303	GH_ERC failed cell yield	1

Cell Yield Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
Lab Control	N	8	18.75	18.16	19.34	18	20	0.25	0.7071	3.77%	0.00%
FR_UFR1		8	86.75	82.59	90.91	82	96	1.76	4.979	5.74%	-362.67%
GH_ER2		8	88.5	84.66	92.34	83	95	1.626	4.598	5.20%	-372.00%
CM_MC1		8	84.12	79.47	88.78	79	93	1.968	5.566	6.62%	-348.67%
LC_SLC		8	86	81.17	90.83	80	97	2.044	5.782	6.72%	-358.67%
FR_FRABCH		4	73.25	68.5	78	69	76	1.493	2.986	4.08%	-290.67%
FR_FRCP1		4	73	61.9	84.1	67	83	3.488	6.976	9.56%	-289.33%
GH_FR1		4	71.25	61.94	80.56	64	78	2.926	5.852	8.21%	-280.00%
GH_ERC		4	65.25	52.76	77.74	61	77	3.924	7.848	12.03%	-248.00%
CM_MC2		4	59	44.3	73.7	51	67	4.619	9.238	15.66%	-214.67%
EV_MC2		4	65.25	51.72	78.78	57	74	4.25	8.5	13.03%	-248.00%
EV_HC1		4	68.5	60.44	76.56	65	76	2.533	5.066	7.40%	-265.33%
LC_DCDS		4	74.5	66.65	82.35	69	81	2.466	4.933	6.62%	-297.33%
LC_LC3		4	75	69.64	80.36	73	80	1.683	3.367	4.49%	-300.00%
LC_LC5		4	68.75	59.44	78.06	64	76	2.926	5.852	8.51%	-266.67%
LC_LCDSSLCC		4	61.5	49.42	73.58	54	69	3.797	7.594	12.35%	-228.00%

Cell Yield Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
Lab Control	N	19	18	20	18	18	19	19	19
FR_UFR1		84	92	82	86	83	83	88	96
GH_ER2		83	95	91	83	86	94	89	87
CM_MC1		90	81	80	79	81	89	93	80
LC_SLC		81	87	91	97	80	86	81	85
FR_FRABCH		74	74	69	76				
FR_FRCP1		70	67	72	83				
GH_FR1		64	73	70	78				
GH_ERC		61	61	62	77				
CM_MC2		51	51	67	67				
EV_MC2		57	59	74	71				
EV_HC1		66	65	67	76				
LC_DCDS		74	69	74	81				
LC_LC3		74	73	80	73				
LC_LC5		64	71	76	64				
LC_LCDSSLCC		54	56	69	67				

EC Alga Growth Inhibition Test — **Nautilus Environmental**

Analysis ID:	06-4407-9786	**Endpoint:**	Cell Yield	**CETIS Version:**	CETISv1.9.4
Analyzed:	26 Nov-21 14:43	**Analysis:**	Nonparametric-Multiple Comparison	**Status Level:**	1
Batch ID:	05-1185-6587	**Test Type:**	Cell Growth	**Analyst:**	Sierra Klueppel
Start Date:	14 Oct-21 17:00	**Protocol:**	EC/EPS 1/RM/25	**Diluent:**	Deionized Water + nutrients
Ending Date:	17 Oct-21 17:00	**Species:**	Pseudokirchneriella subcapitata	**Brine:**	
Test Length:	72h	**Taxon:**	Chlorophyta	**Source:**	In-House Culture **Age:** 6d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
Lab Control	11-0298-3780	14 Oct-21	14 Oct-21 06:00	17h	Teck Coal	
FR_UFR1	19-8746-8946	12 Oct-21 11:07	13 Oct-21 11:53	54h (0 °C)		
GH_ER2	20-2628-4137	12 Oct-21 10:50	13 Oct-21 11:30	54h (0 °C)		
CM_MC1	18-3559-2852	12 Oct-21 13:20	13 Oct-21 11:30	52h (0.1 °C)		
LC_SLC	08-7937-3726	12 Oct-21 11:00	13 Oct-21 11:30	54h (2.9 °C)		
FR_FRABCH	18-7592-7020	12 Oct-21 11:20	13 Oct-21 11:53	54h (0 °C)		
FR_FRCP1	10-3969-8000	12 Oct-21 11:48	13 Oct-21 11:53	53h (1.3 °C)		
GH_FR1	11-8224-4576	12 Oct-21 10:00	13 Oct-21 11:30	55h (0 °C)		
GH_ERC	00-1276-7572	12 Oct-21 11:50	13 Oct-21 11:30	53h (0 °C)		
CM_MC2	03-9569-8600	12 Oct-21 12:47	13 Oct-21 11:30	52h (1.3 °C)		
EV_MC2	13-1923-7722	12 Oct-21 11:38	13 Oct-21 11:30	53h (0.2 °C)		
EV_HC1	18-6648-8827	12 Oct-21 10:33	13 Oct-21 11:30	54h (0 °C)		
LC_DCDS	17-4710-4100	12 Oct-21	13 Oct-21 11:30	65h (1.7 °C)		
LC_LC3	20-0894-5906	12 Oct-21 12:00	13 Oct-21 11:30	53h (8.8 °C)		
LC_LC5	14-5637-1032	12 Oct-21 13:30	13 Oct-21 11:30	52h (2.6 °C)		
LC_LCDSSLCC	06-4184-4349	12 Oct-21 12:30	13 Oct-21 11:30	52h (4.7 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
Lab Control	Water Sample	Teck Coal	Lab Control	
FR_UFR1	Water Sample	Teck Coal	FR_UFR1_WEK_2021-09-1	
GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-10-12_	
CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-10-12	
LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-10-19_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_WEK_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_WEK_2021-09	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-10-12_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-10-12	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-10-12	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2021_Q4_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2021_Q4_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-10-19	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-10-19_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-10-19_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	

EC Alga Growth Inhibition Test — **Nautilus Environmental**

Analysis ID: 06-4407-9786 **Endpoint:** Cell Yield **CETIS Version:** CETISv1.9.4
Analyzed: 26 Nov-21 14:43 **Analysis:** Nonparametric-Multiple Comparison **Status Level:** 1

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C < T	FR_UFR1 failed cell yield	51.62%
		GH_ER2 failed cell yield	51.62%
		CM_MC1 failed cell yield	51.62%
		LC_SLC failed cell yield	51.62%
		FR_FRABCH failed cell yield	51.62%
		FR_FRCP1 failed cell yield	51.62%
		GH_FR1 failed cell yield	51.62%
		GH_ERC failed cell yield	51.62%
		CM_MC2 failed cell yield	51.62%
		EV_MC2 failed cell yield	51.62%
		EV_HC1 failed cell yield	51.62%
		LC_DCDS failed cell yield	51.62%
		LC_LC3 failed cell yield	51.62%
		LC_LC5 failed cell yield	51.62%
		LC_LCDSSLCC failed cell yield	51.62%

Wilcoxon/Bonferroni Adj Test

Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)
Negative Control		FR_UFR1*	36	n/a	0	14	Exact	0.0012	Significant Effect
		GH_ER2*	36	n/a	0	14	Exact	0.0012	Significant Effect
		CM_MC1*	36	n/a	0	14	Exact	0.0012	Significant Effect
		LC_SLC*	36	n/a	0	14	Exact	0.0012	Significant Effect
		FR_FRABCH*	10	n/a	0	10	Exact	0.0303	Significant Effect
		FR_FRCP1*	10	n/a	0	10	Exact	0.0303	Significant Effect
		GH_FR1*	10	n/a	0	10	Exact	0.0303	Significant Effect
		GH_ERC*	10	n/a	0	10	Exact	0.0303	Significant Effect
		CM_MC2*	10	n/a	0	10	Exact	0.0303	Significant Effect
		EV_MC2*	10	n/a	0	10	Exact	0.0303	Significant Effect
		EV_HC1*	10	n/a	0	10	Exact	0.0303	Significant Effect
		LC_DCDS*	10	n/a	0	10	Exact	0.0303	Significant Effect
		LC_LC3*	10	n/a	0	10	Exact	0.0303	Significant Effect
		LC_LC5*	10	n/a	0	10	Exact	0.0303	Significant Effect
		LC_LCDSSLCC*	10	n/a	0	10	Exact	0.0303	Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	2.299	3.323	1.0000	No Outliers Detected
Control Trend	Mann-Kendall Trend Test	2.299		0.7250	Non-Significant Trend in Controls

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	30838.7	2055.91	15	64.47	<1.0E-37	Significant Effect
Error	2168.62	31.8915	68			
Total	33007.3		83			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance Test	28.39	30.58	0.0193	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9492	0.9596	0.0023	Non-Normal Distribution

EC Alga Growth Inhibition Test — **Nautilus Environmental**

Analysis ID: 06-4407-9786 **Endpoint:** Cell Yield **CETIS Version:** CETISv1.9.4
Analyzed: 26 Nov-21 14:43 **Analysis:** Nonparametric-Multiple Comparison **Status Level:** 1

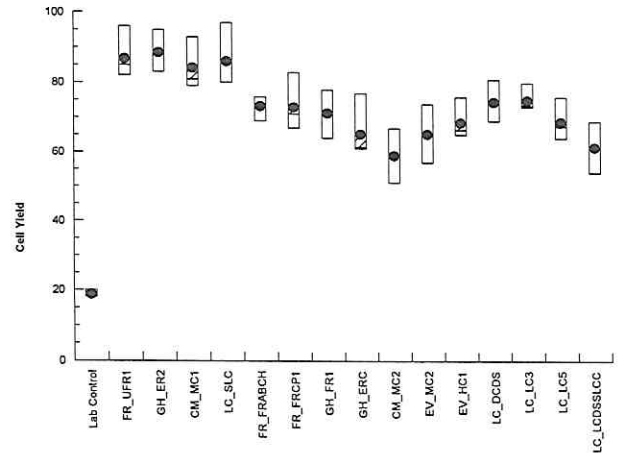
Cell Yield Summary

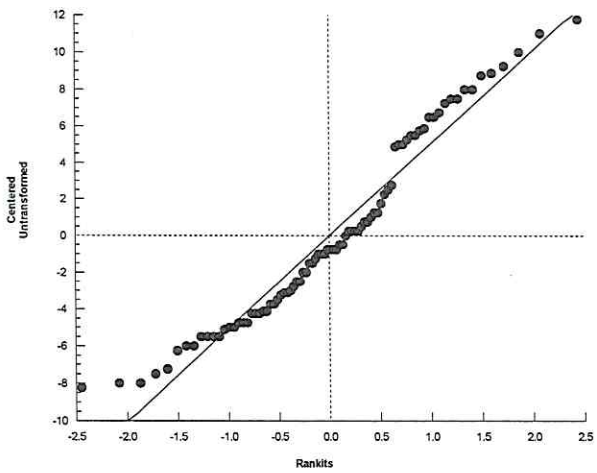
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
Lab Control	N	8	18.75	18.16	19.34	19	18	20	0.25	3.77%	0.00%
FR_UFR1		8	86.75	82.59	90.91	85	82	96	1.76	5.74%	-362.67%
GH_ER2		8	88.5	84.66	92.34	88	83	95	1.626	5.20%	-372.00%
CM_MC1		8	84.12	79.47	88.78	81	79	93	1.968	6.62%	-348.67%
LC_SLC		8	86	81.17	90.83	85.5	80	97	2.044	6.72%	-358.67%
FR_FRABCH		4	73.25	68.5	78	74	69	76	1.493	4.08%	-290.67%
FR_FRCP1		4	73	61.9	84.1	71	67	83	3.488	9.56%	-289.33%
GH_FR1		4	71.25	61.94	80.56	71.5	64	78	2.926	8.21%	-280.00%
GH_ERC		4	65.25	52.76	77.74	61.5	61	77	3.924	12.03%	-248.00%
CM_MC2		4	59	44.3	73.7	59	51	67	4.619	15.66%	-214.67%
EV_MC2		4	65.25	51.72	78.78	65	57	74	4.25	13.03%	-248.00%
EV_HC1		4	68.5	60.44	76.56	66.5	65	76	2.533	7.40%	-265.33%
LC_DCDS		4	74.5	66.65	82.35	74	69	81	2.466	6.62%	-297.33%
LC_LC3		4	75	69.64	80.36	73.5	73	80	1.683	4.49%	-300.00%
LC_LC5		4	68.75	59.44	78.06	67.5	64	76	2.926	8.51%	-266.67%
LC_LCDSSLCC		4	61.5	49.42	73.58	61.5	54	69	3.797	12.35%	-228.00%

Cell Yield Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
Lab Control	N	19	18	20	18	18	19	19	19
FR_UFR1		84	92	82	86	83	83	88	96
GH_ER2		83	95	91	83	86	94	89	87
CM_MC1		90	81	80	79	81	89	93	80
LC_SLC		81	87	91	97	80	86	81	85
FR_FRABCH		74	74	69	76				
FR_FRCP1		70	67	72	83				
GH_FR1		64	73	70	78				
GH_ERC		61	61	62	77				
CM_MC2		51	51	67	67				
EV_MC2		57	59	74	71				
EV_HC1		66	65	67	76				
LC_DCDS		74	69	74	81				
LC_LC3		74	73	80	73				
LC_LC5		64	71	76	64				
LC_LCDSSLCC		54	56	69	67				

Graphics





EC Alga Growth Inhibition Test — **Nautilus Environmental**

Analysis ID:	18-1479-6922	**Endpoint:**	Cell Yield	**CETIS Version:**	CETISv1.9.4
Analyzed:	26 Nov-21 14:13	**Analysis:**	Nonparametric-Multiple Comparison	**Status Level:**	1
Batch ID:	05-1185-6587	**Test Type:**	Cell Growth	**Analyst:**	Sierra Klueppel
Start Date:	14 Oct-21 17:00	**Protocol:**	EC/EPS 1/RM/25	**Diluent:**	Deionized Water + nutrients
Ending Date:	17 Oct-21 17:00	**Species:**	Pseudokirchneriella subcapitata	**Brine:**	
Test Length:	72h	**Taxon:**	Chlorophyta	**Source:**	In-House Culture **Age:** 6d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
FR_UFR1	19-8746-8946	12 Oct-21 11:07	13 Oct-21 11:53	54h (0 °C)	Teck Coal	
GH_ER2	20-2628-4137	12 Oct-21 10:50	13 Oct-21 11:30	54h (0 °C)		
CM_MC1	18-3559-2852	12 Oct-21 13:20	13 Oct-21 11:30	52h (0.1 °C)		
LC_SLC	08-7937-3726	12 Oct-21 11:00	13 Oct-21 11:30	54h (2.9 °C)		
FR_FRABCH	18-7592-7020	12 Oct-21 11:20	13 Oct-21 11:53	54h (0 °C)		
FR_FRCP1	10-3969-8000	12 Oct-21 11:48	13 Oct-21 11:53	53h (1.3 °C)		
GH_FR1	11-8224-4576	12 Oct-21 10:00	13 Oct-21 11:30	55h (0 °C)		
GH_ERC	00-1276-7572	12 Oct-21 11:50	13 Oct-21 11:30	53h (0 °C)		
CM_MC2	03-9569-8600	12 Oct-21 12:47	13 Oct-21 11:30	52h (1.3 °C)		
EV_MC2	13-1923-7722	12 Oct-21 11:38	13 Oct-21 11:30	53h (0.2 °C)		
EV_HC1	18-6648-8827	12 Oct-21 10:33	13 Oct-21 11:30	54h (0 °C)		
LC_DCDS	17-4710-4100	12 Oct-21	13 Oct-21 11:30	65h (1.7 °C)		
LC_LC3	20-0894-5906	12 Oct-21 12:00	13 Oct-21 11:30	53h (8.8 °C)		
LC_LC5	14-5637-1032	12 Oct-21 13:30	13 Oct-21 11:30	52h (2.6 °C)		
LC_LCDSSLCC	06-4184-4349	12 Oct-21 12:30	13 Oct-21 11:30	52h (4.7 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_UFR1	Water Sample	Teck Coal	FR_UFR1_WEK_2021-09-1	
GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-10-12_	
CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-10-12	
LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-10-19_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_WEK_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_WEK_2021-09	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-10-12_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-10-12	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-10-12	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2021_Q4_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2021_Q4_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-10-19	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-10-19_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-10-19_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	

EC Alga Growth Inhibition Test — **Nautilus Environmental**

Analysis ID: 18-1479-6922 **Endpoint:** Cell Yield **CETIS Version:** CETISv1.9.4
Analyzed: 26 Nov-21 14:13 **Analysis:** Nonparametric-Multiple Comparison **Status Level:** 1

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	GH_ER2 passed cell yield	11.71%
		CM_MC1 passed cell yield	11.71%
		LC_SLC passed cell yield	11.71%
		FR_FRABCH failed cell yield	11.71%
		FR_FRCP1 passed cell yield	11.71%
		GH_FR1 failed cell yield	11.71%
		GH_ERC failed cell yield	11.71%
		CM_MC2 failed cell yield	11.71%
		EV_MC2 failed cell yield	11.71%
		EV_HC1 failed cell yield	11.71%
		LC_DCDS failed cell yield	11.71%
		LC_LC3 failed cell yield	11.71%
		LC_LC5 failed cell yield	11.71%
		LC_LCDSSLCC failed cell yield	11.71%

Wilcoxon/Bonferroni Adj Test

Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)
Site Control		GH_ER2	75.5	n/a	2	14	Exact	1.0000	Non-Significant Effect
(FR_UFRI)		CM_MC1	55	n/a	0	14	Exact	1.0000	Non-Significant Effect
		LC_SLC	63.5	n/a	1	14	Exact	1.0000	Non-Significant Effect
		FR_FRABCH*	10	n/a	0	10	Exact	0.0283	Significant Effect
		FR_FRCP1	12	n/a	1	10	Exact	0.1131	Non-Significant Effect
		GH_FR1*	10	n/a	0	10	Exact	0.0283	Significant Effect
		GH_ERC*	10	n/a	0	10	Exact	0.0283	Significant Effect
		CM_MC2*	10	n/a	0	10	Exact	0.0283	Significant Effect
		EV_MC2*	10	n/a	0	10	Exact	0.0283	Significant Effect
		EV_HC1*	10	n/a	0	10	Exact	0.0283	Significant Effect
		LC_DCDS*	10	n/a	0	10	Exact	0.0283	Significant Effect
		LC_LC3*	10	n/a	0	10	Exact	0.0283	Significant Effect
		LC_LC5*	10	n/a	0	10	Exact	0.0283	Significant Effect
		LC_LCDSSLCC*	10	n/a	0	10	Exact	0.0283	Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	2.187	3.288	1.0000	No Outliers Detected
Control Trend	Mann-Kendall Trend Test	2.187		0.5484	Non-Significant Trend in Controls

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	7028.03	502.002	14	14.14	<1.0E-37	Significant Effect
Error	2165.12	35.4939	61			
Total	9193.16		75			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance Test	7.796	29.14	0.8997	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9367	0.9559	9.1E-04	Non-Normal Distribution

EC Alga Growth Inhibition Test — **Nautilus Environmental**

Analysis ID: 18-1479-6922 **Endpoint:** Cell Yield **CETIS Version:** CETISv1.9.4
Analyzed: 26 Nov-21 14:13 **Analysis:** Nonparametric-Multiple Comparison **Status Level:** 1

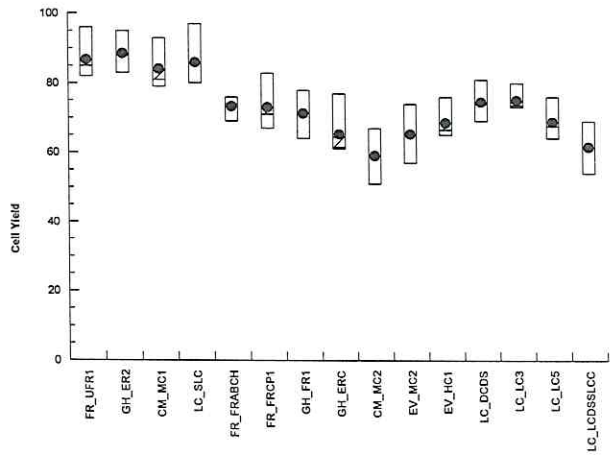
Cell Yield Summary

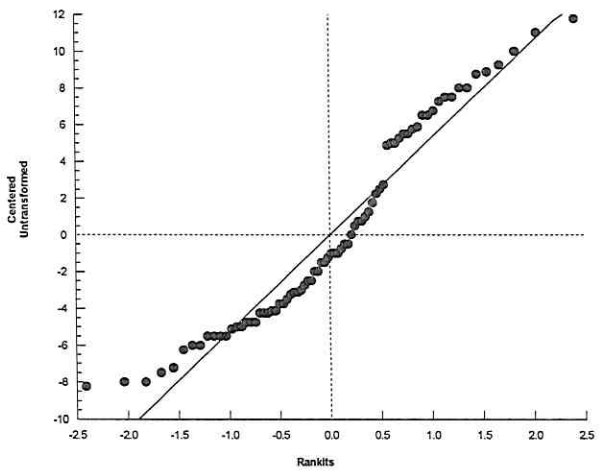
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
FR_UFR1	XC	8	86.75	82.59	90.91	85	82	96	1.76	5.74%	0.00%
GH_ER2		8	88.5	84.66	92.34	88	83	95	1.626	5.20%	-2.02%
CM_MC1		8	84.12	79.47	88.78	81	79	93	1.968	6.62%	3.03%
LC_SLC		8	86	81.17	90.83	85.5	80	97	2.044	6.72%	0.86%
FR_FRABCH		4	73.25	68.5	78	74	69	76	1.493	4.08%	15.56%
FR_FRCP1		4	73	61.9	84.1	71	67	83	3.488	9.56%	15.85%
GH_FR1		4	71.25	61.94	80.56	71.5	64	78	2.926	8.21%	17.87%
GH_ERC		4	65.25	52.76	77.74	61.5	61	77	3.924	12.03%	24.78%
CM_MC2		4	59	44.3	73.7	59	51	67	4.619	15.66%	31.99%
EV_MC2		4	65.25	51.72	78.78	65	57	74	4.25	13.03%	24.78%
EV_HC1		4	68.5	60.44	76.56	66.5	65	76	2.533	7.40%	21.04%
LC_DCDS		4	74.5	66.65	82.35	74	69	81	2.466	6.62%	14.12%
LC_LC3		4	75	69.64	80.36	73.5	73	80	1.683	4.49%	13.54%
LC_LC5		4	68.75	59.44	78.06	67.5	64	76	2.926	8.51%	20.75%
LC_LCDSSLCC		4	61.5	49.42	73.58	61.5	54	69	3.797	12.35%	29.11%

Cell Yield Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
FR_UFR1	XC	84	92	82	86	83	83	88	96
GH_ER2		83	95	91	83	86	94	89	87
CM_MC1		90	81	80	79	81	89	93	80
LC_SLC		81	87	91	97	80	86	81	85
FR_FRABCH		74	74	69	76				
FR_FRCP1		70	67	72	83				
GH_FR1		64	73	70	78				
GH_ERC		61	61	62	77				
CM_MC2		51	51	67	67				
EV_MC2		57	59	74	71				
EV_HC1		66	65	67	76				
LC_DCDS		74	69	74	81				
LC_LC3		74	73	80	73				
LC_LC5		64	71	76	64				
LC_LCDSSLCC		54	56	69	67				

Graphics





EC Alga Growth Inhibition Test — **Nautilus Environmental**

Analysis ID:	05-4432-7464	**Endpoint:**	Cell Yield	**CETIS Version:**	CETISv1.9.4
Analyzed:	26 Nov-21 14:13	**Analysis:**	Nonparametric-Multiple Comparison	**Status Level:**	1
Batch ID:	05-1185-6587	**Test Type:**	Cell Growth	**Analyst:**	Sierra Klueppel
Start Date:	14 Oct-21 17:00	**Protocol:**	EC/EPS 1/RM/25	**Diluent:**	Deionized Water + nutrients
Ending Date:	17 Oct-21 17:00	**Species:**	Pseudokirchneriella subcapitata	**Brine:**	
Test Length:	72h	**Taxon:**	Chlorophyta	**Source:**	In-House Culture **Age:** 6d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
FR_UFR1	19-8746-8946	12 Oct-21 11:07	13 Oct-21 11:53	54h (0 °C)	Teck Coal	
GH_ER2	20-2628-4137	12 Oct-21 10:50	13 Oct-21 11:30	54h (0 °C)		
CM_MC1	18-3559-2852	12 Oct-21 13:20	13 Oct-21 11:30	52h (0.1 °C)		
LC_SLC	08-7937-3726	12 Oct-21 11:00	13 Oct-21 11:30	54h (2.9 °C)		
FR_FRABCH	18-7592-7020	12 Oct-21 11:20	13 Oct-21 11:53	54h (0 °C)		
FR_FRCP1	10-3969-8000	12 Oct-21 11:48	13 Oct-21 11:53	53h (1.3 °C)		
GH_FR1	11-8224-4576	12 Oct-21 10:00	13 Oct-21 11:30	55h (0 °C)		
GH_ERC	00-1276-7572	12 Oct-21 11:50	13 Oct-21 11:30	53h (0 °C)		
CM_MC2	03-9569-8600	12 Oct-21 12:47	13 Oct-21 11:30	52h (1.3 °C)		
EV_MC2	13-1923-7722	12 Oct-21 11:38	13 Oct-21 11:30	53h (0.2 °C)		
EV_HC1	18-6648-8827	12 Oct-21 10:33	13 Oct-21 11:30	54h (0 °C)		
LC_DCDS	17-4710-4100	12 Oct-21	13 Oct-21 11:30	65h (1.7 °C)		
LC_LC3	20-0894-5906	12 Oct-21 12:00	13 Oct-21 11:30	53h (8.8 °C)		
LC_LC5	14-5637-1032	12 Oct-21 13:30	13 Oct-21 11:30	52h (2.6 °C)		
LC_LCDSSLCC	06-4184-4349	12 Oct-21 12:30	13 Oct-21 11:30	52h (4.7 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_UFR1	Water Sample	Teck Coal	FR_UFR1_WEK_2021-09-1	
GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-10-12_	
CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-10-12	
LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-10-19_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_WEK_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_WEK_2021-09	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-10-12_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-10-12	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-10-12	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2021_Q4_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2021_Q4_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-10-19	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-10-19_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-10-19_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	

EC Alga Growth Inhibition Test — **Nautilus Environmental**

Analysis ID: 05-4432-7464 **Endpoint:** Cell Yield **CETIS Version:** CETISv1.9.4
Analyzed: 26 Nov-21 14:13 **Analysis:** Nonparametric-Multiple Comparison **Status Level:** 1

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C < T	GH_ER2 passed cell yield	11.71%
		CM_MC1 passed cell yield	11.71%
		LC_SLC passed cell yield	11.71%
		FR_FRABCH passed cell yield	11.71%
		FR_FRCP1 passed cell yield	11.71%
		GH_FR1 passed cell yield	11.71%
		GH_ERC passed cell yield	11.71%
		CM_MC2 passed cell yield	11.71%
		EV_MC2 passed cell yield	11.71%
		EV_HC1 passed cell yield	11.71%
		LC_DCDS passed cell yield	11.71%
		LC_LC3 passed cell yield	11.71%
		LC_LC5 passed cell yield	11.71%
		LC_LCDSSLCC passed cell yield	11.71%

Wilcoxon/Bonferroni Adj Test

Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)
Site Control (FR-UFR1)		GH_ER2	60.5	n/a	2	14	Exact	1.0000	Non-Significant Effect
		CM_MC1	81	n/a	0	14	Exact	1.0000	Non-Significant Effect
		LC_SLC	72.5	n/a	1	14	Exact	1.0000	Non-Significant Effect
		FR_FRABCH	42	n/a	0	10	Exact	1.0000	Non-Significant Effect
		FR_FRCP1	40	n/a	1	10	Exact	1.0000	Non-Significant Effect
		GH_FR1	42	n/a	0	10	Exact	1.0000	Non-Significant Effect
		GH_ERC	42	n/a	0	10	Exact	1.0000	Non-Significant Effect
		CM_MC2	42	n/a	0	10	Exact	1.0000	Non-Significant Effect
		EV_MC2	42	n/a	0	10	Exact	1.0000	Non-Significant Effect
		EV_HC1	42	n/a	0	10	Exact	1.0000	Non-Significant Effect
		LC_DCDS	42	n/a	0	10	Exact	1.0000	Non-Significant Effect
		LC_LC3	42	n/a	0	10	Exact	1.0000	Non-Significant Effect
		LC_LC5	42	n/a	0	10	Exact	1.0000	Non-Significant Effect
		LC_LCDSSLCC	42	n/a	0	10	Exact	1.0000	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	2.187	3.288	1.0000	No Outliers Detected
Control Trend	Mann-Kendall Trend Test	2.187		0.5484	Non-Significant Trend in Controls

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	7028.03	502.002	14	14.14	<1.0E-37	Significant Effect
Error	2165.12	35.4939	61			
Total	9193.16		75			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance Test	7.796	29.14	0.8997	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9367	0.9559	9.1E-04	Non-Normal Distribution

EC Alga Growth Inhibition Test — **Nautilus Environmental**

Analysis ID: 05-4432-7464 **Endpoint:** Cell Yield **CETIS Version:** CETISv1.9.4
Analyzed: 26 Nov-21 14:13 **Analysis:** Nonparametric-Multiple Comparison **Status Level:** 1

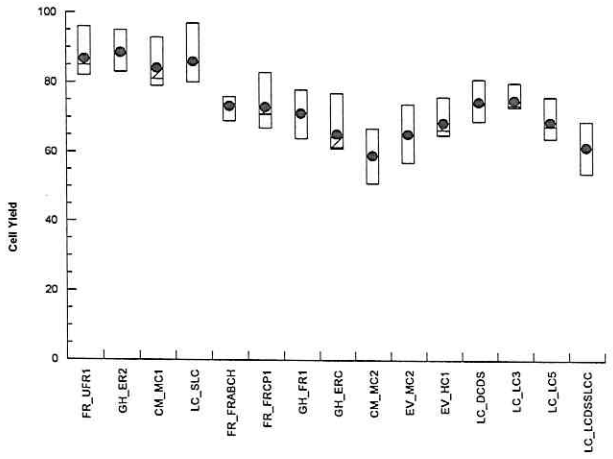
Cell Yield Summary

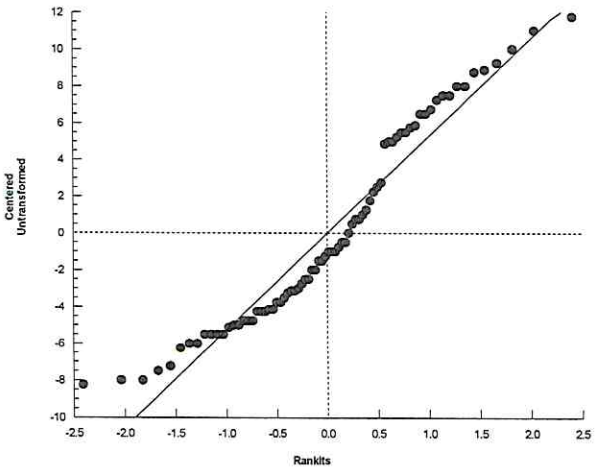
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
FR_UFR1	XC	8	86.75	82.59	90.91	85	82	96	1.76	5.74%	0.00%
GH_ER2		8	88.5	84.66	92.34	88	83	95	1.626	5.20%	-2.02%
CM_MC1		8	84.12	79.47	88.78	81	79	93	1.968	6.62%	3.03%
LC_SLC		8	86	81.17	90.83	85.5	80	97	2.044	6.72%	0.86%
FR_FRABCH		4	73.25	68.5	78	74	69	76	1.493	4.08%	15.56%
FR_FRCP1		4	73	61.9	84.1	71	67	83	3.488	9.56%	15.85%
GH_FR1		4	71.25	61.94	80.56	71.5	64	78	2.926	8.21%	17.87%
GH_ERC		4	65.25	52.76	77.74	61.5	61	77	3.924	12.03%	24.78%
CM_MC2		4	59	44.3	73.7	59	51	67	4.619	15.66%	31.99%
EV_MC2		4	65.25	51.72	78.78	65	57	74	4.25	13.03%	24.78%
EV_HC1		4	68.5	60.44	76.56	66.5	65	76	2.533	7.40%	21.04%
LC_DCDS		4	74.5	66.65	82.35	74	69	81	2.466	6.62%	14.12%
LC_LC3		4	75	69.64	80.36	73.5	73	80	1.683	4.49%	13.54%
LC_LC5		4	68.75	59.44	78.06	67.5	64	76	2.926	8.51%	20.75%
LC_LCDSSLCC		4	61.5	49.42	73.58	61.5	54	69	3.797	12.35%	29.11%

Cell Yield Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
FR_UFR1	XC	84	92	82	86	83	83	88	96
GH_ER2		83	95	91	83	86	94	89	87
CM_MC1		90	81	80	79	81	89	93	80
LC_SLC		81	87	91	97	80	86	81	85
FR_FRABCH		74	74	69	76				
FR_FRCP1		70	67	72	83				
GH_FR1		64	73	70	78				
GH_ERC		61	61	62	77				
CM_MC2		51	51	67	67				
EV_MC2		57	59	74	71				
EV_HC1		66	65	67	76				
LC_DCDS		74	69	74	81				
LC_LC3		74	73	80	73				
LC_LC5		64	71	76	64				
LC_LCDSSLCC		54	56	69	67				

Graphics





EC Alga Growth Inhibition Test — **Nautilus Environmental**

Analysis ID:	08-4929-0324	**Endpoint:**	Cell Yield	**CETIS Version:**	CETISv1.9.4
Analyzed:	26 Nov-21 14:14	**Analysis:**	Nonparametric-Multiple Comparison	**Status Level:**	1
Batch ID:	05-1185-6587	**Test Type:**	Cell Growth	**Analyst:**	Sierra Klueppel
Start Date:	14 Oct-21 17:00	**Protocol:**	EC/EPS 1/RM/25	**Diluent:**	Deionized Water + nutrients
Ending Date:	17 Oct-21 17:00	**Species:**	Pseudokirchneriella subcapitata	**Brine:**	
Test Length:	72h	**Taxon:**	Chlorophyta	**Source:**	In-House Culture **Age:** 6d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
FR_UFR1	19-8746-8946	12 Oct-21 11:07	13 Oct-21 11:53	54h (0 °C)	Teck Coal	
GH_ER2	20-2628-4137	12 Oct-21 10:50	13 Oct-21 11:30	54h (0 °C)		
CM_MC1	18-3559-2852	12 Oct-21 13:20	13 Oct-21 11:30	52h (0.1 °C)		
LC_SLC	08-7937-3726	12 Oct-21 11:00	13 Oct-21 11:30	54h (2.9 °C)		
FR_FRABCH	18-7592-7020	12 Oct-21 11:20	13 Oct-21 11:53	54h (0 °C)		
FR_FRCP1	10-3969-8000	12 Oct-21 11:48	13 Oct-21 11:53	53h (1.3 °C)		
GH_FR1	11-8224-4576	12 Oct-21 10:00	13 Oct-21 11:30	55h (0 °C)		
GH_ERC	00-1276-7572	12 Oct-21 11:50	13 Oct-21 11:30	53h (0 °C)		
CM_MC2	03-9569-8600	12 Oct-21 12:47	13 Oct-21 11:30	52h (1.3 °C)		
EV_MC2	13-1923-7722	12 Oct-21 11:38	13 Oct-21 11:30	53h (0.2 °C)		
EV_HC1	18-6648-8827	12 Oct-21 10:33	13 Oct-21 11:30	54h (0 °C)		
LC_DCDS	17-4710-4100	12 Oct-21	13 Oct-21 11:30	65h (1.7 °C)		
LC_LC3	20-0894-5906	12 Oct-21 12:00	13 Oct-21 11:30	53h (8.8 °C)		
LC_LC5	14-5637-1032	12 Oct-21 13:30	13 Oct-21 11:30	52h (2.6 °C)		
LC_LCDSSLCC	06-4184-4349	12 Oct-21 12:30	13 Oct-21 11:30	52h (4.7 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_UFR1	Water Sample	Teck Coal	FR_UFR1_WEK_2021-09-1	
GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-10-12_	
CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-10-12	
LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-10-19_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_WEK_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_WEK_2021-09	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-10-12_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-10-12	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-10-12	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2021_Q4_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2021_Q4_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-10-19	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-10-19_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-10-19_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	

Analyst: SKM QA: Dec-3/21

EC Alga Growth Inhibition Test **Nautilus Environmental**

Analysis ID: 08-4929-0324 **Endpoint:** Cell Yield **CETIS Version:** CETISv1.9.4
Analyzed: 26 Nov-21 14:14 **Analysis:** Nonparametric-Multiple Comparison **Status Level:** 1

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	FR_UFR1 passed cell yield	11.48%
		CM_MC1 passed cell yield	11.48%
		LC_SLC passed cell yield	11.48%
		FR_FRABCH failed cell yield	11.48%
		FR_FRCP1 passed cell yield	11.48%
		GH_FR1 failed cell yield	11.48%
		GH_ERC failed cell yield	11.48%
		CM_MC2 failed cell yield	11.48%
		EV_MC2 failed cell yield	11.48%
		EV_HC1 failed cell yield	11.48%
		LC_DCDS failed cell yield	11.48%
		LC_LC3 failed cell yield	11.48%
		LC_LC5 failed cell yield	11.48%
		LC_LCDSSLCC failed cell yield	11.48%

Wilcoxon/Bonferroni Adj Test

Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)
Site Control (GH-ER2)		FR_UFR1	60.5	n/a	2	14	Exact	1.0000	Non-Significant Effect
		CM_MC1	51.5	n/a	1	14	Exact	0.6059	Non-Significant Effect
		LC_SLC	57.5	n/a	3	14	Exact	1.0000	Non-Significant Effect
		FR_FRABCH*	10	n/a	0	10	Exact	0.0283	Significant Effect
		FR_FRCP1	11	n/a	1	10	Exact	0.0848	Non-Significant Effect
		GH_FR1*	10	n/a	0	10	Exact	0.0283	Significant Effect
		GH_ERC*	10	n/a	0	10	Exact	0.0283	Significant Effect
		CM_MC2*	10	n/a	0	10	Exact	0.0283	Significant Effect
		EV_MC2*	10	n/a	0	10	Exact	0.0283	Significant Effect
		EV_HC1*	10	n/a	0	10	Exact	0.0283	Significant Effect
		LC_DCDS*	10	n/a	0	10	Exact	0.0283	Significant Effect
		LC_LC3*	10	n/a	0	10	Exact	0.0283	Significant Effect
		LC_LC5*	10	n/a	0	10	Exact	0.0283	Significant Effect
		LC_LCDSSLCC*	10	n/a	0	10	Exact	0.0283	Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	2.187	3.288	1.0000	No Outliers Detected
Control Trend	Mann-Kendall Trend Test	2.187		1.0000	Non-Significant Trend in Controls

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	7028.03	502.002	14	14.14	<1.0E-37	Significant Effect
Error	2165.12	35.4939	61			
Total	9193.16		75			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance Test	7.796	29.14	0.8997	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9367	0.9559	9.1E-04	Non-Normal Distribution

EC Alga Growth Inhibition Test — **Nautilus Environmental**

Analysis ID: 08-4929-0324 **Endpoint:** Cell Yield **CETIS Version:** CETISv1.9.4
Analyzed: 26 Nov-21 14:14 **Analysis:** Nonparametric-Multiple Comparison **Status Level:** 1

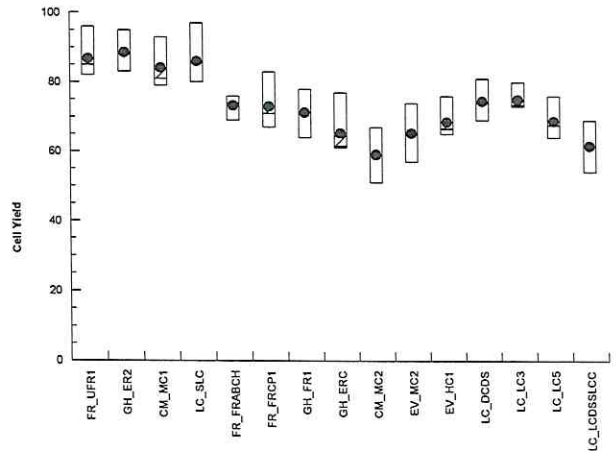
Cell Yield Summary

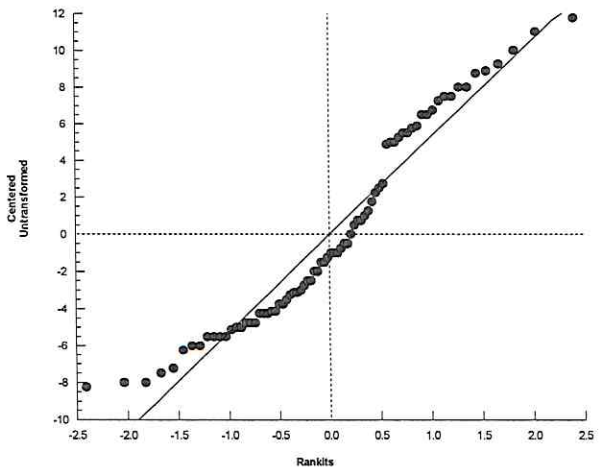
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
FR_UFR1		8	86.75	82.59	90.91	85	82	96	1.76	5.74%	0.00%
GH_ER2	XC	8	88.5	84.66	92.34	88	83	95	1.626	5.20%	-2.02%
CM_MC1		8	84.12	79.47	88.78	81	79	93	1.968	6.62%	3.03%
LC_SLC		8	86	81.17	90.83	85.5	80	97	2.044	6.72%	0.86%
FR_FRABCH		4	73.25	68.5	78	74	69	76	1.493	4.08%	15.56%
FR_FRCP1		4	73	61.9	84.1	71	67	83	3.488	9.56%	15.85%
GH_FR1		4	71.25	61.94	80.56	71.5	64	78	2.926	8.21%	17.87%
GH_ERC		4	65.25	52.76	77.74	61.5	61	77	3.924	12.03%	24.78%
CM_MC2		4	59	44.3	73.7	59	51	67	4.619	15.66%	31.99%
EV_MC2		4	65.25	51.72	78.78	65	57	74	4.25	13.03%	24.78%
EV_HC1		4	68.5	60.44	76.56	66.5	65	76	2.533	7.40%	21.04%
LC_DCDS		4	74.5	66.65	82.35	74	69	81	2.466	6.62%	14.12%
LC_LC3		4	75	69.64	80.36	73.5	73	80	1.683	4.49%	13.54%
LC_LC5		4	68.75	59.44	78.06	67.5	64	76	2.926	8.51%	20.75%
LC_LCDSSLCC		4	61.5	49.42	73.58	61.5	54	69	3.797	12.35%	29.11%

Cell Yield Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
FR_UFR1		84	92	82	86	83	83	88	96
GH_ER2	XC	83	95	91	83	86	94	89	87
CM_MC1		90	81	80	79	81	89	93	80
LC_SLC		81	87	91	97	80	86	81	85
FR_FRABCH		74	74	69	76				
FR_FRCP1		70	67	72	83				
GH_FR1		64	73	70	78				
GH_ERC		61	61	62	77				
CM_MC2		51	51	67	67				
EV_MC2		57	59	74	71				
EV_HC1		66	65	67	76				
LC_DCDS		74	69	74	81				
LC_LC3		74	73	80	73				
LC_LC5		64	71	76	64				
LC_LCDSSLCC		54	56	69	67				

Graphics





EC Alga Growth Inhibition Test — **Nautilus Environmental**

Analysis ID:	20-7997-6091	**Endpoint:**	Cell Yield	**CETIS Version:**	CETISv1.9.4
Analyzed:	26 Nov-21 14:14	**Analysis:**	Nonparametric-Multiple Comparison	**Status Level:**	1
Batch ID:	05-1185-6587	**Test Type:**	Cell Growth	**Analyst:**	Sierra Klueppel
Start Date:	14 Oct-21 17:00	**Protocol:**	EC/EPS 1/RM/25	**Diluent:**	Deionized Water + nutrients
Ending Date:	17 Oct-21 17:00	**Species:**	Pseudokirchneriella subcapitata	**Brine:**	
Test Length:	72h	**Taxon:**	Chlorophyta	**Source:**	In-House Culture **Age:** 6d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
FR_UFR1	19-8746-8946	12 Oct-21 11:07	13 Oct-21 11:53	54h (0 °C)	Teck Coal	
GH_ER2	20-2628-4137	12 Oct-21 10:50	13 Oct-21 11:30	54h (0 °C)		
CM_MC1	18-3559-2852	12 Oct-21 13:20	13 Oct-21 11:30	52h (0.1 °C)		
LC_SLC	08-7937-3726	12 Oct-21 11:00	13 Oct-21 11:30	54h (2.9 °C)		
FR_FRABCH	18-7592-7020	12 Oct-21 11:20	13 Oct-21 11:53	54h (0 °C)		
FR_FRCP1	10-3969-8000	12 Oct-21 11:48	13 Oct-21 11:53	53h (1.3 °C)		
GH_FR1	11-8224-4576	12 Oct-21 10:00	13 Oct-21 11:30	55h (0 °C)		
GH_ERC	00-1276-7572	12 Oct-21 11:50	13 Oct-21 11:30	53h (0 °C)		
CM_MC2	03-9569-8600	12 Oct-21 12:47	13 Oct-21 11:30	52h (1.3 °C)		
EV_MC2	13-1923-7722	12 Oct-21 11:38	13 Oct-21 11:30	53h (0.2 °C)		
EV_HC1	18-6648-8827	12 Oct-21 10:33	13 Oct-21 11:30	54h (0 °C)		
LC_DCDS	17-4710-4100	12 Oct-21	13 Oct-21 11:30	65h (1.7 °C)		
LC_LC3	20-0894-5906	12 Oct-21 12:00	13 Oct-21 11:30	53h (8.8 °C)		
LC_LC5	14-5637-1032	12 Oct-21 13:30	13 Oct-21 11:30	52h (2.6 °C)		
LC_LCDSSLCC	06-4184-4349	12 Oct-21 12:30	13 Oct-21 11:30	52h (4.7 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_UFR1	Water Sample	Teck Coal	FR_UFR1_WEK_2021-09-1	
GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-10-12_	
CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-10-12	
LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-10-19_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_WEK_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_WEK_2021-09	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-10-12_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-10-12	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-10-12	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2021_Q4_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2021_Q4_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-10-19	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-10-19_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-10-19_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	

EC Alga Growth Inhibition Test — **Nautilus Environmental**

Analysis ID:	20-7997-6091	**Endpoint:**	Cell Yield	**CETIS Version:**	CETISv1.9.4
Analyzed:	26 Nov-21 14:14	**Analysis:**	Nonparametric-Multiple Comparison	**Status Level:**	1

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C < T	FR_UFR1 passed cell yield	11.48%
		CM_MC1 passed cell yield	11.48%
		LC_SLC passed cell yield	11.48%
		FR_FRABCH passed cell yield	11.48%
		FR_FRCP1 passed cell yield	11.48%
		GH_FR1 passed cell yield	11.48%
		GH_ERC passed cell yield	11.48%
		CM_MC2 passed cell yield	11.48%
		EV_MC2 passed cell yield	11.48%
		EV_HC1 passed cell yield	11.48%
		LC_DCDS passed cell yield	11.48%
		LC_LC3 passed cell yield	11.48%
		LC_LC5 passed cell yield	11.48%
		LC_LCDSSLCC passed cell yield	11.48%

Wilcoxon/Bonferroni Adj Test

Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)
Site Control (GH-ER2)		FR_UFR1	75.5	n/a	2	14	Exact	1.0000	Non-Significant Effect
		CM_MC1	84.5	n/a	1	14	Exact	1.0000	Non-Significant Effect
		LC_SLC	78.5	n/a	3	14	Exact	1.0000	Non-Significant Effect
		FR_FRABCH	42	n/a	0	10	Exact	1.0000	Non-Significant Effect
		FR_FRCP1	41	n/a	1	10	Exact	1.0000	Non-Significant Effect
		GH_FR1	42	n/a	0	10	Exact	1.0000	Non-Significant Effect
		GH_ERC	42	n/a	0	10	Exact	1.0000	Non-Significant Effect
		CM_MC2	42	n/a	0	10	Exact	1.0000	Non-Significant Effect
		EV_MC2	42	n/a	0	10	Exact	1.0000	Non-Significant Effect
		EV_HC1	42	n/a	0	10	Exact	1.0000	Non-Significant Effect
		LC_DCDS	42	n/a	0	10	Exact	1.0000	Non-Significant Effect
		LC_LC3	42	n/a	0	10	Exact	1.0000	Non-Significant Effect
		LC_LC5	42	n/a	0	10	Exact	1.0000	Non-Significant Effect
		LC_LCDSSLCC	42	n/a	0	10	Exact	1.0000	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	2.187	3.288	1.0000	No Outliers Detected
Control Trend	Mann-Kendall Trend Test	2.187		1.0000	Non-Significant Trend in Controls

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	7028.03	502.002	14	14.14	<1.0E-37	Significant Effect
Error	2165.12	35.4939	61			
Total	9193.16		75			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance Test	7.796	29.14	0.8997	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9367	0.9559	9.1E-04	Non-Normal Distribution

EC Alga Growth Inhibition Test — **Nautilus Environmental**

Analysis ID:	20-7997-6091	**Endpoint:**	Cell Yield	**CETIS Version:**	CETISv1.9.4
Analyzed:	26 Nov-21 14:14	**Analysis:**	Nonparametric-Multiple Comparison	**Status Level:**	1

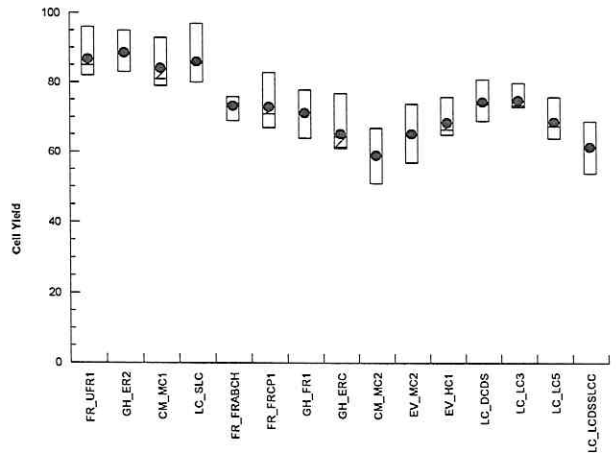
Cell Yield Summary

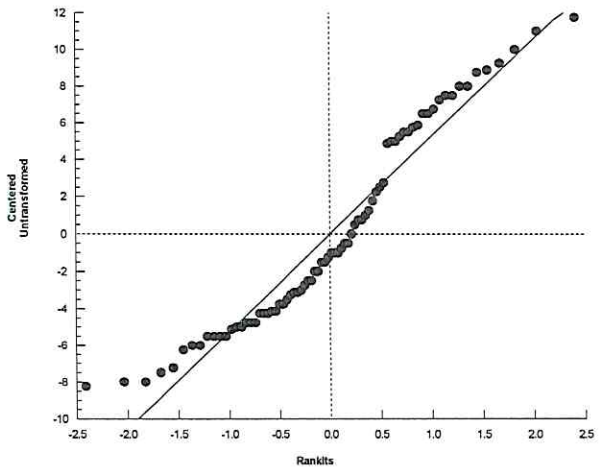
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
FR_UFR1		8	86.75	82.59	90.91	85	82	96	1.76	5.74%	0.00%
GH_ER2	XC	8	88.5	84.66	92.34	88	83	95	1.626	5.20%	-2.02%
CM_MC1		8	84.12	79.47	88.78	81	79	93	1.968	6.62%	3.03%
LC_SLC		8	86	81.17	90.83	85.5	80	97	2.044	6.72%	0.86%
FR_FRABCH		4	73.25	68.5	78	74	69	76	1.493	4.08%	15.56%
FR_FRCP1		4	73	61.9	84.1	71	67	83	3.488	9.56%	15.85%
GH_FR1		4	71.25	61.94	80.56	71.5	64	78	2.926	8.21%	17.87%
GH_ERC		4	65.25	52.76	77.74	61.5	61	77	3.924	12.03%	24.78%
CM_MC2		4	59	44.3	73.7	59	51	67	4.619	15.66%	31.99%
EV_MC2		4	65.25	51.72	78.78	65	57	74	4.25	13.03%	24.78%
EV_HC1		4	68.5	60.44	76.56	66.5	65	76	2.533	7.40%	21.04%
LC_DCDS		4	74.5	66.65	82.35	74	69	81	2.466	6.62%	14.12%
LC_LC3		4	75	69.64	80.36	73.5	73	80	1.683	4.49%	13.54%
LC_LC5		4	68.75	59.44	78.06	67.5	64	76	2.926	8.51%	20.75%
LC_LCDSSLCC		4	61.5	49.42	73.58	61.5	54	69	3.797	12.35%	29.11%

Cell Yield Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
FR_UFR1		84	92	82	86	83	83	88	96
GH_ER2	XC	83	95	91	83	86	94	89	87
CM_MC1		90	81	80	79	81	89	93	80
LC_SLC		81	87	91	97	80	86	81	85
FR_FRABCH		74	74	69	76				
FR_FRCP1		70	67	72	83				
GH_FR1		64	73	70	78				
GH_ERC		61	61	62	77				
CM_MC2		51	51	67	67				
EV_MC2		57	59	74	71				
EV_HC1		66	65	67	76				
LC_DCDS		74	69	74	81				
LC_LC3		74	73	80	73				
LC_LC5		64	71	76	64				
LC_LCDSSLCC		54	56	69	67				

Graphics





EC Alga Growth Inhibition Test — **Nautilus Environmental**

Analysis ID:	02-4455-1688	**Endpoint:**	Cell Yield	**CETIS Version:**	CETISv1.9.4
Analyzed:	26 Nov-21 14:14	**Analysis:**	Nonparametric-Multiple Comparison	**Status Level:**	1
Batch ID:	05-1185-6587	**Test Type:**	Cell Growth	**Analyst:**	Sierra Klueppel
Start Date:	14 Oct-21 17:00	**Protocol:**	EC/EPS 1/RM/25	**Diluent:**	Deionized Water + nutrients
Ending Date:	17 Oct-21 17:00	**Species:**	Pseudokirchneriella subcapitata	**Brine:**	
Test Length:	72h	**Taxon:**	Chlorophyta	**Source:**	In-House Culture **Age:** 6d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
FR_UFR1	19-8746-8946	12 Oct-21 11:07	13 Oct-21 11:53	54h (0 °C)	Teck Coal	
GH_ER2	20-2628-4137	12 Oct-21 10:50	13 Oct-21 11:30	54h (0 °C)		
CM_MC1	18-3559-2852	12 Oct-21 13:20	13 Oct-21 11:30	52h (0.1 °C)		
LC_SLC	08-7937-3726	12 Oct-21 11:00	13 Oct-21 11:30	54h (2.9 °C)		
FR_FRABCH	18-7592-7020	12 Oct-21 11:20	13 Oct-21 11:53	54h (0 °C)		
FR_FRCP1	10-3969-8000	12 Oct-21 11:48	13 Oct-21 11:53	53h (1.3 °C)		
GH_FR1	11-8224-4576	12 Oct-21 10:00	13 Oct-21 11:30	55h (0 °C)		
GH_ERC	00-1276-7572	12 Oct-21 11:50	13 Oct-21 11:30	53h (0 °C)		
CM_MC2	03-9569-8600	12 Oct-21 12:47	13 Oct-21 11:30	52h (1.3 °C)		
EV_MC2	13-1923-7722	12 Oct-21 11:38	13 Oct-21 11:30	53h (0.2 °C)		
EV_HC1	18-6648-8827	12 Oct-21 10:33	13 Oct-21 11:30	54h (0 °C)		
LC_DCDS	17-4710-4100	12 Oct-21	13 Oct-21 11:30	65h (1.7 °C)		
LC_LC3	20-0894-5906	12 Oct-21 12:00	13 Oct-21 11:30	53h (8.8 °C)		
LC_LC5	14-5637-1032	12 Oct-21 13:30	13 Oct-21 11:30	52h (2.6 °C)		
LC_LCDSSLCC	06-4184-4349	12 Oct-21 12:30	13 Oct-21 11:30	52h (4.7 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_UFR1	Water Sample	Teck Coal	FR_UFR1_WEK_2021-09-1	
GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-10-12_	
CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-10-12	
LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-10-19_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_WEK_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_WEK_2021-09	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-10-12_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-10-12	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-10-12	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2021_Q4_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2021_Q4_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-10-19	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-10-19_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-10-19_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	

EC Alga Growth Inhibition Test — **Nautilus Environmental**

Analysis ID: 02-4455-1688 **Endpoint:** Cell Yield **CETIS Version:** CETISv1.9.4
Analyzed: 26 Nov-21 14:14 **Analysis:** Nonparametric-Multiple Comparison **Status Level:** 1

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	FR_UFR1 passed cell yield	12.07%
		GH_ER2 passed cell yield	12.07%
		LC_SLC passed cell yield	12.07%
		FR_FRABCH failed cell yield	12.07%
		FR_FRCP1 passed cell yield	12.07%
		GH_FR1 failed cell yield	12.07%
		GH_ERC failed cell yield	12.07%
		CM_MC2 failed cell yield	12.07%
		EV_MC2 failed cell yield	12.07%
		EV_HC1 failed cell yield	12.07%
		LC_DCDS passed cell yield	12.07%
		LC_LC3 passed cell yield	12.07%
		LC_LC5 failed cell yield	12.07%
		LC_LCDSSLCC failed cell yield	12.07%

Wilcoxon/Bonferroni Adj Test

Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)
Site Control (CM_MC1)		FR_UFR1	81	n/a	0	14	Exact	1.0000	Non-Significant Effect
		GH_ER2	84.5	n/a	1	14	Exact	1.0000	Non-Significant Effect
		LC_SLC	76	n/a	2	14	Exact	1.0000	Non-Significant Effect
		FR_FRABCH*	10	n/a	0	10	Exact	0.0283	Significant Effect
		FR_FRCP1	15	n/a	0	10	Exact	0.4525	Non-Significant Effect
		GH_FR1*	10	n/a	0	10	Exact	0.0283	Significant Effect
		GH_ERC*	10	n/a	0	10	Exact	0.0283	Significant Effect
		CM_MC2*	10	n/a	0	10	Exact	0.0283	Significant Effect
		EV_MC2*	10	n/a	0	10	Exact	0.0283	Significant Effect
		EV_HC1*	10	n/a	0	10	Exact	0.0283	Significant Effect
		LC_DCDS	14	n/a	1	10	Exact	0.2828	Non-Significant Effect
		LC_LC3	12	n/a	1	10	Exact	0.1131	Non-Significant Effect
		LC_LC5*	10	n/a	0	10	Exact	0.0283	Significant Effect
		LC_LCDSSLCC*	10	n/a	0	10	Exact	0.0283	Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	2.187	3.288	1.0000	No Outliers Detected
Control Trend	Mann-Kendall Trend Test	2.187		0.9061	Non-Significant Trend in Controls

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	7028.03	502.002	14	14.14	<1.0E-37	Significant Effect
Error	2165.12	35.4939	61			
Total	9193.16		75			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance Test	7.796	29.14	0.8997	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9367	0.9559	9.1E-04	Non-Normal Distribution

EC Alga Growth Inhibition Test — **Nautilus Environmental**

Analysis ID: 02-4455-1688 **Endpoint:** Cell Yield **CETIS Version:** CETISv1.9.4
Analyzed: 26 Nov-21 14:14 **Analysis:** Nonparametric-Multiple Comparison **Status Level:** 1

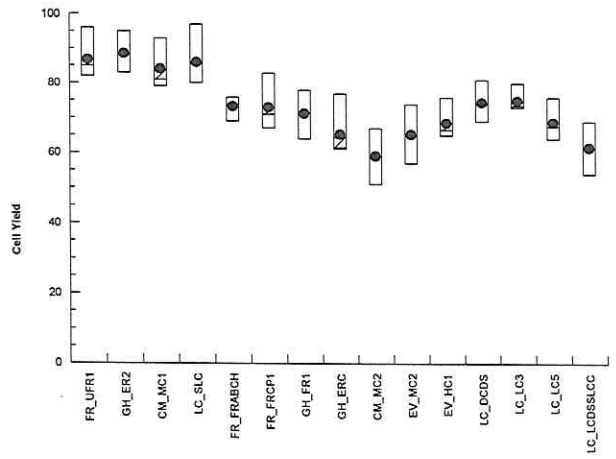
Cell Yield Summary

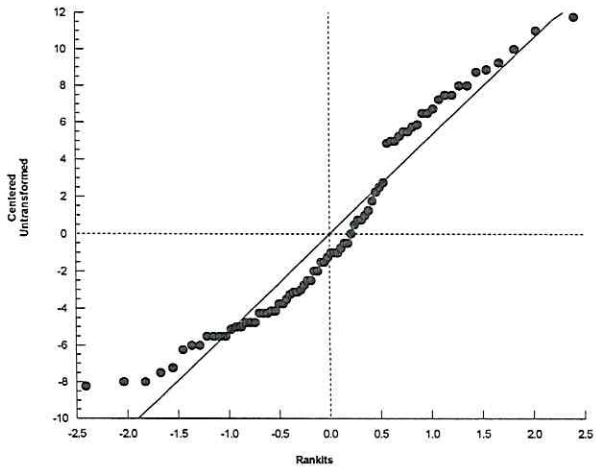
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
FR_UFR1		8	86.75	82.59	90.91	85	82	96	1.76	5.74%	0.00%
GH_ER2		8	88.5	84.66	92.34	88	83	95	1.626	5.20%	-2.02%
CM_MC1	XC	8	84.12	79.47	88.78	81	79	93	1.968	6.62%	3.03%
LC_SLC		8	86	81.17	90.83	85.5	80	97	2.044	6.72%	0.86%
FR_FRABCH		4	73.25	68.5	78	74	69	76	1.493	4.08%	15.56%
FR_FRCP1		4	73	61.9	84.1	71	67	83	3.488	9.56%	15.85%
GH_FR1		4	71.25	61.94	80.56	71.5	64	78	2.926	8.21%	17.87%
GH_ERC		4	65.25	52.76	77.74	61.5	61	77	3.924	12.03%	24.78%
CM_MC2		4	59	44.3	73.7	59	51	67	4.619	15.66%	31.99%
EV_MC2		4	65.25	51.72	78.78	65	57	74	4.25	13.03%	24.78%
EV_HC1		4	68.5	60.44	76.56	66.5	65	76	2.533	7.40%	21.04%
LC_DCDS		4	74.5	66.65	82.35	74	69	81	2.466	6.62%	14.12%
LC_LC3		4	75	69.64	80.36	73.5	73	80	1.683	4.49%	13.54%
LC_LC5		4	68.75	59.44	78.06	67.5	64	76	2.926	8.51%	20.75%
LC_LCDSSLCC		4	61.5	49.42	73.58	61.5	54	69	3.797	12.35%	29.11%

Cell Yield Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
FR_UFR1		84	92	82	86	83	83	88	96
GH_ER2		83	95	91	83	86	94	89	87
CM_MC1	XC	90	81	80	79	81	89	93	80
LC_SLC		81	87	91	97	80	86	81	85
FR_FRABCH		74	74	69	76				
FR_FRCP1		70	67	72	83				
GH_FR1		64	73	70	78				
GH_ERC		61	61	62	77				
CM_MC2		51	51	67	67				
EV_MC2		57	59	74	71				
EV_HC1		66	65	67	76				
LC_DCDS		74	69	74	81				
LC_LC3		74	73	80	73				
LC_LC5		64	71	76	64				
LC_LCDSSLCC		54	56	69	67				

Graphics





EC Alga Growth Inhibition Test **Nautilus Environmental**

Analysis ID:	08-5281-5958	**Endpoint:**	Cell Yield	**CETIS Version:**	CETISv1.9.4
Analyzed:	26 Nov-21 14:14	**Analysis:**	Nonparametric-Multiple Comparison	**Status Level:**	1
Batch ID:	05-1185-6587	**Test Type:**	Cell Growth	**Analyst:**	Sierra Klueppel
Start Date:	14 Oct-21 17:00	**Protocol:**	EC/EPS 1/RM/25	**Diluent:**	Deionized Water + nutrients
Ending Date:	17 Oct-21 17:00	**Species:**	Pseudokirchneriella subcapitata	**Brine:**	
Test Length:	72h	**Taxon:**	Chlorophyta	**Source:**	In-House Culture **Age:** 6d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
FR_UFR1	19-8746-8946	12 Oct-21 11:07	13 Oct-21 11:53	54h (0 °C)	Teck Coal	
GH_ER2	20-2628-4137	12 Oct-21 10:50	13 Oct-21 11:30	54h (0 °C)		
CM_MC1	18-3559-2852	12 Oct-21 13:20	13 Oct-21 11:30	52h (0.1 °C)		
LC_SLC	08-7937-3726	12 Oct-21 11:00	13 Oct-21 11:30	54h (2.9 °C)		
FR_FRABCH	18-7592-7020	12 Oct-21 11:20	13 Oct-21 11:53	54h (0 °C)		
FR_FRCP1	10-3969-8000	12 Oct-21 11:48	13 Oct-21 11:53	53h (1.3 °C)		
GH_FR1	11-8224-4576	12 Oct-21 10:00	13 Oct-21 11:30	55h (0 °C)		
GH_ERC	00-1276-7572	12 Oct-21 11:50	13 Oct-21 11:30	53h (0 °C)		
CM_MC2	03-9569-8600	12 Oct-21 12:47	13 Oct-21 11:30	52h (1.3 °C)		
EV_MC2	13-1923-7722	12 Oct-21 11:38	13 Oct-21 11:30	53h (0.2 °C)		
EV_HC1	18-6648-8827	12 Oct-21 10:33	13 Oct-21 11:30	54h (0 °C)		
LC_DCDS	17-4710-4100	12 Oct-21	13 Oct-21 11:30	65h (1.7 °C)		
LC_LC3	20-0894-5906	12 Oct-21 12:00	13 Oct-21 11:30	53h (8.8 °C)		
LC_LC5	14-5637-1032	12 Oct-21 13:30	13 Oct-21 11:30	52h (2.6 °C)		
LC_LCDSSLCC	06-4184-4349	12 Oct-21 12:30	13 Oct-21 11:30	52h (4.7 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_UFR1	Water Sample	Teck Coal	FR_UFR1_WEK_2021-09-1	
GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-10-12_	
CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-10-12	
LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-10-19_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_WEK_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_WEK_2021-09	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-10-12_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-10-12	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-10-12	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2021_Q4_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2021_Q4_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-10-19	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-10-19_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-10-19_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	

EC Alga Growth Inhibition Test — **Nautilus Environmental**

Analysis ID: 08-5281-5958 **Endpoint:** Cell Yield **CETIS Version:** CETISv1.9.4
Analyzed: 26 Nov-21 14:14 **Analysis:** Nonparametric-Multiple Comparison **Status Level:** 1

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C < T	FR_UFR1 passed cell yield	12.07%
		GH_ER2 passed cell yield	12.07%
		LC_SLC passed cell yield	12.07%
		FR_FRABCH passed cell yield	12.07%
		FR_FRCP1 passed cell yield	12.07%
		GH_FR1 passed cell yield	12.07%
		GH_ERC passed cell yield	12.07%
		CM_MC2 passed cell yield	12.07%
		EV_MC2 passed cell yield	12.07%
		EV_HC1 passed cell yield	12.07%
		LC_DCDS passed cell yield	12.07%
		LC_LC3 passed cell yield	12.07%
		LC_LC5 passed cell yield	12.07%
		LC_LCDSSLCC passed cell yield	12.07%

Wilcoxon/Bonferroni Adj Test

Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)
Site Control (CM-MC1)		FR_UFR1	55	n/a	0	14	Exact	1.0000	Non-Significant Effect
		GH_ER2	51.5	n/a	1	14	Exact	0.6059	Non-Significant Effect
		LC_SLC	60	n/a	2	14	Exact	1.0000	Non-Significant Effect
		FR_FRABCH	42	n/a	0	10	Exact	1.0000	Non-Significant Effect
		FR_FRCP1	37	n/a	0	10	Exact	1.0000	Non-Significant Effect
		GH_FR1	42	n/a	0	10	Exact	1.0000	Non-Significant Effect
		GH_ERC	42	n/a	0	10	Exact	1.0000	Non-Significant Effect
		CM_MC2	42	n/a	0	10	Exact	1.0000	Non-Significant Effect
		EV_MC2	42	n/a	0	10	Exact	1.0000	Non-Significant Effect
		EV_HC1	42	n/a	0	10	Exact	1.0000	Non-Significant Effect
		LC_DCDS	38	n/a	1	10	Exact	1.0000	Non-Significant Effect
		LC_LC3	40	n/a	1	10	Exact	1.0000	Non-Significant Effect
		LC_LC5	42	n/a	0	10	Exact	1.0000	Non-Significant Effect
		LC_LCDSSLCC	42	n/a	0	10	Exact	1.0000	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	2.187	3.288	1.0000	No Outliers Detected
Control Trend	Mann-Kendall Trend Test	2.187		0.9061	Non-Significant Trend in Controls

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	7028.03	502.002	14	14.14	<1.0E-37	Significant Effect
Error	2165.12	35.4939	61			
Total	9193.16		75			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance Test	7.796	29.14	0.8997	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9367	0.9559	9.1E-04	Non-Normal Distribution

EC Alga Growth Inhibition Test — **Nautilus Environmental**

Analysis ID: 08-5281-5958 **Endpoint:** Cell Yield **CETIS Version:** CETISv1.9.4
Analyzed: 26 Nov-21 14:14 **Analysis:** Nonparametric-Multiple Comparison **Status Level:** 1

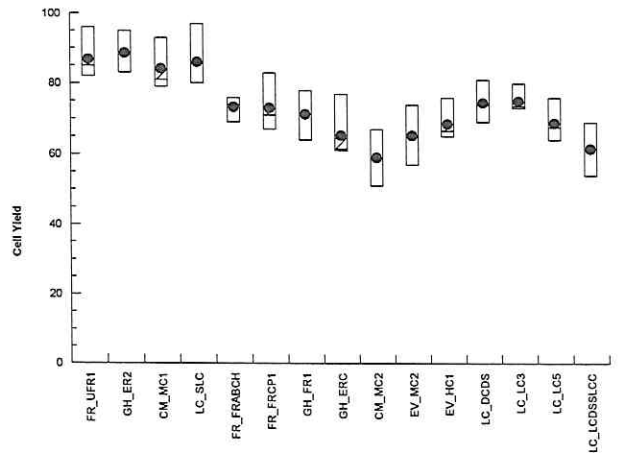
Cell Yield Summary

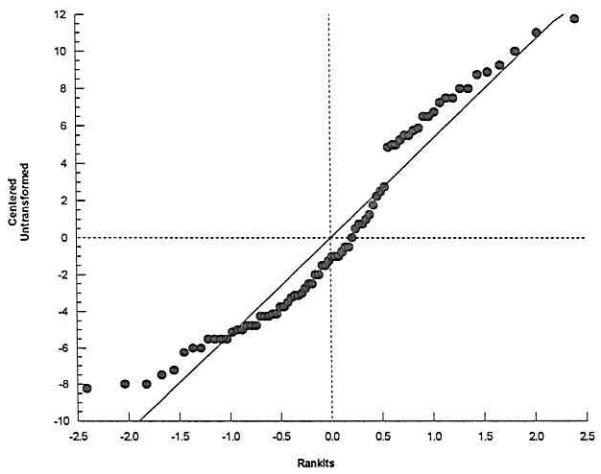
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
FR_UFR1		8	86.75	82.59	90.91	85	82	96	1.76	5.74%	0.00%
GH_ER2		8	88.5	84.66	92.34	88	83	95	1.626	5.20%	-2.02%
CM_MC1	XC	8	84.12	79.47	88.78	81	79	93	1.968	6.62%	3.03%
LC_SLC		8	86	81.17	90.83	85.5	80	97	2.044	6.72%	0.86%
FR_FRABCH		4	73.25	68.5	78	74	69	76	1.493	4.08%	15.56%
FR_FRCP1		4	73	61.9	84.1	71	67	83	3.488	9.56%	15.85%
GH_FR1		4	71.25	61.94	80.56	71.5	64	78	2.926	8.21%	17.87%
GH_ERC		4	65.25	52.76	77.74	61.5	61	77	3.924	12.03%	24.78%
CM_MC2		4	59	44.3	73.7	59	51	67	4.619	15.66%	31.99%
EV_MC2		4	65.25	51.72	78.78	65	57	74	4.25	13.03%	24.78%
EV_HC1		4	68.5	60.44	76.56	66.5	65	76	2.533	7.40%	21.04%
LC_DCDS		4	74.5	66.65	82.35	74	69	81	2.466	6.62%	14.12%
LC_LC3		4	75	69.64	80.36	73.5	73	80	1.683	4.49%	13.54%
LC_LC5		4	68.75	59.44	78.06	67.5	64	76	2.926	8.51%	20.75%
LC_LCDSSLCC		4	61.5	49.42	73.58	61.5	54	69	3.797	12.35%	29.11%

Cell Yield Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
FR_UFR1		84	92	82	86	83	83	88	96
GH_ER2		83	95	91	83	86	94	89	87
CM_MC1	XC	90	81	80	79	81	89	93	80
LC_SLC		81	87	91	97	80	86	81	85
FR_FRABCH		74	74	69	76				
FR_FRCP1		70	67	72	83				
GH_FR1		64	73	70	78				
GH_ERC		61	61	62	77				
CM_MC2		51	51	67	67				
EV_MC2		57	59	74	71				
EV_HC1		66	65	67	76				
LC_DCDS		74	69	74	81				
LC_LC3		74	73	80	73				
LC_LC5		64	71	76	64				
LC_LCDSSLCC		54	56	69	67				

Graphics





EC Alga Growth Inhibition Test

Nautilus Environmental

Analysis ID:	07-4610-9638	**Endpoint:**	Cell Yield	**CETIS Version:**	CETISv1.9.4
Analyzed:	26 Nov-21 14:15	**Analysis:**	Nonparametric-Multiple Comparison	**Status Level:**	1
Batch ID:	05-1185-6587	**Test Type:**	Cell Growth	**Analyst:**	Sierra Klueppel
Start Date:	14 Oct-21 17:00	**Protocol:**	EC/EPS 1/RM/25	**Diluent:**	Deionized Water + nutrients
Ending Date:	17 Oct-21 17:00	**Species:**	Pseudokirchneriella subcapitata	**Brine:**	
Test Length:	72h	**Taxon:**	Chlorophyta	**Source:**	In-House Culture **Age:** 6d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
FR_UFR1	19-8746-8946	12 Oct-21 11:07	13 Oct-21 11:53	54h (0 °C)	Teck Coal	
GH_ER2	20-2628-4137	12 Oct-21 10:50	13 Oct-21 11:30	54h (0 °C)		
CM_MC1	18-3559-2852	12 Oct-21 13:20	13 Oct-21 11:30	52h (0.1 °C)		
LC_SLC	08-7937-3726	12 Oct-21 11:00	13 Oct-21 11:30	54h (2.9 °C)		
FR_FRABCH	18-7592-7020	12 Oct-21 11:20	13 Oct-21 11:53	54h (0 °C)		
FR_FRCP1	10-3969-8000	12 Oct-21 11:48	13 Oct-21 11:53	53h (1.3 °C)		
GH_FR1	11-8224-4576	12 Oct-21 10:00	13 Oct-21 11:30	55h (0 °C)		
GH_ERC	00-1276-7572	12 Oct-21 11:50	13 Oct-21 11:30	53h (0 °C)		
CM_MC2	03-9569-8600	12 Oct-21 12:47	13 Oct-21 11:30	52h (1.3 °C)		
EV_MC2	13-1923-7722	12 Oct-21 11:38	13 Oct-21 11:30	53h (0.2 °C)		
EV_HC1	18-6648-8827	12 Oct-21 10:33	13 Oct-21 11:30	54h (0 °C)		
LC_DCDS	17-4710-4100	12 Oct-21	13 Oct-21 11:30	65h (1.7 °C)		
LC_LC3	20-0894-5906	12 Oct-21 12:00	13 Oct-21 11:30	53h (8.8 °C)		
LC_LC5	14-5637-1032	12 Oct-21 13:30	13 Oct-21 11:30	52h (2.6 °C)		
LC_LCDSSLCC	06-4184-4349	12 Oct-21 12:30	13 Oct-21 11:30	52h (4.7 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_UFR1	Water Sample	Teck Coal	FR_UFR1_WEK_2021-09-1	
GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-10-12_	
CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-10-12	
LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-10-19_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_WEK_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_WEK_2021-09	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-10-12_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-10-12	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-10-12	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2021_Q4_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2021_Q4_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-10-19	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-10-19_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-10-19_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	

EC Alga Growth Inhibition Test **Nautilus Environmental**

Analysis ID: 07-4610-9638 **Endpoint:** Cell Yield **CETIS Version:** CETISv1.9.4
Analyzed: 26 Nov-21 14:15 **Analysis:** Nonparametric-Multiple Comparison **Status Level:** 1

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	FR_UFR1 passed cell yield	11.81%
		GH_ER2 passed cell yield	11.81%
		CM_MC1 passed cell yield	11.81%
		FR_FRABCH failed cell yield	11.81%
		FR_FRCP1 passed cell yield	11.81%
		GH_FR1 failed cell yield	11.81%
		GH_ERC failed cell yield	11.81%
		CM_MC2 failed cell yield	11.81%
		EV_MC2 failed cell yield	11.81%
		EV_HC1 failed cell yield	11.81%
		LC_DCDS passed cell yield	11.81%
		LC_LC3 passed cell yield	11.81%
		LC_LC5 failed cell yield	11.81%
		LC_LCDSSLCC failed cell yield	11.81%

Wilcoxon/Bonferroni Adj Test

Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)
Site Control (LC-SLC)		FR_UFR1	72.5	n/a	1	14	Exact	1.0000	Non-Significant Effect
		GH_ER2	78.5	n/a	3	14	Exact	1.0000	Non-Significant Effect
		CM_MC1	60	n/a	2	14	Exact	1.0000	Non-Significant Effect
		FR_FRABCH*	10	n/a	0	10	Exact	0.0283	Significant Effect
		FR_FRCP1	13	n/a	0	10	Exact	0.1697	Non-Significant Effect
		GH_FR1*	10	n/a	0	10	Exact	0.0283	Significant Effect
		GH_ERC*	10	n/a	0	10	Exact	0.0283	Significant Effect
		CM_MC2*	10	n/a	0	10	Exact	0.0283	Significant Effect
		EV_MC2*	10	n/a	0	10	Exact	0.0283	Significant Effect
		EV_HC1*	10	n/a	0	10	Exact	0.0283	Significant Effect
		LC_DCDS	12	n/a	1	10	Exact	0.1131	Non-Significant Effect
		LC_LC3	10.5	n/a	1	10	Exact	0.0566	Non-Significant Effect
		LC_LC5*	10	n/a	0	10	Exact	0.0283	Significant Effect
		LC_LCDSSLCC*	10	n/a	0	10	Exact	0.0283	Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	2.187	3.288	1.0000	No Outliers Detected
Control Trend	Mann-Kendall Trend Test	2.187		0.7195	Non-Significant Trend in Controls

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	7028.03	502.002	14	14.14	<1.0E-37	Significant Effect
Error	2165.12	35.4939	61			
Total	9193.16		75			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance Test	7.796	29.14	0.8997	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9367	0.9559	9.1E-04	Non-Normal Distribution

EC Alga Growth Inhibition Test — **Nautilus Environmental**

Analysis ID: 07-4610-9638 **Endpoint:** Cell Yield **CETIS Version:** CETISv1.9.4
Analyzed: 26 Nov-21 14:15 **Analysis:** Nonparametric-Multiple Comparison **Status Level:** 1

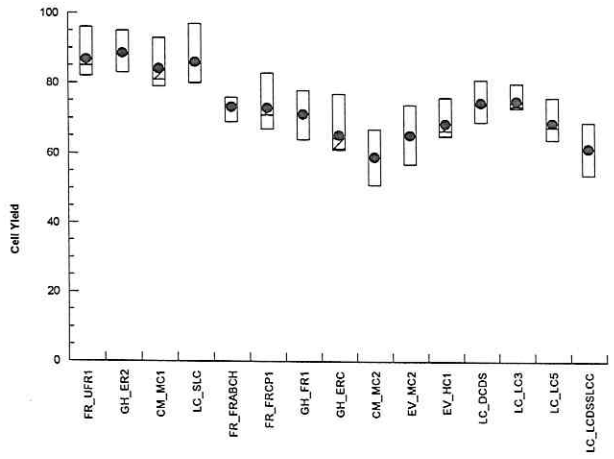
Cell Yield Summary

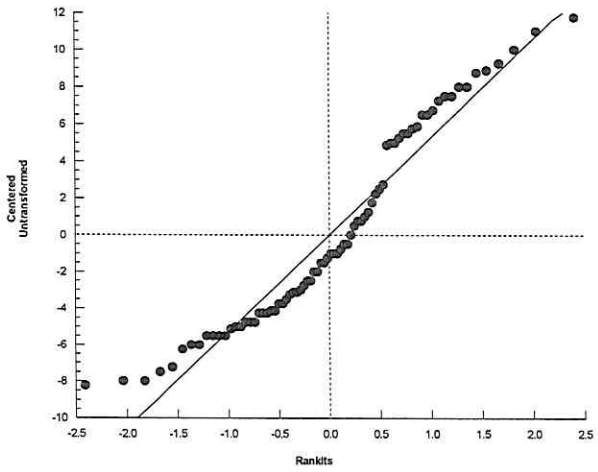
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
FR_UFR1		8	86.75	82.59	90.91	85	82	96	1.76	5.74%	0.00%
GH_ER2		8	88.5	84.66	92.34	88	83	95	1.626	5.20%	-2.02%
CM_MC1		8	84.12	79.47	88.78	81	79	93	1.968	6.62%	3.03%
LC_SLC	XC	8	86	81.17	90.83	85.5	80	97	2.044	6.72%	0.86%
FR_FRABCH		4	73.25	68.5	78	74	69	76	1.493	4.08%	15.56%
FR_FRCP1		4	73	61.9	84.1	71	67	83	3.488	9.56%	15.85%
GH_FR1		4	71.25	61.94	80.56	71.5	64	78	2.926	8.21%	17.87%
GH_ERC		4	65.25	52.76	77.74	61.5	61	77	3.924	12.03%	24.78%
CM_MC2		4	59	44.3	73.7	59	51	67	4.619	15.66%	31.99%
EV_MC2		4	65.25	51.72	78.78	65	57	74	4.25	13.03%	24.78%
EV_HC1		4	68.5	60.44	76.56	66.5	65	76	2.533	7.40%	21.04%
LC_DCDS		4	74.5	66.65	82.35	74	69	81	2.466	6.62%	14.12%
LC_LC3		4	75	69.64	80.36	73.5	73	80	1.683	4.49%	13.54%
LC_LC5		4	68.75	59.44	78.06	67.5	64	76	2.926	8.51%	20.75%
LC_LCDSSLCC		4	61.5	49.42	73.58	61.5	54	69	3.797	12.35%	29.11%

Cell Yield Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
FR_UFR1		84	92	82	86	83	83	88	96
GH_ER2		83	95	91	83	86	94	89	87
CM_MC1		90	81	80	79	81	89	93	80
LC_SLC	XC	81	87	91	97	80	86	81	85
FR_FRABCH		74	74	69	76				
FR_FRCP1		70	67	72	83				
GH_FR1		64	73	70	78				
GH_ERC		61	61	62	77				
CM_MC2		51	51	67	67				
EV_MC2		57	59	74	71				
EV_HC1		66	65	67	76				
LC_DCDS		74	69	74	81				
LC_LC3		74	73	80	73				
LC_LC5		64	71	76	64				
LC_LCDSSLCC		54	56	69	67				

Graphics





EC Alga Growth Inhibition Test — **Nautilus Environmental**

Analysis ID:	17-2533-9731	**Endpoint:**	Cell Yield	**CETIS Version:**	CETISv1.9.4
Analyzed:	26 Nov-21 14:15	**Analysis:**	Nonparametric-Multiple Comparison	**Status Level:**	1
Batch ID:	05-1185-6587	**Test Type:**	Cell Growth	**Analyst:**	Sierra Klueppel
Start Date:	14 Oct-21 17:00	**Protocol:**	EC/EPS 1/RM/25	**Diluent:**	Deionized Water + nutrients
Ending Date:	17 Oct-21 17:00	**Species:**	Pseudokirchneriella subcapitata	**Brine:**	
Test Length:	72h	**Taxon:**	Chlorophyta	**Source:**	In-House Culture **Age:** 6d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
FR_UFR1	19-8746-8946	12 Oct-21 11:07	13 Oct-21 11:53	54h (0 °C)	Teck Coal	
GH_ER2	20-2628-4137	12 Oct-21 10:50	13 Oct-21 11:30	54h (0 °C)		
CM_MC1	18-3559-2852	12 Oct-21 13:20	13 Oct-21 11:30	52h (0.1 °C)		
LC_SLC	08-7937-3726	12 Oct-21 11:00	13 Oct-21 11:30	54h (2.9 °C)		
FR_FRABCH	18-7592-7020	12 Oct-21 11:20	13 Oct-21 11:53	54h (0 °C)		
FR_FRCP1	10-3969-8000	12 Oct-21 11:48	13 Oct-21 11:53	53h (1.3 °C)		
GH_FR1	11-8224-4576	12 Oct-21 10:00	13 Oct-21 11:30	55h (0 °C)		
GH_ERC	00-1276-7572	12 Oct-21 11:50	13 Oct-21 11:30	53h (0 °C)		
CM_MC2	03-9569-8600	12 Oct-21 12:47	13 Oct-21 11:30	52h (1.3 °C)		
EV_MC2	13-1923-7722	12 Oct-21 11:38	13 Oct-21 11:30	53h (0.2 °C)		
EV_HC1	18-6648-8827	12 Oct-21 10:33	13 Oct-21 11:30	54h (0 °C)		
LC_DCDS	17-4710-4100	12 Oct-21	13 Oct-21 11:30	65h (1.7 °C)		
LC_LC3	20-0894-5906	12 Oct-21 12:00	13 Oct-21 11:30	53h (8.8 °C)		
LC_LC5	14-5637-1032	12 Oct-21 13:30	13 Oct-21 11:30	52h (2.6 °C)		
LC_LCDSSLCC	06-4184-4349	12 Oct-21 12:30	13 Oct-21 11:30	52h (4.7 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_UFR1	Water Sample	Teck Coal	FR_UFR1_WEK_2021-09-1	
GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-10-12_	
CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-10-12	
LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-10-19_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_WEK_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_WEK_2021-09	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-10-12_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-10-12	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-10-12	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2021_Q4_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2021_Q4_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-10-19	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-10-19_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-10-19_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	

EC Alga Growth Inhibition Test — **Nautilus Environmental**

Analysis ID:	17-2533-9731	**Endpoint:**	Cell Yield	**CETIS Version:**	CETISv1.9.4
Analyzed:	26 Nov-21 14:15	**Analysis:**	Nonparametric-Multiple Comparison	**Status Level:**	1

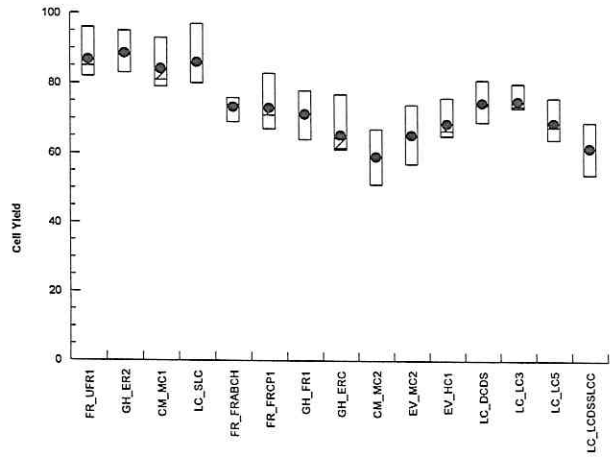
Cell Yield Summary

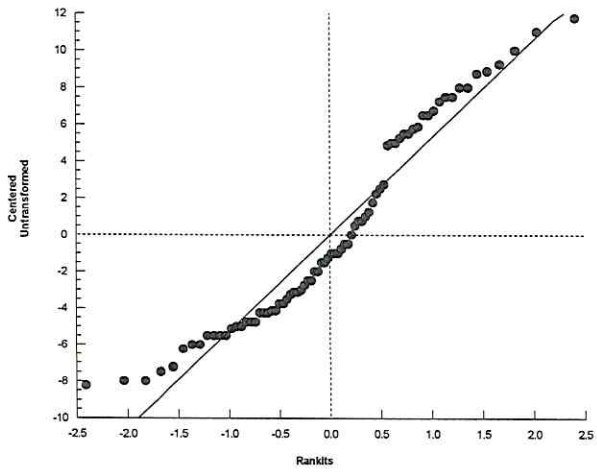
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
FR_UFR1		8	86.75	82.59	90.91	85	82	96	1.76	5.74%	0.00%
GH_ER2		8	88.5	84.66	92.34	88	83	95	1.626	5.20%	-2.02%
CM_MC1		8	84.12	79.47	88.78	81	79	93	1.968	6.62%	3.03%
LC_SLC	XC	8	86	81.17	90.83	85.5	80	97	2.044	6.72%	0.86%
FR_FRABCH		4	73.25	68.5	78	74	69	76	1.493	4.08%	15.56%
FR_FRCP1		4	73	61.9	84.1	71	67	83	3.488	9.56%	15.85%
GH_FR1		4	71.25	61.94	80.56	71.5	64	78	2.926	8.21%	17.87%
GH_ERC		4	65.25	52.76	77.74	61.5	61	77	3.924	12.03%	24.78%
CM_MC2		4	59	44.3	73.7	59	51	67	4.619	15.66%	31.99%
EV_MC2		4	65.25	51.72	78.78	65	57	74	4.25	13.03%	24.78%
EV_HC1		4	68.5	60.44	76.56	66.5	65	76	2.533	7.40%	21.04%
LC_DCDS		4	74.5	66.65	82.35	74	69	81	2.466	6.62%	14.12%
LC_LC3		4	75	69.64	80.36	73.5	73	80	1.683	4.49%	13.54%
LC_LC5		4	68.75	59.44	78.06	67.5	64	76	2.926	8.51%	20.75%
LC_LCDSSLCC		4	61.5	49.42	73.58	61.5	54	69	3.797	12.35%	29.11%

Cell Yield Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
FR_UFR1		84	92	82	86	83	83	88	96
GH_ER2		83	95	91	83	86	94	89	87
CM_MC1		90	81	80	79	81	89	93	80
LC_SLC	XC	81	87	91	97	80	86	81	85
FR_FRABCH		74	74	69	76				
FR_FRCP1		70	67	72	83				
GH_FR1		64	73	70	78				
GH_ERC		61	61	62	77				
CM_MC2		51	51	67	67				
EV_MC2		57	59	74	71				
EV_HC1		66	65	67	76				
LC_DCDS		74	69	74	81				
LC_LC3		74	73	80	73				
LC_LC5		64	71	76	64				
LC_LCDSSLCC		54	56	69	67				

Graphics





APPENDIX C – *Hyalella azteca* Toxicity Test Data

Hyalella azteca ~~Sediment~~ Water only Test Summary Sheet

Client: Teck
Work Order No.: 212109

Start Date: Oct. 14/21
Set up by: JW

Sample Information:

Sample ID: Various - see below
Sample Date: Oct. 12, 19, 26, Nov. 2, 9/2021
Date Received: Oct. 13, 20, 27, Nov. 3, 4, 10/2021
Sample Volume: 4 x 20L

α Indicates a significant difference compared to reference site FR-UFR1.

β Indicates a significant difference compared to reference site GH-ER2.

ε Indicates a significant difference compared to reference site CM-MC1.

No statistically significant survival or growth responses were detected in any of the samples relative to the lab control.

Test Organism Information:

Species: *Hyalella azteca*
Supplier: Aquatic Biosystems
Date received: Oct. 13/21
Age or size (Day 0): 7-8 days

NaCl Reference Toxicant Results:

Reference Toxicant ID: HA 217
Stock Solution ID: n/a
Date Initiated: Oct. 14/21

96-h LC50 (95% CL): 6.9 (5.7 - 8.4) g/L NaCl

96-h LC50 Reference Toxicant Mean and Range: 6.2 (4.2 - 9.2) g/L NaCl CV (%): 20

Test Results:

Sample ID	Survival ± SD (%)	Average Dry Wt. ± SD (mg)
Control	92.0 ± 8.4	0.43 ± 0.06
FR-UFR 1	98.0 ± 4.5	0.49 ± 0.06
GH-ER 2	96.0 ± 5.5	0.56 ± 0.12
CM-MC1	90.0 ± 17.3	0.56 ± 0.06
LC-SLC	96.0 ± 5.5	0.49 ± 0.13
FR-FRABCH	96.0 ± 5.5	0.62 ± 0.11
FR-FRCP1	98.0 ± 4.5	0.53 ± 0.07
GH-FR1	92.0 ± 8.4	0.44 ± 0.15

Reviewed by: [signature]

Date reviewed: Dec 14, 2021

Hyalella azteca ~~Sediment~~ Water only Test Summary Sheet

Client: Teck
Work Order No.: 212109

Start Date: Oct. 14/21
Set up by: JW

Sample Information:

Sample ID: Various - see below
Sample Date: Oct. 12, 19, 26, Nov. 2, 9/2021
Date Received: Oct. 13, 20, 27, Nov. 3, ~~4~~ 10/2021
Sample Volume: 4 x 20L

α Indicates a significant difference compared to reference site FR-UFR1.

β Indicates a significant difference compared to reference site GH-ER2.

ε Indicates a significant difference compared to reference site CM-MC1.

No statistically significant survival or growth responses were detected in any of the samples relative to the lab control.

Test Organism Information:

Species: *Hyalella azteca*
Supplier: Aquatic Biosystems
Date received: Oct. 13/21
Age or size (Day 0): 7-8 days

NaCl Reference Toxicant Results:

Reference Toxicant ID: HA217
Stock Solution ID: n/a
Date Initiated: Oct. 14/21

96-h LC50 (95% CL): 6.9 (5.7 - 8.4) g/L NaCl

96-h LC50 Reference Toxicant Mean and Range: 6.2 (4.2 - 9.2) g/L NaCl CV (%): 20

Test Results:

Sample ID	Survival ± SD (%)	Average Dry Wt. ± SD (mg)
GH-ERC	90.0 ± 10.0	0.41 ± 0.02 β
CM-MC2	98.0 ± 4.5	0.57 ± 0.09
EV-MC2	96.0 ± 5.5	0.42 ± 0.06
EV-HC1	94.0 ± 8.9	0.57 ± 0.13
LC-DCDS	76.0 ± 32.9 α	0.39 ± 0.08 βε
LC-LC3	94.0 ± 8.9	0.52 ± 0.04
LC-LC5	96.0 ± 5.5	0.54 ± 0.04
LC-LCDSSLCC	98.0 ± 4.5	0.49 ± 0.08

Reviewed by: [signature]

Date reviewed: Dec 14, 2021

Hyalella azteca ~~Sediment~~ Water only Test Summary Sheet

Client: Teck
Work Order No.: 212109

Start Date: Oct. 14/21
Set up by: JW

Sample Information:

Sample ID: various - see below
Sample Date: Oct. 12, 19, 26, Nov. 2, 9 /2021
Date Received: Oct. 13, 20, 27, Nov. 3, 4, 10/2021
Sample Volume: 4 x 20 L

α Indicates a significant difference compared to reference site FR-UFR1.

β Indicates a significant difference compared to reference site GH-ER2.

ε Indicates a significant difference compared to reference site CM-MC1

No statistically significant survival or growth response were detected in any of the samples relative to the lab control.

Test Organism Information:

Species: *Hyalella azteca*
Supplier: Aquatic Biosystems
Date received: Oct. 13/21
Age or size (Day 0): 7-8 days

NaCl Reference Toxicant Results:

Reference Toxicant ID: HA217
Stock Solution ID: n/a
Date Initiated: Oct. 14/21

96-h LC50 (95% CL): 6.9(5.7 - 8.4) g/L NaCl

96-h LC50 Reference Toxicant Mean and Range: 6.2(4.2-9.2) g/L NaCl CV (%): 20

Test Results:

Sample ID	Survival ± SD (%)	Average Dry Wt. ± SD (mg)
RG - MIDAG	100.0 ± 0.0	0.50 ± 0.09
FR - FR4	94.0 ± 8.9	0.40 ± 0.07 βε
FR - FR2	92.0 ± 4.5	0.46 ± 0.06
FR - MULTIPLATE	86.0 ± 11.4	0.46 ± 0.04
FR - FRRD	98.0 ± 4.5	0.35 ± 0.03 βε
	±	±
	±	±
	±	±

Reviewed by: _____ Date reviewed: Dec 14, 2021

Chronic *H. azteca* Water-Only Toxicity Test Data Sheet
Water Quality

Client: Teck
Work Order No.: 212109
Sample ID: various - see below

Start Date: Oct 14 / 21
Termination Date: Nov 11 / 21
CER #: 6
Test Organism: *Hyalella azteca*

Temperature (°C)

Sample ID/Conc.	Day													
	0	1		2		3		4		5		6		7
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
CONTROL	22.0	22.0	22.0	23.0	22.5	23.0	22.5	22.5	22.5	22.5	22.5	22.5	~~23.0~~ ①	23.0
FR - UFR 1	↓	22.5	22.5	23.0	22.0	↓	↓	↓	23.0	↓	23.0	↓	23.0	22.5
GH - ER 2		22.5	22.5	23.0	22.0				↓		↓		↓	↓
CM - MC 1		22.5	22.5	23.0	22.0		↓							
LC - SLC		22.5	22.5	23.0	22.0		22.0							
FR - FRABCH		22.5	22.5	23.0	22.0		↓							
FR - FRCP1		22.5	22.5	23.0	22.0		↓							
GH - FR 1		22.5	22.5	23.0	22.0		22.5							
GH - ERC		22.5	23.0	23.0	22.0		22.0							
CM - MC 2	↓	22.5	23.0	23.0	22.0	↓	↓	↓	↓	↓	↓	↓	↓	↓
Technician Initials	JW	JW	MDO	JZL	JZL	RZJ	RZJ	RZJ	RZJ	RZJ	RZJ	RZJ	RZJ	RZJ

Thermometer: CER #6

① 22.5

Conductivity (µS)

Sample ID/Conc.	Day													
	0	1		2		3		4		5		6		7
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
CONTROL	438	~~430~~ ①	425	431	428	433	425	433	425	431	424	432	426	429
FR - UFR 1	441	450	443	450	441	442	441	447	439	447	440	448	442	448
GH - ER 2	387	397	389	394	387	392	387	394	387	392	387	394	389	395
CM - MC 1	387	397	389	393	390	393	388	395	385	392	386	394	389	394
LC - SLC	463	471	463	466	461	468	461	468	462	469	464	470	466	470
FR - FRABCH	1260	1241	1245	1234	1238	1219	1220	1207	1232	1216	1215	1212	1205	1191
FR - FRCP1	1322	1319	1319	1314	1321	1310	1317	1314	1321	1320	1316	1318	1320	1310
GH - FR 1	976	974	974	970	969	968	959	960	965	965	955	949	951	948
GH - ERC	406	419	409	409	411	416	409	415	411	418	411	420	414	422
CM - MC 2	1314	1292	1302	1301	1295	1291	1281	1284	1286	1278	1271	1275	1269	1255
Technician Initials	JW	JW	MDO	JZL	JZL	RZJ	RZJ	RZJ	RZJ	RZJ	RZJ	RZJ	RZJ	RZJ

Conductivity meter: 3/3

Comments: ① 434

Reviewed by: [signature]

Date Reviewed: Dec 14, 2021

Chronic *H. azteca* Water-Only Toxicity Test Data Sheet
Water Quality

Client: Teck
Work Order No.: 212109
Sample ID: various - see below

Start Date: Oct 14 '21
Termination Date: Nov 11 '21
CER #: 6
Test Organism: *Hyalella azteca*

Temperature (°C)

Sample ID/Conc.	Day 0	1		2		3		4		5		6		7
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
EV - MC 2	22.0	22.5	22.5	23.0	22.0	23.0	22.0	22.5	23.0	22.5	23.0	22.5	23.0	22.5
EV - HC 1	↓	22.5	23.0	23.0	22.0	↓	22.0	23.0	↓	23.5	↓	↓	↓	23.0
LC - DC05	↓	22.5	23.0	23.0	22.0	↓	22.5	23.0	↓	↓	↓	↓	↓	23.0
LC - LC3 RZJ	~~21.5~~ ①	22.5	22.0	23.0	22.0	↓	22.5	23.0	↓	↓	↓	↓	↓	23.0
LC - LC5	↓	22.5	22.0	22.5	22.0	↓	↓	22.5	↓	↓	↓	↓	↓	22.5
LC - LC05SLCC	↓	22.5	22.0	22.5	22.0	↓	↓	↓	22.5	↓	22.0	↓	22.0	↓
RG - MIDAG	↓	22.5	22.0	22.5	22.0	↓	↓	↓	22.0	↓	↓	↓	↓	↓
FR - FR4	↓	22.5	22.0	23.0	22.0	↓	22.0	↓	↓	↓	↓	↓	↓	↓
FR - FR2	↓	22.5	22.0	23.0	22.0	↓	↓	↓	↓	↓	↓	↓	↓	↓
JW BR FR - MULTIPLATE	22.0	22.5	22.5	23.0	22.0	↓	↓	↓	↓	↓	↓	↓	↓	↓
Technician Initials	JW	JW	MDO	JZL	JZL	RZJ	RZJ	RZJ	RZJ	RZJ	RZJ	RZJ	RZJ	RZJ

Thermometer: CER 6

① 22.0

Conductivity (µS)

Sample ID/Conc.	Day 0	1		2		3		4		5		6		7
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
EV - MC 2	705	R729	702	707	701	701	697	701	687	699	688	696	690	690
EV - HC 1	804	798	802	802	806	800	801	806	803	813	804	812	809	808
LC - DC05	1241	1229	1239	1240	1235	1235	1235	1239	1237	1231	1237	1249	1246	1242
LC - LC3	1234	1223	1229	1227	1229	1221	1224	1222	1231	1236	1230	1239	1237	1235
LC - LC5	907	889	898	903	902	853	886	888	893	893	885	891	883	877
LC - LC05SLCC	996	999	999	967	1001	996	995	996	996	1003	992	1003	997	994
RG - MIDAG	778	778	775	781	778	779	776	782	777	784	778	785	781	781
FR - FR4	1322	1313	1318	1316	1311	1309	1312	1311	1322	1325	1321	1325	1327	1325
FR - FR2	1018	1022	1015	1016	1010	1005	1003	1004	1008	1006	1000	1006	998	990
FR - MULTIPLATE	1020	1019	1018	1013	1012	1009	1007	1006	1012	1014	1008	1014	1005	1000
Technician Initials	JW	JW	MDO	JZL	JZL	RZJ	RZJ	RZJ	RZJ	RZJ	RZJ	RZJ	RZJ	RZJ

Conductivity meter: 3/3

Comments:

Reviewed by: [signature]

Date Reviewed: Dec 14, 2021

Chronic *H. azteca* Water-Only Toxicity Test Data Sheet
Water Quality

Client: Teck
Work Order No.: 212109
Sample ID: various - see below

Start Date: Oct 14 / 21
Termination Date: Nov 11 / 21
CER #: 6
Test Organism: *Hyalella azteca*

Temperature (°C)

Sample ID/Conc.	Day													
	0	1		2		3		4		5		6		7
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
~~FR-FRDD~~ MDO	22.0	22.5	22.5	23.0	22.0	23.0	22.0	22.5	22.0	22.5	22.0	22.5	22.0	22.5
FR-FRRD														
Technician Initials	JW	JW	MDO	TBL	TBL	RZJ	RZJ	RZJ	RZJ	RZJ	RZJ	RZJ	RZJ	RZJ

Thermometer: CER #6

Conductivity (µS)

Sample ID/Conc.	Day													
	0	1		2		3		4		5		6		7
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
~~FR-FRDD~~ MDO	1342	1318	1317	1310	1300	1281	1289	1273	1309	1292	1294	1285	1278	1260
FR-FRRD														
Technician Initials	JW	JW	MDO	TBL	TBL	RZJ	RZJ	RZJ	RZJ	RZJ	RZJ	RZJ	RZJ	RZJ

Conductivity meter: 313

Comments:

Reviewed by: [signature] Date Reviewed: Dec. 14, 2021

Chronic *H. azteca* Water-Only Toxicity Test Data Sheet
Water Quality

Client: Teck
Work Order No.: 212109
Sample ID: Various - see below

Start Date: Oct. 14/21
Termination Date: Nov. 11/21
CER #: 6
Test Organism: *Hyalella azteca*

Temperature (°C)

Sample ID/Conc.	Day													
	0	1		2		3		4		5		6		7
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Control + EDTA	22.0	22.5	23.0	22.5	22.0	23.0	23.0	22.5	22.0	22.5	22.5	22.5	22.5	22.5
FR-FRCP1 + EDTA	↓	↓	23.0	22.5	22.0	↓	22.5	↓	23.0	↓	↓	22.0	↓	↓
CM-MC2 + EDTA	↓	↓	23.0	22.5	22.0	↓	↓	↓	↓	↓	↓	22.0	↓	↓
RG-MIDAG+EDTA	↓	↓	23.0	22.5	22.0	↓	↓	↓	↓	↓	↓	22.5	↓	↓
Technician Initials	EC	JW	MDO	JRL	JRL	RZS	RZJ	RZS	RZS	RZJ	RZS	RZJ	RZJ	RZJ

Thermometer: CER#6

Conductivity (µS)

Sample ID/Conc.	Day													
	0	1		2		3		4		5		6		7
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Control + EDTA	430	434	430	435	436	433	432	438	423	434	427	434	429	435
FR-FRCP1 + EDTA	1323	1299	1320	1311	1321	1318	1320	1320	1323	1326	1321	1324	1321	1314
CM-MC2 + EDTA	1311	1292	1298	1290	1300	1278	1281	1280	1295	1285	1290	1281	1277	1267
RG-MIDAG+EDTA	780	783	779	778	776	776	777	785	780	785	781	785	785	786
Technician Initials	EC	JW	MDO	JRL	JRL	RZS	RZJ	RZS	RZS	RZS	RZJ	RZJ	RZJ	RZS

Conductivity meter: 3/3

Comments:

Reviewed by: [signature]

Date Reviewed: Dec 14, 2021

Chronic *H. azteca* Water-Only Toxicity Test Data Sheet
Water Quality

Client: Teck
Work Order No.: 212109
Sample ID: various - see below
Start Date: Oct 14/21
Termination Date: Nov 11/21
Test Organism: *Hyalella azteca*

Dissolved Oxygen (mg/L)

Sample ID/Conc.	Day													
	0	1		2		3		4		5		6		7
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
control	8.2	6.9	8.2	6.7	8.2	6.1	8.3	6.1	8.2	6.1	8.2	6.5	8.2	6.6
FR_UFR1	8.7	6.9	8.0	6.7	8.0	6.8	8.1	6.2	8.3	6.0	8.0	6.2	7.8	5.8
GH_ER2	8.8	6.9	8.0	6.5	8.0	6.8	8.1	6.2	8.3	6.3	8.0	6.3	7.8	6.2
CM_MC1	8.7	6.9	8.0	6.5	8.0	6.1	8.0	5.8	8.1	6.0	7.8	6.1	7.7	6.2
LC_SLC	8.7	6.8	8.0	6.5	8.0	6.1	8.1	6.2	8.3	6.1	7.9	6.2	7.8	6.1
FR_FRABCH	8.8	6.8	8.0	6.6	8.0	6.2	8.1	6.4	8.2	6.8	7.9	6.5	7.8	6.3
FR_FRCP1	8.7	6.9	8.0	6.6	8.0	6.2	8.2	7.0	8.3	6.4	8.0	6.5	7.9	6.1
GH_FR1	8.7	6.9	8.0	6.7	8.0	6.1	8.2	6.4	8.1	6.1	7.9	6.6	7.8	6.2
GH_ERC	8.7	6.9	8.0	6.6	8.0	6.2	8.2	6.4	8.0	6.2	8.0	6.1	7.8	6.1
CM_MC2	8.7	6.9	8.0	6.5	8.0	6.1	8.2	6.2	8.1	6.8	7.9	6.8	7.7	6.5
Technician Initials	JW	JW	MDO	JZL	JZL	RZS	RZS	RZS	RZS	RZS	RZS	RZS	RZS	RZS

DO meter: 3/3

pH

Sample ID/Conc.	Day													
	0	1		2		3		4		5		6		7
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
control	7.8	7.3	7.8	7.2	7.8	7.2	7.8	7.2	7.8	7.3	7.8	7.3	7.8	7.2
FR_UFR1	7.9	7.7	8.0	7.7	7.9	7.8	8.0	7.7	8.1	7.7	8.0	7.7	7.9	7.6
GH_ER2	7.8	7.7	7.9	7.7	7.9	7.8	7.9	7.7	8.0	7.8	8.0	7.8	8.0	7.6
CM_MC1	7.8	7.6	7.9	7.8	7.9	7.7	8.0	7.7	8.1	7.7	8.0	7.8	8.0	7.6
LC_SLC	7.9	7.6	8.0	7.7	8.0	7.6	8.0	7.7	8.0	7.7	8.0	7.8	8.0	7.6
FR_FRABCH	7.9	8.0	7.9	7.8	8.0	8.0	7.9	8.0	7.8	8.1	7.8	8.1	7.8	7.9
FR_FRCP1	8.1	8.0	8.2	8.0	8.3	8.2	8.3	8.3	8.3	8.2	8.3	8.2	8.2	8.0
GH_FR1	8.0	8.0	8.1	8.1	8.1	8.0	8.0	8.0	8.1	8.0	8.0	8.1	7.9	7.8
GH_ERC	7.8	7.8	8.0	7.8	8.1	7.8	8.0	7.7	8.0	7.8	8.1	7.8	8.1	7.7
CM_MC2	8.1	8.0	8.1	8.0	8.1	8.1	8.0	8.1	7.9	8.1	7.9	8.2	7.9	7.9
Technician Initials	JW	JW	MDO	JZL	JZL	RZS	RZS	RZS	RZS	RZS	RZS	RZS	RZS	RZS

pH meter: 3/3

Light meter: Lit -1
Light intensity (Lux): 400 - 950

Comments:

Reviewed by: [signature]
Date Reviewed: Dec 14, 2021

Chronic *H. azteca* Water-Only Toxicity Test Data Sheet
Water Quality

Client: Teck
Work Order No.: 212109
Sample ID: various - see below

Start Date: Oct 14 / 21
Termination Date: Nov 11 / 21
Test Organism: *Hyalella azteca*

Dissolved Oxygen (mg/L)

Sample ID/Conc.	Day													
	0	1		2		3		4		5		6		7
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
EV - MC2	8.7	6.9	8.0	6.5	8.0	6.2	8.0	6.1	8.2	6.2	8.0	6.4	7.8	6.2
EV - HC1	8.6	6.9	8.1	6.6	8.0	6.2	8.1	6.0	8.1	6.2	7.9	6.5	7.8	6.3
LC - DCDS	8.6	6.9	8.0	6.7	8.0	6.3	8.3	6.0	8.2	6.1	7.9	6.1	7.8	6.1
LC - LC3	8.7	6.8	8.2	6.2	8.1	6.2	8.3	6.1	8.1	6.1	7.9	5.9	7.8	6.0
LC - LC5	8.7	6.8	8.2	6.4	8.0	6.1	8.2	6.2	8.1	6.1	7.9	6.0	7.9	6.0
LC - LCDSSLCC	8.6	6.9	8.1	6.5	8.1	6.2	8.3	6.3	8.2	6.3	8.1	6.1	8.0	6.1
RG - MIDAG	8.6	6.2	8.2	6.4	8.1	6.2	8.3	6.0	8.3	6.4	8.1	6.7	8.0	6.7
FR - FR4	8.6	6.6	8.1	6.6	8.2	6.4	8.3	6.0	8.4	6.3	8.2	6.2	8.1	6.2
FR - FR2	8.6	6.9	8.2	6.7	8.0	6.4	8.2	6.2	8.3	6.4	8.1	6.2	8.0	6.0
FR - MULTIPLATE	8.6	7.0	8.0	6.7	8.1	6.2	8.2	6.2	8.4	6.3	8.1	6.0	8.0	5.9
Technician Initials	JW	JW	MDO	JZ	JZ	RZ	RZ	RZ	RZ	RZ	EC	RZ	RZ	RZ

DO meter: 3/3

pH

Sample ID/Conc.	Day													
	0	1		2		3		4		5		6		7
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
EV - MC2	7.8	7.9	8.1	8.0	8.1	8.0	8.2	8.0	8.1	8.0	8.2	8.1	8.2	7.8
EV - HC1	8.0	7.9	8.1	8.1	8.1	8.0	8.2	8.1	8.2	8.0	8.2	8.1	8.2	7.9
LC - DCDS	8.0	7.8	8.1	8.0	8.1	8.0	8.1	8.0	8.2	7.9	8.2	8.0	8.2	7.9
LC - LC3	7.8	7.9	8.0	8.0	8.1	8.1	8.2	8.1	8.2	8.1	8.2	8.2	8.3	8.0
LC - LC5	8.0	7.9	8.2	8.0	8.2	8.0	8.0	7.9	8.0	8.0	8.0	7.9	7.9	7.7
LC - LCDSSLCC	8.0	8.0	8.2	8.1	8.2	8.1	8.2	8.1	8.2	8.1	8.2	8.1	8.2	7.9
RG - MIDAG	7.9	7.8	8.1	8.0	8.2	8.0	8.2	8.0	8.1	8.0	8.2	8.1	8.2	7.9
FR - FR4	8.1	8.1	8.2	8.2	8.2	8.2	8.3	8.2	8.2	8.2	8.3	8.2	8.3	8.0
FR - FR2	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	7.9	7.9	7.9	7.7
FR - MULTIPLATE	7.9	7.9	8.1	8.1	8.1	8.0	8.0	7.9	8.1	8.0	8.0	7.9	8.0	7.7
Technician Initials	JW	JW	MDO	JZ	JZ	RZ	RZ	RZ	RZ	RZ	EC	RZ	RZ	RZ

pH meter: 3/3

Light meter: LH - 1
Light intensity (Lux): 400-950

Comments:

Reviewed by: [signature]
Date Reviewed: Dec 14, 2021

Chronic *H. azteca* Water-Only Toxicity Test Data Sheet
Water Quality

Client: Teck
Work Order No.: 212109
Sample ID: Various-see below
Start Date: Oct. 14/21
Termination Date: Nov. 11/21
Test Organism: *Hyalella azteca*

Dissolved Oxygen (mg/L)

Sample ID/Conc.	Day													
	0	1		2		3		4		5		6		7
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
FR-FRRD	9.3	7.0	8.0	6.5	8.1	6.0	8.2	6.2	8.4	6.1	8.1	6.3	8.0	6.0
JW	8.6													
Technician Initials	JW	JW	MDO	JL	JL	RZ	RZ	RZ	RZ	RZ	CC	RZ	RZ	RZ

DO meter: 3/3

pH

Sample ID/Conc.	Day													
	0	1		2		3		4		5		6		7
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
FR-FRRD	7.8	8.0	7.9	8.1	8.0	8.1	7.9	8.0	7.8	8.0	7.8	8.1	7.8	7.9
Technician Initials	JW	JW	MDO	JL	JL	RZ	RZ	RZ	RZ	RZ	CC	RZ	RZ	RZ

pH meter: 3/3

Light meter: Li-1
Light intensity (Lux): 400-950

Comments:

Reviewed by:
Date Reviewed: Dec 14, 2021

Chronic *H. azteca* Water-Only Toxicity Test Data Sheet
Water Quality

Client: Teck
Work Order No.: 212109
Sample ID: various - see below

Start Date: Oct 14 /21
Termination Date: Nov 11 /21
Test Organism: *Hyalella azteca*

Dissolved Oxygen (mg/L)

Sample ID/Conc.	Day													
	0	1		2		3		4		5		6		7
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
CONTROL + EDTA	8.6	7.0	7.9	6.5	7.9	6.2	8.0	6.1	8.1	6.3	7.9	6.2	7.7	6.0
FR_FRCP1 + EDTA	8.6	6.9	8.0	6.5	7.9	6.1	8.1	6.0	8.1	6.5	7.9	6.1	7.9	6.3
CM_MC2 + EDTA	8.6	7.00 JW	8.0	6.7	8.0	6.1	8.2	6.1	8.2	6.7	8.0	6.1	7.9	6.1
RG_MIDAG + EDTA	8.6	7.0	8.0	6.6	8.0	6.3	8.2	6.0	8.1	6.7	7.9	6.5	7.8	6.6
Technician Initials	JW	JW	MDO	[illegible]	[illegible]	RZ	RZ	RZ	RZ	RZ	EC	RZ	RZ	RZ

DO meter: 313

pH

Sample ID/Conc.	Day													
	0	1		2		3		4		5		6		7
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
CONTROL + EDTA	7.3	7.5	7.7	7.6	7.7	7.3	7.7	7.3	7.5	7.3	7.6	7.3	7.6	7.2
FR_FRCP1 + EDTA	8.0	8.0	8.2	8.0	8.1	8.1	8.3	8.2	8.2	8.2	8.3	8.2	8.2	8.0
CM_MC2+ EDTA	8.0	8.1	8.0	8.1	8.1	8.1	8.1	8.1	8.0	8.2	8.0	8.1	8.0	7.9
RG_MIDAG +EDTA	7.8	7.9	8.1	8.0	8.2	8.0	8.2	8.0	8.1	8.1	8.1	8.1	8.2	7.9
Technician Initials	JW	JW	MDO	[illegible]	[illegible]	RZ	RZ	RZ	RZ	RZ	EC	RZ	RZ	RZ

pH meter: 313

Light meter: LH -1
Light intensity (Lux): 400-950

Comments:

Reviewed by: [signature]
Date Reviewed: Dec 14, 2021

Chronic *H. azteca* Water-Only Toxicity Test Data Sheet
Water Quality

Client: Teck
Work Order No.: 2121009
Sample ID: Various - see below

Start Date: Oct. 14/21
Termination Date: Nov. 11/21
CER #: 6
Test Organism: *Hyalella azteca*

Temperature (°C)

Sample ID/Conc.	Day													
	7	8		9		10		11		12		13		14
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Control	22.0	23.0	23.0	23.0	22.5	23.0	22.5	23.0	22.5	23.0	22.0	22.5	22.0	22.5
FR-UFR1	22.5	23.0	↓	↓	22.5	↓	22.5	22.5	23.0	22.5	23.0	↓	23.0	↓
GH-ER2	↓	23.0	↓	↓	22.0	22.5	22.0	23.0	23.0	↓	23.0	↓	23.0	↓
CM-MC1	↓	23.0	↓	↓	↓	↓	↓	↓	22.5	↓	22.5	↓	22.0	↓
LC-SLC	22.0	23.0	↓	↓	↓	↓	↓	↓	↓	↓	22.5	↓	↓	↓
FR-FRABCH	↓	23.0	↓	↓	↓	23.0	↓	↓	↓	↓	22.0	↓	↓	↓
FR-FRCP1	↓	23.0	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
GH-FR1	↓	23.0	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
GH-ERC	↓	23.0	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
CM-MC2	↓	23.0	↓	↓	↓	↓	↓	↓	23.0	↓	23.0	↓	23.0	↓
Technician Initials	RZ	EC	EC	TR	TR	RZ	RZ	RZ	RZ	RZ	RZ	RZ	RZ	RZ

Thermometer: CER#6

Conductivity (µS)

Sample ID/Conc.	Day													
	7	8		9		10		11		12		13		14
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Control	426	432	~~488~~	431	428	429	425	430	425	428	~~446~~	432	427	437
(D425) FR-UFR1	439	446	440	446	440	445	440	447	439	444	440	446	442	446
GH-ER2	389	398	391	395	390	394	389	397	391	398	392	397	394	390
CM-MC1	383	389	385	388	384	388	383	391	381	389	381	388	383	387
LC-SLC	~~462~~	467	464	466	464	466	464	467	459	465	462	466	463	467
FR-FRABCH	1248	1228	1233	1220	1218	1206	1202	1195	1227	1208	1212	1205	1203	1200
FR-FRCP1	1338	1327	1338	1323	1335	1308	1318	1313	1328	1324	1325	1305	1319	1309
GH-FR1	976	971	971	971	962	950	949	950	963	960	946	955	948	942
GH-ERC	412	420	413	415	416	409	410	418	416	417	409	419	413	423
CM-MC2	1224	1212	1203	1192	1202	1184	1180	1181	1189	1180	1182	1174	1171	1164
Technician Initials	RZ	EC	EC	TR	TR	RZ	RZ	RZ	RZ	RZ	RZ	RZ	RZ	RZ

Conductivity meter: 313

Comments:

Reviewed by: [signature]

Date Reviewed: Dec 14, 2021

Chronic *H. azteca* Water-Only Toxicity Test Data Sheet
Water Quality

Client: Teck
Work Order No.: 212109
Sample ID: Various - see below

Start Date: Oct. 14/21
Termination Date: Nov. 11/21
CER #: 6
Test Organism: *Hyalella azteca*

Temperature (°C)

Sample ID/Conc.	Day													
	7	8		9		10		11		12		13		14
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
EV-MC2	22.0	23.0	23.0	22.0	22.0	22.5	22.0	22.5	23.0	22.5	23.0	22.5	23.0	22.5
EV-HC1	22.0	↓	↓	22.5	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
LC-DCDS	↓	↓	↓	22.5	↓	23.0	↓	23.0	↓	↓	↓	↓	↓	↓
LC-LC3	↓	↓	↓	23.0	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
LC-LC5	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
LC-LCDSSLCC	22.0	↓	22.0	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
RG-MIDAG	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
FR-FR4	↓	↓	↓	↓	↓	22.5	↓	22.5	↓	↓	↓	↓	↓	↓
FR-FR2	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
FR-MULTIPLATE	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
Technician Initials	RZ	EC	EC	JR	JR	RZS	RZS	RZS	RZS	RZ	RZS	RZS	RZ	RZ

Thermometer: CER#6

Conductivity (µS)

Sample ID/Conc.	Day													
	7	8		9		10		11		12		13		14
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
EV-MC2	697	699	698	703	700	695	690	703	694	696	694	697	690	695
EV-HC1	802	805	803	804	802	799	800	805	804	805	805	808	806	806
LC-DCDS	1182	1189	1184	1186	1185	1184	1181	1187	1190	1185	1191	1190	1195	1193
LC-LC3	1236	1240	1239	1242	1235	1217	1226	1225	1242	1234	1238	1230	1239	1238
LC-LC5	896	895	889	884	881	877	869	872	888	882	876	878	870	869
LC-LCDSSLCC	1008	1010	1008	1005	1008	996	999	999	1007	997	999	998	993	987
RG-MIDAG	796	797	797	797	798	792	792	795	797	796	796	799	796	795
FR-FR4	1396	1337	1346	1336	1342	1320	1329	1327	1339	1324	1334	1324	1328	1317
FR-FR2	1050	1039	1036	1030	1032	1015	1015	1017	1029	1018	1017	1015	1008	1002
FR-MULTIPLATE	1014	1014	1010	1012	1011	991	995	996	1009	1002	1004	995	998	994
Technician Initials	RZ	EC	EC	JR	JR	RZS	RZS	RZS	RZS	RZ	RZS	RZS	RZS	RZ

Conductivity meter: 313

Comments:

Reviewed by: [signature]

Date Reviewed: Dec 14, 2021

Chronic *H. azteca* Water-Only Toxicity Test Data Sheet
Water Quality

Client: Teck
Work Order No.: 212109
Sample ID: Various - see below

Start Date: Oct. 14/21
Termination Date: Nov. 11/21
CER #: 6
Test Organism: *Hyalella azteca*

Temperature (°C)

Sample ID/Conc.	Day													
	7	8		9		10		11		12		13		14
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
FR-FRRD	22.0	23.0	22.0	23.0	22.0	22.5	22.0	22.5	23.0	22.5	23.0	22.5	23.0	22.5
Technician Initials	RZJ	EC	EC	m	m	RZJ	RZJ	RZJ	RZS	RZJ	RZS	RZS	RZJ	RZ

Thermometer: CER#6

Conductivity (µS)

Sample ID/Conc.	Day													
	7	8		9		10		11		12		13		14
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
FR-FRRD	1327	1302	1309	1296	1291	1268	1271	1259	1299	1264	1274	1254	1254	1248
Technician Initials	RZJ	EC	EC	m	m	RZJ	RZS	RZJ	RZS	RZS	RZJ	RZS	RZJ	RZ

Conductivity meter: 313

Comments:

Reviewed by: [signature] Date Reviewed: Dec. 14, 2021

Chronic *H. azteca* Water-Only Toxicity Test Data Sheet
Water Quality

Client: Teck
Work Order No.: 212109
Sample ID: Various - see below

Start Date: Oct. 14/21
Termination Date: Nov. 11/21
CER #: 6
Test Organism: *Hyalella azteca*

Temperature (°C)

Sample ID/Conc.	Day													
	7	8		9		10		11		12		13		14
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Control + EDTA	22.0	23.0	23.0	23.0	23.0	23.0	23.0	22.5	23.0	22.5	23.0	22.5	23.0	22.5
FR-FRCP1+EDTA	↓	↓	↓	↓	22.0	22.5	22.0	↓	↓	↓	↓	↓	↓	↓
CM_MC2+EDTA	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
RG-MIDAG+EDTA	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
Technician Initials	RJ	EC	EC	TM	TM	RJS	RJS	RJ	RJ	RJS	RJS	RJS	RJ	RJ

Thermometer: CER#6

Conductivity (µS)

Sample ID/Conc.	Day													
	7	8		9		10		11		12		13		14
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Control +EDTA	426	434	428	435	428	430	428	435	425	434	427	431	429	432
FR-FRCP1+EDTA	1342	1331	1338	1334	1329	1312	1322	1317	1329	1319	1329	1319	1314	1303
CM_MC2+EDTA	1211	1231	1200	1198	1187	1173	1177	1177	1194	1189	1184	1184	1180	1173
RG-MIDAG+EDTA	798	803	800	796	806	797	793	799	803	809	803	810	803	806
Technician Initials	RJ	EC	EC	TM	TM	RJS	RJ	RJ	RJ	RJ	RJS	RJ	RJ	RJ

Conductivity meter: 3|3

Comments:

Reviewed by: [signature] Date Reviewed: Dec 14, 2021

Chronic *H. azteca* Water-Only Toxicity Test Data Sheet
Water Quality

Client: Teck
Work Order No.: 212109
Sample ID: Various - see below

Start Date: Oct. 14/21
Termination Date: Nov. 11/21
Test Organism: *Hyalella azteca*

Dissolved Oxygen (mg/L)

Sample ID/Conc.	Day 7	8		9		10		11		12		13		14
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Control	8.3	6.3	8.2	6.3	8.2	6.1	8.3	5.8	8.3	(2) 6.1	8.4	6.1	8.4	5.7
FR-UFR1	8.5	6.1	8.0	5.8	8.0	5.8	8.2	5.9	8.2	6.3	8.1	6.3	8.1	5.9
GH-ER2	8.5	6.5	8.0	6.1	8.1	6.0	8.1	5.9	8.3	6.2	8.1	6.1	8.1	6.2
CM_MC1	8.4	6.1	8.0	6.0	8.0	5.5	8.1	6.0	8.2	6.1	8.2	6.0	8.2	6.2
LC-SLC	8.5	6.2	8.0	5.8	8.0	5.5	8.2	6.1	8.3	6.1	8.4	6.1	8.2	6.2
FR-FRABCH	8.6	6.4	8.2	5.9	8.1	5.7	8.2	6.0	8.4	6.3	8.4	6.2	8.3	6.2
FR-FRCP1	8.6	6.4	8.0	5.9	8.0	5.8	8.2	5.7	8.5	6.0	8.4	6.2	8.3	6.3
GH-FR1	8.1	6.2	8.1	6.1	8.0	6.0	8.2	6.0	8.5	6.2	8.4	6.2	8.3	6.7
GH-ERC	8.3	6.3	8.0	6.2	8.1	6.4	8.3	6.4	8.5	6.4	8.4	6.4	8.3	6.9
CM-MC2	8.1	6.5	8.1	6.3	8.1	6.3	8.3	6.2	8.3	6.0	8.1	6.0	8.1	6.3
Technician Initials	RZS	EC	EC	JZL	JZL	RZS	RZS	RZS	RZS	RZS	RZS	RZS	RZS	RZS

DO meter: 3/3

pH

Sample ID/Conc.	Day 7	8		9		10		11		12		13		14
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Control	7.8	7.3	7.8	7.5	8.0	7.5	8.1	7.6	8.1	7.5	8.1	7.5	8.1	7.5
FR-UFR1	7.8	7.8	8.3	7.9	8.3	7.9	8.3	8.0	8.3	8.1	8.4	8.1	8.4	8.0
GH-ER2	7.7	7.8	8.2	8.0	8.3	8.0	8.4	8.0	8.3	8.0	8.4	8.0	8.4	8.1
CM-MC1	7.7	7.8	8.2	7.9	8.3	7.9	8.3	8.0	8.3	8.0	8.3	8.0	8.4	8.1
LC-SLC	7.8	7.8	8.3	7.9	8.3	7.9	8.3	8.1	8.3	8.0	8.3	8.0	8.4	8.1
FR-FRABCH	7.8	8.1	8.0	8.1	7.9	8.1	8.1	8.2	7.9	8.2	7.9	8.2	8.0	8.1
FR-FRCP1	8.0	8.2	8.3	8.2	8.3	8.2	8.3	8.2	8.3	8.2	8.3	8.2	8.2	8.3
GH-FR1	7.9	8.0	8.2	8.1	8.2	8.1	8.2	8.2	8.1	8.1	8.1	8.1	8.1	8.2
GH-ERC	7.8	7.9	8.3	8.0	8.3	8.1	8.4	8.2	8.3	8.1	8.4	8.2	8.4	8.2
CM-MC2	7.9	8.1	8.1	8.2	8.1	8.2	8.2	8.2	8.1	8.1	8.1	8.1	8.1	8.1
Technician Initials	EC	EC	EC	JZL	JZL	RZS	RZS	RZS	RZS	RZS	RZS	RZS	RZS	RZS

pH meter: 3/3

Light meter: Lit-1
Light intensity (Lux): 400-950

Comments:

Reviewed by: [signature]
Date Reviewed: Dec 14, 2021

Chronic *H. azteca* Water-Only Toxicity Test Data Sheet
Water Quality

Client: Teck
Work Order No.: 212109
Sample ID: Various - see below

Start Date: Oct. 14/21
Termination Date: Nov. 11/21
Test Organism: *Hyalella azteca*

Dissolved Oxygen (mg/L)

Sample ID/Conc.	Day 7	8		9		10		11		12		13		14
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
EV-MC2	8.3	6.3	8.1	6.3	8.1	5.3	8.4	5.3	8.3	6.0	8.1	6.0	8.0	5.8
EV-MC1	8.4	6.4	8.0	6.2	8.1	6.0	8.4	5.4	8.3	6.0	8.1	6.1	8.1	6.2
LC-DCDS	8.4	6.3	8.2	6.3	8.0	4.7	8.3	5.6	8.4	6.1	8.1	6.2	8.1	6.3
LC-LC3	8.3	6.3	8.0	5.9	8.0	5.8	@ 8.4 8.2	6.0	8.3	6.2	8.2	6.0	8.1	6.0
LC-LC5	8.2	6.2	7.9	5.9	8.0	5.9	8.2	6.0	8.3	6.4	8.2	6.3	8.1	6.2
LC-LCDSSLCC	8.4	6.2	8.3	5.9	8.2	5.9	8.3	5.9	8.3	6.5	8.1	6.3	8.0	6.4
RG-MIDAG	8.5	6.9	8.1	6.5	8.2	6.0	8.4	6.3	8.2	6.5	8.2	6.5	8.1	6.6
FR-FR4	8.4	6.4	8.2	6.3	8.2	6.0	8.4	6.1	8.3	6.3	8.2	6.7	8.0	6.7
FR-FR2	8.6	6.4	8.2	6.2	8.3	6.1	8.2	6.2	8.2	6.2	8.2	6.2	8.0	6.7
FR-MULTIPLATE	8.6	6.8	8.3	6.7	8.3	6.2	8.1	6.0	8.3	6.2	8.2	6.3	8.0	6.6
Technician Initials	RZJ	EC	EC	JZ	JZ	RZJ	RZJ	RZJ	RZJ	RZJ	RZJ	RZJ	RZJ	RZJ

DO meter: 3/3

pH

Sample ID/Conc.	Day 7	8		9		10		11		12		13		14
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
EV-MC2	7.9	8.0	8.3	8.1	8.3	8.1	8.4	8.1	8.3	8.2	8.4	8.2	8.4	8.2
EV-MC1	7.9	8.1	8.3	8.2	8.4	8.2	8.4	8.2	8.4	8.2	8.4	8.4	8.5	8.3
LC-DCDS	7.9	7.9	8.2	8.0	8.2	7.9	8.3	8.1	8.3	8.1	8.3	8.1	8.4	8.1
LC-LC3	7.8	8.1	8.2	8.1	8.3	8.2	8.4	8.3	8.3	8.2	8.4	8.3	8.4	8.3
LC-LC5	7.9	8.0	8.1	8.1	8.1	8.1	8.2	8.1	8.1	8.1	8.1	8.1	8.1	8.1
LC-LCDSSLCC	7.9	8.1	8.3	8.1	8.3	8.2	8.3	8.2	8.3	8.2	8.3	8.2	8.3	8.2
RG-MIDAG	7.9	8.1	8.2	8.2	8.3	8.2	8.4	8.3	8.4	8.3	8.4	8.2	8.4	8.3
FR-FR4	8.0	8.2	8.3	8.3	8.3	8.3	8.4	8.3	8.3	8.3	8.3	8.3	8.3	8.3
FR-FR2	7.9	8.0	8.0	8.1	8.1	8.2	8.1	8.2	8.0	8.1	8.0	8.1	8.0	8.2
FR-MULTIPLATE	7.9	8.1	8.1	8.1	8.1	8.1	8.2	8.1	8.1	8.1	8.1	8.1	8.1	8.1
Technician Initials	EC	EC	EC	JZ	JZ	RZS	RZS	RZJ	RZJ	RZJ	RZJ	RZJ	RZJ	RZJ

pH meter: 3/3

Light meter: Lit-1
Light intensity (Lux): 400-950

Comments:

Reviewed by:
Date Reviewed: Dec. 14, 2021

Chronic *H. azteca* Water-Only Toxicity Test Data Sheet
Water Quality

Client: Teck
Work Order No.: 212109
Sample ID: Various-see below

Start Date: Oct. 14/21
Termination Date: Nov. 11/21
Test Organism: *Hyalella azteca*

Dissolved Oxygen (mg/L)

Sample ID/Conc.	Day													
	7	8		9		10		11		12		13		14
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
FR-FRRD	8.6	6.3	8.3	6.3	8.3	6.1	8.2	6.1	8.2	6.7	8.2	6.7	8.0	6.8
Technician Initials	RZS	EC	EC	[illegible]	[illegible]	RZS	RZS	RZS	RZS	RZS	RZS	RZS	RZS	RZS

DO meter: 3/3

pH

Sample ID/Conc.	Day													
	7	8		9		10		11		12		13		14
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
FR-FRRD	7.7	8.1	7.9	8.1	7.9	8.1	7.9	8.2	7.9	8.2	7.9	8.2	8.0	8.3
Technician Initials	EC	EC	EC	[illegible]	[illegible]	RZS	RZS	RZS	RZS	RZS	RZS	RZS	RZS	RZS

pH meter: 3/3

Light meter: Lit-1

Light intensity (Lux): 400-950

Comments:

Reviewed by: [signature]

Date Reviewed: Dec. 14, 2021

Chronic *H. azteca* Water-Only Toxicity Test Data Sheet
Water Quality

Client: Teck
Work Order No.: 212109
Sample ID: Various- See below

Start Date: Oct. 14/21
Termination Date: Nov. 11/21
Test Organism: *Hyalella azteca*

Dissolved Oxygen (mg/L)

Sample ID/Conc.	Day													
	7	8		9		10		11		12		13		14
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Control+EDTA	8.1	6.0	~~7.8~~	5.9	7.8	5.6	8.0	5.6	8.0	5.9	8.0	6.5	7.9	7.0
FR-FRCP1+EDTA	8.1	6.5	7.9	6.5	7.9	5.5	8.2	5.9	8.2	6.2	8.1	6.1	8.0	6.5
CM-MC2+EDTA	8.2	6.5	8.0	6.5	8.1	5.7	8.2	5.8	8.2	6.3	8.1	6.1	8.1	6.3
RG-MIDAG+EDTA	8.2	6.7	8.0	6.5	8.2	5.7	8.3	6.1	8.2	6.2	8.2	6.2	8.1	6.5
Technician Initials	RZJ	EC	EC	TM	TM	RZJ	RZJ	RZJ	RZJ	RZJ	RZJ	RZJ	RZJ	RZJ

DO meter: 3/3

pH

Sample ID/Conc.	Day													
	7	8		9		10		11		12		13		14
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Control+EDTA	7.4	7.5	7.9	7.6	7.9	7.5	8.0	7.6	7.9	7.6	8.0	7.7	8.1	7.8
FR-FRCP1+EDTA	8.0	8.2	~~8.3~~	8.2	8.3	8.2	8.3	8.3	8.2	8.2	8.2	8.2	8.2	8.3
CM-MC2+EDTA	7.9	~~8.1 6.5~~	8.1	8.2	8.1	8.1	8.2	8.2	8.1	8.2	8.1	8.2	8.1	8.2
RG-MIDAG+EDTA	7.8	~~6.7 8.1~~	8.2	8.2	8.3	8.1	8.4	8.3	8.3	8.2	8.4	8.2	8.4	8.3
Technician Initials	EC	EC	EC	TM	TM	RZJ	RZJ	RZJ	RZJ	RZJ	RZJ	RZJ	RZJ	RZJ

pH meter: 3/3

Light meter: lit-1
Light intensity (Lux): 400-950

Comments:

Reviewed by: [signature]
Date Reviewed: Dec 14, 2021

Chronic *H. azteca* Water-Only Toxicity Test Data Sheet
Water Quality

Client: Teck
Work Order No.: 212109
Sample ID: Various - see below

Start Date: Oct. 14/21
Termination Date: Nov. 11/21
CER #: 6
Test Organism: *Hyalella azteca*

Temperature (°C)

Sample ID/Conc.	Day													
	14	15		16		17		18		19		20		21
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Control	22.0	23.0	22.0	22.5	22.0	23.0	22.5	23.0	22.5	22.5	22.5	22.5	22.5	22.5
FR-UFR1	↓	23.0	22.5	↓	22.0	22.5	22.0	22.5	23.0	↓	23.0	↓	23.0	↓
GH-ER2	↓	23.0	23.0	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
CM-MC1	22.0	23.0	22.0	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
LC-SLC	↓	22.5	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
FR-FRABCH	↓	22.5	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
FR-FRCP1	↓	22.5	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
GH-FR1	↓	22.5	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
GH-ERC	↓	22.5	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
CM-MC2	↓	22.5	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
Technician Initials	RZS	EC	EC	TAL	TAL	RZS	RZS	RZS	RZS	RZS	RZS	RZS	RZS	RZS

Thermometer: CER#6

Conductivity (µS)

Sample ID/Conc.	Day													
	14	15		16		17		18		19		20		21
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Control	426	432	417	428	426	426	420	429	419	427	421	425	420	423
FR-UFR1	436	444	441	446	439	446	441	446	438	446	442	448	442	448
GH-ER2	391	397	393	395	392	396	392	404	391	399	391	399	393	402
CM-MC1	365	382	368	377	370	376	370	379	369	379	371	375	373	377
LC-SLC	462	470	464	467	470	467	464	473	466	472	468	474	470	475
FR-FRABCH	1255	1251	1240	1229	1243	1205	1210	1201	1229	1220	1222	1211	1208	1198
FR-FRCP1	1328 EC	1330 EC	1320	1310	1318	1303	1304	1304	1323	1314	1316	1312	1308	1300
GH-FR1	969	991	979	977	976	966	963	967	978	971	967	965	961	959
GH-ERC	413 EC	412	412	416	413	414	412	427	410	421	415	417	416	422
CM-MC2	1036	1040	1030	1039	1027	1011	1011	1015	1020	1015	1018	1007	1015	1010
Technician Initials	EC	EC	EC	TAL	TAL	RZS	RZS	RZS	RZS	RZS	RZS	RZS	RZS	RZS

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Conductivity meter: 313

Comments:

Reviewed by: [signature]

Date Reviewed: Dec 14, 2021

Chronic *H. azteca* Water-Only Toxicity Test Data Sheet
Water Quality

Client: Teck
Work Order No.: 212109
Sample ID: Various - see below

Start Date: Oct. 14/21
Termination Date: Nov. 11/21
CER #: 6
Test Organism: *Hyalella azteca*

Temperature (°C)

Sample ID/Conc.	Day													
	14	15		16		17		18		19		20		21
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
EV-MC2	22.0	22.5	23.0	22.5	22.0	22.5	22.0	22.5	23.0	22.5	23.0	22.5	23.0	22.5
EV-HC1	↓	23.0	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
LC-DCDS	↓	22.5	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
LC-LC3	↓	↓	↓	↓	↓	23.0	↓	↓	↓	↓	↓	↓	↓	↓
LC-LC5	↓	↓	↓	↓	↓	↓	↓	↓	22.0	↓	22.0	↓	22.5	↓
LC-LCDSSLCC	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	22.0	↓
RG-MIDAG	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
FR-FR4	↓	↓	↓	↓	↓	22.5	↓	↓	↓	↓	↓	↓	↓	↓
FR-FR2	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
FR-MULTIPLATE	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
Technician Initials	RE	EC	EC	TM	TM	RE	RE	RE	RE	RE	RE	RE	RE	RE

Thermometer: CER#6

Conductivity (µS)

Sample ID/Conc.	Day													
	14	15		16		17		18		19		20		21
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
EV-MC2	630	637	631	636	633	634	628	640	627	635	629	636	631	640
EV-HC1	810	815	814	809	817	810	809	810	812	817	814	815	817	823
LC-DCDS	1202	1211	1212	1208	1212	1204	1211	1202	1220	1227	1229	1225	1230	1236
LC-LC3	1259	1260	1265	1258	1261	1249	1256	1256	1262	1264	1267	1258	1267	1267
LC-LC5	900	902	893	893	891	880	879	882	887	885	882	877	874	871
LC-LCDSSLCC	1022	1024	1019	1020	1021	1004	1004	1009	1010	1012	1011	1001	1006	1006
RG-MIDAG	745	749	755	756	757	752	751	759	754	756	755	757	754	757
FR-FR4	1329	1334	1331	1324	1333	1310	1315	1312	1329	1310	1322	1306	1312	1303
FR-FR2	1053	1054	1040	1038	1035	1012	1020	1020	1023	1029	1025	1013	1013	1010
FR-MULTIPLATE	1020	1021	1015	1010	1014	996	1001	1001	1009	1004	1008	1002	1000	995
Technician Initials	RE	EC	EC	TM	TM	RE	RE	RE	RE	RE	RE	RE	RE	RE

Conductivity meter: 313

Comments:

Reviewed by: [signature]

Date Reviewed: Dec. 14, 2021

Chronic *H. azteca* Water-Only Toxicity Test Data Sheet
Water Quality

Client: Teck
Work Order No.: 212109
Sample ID: Various - see below

Start Date: Oct. 14/21
Termination Date: Nov. 11/21
CER #: 6
Test Organism: *Hyalella azteca*

Temperature (°C)

Sample ID/Conc.	Day													
	14	15		16		17		18		19		20		21
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
FR-FRRD	22.0	22.5	23.0	22.5	22.0	22.5	22.6	22.5	22.0	22.5	22.0	22.5	22.0	22.5
Technician Initials	LB	EC	EC	[illegible]	[illegible]	RZJ	RZJ	RZJ	RZJ	RZJ	RZJ	RZJ	RZJ	RZJ

Thermometer: CER#6

Conductivity (µS)

Sample ID/Conc.	Day													
	14	15		16		17		18		19		20		21
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
FR-FRRD	1340	1330	1313	1291	1298	1265	1278	1262	1302	1283	1289	1270	1270	1257
Technician Initials	RZJ	EC	EC	[illegible]	[illegible]	RZJ	RZJ	RZJ	RZJ	RZJ	RZJ	RZJ	RZJ	RZJ

Conductivity meter: 313

Comments:

Reviewed by: [signature] Date Reviewed: Dec 14, 2021

Chronic *H. azteca* Water-Only Toxicity Test Data Sheet
Water Quality

Client: Teck
Work Order No.: 212109
Sample ID: Various - see below

Start Date: Oct. 14/21
Termination Date: Nov. 11/21
CER #: 6
Test Organism: *Hyalella azteca*

Temperature (°C)

Sample ID/Conc.	Day													
	14	15		16		17		18		19		20		21
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Control + EDTA	22.0	22.5	23.0	22.0	23.0	22.5	23.0	22.5	22.5	22.5	23.0	22.5	23.0	22.5
FR-FRCP1+EDTA	↓	↓	↓	↓	22.0	↓	22.0	↓	23.0	↓	↓	↓	↓	↓
CM_MC2+EDTA	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
RG-MIDAG+EDTA	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
Technician Initials	EC	EC	EC	TR	TR	RZS	RZS	RZ	RZ	RZ	RZ	RZS	RZS	RZ

Thermometer: CER#6

Conductivity (µS)

Sample ID/Conc.	Day													
	14	15		16		17		18		19		20		21
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Control + EDTA	429	435	428	434	433	443	431	441	417	428	420	424	422	430
FR-FRCP1+EDTA	1331	1333	1330	1321	1318	1307	1312	1299	1302	1313	1315	1309	1305	1306
CM_MC2+EDTA	1037	1044	1034	1026	1024	1016	1016	1021	1027	1026	1024	1015	1016	1009
RG-MIDAG+EDTA	753	762	756	758	755	751	753	762	755	766	761	761	762	767
Technician Initials	EC	EC	EC	TR	TR	RZS	RZS	RZS	RZS	RZS	RZS	RZS	RZS	RZS

Conductivity meter: 3|3

Comments:

Reviewed by: [signature]

Date Reviewed: Dec. 14, 2021

Chronic *H. azteca* Water-Only Toxicity Test Data Sheet
Water Quality

Client: Teck
Work Order No.: 212109
Sample ID: Various - See below

Start Date: Oct. 14/21
Termination Date: Nov. 11/21
Test Organism: *Hyalella azteca*

Dissolved Oxygen (mg/L)

Sample ID/Conc.	Day													
	14	15		16		17		18		19		20		21
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Control	8.4	6.6	8.4	5.9	8.5	5.4	8.3	5.7	8.3	5.6	8.3	5.6	8.4	5.4
FR-UFR1	8.5	6.5	8.1	6.0	8.1	5.6	8.0	5.4	8.2	5.6	8.1	5.6	8.0	5.5
GH-ER2	8.5	6.5	8.1	6.0	8.4	5.5	8.1	5.3	8.2	5.2	8.1	5.4	8.0	5.2
CM_MC1	8.7	6.5	8.3	6.1	8.4	5.5	8.1	5.6	8.2	5.4	8.0	5.5	8.1	5.1
LC-SLC	8.7	6.4	8.4	6.2	8.3	5.7	8.3	6.1	8.2	6.3	8.1	6.2	8.1	5.9
FR-FRABCH	8.7	6.7	8.4	6.2	8.5	5.9	8.2	6.4	8.1	6.2	8.0	5.8	8.0	6.0
FR-FRCP1	8.7	6.7	8.3	6.1	8.4	5.8	8.2	5.5	8.2	6.1	8.1	6.3	8.1	5.9
GH-FR1	8.7	6.8	8.4	6.4	8.4	6.0	8.2	6.2	8.2	6.3	8.1	6.4	7.9	6.2
GH-ERC	8.7	6.6	8.4	6.3	8.3	5.8	8.2	5.7	8.1	6.0	8.0	6.2	8.0	6.3
CM-MC2	8.5	6.7	8.1	6.0	8.2	5.9	8.1	6.2	8.2	6.7	8.0	6.1	8.0	5.8
Technician Initials	RZS	EC	EC	[illegible]	[illegible]	RZS	RZS	RZS	EC	RZS	RZS	RZS	RZS	RZS

DO meter: 3/3

pH

Sample ID/Conc.	Day													
	14	15		16		17		18		19		20		21
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Control	8.1	7.6	8.2	7.5	8.0	7.5	8.0	7.5	8.0	7.5	8.0	7.5	8.1	7.4
FR-UFR1	8.6	8.0	8.4	7.9	8.4	7.9	8.3	7.9	8.3	7.8	8.3	7.9	8.4	7.9
GH-ER2	8.6	8.0	8.3	7.9	8.3	7.8	8.3	7.8	8.3	7.8	8.3	7.9	8.4	7.9
CM-MC1	8.5	8.0	8.3	7.9	8.3	7.9	8.3	7.9	8.3	7.8	8.3	7.8	8.4	7.7
LC-SLC	8.5	8.0	8.3	7.9	8.3	7.9	8.3	8.0	8.3	8.0	8.3	8.0	8.3	7.9
FR-FRABCH	8.3	8.2	7.9	8.1	7.9	8.1	8.0	8.2	7.9	8.1	7.9	8.0	7.9	8.0
FR-FRCP1	8.5	8.2	8.2	8.2	8.2	8.1	8.2	8.1	8.2	8.2	8.2	8.2	8.1	8.1
GH-FR1	8.4	8.2	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.0	8.1	8.1	8.0
GH-ERC	8.5	8.0	8.3	8.0	8.3	8.0	8.3	8.0	8.3	8.0	8.3	8.0	8.4	8.0
CM-MC2	8.4	8.2	8.1	8.0	8.1	8.0	8.1	8.1	8.1	8.2	8.1	8.1	8.1	8.0
Technician Initials	EC	EC	EC	[illegible]	[illegible]	RZS	RZS	RZS	EC	RZS	RZS	RZS	RZS	RZS

pH meter: 3/3

Light meter: Lit-1

Light intensity (Lux): 400-950

Comments:

Reviewed by: [signature]

Date Reviewed: Dec 14, 2021

Chronic *H. azteca* Water-Only Toxicity Test Data Sheet
Water Quality

Client: Teck
Work Order No.: 212109
Sample ID: Various - See below

Start Date: Oct. 14/21
Termination Date: Nov. 11/21
Test Organism: *Hyalella azteca*

Dissolved Oxygen (mg/L)

Sample ID/Conc.	Day													
	14	15		16		17		18		19		20		21
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
EV-MC2	8.5	6.6	8.1	6.2	8.3	4.7	8.1	4.8	8.1	5.0	8.0	5.3	7.9	5.5
EV-HC1	8.5	6.7	8.2	6.1	8.3	5.6	8.1	5.4	8.1	5.7	8.0	5.3	8.0	5.1
LC-DCDS	8.4	6.4	8.2	6.2	8.4	5.7	8.2	5.6	8.1	5.8	8.1	5.8	8.0	5.7
LC-LC3	8.4	6.5	8.1	6.1	8.4	6.1	8.1	5.7	8.1	5.7	8.0	5.7	8.0	5.4
LC-LC5	8.4	6.7	8.3	6.0	8.4	5.7	8.2	5.8	8.5	5.9	8.2	6.3	8.2	5.9
LC-LCDSSLCC	8.5	6.6	8.2	6.2	8.4	5.9	8.2	5.9	8.4	6.0	8.2	6.1	8.2	6.2
RG-MIDAG	8.5	6.8	8.1	6.2	8.3	6.0	8.2	6.4	8.3	6.5	8.2	6.7	8.2	6.6
FR-FR4	8.5	6.7	8.1	6.3	8.3	6.0	8.1	6.1	8.3	5.9	8.2	6.3	8.2	6.2
FR-FR2	8.5	6.7	8.2	6.2	8.4	5.9	8.1	5.9	8.3	6.1	8.2	5.9	8.2	6.0
FR-MULTIPLATE	8.4	6.8	8.2	6.5	8.4	6.0	8.2	6.3	8.3	6.8	8.2	6.8	8.2	6.6
Technician Initials	RZS	EC	EC	JR	JR	RZS	RZS	RZS	EC	RZS	RZS	RZS	RZS	RZS

DO meter: 3/3

pH

Sample ID/Conc.	Day													
	14	15		16		17		18		19		20		21
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
EV-MC2	8.5	8.1	8.3	7.9	8.3	7.9	8.4	7.9	8.3	7.9	8.3	8.0	8.1	8.1
EV-HC1	8.5	8.2	8.3	8.1	8.3	8.1	8.4	8.1	8.4	8.1	8.4	8.1	8.4	8.1
LC-DCDS	8.4	8.0	8.3	8.0	8.2	8.0	8.3	8.0	8.3	8.0	8.3	8.0	8.3	8.1
LC-LC3	8.3	8.2	8.2	8.2	8.3	8.2	8.3	8.2	8.2	8.2	8.3	8.2	8.4	8.2
LC-LC5	8.4	8.2	8.1	8.1	8.1	8.0	8.1	8.0	8.1	8.0	8.1	8.0	8.1	8.0
LC-LCDSSLCC	8.4	8.2	8.2	8.1	8.2	8.1	8.2	8.1	8.2	8.1	8.2	8.1	8.2	8.1
RG-MIDAG	8.4	8.2	8.3	8.1	8.3	8.1	8.3	8.2	8.3	8.2	8.3	8.2	8.3	8.2
FR-FR4	8.4	8.3	8.3	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2
FR-FR2	8.3	8.2	8.0	8.1	8.0	8.0	8.1	8.1	8.0	8.0	8.0	8.0	8.0	8.0
FR-MULTIPLATE	8.3	8.1	8.1	8.1	8.1	8.0	8.1	8.1	8.0	8.1	8.0	8.1	8.0	8.1
Technician Initials	EC	EC	EC	JR	JR	RZS	RZS	RZS	EC	RZS	RZS	RZS	RZS	RZS

pH meter: 3/3

Light meter: Lit-1
Light intensity (Lux): 400-950

Comments:

Reviewed by:
Date Reviewed: Dec. 14, 2021

Chronic *H. azteca* Water-Only Toxicity Test Data Sheet
Water Quality

Client: Teck
Work Order No.: 212109
Sample ID: Various-see below
Start Date: Oct. 14/21
Termination Date: Nov. 11/21
Test Organism: *Hyalella azteca*

Dissolved Oxygen (mg/L)

Sample ID/Conc.	Day													
	14	15		16		17		18		19		20		21
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
FR-FRRD	8.5	6.7	8.1	6.7	8.3	6.0	8.2	6.5	8.4	6.8	8.2	6.3	8.2	6.1
Technician Initials	RZ	EC	EC	[illegible]	[illegible]	RZ	RZ	RZ	RZ	RZ	RZ	RZ	RZ	RZ

DO meter: 3/3

pH

Sample ID/Conc.	Day													
	14	15		16		17		18		19		20		21
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
FR-FRRD	8.2	8.1	7.9	8.1	7.9	8.1	7.9	8.2	7.8	8.2	7.8	8.2	7.9	8.2
Technician Initials	RZ	EC	EC	[illegible]	[illegible]	RZ	RZ	RZ	RZ	RZ	RZ	RZ	RZ	RZ

pH meter: 3/3

Light meter: lit-1
Light intensity (Lux): 400-950

Comments:

Reviewed by: [signature]
Date Reviewed: Dec. 14, 2021

Chronic *H. azteca* Water-Only Toxicity Test Data Sheet
Water Quality

Client: Teck
Work Order No.: 212109
Sample ID: Various- See below

Start Date: Oct. 14/21
Termination Date: Nov. 11/21
Test Organism: *Hyalella azteca*

Dissolved Oxygen (mg/L)

Sample ID/Conc.	Day													
	14	15		16		17		18		19		20		21
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Control+EDTA	8.4	6.7	8.0	6.3	8.0	5.8	7.9	6.4	8.2	6.9	8.0	6.6	8.0	6.2
FR-FRCP1+EDTA	8.5	6.7	8.1	6.5	8.2	5.8	8.0	6.5	8.1	6.8	8.0	6.6	8.0	5.9
CM-MC2+EDTA	8.5	6.7	8.2	6.6	8.1	5.8	8.1	6.0	8.2	6.6	8.1	6.5	8.0	5.9
RG-MIDAG+EDTA	8.5	6.5	8.1	6.5	8.1	5.8	8.1	6.0	8.1	6.5	8.0	6.3	8.0	5.9
Technician Initials		EC	EC	[illegible]	[illegible]	RZ	RZ	RZS	EC	RZ	RZ	RZS	RZS	RZ

DO meter: 3/3

pH

Sample ID/Conc.	Day													
	14	15		16		17		18		19		20		21
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Control+EDTA	7.9	7.6	8.0	7.5	7.9	7.5	8.0	7.7	7.8	7.7	7.9	[illegible]	8.0	7.7
FR-FRCP1+EDTA	8.4	8.2	8.3	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.1	8.2	8.1	8.2
CM-MC2+EDTA	8.4	8.2	8.2	8.1	8.1	8.0	8.2	8.1	8.1	8.2	8.1	8.2	8.1	8.1
RG-MIDAG+EDTA	8.3	8.1	8.3	8.1	8.3	8.1	8.3	8.1	8.3	8.2	8.3	8.2	8.4	8.2
Technician Initials	EC	EC	EC	[illegible]	[illegible]	RZ	RZS	RZS	EC	RZ	RZ	RZS	RZS	RZ

pH meter: 3/3

Light meter: lit-1

Light intensity (Lux): 400-950

Comments:

Reviewed by: [signature]

Date Reviewed: Dec 14, 2021

Chronic *H. azteca* Water-Only Toxicity Test Data Sheet
Water Quality

Client: Teck
Work Order No.: 212109
Sample ID: Various - see below

Start Date: Oct. 14/21
Termination Date: Nov. 11/21
CER #: 6
Test Organism: *Hyalella azteca*

Temperature (°C)

Sample ID/Conc.	Day													
	21	22		23		24		25		26		27		28
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Control	22.0	22.0	23.0	22.5	22.0	23.0	22.5	22.5	22.0	22.5	22.0	22.5	22.0	22.5
FR-UFR1	22.5	22.5	↓	↓	↓	↓	22.0	↓	23.0	↓	23.0	↓	23.0	22.5
GH-ER2	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	22.5
CM-MC1	22.0	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	22.5
LC-SLC	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	22.5
FR-FRABCH	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	22.5
FR-FRCP1	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	22.5
GH-FR1	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	22.5
GH-ERC	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	22.5
CM-MC2	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	22.5
Technician Initials	RZS	EC	EC	TR	TR	RZS	RZS	RZS	RZS	RZS	RZS	RZ	RZ	KR

Thermometer: CER#6

Conductivity (µS)

Sample ID/Conc.	Day													
	21	22		23		24		25		26		27		28
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Control	421	428	426	428	428	426	422	426	420	429	421	429	423	428
FR-UFR1	433	442	435	448	437	447	438	450	433	445	434	444	436	445
GH-ER2	396	400	397	404	397	405	397	409	396	408	400	406	400	409
CM-MC1	353	348	335	345	335	344	335	346	335	343	337	345	337	345
LC-SLC	456	462	458	465	462	465	460	469	463	471	464	470	466	473
FR-FRABCH	1273	1233	1250	1243	1236	1231	1229	1217	1248	1232	1236	1220	1214	1211
FR-FRCP1	1397	1362	1384	1364	1376	1365	1361	1367	1383	1373	1369	1356	1358	1350
GH-FR1	1008	996	996	989	991	982	960	980	994	992	982	979	976	976
GH-ERC	411	415	413	413	413	420	412	420	418	429	416	424	420	426
CM-MC2	982	977	979	974	978	968	965	973	978	981	972	967	961	957
Technician Initials	RZS	EC	EC	TR	TR	RZ	RZ	RZS	RZS	RZ	RZ	RZ	RZ	KR

Conductivity meter: 313

Comments:

Reviewed by: [signature]

Date Reviewed: Dec 14, 2021

Chronic *H. azteca* Water-Only Toxicity Test Data Sheet
Water Quality

Client: Teck
Work Order No.: 212109
Sample ID: Various - see below

Start Date: Oct. 14/21
Termination Date: Nov. 11/21
CER #: 16
Test Organism: *Hyalella azteca*

Temperature (°C)

Sample ID/Conc.	Day													
	21	22		23		24		25		26		27		28
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
EV-MC2	22.0	22.5	23.0	22.0	22.0	23.0	22.0	22.5	23.0	22.5	23.0	22.5	23.0	22.5
EV-HC1	↓	↓	↓	22.5	↓	↓	↓	↓	↓	↓	↓	↓	↓	22.5
LC-DCDS	↓	↓	↓	22.0	↓	↓	↓	↓	↓	↓	↓	↓	↓	22.5
LC-LC3	↓	↓	↓	22.5	↓	↓	↓	↓	↓	↓	↓	↓	↓	22.5
LC-LC5	↓	↓	↓	↓	↓	22.5	↓	↓	↓	↓	↓	↓	↓	22.5
LC-LCDSSLCC	↓	↓	22.0	↓	↓	↓	↓	↓	22.0	↓	22.0	↓	22.0	22.5
RG-MIDAG	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	22.5
FR-FR4	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	22.5
FR-FR2	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	22.5
FR-MULTIPLATE	↓	↓	↓	↓	↓	↓	↓	✓	↓	↓	↓	↓	↓	22.5
Technician Initials	RZS	EC	EC	[illegible]	[illegible]	RZS	RZS	RZS	RZS	RZS	RZS	RZS	RZS	[illegible]

Thermometer: CER#6

Conductivity (µS)

Sample ID/Conc.	Day													
	21	22		23		24		25		26		27		28
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
EV-MC2	495	520	497	509	500	499	496	512	504	513	502	509	508	524
EV-HC1	860	850	863	866	865	860	857	866	867	877	867	870	869	862
LC-DCDS	1166	1174	1169	1174	1171	1168	1162	1173	1174	1184	1177	1182	1182	1192
LC-LC3	1237	1245	1237	1239	1240	1238	1228	1241	1252	1243	1242	1245	1250	1241
LC-LC5	920	905	908	906	903	902	894	903	916	913	901	905	900	882
LC-LCDSSLCC	1011	1010	1005	1008	1007	1001	999	999	1010	1019	1009	1010	1004	1002
RG-MIDAG	607	629	608	614	608	615	610	620	609	625	610	620	616	622
FR-FR4	1389	1367	1383	1375	1381	1366	1363	1364	1387	1380	1382	1372	1372	1351
FR-FR2	1128	1103	1115	1105	1116	1097	1094	1089	1110	1112	1098	1089	1087	1080
FR-MULTIPLATE	1112	1087	1101	1095	1108	1091	1091	1094	1108	1110	1097	1095	1093	1083
Technician Initials	RZS	EC	EC	[illegible]	[illegible]	RZS	RZS	RZS	RZS	RZS	RZS	RZS	RZS	[illegible]

Conductivity meter: 313

Comments:

Reviewed by: [signature]

Date Reviewed: Dec 14, 2021

Chronic *H. azteca* Water-Only Toxicity Test Data Sheet
Water Quality

Client: Teck
Work Order No.: 212109
Sample ID: Various - see below

Start Date: Oct. 14/21
Termination Date: Nov. 11/21
CER #: 6
Test Organism: *Hyalella azteca*

Temperature (°C)

Sample ID/Conc.	Day													
	21	22		23		24		25		26		27		28
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
FR-FRRD	22.0	22.5	22.0	22.5	22.0	22.5	22.0	22.5	22.0	22.5	22.0	22.5	22.0	22.5
Technician Initials	RZ	EC	EC	TM	TM	RZ	RZ	RZ	RZ	RZ	RZ	RZ	RZ	KW

Thermometer: CER#6

Conductivity (µS)

Sample ID/Conc.	Day													
	21	22		23		24		25		26		27		28
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
FR-FRRD	1349	1313	1327	1305	1317	1294	1294	1283	1325	1314	1307	1294	1296	1278
Technician Initials	RZ	EC	EC	TM	TM	RZ	RZ	RZ	RZ	RZ	RZ	RZ	RZ	KW

Conductivity meter: 313

Comments:

Reviewed by: [signature]

Date Reviewed: Nov. 14, 2021

Chronic *H. azteca* Water-Only Toxicity Test Data Sheet
Water Quality

Client: Teck
Work Order No.: 212109
Sample ID: Various - see below

Start Date: Oct. 14/21
Termination Date: Nov. 11/21
CER #: 6
Test Organism: *Hyalella azteca*

Temperature (°C)

Sample ID/Conc.	Day 21	22		23		24		25		26		27		28
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Control + EDTA	22.0	22.5	23.0	22.5	23.0	22.5	23.0	22.5	22.0	22.5	22.5	22.5	23.0	22.5
FR-FRCP1 + EDTA	↓	↓	↓	↓	22.5	↓	22.5	↓	23.0	↓	↓		↓	22.5
CM_MC2 + EDTA	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	22.5
RG-MIDAG+EDTA	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	23.0	↓	↓	22.5
Technician Initials	RJ	EC	EC	[illegible]	[illegible]	RJ	RJ	RJ	RJ	RJ	RJ	RJ	RJ	KJ

Thermometer: CER#6

Conductivity (µS)

Sample ID/Conc.	Day 21	22		23		24		25		26		27		28
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Control + EDTA	418	427	422	428	423	430	423	434	420	429	424	426	426	431
FR-FRCP1 + EDTA	1396	1369	1383	1373	1378	1356	1361	1361	1386	1377	1375	1353	1365	1343
CM_MC2 + EDTA	979	985	976	978	971	974	968	972	976	986	972	980	968	962
RG-MIDAG+EDTA	609	650	610	620	618	620	613	626	616	635	619	624	623	637
Technician Initials	RJ	EC	EC	[illegible]	[illegible]	RJ	RJ	RJ	RJ	RJ	RJ	RJ	RJ	KJ

Conductivity meter: 3/3

Comments:

Reviewed by: [signature]

Date Reviewed: Dec 14, 2021

Chronic *H. azteca* Water-Only Toxicity Test Data Sheet
Water Quality

Client: Teck
Work Order No.: 212109
Sample ID: Various - See below

Start Date: Oct. 14/21
Termination Date: Nov. 11/21
Test Organism: *Hyalella azteca*

Dissolved Oxygen (mg/L)

Sample ID/Conc.	Day													
	21	22		23		24		25		26		27		28
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Control	8.3	5.3	8.3	5.2	8.5	5.1	8.4	5.8	8.4	5.2	8.4	5.5	8.3	6.2
FR-UFR1	8.4	5.4	8.1	5.4	8.1	5.3	8.0	5.0	8.2	5.1	8.1	4.9	7.8	6.0
GH-ER2	8.5	5.4	8.0	5.5	8.3	5.2	8.0	5.1	8.1	5.0	8.1	4.8	7.8	5.9
CM_MC1	8.5	4.7	8.0	5.0	8.3	4.8	8.0	5.1	8.3	5.1	8.2	5.1	7.9	5.8
LC-SLC	8.7	5.7	8.0	5.5	8.3	5.0	8.1	5.2	8.3	5.5	8.2	5.3	8.0	5.8
FR-FRABCH	8.6	5.7	8.0	5.6	8.1	4.8	8.0	5.3	8.2	5.2	8.2	5.3	8.0	5.8
FR-FRCP1	8.6	5.7	8.0	5.6	8.3	5.1	8.1	5.4	8.3	5.4	8.1	5.3	7.9	5.9
GH-FR1	8.7	5.8	8.1	5.8	8.3	5.3	8.1	5.5	8.3	5.5	8.1	5.4	7.9	6.1
GH-ERC	8.5	5.8	8.0	5.9	8.2	5.1	8.1	5.4	8.2	5.1	8.2	5.2	7.8	6.1
CM_MC2	8.5	6.0	8.0	5.9	8.1	4.8	7.9	5.2	8.2	5.2	8.2	5.0	7.9	6.0
Technician Initials	RZJ	EC	EC	TM	TM	RZJ	RZJ	RZJ	RZJ	RZJ	RZJ	RZJ	RZJ	KDL

DO meter: 3/3

pH

Sample ID/Conc.	Day													
	21	22		23		24		25		26		27		28
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Control	8.1	7.4	8.2	7.5	8.1	7.5	8.1	7.5	8.1	7.5	8.4	7.5	8.0	7.3
FR-UFR1	8.1	7.7	8.2	7.8	8.3	7.9	8.4	7.9	8.5	7.8	8.3	7.8	8.4	7.7
GH-ER2	8.0	7.8	8.2	7.9	8.3	7.9	8.4	7.9	8.5	7.8	8.3	7.8	8.4	7.7
CM_MC1	8.0	7.6	8.1	7.7	8.2	7.7	8.3	7.8	8.5	7.7	8.3	7.7	8.3	7.6
LC-SLC	8.0	7.8	8.2	7.8	8.3	7.8	8.3	7.9	8.3	7.8	8.3	7.8	8.3	7.7
FR-FRABCH	7.8	8.0	7.8	8.0	7.9	8.0	8.0	8.0	7.9	7.9	7.9	7.9	7.9	7.7
FR-FRCP1	8.0	8.1	8.0	8.1	8.1	8.1	8.1	8.1	8.0	8.0	8.0	8.0	8.0	7.9
GH-FR1	7.9	8.0	8.0	8.0	8.1	8.0	8.1	8.0	8.2	8.0	8.0	7.9	8.0	7.8
GH-ERC	7.9	7.9	8.1	7.9	8.2	7.9	8.3	7.9	8.1	7.9	8.3	7.9	8.3	7.9
CM_MC2	8.0	8.1	8.1	8.1	8.2	8.0	8.2	8.0	8.2	8.0	8.1	7.9	8.1	7.8
Technician Initials	RZJ	EC	EC	TM	TM	RZJ	RZJ	RZJ	RZJ	RZJ	RZJ	RZJ	RZJ	KDL

pH meter: 3/3

Light meter: Li-1

Light intensity (Lux): 400-950

Comments:

Reviewed by: [signature]

Date Reviewed: Dec 14, 2021

Chronic *H. azteca* Water-Only Toxicity Test Data Sheet
Water Quality

Client: Teck
Work Order No.: 212109
Sample ID: Various - see below

Start Date: Oct. 14/21
Termination Date: Nov. 11/21
Test Organism: *Hyalella azteca*

Dissolved Oxygen (mg/L)

Sample ID/Conc.	Day													
	21	22		23		24		25		26		27		28
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
EV-MC2	8.5	5.3	7.9	5.3	8.3	5.3	8.0	5.4	8.3	5.4	8.2	4.5	7.8	6.0
EV-HC1	8.7	5.0	7.9	5.4	8.3	5.3	8.1	5.4	8.3	5.1	8.2	5.0	7.8	5.9
LC-DCDS	8.6	5.1	8.1	5.4	8.3	4.2	8.1	4.7	8.3	4.9	8.1	4.9	7.9	6.0
LC-LC3	8.5	4.8	8.0	4.7	8.3	4.7	8.1	5.4	8.2	5.2	8.1	5.2	7.8	5.9
LC-LC5	8.5	5.0	8.1	4.9	8.3	4.8	8.1	5.0	8.2	5.3	8.2	5.2	7.8	5.7
LC-LCDSSLCC	8.7	6.0	8.2	5.6	8.5	5.3	8.1	5.6	8.4	5.7	8.3	5.8	8.0	5.7
RG-MIDAG	8.7	6.3	8.3	5.9	8.4	5.4	8.2	5.7	8.5	5.5	8.4	5.4	8.1	5.9
FR-FR4	8.7	6.8	8.4	6.0	8.5	5.5	8.1	5.7	8.5	5.6	8.4	5.5	8.1	5.8
FR-FR2	8.7	5.8	8.4	6.1	8.5	5.7	8.2	5.5	8.5	5.5	8.4	5.3	8.0	6.1
FR-MULTIPLATE	8.7	6.3	8.3	6.5	8.4	5.2	8.2	5.4	8.5	5.4	8.3	5.2	8.1	5.8
Technician Initials	RZ	EC	EC	[illegible]	[illegible]	RZ	RD	RZ	RD	RZ	RZ	RZ	RD	KM

DO meter: 3/3

pH

Sample ID/Conc.	Day													
	21	22		23		24		25		26		27		28
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
EV-MC2	7.9	7.8	8.1	7.8	8.2	7.8	8.3	7.9	8.2	7.8	8.3	7.7	8.3	7.7
EV-HC1	8.0	7.9	8.2	8.0	8.3	8.1	8.4	8.2	8.3	8.1	8.4	8.1	8.4	8.0
LC-DCDS	7.9	7.8	8.1	7.7	8.2	7.8	8.3	7.9	8.3	7.8	8.3	7.9	8.3	7.8
LC-LC3	7.8	7.9	8.1	7.9	8.2	8.1	8.3	8.2	8.3	8.1	8.3	8.1	8.3	8.0
LC-LC5	8.0	7.9	8.0	8.0	8.0	7.9	8.1	7.9	8.1	7.9	8.0	7.9	8.0	8.0
LC-LCDSSLCC	8.0	8.1	8.2	8.1	8.3	8.1	8.2	8.1	8.2	8.1	8.2	8.1	8.2	8.0
RG-MIDAG	7.9	8.0	8.1	8.1	8.2	8.0	8.3	8.1	8.3	8.0	8.3	8.0	8.3	8.1
FR-FR4	8.0	8.2	8.1	8.2	8.2	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1
FR-FR2	7.9	8.0	7.9	8.1	8.0	8.1	8.0	8.0	8.0	8.0	7.9	7.9	8.0	8.0
FR-MULTIPLATE	8.0	8.1	7.9	8.1	8.0	7.9	8.1	7.9	8.0	7.9	8.0	7.9	8.0	8.0
Technician Initials	RZ	EC	EC	[illegible]	[illegible]	RD	RD	RZ	RZ	RZ	RZ	RZ	RD	KM

pH meter: 3/3

Light meter: Lit-1

Light intensity (Lux): 400-950

Comments:

Reviewed by: [signature]

Date Reviewed: Dec 14, 2021

Chronic *H. azteca* Water-Only Toxicity Test Data Sheet
Water Quality

Client: Teck
Work Order No.: 212109
Sample ID: Various-see below

Start Date: Oct. 14/21
Termination Date: Nov. 11/21
Test Organism: *Hyalella azteca*

Dissolved Oxygen (mg/L)

Sample ID/Conc.	Day													
	21	22		23		24		25		26		27		28
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
FR-FRD	8.7	5.9	8.2	6.2	8.3	5.8	8.2	5.6	8.4	5.5	8.0	5.7	8.0	~~5.0~~ 5.9
Technician Initials	RZ	EC	EC	m	m	RZ	RZ	RZ	RZ	RZ	RZ	RZ	RZ	KC

DO meter: 3/3

pH

Sample ID/Conc.	Day													
	21	22		23		24		25		26		27		28
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
FR-FRD	7.8	8.1	7.7	8.1	7.9	8.1	7.9	8.1	7.8	8.0	7.8	8.0	7.9	8.0
Technician Initials	RZ	EC	EC	m	m	RZ	RZ	RZ	RZ	RZ	RZ	RZ	RZ	KC

pH meter: 3/3

Light meter: Lit-1

Light intensity (Lux): 400-950

Comments:

Reviewed by: [signature]

Date Reviewed: Dec. 14, 2021

Chronic *H. azteca* Water-Only Toxicity Test Data Sheet
Water Quality

Client: Teck
Work Order No.: 22109
Sample ID: Various- See below

Start Date: Oct. 14/21
Termination Date: Nov. 11/21
Test Organism: *Hyalella azteca*

Dissolved Oxygen (mg/L)

Sample ID/Conc.	Day													
	21	22		23		24		25		26		27		28
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Control+EDTA	8.4	6.0	7.9	5.9	8.1	5.3	7.9	5.8	8.3	5.5	8.0	6.0	7.9	6.3
FR-FRCP1+EDTA	8.4	5.8	7.8	5.9	8.2	5.6	8.0	5.6	8.2	5.6	8.1	5.8	7.8	6.2
CM-MC2+EDTA	8.6	5.7	7.9	6.1	8.2	5.0	8.0	4.9	8.3	5.2	8.1	5.4	7.9	6.3
RG-MIDAG+EDTA	8.5	5.7	8.0	6.0	8.3	4.7	8.0	5.3	8.2	5.3	8.1	6.0	7.9	6.3
Technician Initials	RZ	EC	EC	TR	TR	RZ	RZ	RZ	RZ	RZ	RZ	RZ	RZ	KR

DO meter: 3/3

pH

Sample ID/Conc.	Day													
	21	22		23		24		25		26		27		28
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Control+EDTA	7.8	7.5	7.8	7.5	7.9	7.5	7.9	7.5	7.9	7.5	7.9	7.5	8.0	7.7
FR-FRCP1+EDTA	8.1	8.1	8.1	8.1	8.1	8.0	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.0
CM-MC2+EDTA	8.1	8.0	8.1	8.0	8.1	8.0	8.2	8.0	8.3	8.0	8.2	8.0	8.2	8.1
RG-MIDAG+EDTA	8.1	7.9	8.1	7.9	8.1	7.9	8.3	8.0	8.4	7.9	8.3	8.1	8.4	8.0
Technician Initials	RZ	EC	EC	TR	TR	RZ	RZ	RZ	RZ	RZ	RZ	RZ	RZ	KR

pH meter: 3/3

Light meter: lit-1
Light intensity (Lux): 400-950

Comments:

Reviewed by:
Date Reviewed: Dec. 14, 2021

H. azteca Water-only Toxicity Test Data Sheet

28-d Survival and Weight

Client: Teck
Work Order No: 212109
Sample ID: Various - see below

Start Date: Oct. 14/21
Termination Date: NOV. 11/21
Test Organism: *Hyalella azteca*
Balance: 1

Sample ID	Pan No. (Q4 black)	Rep	No. alive	No. dead	No. missing	Initials	Pan weight (mg)	Pan + organism (mg)	No. weighed	Initials
Control	1	A	9	0	1	KJL	1015.94	1019.28	9	EC/EC
	2	B	10		0		998.59	1003.05	10	
	3	C	8		2		999.99	1002.94	8	
	4	D	10		0		1005.51	1009.70	10	
	5	E	9		1		1012.76	1017.50	9	
FR-UFR1	6	A	10	0	0	KJL	1008.23	1013.01	10	
LOE	7	B	10		0		998.40	1003.76	10	
	8	C	9		1		1014.15	1019.09	9	
	9	D	10		0		1008.83	1013.15	10	
	10	E	10		0		1000.23	1004.55	10	
GH-ER2	11	A	10	0	0	KJL	1001.41	1008.14	10	
	12	B	10		0		1006.96	1013.96	10	
	13	C	10		0		1004.26	1008.41	10	
	14	D	9		1		1011.49	1015.79	9	
	15	E	9		1		996.05	1005.85	9	
CM-MC1	16	A	6	0	4	KJL	1000.47	1004.01	6	
	17	B	10		0		1001.13	1007.32	10	
	18	C	10		0		1004.94	1010.43	10	
	19	D	9		1		1006.23	1010.35	9	
	20	E	10		0		1008.94	1014.53	10	

Date/time pan placed in oven: Oct. 21/21 @ 0700h
Date/time pan removed from oven: Oct 22/21 @ 0830h

Date/time pan + organisms placed in oven: Nov. 11/21 @ 1430h
Date/time pan + organisms removed from oven: Nov. 12/21 @ 1000

Comments: Reweigh : 9: 1013.05 13 : 1008.35

Reviewed by:

Date Reviewed: Dec 14, 2021

H. azteca Water-only Toxicity Test Data Sheet

28-d Survival and Weight

Client: Teck
Work Order No: 212109
Sample ID: Various - see below

Start Date: Oct. 14/21
Termination Date: Nov. 11/21
Test Organism: *Hyalella azteca*
Balance: 1

Sample ID	Pan No. (Q4 black)	Rep	No. alive	No. dead	No. missing	Initials	Pan weight (mg)	Pan + organism (mg)	No. weighed	Initials
~~Control~~	21	A	9	0	1	KJL	998.25	1001.50	9	EC/EC
LC-SLC	22	B	10		0		996.28	1000.74	10	
	23	C	10		0		997.87	1002.60	10	
	24	D	9		1		1002.17	1008.58	9	
	25	E	10		0		995.16	999.58	10	
FR-FRABCH	26	A	10	0	0	KJL	993.10	999.24	10	
	27	B	10		0		999.13	1006.50	10	
	28	C	10		0		996.70	1003.91	10	
	29	D	9		1		1004.50	1009.31	9	
	30	E	9		1		997.56	1001.35	8①	
FR-FRCP2	31	A	10	0	0	KJL	1004.97	1010.71	10	
	32	B	9		1		995.28	1000.58	9	
	33	C	10		0		995.68	1001.07	10	
	34	D	10		0		1005.77	1010.34	10	
	35	E	10		0		1000.96	1005.37	10	
GH-FR1	36	A	10	0	0	KJL	1014.30	1019.28	10	
	37	B	9		1		1012.28	1016.58	9	
	38	C	10		0		993.22	999.64	10	
	39	D	9		1		1006.44	1009.19	9	
	40	E	8		2		1004.56	1006.93	8	

Date/time pan placed in oven: Oct. 21/21 @ 0700h
Date/time pan removed from oven: Oct. 22/21 @ 0830h

Date/time pan + organisms placed in oven: Nov. 11/21 @ 1430h
Date/time pan + organisms removed from oven: Nov. 12/21 @ 1000h

Comments: ①One lost during transfer
Reweigh: 23: 1002.51 29: 1009.14

Reviewed by:

Date Reviewed: Dec. 14, 2021

H. azteca Water-only Toxicity Test Data Sheet

28-d Survival and Weight

Client: Teck
Work Order No: 212109
Sample ID: Various - see below

Start Date: Oct. 14/21
Termination Date: Nov. 11/21
Test Organism: *Hyalella azteca*
Balance: 1

Sample ID	Pan No. (Q4 black)	Rep	No. alive	No. dead	No. missing	Initials	Pan weight (mg)	Pan + organism (mg)	No. weighed	Initials
~~Control~~	41	A	10	0	0	KJV	1018.74	1022.86	10	EC/EC
GH-ERC	42	B	10		0		1008.12	1012.10	10	
	43	C	9		1		1004.20	1007.87	9	
	44	D	8		2		1010.98	1014.62	8	
	45	E	8		2		1006.16	1009.32	8	
CM-MC2	46	A	10	0	0	KJV	1004.37	1010.90	10	
	47	B	10		0		1002.75	1006.55	10	
	48	C	9		1		1004.50	1009.77	9	
	49	D	10		0		999.62	1005.27	10	
	50	E	10		0		1015.93	1022.15	10	
EV-MC2	51	A	10	0	0	KJV	1016.68	1019.97	90	
	52	B	10		0		1006.17	1009.86	10	
	53	C	9		1		1010.00	1013.53	9	
	54	D	10		0		1012.59	1017.68	10	
	55	E	9		1		1011.67	1015.71	9	
EV-MC1	56	A	10	0	0	KJV	1007.39	1015.25	10	
	57	B	8		2		1006.90	1010.89	8	
	58	C	10		0		1006.89	1012.01	10	
	59	D	10		0		1007.83	1012.51	10	
	60	E	9		1		1014.52	1019.57	9	

Date/time pan placed in oven: Oct. 21/21 @ 0700h
Date/time pan removed from oven: Oct. 22/21 @ 0830h

Date/time pan + organisms placed in oven: Nov. 11/21 @ 1430h
Date/time pan + organisms removed from oven: Nov. 12/21 @ 100h

Comments: ① one lost during transfer
Reweigh 47: 1006.27 55: 1015.44

Reviewed by:

Date Reviewed: Dec. 14, 2021

H. azteca Water-only Toxicity Test Data Sheet

28-d Survival and Weight

Client: Teck
Work Order No: 212109
Sample ID: Various - see below

Start Date: Oct. 14/21
Termination Date: Nov. 11/21
Test Organism: *Hyalella azteca*
Balance: 1

Sample ID	Pan No. (Q4 black)	Rep	No. alive	No. dead	No. missing	Initials	Pan weight (mg)	Pan + organism (mg)	No. weighed	Initials
~~Control~~	61	A	10	0	0	KJL	1005.88	1010.36	10	EC/EC
LC-DCDS	62	B	2	5	3		1007.96	1008.46	2	
	63	C	10	0	0		1003.77	1008.25	10	
	64	D	8	0	2		1009.39	1012.70	8	
	65	E	8	0	2		1013.54	1016.69	8	
LC-LC3	66	A	10	0	0	KJL	996.56	1001.46	9①	
	67	B	10	0	0		1000.74	1005.78	10	
	68	C	10	0	0		1010.98	1015.84	10	
	69	D	9	0	1		1015.80	1020.92	9	
	70	E	8	0	2		1010.90	1014.80	8	
LC-LC5	71	A	10	0	0	KJL	1002.80	1008.03	10	
	72	B	10	0	0		1000.70	1006.71	10	
	73	C	10	0	0		1003.77	1009.48	10	
	74	D	9	0	1		1004.82	1009.19	9	
	75	E	9	0	1		1011.67	1016.54	9	
LC-LCDSSLCC	76	A	10	0	0	KJL	1017.56	1023.56	10	
	77	B	10	0	0		1002.84	1006.89	10	
	78	C	10	0	0		1009.50	1014.23	10	
	79	D	9	0	1		1014.28	1019.18	9	
	80	E	10	0	0		1003.47	1007.85	10	

Date/time pan placed in oven: Oct. 21/21 @ 0700h
Date/time pan removed from oven: Oct. 22/21 @ 0830h

Date/time pan + organisms placed in oven: Nov. 11/21 @ 1430h
Date/time pan + organisms removed from oven: Nov. 12/21 @ 1000h

Comments: Reweigh 61 : 1010.27 74 : 1009.01
① lost during transfer
one

Reviewed by:

Date Reviewed: Dec. 14, 2021

H. azteca Water-only Toxicity Test Data Sheet

28-d Survival and Weight

Client: Teck
Work Order No: 312104
Sample ID: Various - see below

Start Date: Oct. 14/21
Termination Date: Nov. 11/21
Test Organism: *Hyalella azteca*
Balance: 1

Sample ID	Pan No. (Q4 black)	Rep	No. alive	No. dead	No. missing	Initials	Pan weight (mg)	Pan + organism (mg)	No. weighed	Initials
RZ) ~~Control~~	81	A	10	0	0	KJL	1007.49	1012.21	10	EC/EC
RG-MIDAG	82	B	10	↓	↓	↓	1006.93	1012.99	10	↓
	83	C	10	↓	↓	↓	1003.86	1008.15	10	↓
	84	D	10	↓	↓	↓	1009.91	1015.90	10	↓
	85	E	10	↓	↓	↓	1009.98	1014.13	10	↓
FR-FR4	86	A	8	0	2	KJL	1009.85	1012.94	8	↓
	87	B	10	↓	0	↓	1005.51	1009.24	10	↓
	88	C	10	↓	0	↓	1019.56	1024.75	10	↓
	89	D	9	↓	1	↓	1012.56	1016.08	9	↓
	90	E	10	↓	0	↓	1015.34	1018.62	10	↓
FR-FR2	91	A	9	0	1	KJL	1015.00	1019.38	9	↓
	92	B	9	↓	1	↓	1014.74	1019.13	9	↓
	93	C	9	↓	1	↓	1013.80	1017.50	9	↓
	94	D	10	↓	0	↓	1008.51	1012.37	10	↓
	95	E	9	↓	1	↓	1002.26	1007.13	9	↓
FR-MULTIPLATE	96	A	10	0	0	KJL	999.92	1005.16	10	↓
	97	B	7	↓	3	↓	1003.69	1007.05	7	↓
	98	C	9	↓	1	↓	1000.61	1004.52	9	↓
	99	D	8	↓	2	↓	1017.13	1020.64	8	↓
	100	E	9	↓	1	↓	1022.84	1026.74	9	↓

Date/time pan placed in oven: Oct. 21/21 @ 0700h
Date/time pan removed from oven: Oct. 22/21 @ 0830h

Date/time pan + organisms placed in oven: Nov. 11/21 @ 1430h
Date/time pan + organisms removed from oven: Nov. 12/21 @ 1000h

Comments: rewegh: 82: 1012.72 91: 1019.20

Reviewed by: [signature]

Date Reviewed: Dec. 14, 2021

H. azteca Water-only Toxicity Test Data Sheet

28-d Survival and Weight

Client: Teck
Work Order No: 212109
Sample ID: Various - see below

Start Date: Oct. 14/21
Termination Date: Nov. 11/21
Test Organism: *Hyalella azteca*
Balance: 1

Sample ID	Pan No. (Q4 black)	Rep	No. alive	No. dead	No. missing	Initials	Pan weight (mg)	Pan + organism (mg)	No. weighed	Initials
R2) ~~Control~~	101	A	10	0	0	KJV	1014.33	1017.37	10	EC/EC
FR-FRRD	102	B	10	↓	0	↓	1003.60	1007.09	10	↓
	103	C	10		0		1005.51	1008.81	10	
	104	D	10		0		1016.92	1020.56	10	
	105	E	9		1		1007.92	1011.45	9	↓
		A								
		B								
		C								
		D								
		E								
		A								
		B								
		C								
		D								
		E								
		A								
		B								
		C								
		D								
		E								

Date/time pan placed in oven: Oct. 21/21 @ 0700h
Date/time pan removed from oven: Oct. 22/21 @ 0830h

Date/time pan + organisms placed in oven: Nov. 11/21 @ 1430h
Date/time pan + organisms removed from oven: Nov. 12/21 @ 1000h

Comments: new weigh 102 : 1007.02

Reviewed by: [signature]

Date Reviewed: Dec. 14, 2021

H. azteca Water-only Toxicity Test Data Sheet

28-d Survival and Weight

Client: Teck
Work Order No: 212109
Sample ID: Various - see below

Start Date: Oct. 14/21
Termination Date: Nov. 11/21
Test Organism: *Hyalella azteca*
Balance: 1

Sample ID	Pan No. (Q4 blacks)	Rep	No. alive	No. dead	No. missing	Initials	Pan weight (mg)	Pan + organism (mg)	No. weighed	Initials
Control + EDTA	106	A	9	0	1	EJL	1013.89	1020.41	9	CC/EC
	107	B	10		0		1011.69	1017.60	10	
	108	C	10		0		1010.05	1015.82	10	
	109	D	10		0		1010.93	1017.91	10	
	110	E	9		1		1006.15	1012.55	~~9~~ EC 9	
FR-FRCP1 + EDTA	111	A	10	0	0	EJL	1006.75	1011.08	10	
	112	B	10	0	0		1001.53	~~1008.91~~	10	
	113	C	10	0	0		1017.22	1023.88	10	
	114	D	10	0	0		1000.00	1007.03	10	
	115	E	8	~~0~~ 0	2		1004.48	1010.23	8	
CM-MC2 + EDTA	~~116~~ 116	A	10	0	0	EJL	999.97	1004.49	10	
	117	B	10		0		1002.68	1010.39	10	
	118	C	10		0		1005.18	1012.11	10	
	119	D	9		1		998.90	1005.41	09	
	120	E	10		0		996.68	1003.32	10	
RG-MIDAG + EDTA	121	A	10	0	0	EJL	1006.68	1010.25	10	
	122	B	10		0		1013.21	1018.14	10	
	123	C	9		1		996.64	1001.16	9	
	124	D	9		1		1009.46	1013.88	9	
	125	E	9		1		1018.08	1022.19	9	

Date/time pan placed in oven: Oct. ~~22~~ 21/21 @ 0700h
Date/time pan removed from oven: Oct. 22/21 @ 0830h

Date/time pan + organisms placed in oven: Nov. 11/21 @ 1430h
Date/time pan + organisms removed from oven: Nov. 12/21 @ 1000h

Comments: reweigh: 108: 1015.60 115: 1010.00

Reviewed by: [signature]

Date Reviewed: Dec. 14, 2021

CETIS Summary Report

Hyalella 28-d Survival and Growth Sediment Test — **Nautilus Environmental**

Batch ID:	11-3778-4609	**Test Type:**	Survival-Growth	**Analyst:**	Rachel Sakurdeep
Start Date:	14 Oct-21	**Protocol:**	EPA/600/R-99/064 (2000)	**Diluent:**	Reconstituted Water
Ending Date:	11 Nov-21	**Species:**	Hyalella azteca	**Brine:**	
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	Aquatic Biosystems, CO **Age:** 7-8d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
Control	10-2210-7910	14 Oct-21	14 Oct-21	n/a	Teck Coal	
FR_UFR1	19-8746-8946	12 Oct-21 11:07	13 Oct-21 11:53	37h (0 °C)		
GH_ER2	20-2628-4137	12 Oct-21 10:50	13 Oct-21 11:30	37h (0 °C)		
CM_MC1	18-3559-2852	12 Oct-21 13:20	13 Oct-21 11:30	35h (0.1 °C)		
LC_SLC	08-7937-3726	12 Oct-21 11:00	13 Oct-21 11:30	37h (2.9 °C)		
FR_FRABCH	18-7592-7020	12 Oct-21 11:20	13 Oct-21 11:53	37h (0 °C)		
FR_FRCP1	10-3969-8000	12 Oct-21 11:48	13 Oct-21 11:53	36h (1.3 °C)		
GH_FR1	11-8224-4576	12 Oct-21 10:00	13 Oct-21 11:30	38h (0 °C)		
GH_ERC	00-1276-7572	12 Oct-21 11:50	13 Oct-21 11:30	36h (0 °C)		
CM_MC2	03-9569-8600	12 Oct-21 12:47	13 Oct-21 11:30	35h (1.3 °C)		
EV_MC2	13-1923-7722	12 Oct-21 11:38	13 Oct-21 11:30	36h (0.2 °C)		
EV_HC1	18-6648-8827	12 Oct-21 10:33	13 Oct-21 11:30	37h (0 °C)		
LC_DCDS	17-4710-4100	12 Oct-21	13 Oct-21 11:30	48h (1.7 °C)		
LC_LC3	20-0894-5906	12 Oct-21 12:00	13 Oct-21 11:30	36h (8.8 °C)		
LC_LC5	14-5637-1032	12 Oct-21 13:30	13 Oct-21 11:30	34h (2.6 °C)		
LC_LCDSSLCC	06-4184-4349	12 Oct-21 12:30	13 Oct-21 11:30	35h (4.7 °C)		
RG_MIDAG	02-5873-2402	12 Oct-21 12:24	13 Oct-21 11:30	36h (3.9 °C)		
FR_FR4	16-7272-1140	12 Oct-21 11:05	13 Oct-21 11:30	37h (0 °C)		
FR_FR2	09-1936-7906	12 Oct-21 10:25	13 Oct-21 11:30	38h (0 °C)		
FR_MULTIPLATE	07-2028-3040	12 Oct-21 09:45	13 Oct-21 11:30	38h (0 °C)		
FR_FRRD	04-7874-3326	12 Oct-21 11:45	13 Oct-21 11:30	36h (0 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
Control	Water Sample	Teck Coal	Control	
FR_UFR1	Water Sample	Teck Coal	FR_UFR1_WEK_2021-09-1	
GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-10-12_	
CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-10-12	
LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-10-19_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_WEK_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_WEK_2021-09	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-10-12_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-10-12	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-10-12	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2021_Q4_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2021_Q4_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-10-19	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-10-19_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-10-19_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	
RG_MIDAG	Water Sample	Teck Coal	RG_MIDAG_WS_2021-10-	
FR_FR4	Water Sample	Teck Coal	FR_FR4_WS_2021-10-12_	
FR_FR2	Water Sample	Teck Coal	FR_FR2_WS_2021-10-12_	
FR_MULTIPLATE	Water Sample	Teck Coal	FR_MULTIPLATE_WS_202	
FR_FRRD	Water Sample	Teck Coal	FR_FRRD_WS_2021-10-12	

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9990	LC_LCDSSLCC passed mean dry weight-	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9990	FR_MULTIPLATE passed mean dry weight	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9990	LC_SLC passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9990	FR_FR2 passed mean dry weight-mg	1

Analyst: RD QA: Dec-15/21

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9990	FR_FRABCH passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9990	FR_FR4 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9990	FR_FRCP1 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9990	GH_FR1 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9990	CM_MC1 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9990	CM_MC2 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9990	RG_MIDAG passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9990	GH_ERC passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9990	LC_LC5 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9990	GH_ER2 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9990	FR_FRRD passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9990	LC_LC3 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9990	EV_MC2 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9990	FR_UFR1 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9990	Control passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9990	EV_HC1 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9990	LC_DCDS passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	FR_FRRD passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	LC_SLC passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	FR_FR2 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	FR_UFR1 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	FR_FRABCH passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	FR_FR4 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	LC_LCDSSLCC passed mean dry weight-	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	RG_MIDAG passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	LC_DCDS passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	EV_MC2 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	GH_FR1 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	FR_MULTIPLATE passed mean dry weight	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	LC_LC3 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	GH_ERC passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	LC_LC5 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	Control passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	FR_FRCP1 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	EV_HC1 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	GH_ER2 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	CM_MC1 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	CM_MC2 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	LC_LC5 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	FR_FR4 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	FR_FRCP1 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	RG_MIDAG passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	CM_MC1 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	GH_FR1 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	FR_MULTIPLATE passed mean dry weight	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	LC_LCDSSLCC passed mean dry weight-	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	FR_FRABCH passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	GH_ERC passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	Control passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	LC_LC3 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	EV_MC2 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	LC_DCDS passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	FR_UFR1 passed mean dry weight-mg	1

SIngle Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	GH_ER2 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	FR_FRRD passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	CM_MC2 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	LC_SLC passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	FR_FR2 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	EV_HC1 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9991	LC_LC5 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9991	CM_MC2 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9991	CM_MC1 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9991	LC_LCDSSLCC passed mean dry weight-	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9991	GH_ERC passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9991	LC_LC3 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9991	LC_SLC passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9991	FR_FR4 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9991	FR_FRCP1 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9991	FR_UFR1 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9991	Control passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9991	EV_MC2 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9991	LC_DCDS passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9991	GH_FR1 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9991	EV_HC1 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9991	FR_FRABCH passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9991	RG_MIDAG passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9991	GH_ER2 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9991	FR_FR2 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9991	FR_FRRD passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9991	FR_MULTIPLATE passed mean dry weight	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	GH_FR1 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	GH_ERC passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	FR_FR2 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	LC_LCDSSLCC passed mean dry weight-	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	LC_LC5 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	CM_MC2 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	LC_SLC passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	LC_LC3 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	FR_UFR1 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	LC_DCDS passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	EV_MC2 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	GH_ER2 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	FR_MULTIPLATE passed mean dry weight	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	EV_HC1 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	FR_FRRD passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	Control passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	FR_FRABCH passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	FR_FRCP1 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	FR_FR4 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	RG_MIDAG passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	CM_MC1 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	FR_FRCP1 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	LC_LC5 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	CM_MC1 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	CM_MC2 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	EV_MC2 passed mean dry weight-mg	1

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	FR_UFR1 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	EV_HC1 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	GH_ERC passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	GH_ER2 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	LC_LC3 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	FR_MULTIPLATE passed mean dry weight	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	Control passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	FR_FR4 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	LC_DCDS passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	FR_FRABCH passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	FR_FRRD passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	GH_FR1 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	FR_FR2 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	LC_LCDSSLCC passed mean dry weight-	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	LC_SLC passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	RG_MIDAG passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9818	GH_ERC passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9818	CM_MC1 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9818	EV_MC2 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9818	RG_MIDAG passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9818	FR_UFR1 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9818	FR_FR2 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9818	LC_LC3 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9818	FR_FRRD passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9818	GH_FR1 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9818	LC_LCDSSLCC passed mean dry weight-	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9818	EV_HC1 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9818	LC_DCDS passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9818	FR_FR4 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9818	FR_MULTIPLATE passed mean dry weight	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9818	LC_SLC passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9818	GH_ER2 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9818	FR_FRABCH passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9818	Control passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9818	LC_LC5 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9818	CM_MC2 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9818	FR_FRCP1 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9134	Control passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9134	EV_HC1 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9134	GH_ER2 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9134	CM_MC1 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9134	FR_FR4 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9134	LC_LC5 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9134	FR_FRCP1 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9134	FR_MULTIPLATE passed mean dry weight	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9134	FR_UFR1 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9134	LC_SLC passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9134	CM_MC2 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9134	FR_FR2 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9134	LC_LC3 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9134	FR_FRRD passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9134	FR_FRABCH passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9134	RG_MIDAG passed mean dry weight-mg	1

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9134	LC_DCDS passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9134	EV_MC2 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9134	GH_ERC passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9134	GH_FR1 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9134	LC_LCDSSLCC passed mean dry weight-	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	FR_FR4 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	FR_MULTIPLATE passed mean dry weight	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	LC_SLC passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	CM_MC1 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	EV_MC2 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	LC_LC5 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	FR_FRCP1 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	LC_LCDSSLCC passed mean dry weight-	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	RG_MIDAG passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	FR_FR2 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	GH_FR1 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	EV_HC1 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	FR_UFR1 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	LC_DCDS passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	GH_ERC passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	CM_MC2 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	GH_ER2 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	Control passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	LC_LC3 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	FR_FRABCH passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	FR_FRRD passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9255	GH_FR1 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9255	CM_MC1 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9255	GH_ERC passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9255	EV_MC2 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9255	Control passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9255	FR_UFR1 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9255	LC_SLC passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9255	FR_FRCP1 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9255	FR_FRABCH passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9255	GH_ER2 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9255	RG_MIDAG passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9255	FR_FRRD passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9255	CM_MC2 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9255	LC_LC3 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9255	LC_LC5 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9255	FR_FR4 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9255	EV_HC1 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9255	FR_MULTIPLATE passed mean dry weight	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9255	LC_DCDS passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9255	FR_FR2 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9255	LC_LCDSSLCC passed mean dry weight-	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	FR_FR4 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	FR_FRCP1 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	LC_LCDSSLCC passed mean dry weight-	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	RG_MIDAG passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	EV_HC1 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	Control passed mean dry weight-mg	1

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	FR_FRRD passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	FR_UFR1 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	LC_LC3 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	GH_FR1 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	FR_FRABCH passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	LC_SLC passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	FR_FR2 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	EV_MC2 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	CM_MC1 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	FR_MULTIPLATE passed mean dry weight	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	LC_LC5 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	GH_ER2 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	CM_MC2 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	GH_ERC passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	LC_DCDS passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.7924	GH_FR1 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.7924	LC_LCDSSLCC passed mean dry weight-	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.7924	LC_LC5 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.7924	FR_FRCP1 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.7924	EV_HC1 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.7924	RG_MIDAG passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.7924	GH_ERC passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.7924	FR_FRABCH passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.7924	FR_FR4 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.7924	LC_SLC passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.7924	FR_FR2 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.7924	CM_MC1 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.7924	FR_MULTIPLATE passed mean dry weight	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.7924	GH_ER2 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.7924	CM_MC2 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.7924	FR_UFR1 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.7924	Control passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.7924	FR_FRRD passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.7924	EV_MC2 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.7924	LC_DCDS passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.7924	LC_LC3 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9999	FR_FR4 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9999	FR_FR2 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9999	LC_SLC passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9999	LC_DCDS passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9999	FR_FRABCH passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9999	GH_ERC passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9999	CM_MC1 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9999	EV_HC1 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9999	LC_LCDSSLCC passed mean dry weight-	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9999	LC_LC3 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9999	FR_FRCP1 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9999	FR_UFR1 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9999	GH_FR1 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9999	EV_MC2 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9999	LC_LC5 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9999	RG_MIDAG passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9999	FR_MULTIPLATE passed mean dry weight	1

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9999	Control passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9999	GH_ER2 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9999	FR_FRRD passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9999	CM_MC2 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	FR_FRABCH passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	Control passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	RG_MIDAG passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	LC_DCDS passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	FR_FR4 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	LC_SLC passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	FR_FR2 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	CM_MC1 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	FR_FRRD passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	EV_MC2 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	FR_MULTIPLATE passed mean dry weight	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	GH_ER2 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	CM_MC2 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	FR_UFR1 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	EV_HC1 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	GH_ERC passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	FR_FRCP1 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	GH_FR1 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	LC_LCDSSLCC passed mean dry weight-	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	LC_LC3 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	LC_LC5 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9994	FR_FRRD passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9994	LC_LCDSSLCC passed mean dry weight-	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9994	CM_MC1 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9994	LC_LC3 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9994	LC_LC5 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9994	FR_FR4 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9994	LC_DCDS passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9994	FR_UFR1 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9994	GH_FR1 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9994	LC_SLC passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9994	FR_FR2 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9994	GH_ER2 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9994	CM_MC2 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9994	GH_ERC passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9994	FR_FRCP1 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9994	EV_HC1 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9994	FR_FRABCH passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9994	RG_MIDAG passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9994	FR_MULTIPLATE passed mean dry weight	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9994	EV_MC2 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9994	Control passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9998	GH_ER2 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9998	FR_UFR1 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9998	FR_FR2 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9998	CM_MC1 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9998	FR_MULTIPLATE passed mean dry weight	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9998	LC_LC5 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9998	EV_HC1 passed mean dry weight-mg	1

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9998	GH_FR1 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9998	EV_MC2 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9998	FR_FRRD passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9998	GH_ERC passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9998	CM_MC2 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9998	RG_MIDAG passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9998	FR_FRABCH passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9998	LC_SLC passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9998	LC_DCDS passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9998	FR_FRCP1 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9998	LC_LC3 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9998	FR_FR4 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9998	Control passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9998	LC_LCDSSLCC passed mean dry weight-	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.8472	GH_ERC passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.8472	FR_FRRD passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.8472	LC_LCDSSLCC passed mean dry weight-	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.8472	FR_MULTIPLATE passed mean dry weight	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.8472	GH_ER2 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.8472	FR_FRCP1 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.8472	FR_FRABCH passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.8472	EV_MC2 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.8472	LC_LC3 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.8472	LC_DCDS passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.8472	CM_MC2 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.8472	EV_HC1 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.8472	FR_FR4 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.8472	GH_FR1 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.8472	Control passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.8472	LC_SLC passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.8472	FR_UFR1 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.8472	FR_FR2 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.8472	CM_MC1 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.8472	RG_MIDAG passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.8472	LC_LC5 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9944	FR_FRRD passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9944	LC_DCDS passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9944	FR_FRCP1 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9944	LC_LC3 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9944	EV_MC2 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9944	EV_HC1 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9944	LC_SLC passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9944	CM_MC2 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9944	FR_FR4 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9944	GH_ERC passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9944	LC_LCDSSLCC passed mean dry weight-	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9944	GH_ER2 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9944	FR_UFR1 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9944	FR_MULTIPLATE passed mean dry weight	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9944	RG_MIDAG passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9944	CM_MC1 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9944	FR_FRABCH passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9944	Control passed mean dry weight-mg	1

SIngle Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9944	GH_FR1 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9944	FR_FR2 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9944	LC_LC5 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9950	FR_UFR1 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9950	EV_HC1 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9950	GH_ERC passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9950	LC_LCDSSLCC passed mean dry weight-	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9950	LC_LC3 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9950	LC_DCDS passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9950	RG_MIDAG passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9950	FR_FRRD passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9950	FR_FR4 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9950	EV_MC2 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9950	Control passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9950	LC_LC5 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9950	FR_FR2 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9950	CM_MC2 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9950	GH_FR1 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9950	FR_MULTIPLATE passed mean dry weight	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9950	FR_FRCP1 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9950	FR_FRABCH passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9950	LC_SLC passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9950	CM_MC1 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9950	GH_ER2 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.4176	FR_MULTIPLATE passed mean dry weight	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.4176	FR_FR4 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.4176	CM_MC2 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.4176	RG_MIDAG passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.4176	EV_HC1 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.4176	LC_LCDSSLCC passed mean dry weight-	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.4176	FR_UFR1 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.4176	FR_FR2 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.4176	CM_MC1 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.4176	LC_LC5 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.4176	GH_ER2 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.4176	LC_SLC passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.4176	FR_FRABCH passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.4176	FR_FRCP1 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.4176	GH_FR1 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.4176	Control passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.4176	EV_MC2 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.4176	FR_FRRD passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.4176	LC_DCDS passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.4176	LC_LC3 passed mean dry weight-mg	1
15-7281-6493	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.4176	GH_ERC passed mean dry weight-mg	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed survival rate	1

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	RG_MIDAG passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Control passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	RG_MIDAG passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Control passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	RG_MIDAG passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Control passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed survival rate	1

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Control passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	RG_MIDAG passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Control passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	RG_MIDAG passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed survival rate	1

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	RG_MIDAG passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Control passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Control passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	RG_MIDAG passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Control passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	RG_MIDAG passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed survival rate	1

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	RG_MIDAG passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Control passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Control passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	RG_MIDAG passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	RG_MIDAG passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Control passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed survival rate	1

SIngle Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.5376	GH_FR1 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.5376	LC_LC5 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.5376	LC_LCDSSLCC passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.5376	FR_FRCP1 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.5376	EV_HC1 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.5376	RG_MIDAG passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.5376	GH_ERC passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.5376	FR_FRABCH passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.5376	FR_FR4 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.5376	LC_SLC passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.5376	FR_FR2 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.5376	CM_MC1 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.5376	FR_MULTIPLATE passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.5376	GH_ER2 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.5376	CM_MC2 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.5376	FR_UFR1 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.5376	Control passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.5376	FR_FRRD passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.5376	LC_DCDS passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.5376	EV_MC2 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.5376	LC_LC3 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	RG_MIDAG passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Control passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed survival rate	1

Hyalella 28-d Survival and Growth Sediment Test — **Nautilus Environmental**

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Control passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	RG_MIDAG passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Control passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	RG_MIDAG passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed survival rate	1

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	RG_MIDAG passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Control passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Control passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	RG_MIDAG passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	RG_MIDAG passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Control passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed survival rate	1

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	RG_MIDAG passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Control passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	RG_MIDAG passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Control passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed survival rate	1
20-7719-2466	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed survival rate	1

Test Acceptability

Analysis ID	Endpoint	Attribute	Test Stat	TAC Limits Lower	TAC Limits Upper	Overlap	Decision
20-7719-2466	Survival Rate	Control Resp	0.92	0.8	>>	Yes	Passes Criteria

Hyalella 28-d Survival and Growth Sediment Test

Nautilus Environmental

Mean Dry Weight-mg Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
Control	N	5	0.4263	0.3457	0.5069	0.3688	0.5267	0.02904	0.06495	15.23%	0.00%
FR_UFR1		5	0.4854	0.4164	0.5544	0.432	0.5489	0.02485	0.05556	11.45%	-13.86%
GH_ER2		5	0.5587	0.4051	0.7123	0.415	0.7	0.05531	0.1237	22.14%	-31.06%
CM_MC1		5	0.555	0.4794	0.6306	0.4578	0.619	0.02723	0.06088	10.97%	-30.18%
LC_SLC		5	0.4869	0.3221	0.6517	0.3611	0.7122	0.05936	0.1327	27.26%	-14.21%
FR_FRABCH		5	0.616	0.4737	0.7584	0.4737	0.737	0.05126	0.1146	18.61%	-44.51%
FR_FRCP1		5	0.53	0.4376	0.6223	0.441	0.589	0.03327	0.07439	14.04%	-24.32%
GH_FR1		5	0.4439	0.2637	0.6241	0.2962	0.642	0.06491	0.1451	32.69%	-4.13%
GH_ERC		5	0.4136	0.3835	0.4436	0.395	0.455	0.01082	0.02419	5.85%	2.99%
CM_MC2		5	0.5711	0.4646	0.6777	0.43	0.653	0.03838	0.08581	15.03%	-33.97%
EV_MC2		5	0.4169	0.3408	0.4931	0.3656	0.509	0.02743	0.06133	14.71%	2.20%
EV_HC1		5	0.5652	0.4063	0.724	0.468	0.786	0.05721	0.1279	22.64%	-32.57%
LC_DCDS		5	0.3907	0.2889	0.4925	0.25	0.448	0.03668	0.08201	20.99%	8.35%
LC_LC3		5	0.5182	0.4724	0.564	0.486	0.5689	0.01649	0.03687	7.12%	-21.55%
LC_LC5		5	0.5443	0.4894	0.5993	0.4856	0.601	0.0198	0.04428	8.13%	-27.69%
LC_LCDSSLCC		5	0.4921	0.3934	0.5908	0.405	0.6	0.03554	0.07947	16.15%	-15.43%
RG_MIDAG		5	0.5042	0.3897	0.6187	0.415	0.606	0.04123	0.09219	18.28%	-18.27%
FR_FR4		5	0.3995	0.3109	0.488	0.328	0.519	0.03189	0.07131	17.85%	6.29%
FR_FR2		5	0.4625	0.3843	0.5408	0.386	0.5411	0.02819	0.06304	13.63%	-8.50%
FR_MULTIPLATE		5	0.4641	0.4132	0.515	0.4333	0.524	0.01834	0.04101	8.84%	-8.87%
FR_FRRD		5	0.3472	0.3045	0.39	0.301	0.3922	0.0154	0.03443	9.92%	18.55%

Survival Rate Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
Control	N	5	0.9200	0.8161	1.0000	0.8000	1.0000	0.0374	0.0837	9.09%	0.00%
FR_UFR1		5	0.9800	0.9245	1.0000	0.9000	1.0000	0.0200	0.0447	4.56%	-6.52%
GH_ER2		5	0.9600	0.8920	1.0000	0.9000	1.0000	0.0245	0.0548	5.71%	-4.35%
CM_MC1		5	0.9000	0.6849	1.0000	0.6000	1.0000	0.0775	0.1732	19.25%	2.17%
LC_SLC		5	0.9600	0.8920	1.0000	0.9000	1.0000	0.0245	0.0548	5.71%	-4.35%
FR_FRABCH		5	0.9600	0.8920	1.0000	0.9000	1.0000	0.0245	0.0548	5.71%	-4.35%
FR_FRCP1		5	0.9800	0.9245	1.0000	0.9000	1.0000	0.0200	0.0447	4.56%	-6.52%
GH_FR1		5	0.9200	0.8161	1.0000	0.8000	1.0000	0.0374	0.0837	9.09%	0.00%
GH_ERC		5	0.9000	0.7758	1.0000	0.8000	1.0000	0.0447	0.1000	11.11%	2.17%
CM_MC2		5	0.9800	0.9245	1.0000	0.9000	1.0000	0.0200	0.0447	4.56%	-6.52%
EV_MC2		5	0.9600	0.8920	1.0000	0.9000	1.0000	0.0245	0.0548	5.71%	-4.35%
EV_HC1		5	0.9400	0.8289	1.0000	0.8000	1.0000	0.0400	0.0894	9.52%	-2.17%
LC_DCDS		5	0.7600	0.3519	1.0000	0.2000	1.0000	0.1470	0.3286	43.24%	17.39%
LC_LC3		5	0.9400	0.8289	1.0000	0.8000	1.0000	0.0400	0.0894	9.52%	-2.17%
LC_LC5		5	0.9600	0.8920	1.0000	0.9000	1.0000	0.0245	0.0548	5.71%	-4.35%
LC_LCDSSLCC		5	0.9800	0.9245	1.0000	0.9000	1.0000	0.0200	0.0447	4.56%	-6.52%
RG_MIDAG		5	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	-8.70%
FR_FR4		5	0.9400	0.8289	1.0000	0.8000	1.0000	0.0400	0.0894	9.52%	-2.17%
FR_FR2		5	0.9200	0.8645	0.9755	0.9000	1.0000	0.0200	0.0447	4.86%	0.00%
FR_MULTIPLATE		5	0.8600	0.7184	1.0000	0.7000	1.0000	0.0510	0.1140	13.26%	6.52%
FR_FRRD		5	0.9800	0.9245	1.0000	0.9000	1.0000	0.0200	0.0447	4.56%	-6.52%

Hyalella 28-d Survival and Growth Sediment Test — **Nautilus Environmental**

Mean Dry Weight-mg Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
Control	N	0.3711	0.446	0.3688	0.419	0.5267
FR_UFR1		0.478	0.536	0.5489	0.432	0.432
GH_ER2		0.673	0.7	0.415	0.4778	0.5278
CM_MC1		0.59	0.619	0.549	0.4578	0.559
LC_SLC		0.3611	0.446	0.473	0.7122	0.442
FR_FRABCH		0.614	0.737	0.721	0.5344	0.4737
FR_FRCP1		0.574	0.5889	0.589	0.457	0.441
GH_FR1		0.498	0.4778	0.642	0.3056	0.2962
GH_ERC		0.412	0.398	0.4078	0.455	0.395
CM_MC2		0.653	0.43	0.5856	0.565	0.622
EV_MC2		0.3656	0.369	0.3922	0.509	0.4489
EV_HC1		0.786	0.4987	0.512	0.468	0.5611
LC_DCDS		0.448	0.25	0.448	0.4137	0.3938
LC_LC3		0.5444	0.504	0.486	0.5689	0.4875
LC_LC5		0.523	0.601	0.571	0.4856	0.5411
LC_LCDSSLCC		0.6	0.405	0.473	0.5444	0.438
RG_MIDAG		0.472	0.606	0.429	0.599	0.415
FR_FR4		0.3863	0.373	0.519	0.3911	0.328
FR_FR2		0.4867	0.4878	0.4111	0.386	0.5411
FR_MULTIPLATE		0.524	0.49	0.4344	0.4388	0.4333
FR_FRRD		0.301	0.349	0.33	0.364	0.3922

Survival Rate Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
Control	N	0.9000	1.0000	0.8000	1.0000	0.9000
FR_UFR1		1.0000	1.0000	0.9000	1.0000	1.0000
GH_ER2		1.0000	1.0000	1.0000	0.9000	0.9000
CM_MC1		0.6000	1.0000	1.0000	0.9000	1.0000
LC_SLC		0.9000	1.0000	1.0000	0.9000	1.0000
FR_FRABCH		1.0000	1.0000	1.0000	0.9000	0.9000
FR_FRCP1		1.0000	0.9000	1.0000	1.0000	1.0000
GH_FR1		1.0000	0.9000	1.0000	0.9000	0.8000
GH_ERC		1.0000	1.0000	0.9000	0.8000	0.8000
CM_MC2		1.0000	1.0000	0.9000	1.0000	1.0000
EV_MC2		1.0000	1.0000	0.9000	1.0000	0.9000
EV_HC1		1.0000	0.8000	1.0000	1.0000	0.9000
LC_DCDS		1.0000	0.2000	1.0000	0.8000	0.8000
LC_LC3		1.0000	1.0000	1.0000	0.9000	0.8000
LC_LC5		1.0000	1.0000	1.0000	0.9000	0.9000
LC_LCDSSLCC		1.0000	1.0000	1.0000	0.9000	1.0000
RG_MIDAG		1.0000	1.0000	1.0000	1.0000	1.0000
FR_FR4		0.8000	1.0000	1.0000	0.9000	1.0000
FR_FR2		0.9000	0.9000	0.9000	1.0000	0.9000
FR_MULTIPLATE		1.0000	0.7000	0.9000	0.8000	0.9000
FR_FRRD		1.0000	1.0000	1.0000	1.0000	0.9000

Survival Rate Binomials

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
Control	N	9/10	10/10	8/10	10/10	9/10
FR_UFR1		10/10	10/10	9/10	10/10	10/10
GH_ER2		10/10	10/10	10/10	9/10	9/10
CM_MC1		6/10	10/10	10/10	9/10	10/10
LC_SLC		9/10	10/10	10/10	9/10	10/10
FR_FRABCH		10/10	10/10	10/10	9/10	9/10
FR_FRCP1		10/10	9/10	10/10	10/10	10/10
GH_FR1		10/10	9/10	10/10	9/10	8/10
GH_ERC		10/10	10/10	9/10	8/10	8/10
CM_MC2		10/10	10/10	9/10	10/10	10/10
EV_MC2		10/10	10/10	9/10	10/10	9/10
EV_HC1		10/10	8/10	10/10	10/10	9/10
LC_DCDS		10/10	2/10	10/10	8/10	8/10
LC_LC3		10/10	10/10	10/10	9/10	8/10
LC_LC5		10/10	10/10	10/10	9/10	9/10
LC_LCDSSLCC		10/10	10/10	10/10	9/10	10/10
RG_MIDAG		10/10	10/10	10/10	10/10	10/10
FR_FR4		8/10	10/10	10/10	9/10	10/10
FR_FR2		9/10	9/10	9/10	10/10	9/10
FR_MULTIPLATE		10/10	7/10	9/10	8/10	9/10
FR_FRRD		10/10	10/10	10/10	10/10	9/10

Hyalella 28-d Survival and Growth Sediment Test

Nautilus Environmental

Analysis ID:	20-7719-2466	**Endpoint:**	Survival Rate	**CETIS Version:**	CETISv1.9.4
Analyzed:	08 Dec-21 10:37	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1
Batch ID:	11-3778-4609	**Test Type:**	Survival-Growth	**Analyst:**	Rachel Sakurdeep
Start Date:	14 Oct-21	**Protocol:**	EPA/600/R-99/064 (2000)	**Diluent:**	Reconstituted Water
Ending Date:	11 Nov-21	**Species:**	Hyalella azteca	**Brine:**	
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	Aquatic Biosystems, CO **Age:** 7-8d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
Control	10-2210-7910	14 Oct-21	14 Oct-21	n/a	Teck Coal	
FR_UFR1	19-8746-8946	12 Oct-21 11:07	13 Oct-21 11:53	37h (0 °C)		
GH_ER2	20-2628-4137	12 Oct-21 10:50	13 Oct-21 11:30	37h (0 °C)		
CM_MC1	18-3559-2852	12 Oct-21 13:20	13 Oct-21 11:30	35h (0.1 °C)		
LC_SLC	08-7937-3726	12 Oct-21 11:00	13 Oct-21 11:30	37h (2.9 °C)		
FR_FRABCH	18-7592-7020	12 Oct-21 11:20	13 Oct-21 11:53	37h (0 °C)		
FR_FRCP1	10-3969-8000	12 Oct-21 11:48	13 Oct-21 11:53	36h (1.3 °C)		
GH_FR1	11-8224-4576	12 Oct-21 10:00	13 Oct-21 11:30	38h (0 °C)		
GH_ERC	00-1276-7572	12 Oct-21 11:50	13 Oct-21 11:30	36h (0 °C)		
CM_MC2	03-9569-8600	12 Oct-21 12:47	13 Oct-21 11:30	35h (1.3 °C)		
EV_MC2	13-1923-7722	12 Oct-21 11:38	13 Oct-21 11:30	36h (0.2 °C)		
EV_HC1	18-6648-8827	12 Oct-21 10:33	13 Oct-21 11:30	37h (0 °C)		
LC_DCDS	17-4710-4100	12 Oct-21	13 Oct-21 11:30	48h (1.7 °C)		
LC_LC3	20-0894-5906	12 Oct-21 12:00	13 Oct-21 11:30	36h (8.8 °C)		
LC_LC5	14-5637-1032	12 Oct-21 13:30	13 Oct-21 11:30	34h (2.6 °C)		
LC_LCDSSLCC	06-4184-4349	12 Oct-21 12:30	13 Oct-21 11:30	35h (4.7 °C)		
RG_MIDAG	02-5873-2402	12 Oct-21 12:24	13 Oct-21 11:30	36h (3.9 °C)		
FR_FR4	16-7272-1140	12 Oct-21 11:05	13 Oct-21 11:30	37h (0 °C)		
FR_FR2	09-1936-7906	12 Oct-21 10:25	13 Oct-21 11:30	38h (0 °C)		
FR_MULTIPLATE	07-2028-3040	12 Oct-21 09:45	13 Oct-21 11:30	38h (0 °C)		
FR_FRRD	04-7874-3326	12 Oct-21 11:45	13 Oct-21 11:30	36h (0 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
Control	Water Sample	Teck Coal	Control	
FR_UFR1	Water Sample	Teck Coal	FR_UFR1_WEK_2021-09-1	
GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-10-12_	
CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-10-12	
LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-10-19_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_WEK_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_WEK_2021-09	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-10-12_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-10-12	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-10-12	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2021_Q4_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2021_Q4_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-10-19	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-10-19_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-10-19_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	
RG_MIDAG	Water Sample	Teck Coal	RG_MIDAG_WS_2021-10-	
FR_FR4	Water Sample	Teck Coal	FR_FR4_WS_2021-10-12_	
FR_FR2	Water Sample	Teck Coal	FR_FR2_WS_2021-10-12_	
FR_MULTIPLATE	Water Sample	Teck Coal	FR_MULTIPLATE_WS_202	
FR_FRRD	Water Sample	Teck Coal	FR_FRRD_WS_2021-10-12	

Fisher Exact/Bonferroni-Holm Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
Negative Control		FR_UFR1	0.9719	Exact	1.0000	Non-Significant Effect
		GH_ER2	0.8978	Exact	1.0000	Non-Significant Effect

Hyalella 28-d Survival and Growth Sediment Test — **Nautilus Environmental**

Analysis ID: 20-7719-2466 **Endpoint:** Survival Rate **CETIS Version:** CETISv1.9.4
Analyzed: 08 Dec-21 10:37 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Fisher Exact/Bonferroni-Holm Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
		CM_MC1	0.5000	Exact	1.0000	Non-Significant Effect
		LC_SLC	0.8978	Exact	1.0000	Non-Significant Effect
		FR_FRABCH	0.8978	Exact	1.0000	Non-Significant Effect
		FR_FRCP1	0.9719	Exact	1.0000	Non-Significant Effect
		GH_FR1	0.6425	Exact	1.0000	Non-Significant Effect
		GH_ERC	0.5000	Exact	1.0000	Non-Significant Effect
		CM_MC2	0.9719	Exact	1.0000	Non-Significant Effect
		EV_MC2	0.8978	Exact	1.0000	Non-Significant Effect
		EV_HC1	0.7820	Exact	1.0000	Non-Significant Effect
		LC_DCDS	0.0269	Exact	0.5376	Non-Significant Effect
		LC_LC3	0.7820	Exact	1.0000	Non-Significant Effect
		LC_LC5	0.8978	Exact	1.0000	Non-Significant Effect
		LC_LCDSSLCC	0.9719	Exact	1.0000	Non-Significant Effect
		RG_MIDAG	1.0000	Exact	1.0000	Non-Significant Effect
		FR_FR4	0.7820	Exact	1.0000	Non-Significant Effect
		FR_FR2	0.6425	Exact	1.0000	Non-Significant Effect
		FR_MULTIPLATE	0.2623	Exact	1.0000	Non-Significant Effect
		FR_FRRD	0.9719	Exact	1.0000	Non-Significant Effect

Test Acceptability Criteria

		TAC Limits			
Attribute	**Test Stat**	**Lower**	**Upper**	**Overlap**	**Decision**
Control Resp	0.92	0.8	>>	Yes	Passes Criteria

Data Summary

Conc-%	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
Control	N	46	4	50	0.92	0.08	-2.22%
FR_UFR1		49	1	50	0.98	0.02	-8.89%
GH_ER2		48	2	50	0.96	0.04	-6.67%
CM_MC1		45	5	50	0.9	0.1	0.0%
LC_SLC		48	2	50	0.96	0.04	-6.67%
FR_FRABCH		48	2	50	0.96	0.04	-6.67%
FR_FRCP1		49	1	50	0.98	0.02	-8.89%
GH_FR1		46	4	50	0.92	0.08	-2.22%
GH_ERC		45	5	50	0.9	0.1	0.0%
CM_MC2		49	1	50	0.98	0.02	-8.89%
EV_MC2		48	2	50	0.96	0.04	-6.67%
EV_HC1		47	3	50	0.94	0.06	-4.44%
LC_DCDS		38	12	50	0.76	0.24	15.56%
LC_LC3		47	3	50	0.94	0.06	-4.44%
LC_LC5		48	2	50	0.96	0.04	-6.67%
LC_LCDSSLCC		49	1	50	0.98	0.02	-8.89%
RG_MIDAG		50	0	50	1	0	-11.11%
FR_FR4		47	3	50	0.94	0.06	-4.44%
FR_FR2		46	4	50	0.92	0.08	-2.22%
FR_MULTIPLATE		43	7	50	0.86	0.14	4.44%
FR_FRRD		49	1	50	0.98	0.02	-8.89%

Hyalella 28-d Survival and Growth Sediment Test — **Nautilus Environmental**

Analysis ID: 20-7719-2466 **Endpoint:** Survival Rate **CETIS Version:** CETISv1.9.4
Analyzed: 08 Dec-21 10:37 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Survival Rate Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
Control	N	0.9000	1.0000	0.8000	1.0000	0.9000
FR_UFR1		1.0000	1.0000	0.9000	1.0000	1.0000
GH_ER2		1.0000	1.0000	1.0000	0.9000	0.9000
CM_MC1		0.6000	1.0000	1.0000	0.9000	1.0000
LC_SLC		0.9000	1.0000	1.0000	0.9000	1.0000
FR_FRABCH		1.0000	1.0000	1.0000	0.9000	0.9000
FR_FRCP1		1.0000	0.9000	1.0000	1.0000	1.0000
GH_FR1		1.0000	0.9000	1.0000	0.9000	0.8000
GH_ERC		1.0000	1.0000	0.9000	0.8000	0.8000
CM_MC2		1.0000	1.0000	0.9000	1.0000	1.0000
EV_MC2		1.0000	1.0000	0.9000	1.0000	0.9000
EV_HC1		1.0000	0.8000	1.0000	1.0000	0.9000
LC_DCDS		1.0000	0.2000	1.0000	0.8000	0.8000
LC_LC3		1.0000	1.0000	1.0000	0.9000	0.8000
LC_LC5		1.0000	1.0000	1.0000	0.9000	0.9000
LC_LCDSSLCC		1.0000	1.0000	1.0000	0.9000	1.0000
RG_MIDAG		1.0000	1.0000	1.0000	1.0000	1.0000
FR_FR4		0.8000	1.0000	1.0000	0.9000	1.0000
FR_FR2		0.9000	0.9000	0.9000	1.0000	0.9000
FR_MULTIPLATE		1.0000	0.7000	0.9000	0.8000	0.9000
FR_FRRD		1.0000	1.0000	1.0000	1.0000	0.9000

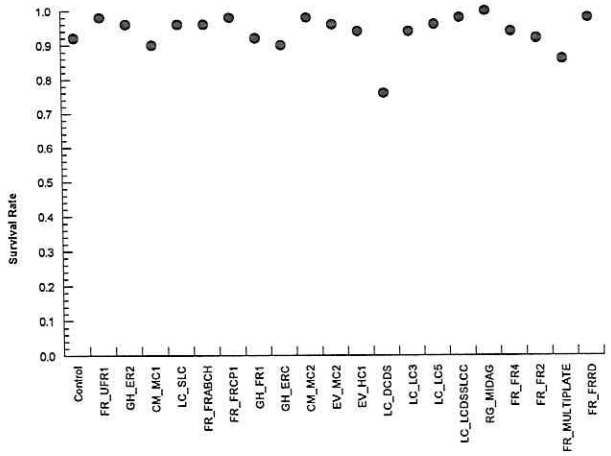
Survival Rate Binomials

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
Control	N	9/10	10/10	8/10	10/10	9/10
FR_UFR1		10/10	10/10	9/10	10/10	10/10
GH_ER2		10/10	10/10	10/10	9/10	9/10
CM_MC1		6/10	10/10	10/10	9/10	10/10
LC_SLC		9/10	10/10	10/10	9/10	10/10
FR_FRABCH		10/10	10/10	10/10	9/10	9/10
FR_FRCP1		10/10	9/10	10/10	10/10	10/10
GH_FR1		10/10	9/10	10/10	9/10	8/10
GH_ERC		10/10	10/10	9/10	8/10	8/10
CM_MC2		10/10	10/10	9/10	10/10	10/10
EV_MC2		10/10	10/10	9/10	10/10	9/10
EV_HC1		10/10	8/10	10/10	10/10	9/10
LC_DCDS		10/10	2/10	10/10	8/10	8/10
LC_LC3		10/10	10/10	10/10	9/10	8/10
LC_LC5		10/10	10/10	10/10	9/10	9/10
LC_LCDSSLCC		10/10	10/10	10/10	9/10	10/10
RG_MIDAG		10/10	10/10	10/10	10/10	10/10
FR_FR4		8/10	10/10	10/10	9/10	10/10
FR_FR2		9/10	9/10	9/10	10/10	9/10
FR_MULTIPLATE		10/10	7/10	9/10	8/10	9/10
FR_FRRD		10/10	10/10	10/10	10/10	9/10

Hyalella 28-d Survival and Growth Sediment Test — **Nautilus Environmental**

Analysis ID:	20-7719-2466	**Endpoint:**	Survival Rate	**CETIS Version:**	CETISv1.9.4
Analyzed:	08 Dec-21 10:37	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1

Graphics



Analyst: RD QA: Dec 15/21

Hyalella 28-d Survival and Growth Sediment Test — **Nautilus Environmental**

Analysis ID:	15-7281-6493	**Endpoint:**	Mean Dry Weight-mg	**CETIS Version:**	CETISv1.9.4
Analyzed:	08 Dec-21 10:37	**Analysis:**	Parametric-Control vs Treatments	**Status Level:**	1
Batch ID:	11-3778-4609	**Test Type:**	Survival-Growth	**Analyst:**	Rachel Sakurdeep
Start Date:	14 Oct-21	**Protocol:**	EPA/600/R-99/064 (2000)	**Diluent:**	Reconstituted Water
Ending Date:	11 Nov-21	**Species:**	Hyalella azteca	**Brine:**	
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	Aquatic Biosystems, CO **Age:** 7-8d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
Control	10-2210-7910	14 Oct-21	14 Oct-21	n/a	Teck Coal	
FR_UFR1	19-8746-8946	12 Oct-21 11:07	13 Oct-21 11:53	37h (0 °C)		
GH_ER2	20-2628-4137	12 Oct-21 10:50	13 Oct-21 11:30	37h (0 °C)		
CM_MC1	18-3559-2852	12 Oct-21 13:20	13 Oct-21 11:30	35h (0.1 °C)		
LC_SLC	08-7937-3726	12 Oct-21 11:00	13 Oct-21 11:30	37h (2.9 °C)		
FR_FRABCH	18-7592-7020	12 Oct-21 11:20	13 Oct-21 11:53	37h (0 °C)		
FR_FRCP1	10-3969-8000	12 Oct-21 11:48	13 Oct-21 11:53	36h (1.3 °C)		
GH_FR1	11-8224-4576	12 Oct-21 10:00	13 Oct-21 11:30	38h (0 °C)		
GH_ERC	00-1276-7572	12 Oct-21 11:50	13 Oct-21 11:30	36h (0 °C)		
CM_MC2	03-9569-8600	12 Oct-21 12:47	13 Oct-21 11:30	35h (1.3 °C)		
EV_MC2	13-1923-7722	12 Oct-21 11:38	13 Oct-21 11:30	36h (0.2 °C)		
EV_HC1	18-6648-8827	12 Oct-21 10:33	13 Oct-21 11:30	37h (0 °C)		
LC_DCDS	17-4710-4100	12 Oct-21	13 Oct-21 11:30	48h (1.7 °C)		
LC_LC3	20-0894-5906	12 Oct-21 12:00	13 Oct-21 11:30	36h (8.8 °C)		
LC_LC5	14-5637-1032	12 Oct-21 13:30	13 Oct-21 11:30	34h (2.6 °C)		
LC_LCDSSLCC	06-4184-4349	12 Oct-21 12:30	13 Oct-21 11:30	35h (4.7 °C)		
RG_MIDAG	02-5873-2402	12 Oct-21 12:24	13 Oct-21 11:30	36h (3.9 °C)		
FR_FR4	16-7272-1140	12 Oct-21 11:05	13 Oct-21 11:30	37h (0 °C)		
FR_FR2	09-1936-7906	12 Oct-21 10:25	13 Oct-21 11:30	38h (0 °C)		
FR_MULTIPLATE	07-2028-3040	12 Oct-21 09:45	13 Oct-21 11:30	38h (0 °C)		
FR_FRRD	04-7874-3326	12 Oct-21 11:45	13 Oct-21 11:30	36h (0 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
Control	Water Sample	Teck Coal	Control	
FR_UFR1	Water Sample	Teck Coal	FR_UFR1_WEK_2021-09-1	
GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-10-12_	
CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-10-12	
LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-10-19_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_WEK_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_WEK_2021-09	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-10-12_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-10-12	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-10-12	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2021_Q4_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2021_Q4_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-10-19	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-10-19_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-10-19_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	
RG_MIDAG	Water Sample	Teck Coal	RG_MIDAG_WS_2021-10-	
FR_FR4	Water Sample	Teck Coal	FR_FR4_WS_2021-10-12_	
FR_FR2	Water Sample	Teck Coal	FR_FR2_WS_2021-10-12_	
FR_MULTIPLATE	Water Sample	Teck Coal	FR_MULTIPLATE_WS_202	
FR_FRRD	Water Sample	Teck Coal	FR_FRRD_WS_2021-10-12	

Hyalella 28-d Survival and Growth Sediment Test — **Nautilus Environmental**

Analysis ID: 15-7281-6493 **Endpoint:** Mean Dry Weight-mg **CETIS Version:** CETISv1.9.4
Analyzed: 08 Dec-21 10:37 **Analysis:** Parametric-Control vs Treatments **Status Level:** 1

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	FR_UFR1 passed mean dry weight-mg	33.63%
		GH_ER2 passed mean dry weight-mg	33.63%
		CM_MC1 passed mean dry weight-mg	33.63%
		LC_SLC passed mean dry weight-mg	33.63%
		FR_FRABCH passed mean dry weight-mg	33.63%
		FR_FRCP1 passed mean dry weight-mg	33.63%
		GH_FR1 passed mean dry weight-mg	33.63%
		GH_ERC passed mean dry weight-mg	33.63%
		CM_MC2 passed mean dry weight-mg	33.63%
		EV_MC2 passed mean dry weight-mg	33.63%
		EV_HC1 passed mean dry weight-mg	33.63%
		LC_DCDS passed mean dry weight-mg	33.63%
		LC_LC3 passed mean dry weight-mg	33.63%
		LC_LC5 passed mean dry weight-mg	33.63%
		LC_LCDSSLCC passed mean dry weight-mg	33.63%
		RG_MIDAG passed mean dry weight-mg	33.63%
		FR_FR4 passed mean dry weight-mg	33.63%
		FR_FR2 passed mean dry weight-mg	33.63%
		FR_MULTIPLATE passed mean dry weight-m	33.63%
		FR_FRRD passed mean dry weight-mg	33.63%

Dunnett Multiple Comparison Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Negative Control		FR_UFR1	-1.111	2.696	0.143	8	CDF	0.9990	Non-Significant Effect
		GH_ER2	-2.489	2.696	0.143	8	CDF	1.0000	Non-Significant Effect
		CM_MC1	-2.419	2.696	0.143	8	CDF	1.0000	Non-Significant Effect
		LC_SLC	-1.139	2.696	0.143	8	CDF	0.9991	Non-Significant Effect
		FR_FRABCH	-3.567	2.696	0.143	8	CDF	1.0000	Non-Significant Effect
		FR_FRCP1	-1.949	2.696	0.143	8	CDF	1.0000	Non-Significant Effect
		GH_FR1	-0.3311	2.696	0.143	8	CDF	0.9818	Non-Significant Effect
		GH_ERC	0.2397	2.696	0.143	8	CDF	0.9134	Non-Significant Effect
		CM_MC2	-2.722	2.696	0.143	8	CDF	1.0000	Non-Significant Effect
		EV_MC2	0.1762	2.696	0.143	8	CDF	0.9255	Non-Significant Effect
		EV_HC1	-2.611	2.696	0.143	8	CDF	1.0000	Non-Significant Effect
		LC_DCDS	0.6694	2.696	0.143	8	CDF	0.7924	Non-Significant Effect
		LC_LC3	-1.727	2.696	0.143	8	CDF	0.9999	Non-Significant Effect
		LC_LC5	-2.219	2.696	0.143	8	CDF	1.0000	Non-Significant Effect
		LC_LCDSSLCC	-1.237	2.696	0.143	8	CDF	0.9994	Non-Significant Effect
		RG_MIDAG	-1.465	2.696	0.143	8	CDF	0.9998	Non-Significant Effect
		FR_FR4	0.5045	2.696	0.143	8	CDF	0.8472	Non-Significant Effect
		FR_FR2	-0.6811	2.696	0.143	8	CDF	0.9944	Non-Significant Effect
		FR_MULTIPLATE	-0.7107	2.696	0.143	8	CDF	0.9950	Non-Significant Effect
		FR_FRRD	1.486	2.696	0.143	8	CDF	0.4176	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.497	0.02485	20	3.513	2.8E-05	Significant Effect
Error	0.594115	0.0070728	84			
Total	1.09112		104			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance Test	29.9	37.57	0.0715	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9771	0.9669	0.0658	Normal Distribution

Hyalella 28-d Survival and Growth Sediment Test — Nautilus Environmental

Analysis ID: 15-7281-6493 Endpoint: Mean Dry Weight-mg CETIS Version: CETISv1.9.4
Analyzed: 08 Dec-21 10:37 Analysis: Parametric-Control vs Treatments Status Level: 1

Mean Dry Weight-mg Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
Control	N	5	0.4263	0.3457	0.5069	0.419	0.3688	0.5267	0.02904	15.23%	0.00%
FR_UFR1		5	0.4854	0.4164	0.5544	0.478	0.432	0.5489	0.02485	11.45%	-13.86%
GH_ER2		5	0.5587	0.4051	0.7123	0.5278	0.415	0.7	0.05531	22.14%	-31.06%
CM_MC1		5	0.555	0.4794	0.6306	0.559	0.4578	0.619	0.02723	10.97%	-30.18%
LC_SLC		5	0.4869	0.3221	0.6517	0.446	0.3611	0.7122	0.05936	27.26%	-14.21%
FR_FRABCH		5	0.616	0.4737	0.7584	0.614	0.4737	0.737	0.05126	18.61%	-44.51%
FR_FRCP1		5	0.53	0.4376	0.6223	0.574	0.441	0.589	0.03327	14.04%	-24.32%
GH_FR1		5	0.4439	0.2637	0.6241	0.4778	0.2962	0.642	0.06491	32.69%	-4.13%
GH_ERC		5	0.4136	0.3835	0.4436	0.4078	0.395	0.455	0.01082	5.85%	2.99%
CM_MC2		5	0.5711	0.4646	0.6777	0.5856	0.43	0.653	0.03838	15.03%	-33.97%
EV_MC2		5	0.4169	0.3408	0.4931	0.3922	0.3656	0.509	0.02743	14.71%	2.20%
EV_HC1		5	0.5652	0.4063	0.724	0.512	0.468	0.786	0.05721	22.64%	-32.57%
LC_DCDS		5	0.3907	0.2889	0.4925	0.4137	0.25	0.448	0.03668	20.99%	8.35%
LC_LC3		5	0.5182	0.4724	0.564	0.504	0.486	0.5689	0.01649	7.12%	-21.55%
LC_LC5		5	0.5443	0.4894	0.5993	0.5411	0.4856	0.601	0.0198	8.13%	-27.69%
LC_LCDSSLCC		5	0.4921	0.3934	0.5908	0.473	0.405	0.6	0.03554	16.15%	-15.43%
RG_MIDAG		5	0.5042	0.3897	0.6187	0.472	0.415	0.606	0.04123	18.28%	-18.27%
FR_FR4		5	0.3995	0.3109	0.488	0.3863	0.328	0.519	0.03189	17.85%	6.29%
FR_FR2		5	0.4625	0.3843	0.5408	0.4867	0.386	0.5411	0.02819	13.63%	-8.50%
FR_MULTIPLATE		5	0.4641	0.4132	0.515	0.4388	0.4333	0.524	0.01834	8.84%	-8.87%
FR_FRRD		5	0.3472	0.3045	0.39	0.349	0.301	0.3922	0.0154	9.92%	18.55%

Mean Dry Weight-mg Detail

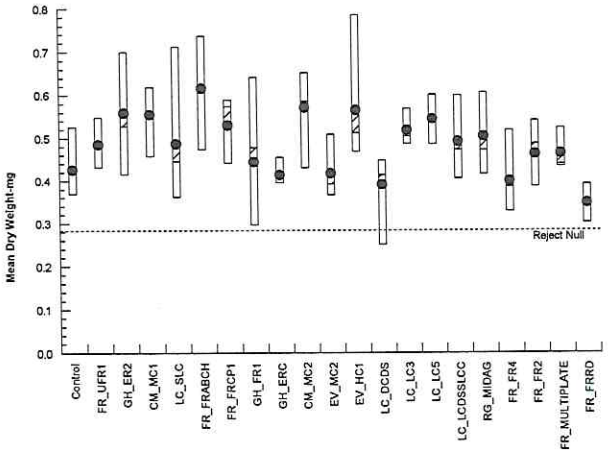
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
Control	N	0.3711	0.446	0.3688	0.419	0.5267
FR_UFR1		0.478	0.536	0.5489	0.432	0.432
GH_ER2		0.673	0.7	0.415	0.4778	0.5278
CM_MC1		0.59	0.619	0.549	0.4578	0.559
LC_SLC		0.3611	0.446	0.473	0.7122	0.442
FR_FRABCH		0.614	0.737	0.721	0.5344	0.4737
FR_FRCP1		0.574	0.5889	0.589	0.457	0.441
GH_FR1		0.498	0.4778	0.642	0.3056	0.2962
GH_ERC		0.412	0.398	0.4078	0.455	0.395
CM_MC2		0.653	0.43	0.5856	0.565	0.622
EV_MC2		0.3656	0.369	0.3922	0.509	0.4489
EV_HC1		0.786	0.4987	0.512	0.468	0.5611
LC_DCDS		0.448	0.25	0.448	0.4137	0.3938
LC_LC3		0.5444	0.504	0.486	0.5689	0.4875
LC_LC5		0.523	0.601	0.571	0.4856	0.5411
LC_LCDSSLCC		0.6	0.405	0.473	0.5444	0.438
RG_MIDAG		0.472	0.606	0.429	0.599	0.415
FR_FR4		0.3863	0.373	0.519	0.3911	0.328
FR_FR2		0.4867	0.4878	0.4111	0.386	0.5411
FR_MULTIPLATE		0.524	0.49	0.4344	0.4388	0.4333
FR_FRRD		0.301	0.349	0.33	0.364	0.3922

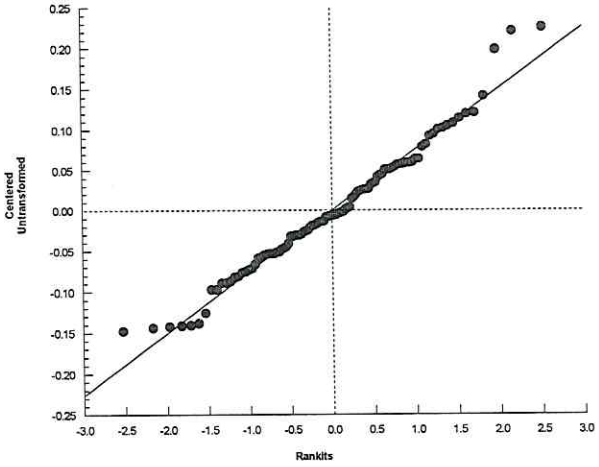
Hyalella 28-d Survival and Growth Sediment Test

Nautilus Environmental

Analysis ID:	15-7281-6493	**Endpoint:**	Mean Dry Weight-mg	**CETIS Version:**	CETISv1.9.4
Analyzed:	08 Dec-21 10:37	**Analysis:**	Parametric-Control vs Treatments	**Status Level:**	1

Graphics





Hyalella 28-d Survival and Growth Sediment Test

Nautilus Environmental

Analysis ID:	15-8668-6811	**Endpoint:**	Survival Rate	**CETIS Version:**	CETISv1.9.4
Analyzed:	08 Dec-21 10:48	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1
Batch ID:	11-3778-4609	**Test Type:**	Survival-Growth	**Analyst:**	Rachel Sakurdeep
Start Date:	14 Oct-21	**Protocol:**	EPA/600/R-99/064 (2000)	**Diluent:**	Reconstituted Water
Ending Date:	11 Nov-21	**Species:**	Hyalella azteca	**Brine:**	
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	Aquatic Biosystems, CO **Age:** 7-8d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
FR_UFR1	19-8746-8946	12 Oct-21 11:07	13 Oct-21 11:53	37h (0 °C)	Teck Coal	
GH_ER2	20-2628-4137	12 Oct-21 10:50	13 Oct-21 11:30	37h (0 °C)		
CM_MC1	18-3559-2852	12 Oct-21 13:20	13 Oct-21 11:30	35h (0.1 °C)		
LC_SLC	08-7937-3726	12 Oct-21 11:00	13 Oct-21 11:30	37h (2.9 °C)		
FR_FRABCH	18-7592-7020	12 Oct-21 11:20	13 Oct-21 11:53	37h (0 °C)		
FR_FRCP1	10-3969-8000	12 Oct-21 11:48	13 Oct-21 11:53	36h (1.3 °C)		
GH_FR1	11-8224-4576	12 Oct-21 10:00	13 Oct-21 11:30	38h (0 °C)		
GH_ERC	00-1276-7572	12 Oct-21 11:50	13 Oct-21 11:30	36h (0 °C)		
CM_MC2	03-9569-8600	12 Oct-21 12:47	13 Oct-21 11:30	35h (1.3 °C)		
EV_MC2	13-1923-7722	12 Oct-21 11:38	13 Oct-21 11:30	36h (0.2 °C)		
EV_HC1	18-6648-8827	12 Oct-21 10:33	13 Oct-21 11:30	37h (0 °C)		
LC_DCDS	17-4710-4100	12 Oct-21	13 Oct-21 11:30	48h (1.7 °C)		
LC_LC3	20-0894-5906	12 Oct-21 12:00	13 Oct-21 11:30	36h (8.8 °C)		
LC_LC5	14-5637-1032	12 Oct-21 13:30	13 Oct-21 11:30	34h (2.6 °C)		
LC_LCDSSLCC	06-4184-4349	12 Oct-21 12:30	13 Oct-21 11:30	35h (4.7 °C)		
RG_MIDAG	02-5873-2402	12 Oct-21 12:24	13 Oct-21 11:30	36h (3.9 °C)		
FR_FR4	16-7272-1140	12 Oct-21 11:05	13 Oct-21 11:30	37h (0 °C)		
FR_FR2	09-1936-7906	12 Oct-21 10:25	13 Oct-21 11:30	38h (0 °C)		
FR_MULTIPLATE	07-2028-3040	12 Oct-21 09:45	13 Oct-21 11:30	38h (0 °C)		
FR_FRRD	04-7874-3326	12 Oct-21 11:45	13 Oct-21 11:30	36h (0 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_UFR1	Water Sample	Teck Coal	FR_UFR1_WEK_2021-09-1	
GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-10-12_	
CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-10-12	
LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-10-19_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_WEK_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_WEK_2021-09	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-10-12_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-10-12	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-10-12	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2021_Q4_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2021_Q4_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-10-19	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-10-19_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-10-19_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	
RG_MIDAG	Water Sample	Teck Coal	RG_MIDAG_WS_2021-10-	
FR_FR4	Water Sample	Teck Coal	FR_FR4_WS_2021-10-12_	
FR_FR2	Water Sample	Teck Coal	FR_FR2_WS_2021-10-12_	
FR_MULTIPLATE	Water Sample	Teck Coal	FR_MULTIPLATE_WS_202	
FR_FRRD	Water Sample	Teck Coal	FR_FRRD_WS_2021-10-12	

Fisher Exact/Bonferroni-Holm Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
Reference Sed (FR-UFR1)		GH_ER2	0.5000	Exact	1.0000	Non-Significant Effect
		CM_MC1	0.1022	Exact	1.0000	Non-Significant Effect
		LC_SLC	0.5000	Exact	1.0000	Non-Significant Effect
		FR_FRABCH	0.5000	Exact	1.0000	Non-Significant Effect

Hyalella 28-d Survival and Growth Sediment Test — **Nautilus Environmental**

Analysis ID:	15-8668-6811	**Endpoint:**	Survival Rate	**CETIS Version:**	CETISv1.9.4
Analyzed:	08 Dec-21 10:48	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1

Fisher Exact/Bonferroni-Holm Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
		FR_FRCP1	0.7525	Exact	1.0000	Non-Significant Effect
		GH_FR1	0.1811	Exact	1.0000	Non-Significant Effect
		GH_ERC	0.1022	Exact	1.0000	Non-Significant Effect
		CM_MC2	0.7525	Exact	1.0000	Non-Significant Effect
		EV_MC2	0.5000	Exact	1.0000	Non-Significant Effect
		EV_HC1	0.3087	Exact	1.0000	Non-Significant Effect
		LC_DCDS*	0.0009	Exact	0.0172	Significant Effect
		LC_LC3	0.3087	Exact	1.0000	Non-Significant Effect
		LC_LC5	0.5000	Exact	1.0000	Non-Significant Effect
		LC_LCDSSLCC	0.7525	Exact	1.0000	Non-Significant Effect
		RG_MIDAG	1.0000	Exact	1.0000	Non-Significant Effect
		FR_FR4	0.3087	Exact	1.0000	Non-Significant Effect
		FR_FR2	0.1811	Exact	1.0000	Non-Significant Effect
		FR_MULTIPLATE	0.0297	Exact	0.5350	Non-Significant Effect
		FR_FRRD	0.7525	Exact	1.0000	Non-Significant Effect

Data Summary

Sample	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
FR_UFR1	RS	49	1	50	0.98	0.02	-8.89%
GH_ER2		48	2	50	0.96	0.04	-6.67%
CM_MC1		45	5	50	0.9	0.1	0.0%
LC_SLC		48	2	50	0.96	0.04	-6.67%
FR_FRABCH		48	2	50	0.96	0.04	-6.67%
FR_FRCP1		49	1	50	0.98	0.02	-8.89%
GH_FR1		46	4	50	0.92	0.08	-2.22%
GH_ERC		45	5	50	0.9	0.1	0.0%
CM_MC2		49	1	50	0.98	0.02	-8.89%
EV_MC2		48	2	50	0.96	0.04	-6.67%
EV_HC1		47	3	50	0.94	0.06	-4.44%
LC_DCDS		38	12	50	0.76	0.24	15.56%
LC_LC3		47	3	50	0.94	0.06	-4.44%
LC_LC5		48	2	50	0.96	0.04	-6.67%
LC_LCDSSLCC		49	1	50	0.98	0.02	-8.89%
RG_MIDAG		50	0	50	1	0	-11.11%
FR_FR4		47	3	50	0.94	0.06	-4.44%
FR_FR2		46	4	50	0.92	0.08	-2.22%
FR_MULTIPLATE		43	7	50	0.86	0.14	4.44%
FR_FRRD		49	1	50	0.98	0.02	-8.89%

Hyalella 28-d Survival and Growth Sediment Test — **Nautilus Environmental**

Analysis ID: 15-8668-6811 **Endpoint:** Survival Rate **CETIS Version:** CETISv1.9.4
Analyzed: 08 Dec-21 10:48 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Survival Rate Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
FR_UFR1	RS	1.0000	1.0000	0.9000	1.0000	1.0000
GH_ER2		1.0000	1.0000	1.0000	0.9000	0.9000
CM_MC1		0.6000	1.0000	1.0000	0.9000	1.0000
LC_SLC		0.9000	1.0000	1.0000	0.9000	1.0000
FR_FRABCH		1.0000	1.0000	1.0000	0.9000	0.9000
FR_FRCP1		1.0000	0.9000	1.0000	1.0000	1.0000
GH_FR1		1.0000	0.9000	1.0000	0.9000	0.8000
GH_ERC		1.0000	1.0000	0.9000	0.8000	0.8000
CM_MC2		1.0000	1.0000	0.9000	1.0000	1.0000
EV_MC2		1.0000	1.0000	0.9000	1.0000	0.9000
EV_HC1		1.0000	0.8000	1.0000	1.0000	0.9000
LC_DCDS		1.0000	0.2000	1.0000	0.8000	0.8000
LC_LC3		1.0000	1.0000	1.0000	0.9000	0.8000
LC_LC5		1.0000	1.0000	1.0000	0.9000	0.9000
LC_LCDSSLCC		1.0000	1.0000	1.0000	0.9000	1.0000
RG_MIDAG		1.0000	1.0000	1.0000	1.0000	1.0000
FR_FR4		0.8000	1.0000	1.0000	0.9000	1.0000
FR_FR2		0.9000	0.9000	0.9000	1.0000	0.9000
FR_MULTIPLATE		1.0000	0.7000	0.9000	0.8000	0.9000
FR_FRRD		1.0000	1.0000	1.0000	1.0000	0.9000

Survival Rate Binomials

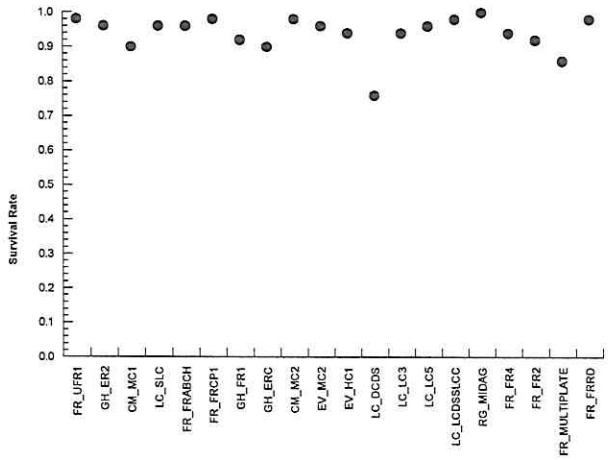
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
FR_UFR1	RS	10/10	10/10	9/10	10/10	10/10
GH_ER2		10/10	10/10	10/10	9/10	9/10
CM_MC1		6/10	10/10	10/10	9/10	10/10
LC_SLC		9/10	10/10	10/10	9/10	10/10
FR_FRABCH		10/10	10/10	10/10	9/10	9/10
FR_FRCP1		10/10	9/10	10/10	10/10	10/10
GH_FR1		10/10	9/10	10/10	9/10	8/10
GH_ERC		10/10	10/10	9/10	8/10	8/10
CM_MC2		10/10	10/10	9/10	10/10	10/10
EV_MC2		10/10	10/10	9/10	10/10	9/10
EV_HC1		10/10	8/10	10/10	10/10	9/10
LC_DCDS		10/10	2/10	10/10	8/10	8/10
LC_LC3		10/10	10/10	10/10	9/10	8/10
LC_LC5		10/10	10/10	10/10	9/10	9/10
LC_LCDSSLCC		10/10	10/10	10/10	9/10	10/10
RG_MIDAG		10/10	10/10	10/10	10/10	10/10
FR_FR4		8/10	10/10	10/10	9/10	10/10
FR_FR2		9/10	9/10	9/10	10/10	9/10
FR_MULTIPLATE		10/10	7/10	9/10	8/10	9/10
FR_FRRD		10/10	10/10	10/10	10/10	9/10

Analyst: RZ QA: Dec-15/21

Hyalella 28-d Survival and Growth Sediment Test **Nautilus Environmental**

Analysis ID:	15-8668-6811	**Endpoint:**	Survival Rate	**CETIS Version:**	CETISv1.9.4
Analyzed:	08 Dec-21 10:48	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1

Graphics



Hyalella 28-d Survival and Growth Sediment Test

Nautilus Environmental

Analysis ID:	08-2381-8084	**Endpoint:**	Mean Dry Weight-mg	**CETIS Version:**	CETISv1.9.4
Analyzed:	08 Dec-21 10:48	**Analysis:**	Parametric-Control vs Treatments	**Status Level:**	1
Batch ID:	11-3778-4609	**Test Type:**	Survival-Growth	**Analyst:**	Rachel Sakurdeep
Start Date:	14 Oct-21	**Protocol:**	EPA/600/R-99/064 (2000)	**Diluent:**	Reconstituted Water
Ending Date:	11 Nov-21	**Species:**	Hyalella azteca	**Brine:**	
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	Aquatic Biosystems, CO **Age:** 7-8d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
FR_UFR1	19-8746-8946	12 Oct-21 11:07	13 Oct-21 11:53	37h (0 °C)	Teck Coal	
GH_ER2	20-2628-4137	12 Oct-21 10:50	13 Oct-21 11:30	37h (0 °C)		
CM_MC1	18-3559-2852	12 Oct-21 13:20	13 Oct-21 11:30	35h (0.1 °C)		
LC_SLC	08-7937-3726	12 Oct-21 11:00	13 Oct-21 11:30	37h (2.9 °C)		
FR_FRABCH	18-7592-7020	12 Oct-21 11:20	13 Oct-21 11:53	37h (0 °C)		
FR_FRCP1	10-3969-8000	12 Oct-21 11:48	13 Oct-21 11:53	36h (1.3 °C)		
GH_FR1	11-8224-4576	12 Oct-21 10:00	13 Oct-21 11:30	38h (0 °C)		
GH_ERC	00-1276-7572	12 Oct-21 11:50	13 Oct-21 11:30	36h (0 °C)		
CM_MC2	03-9569-8600	12 Oct-21 12:47	13 Oct-21 11:30	35h (1.3 °C)		
EV_MC2	13-1923-7722	12 Oct-21 11:38	13 Oct-21 11:30	36h (0.2 °C)		
EV_HC1	18-6648-8827	12 Oct-21 10:33	13 Oct-21 11:30	37h (0 °C)		
LC_DCDS	17-4710-4100	12 Oct-21	13 Oct-21 11:30	48h (1.7 °C)		
LC_LC3	20-0894-5906	12 Oct-21 12:00	13 Oct-21 11:30	36h (8.8 °C)		
LC_LC5	14-5637-1032	12 Oct-21 13:30	13 Oct-21 11:30	34h (2.6 °C)		
LC_LCDSSLCC	06-4184-4349	12 Oct-21 12:30	13 Oct-21 11:30	35h (4.7 °C)		
RG_MIDAG	02-5873-2402	12 Oct-21 12:24	13 Oct-21 11:30	36h (3.9 °C)		
FR_FR4	16-7272-1140	12 Oct-21 11:05	13 Oct-21 11:30	37h (0 °C)		
FR_FR2	09-1936-7906	12 Oct-21 10:25	13 Oct-21 11:30	38h (0 °C)		
FR_MULTIPLATE	07-2028-3040	12 Oct-21 09:45	13 Oct-21 11:30	38h (0 °C)		
FR_FRRD	04-7874-3326	12 Oct-21 11:45	13 Oct-21 11:30	36h (0 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_UFR1	Water Sample	Teck Coal	FR_UFR1_WEK_2021-09-1	
GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-10-12_	
CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-10-12	
LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-10-19_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_WEK_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_WEK_2021-09	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-10-12_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-10-12	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-10-12	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2021_Q4_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2021_Q4_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-10-19	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-10-19_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-10-19_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	
RG_MIDAG	Water Sample	Teck Coal	RG_MIDAG_WS_2021-10-	
FR_FR4	Water Sample	Teck Coal	FR_FR4_WS_2021-10-12_	
FR_FR2	Water Sample	Teck Coal	FR_FR2_WS_2021-10-12_	
FR_MULTIPLATE	Water Sample	Teck Coal	FR_MULTIPLATE_WS_202	
FR_FRRD	Water Sample	Teck Coal	FR_FRRD_WS_2021-10-12	

Hyalella 28-d Survival and Growth Sediment Test — **Nautilus Environmental**

Analysis ID:	08-2381-8084	**Endpoint:**	Mean Dry Weight-mg	**CETIS Version:**	CETISv1.9.4
Analyzed:	08 Dec-21 10:48	**Analysis:**	Parametric-Control vs Treatments	**Status Level:**	1

Data Transform	Alt Hyp
Untransformed	C > T

Comparison Result	PMSD
GH_ER2 passed mean dry weight-mg	29.70%
CM_MC1 passed mean dry weight-mg	29.70%
LC_SLC passed mean dry weight-mg	29.70%
FR_FRABCH passed mean dry weight-mg	29.70%
FR_FRCP1 passed mean dry weight-mg	29.70%
GH_FR1 passed mean dry weight-mg	29.70%
GH_ERC passed mean dry weight-mg	29.70%
CM_MC2 passed mean dry weight-mg	29.70%
EV_MC2 passed mean dry weight-mg	29.70%
EV_HC1 passed mean dry weight-mg	29.70%
LC_DCDS passed mean dry weight-mg	29.70%
LC_LC3 passed mean dry weight-mg	29.70%
LC_LC5 passed mean dry weight-mg	29.70%
LC_LCDSSLCC passed mean dry weight-mg	29.70%
RG_MIDAG passed mean dry weight-mg	29.70%
FR_FR4 passed mean dry weight-mg	29.70%
FR_FR2 passed mean dry weight-mg	29.70%
FR_MULTIPLATE passed mean dry weight-m	29.70%
FR_FRRD passed mean dry weight-mg	29.70%

Dunnett Multiple Comparison Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Reference Sed (FR-UFR1)		GH_ER2	-1.365	2.684	0.144	8	CDF	0.9996	Non-Significant Effect
		CM_MC1	-1.295	2.684	0.144	8	CDF	0.9995	Non-Significant Effect
		LC_SLC	-0.02771	2.684	0.144	8	CDF	0.9535	Non-Significant Effect
		FR_FRABCH	-2.432	2.684	0.144	8	CDF	1.0000	Non-Significant Effect
		FR_FRCP1	-0.8302	2.684	0.144	8	CDF	0.9965	Non-Significant Effect
		GH_FR1	0.7717	2.684	0.144	8	CDF	0.7465	Non-Significant Effect
		GH_ERC	1.337	2.684	0.144	8	CDF	0.4827	Non-Significant Effect
		CM_MC2	-1.596	2.684	0.144	8	CDF	0.9999	Non-Significant Effect
		EV_MC2	1.274	2.684	0.144	8	CDF	0.5138	Non-Significant Effect
		EV_HC1	-1.485	2.684	0.144	8	CDF	0.9998	Non-Significant Effect
		LC_DCDS	1.762	2.684	0.144	8	CDF	0.2864	Non-Significant Effect
		LC_LC3	-0.6103	2.684	0.144	8	CDF	0.9923	Non-Significant Effect
		LC_LC5	-1.097	2.684	0.144	8	CDF	0.9988	Non-Significant Effect
		LC_LCDSSLCC	-0.1249	2.684	0.144	8	CDF	0.9644	Non-Significant Effect
		RG_MIDAG	-0.3504	2.684	0.144	8	CDF	0.9818	Non-Significant Effect
		FR_FR4	1.599	2.684	0.144	8	CDF	0.3574	Non-Significant Effect
		FR_FR2	0.4252	2.684	0.144	8	CDF	0.8649	Non-Significant Effect
		FR_MULTIPLATE	0.396	2.684	0.144	8	CDF	0.8728	Non-Significant Effect
		FR_FRRD	2.571	2.684	0.144	8	CDF	0.0647	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.478714	0.0251955	19	3.492	4.5E-05	Significant Effect
Error	0.577243	0.0072155	80			
Total	1.05596		99			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance Test	29.46	36.19	0.0590	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9765	0.9654	0.0708	Normal Distribution

Analyst: RT QA: Dec-15/21

Hyalella 28-d Survival and Growth Sediment Test **Nautilus Environmental**

Analysis ID: 08-2381-8084 **Endpoint:** Mean Dry Weight-mg **CETIS Version:** CETISv1.9.4
Analyzed: 08 Dec-21 10:48 **Analysis:** Parametric-Control vs Treatments **Status Level:** 1

Mean Dry Weight-mg Summary

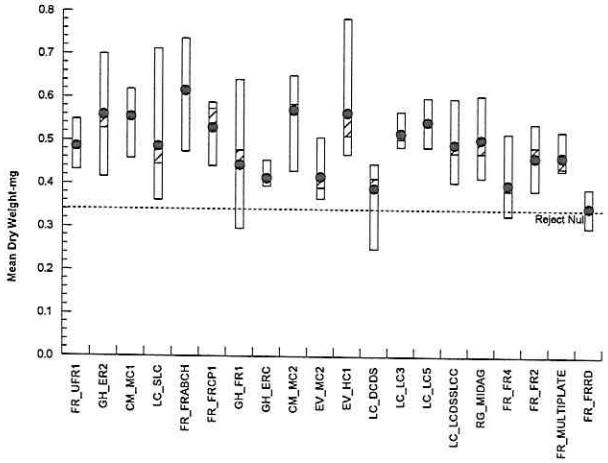
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
FR_UFR1	RS	5	0.4854	0.4164	0.5544	0.478	0.432	0.5489	0.02485	11.45%	0.00%
GH_ER2		5	0.5587	0.4051	0.7123	0.5278	0.415	0.7	0.05531	22.14%	-15.11%
CM_MC1		5	0.555	0.4794	0.6306	0.559	0.4578	0.619	0.02723	10.97%	-14.33%
LC_SLC		5	0.4869	0.3221	0.6517	0.446	0.3611	0.7122	0.05936	27.26%	-0.31%
FR_FRABCH		5	0.616	0.4737	0.7584	0.614	0.4737	0.737	0.05126	18.61%	-26.92%
FR_FRCP1		5	0.53	0.4376	0.6223	0.574	0.441	0.589	0.03327	14.04%	-9.19%
GH_FR1		5	0.4439	0.2637	0.6241	0.4778	0.2962	0.642	0.06491	32.69%	8.54%
GH_ERC		5	0.4136	0.3835	0.4436	0.4078	0.395	0.455	0.01082	5.85%	14.80%
CM_MC2		5	0.5711	0.4646	0.6777	0.5856	0.43	0.653	0.03838	15.03%	-17.66%
EV_MC2		5	0.4169	0.3408	0.4931	0.3922	0.3656	0.509	0.02743	14.71%	14.10%
EV_HC1		5	0.5652	0.4063	0.724	0.512	0.468	0.786	0.05721	22.64%	-16.44%
LC_DCDS		5	0.3907	0.2889	0.4925	0.4137	0.25	0.448	0.03668	20.99%	19.51%
LC_LC3		5	0.5182	0.4724	0.564	0.504	0.486	0.5689	0.01649	7.12%	-6.76%
LC_LC5		5	0.5443	0.4894	0.5993	0.5411	0.4856	0.601	0.0198	8.13%	-12.15%
LC_LCDSSLCC		5	0.4921	0.3934	0.5908	0.473	0.405	0.6	0.03554	16.15%	-1.38%
RG_MIDAG		5	0.5042	0.3897	0.6187	0.472	0.415	0.606	0.04123	18.28%	-3.88%
FR_FR4		5	0.3995	0.3109	0.488	0.3863	0.328	0.519	0.03189	17.85%	17.70%
FR_FR2		5	0.4625	0.3843	0.5408	0.4867	0.386	0.5411	0.02819	13.63%	4.71%
FR_MULTIPLATE		5	0.4641	0.4132	0.515	0.4388	0.4333	0.524	0.01834	8.84%	4.38%
FR_FRRD		5	0.3472	0.3045	0.39	0.349	0.301	0.3922	0.0154	9.92%	28.46%

Mean Dry Weight-mg Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
FR_UFR1	RS	0.478	0.536	0.5489	0.432	0.432
GH_ER2		0.673	0.7	0.415	0.4778	0.5278
CM_MC1		0.59	0.619	0.549	0.4578	0.559
LC_SLC		0.3611	0.446	0.473	0.7122	0.442
FR_FRABCH		0.614	0.737	0.721	0.5344	0.4737
FR_FRCP1		0.574	0.5889	0.589	0.457	0.441
GH_FR1		0.498	0.4778	0.642	0.3056	0.2962
GH_ERC		0.412	0.398	0.4078	0.455	0.395
CM_MC2		0.653	0.43	0.5856	0.565	0.622
EV_MC2		0.3656	0.369	0.3922	0.509	0.4489
EV_HC1		0.786	0.4987	0.512	0.468	0.5611
LC_DCDS		0.448	0.25	0.448	0.4137	0.3938
LC_LC3		0.5444	0.504	0.486	0.5689	0.4875
LC_LC5		0.523	0.601	0.571	0.4856	0.5411
LC_LCDSSLCC		0.6	0.405	0.473	0.5444	0.438
RG_MIDAG		0.472	0.606	0.429	0.599	0.415
FR_FR4		0.3863	0.373	0.519	0.3911	0.328
FR_FR2		0.4867	0.4878	0.4111	0.386	0.5411
FR_MULTIPLATE		0.524	0.49	0.4344	0.4388	0.4333
FR_FRRD		0.301	0.349	0.33	0.364	0.3922

Analyst: RZ QA: Dec 15/21

Graphics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CM_MC1
LC_SLC
FR_FRABCH
FR_FRCP1
GH_FR1
GH_ERC
CM_MC2
EV_MC2
EV_HC1
LC_DCDS
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LC_LCDSSLCC
RG_MIDAG
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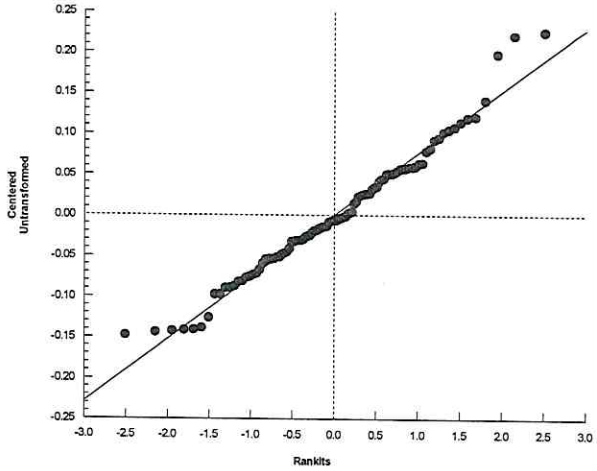
FR_FR2
FR_MULTIPLATE
FR_FRRD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Hyalella 28-d Survival and Growth Sediment Test

Nautilus Environmental

Analysis ID:	06-4855-2311	**Endpoint:**	Survival Rate	**CETIS Version:**	CETISv1.9.4
Analyzed:	08 Dec-21 10:50	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1
Batch ID:	11-3778-4609	**Test Type:**	Survival-Growth	**Analyst:**	Rachel Sakurdeep
Start Date:	14 Oct-21	**Protocol:**	EPA/600/R-99/064 (2000)	**Diluent:**	Reconstituted Water
Ending Date:	11 Nov-21	**Species:**	Hyalella azteca	**Brine:**	
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	Aquatic Biosystems, CO **Age:** 7-8d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
FR_UFR1	19-8746-8946	12 Oct-21 11:07	13 Oct-21 11:53	37h (0 °C)	Teck Coal	
GH_ER2	20-2628-4137	12 Oct-21 10:50	13 Oct-21 11:30	37h (0 °C)		
CM_MC1	18-3559-2852	12 Oct-21 13:20	13 Oct-21 11:30	35h (0.1 °C)		
LC_SLC	08-7937-3726	12 Oct-21 11:00	13 Oct-21 11:30	37h (2.9 °C)		
FR_FRABCH	18-7592-7020	12 Oct-21 11:20	13 Oct-21 11:53	37h (0 °C)		
FR_FRCP1	10-3969-8000	12 Oct-21 11:48	13 Oct-21 11:53	36h (1.3 °C)		
GH_FR1	11-8224-4576	12 Oct-21 10:00	13 Oct-21 11:30	38h (0 °C)		
GH_ERC	00-1276-7572	12 Oct-21 11:50	13 Oct-21 11:30	36h (0 °C)		
CM_MC2	03-9569-8600	12 Oct-21 12:47	13 Oct-21 11:30	35h (1.3 °C)		
EV_MC2	13-1923-7722	12 Oct-21 11:38	13 Oct-21 11:30	36h (0.2 °C)		
EV_HC1	18-6648-8827	12 Oct-21 10:33	13 Oct-21 11:30	37h (0 °C)		
LC_DCDS	17-4710-4100	12 Oct-21	13 Oct-21 11:30	48h (1.7 °C)		
LC_LC3	20-0894-5906	12 Oct-21 12:00	13 Oct-21 11:30	36h (8.8 °C)		
LC_LC5	14-5637-1032	12 Oct-21 13:30	13 Oct-21 11:30	34h (2.6 °C)		
LC_LCDSSLCC	06-4184-4349	12 Oct-21 12:30	13 Oct-21 11:30	35h (4.7 °C)		
RG_MIDAG	02-5873-2402	12 Oct-21 12:24	13 Oct-21 11:30	36h (3.9 °C)		
FR_FR4	16-7272-1140	12 Oct-21 11:05	13 Oct-21 11:30	37h (0 °C)		
FR_FR2	09-1936-7906	12 Oct-21 10:25	13 Oct-21 11:30	38h (0 °C)		
FR_MULTIPLATE	07-2028-3040	12 Oct-21 09:45	13 Oct-21 11:30	38h (0 °C)		
FR_FRRD	04-7874-3326	12 Oct-21 11:45	13 Oct-21 11:30	36h (0 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_UFR1	Water Sample	Teck Coal	FR_UFR1_WEK_2021-09-1	
GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-10-12_	
CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-10-12	
LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-10-19_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_WEK_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_WEK_2021-09	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-10-12_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-10-12	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-10-12	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2021_Q4_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2021_Q4_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-10-19	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-10-19_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-10-19_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	
RG_MIDAG	Water Sample	Teck Coal	RG_MIDAG_WS_2021-10-	
FR_FR4	Water Sample	Teck Coal	FR_FR4_WS_2021-10-12_	
FR_FR2	Water Sample	Teck Coal	FR_FR2_WS_2021-10-12_	
FR_MULTIPLATE	Water Sample	Teck Coal	FR_MULTIPLATE_WS_202	
FR_FRRD	Water Sample	Teck Coal	FR_FRRD_WS_2021-10-12	

Fisher Exact/Bonferroni-Holm Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
Reference Sed (GH-ER2)		FR_UFR1	0.8788	Exact	1.0000	Non-Significant Effect
		CM_MC1	0.2180	Exact	1.0000	Non-Significant Effect
		LC_SLC	0.6913	Exact	1.0000	Non-Significant Effect
		FR_FRABCH	0.6913	Exact	1.0000	Non-Significant Effect

Hyalella 28-d Survival and Growth Sediment Test — **Nautilus Environmental**

Analysis ID: 06-4855-2311 **Endpoint:** Survival Rate **CETIS Version:** CETISv1.9.4
Analyzed: 08 Dec-21 10:50 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Fisher Exact/Bonferroni-Holm Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
		FR_FRCP1	0.8788	Exact	1.0000	Non-Significant Effect
		GH_FR1	0.3389	Exact	1.0000	Non-Significant Effect
		GH_ERC	0.2180	Exact	1.0000	Non-Significant Effect
		CM_MC2	0.8788	Exact	1.0000	Non-Significant Effect
		EV_MC2	0.6913	Exact	1.0000	Non-Significant Effect
		EV_HC1	0.5000	Exact	1.0000	Non-Significant Effect
		LC_DCDS	0.0038	Exact	0.0720	Non-Significant Effect
		LC_LC3	0.5000	Exact	1.0000	Non-Significant Effect
		LC_LC5	0.6913	Exact	1.0000	Non-Significant Effect
		LC_LCDSSLCC	0.8788	Exact	1.0000	Non-Significant Effect
		RG_MIDAG	1.0000	Exact	1.0000	Non-Significant Effect
		FR_FR4	0.5000	Exact	1.0000	Non-Significant Effect
		FR_FR2	0.3389	Exact	1.0000	Non-Significant Effect
		FR_MULTIPLATE	0.0798	Exact	1.0000	Non-Significant Effect
		FR_FRRD	0.8788	Exact	1.0000	Non-Significant Effect

Data Summary

Sample	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
FR_UFR1		49	1	50	0.98	0.02	-8.89%
GH_ER2	RS	48	2	50	0.96	0.04	-6.67%
CM_MC1		45	5	50	0.9	0.1	0.0%
LC_SLC		48	2	50	0.96	0.04	-6.67%
FR_FRABCH		48	2	50	0.96	0.04	-6.67%
FR_FRCP1		49	1	50	0.98	0.02	-8.89%
GH_FR1		46	4	50	0.92	0.08	-2.22%
GH_ERC		45	5	50	0.9	0.1	0.0%
CM_MC2		49	1	50	0.98	0.02	-8.89%
EV_MC2		48	2	50	0.96	0.04	-6.67%
EV_HC1		47	3	50	0.94	0.06	-4.44%
LC_DCDS		38	12	50	0.76	0.24	15.56%
LC_LC3		47	3	50	0.94	0.06	-4.44%
LC_LC5		48	2	50	0.96	0.04	-6.67%
LC_LCDSSLCC		49	1	50	0.98	0.02	-8.89%
RG_MIDAG		50	0	50	1	0	-11.11%
FR_FR4		47	3	50	0.94	0.06	-4.44%
FR_FR2		46	4	50	0.92	0.08	-2.22%
FR_MULTIPLATE		43	7	50	0.86	0.14	4.44%
FR_FRRD		49	1	50	0.98	0.02	-8.89%

Hyalella 28-d Survival and Growth Sediment Test — **Nautilus Environmental**

Analysis ID:	06-4855-2311	**Endpoint:**	Survival Rate	**CETIS Version:**	CETISv1.9.4
Analyzed:	08 Dec-21 10:50	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1

Survival Rate Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
FR_UFR1		1.0000	1.0000	0.9000	1.0000	1.0000
GH_ER2	RS	1.0000	1.0000	1.0000	0.9000	0.9000
CM_MC1		0.6000	1.0000	1.0000	0.9000	1.0000
LC_SLC		0.9000	1.0000	1.0000	0.9000	1.0000
FR_FRABCH		1.0000	1.0000	1.0000	0.9000	0.9000
FR_FRCP1		1.0000	0.9000	1.0000	1.0000	1.0000
GH_FR1		1.0000	0.9000	1.0000	0.9000	0.8000
GH_ERC		1.0000	1.0000	0.9000	0.8000	0.8000
CM_MC2		1.0000	1.0000	0.9000	1.0000	1.0000
EV_MC2		1.0000	1.0000	0.9000	1.0000	0.9000
EV_HC1		1.0000	0.8000	1.0000	1.0000	0.9000
LC_DCDS		1.0000	0.2000	1.0000	0.8000	0.8000
LC_LC3		1.0000	1.0000	1.0000	0.9000	0.8000
LC_LC5		1.0000	1.0000	1.0000	0.9000	0.9000
LC_LCDSSLCC		1.0000	1.0000	1.0000	0.9000	1.0000
RG_MIDAG		1.0000	1.0000	1.0000	1.0000	1.0000
FR_FR4		0.8000	1.0000	1.0000	0.9000	1.0000
FR_FR2		0.9000	0.9000	0.9000	1.0000	0.9000
FR_MULTIPLATE		1.0000	0.7000	0.9000	0.8000	0.9000
FR_FRRD		1.0000	1.0000	1.0000	1.0000	0.9000

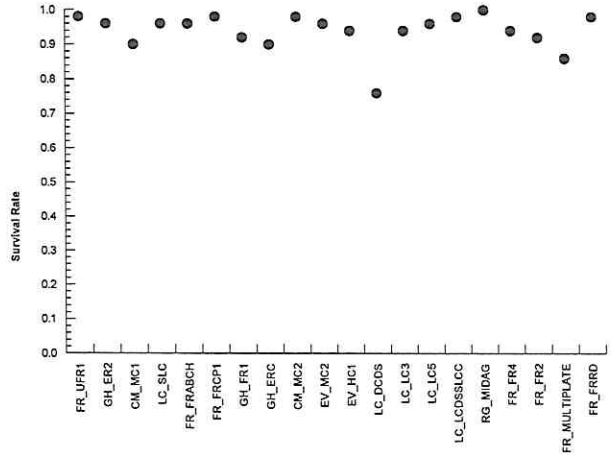
Survival Rate Binomials

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
FR_UFR1		10/10	10/10	9/10	10/10	10/10
GH_ER2	RS	10/10	10/10	10/10	9/10	9/10
CM_MC1		6/10	10/10	10/10	9/10	10/10
LC_SLC		9/10	10/10	10/10	9/10	10/10
FR_FRABCH		10/10	10/10	10/10	9/10	9/10
FR_FRCP1		10/10	9/10	10/10	10/10	10/10
GH_FR1		10/10	9/10	10/10	9/10	8/10
GH_ERC		10/10	10/10	9/10	8/10	8/10
CM_MC2		10/10	10/10	9/10	10/10	10/10
EV_MC2		10/10	10/10	9/10	10/10	9/10
EV_HC1		10/10	8/10	10/10	10/10	9/10
LC_DCDS		10/10	2/10	10/10	8/10	8/10
LC_LC3		10/10	10/10	10/10	9/10	8/10
LC_LC5		10/10	10/10	10/10	9/10	9/10
LC_LCDSSLCC		10/10	10/10	10/10	9/10	10/10
RG_MIDAG		10/10	10/10	10/10	10/10	10/10
FR_FR4		8/10	10/10	10/10	9/10	10/10
FR_FR2		9/10	9/10	9/10	10/10	9/10
FR_MULTIPLATE		10/10	7/10	9/10	8/10	9/10
FR_FRRD		10/10	10/10	10/10	10/10	9/10

Hyalella 28-d Survival and Growth Sediment Test — **Nautilus Environmental**

Analysis ID:	06-4855-2311	**Endpoint:**	Survival Rate	**CETIS Version:**	CETISv1.9.4
Analyzed:	08 Dec-21 10:50	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1

Graphics



 Analyst: RD QA: Dec-15/21

Hyalella 28-d Survival and Growth Sediment Test

Nautilus Environmental

Analysis ID:	00-7628-5832	**Endpoint:**	Mean Dry Weight-mg	**CETIS Version:**	CETISv1.9.4
Analyzed:	08 Dec-21 10:50	**Analysis:**	Parametric-Control vs Treatments	**Status Level:**	1
Batch ID:	11-3778-4609	**Test Type:**	Survival-Growth	**Analyst:**	Rachel Sakurdeep
Start Date:	14 Oct-21	**Protocol:**	EPA/600/R-99/064 (2000)	**Diluent:**	Reconstituted Water
Ending Date:	11 Nov-21	**Species:**	Hyalella azteca	**Brine:**	
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	Aquatic Biosystems, CO **Age:** 7-8d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
FR_UFR1	19-8746-8946	12 Oct-21 11:07	13 Oct-21 11:53	37h (0 °C)	Teck Coal	
GH_ER2	20-2628-4137	12 Oct-21 10:50	13 Oct-21 11:30	37h (0 °C)		
CM_MC1	18-3559-2852	12 Oct-21 13:20	13 Oct-21 11:30	35h (0.1 °C)		
LC_SLC	08-7937-3726	12 Oct-21 11:00	13 Oct-21 11:30	37h (2.9 °C)		
FR_FRABCH	18-7592-7020	12 Oct-21 11:20	13 Oct-21 11:53	37h (0 °C)		
FR_FRCP1	10-3969-8000	12 Oct-21 11:48	13 Oct-21 11:53	36h (1.3 °C)		
GH_FR1	11-8224-4576	12 Oct-21 10:00	13 Oct-21 11:30	38h (0 °C)		
GH_ERC	00-1276-7572	12 Oct-21 11:50	13 Oct-21 11:30	36h (0 °C)		
CM_MC2	03-9569-8600	12 Oct-21 12:47	13 Oct-21 11:30	35h (1.3 °C)		
EV_MC2	13-1923-7722	12 Oct-21 11:38	13 Oct-21 11:30	36h (0.2 °C)		
EV_HC1	18-6648-8827	12 Oct-21 10:33	13 Oct-21 11:30	37h (0 °C)		
LC_DCDS	17-4710-4100	12 Oct-21	13 Oct-21 11:30	48h (1.7 °C)		
LC_LC3	20-0894-5906	12 Oct-21 12:00	13 Oct-21 11:30	36h (8.8 °C)		
LC_LC5	14-5637-1032	12 Oct-21 13:30	13 Oct-21 11:30	34h (2.6 °C)		
LC_LCDSSLCC	06-4184-4349	12 Oct-21 12:30	13 Oct-21 11:30	35h (4.7 °C)		
RG_MIDAG	02-5873-2402	12 Oct-21 12:24	13 Oct-21 11:30	36h (3.9 °C)		
FR_FR4	16-7272-1140	12 Oct-21 11:05	13 Oct-21 11:30	37h (0 °C)		
FR_FR2	09-1936-7906	12 Oct-21 10:25	13 Oct-21 11:30	38h (0 °C)		
FR_MULTIPLATE	07-2028-3040	12 Oct-21 09:45	13 Oct-21 11:30	38h (0 °C)		
FR_FRRD	04-7874-3326	12 Oct-21 11:45	13 Oct-21 11:30	36h (0 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_UFR1	Water Sample	Teck Coal	FR_UFR1_WEK_2021-09-1	
GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-10-12_	
CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-10-12	
LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-10-19_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_WEK_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_WEK_2021-09	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-10-12_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-10-12	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-10-12	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2021_Q4_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2021_Q4_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-10-19	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-10-19_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-10-19_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	
RG_MIDAG	Water Sample	Teck Coal	RG_MIDAG_WS_2021-10-	
FR_FR4	Water Sample	Teck Coal	FR_FR4_WS_2021-10-12_	
FR_FR2	Water Sample	Teck Coal	FR_FR2_WS_2021-10-12_	
FR_MULTIPLATE	Water Sample	Teck Coal	FR_MULTIPLATE_WS_202	
FR_FRRD	Water Sample	Teck Coal	FR_FRRD_WS_2021-10-12	

Hyalella 28-d Survival and Growth Sediment Test

Nautilus Environmental

Analysis ID: 00-7628-5832 **Endpoint:** Mean Dry Weight-mg **CETIS Version:** CETISv1.9.4
Analyzed: 08 Dec-21 10:50 **Analysis:** Parametric-Control vs Treatments **Status Level:** 1

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	FR_UFR1 passed mean dry weight-mg	25.80%
		CM_MC1 passed mean dry weight-mg	25.80%
		LC_SLC passed mean dry weight-mg	25.80%
		FR_FRABCH passed mean dry weight-mg	25.80%
		FR_FRCP1 passed mean dry weight-mg	25.80%
		GH_FR1 passed mean dry weight-mg	25.80%
		GH_ERC failed mean dry weight-mg	25.80%
		CM_MC2 passed mean dry weight-mg	25.80%
		EV_MC2 passed mean dry weight-mg	25.80%
		EV_HC1 passed mean dry weight-mg	25.80%
		LC_DCDS failed mean dry weight-mg	25.80%
		LC_LC3 passed mean dry weight-mg	25.80%
		LC_LC5 passed mean dry weight-mg	25.80%
		LC_LCDSSLCC passed mean dry weight-mg	25.80%
		RG_MIDAG passed mean dry weight-mg	25.80%
		FR_FR4 failed mean dry weight-mg	25.80%
		FR_FR2 passed mean dry weight-mg	25.80%
		FR_MULTIPLATE passed mean dry weight-m	25.80%
		FR_FRRD failed mean dry weight-mg	25.80%

Dunnett Multiple Comparison Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Reference Sed (GH-ERC)		FR_UFR1	1.365	2.684	0.144	8	CDF	0.4688	Non-Significant Effect
		CM_MC1	0.06987	2.684	0.144	8	CDF	0.9401	Non-Significant Effect
		LC_SLC	1.337	2.684	0.144	8	CDF	0.4825	Non-Significant Effect
		FR_FRABCH	-1.067	2.684	0.144	8	CDF	0.9986	Non-Significant Effect
		FR_FRCP1	0.5348	2.684	0.144	8	CDF	0.8323	Non-Significant Effect
		GH_FR1	2.137	2.684	0.144	8	CDF	0.1559	Non-Significant Effect
		GH_ERC*	2.702	2.684	0.144	8	CDF	0.0479	Significant Effect
		CM_MC2	-0.2309	2.684	0.144	8	CDF	0.9738	Non-Significant Effect
		EV_MC2	2.639	2.684	0.144	8	CDF	0.0555	Non-Significant Effect
		EV_HC1	-0.1202	2.684	0.144	8	CDF	0.9639	Non-Significant Effect
		LC_DCDS*	3.127	2.684	0.144	8	CDF	0.0162	Significant Effect
		LC_LC3	0.7547	2.684	0.144	8	CDF	0.7533	Non-Significant Effect
		LC_LC5	0.2676	2.684	0.144	8	CDF	0.9038	Non-Significant Effect
		LC_LCDSSLCC	1.24	2.684	0.144	8	CDF	0.5305	Non-Significant Effect
		RG_MIDAG	1.015	2.684	0.144	8	CDF	0.6398	Non-Significant Effect
		FR_FR4*	2.964	2.684	0.144	8	CDF	0.0250	Significant Effect
		FR_FR2	1.79	2.684	0.144	8	CDF	0.2751	Non-Significant Effect
		FR_MULTIPLATE	1.761	2.684	0.144	8	CDF	0.2870	Non-Significant Effect
		FR_FRRD*	3.936	2.684	0.144	8	CDF	0.0014	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.478714	0.0251955	19	3.492	4.5E-05	Significant Effect
Error	0.577243	0.0072155	80			
Total	1.05596		99			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance Test	29.46	36.19	0.0590	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9765	0.9654	0.0708	Normal Distribution

Hyalella 28-d Survival and Growth Sediment Test **Nautilus Environmental**

Analysis ID: 00-7628-5832 **Endpoint:** Mean Dry Weight-mg **CETIS Version:** CETISv1.9.4
Analyzed: 08 Dec-21 10:50 **Analysis:** Parametric-Control vs Treatments **Status Level:** 1

Mean Dry Weight-mg Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
FR_UFR1		5	0.4854	0.4164	0.5544	0.478	0.432	0.5489	0.02485	11.45%	0.00%
GH_ER2	RS	5	0.5587	0.4051	0.7123	0.5278	0.415	0.7	0.05531	22.14%	-15.11%
CM_MC1		5	0.555	0.4794	0.6306	0.559	0.4578	0.619	0.02723	10.97%	-14.33%
LC_SLC		5	0.4869	0.3221	0.6517	0.446	0.3611	0.7122	0.05936	27.26%	-0.31%
FR_FRABCH		5	0.616	0.4737	0.7584	0.614	0.4737	0.737	0.05126	18.61%	-26.92%
FR_FRCP1		5	0.53	0.4376	0.6223	0.574	0.441	0.589	0.03327	14.04%	-9.19%
GH_FR1		5	0.4439	0.2637	0.6241	0.4778	0.2962	0.642	0.06491	32.69%	8.54%
GH_ERC		5	0.4136	0.3835	0.4436	0.4078	0.395	0.455	0.01082	5.85%	14.80%
CM_MC2		5	0.5711	0.4646	0.6777	0.5856	0.43	0.653	0.03838	15.03%	-17.66%
EV_MC2		5	0.4169	0.3408	0.4931	0.3922	0.3656	0.509	0.02743	14.71%	14.10%
EV_HC1		5	0.5652	0.4063	0.724	0.512	0.468	0.786	0.05721	22.64%	-16.44%
LC_DCDS		5	0.3907	0.2889	0.4925	0.4137	0.25	0.448	0.03668	20.99%	19.51%
LC_LC3		5	0.5182	0.4724	0.564	0.504	0.486	0.5689	0.01649	7.12%	-6.76%
LC_LC5		5	0.5443	0.4894	0.5993	0.5411	0.4856	0.601	0.0198	8.13%	-12.15%
LC_LCDSSLCC		5	0.4921	0.3934	0.5908	0.473	0.405	0.6	0.03554	16.15%	-1.38%
RG_MIDAG		5	0.5042	0.3897	0.6187	0.472	0.415	0.606	0.04123	18.28%	-3.88%
FR_FR4		5	0.3995	0.3109	0.488	0.3863	0.328	0.519	0.03189	17.85%	17.70%
FR_FR2		5	0.4625	0.3843	0.5408	0.4867	0.386	0.5411	0.02819	13.63%	4.71%
FR_MULTIPLATE		5	0.4641	0.4132	0.515	0.4388	0.4333	0.524	0.01834	8.84%	4.38%
FR_FRRD		5	0.3472	0.3045	0.39	0.349	0.301	0.3922	0.0154	9.92%	28.46%

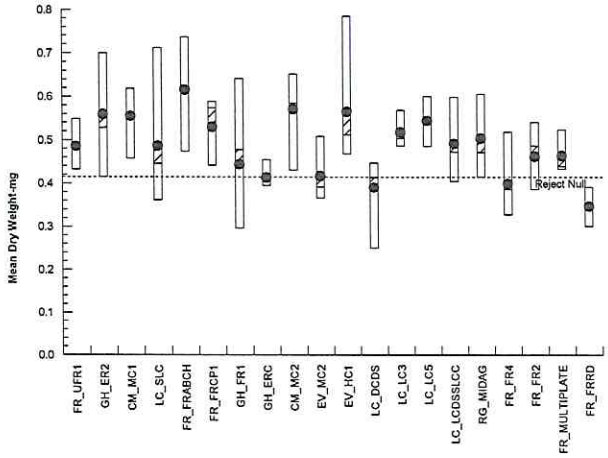
Mean Dry Weight-mg Detail

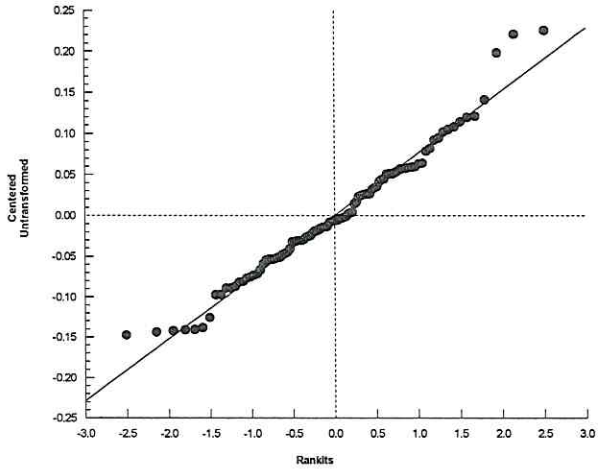
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
FR_UFR1		0.478	0.536	0.5489	0.432	0.432
GH_ER2	RS	0.673	0.7	0.415	0.4778	0.5278
CM_MC1		0.59	0.619	0.549	0.4578	0.559
LC_SLC		0.3611	0.446	0.473	0.7122	0.442
FR_FRABCH		0.614	0.737	0.721	0.5344	0.4737
FR_FRCP1		0.574	0.5889	0.589	0.457	0.441
GH_FR1		0.498	0.4778	0.642	0.3056	0.2962
GH_ERC		0.412	0.398	0.4078	0.455	0.395
CM_MC2		0.653	0.43	0.5856	0.565	0.622
EV_MC2		0.3656	0.369	0.3922	0.509	0.4489
EV_HC1		0.786	0.4987	0.512	0.468	0.5611
LC_DCDS		0.448	0.25	0.448	0.4137	0.3938
LC_LC3		0.5444	0.504	0.486	0.5689	0.4875
LC_LC5		0.523	0.601	0.571	0.4856	0.5411
LC_LCDSSLCC		0.6	0.405	0.473	0.5444	0.438
RG_MIDAG		0.472	0.606	0.429	0.599	0.415
FR_FR4		0.3863	0.373	0.519	0.3911	0.328
FR_FR2		0.4867	0.4878	0.4111	0.386	0.5411
FR_MULTIPLATE		0.524	0.49	0.4344	0.4388	0.4333
FR_FRRD		0.301	0.349	0.33	0.364	0.3922

Hyalella 28-d Survival and Growth Sediment Test — **Nautilus Environmental**

Analysis ID:	00-7628-5832	**Endpoint:**	Mean Dry Weight-mg	**CETIS Version:**	CETISv1.9.4
Analyzed:	08 Dec-21 10:50	**Analysis:**	Parametric-Control vs Treatments	**Status Level:**	1

Graphics





Hyalella 28-d Survival and Growth Sediment Test — **Nautilus Environmental**

Analysis ID:	15-6763-8234	**Endpoint:**	Survival Rate	**CETIS Version:**	CETISv1.9.4
Analyzed:	08 Dec-21 10:52	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1
Batch ID:	11-3778-4609	**Test Type:**	Survival-Growth	**Analyst:**	Rachel Sakurdeep
Start Date:	14 Oct-21	**Protocol:**	EPA/600/R-99/064 (2000)	**Diluent:**	Reconstituted Water
Ending Date:	11 Nov-21	**Species:**	Hyalella azteca	**Brine:**	
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	Aquatic Biosystems, CO **Age:** 7-8d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
FR_UFR1	19-8746-8946	12 Oct-21 11:07	13 Oct-21 11:53	37h (0 °C)	Teck Coal	
GH_ER2	20-2628-4137	12 Oct-21 10:50	13 Oct-21 11:30	37h (0 °C)		
CM_MC1	18-3559-2852	12 Oct-21 13:20	13 Oct-21 11:30	35h (0.1 °C)		
LC_SLC	08-7937-3726	12 Oct-21 11:00	13 Oct-21 11:30	37h (2.9 °C)		
FR_FRABCH	18-7592-7020	12 Oct-21 11:20	13 Oct-21 11:53	37h (0 °C)		
FR_FRCP1	10-3969-8000	12 Oct-21 11:48	13 Oct-21 11:53	36h (1.3 °C)		
GH_FR1	11-8224-4576	12 Oct-21 10:00	13 Oct-21 11:30	38h (0 °C)		
GH_ERC	00-1276-7572	12 Oct-21 11:50	13 Oct-21 11:30	36h (0 °C)		
CM_MC2	03-9569-8600	12 Oct-21 12:47	13 Oct-21 11:30	35h (1.3 °C)		
EV_MC2	13-1923-7722	12 Oct-21 11:38	13 Oct-21 11:30	36h (0.2 °C)		
EV_HC1	18-6648-8827	12 Oct-21 10:33	13 Oct-21 11:30	37h (0 °C)		
LC_DCDS	17-4710-4100	12 Oct-21	13 Oct-21 11:30	48h (1.7 °C)		
LC_LC3	20-0894-5906	12 Oct-21 12:00	13 Oct-21 11:30	36h (8.8 °C)		
LC_LC5	14-5637-1032	12 Oct-21 13:30	13 Oct-21 11:30	34h (2.6 °C)		
LC_LCDSSLCC	06-4184-4349	12 Oct-21 12:30	13 Oct-21 11:30	35h (4.7 °C)		
RG_MIDAG	02-5873-2402	12 Oct-21 12:24	13 Oct-21 11:30	36h (3.9 °C)		
FR_FR4	16-7272-1140	12 Oct-21 11:05	13 Oct-21 11:30	37h (0 °C)		
FR_FR2	09-1936-7906	12 Oct-21 10:25	13 Oct-21 11:30	38h (0 °C)		
FR_MULTIPLATE	07-2028-3040	12 Oct-21 09:45	13 Oct-21 11:30	38h (0 °C)		
FR_FRRD	04-7874-3326	12 Oct-21 11:45	13 Oct-21 11:30	36h (0 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_UFR1	Water Sample	Teck Coal	FR_UFR1_WEK_2021-09-1	
GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-10-12_	
CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-10-12	
LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-10-19_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_WEK_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_WEK_2021-09	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-10-12_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-10-12	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-10-12	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2021_Q4_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2021_Q4_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-10-19	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-10-19_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-10-19_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	
RG_MIDAG	Water Sample	Teck Coal	RG_MIDAG_WS_2021-10-	
FR_FR4	Water Sample	Teck Coal	FR_FR4_WS_2021-10-12_	
FR_FR2	Water Sample	Teck Coal	FR_FR2_WS_2021-10-12_	
FR_MULTIPLATE	Water Sample	Teck Coal	FR_MULTIPLATE_WS_202	
FR_FRRD	Water Sample	Teck Coal	FR_FRRD_WS_2021-10-12	

Fisher Exact/Bonferroni-Holm Test

Sample I vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
Reference Sed (CM_MC1)	FR_UFR1	0.9867	Exact	1.0000	Non-Significant Effect
	GH_ER2	0.9441	Exact	1.0000	Non-Significant Effect
	LC_SLC	0.9441	Exact	1.0000	Non-Significant Effect
	FR_FRABCH	0.9441	Exact	1.0000	Non-Significant Effect

Analysis ID:	15-6763-8234	**Endpoint:** Survival Rate	**CETIS Version:** CETISv1.9.4
Analyzed:	08 Dec-21 10:52	**Analysis:** STP 2xK Contingency Tables	**Status Level:** 1

Fisher Exact/Bonferroni-Holm Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
		FR_FRCP1	0.9867	Exact	1.0000	Non-Significant Effect
		GH_FR1	0.7565	Exact	1.0000	Non-Significant Effect
		GH_ERC	0.6297	Exact	1.0000	Non-Significant Effect
		CM_MC2	0.9867	Exact	1.0000	Non-Significant Effect
		EV_MC2	0.9441	Exact	1.0000	Non-Significant Effect
		EV_HC1	0.8657	Exact	1.0000	Non-Significant Effect
		LC_DCDS	0.0542	Exact	1.0000	Non-Significant Effect
		LC_LC3	0.8657	Exact	1.0000	Non-Significant Effect
		LC_LC5	0.9441	Exact	1.0000	Non-Significant Effect
		LC_LCDSSLCC	0.9867	Exact	1.0000	Non-Significant Effect
		RG_MIDAG	1.0000	Exact	1.0000	Non-Significant Effect
		FR_FR4	0.8657	Exact	1.0000	Non-Significant Effect
		FR_FR2	0.7565	Exact	1.0000	Non-Significant Effect
		FR_MULTIPLATE	0.3798	Exact	1.0000	Non-Significant Effect
		FR_FRRD	0.9867	Exact	1.0000	Non-Significant Effect

Data Summary

Sample	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
FR_UFR1		49	1	50	0.98	0.02	-8.89%
GH_ER2		48	2	50	0.96	0.04	-6.67%
CM_MC1	RS	45	5	50	0.9	0.1	0.0%
LC_SLC		48	2	50	0.96	0.04	-6.67%
FR_FRABCH		48	2	50	0.96	0.04	-6.67%
FR_FRCP1		49	1	50	0.98	0.02	-8.89%
GH_FR1		46	4	50	0.92	0.08	-2.22%
GH_ERC		45	5	50	0.9	0.1	0.0%
CM_MC2		49	1	50	0.98	0.02	-8.89%
EV_MC2		48	2	50	0.96	0.04	-6.67%
EV_HC1		47	3	50	0.94	0.06	-4.44%
LC_DCDS		38	12	50	0.76	0.24	15.56%
LC_LC3		47	3	50	0.94	0.06	-4.44%
LC_LC5		48	2	50	0.96	0.04	-6.67%
LC_LCDSSLCC		49	1	50	0.98	0.02	-8.89%
RG_MIDAG		50	0	50	1	0	-11.11%
FR_FR4		47	3	50	0.94	0.06	-4.44%
FR_FR2		46	4	50	0.92	0.08	-2.22%
FR_MULTIPLATE		43	7	50	0.86	0.14	4.44%
FR_FRRD		49	1	50	0.98	0.02	-8.89%

Hyalella 28-d Survival and Growth Sediment Test **Nautilus Environmental**

Analysis ID: 15-6763-8234 **Endpoint:** Survival Rate **CETIS Version:** CETISv1.9.4
Analyzed: 08 Dec-21 10:52 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Survival Rate Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
FR_UFR1		1.0000	1.0000	0.9000	1.0000	1.0000
GH_ER2		1.0000	1.0000	1.0000	0.9000	0.9000
CM_MC1	RS	0.6000	1.0000	1.0000	0.9000	1.0000
LC_SLC		0.9000	1.0000	1.0000	0.9000	1.0000
FR_FRABCH		1.0000	1.0000	1.0000	0.9000	0.9000
FR_FRCP1		1.0000	0.9000	1.0000	1.0000	1.0000
GH_FR1		1.0000	0.9000	1.0000	0.9000	0.8000
GH_ERC		1.0000	1.0000	0.9000	0.8000	0.8000
CM_MC2		1.0000	1.0000	0.9000	1.0000	1.0000
EV_MC2		1.0000	1.0000	0.9000	1.0000	0.9000
EV_HC1		1.0000	0.8000	1.0000	1.0000	0.9000
LC_DCDS		1.0000	0.2000	1.0000	0.8000	0.8000
LC_LC3		1.0000	1.0000	1.0000	0.9000	0.8000
LC_LC5		1.0000	1.0000	1.0000	0.9000	0.9000
LC_LCDSSLCC		1.0000	1.0000	1.0000	0.9000	1.0000
RG_MIDAG		1.0000	1.0000	1.0000	1.0000	1.0000
FR_FR4		0.8000	1.0000	1.0000	0.9000	1.0000
FR_FR2		0.9000	0.9000	0.9000	1.0000	0.9000
FR_MULTIPLATE		1.0000	0.7000	0.9000	0.8000	0.9000
FR_FRRD		1.0000	1.0000	1.0000	1.0000	0.9000

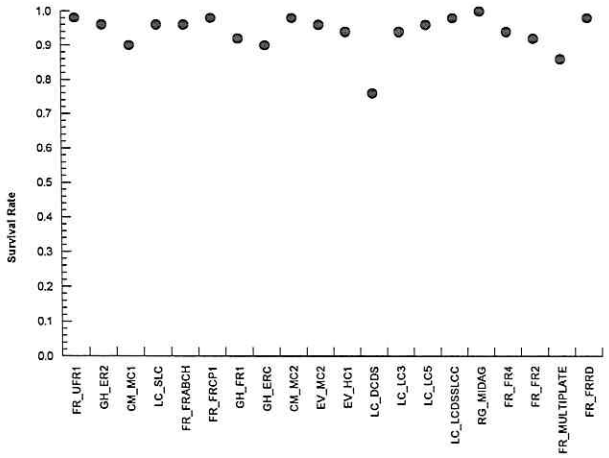
Survival Rate Binomials

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
FR_UFR1		10/10	10/10	9/10	10/10	10/10
GH_ER2		10/10	10/10	10/10	9/10	9/10
CM_MC1	RS	6/10	10/10	10/10	9/10	10/10
LC_SLC		9/10	10/10	10/10	9/10	10/10
FR_FRABCH		10/10	10/10	10/10	9/10	9/10
FR_FRCP1		10/10	9/10	10/10	10/10	10/10
GH_FR1		10/10	9/10	10/10	9/10	8/10
GH_ERC		10/10	10/10	9/10	8/10	8/10
CM_MC2		10/10	10/10	9/10	10/10	10/10
EV_MC2		10/10	10/10	9/10	10/10	9/10
EV_HC1		10/10	8/10	10/10	10/10	9/10
LC_DCDS		10/10	2/10	10/10	8/10	8/10
LC_LC3		10/10	10/10	10/10	9/10	8/10
LC_LC5		10/10	10/10	10/10	9/10	9/10
LC_LCDSSLCC		10/10	10/10	10/10	9/10	10/10
RG_MIDAG		10/10	10/10	10/10	10/10	10/10
FR_FR4		8/10	10/10	10/10	9/10	10/10
FR_FR2		9/10	9/10	9/10	10/10	9/10
FR_MULTIPLATE		10/10	7/10	9/10	8/10	9/10
FR_FRRD		10/10	10/10	10/10	10/10	9/10

Hyalella 28-d Survival and Growth Sediment Test **Nautilus Environmental**

Analysis ID:	15-6763-8234	**Endpoint:**	Survival Rate	**CETIS Version:**	CETISv1.9.4
Analyzed:	08 Dec-21 10:52	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1

Graphics



Hyalella 28-d Survival and Growth Sediment Test

Nautilus Environmental

Analysis ID:	05-1269-4155	**Endpoint:**	Mean Dry Weight-mg	**CETIS Version:**	CETISv1.9.4
Analyzed:	08 Dec-21 10:55	**Analysis:**	Parametric-Control vs Treatments	**Status Level:**	1
Batch ID:	11-3778-4609	**Test Type:**	Survival-Growth	**Analyst:**	Rachel Sakurdeep
Start Date:	14 Oct-21	**Protocol:**	EPA/600/R-99/064 (2000)	**Diluent:**	Reconstituted Water
Ending Date:	11 Nov-21	**Species:**	Hyalella azteca	**Brine:**	
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	Aquatic Biosystems, CO **Age:** 7-8d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
FR_UFR1	19-8746-8946	12 Oct-21 11:07	13 Oct-21 11:53	37h (0 °C)	Teck Coal	
GH_ER2	20-2628-4137	12 Oct-21 10:50	13 Oct-21 11:30	37h (0 °C)		
CM_MC1	18-3559-2852	12 Oct-21 13:20	13 Oct-21 11:30	35h (0.1 °C)		
LC_SLC	08-7937-3726	12 Oct-21 11:00	13 Oct-21 11:30	37h (2.9 °C)		
FR_FRABCH	18-7592-7020	12 Oct-21 11:20	13 Oct-21 11:53	37h (0 °C)		
FR_FRCP1	10-3969-8000	12 Oct-21 11:48	13 Oct-21 11:53	36h (1.3 °C)		
GH_FR1	11-8224-4576	12 Oct-21 10:00	13 Oct-21 11:30	38h (0 °C)		
GH_ERC	00-1276-7572	12 Oct-21 11:50	13 Oct-21 11:30	36h (0 °C)		
CM_MC2	03-9569-8600	12 Oct-21 12:47	13 Oct-21 11:30	35h (1.3 °C)		
EV_MC2	13-1923-7722	12 Oct-21 11:38	13 Oct-21 11:30	36h (0.2 °C)		
EV_HC1	18-6648-8827	12 Oct-21 10:33	13 Oct-21 11:30	37h (0 °C)		
LC_DCDS	17-4710-4100	12 Oct-21	13 Oct-21 11:30	48h (1.7 °C)		
LC_LC3	20-0894-5906	12 Oct-21 12:00	13 Oct-21 11:30	36h (8.8 °C)		
LC_LC5	14-5637-1032	12 Oct-21 13:30	13 Oct-21 11:30	34h (2.6 °C)		
LC_LCDSSLCC	06-4184-4349	12 Oct-21 12:30	13 Oct-21 11:30	35h (4.7 °C)		
RG_MIDAG	02-5873-2402	12 Oct-21 12:24	13 Oct-21 11:30	36h (3.9 °C)		
FR_FR4	16-7272-1140	12 Oct-21 11:05	13 Oct-21 11:30	37h (0 °C)		
FR_FR2	09-1936-7906	12 Oct-21 10:25	13 Oct-21 11:30	38h (0 °C)		
FR_MULTIPLATE	07-2028-3040	12 Oct-21 09:45	13 Oct-21 11:30	38h (0 °C)		
FR_FRRD	04-7874-3326	12 Oct-21 11:45	13 Oct-21 11:30	36h (0 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_UFR1	Water Sample	Teck Coal	FR_UFR1_WEK_2021-09-1	
GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-10-12_	
CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-10-12	
LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-10-19_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_WEK_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_WEK_2021-09	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-10-12_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-10-12	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-10-12	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2021_Q4_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2021_Q4_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-10-19	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-10-19_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-10-19_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	
RG_MIDAG	Water Sample	Teck Coal	RG_MIDAG_WS_2021-10-	
FR_FR4	Water Sample	Teck Coal	FR_FR4_WS_2021-10-12_	
FR_FR2	Water Sample	Teck Coal	FR_FR2_WS_2021-10-12_	
FR_MULTIPLATE	Water Sample	Teck Coal	FR_MULTIPLATE_WS_202	
FR_FRRD	Water Sample	Teck Coal	FR_FRRD_WS_2021-10-12	

Hyalella 28-d Survival and Growth Sediment Test — **Nautilus Environmental**

Analysis ID: 05-1269-4155 **Endpoint:** Mean Dry Weight-mg **CETIS Version:** CETISv1.9.4
Analyzed: 08 Dec-21 10:55 **Analysis:** Parametric-Control vs Treatments **Status Level:** 1

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	FR_UFR1 passed mean dry weight-mg	25.98%
		GH_ER2 passed mean dry weight-mg	25.98%
		LC_SLC passed mean dry weight-mg	25.98%
		FR_FRABCH passed mean dry weight-mg	25.98%
		FR_FRCP1 passed mean dry weight-mg	25.98%
		GH_FR1 passed mean dry weight-mg	25.98%
		GH_ERC passed mean dry weight-mg	25.98%
		CM_MC2 passed mean dry weight-mg	25.98%
		EV_MC2 passed mean dry weight-mg	25.98%
		EV_HC1 passed mean dry weight-mg	25.98%
		LC_DCDS failed mean dry weight-mg	25.98%
		LC_LC3 passed mean dry weight-mg	25.98%
		LC_LC5 passed mean dry weight-mg	25.98%
		LC_LCDSSLCC passed mean dry weight-mg	25.98%
		RG_MIDAG passed mean dry weight-mg	25.98%
		FR_FR4 failed mean dry weight-mg	25.98%
		FR_FR2 passed mean dry weight-mg	25.98%
		FR_MULTIPLATE passed mean dry weight-m	25.98%
		FR_FRRD failed mean dry weight-mg	25.98%

Dunnett Multiple Comparison Test

Sample I vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Reference Sed (CM-MC1)	FR_UFR1	1.295	2.684	0.144	8	CDF	0.5033	Non-Significant Effect
	GH_ER2	-0.06987	2.684	0.144	8	CDF	0.9585	Non-Significant Effect
	LC_SLC	1.267	2.684	0.144	8	CDF	0.5170	Non-Significant Effect
	FR_FRABCH	-1.137	2.684	0.144	8	CDF	0.9990	Non-Significant Effect
	FR_FRCP1	0.4649	2.684	0.144	8	CDF	0.8536	Non-Significant Effect
	GH_FR1	2.067	2.684	0.144	8	CDF	0.1765	Non-Significant Effect
	GH_ERC	2.632	2.684	0.144	8	CDF	0.0563	Non-Significant Effect
	CM_MC2	-0.3007	2.684	0.144	8	CDF	0.9787	Non-Significant Effect
	EV_MC2	2.569	2.684	0.144	8	CDF	0.0650	Non-Significant Effect
	EV_HC1	-0.1901	2.684	0.144	8	CDF	0.9705	Non-Significant Effect
	LC_DCDS*	3.057	2.684	0.144	8	CDF	0.0196	Significant Effect
	LC_LC3	0.6848	2.684	0.144	8	CDF	0.7803	Non-Significant Effect
	LC_LC5	0.1977	2.684	0.144	8	CDF	0.9181	Non-Significant Effect
	LC_LCDSSLCC	1.17	2.684	0.144	8	CDF	0.5649	Non-Significant Effect
	RG_MIDAG	0.9447	2.684	0.144	8	CDF	0.6720	Non-Significant Effect
	FR_FR4*	2.894	2.684	0.144	8	CDF	0.0299	Significant Effect
	FR_FR2	1.72	2.684	0.144	8	CDF	0.3040	Non-Significant Effect
	FR_MULTIPLATE	1.691	2.684	0.144	8	CDF	0.3165	Non-Significant Effect
	FR_FRRD*	3.866	2.684	0.144	8	CDF	0.0017	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.478714	0.0251955	19	3.492	4.5E-05	Significant Effect
Error	0.577243	0.0072155	80			
Total	1.05596		99			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance Test	29.46	36.19	0.0590	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9765	0.9654	0.0708	Normal Distribution

Hyalella 28-d Survival and Growth Sediment Test — **Nautilus Environmental**

Analysis ID: 05-1269-4155 **Endpoint:** Mean Dry Weight-mg **CETIS Version:** CETISv1.9.4
Analyzed: 08 Dec-21 10:55 **Analysis:** Parametric-Control vs Treatments **Status Level:** 1

Mean Dry Weight-mg Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
FR_UFR1		5	0.4854	0.4164	0.5544	0.478	0.432	0.5489	0.02485	11.45%	0.00%
GH_ER2		5	0.5587	0.4051	0.7123	0.5278	0.415	0.7	0.05531	22.14%	-15.11%
CM_MC1	RS	5	0.555	0.4794	0.6306	0.559	0.4578	0.619	0.02723	10.97%	-14.33%
LC_SLC		5	0.4869	0.3221	0.6517	0.446	0.3611	0.7122	0.05936	27.26%	-0.31%
FR_FRABCH		5	0.616	0.4737	0.7584	0.614	0.4737	0.737	0.05126	18.61%	-26.92%
FR_FRCP1		5	0.53	0.4376	0.6223	0.574	0.441	0.589	0.03327	14.04%	-9.19%
GH_FR1		5	0.4439	0.2637	0.6241	0.4778	0.2962	0.642	0.06491	32.69%	8.54%
GH_ERC		5	0.4136	0.3835	0.4436	0.4078	0.395	0.455	0.01082	5.85%	14.80%
CM_MC2		5	0.5711	0.4646	0.6777	0.5856	0.43	0.653	0.03838	15.03%	-17.66%
EV_MC2		5	0.4169	0.3408	0.4931	0.3922	0.3656	0.509	0.02743	14.71%	14.10%
EV_HC1		5	0.5652	0.4063	0.724	0.512	0.468	0.786	0.05721	22.64%	-16.44%
LC_DCDS		5	0.3907	0.2889	0.4925	0.4137	0.25	0.448	0.03668	20.99%	19.51%
LC_LC3		5	0.5182	0.4724	0.564	0.504	0.486	0.5689	0.01649	7.12%	-6.76%
LC_LC5		5	0.5443	0.4894	0.5993	0.5411	0.4856	0.601	0.0198	8.13%	-12.15%
LC_LCDSSLCC		5	0.4921	0.3934	0.5908	0.473	0.405	0.6	0.03554	16.15%	-1.38%
RG_MIDAG		5	0.5042	0.3897	0.6187	0.472	0.415	0.606	0.04123	18.28%	-3.88%
FR_FR4		5	0.3995	0.3109	0.488	0.3863	0.328	0.519	0.03189	17.85%	17.70%
FR_FR2		5	0.4625	0.3843	0.5408	0.4867	0.386	0.5411	0.02819	13.63%	4.71%
FR_MULTIPLATE		5	0.4641	0.4132	0.515	0.4388	0.4333	0.524	0.01834	8.84%	4.38%
FR_FRRD		5	0.3472	0.3045	0.39	0.349	0.301	0.3922	0.0154	9.92%	28.46%

Mean Dry Weight-mg Detail

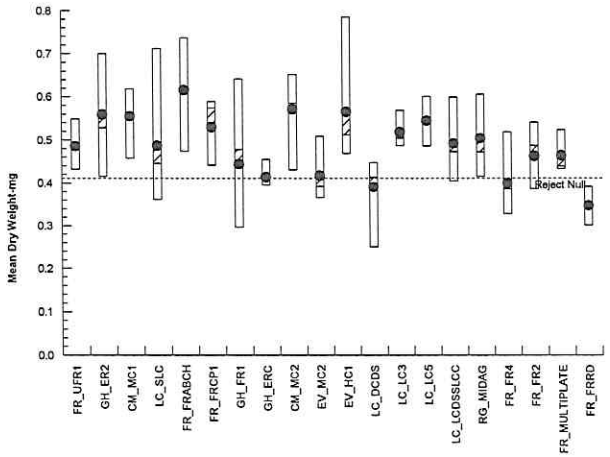
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
FR_UFR1		0.478	0.536	0.5489	0.432	0.432
GH_ER2		0.673	0.7	0.415	0.4778	0.5278
CM_MC1	RS	0.59	0.619	0.549	0.4578	0.559
LC_SLC		0.3611	0.446	0.473	0.7122	0.442
FR_FRABCH		0.614	0.737	0.721	0.5344	0.4737
FR_FRCP1		0.574	0.5889	0.589	0.457	0.441
GH_FR1		0.498	0.4778	0.642	0.3056	0.2962
GH_ERC		0.412	0.398	0.4078	0.455	0.395
CM_MC2		0.653	0.43	0.5856	0.565	0.622
EV_MC2		0.3656	0.369	0.3922	0.509	0.4489
EV_HC1		0.786	0.4987	0.512	0.468	0.5611
LC_DCDS		0.448	0.25	0.448	0.4137	0.3938
LC_LC3		0.5444	0.504	0.486	0.5689	0.4875
LC_LC5		0.523	0.601	0.571	0.4856	0.5411
LC_LCDSSLCC		0.6	0.405	0.473	0.5444	0.438
RG_MIDAG		0.472	0.606	0.429	0.599	0.415
FR_FR4		0.3863	0.373	0.519	0.3911	0.328
FR_FR2		0.4867	0.4878	0.4111	0.386	0.5411
FR_MULTIPLATE		0.524	0.49	0.4344	0.4388	0.4333
FR_FRRD		0.301	0.349	0.33	0.364	0.3922

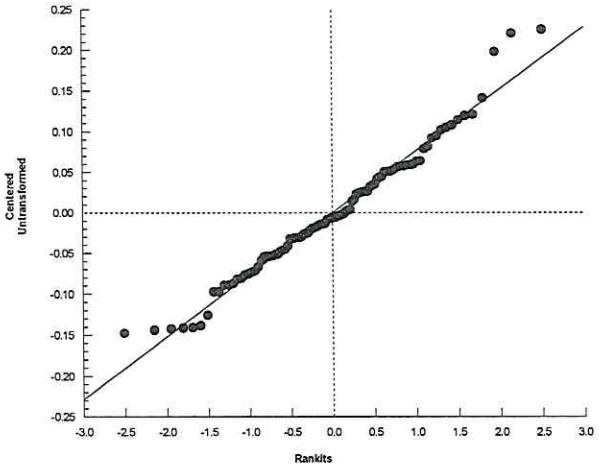
Hyalella 28-d Survival and Growth Sediment Test

Nautilus Environmental

Analysis ID:	05-1269-4155	**Endpoint:**	Mean Dry Weight-mg	**CETIS Version:**	CETISv1.9.4
Analyzed:	08 Dec-21 10:55	**Analysis:**	Parametric-Control vs Treatments	**Status Level:**	1

Graphics





Hyalella 28-d Survival and Growth Sediment Test — **Nautilus Environmental**

Analysis ID:	17-6550-4251	**Endpoint:**	Survival Rate	**CETIS Version:**	CETISv1.9.4
Analyzed:	08 Dec-21 10:57	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1
Batch ID:	11-3778-4609	**Test Type:**	Survival-Growth	**Analyst:**	Rachel Sakurdeep
Start Date:	14 Oct-21	**Protocol:**	EPA/600/R-99/064 (2000)	**Diluent:**	Reconstituted Water
Ending Date:	11 Nov-21	**Species:**	Hyalella azteca	**Brine:**	
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	Aquatic Biosystems, CO **Age:** 7-8d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
FR_UFR1	19-8746-8946	12 Oct-21 11:07	13 Oct-21 11:53	37h (0 °C)	Teck Coal	
GH_ER2	20-2628-4137	12 Oct-21 10:50	13 Oct-21 11:30	37h (0 °C)		
CM_MC1	18-3559-2852	12 Oct-21 13:20	13 Oct-21 11:30	35h (0.1 °C)		
LC_SLC	08-7937-3726	12 Oct-21 11:00	13 Oct-21 11:30	37h (2.9 °C)		
FR_FRABCH	18-7592-7020	12 Oct-21 11:20	13 Oct-21 11:53	37h (0 °C)		
FR_FRCP1	10-3969-8000	12 Oct-21 11:48	13 Oct-21 11:53	36h (1.3 °C)		
GH_FR1	11-8224-4576	12 Oct-21 10:00	13 Oct-21 11:30	38h (0 °C)		
GH_ERC	00-1276-7572	12 Oct-21 11:50	13 Oct-21 11:30	36h (0 °C)		
CM_MC2	03-9569-8600	12 Oct-21 12:47	13 Oct-21 11:30	35h (1.3 °C)		
EV_MC2	13-1923-7722	12 Oct-21 11:38	13 Oct-21 11:30	36h (0.2 °C)		
EV_HC1	18-6648-8827	12 Oct-21 10:33	13 Oct-21 11:30	37h (0 °C)		
LC_DCDS	17-4710-4100	12 Oct-21	13 Oct-21 11:30	48h (1.7 °C)		
LC_LC3	20-0894-5906	12 Oct-21 12:00	13 Oct-21 11:30	36h (8.8 °C)		
LC_LC5	14-5637-1032	12 Oct-21 13:30	13 Oct-21 11:30	34h (2.6 °C)		
LC_LCDSSLCC	06-4184-4349	12 Oct-21 12:30	13 Oct-21 11:30	35h (4.7 °C)		
RG_MIDAG	02-5873-2402	12 Oct-21 12:24	13 Oct-21 11:30	36h (3.9 °C)		
FR_FR4	16-7272-1140	12 Oct-21 11:05	13 Oct-21 11:30	37h (0 °C)		
FR_FR2	09-1936-7906	12 Oct-21 10:25	13 Oct-21 11:30	38h (0 °C)		
FR_MULTIPLATE	07-2028-3040	12 Oct-21 09:45	13 Oct-21 11:30	38h (0 °C)		
FR_FRRD	04-7874-3326	12 Oct-21 11:45	13 Oct-21 11:30	36h (0 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_UFR1	Water Sample	Teck Coal	FR_UFR1_WEK_2021-09-1	
GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-10-12_	
CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-10-12	
LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-10-19_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_WEK_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_WEK_2021-09	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-10-12_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-10-12	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-10-12	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2021_Q4_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2021_Q4_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-10-19	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-10-19_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-10-19_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	
RG_MIDAG	Water Sample	Teck Coal	RG_MIDAG_WS_2021-10-	
FR_FR4	Water Sample	Teck Coal	FR_FR4_WS_2021-10-12_	
FR_FR2	Water Sample	Teck Coal	FR_FR2_WS_2021-10-12_	
FR_MULTIPLATE	Water Sample	Teck Coal	FR_MULTIPLATE_WS_202	
FR_FRRD	Water Sample	Teck Coal	FR_FRRD_WS_2021-10-12	

Fisher Exact/Bonferroni-Holm Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
Reference Sed (LC-SLC)		FR_UFR1	0.8788	Exact	1.0000	Non-Significant Effect
		GH_ER2	0.6913	Exact	1.0000	Non-Significant Effect
		CM_MC1	0.2180	Exact	1.0000	Non-Significant Effect
		FR_FRABCH	0.6913	Exact	1.0000	Non-Significant Effect

Hyalella 28-d Survival and Growth Sediment Test — **Nautilus Environmental**

Analysis ID: 17-6550-4251 **Endpoint:** Survival Rate **CETIS Version:** CETISv1.9.4
Analyzed: 08 Dec-21 10:57 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Fisher Exact/Bonferroni-Holm Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
		FR_FRCP1	0.8788	Exact	1.0000	Non-Significant Effect
		GH_FR1	0.3389	Exact	1.0000	Non-Significant Effect
		GH_ERC	0.2180	Exact	1.0000	Non-Significant Effect
		CM_MC2	0.8788	Exact	1.0000	Non-Significant Effect
		EV_MC2	0.6913	Exact	1.0000	Non-Significant Effect
		EV_HC1	0.5000	Exact	1.0000	Non-Significant Effect
		LC_DCDS	0.0038	Exact	0.0720	Non-Significant Effect
		LC_LC3	0.5000	Exact	1.0000	Non-Significant Effect
		LC_LC5	0.6913	Exact	1.0000	Non-Significant Effect
		LC_LCDSSLCC	0.8788	Exact	1.0000	Non-Significant Effect
		RG_MIDAG	1.0000	Exact	1.0000	Non-Significant Effect
		FR_FR4	0.5000	Exact	1.0000	Non-Significant Effect
		FR_FR2	0.3389	Exact	1.0000	Non-Significant Effect
		FR_MULTIPLATE	0.0798	Exact	1.0000	Non-Significant Effect
		FR_FRRD	0.8788	Exact	1.0000	Non-Significant Effect

Data Summary

Sample	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
FR_UFR1		49	1	50	0.98	0.02	-8.89%
GH_ER2		48	2	50	0.96	0.04	-6.67%
CM_MC1		45	5	50	0.9	0.1	0.0%
LC_SLC	RS	48	2	50	0.96	0.04	-6.67%
FR_FRABCH		48	2	50	0.96	0.04	-6.67%
FR_FRCP1		49	1	50	0.98	0.02	-8.89%
GH_FR1		46	4	50	0.92	0.08	-2.22%
GH_ERC		45	5	50	0.9	0.1	0.0%
CM_MC2		49	1	50	0.98	0.02	-8.89%
EV_MC2		48	2	50	0.96	0.04	-6.67%
EV_HC1		47	3	50	0.94	0.06	-4.44%
LC_DCDS		38	12	50	0.76	0.24	15.56%
LC_LC3		47	3	50	0.94	0.06	-4.44%
LC_LC5		48	2	50	0.96	0.04	-6.67%
LC_LCDSSLCC		49	1	50	0.98	0.02	-8.89%
RG_MIDAG		50	0	50	1	0	-11.11%
FR_FR4		47	3	50	0.94	0.06	-4.44%
FR_FR2		46	4	50	0.92	0.08	-2.22%
FR_MULTIPLATE		43	7	50	0.86	0.14	4.44%
FR_FRRD		49	1	50	0.98	0.02	-8.89%

Hyalella 28-d Survival and Growth Sediment Test — **Nautilus Environmental**

Analysis ID: 17-6550-4251 **Endpoint:** Survival Rate **CETIS Version:** CETISv1.9.4
Analyzed: 08 Dec-21 10:57 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Survival Rate Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
FR_UFR1		1.0000	1.0000	0.9000	1.0000	1.0000
GH_ER2		1.0000	1.0000	1.0000	0.9000	0.9000
CM_MC1		0.6000	1.0000	1.0000	0.9000	1.0000
LC_SLC	RS	0.9000	1.0000	1.0000	0.9000	1.0000
FR_FRABCH		1.0000	1.0000	1.0000	0.9000	0.9000
FR_FRCP1		1.0000	0.9000	1.0000	1.0000	1.0000
GH_FR1		1.0000	0.9000	1.0000	0.9000	0.8000
GH_ERC		1.0000	1.0000	0.9000	0.8000	0.8000
CM_MC2		1.0000	1.0000	0.9000	1.0000	1.0000
EV_MC2		1.0000	1.0000	0.9000	1.0000	0.9000
EV_HC1		1.0000	0.8000	1.0000	1.0000	0.9000
LC_DCDS		1.0000	0.2000	1.0000	0.8000	0.8000
LC_LC3		1.0000	1.0000	1.0000	0.9000	0.8000
LC_LC5		1.0000	1.0000	1.0000	0.9000	0.9000
LC_LCDSSLCC		1.0000	1.0000	1.0000	0.9000	1.0000
RG_MIDAG		1.0000	1.0000	1.0000	1.0000	1.0000
FR_FR4		0.8000	1.0000	1.0000	0.9000	1.0000
FR_FR2		0.9000	0.9000	0.9000	1.0000	0.9000
FR_MULTIPLATE		1.0000	0.7000	0.9000	0.8000	0.9000
FR_FRRD		1.0000	1.0000	1.0000	1.0000	0.9000

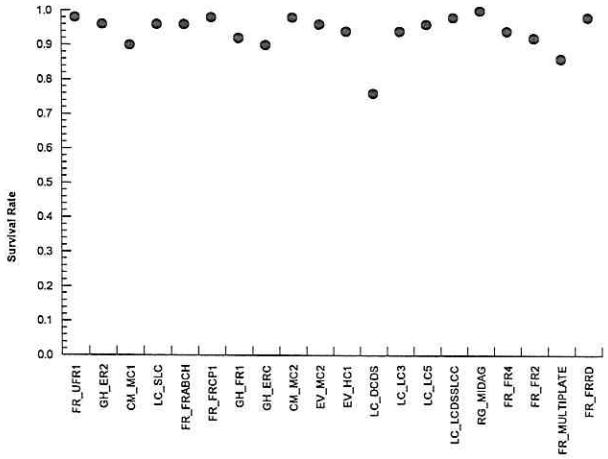
Survival Rate Binomials

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
FR_UFR1		10/10	10/10	9/10	10/10	10/10
GH_ER2		10/10	10/10	10/10	9/10	9/10
CM_MC1		6/10	10/10	10/10	9/10	10/10
LC_SLC	RS	9/10	10/10	10/10	9/10	10/10
FR_FRABCH		10/10	10/10	10/10	9/10	9/10
FR_FRCP1		10/10	9/10	10/10	10/10	10/10
GH_FR1		10/10	9/10	10/10	9/10	8/10
GH_ERC		10/10	10/10	9/10	8/10	8/10
CM_MC2		10/10	10/10	9/10	10/10	10/10
EV_MC2		10/10	10/10	9/10	10/10	9/10
EV_HC1		10/10	8/10	10/10	10/10	9/10
LC_DCDS		10/10	2/10	10/10	8/10	8/10
LC_LC3		10/10	10/10	10/10	9/10	8/10
LC_LC5		10/10	10/10	10/10	9/10	9/10
LC_LCDSSLCC		10/10	10/10	10/10	9/10	10/10
RG_MIDAG		10/10	10/10	10/10	10/10	10/10
FR_FR4		8/10	10/10	10/10	9/10	10/10
FR_FR2		9/10	9/10	9/10	10/10	9/10
FR_MULTIPLATE		10/10	7/10	9/10	8/10	9/10
FR_FRRD		10/10	10/10	10/10	10/10	9/10

Hyalella 28-d Survival and Growth Sediment Test **Nautilus Environmental**

Analysis ID:	17-6550-4251	**Endpoint:**	Survival Rate	**CETIS Version:**	CETISv1.9.4
Analyzed:	08 Dec-21 10:57	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1

Graphics



Analyst: RD QA: Dec 15/21

Hyalella 28-d Survival and Growth Sediment Test

Nautilus Environmental

Analysis ID:	16-9607-5419	**Endpoint:**	Mean Dry Weight-mg	**CETIS Version:**	CETISv1.9.4
Analyzed:	08 Dec-21 10:57	**Analysis:**	Parametric-Control vs Treatments	**Status Level:**	1
Batch ID:	11-3778-4609	**Test Type:**	Survival-Growth	**Analyst:**	Rachel Sakurdeep
Start Date:	14 Oct-21	**Protocol:**	EPA/600/R-99/064 (2000)	**Diluent:**	Reconstituted Water
Ending Date:	11 Nov-21	**Species:**	Hyalella azteca	**Brine:**	
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	Aquatic Biosystems, CO **Age:** 7-8d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
FR_UFR1	19-8746-8946	12 Oct-21 11:07	13 Oct-21 11:53	37h (0 °C)	Teck Coal	
GH_ER2	20-2628-4137	12 Oct-21 10:50	13 Oct-21 11:30	37h (0 °C)		
CM_MC1	18-3559-2852	12 Oct-21 13:20	13 Oct-21 11:30	35h (0.1 °C)		
LC_SLC	08-7937-3726	12 Oct-21 11:00	13 Oct-21 11:30	37h (2.9 °C)		
FR_FRABCH	18-7592-7020	12 Oct-21 11:20	13 Oct-21 11:53	37h (0 °C)		
FR_FRCP1	10-3969-8000	12 Oct-21 11:48	13 Oct-21 11:53	36h (1.3 °C)		
GH_FR1	11-8224-4576	12 Oct-21 10:00	13 Oct-21 11:30	38h (0 °C)		
GH_ERC	00-1276-7572	12 Oct-21 11:50	13 Oct-21 11:30	36h (0 °C)		
CM_MC2	03-9569-8600	12 Oct-21 12:47	13 Oct-21 11:30	35h (1.3 °C)		
EV_MC2	13-1923-7722	12 Oct-21 11:38	13 Oct-21 11:30	36h (0.2 °C)		
EV_HC1	18-6648-8827	12 Oct-21 10:33	13 Oct-21 11:30	37h (0 °C)		
LC_DCDS	17-4710-4100	12 Oct-21	13 Oct-21 11:30	48h (1.7 °C)		
LC_LC3	20-0894-5906	12 Oct-21 12:00	13 Oct-21 11:30	36h (8.8 °C)		
LC_LC5	14-5637-1032	12 Oct-21 13:30	13 Oct-21 11:30	34h (2.6 °C)		
LC_LCDSSLCC	06-4184-4349	12 Oct-21 12:30	13 Oct-21 11:30	35h (4.7 °C)		
RG_MIDAG	02-5873-2402	12 Oct-21 12:24	13 Oct-21 11:30	36h (3.9 °C)		
FR_FR4	16-7272-1140	12 Oct-21 11:05	13 Oct-21 11:30	37h (0 °C)		
FR_FR2	09-1936-7906	12 Oct-21 10:25	13 Oct-21 11:30	38h (0 °C)		
FR_MULTIPLATE	07-2028-3040	12 Oct-21 09:45	13 Oct-21 11:30	38h (0 °C)		
FR_FRRD	04-7874-3326	12 Oct-21 11:45	13 Oct-21 11:30	36h (0 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_UFR1	Water Sample	Teck Coal	FR_UFR1_WEK_2021-09-1	
GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-10-12_	
CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-10-12	
LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-10-19_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_WEK_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_WEK_2021-09	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-10-12_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-10-12	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-10-12	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2021_Q4_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2021_Q4_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-10-19	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-10-19_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-10-19_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	
RG_MIDAG	Water Sample	Teck Coal	RG_MIDAG_WS_2021-10-	
FR_FR4	Water Sample	Teck Coal	FR_FR4_WS_2021-10-12_	
FR_FR2	Water Sample	Teck Coal	FR_FR2_WS_2021-10-12_	
FR_MULTIPLATE	Water Sample	Teck Coal	FR_MULTIPLATE_WS_202	
FR_FRRD	Water Sample	Teck Coal	FR_FRRD_WS_2021-10-12	

Hyalella 28-d Survival and Growth Sediment Test — **Nautilus Environmental**

Analysis ID: 16-9607-5419 **Endpoint:** Mean Dry Weight-mg **CETIS Version:** CETISv1.9.4
Analyzed: 08 Dec-21 10:57 **Analysis:** Parametric-Control vs Treatments **Status Level:** 1

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	FR_UFR1 passed mean dry weight-mg	29.61%
		GH_ER2 passed mean dry weight-mg	29.61%
		CM_MC1 passed mean dry weight-mg	29.61%
		FR_FRABCH passed mean dry weight-mg	29.61%
		FR_FRCP1 passed mean dry weight-mg	29.61%
		GH_FR1 passed mean dry weight-mg	29.61%
		GH_ERC passed mean dry weight-mg	29.61%
		CM_MC2 passed mean dry weight-mg	29.61%
		EV_MC2 passed mean dry weight-mg	29.61%
		EV_HC1 passed mean dry weight-mg	29.61%
		LC_DCDS passed mean dry weight-mg	29.61%
		LC_LC3 passed mean dry weight-mg	29.61%
		LC_LC5 passed mean dry weight-mg	29.61%
		LC_LCDSSLCC passed mean dry weight-mg	29.61%
		RG_MIDAG passed mean dry weight-mg	29.61%
		FR_FR4 passed mean dry weight-mg	29.61%
		FR_FR2 passed mean dry weight-mg	29.61%
		FR_MULTIPLATE passed mean dry weight-m	29.61%
		FR_FRRD passed mean dry weight-mg	29.61%

Dunnett Multiple Comparison Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Reference Sed (LC-SLC)		FR_UFR1	0.02771	2.684	0.144	8	CDF	0.9462	Non-Significant Effect
		GH_ER2	-1.337	2.684	0.144	8	CDF	0.9996	Non-Significant Effect
		CM_MC1	-1.267	2.684	0.144	8	CDF	0.9994	Non-Significant Effect
		FR_FRABCH	-2.404	2.684	0.144	8	CDF	1.0000	Non-Significant Effect
		FR_FRCP1	-0.8025	2.684	0.144	8	CDF	0.9962	Non-Significant Effect
		GH_FR1	0.7994	2.684	0.144	8	CDF	0.7351	Non-Significant Effect
		GH_ERC	1.365	2.684	0.144	8	CDF	0.4691	Non-Significant Effect
		CM_MC2	-1.568	2.684	0.144	8	CDF	0.9999	Non-Significant Effect
		EV_MC2	1.302	2.684	0.144	8	CDF	0.5001	Non-Significant Effect
		EV_HC1	-1.458	2.684	0.144	8	CDF	0.9998	Non-Significant Effect
		LC_DCDS	1.79	2.684	0.144	8	CDF	0.2751	Non-Significant Effect
		LC_LC3	-0.5826	2.684	0.144	8	CDF	0.9915	Non-Significant Effect
		LC_LC5	-1.07	2.684	0.144	8	CDF	0.9987	Non-Significant Effect
		LC_LCDSSLCC	-0.09717	2.684	0.144	8	CDF	0.9615	Non-Significant Effect
		RG_MIDAG	-0.3227	2.684	0.144	8	CDF	0.9801	Non-Significant Effect
		FR_FR4	1.627	2.684	0.144	8	CDF	0.3448	Non-Significant Effect
		FR_FR2	0.4529	2.684	0.144	8	CDF	0.8571	Non-Significant Effect
		FR_MULTIPLATE	0.4237	2.684	0.144	8	CDF	0.8654	Non-Significant Effect
		FR_FRRD	2.599	2.684	0.144	8	CDF	0.0608	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.478714	0.0251955	19	3.492	4.5E-05	Significant Effect
Error	0.577243	0.0072155	80			
Total	1.05596		99			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance Test	29.46	36.19	0.0590	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9765	0.9654	0.0708	Normal Distribution

Hyalella 28-d Survival and Growth Sediment Test **Nautilus Environmental**

Analysis ID: 16-9607-5419 **Endpoint:** Mean Dry Weight-mg **CETIS Version:** CETISv1.9.4
Analyzed: 08 Dec-21 10:57 **Analysis:** Parametric-Control vs Treatments **Status Level:** 1

Mean Dry Weight-mg Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
FR_UFR1		5	0.4854	0.4164	0.5544	0.478	0.432	0.5489	0.02485	11.45%	0.00%
GH_ER2		5	0.5587	0.4051	0.7123	0.5278	0.415	0.7	0.05531	22.14%	-15.11%
CM_MC1		5	0.555	0.4794	0.6306	0.559	0.4578	0.619	0.02723	10.97%	-14.33%
LC_SLC	RS	5	0.4869	0.3221	0.6517	0.446	0.3611	0.7122	0.05936	27.26%	-0.31%
FR_FRABCH		5	0.616	0.4737	0.7584	0.614	0.4737	0.737	0.05126	18.61%	-26.92%
FR_FRCP1		5	0.53	0.4376	0.6223	0.574	0.441	0.589	0.03327	14.04%	-9.19%
GH_FR1		5	0.4439	0.2637	0.6241	0.4778	0.2962	0.642	0.06491	32.69%	8.54%
GH_ERC		5	0.4136	0.3835	0.4436	0.4078	0.395	0.455	0.01082	5.85%	14.80%
CM_MC2		5	0.5711	0.4646	0.6777	0.5856	0.43	0.653	0.03838	15.03%	-17.66%
EV_MC2		5	0.4169	0.3408	0.4931	0.3922	0.3656	0.509	0.02743	14.71%	14.10%
EV_HC1		5	0.5652	0.4063	0.724	0.512	0.468	0.786	0.05721	22.64%	-16.44%
LC_DCDS		5	0.3907	0.2889	0.4925	0.4137	0.25	0.448	0.03668	20.99%	19.51%
LC_LC3		5	0.5182	0.4724	0.564	0.504	0.486	0.5689	0.01649	7.12%	-6.76%
LC_LC5		5	0.5443	0.4894	0.5993	0.5411	0.4856	0.601	0.0198	8.13%	-12.15%
LC_LCDSSLCC		5	0.4921	0.3934	0.5908	0.473	0.405	0.6	0.03554	16.15%	-1.38%
RG_MIDAG		5	0.5042	0.3897	0.6187	0.472	0.415	0.606	0.04123	18.28%	-3.88%
FR_FR4		5	0.3995	0.3109	0.488	0.3863	0.328	0.519	0.03189	17.85%	17.70%
FR_FR2		5	0.4625	0.3843	0.5408	0.4867	0.386	0.5411	0.02819	13.63%	4.71%
FR_MULTIPLATE		5	0.4641	0.4132	0.515	0.4388	0.4333	0.524	0.01834	8.84%	4.38%
FR_FRRD		5	0.3472	0.3045	0.39	0.349	0.301	0.3922	0.0154	9.92%	28.46%

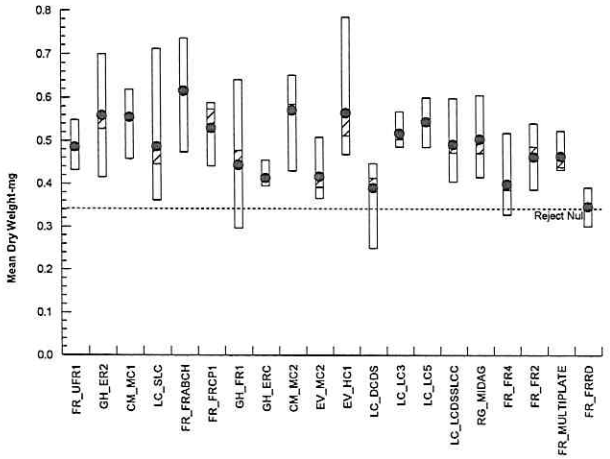
Mean Dry Weight-mg Detail

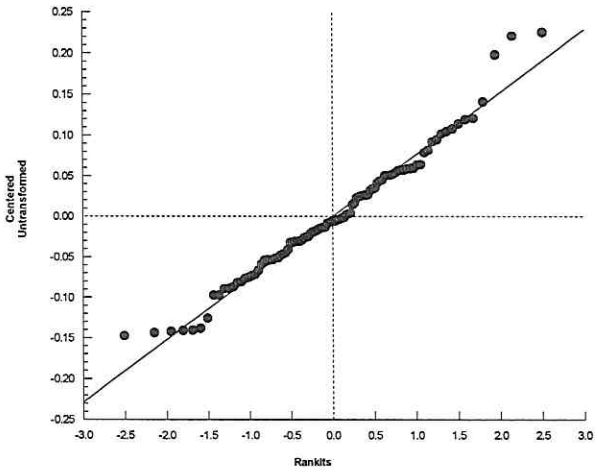
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
FR_UFR1		0.478	0.536	0.5489	0.432	0.432
GH_ER2		0.673	0.7	0.415	0.4778	0.5278
CM_MC1		0.59	0.619	0.549	0.4578	0.559
LC_SLC	RS	0.3611	0.446	0.473	0.7122	0.442
FR_FRABCH		0.614	0.737	0.721	0.5344	0.4737
FR_FRCP1		0.574	0.5889	0.589	0.457	0.441
GH_FR1		0.498	0.4778	0.642	0.3056	0.2962
GH_ERC		0.412	0.398	0.4078	0.455	0.395
CM_MC2		0.653	0.43	0.5856	0.565	0.622
EV_MC2		0.3656	0.369	0.3922	0.509	0.4489
EV_HC1		0.786	0.4987	0.512	0.468	0.5611
LC_DCDS		0.448	0.25	0.448	0.4137	0.3938
LC_LC3		0.5444	0.504	0.486	0.5689	0.4875
LC_LC5		0.523	0.601	0.571	0.4856	0.5411
LC_LCDSSLCC		0.6	0.405	0.473	0.5444	0.438
RG_MIDAG		0.472	0.606	0.429	0.599	0.415
FR_FR4		0.3863	0.373	0.519	0.3911	0.328
FR_FR2		0.4867	0.4878	0.4111	0.386	0.5411
FR_MULTIPLATE		0.524	0.49	0.4344	0.4388	0.4333
FR_FRRD		0.301	0.349	0.33	0.364	0.3922

Hyalella 28-d Survival and Growth Sediment Test **Nautilus Environmental**

Analysis ID:	16-9607-5419	**Endpoint:**	Mean Dry Weight-mg	**CETIS Version:**	CETISv1.9.4
Analyzed:	08 Dec-21 10:57	**Analysis:**	Parametric-Control vs Treatments	**Status Level:**	1

Graphics





APPENDIX D – *Oncorhynchus mykiss* Toxicity Test Data

Embryo-Alevin Test Summary Sheet

Client:	Teck	Test Date:	October 13 - November 12, 2021
Work Order No.:	212110	Test Species:	*Oncorhynchus mykiss*

Sample Information:

Sample ID:	Various - see table below
Sample Date:	October 12, 19, 26, November 2 and 9, 2021
Date Received:	October 13, 20, 27, November 3, 4 and 10, 2021
Sample Volume:	(2 - 5) x 20 L per refresh

Dilution Water:

Type:	Dechlorinated Tap Water
Hardness (mg/L CaCO3):	20 - 23
Alkalinity (mg/L CaCO3):	18 - 20

Test Organism Information:

Batch No:	101321		
Source:	Lyndon Trout Hatchery, New Dundee, ON	Number male broodstock used:	4
Loading Density:	1.02 g	Number female broodstock used:	4
Sperm motility check:	Verification of sperm motility using a compound microscope		

SDS Reference Toxicant Results:

Reference Toxicant ID:	RTE162
Stock Solution ID:	21S02
Date Initiated:	October 13, 2021
7-d EC50 (95% CL):	5.0 (4.8 - 5.3) mg/L SDS

Reference Toxicant Mean and Range:	5.0 (2.4 - 10.3) mg/L SDS
Reference Toxicant CV (%):	38

Test Results:

Sample ID	Survival (%) (Mean ± SD)	Normal (%) (Mean ± SD)	Length (mm) (Mean ± SD)	Wet weight (mg) (Mean ± SD)
Dechlor Control	83.5 ± 11.3	81.9 ± 11.6	18.7 ± 1.8	85.7 ± 9.1
Dechlor + 20 †	86.4 ± 7.4	79.6 ± 13.2	17.5 ± 1.0	80.8 ± 6.8
FR_UFR1 †	85.8 ± 10.6	83.2 ± 13.6	18.6 ± 0.8	85.3 ± 11.1
GH_ER2 †	89.2 ± 5.7	87.5 ± 3.2	19.5 ± 0.3	88.0 ± 9.3
CM_MC1 †	90.0 ± 6.1	88.4 ± 6.4	18.9 ± 0.5	85.8 ± 5.7
LC_SLC †	85.7 ± 5.1	79.0 ± 6.8	18.0 ± 0.4	82.0 ± 8.5
FR_FRABCH †	84.3 ± 1.7	80.2 ± 2.6	19.8 ± 0.9	93.5 ± 12.1
FR_FRCP1 †	69.3 ± 11.6 c1234	68.4 ± 9.9 23	19.6 ± 1.1	93.9 ± 11.1
GH_FR1 †	76.0 ± 12.5 3	73.6 ± 15.6 3	20.1 ± 0.8	102.0 ± 17.4
GH_ERC †	85.7 ± 9.3	81.4 ± 10.6	19.9 ± 0.9	98.0 ± 7.3
CM_MC2 †	82.4 ± 12.5	82.4 ± 12.5	20.1 ± 0.5	96.2 ± 12.2
EV_MC2 †	78.9 ± 11.2	74.6 ± 10.2	18.6 ± 0.7	86.7 ± 9.3
EV_HC1 †	83.2 ± 9.8	75.5 ± 14.0	19.2 ± 1.0	92.8 ± 10.8
LC_DCDS †	87.4 ± 3.2	84.0 ± 5.7	19.7 ± 1.0	91.9 ± 8.4
LC_LC3 †	94.1 ± 3.2	89.9 ± 3.8	19.8 ± 0.8	89.3 ± 7.7
LC_LC5 †	84.4 ± 8.7	77.8 ± 10.9	19.2 ± 1.3	85.9 ± 11.0
LC_LCDSSLCC †	84.1 ± 10.2	81.6 ± 11.3	20.3 ± 0.9	91.6 ± 10.3
FR_FR4 †	76.6 ± 12.0	74.1 ± 12.2	19.6 ± 0.6	92.5 ± 5.9
FR_FRRD †	83.8 ± 4.9	81.6 ± 6.1	19.1 ± 0.4	85.2 ± 9.8
FR_FR2 †	76.7 ± 9.4	75.0 ± 10.4	19.8 ± 1.1	90.5 ± 10.7
FR_MULTIPLATE †	82.3 ± 13.8	78.1 ± 12.4	19.4 ± 1.0	93.5 ± 12.4

† + 20 µg/L Cu

* Indicates results that were significantly lower relative to the laboratory control (dechlor)

[c] Indicates results that were significantly lower relative to the copper control (dechlor + 20 µg/L Cu)

[1] Indicates results that were significantly lower relative to reference site FR_UFR1

[2] Indicates results that were significantly lower relative to reference site GH_ER2

[3] Indicates results that were significantly lower relative to reference site CM_MC1

[4] Indicates results that were significantly lower relative to reference site LC_SLC

Reviewed by: _____ Date reviewed: Dec. 23, 2021

Embryo-Alevin Freshwater Toxicity Test
Initial and Final Water Quality Measurements

Client: Teck
Sample ID: (various) (copper control)
Work Order #: 212110

Start Date & Time: October 13, 2021 @ 15:30h
Stop Date & Time: November 12, 2021 @ ~~0730h~~ 0800h
Test Species: *Oncorhynchus mykiss*

Dechlor & 20 mg/L Cu Concentration	Days												
	0	1		2		3		4		5		6	
	init.	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.5	14.0	14.0	14.5	14.0	14.0	14.0	14.5	14.0	14.0	14.0	14.0	14.0
DO (mg/L)	9.9	10.0	10.0	9.9	10.81	9.8	9.9	10.0	9.7	10.1	10.0	9.9	10.0
pH	6.6	7.1	7.2	7.2	7.2	7.1	7.3	6.7	7.1	~~6.7~~ 7.0	7.3	6.8	7.0
Cond. (µS/cm)	56	57		57		58		57		~~56~~ 58		58	
Initials		UMC		UMC		IMC		RYK		UMC		UMC	

Concentration	Days												
	init.	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)													
DO (mg/L)													
pH													
Cond. (µS/cm)													
Initials													

Concentration	Days												
	init.	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)													
DO (mg/L)													
pH													
Cond. (µS/cm)													
Initials													

Concentration	Days												
	init.	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)													
DO (mg/L)													
pH													
Cond. (µS/cm)													
Initials													

Thermometer: CERT3 **DO meter/probe:** 6 / 6 **pH meter/probe:** 6 / 6 **Conductivity meter/probe:** 6 / 6

	Control			
Hardness*				
Alkalinity*				

* mg/L as CaCO3

Analysts: IMC, RYK, AWD, UMC
Reviewed by: [signature]
Date reviewed: Dec 21, 2021

Sample Description: (not applicable)

Comments: used stock soln 21CuO2 (100 mg/L Cu)

Embryo-Alevin Freshwater Toxicity Test
Initial and Final Water Quality Measurements

Client: Teck
Sample ID: (various)
Work Order #: 21210

Start Date & Time: October 13, 2021 @ 1550h
Stop Date & Time: November 12, 2021 @ 0800h
Test Species: *Oncorhynchus mykiss*

Dechlor Control Concentration	Days												
	0	1		2		3		4		5		6	
	init.	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.5	14.5	14.0	14.5	14.0	14.5	14.0	14.5	14.0	14.0	14.0	14.0	14.0
DO (mg/L)	9.9	10.0	10.1	9.9	10.0	9.8	10.0	10.1	9.7	10.1	10.0	9.9	9.9
pH	6.7	7.2	7.0	7.1	7.2	7.1	7.1	6.8	6.7	6.9	7.2	6.8	7.1
Cond. (µS/cm)	56	57		55		54		57		56		57	
Initials	A	UW		UW		IMC		PYK		UW		UW	

FR_UFR1 Concentration ~20 mg/L Cu	Days												
	0	1		2		3		4		5		6	
	init.	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.0	13.0	14.0	14.0	14.0	14.0	14.0	14.5	14.0	14.5	14.0	14.5	14.0
DO (mg/L)	10.1	10.2	10.0	10.0	10.0	9.8	9.9	10.1	9.7	9.9	10.1	9.8	9.9
pH	7.6	8.0	8.2	7.9	8.1	7.8	8.0	7.9	7.9	7.9	8.0	7.9	8.0
Cond. (µS/cm)	357	355		357		357		355		359		358	
Initials	A	UW		UW		IMC		PYK		UW		UW	

GH_ER2 Concentration ~20 mg/L Cu	Days												
	0	1		2		3		4		5		6	
	init.	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.5	13.0	14.0	14.0	14.0	14.0	14.0	14.5	14.0	14.5	14.0	14.5	14.0
DO (mg/L)	10.1	10.3	10.0	10.1	10.0	9.9	10.1	10.0	9.7	9.9	10.0	9.8	9.9
pH	7.7	8.0	8.2	7.9	8.1	7.8	8.1	7.9	7.9	7.9	8.1	7.9	8.0
Cond. (µS/cm)	305	308		303		305		305		306		307	
Initials	A	UW		UW		IMC		PYK		UW		UW	

CM_MCl Concentration ~20 mg/L Cu	Days												
	0	1		2		3		4		5		6	
	init.	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.0	13.0	14.0	14.0	14.0	14.0	14.0	14.5	14.0	14.5	14.0	14.5	14.0
DO (mg/L)	10.2	10.3	10.0	10.1	10.1	10.0	10.1	9.9	9.7	10.0	10.0	9.8	10.0
pH	7.6	7.8	8.1	7.8	8.1	7.8	8.0	7.9	8.0	8.0	8.0	7.9	8.1
Cond. (µS/cm)	303	302		302		304		301		302		302	
Initials	A	UW		UW		IMC		PYK		UW		UW	

Thermometer: ~~ER#3~~ **DO meter/probe:** 6 / 6 **pH meter/probe:** 6 / 6 **Conductivity meter/probe:** 6 / 6

	Control (Dechlor)	FR_UFR1	GH_ER2	CM_MCl
Hardness*	20	186	160	160
Alkalinity*	19	156	143	158

* mg/L as CaCO3

Analysts: IMC, PYK, AWD, UW

Reviewed by: [signature]

Date reviewed: Dec 31, 2021

Sample Description: FR_UFR1, GH_ER2, CM_MCl - clear, no colour, no odour, few particulates

Comments: used stock soln 21CU02 (100 mg/L Cu)

Embryo-Alevin Freshwater Toxicity Test
Initial and Final Water Quality Measurements

Client: Teck
Sample ID: (various)
Work Order #: 212110

Start Date & Time: October 13, 2021 @ 1550h
Stop Date & Time: November 12, 2021 @ 0800h
Test Species: *Oncorhynchus mykiss*

LC-SLC Concentration ± 20 mg/L Cu

	Days												
	0	1		2		3		4		5		6	
	init.	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.0	13.0	14.0	14.5	14.0	14.0	14.0	14.5	14.0	14.5	14.0	14.5	14.0
DO (mg/L)	10.2	10.3	10.1	10.1	10.0	9.9	10.2	9.9	9.6	9.8	10.0	9.9	9.8
pH	7.7	7.9	8.2	7.9	8.0	7.9	8.1	7.8	7.9	8.0	8.0	7.9	8.0
Cond. (µS/cm)	376	378		380		379		378		379		377	
Initials	~~A~~	MW		MW		IMC		PYK		MW		MW	

FR-FRABCH Concentration ± 20 mg/L Cu

	Days												
	0	1		2		3		4		5		6	
	init.	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.5	13.0	14.0	14.0	14.0	14.0	14.0	14.5	14.0	14.5	14.0	14.5	14.0
DO (mg/L)	10.2	10.2	10.0	10.1	10.0	9.9	10.1	9.9	9.5	9.8	10.0	9.8	9.9
pH	7.7	8.0	8.4	8.0	8.3	8.0	8.3	7.9	8.1	7.9	8.1	7.9	8.2
Cond. (µS/cm)	~~1182~~ 1182	1180		1178		1175		1162		1167		1170	
Initials	A	MW		MW		IMC		PYK		MW		MW	

FR-FRCP1 Concentration ± 20 mg/L Cu

	Days												
	0	1		2		3		4		5		6	
	init.	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.5	14.0	14.0	14.0	14.0	14.0	14.0	14.3	14.0	14.5	14.0	14.5	14.0
DO (mg/L)	10.2	10.3	10.0	10.1	10.1	10.0	10.1	9.9	9.8	9.9	10.1	9.8	9.9
pH	7.8	8.1	8.4	8.1	8.3	8.0	8.3	8.1	8.3	8.1	8.3	8.1	8.3
Cond. (µS/cm)	~~1238~~ 1238	1242		1238		1240		1238		1241		1242	
Initials	~~A~~ 1238 A	MW		MW		IMC		PYK		MW		MW	

GH-FR1 Concentration ± 20 mg/L Cu

	Days												
	0	1		2		3		4		5		6	
	init.	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.5	13.0	14.0	14.0	14.0	14.0	14.0	14.5	14.0	14.5	14.0	14.5	14.0
DO (mg/L)	10.2	10.2	10.0	10.2	10.1	10.0	10.2	10.0	9.7	9.9	10.1	9.8	9.9
pH	7.7	8.0	8.4	8.0	8.3	8.0	8.3	8.1	8.3	8.1	8.3	8.0	8.3
Cond. (µS/cm)	~~889~~ 889	895		890		892		888		892		890	
Initials	A	MW		MW		IMC		PYK		MW		MW	

Thermometer: ~~CER83~~ **DO meter/probe:** 6 / 6 **pH meter/probe:** 6 / 6 **Conductivity meter/probe:** 6 / 6

	~~Control~~ LC-SLC	FR-FRABCH	FR-FRCP1	GH-FR1
Hardness*	202	680	660	480
Alkalinity*	122	270	250	240

* mg/L as $CaCO_3$

Analysts: IMC, PYK, AND MW

Reviewed by: [signature]

Date reviewed: Dec-21-2021

Sample Description: LC-SLC, FR-FRABCH, FR-FRCP1 - clear, no colour, no odour, no particulates
GH-FR1 - clear, no colour, no odour, few particulates

Comments: used stock soln ZiCu02 (100 mg/L Cu)

Embryo-Alevin Freshwater Toxicity Test
Initial and Final Water Quality Measurements

Client: Teck
Sample ID: (various)
Work Order #: 212110

Start Date & Time: October 13, 2021 @ 1550h
Stop Date & Time: November 12, 2021 @ 0800h
Test Species: *Oncorhynchus mykiss*

GH-ERC + 20 mg/L Cu

	Days												
	0	1		2		3		4		5		6	
	init.	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.0	13.0	14.0	14.0	14.0	14.0	14.0	14.5	14.0	14.5	14.0	14.5	14.0
DO (mg/L)	10.3	10.3	10.0	10.1	10.0	9.9	10.1	9.9	9.6	9.9	10.1	9.8	10.0
pH	7.8	7.9	8.3	7.9	8.2	8.0	8.2	7.9	7.9	7.9	8.1	8.0	8.0
Cond. (µS/cm)	329	327		327		327		326		328		329	
Initials	A	YMC		YMC		IMC		PYK		YMC		YMC	

CM-MC2 + 20 mg/L Cu

	Days												
	0	1		2		3		4		5		6	
	init.	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.0	13.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.5	14.0	14.5	14.0
DO (mg/L)	10.2	10.3	10.1	10.2	10.1	10.0	10.1	9.9	9.8	9.8	10.1	9.9	10.0
pH	7.7	8.0	8.2	8.0	8.2	8.0	8.3	8.0	8.1	7.9	8.2	8.0	8.2
Cond. (µS/cm)	1237	1228		1231		1232		1216		1225		1224	
Initials	A	YMC		YMC		IMC		PYK		YMC		YMC	

EV-MC2 + 20 mg/L Cu

	Days												
	0	1		2		3		4		5		6	
	init.	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.5	13.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.5	14.0	14.5	14.0
DO (mg/L)	10.2	10.3	10.0	10.2	10.1	10.2	10.0	9.8	9.7	9.7	10.1	9.9	10.1
pH	7.7	7.9	8.1	8.0	8.0	8.0	8.1	8.0	8.1	8.0	8.2	8.0	8.2
Cond. (µS/cm)	629	614		618		619		614		613		617	
Initials	A	YMC		YMC		IMC		PYK		YMC		YMC	

EV-HCl + 20 mg/L Cu

	Days												
	0	1		2		3		4		5		6	
	init.	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.0	13.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.5	14.0	14.5	14.0
DO (mg/L)	10.3	10.2	10.0	10.2	10.1	10.2	10.1	9.8	9.7	9.8	10.1	9.9	10.1
pH	7.8	8.0	8.1	8.0	8.2	7.9	8.1	8.1	8.2	8.0	8.2	8.0	8.1
Cond. (µS/cm)	720	721		715		719		720		721		723	
Initials	A	YMC		YMC		IMC		PYK		YMC		YMC	

Thermometer: ~~CER#3~~ **DO meter/probe:** 6 / 6 **pH meter/probe:** 6 / 6 **Conductivity meter/probe:** 6 / 6

	~~Control~~ GH-ERC	CM-MC2	EV-MC2	EV-HCl
Hardness*	166	650	330	480
Alkalinity*	140	280	230	210

* mg/L as CaCO3

Analysts: IMC, PYK, AWD, YMC

Reviewed by: [signature]

Date reviewed: Dec-21-2021

Sample Description: GH-ERC, EV-HCl – clear, no colour, no odour, no particulates
CM-MC2, EV-MC2 – clear, no colour, no odour, few particulates

Comments: used stock soln 21Cu02 (100 mg/L Cu)

Embryo-Alevin Freshwater Toxicity Test
Initial and Final Water Quality Measurements

Client: Teck
Sample ID: (various)
Work Order #: 212110

Start Date & Time: October 13, 2021 @ 1550h
Stop Date & Time: November 12, 2021 @ 0800h
Test Species: *Oncorhynchus mykiss*

LC_DCDS Concentration +20 mg/L Cu	Days												
	0	1		2		3		4		5		6	
	init.	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.5	13.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.5	14.0	14.5	14.0
DO (mg/L)	10.3	10.3	10.1	10.1	10.0	9.9	10.1	9.8	9.7	9.8	9.9	9.8	9.9
pH	7.8	8.0	8.2	7.9	8.3	8.0	8.2	8.0	8.2	7.9	8.2	8.0	8.2
Cond. (µS/cm)	~~321~~ 1153	1153		1155		1157		~~1214~~ 1214		1159		1157	
Initials	~~AM~~	MW		MW		JMC		PYK		MW		MW	

LC_LC3 Concentration +20 mg/L Cu	Days												
	0	1		2		3		4		5		6	
	init.	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.0	~~13.0~~ 13.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.5	14.0	14.5	14.0
DO (mg/L)	10.3	10.3	10.0	10.1	10.1	10.0	10.0	9.8	9.7	9.9	9.9	9.7	10.0
pH	7.8	7.9	8.2	7.9	8.3	8.1	8.2	8.1	8.4	8.0	8.3	8.0	8.3
Cond. (µS/cm)	~~1154~~ 1154	1154		1153		1157		1149		1155		1152	
Initials	~~AM~~	MW		MW		JMC		PYK		MW		MW	

LC_LC5 Concentration +20 mg/L Cu	Days												
	0	1		2		3		4		5		6	
	init.	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	~~14.0~~ 14.0	13.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.5	14.0	14.5	14.0
DO (mg/L)	10.3	10.3	10.1	10.1	10.2	10.1	10.0	9.7	9.8	9.9	10.0	9.8	10.0
pH	8.0	8.2	8.2	8.2	8.3	8.1	8.3	8.1	8.2	8.1	8.2	8.1	8.3
Cond. (µS/cm)	819	822		822		825		822		830		828	
Initials	AM	MW		MW		JMC		PYK		MW		MW	

LC_LCDSSLCC Concentration +20 mg/L Cu	Days												
	0	1		2		3		4		5		6	
	init.	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	~~14.0~~ 14.0	13.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.5	14.0	14.5	14.0
DO (mg/L)	10.3	10.3	10.0	10.2	10.1	10.2	10.1	9.9	9.8	9.9	10.0	9.8	10.0
pH	8.0	8.1	8.2	8.1	8.3	8.0	8.3	8.1	8.3	8.0	8.2	8.0	8.3
Cond. (µS/cm)	919	915		916		919		915		915		918	
Initials	AM	MW		MW		JMC		PYK		MW		MW	

Thermometer: ~~CER3~~ **DO meter/probe:** 6 / 6 **pH meter/probe:** 6 / 6 **Conductivity meter/probe:** 6 / 6

	~~Control~~ LC_DCDS	LC_LC3	LC_LC5	LC_LCDSSLCC
Hardness*	580	600	450	550
Alkalinity*	150	250	220	230

* mg/L as CaCO3

Analysts: JMC, PYK, AWD, YMC

Reviewed by: [signature]

Date reviewed: Dec-21-2021

Sample Description: LC_DCDS – clear, no colour, no odour, black particulates.
LC_LC3, LC_LC5, LC_LCDSSLCC – clear, no colour, no odour, no particulates

Comments: used stock sol'n 21Cu02 (100 mg/L Cu)

Embryo-Alevin Freshwater Toxicity Test
Initial and Final Water Quality Measurements

Client: Teck
Sample ID: (various)
Work Order #: 212110

Start Date & Time: October 13, 2021 @ 1550h
Stop Date & Time: November 12, 2021 @ 0800h
Test Species: *Oncorhynchus mykiss*

FR-FR4 Concentration +20 mg/L Cu

	Days												
	0	1		2		3		4		5		6	
	init.	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.5	13.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.5	14.0	14.5	14.0
DO (mg/L)	10.3	10.3	10.0	10.1	10.1	9.9	10.0	10.0	9.7	9.7	9.9	9.9	10.0
pH	8.2	8.2	8.01	8.1	8.2	8.1	8.3	8.2	8.3	8.1	8.3	8.2	8.3
Cond. (µS/cm)	1236	1246		1245		1245		1245		1250		1245	
Initials		MM		MM		IMC		PYK		MM		MM	

FR-FRRD Concentration +20 mg/L Cu

	Days												
	0	1		2		3		4		5		6	
	init.	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.0	13.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.5	14.0	14.5	14.0
DO (mg/L)	10.3	10.3	10.0	10.2	10.1	10.2	10.0	9.8	9.6	9.8	10.0	9.9	10.0
pH	8.1	7.8	7.9	7.9	8.2	8.0	8.2	7.9	8.2	7.9	8.2	8.0	8.2
Cond. (µS/cm)	1257	1258		1251		1253		1244		1244		1250	
Initials		MM		MM		IMC		PYK		MM		MM	

FR-FR2 Concentration +20 mg/L Cu

	Days												
	0	1		2		3		4		5		6	
	init.	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.0	13.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.5	14.0	14.5	14.0
DO (mg/L)	10.3	10.3	10.1	10.2	10.0	10.2	10.1	9.7	9.6	9.8	10.0	9.9	10.0
pH	8.2	8.2	8.2	8.2	8.3	8.1	8.3	8.1	8.2	8.0	8.2	8.0	8.2
Cond. (µS/cm)	941	943		941		944		940		940		942	
Initials		MM		MM		IMC		PYK		MM		MM	

FR_MULTIPLATE Concentration +20 mg/L Cu

	Days												
	0	1		2		3		4		5		6	
	init.	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.0	13.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.5	14.0	14.5	14.0
DO (mg/L)	10.3	10.3	10.1	10.1	10.0	10.2	10.0	9.9	9.7	9.7	10.0	10.0	10.0
pH	8.0	8.0	8.1	8.0	8.2	8.1	8.1	8.1	8.2	8.0	8.3	8.1	8.3
Cond. (µS/cm)	925	933		934		936		933		931		930	
Initials		MM		MM		IMC		PYK		MM		MM	

Thermometer: CEREB **DO meter/probe:** 6 / 6 **pH meter/probe:** 6 / 6 **Conductivity meter/probe:** 6 / 6

	~~Control~~ FR_FR4	FR_FRRD	FR_FR2	FR_MULTIPLATE
Hardness*	680	640	560	500
Alkalinity*	270	320	200	230

* mg/L as $CaCO_3$

Analysts: IMC, PYK, AWD, MM

Reviewed by: [signature]

Date reviewed: Dec 21, 2021

Sample Description: FR-FR4, FR-FRRD - clear, no colour, no odour, no particulates
FR-FR2, FR_MULTIPLATE - clear, no colour, no odour, few particulates.

Comments: used stock soln 21C002 (100 mg/L Cu)

Embryo-Alevin Freshwater Toxicity Test
Initial and Final Water Quality Measurements

Client: Teck
Sample ID: (various) (copper control)
Work Order #: 212110

Start Date & Time: October 13, 2021 @ 1550h
Stop Date & Time: November 12, 2021 @ 0800h
Test Species: *Oncorhynchus mykiss*

Reichert 20 µg/L Cu Concentration	Days													
	7		8		9		10		11		12		13	
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.5	14.0	14.5	14.0	14.5	14.0	14.5	14.5	14.5	14.5	14.0	14.0	14.0	14.0
DO (mg/L)	9.9	10.0	10.1	10.2	9.9	10.0	10.0	10.1	9.9	9.7	9.9	10.0	10.0	10.1
pH	7.2	7.1	7.1	7.1	6.9	7.1	6.9	7.0	7.0	6.8	7.1	7.2	7.1	7.1
Cond. (µS/cm)	52		50		54		53		54		55		54	
Initials	YMM		YMM		YMM		IMC		HEC		YMM		YMM	

Concentration	Days													
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)														
DO (mg/L)														
pH														
Cond. (µS/cm)														
Initials														

Concentration	Days													
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)														
DO (mg/L)														
pH														
Cond. (µS/cm)														
Initials														

Concentration	Days													
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)														
DO (mg/L)														
pH														
Cond. (µS/cm)														
Initials														

Thermometer: CER#2 DO meter/probe: 6 / 6 pH meter/probe: 6 / 6 Conductivity meter/probe: 6 / 6

	Control			
Hardness*				
Alkalinity*				

* mg/L as CaCO3

Analysts: IMC, HEC, YMM

Reviewed by:

Date reviewed: Dec 21, 2021

Sample Description: (not applicable)

Comments: used stock soln 21CuO2 (100 mg/L Cu)

Embryo-Alevin Freshwater Toxicity Test
Initial and Final Water Quality Measurements

Client: Teck
Sample ID: (various)
Work Order #: 212110

Start Date & Time: October 13, 2021 @ 1550h
Stop Date & Time: November 12, 2021 @ 0800h
Test Species: *Oncorhynchus mykiss*

Dechlor Control Concentration	Days													
	7		8		9		10		11		12		13	
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.0	14.0	15.0	14.0	14.0	14.0	14.0	14.0	14.5	14.0	14.0	14.0	14.0	14.0
DO (mg/L)	10.0	10.0	10.0	10.1	10.0	10.1	10.0	9.8	10.1	9.8	10.0	9.9	10.0	10.0
pH	7.1	7.1	7.0	7.1	7.1	7.2	7.1	7.1	7.0	6.7	7.1	7.2	7.0	7.1
Cond. (µS/cm)	53		50		53		52		54		54		54	
Initials	MW		A		MW		IMC		HEC		MW		MW	

FR_UFR1 Concentration +20 mg/L Cu	Days													
	7		8		9		10		11		12		13	
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.5	14.0	13.0	14.0	14.0	14.0	14.0	14.0	15.0	14.0	14.0	14.0	14.0	14.0
DO (mg/L)	10.0	10.0	10.3	10.2	10.1	10.0	9.9	10.0	9.5	9.8	9.8	9.9	10.1	10.0
pH	7.9	8.1	8.2	8.1	8.0	7.8	7.9	8.0	7.9	7.8	7.9	8.1	7.9	7.9
Cond. (µS/cm)	353		354		367		363		366		366		367	
Initials	MW		A		MW		IMC		HEC		MW		MW	

GH_ER2 Concentration +20 mg/L Cu	Days													
	7		8		9		10		11		12		13	
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.5	14.0	13.0	14.0	14.0	14.0	14.0	14.0	15.0	14.0	14.0	14.0	14.0	14.0
DO (mg/L)	9.9	10.0	10.3	10.1	10.1	10.0	9.8	9.9	9.9	9.8	9.9	10.0	10.0	10.1
pH	8.0	8.1	8.3	8.1	7.9	7.9	7.8	8.1	8.0	7.7	7.8	8.1	7.9	8.0
Cond. (µS/cm)	305		304		316		311		315		315		314	
Initials	MW		A		MW		IMC		HEC		MW		MW	

CM_MC1 Concentration +20 mg/L Cu	Days													
	7		8		9		10		11		12		13	
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.5	14.0	13.9	14.0	14.0	14.0	14.0	14.0	15.0	14.0	14.0	14.0	14.0	14.0
DO (mg/L)	10.0	10.0	10.2	10.2	10.1	10.0	9.8	9.9	9.6	9.8	9.8	10.0	10.0	10.1
pH	7.9	8.1	8.3	8.2	7.8	7.9	7.9	8.1	7.9	8.0	7.7	8.1	7.8	8.0
Cond. (µS/cm)	301		305		308		304		308		308		307	
Initials	MW		A		MW		IMC		HEC		MW		MW	

Thermometer: CGR#3 **DO meter/probe:** 6 / 6 **pH meter/probe:** 6 / 6 **Conductivity meter/probe:** 6 / 6

	Dechlor Control	FR_UFR1	GH_ER2	CM_MC1
Hardness*	23	200	200	170
Alkalinity*	20	150	160	130

* mg/L as $CaCO_3$

Analysts: IMC, HEC, AWD, MW

Reviewed by: [signature]

Date reviewed: Dec 21, 2021

Sample Description: FR_UFR1, GH_ER2, CM_MC1 - clear, no colour, no odours, few particulates

Comments: used stock soln 21C002 (100 mg/L Cu)

Embryo-Alevin Freshwater Toxicity Test
Initial and Final Water Quality Measurements

Client: Teck
Sample ID: (various)
Work Order #: 21210

Start Date & Time: October 13, 2021 @ 1550h
Stop Date & Time: November 12, 2021 @ 0900h
Test Species: *Oncorhynchus mykiss*

LC-SLC Concentration +20 mg/L Cu	Days													
	7		8		9		10		11		12		13	
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.5	14.0	13.2	14.0	14.0	14.0	14.0	14.0	15.0	14.0	14.0	14.0	14.0	14.0
DO (mg/L)	10.0	10.0	10.3	10.2	10.1	10.0	10.0	10.1	9.8	9.8	9.9	10.0	9.9	9.9
pH	7.9	8.0	8.1	8.3	7.9	7.9	7.7	8.0	8.0	8.0	7.9	8.1	8.0	7.9
Cond. (µS/cm)	380		378		392		387		393		392		394	
Initials	MM		A		MM		IMC		HEC		MM		MM	

FR-FRABCH Concentration +20 mg/L Cu	Days													
	7		8		9		10		11		12		13	
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.5	14.0	13.2	14.0	14.0	14.0	14.0	14.0	15.0	14.0	14.0	14.0	14.0	14.0
DO (mg/L)	9.9	10.0	10.3	10.2	10.1	10.0	10.0	10.0	9.8	9.7	9.9	10.0	10.0	9.9
pH	7.9	8.1	8.1	8.3	7.8	8.0	7.8	8.1	8.0	8.0	7.8	8.2	7.9	8.0
Cond. (µS/cm)	1155		1179		1208		1201		1199		1203		1200	
Initials	MM		A		MM		IMC		HEC		MM		MM	

FR-FRCP1 Concentration +20 mg/L Cu	Days													
	7		8		9		10		11		12		13	
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.5	14.0	13.2	14.0	14.0	14.0	14.0	14.0	15.0	14.0	14.0	14.0	14.0	14.0
DO (mg/L)	9.9	10.1	10.1	10.2	10.1	10.1	9.9	10.0	9.8	9.6	10.0	10.1	10.1	10.0
pH	8.1	8.3	8.2	8.3	8.1	8.2	8.0	8.3	8.3	8.2	8.0	8.3	8.1	8.2
Cond. (µS/cm)	1243		1264		1301		1293		1303		1302		1300	
Initials	MM		A		MM		IMC		HEC		MM		MM	

GH-FR1 Concentration +20 mg/L Cu	Days													
	7		8		9		10		11		12		13	
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.0	14.0	13.0	14.0	14.0	14.0	14.0	14.0	15.0	14.0	14.0	14.0	14.0	14.0
DO (mg/L)	9.9	10.1	10.3	10.1	10.2	10.1	10.0	9.9	9.8	9.7	9.9	10.1	10.0	10.0
pH	8.0	8.3	8.2	8.2	8.1	8.1	8.1	8.1	8.1	8.1	7.9	8.0	8.0	8.1
Cond. (µS/cm)	891		898		926		918		~~8927~~		928		927	
Initials	MM		A		MM		IMC		HEC		MM		MM	

Thermometer: ~~CER3~~ LC-SLC DO meter/probe: 6 / 6 pH meter/probe: 6 / 6 Conductivity meter/probe: 6 / 6

	~~Control~~	FR-FRABCH	FR-FRCP1	GH-FR1
Hardness*	230	800	660	480
Alkalinity*	200	200	230	290

* mg/L as CaCO3

Analysts: IMC, HEC, AWD, MM

Reviewed by:

Date reviewed: Dec 31, 2021

Sample Description: LC-SLC - clear, no colour, no odour, no particulates
FR-FRABCH, FR-FRCP1, GH-FR1 - clear, no colour, no odour, some particulates

Comments: used stock soln 21Cu02 (100 mg/L Cu)

Embryo-Alevin Freshwater Toxicity Test
Initial and Final Water Quality Measurements

Client: Teck
Sample ID: (various)
Work Order #: 212110

Start Date & Time: October 13, 2021 @ 1550h
Stop Date & Time: November 12, 2021 @ 0800h
Test Species: *Oncorhynchus mykiss*

GH_ERC Concentration ± 20 mg/L Cu	Days													
	7		8		9		10		11		12		13	
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.0	14.0	13.9	14.0	14.0	14.0	14.0	14.0	14.5	14.0	14.0	14.0	14.0	14.0
DO (mg/L)	9.9	10.0	10.2	10.2	10.2	10.1	10.0	10.1	9.8	9.7	9.9	10.0	10.1	10.1
pH	8.0	8.2	A1	A3	7.9	8.0	7.9	8.1	7.9	7.9	7.8	8.2	7.9	8.0
Cond. (µS/cm)	328		328		339		331		340		339		340	
Initials	MW		A		MW		IMC		HEC		MW		MW	

CM_MC2 Concentration ± 20 mg/L Cu	Days													
	7		8		9		10		11		12		13	
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.0	14.0	13.9	14.0	14.0	14.0	14.0	14.0	15.0	14.0	14.0	14.0	14.0	14.0
DO (mg/L)	10.0	10.0	10.2	10.1	10.1	10.1	10.1	10.1	9.7	9.7	9.9	10.1	10.0	10.1
pH	7.9	8.1	8.0	8.2	8.0	8.1	8.0	8.0	7.9	8.1	7.8	8.0	7.9	8.0
Cond. (µS/cm)	1219		1132		1167		1149		1155		1156		1152	
Initials	MW		A		MW		IMC		HEC		MW		MW	

EV_MC2 Concentration ± 20 mg/L Cu	Days													
	7		8		9		10		11		12		13	
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.5	14.0	13.9	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0
DO (mg/L)	10.0	10.0	10.3	10.3	10.1	10.1	9.9	10.1	9.5	9.5	9.8	10.0	10.1	10.0
pH	8.1	8.1	A1	A3	7.9	8.1	7.9	8.1	8.1	8.2	7.8	8.2	7.9	8.1
Cond. (µS/cm)	613		617		640		638		644		640		642	
Initials	MW		A		MW		IMC		HEC		MW		MW	

EV_HCl Concentration ± 20 mg/L Cu	Days													
	7		8		9		10		11		12		13	
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.1	14.0	13.9	14.0	14.0	14.0	14.0	14.0	15.0	14.0	14.5	14.0	14.0	14.0
DO (mg/L)	10.0	10.1	10.1	10.3	10.1	10.0	10.0	10.0	9.6	9.8	9.9	9.9	10.0	10.0
pH	8.1	8.2	A2	A3	8.0	8.1	8.0	8.2	8.2	8.1	7.9	8.3	8.0	8.1
Cond. (µS/cm)	718		713		742		744		744		740		742	
Initials	MW		A		MW		IMC		HEC		MW		MW	

Thermometer: ~~CER#3~~ **DO meter/probe:** 6 / 6 **pH meter/probe:** 6 / 6 **Conductivity meter/probe:** 6 / 6

	~~Control~~ GH_ERC	CM_MC2	EV_MC2	EV_HCl
Hardness*	220	600	380	450
Alkalinity*	160	220	190	210

* mg/L as CaCO3

Analysts: IMC, HEC, AWD, MC

Reviewed by:

Date reviewed: Dec 21, 2021

Sample Description: GH_ERC, CM_MC2, EV_MC2 - clear, no colour, no odour, some particulates.
EV_HCl - clear, no colour, no odour, no particulates.

Comments: used stock soln 21CU02 (100 mg/L Cu)

Embryo-Alevin Freshwater Toxicity Test
Initial and Final Water Quality Measurements

Client: Teck
Sample ID: (various)
Work Order #: 212160

Start Date & Time: October 13, 2021 @ 1550h
Stop Date & Time: November 12, 2021 @ 0800h
Test Species: *Oncorhynchus mykiss*

LC-DCDS Concentration ±20 mg/L Cu	Days													
	7		8		9		10		11		12		13	
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.5	14.0	13.0	14.0	14.0	14.0	14.0	14.0	15.0	14.0	14.5	14.0	14.5	14.0
DO (mg/L)	10.0	10.1	10.2	10.1	10.1	10.1	9.9	10.0	9.6	9.8	10.0	10.0	10.0	10.0
pH	8.0	8.2	8.1	8.2	7.9	8.1	7.9	8.0	8.2	8.1	7.8	8.2	7.9	8.1
Cond. (µS/cm)	1150		1112		1148		1141		1148		1147		1148	
Initials	HM		A		HM		DMC		HEC		HM		HM	

LC-LC3 Concentration ±20 mg/L Cu	Days													
	7		8		9		10		11		12		13	
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.5	14.0	13.0	14.0	14.0	14.0	14.0	14.0	15.0	14.0	14.5	14.0	14.5	14.0
DO (mg/L)	9.9	10.1	10.3	10.2	10.0	10.1	10.1	10.2	9.7	9.8	10.0	10.0	10.0	10.1
pH	8.1	8.3	8.2	8.2	7.9	8.2	8.0	8.2	8.0	8.3	7.8	8.3	7.9	8.3
Cond. (µS/cm)	1215		1161		1196		1190		1198		1194		1195	
Initials	HM		A		HM		DMC		HEC		HM		HM	

LC-LC5 Concentration ±20 mg/L Cu	Days													
	7		8		9		10		11		12		13	
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.5	14.0	13.0	14.0	14.5	14.0	14.0	14.0	15.0	14.0	14.5	14.0	14.5	14.0
DO (mg/L)	9.9	10.1	10.3	10.2	10.0	10.1	10.0	10.2	9.6	9.8	9.9	9.9	9.9	10.1
pH	8.2	8.2	8.2	8.3	8.1	8.2	8.0	8.2	8.1	8.1	8.0	8.3	8.1	8.3
Cond. (µS/cm)	829		828		848		853		848		854		850	
Initials	HM		A		HM		DMC		HEC		HM		HM	

LC-LCDSSLCC Concentration ±20 mg/L Cu	Days													
	7		8		9		10		11		12		13	
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.5	14.0	13.0	14.0	14.5	14.0	14.0	14.0	15.0	14.0	14.5	14.0	14.5	14.0
DO (mg/L)	10.0	10.1	10.3	10.2	10.1	10.2	10.1	10.2	9.8	9.8	9.9	9.9	9.9	10.1
pH	8.2	8.3	8.2	8.3	8.0	8.1	8.0	8.0	8.2	8.2	8.1	8.1	8.1	8.3
Cond. (µS/cm)	917		928		957		950		962		956		957	
Initials	HM		A		HM		DMC		HEC		HM		HM	

Thermometer: ~~CER#3~~ **DO meter/probe:** 6 / 6 **pH meter/probe:** 6 / 6 **Conductivity meter/probe:** 6 / 6

	LC-DCDS ~~Control*~~	LC-LC3	LC-LC5	LC-LCDSSLCC
Hardness*	540	600	430	650
Alkalinity*	130	280	210	230

* mg/L as $CaCO_3$

Analysts: DMC, HEC, AWD, HM

Reviewed by: [illegible]

Date reviewed: Dec-21-2021

Sample Description: LC-DCDS, LC-LC5, LC-LCDSSLCC - clear, no colour, no odour, some particulates
LC-LC3 - clear, slightly yellow, no odour, few particulates

Comments: used stock soln 21CU02 (100 mg/L Cu)

Embryo-Alevin Freshwater Toxicity Test
Initial and Final Water Quality Measurements

Client: Teck
Sample ID: (various)
Work Order #: 212160

Start Date & Time: October 13, 2021 @ 1550h
Stop Date & Time: November 12, 2021 @ 0800h
Test Species: *Oncorhynchus mykiss*

FR_FR4 Concentration +20 mg/L Cu

	Day 7		Day 8		Day 9		Day 10		Day 11		Day 12		Day 13	
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.0	14.0	13.0	14.0	14.0	14.0	14.0	14.0	15.0	14.0	14.5	14.0	14.5	14.2
DO (mg/L)	10.0	10.1	10.1	10.1	10.0	9.9	9.7	9.9	9.7	9.8	9.9	9.9	9.9	10.0
pH	8.1	8.3	8.1	8.2	8.1	8.3	8.0	8.2	8.2	8.3	8.2	8.4	8.1	8.3
Cond. (µS/cm)	1245		1263		1305		1308		1308		1302		1305	
Initials	MM		A		MM		IMC		HEC		MM		MM	

FR_FRRD Concentration +20 mg/L Cu

	Day 7		Day 8		Day 9		Day 10		Day 11		Day 12		Day 13	
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.0	14.0	13.0	14.0	14.0	14.0	14.0	14.0	15.0	14.0	14.5	14.0	14.5	14.0
DO (mg/L)	10.0	10.1	10.1	10.1	10.0	10.0	9.9	10.1	9.7	9.8	9.9	10.0	9.9	10.0
pH	7.9	8.2	8.1	8.3	7.7	8.1	8.0	8.3	7.9	8.2	7.7	8.2	7.8	8.2
Cond. (µS/cm)	1276		1261		1297		1292		1268		1282		1287	
Initials	MM		A		MM		IMC		HEC		MM		MM	

FR_FR2 Concentration +20 mg/L Cu

	Day 7		Day 8		Day 9		Day 10		Day 11		Day 12		Day 13	
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.0	14.0	13.2	14.0	14.5	14.0	14.0	14.0	15.0	14.0	14.5	14.0	14.5	14.0
DO (mg/L)	10.1	10.1	10.1	10.2	10.1	10.0	9.8	9.9	9.8	9.9	9.8	10.0	10.0	10.0
pH	8.0	8.3	8.1	8.3	8.0	8.1	8.1	8.1	8.0	8.1	7.9	8.3	8.0	8.2
Cond. (µS/cm)	945		979		1005		1000		992		994		997	
Initials	MM		A		MM		IMC		HEC		MM		MM	

FR_MULTIPLATE Concentration +20 mg/L Cu

	Day 7		Day 8		Day 9		Day 10		Day 11		Day 12		Day 13	
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.5	14.0	13.0	14.0	14.5	14.0	14.0	14.0	15.0	14.0	14.5	14.0	14.5	14.0
DO (mg/L)	10.1	10.1	10.2	10.1	10.0	10.1	10.0	9.9	9.7	9.8	9.9	10.1	10.0	10.1
pH	8.1	8.2	8.1	8.2	8.0	8.2	8.0	8.1	8.1	8.2	7.9	8.3	8.0	8.2
Cond. (µS/cm)	938		978		966		969		969		965		968	
Initials	MM		A		MM		IMC		HEC		MM		MM	

Thermometer: ~~CERT~~ **DO meter/probe:** 6 / 6 **pH meter/probe:** 6 / 6 **Conductivity meter/probe:** 6 / 6

	~~Control~~ FR_FR4	FR_FRRD	FR_FR2	FR_MULTIPLATE
Hardness*	730	900	670	460
Alkalinity*	300	330	300	210

* mg/L as CaCO3

Analysts: IMC, HEC, AWD, MM

Reviewed by: [signature]

Date reviewed: Dec 21, 2021

Sample Description: FR_FR4, FR_FRRD, FR_FR2, FR_MULTIPLATE - clear, no colour, no odour, no particulates

Comments: used stock soln 21Cu02 (100 mg/L Cu)

Embryo-Alevin Freshwater Toxicity Test
Initial and Final Water Quality Measurements

Client: Teck
Sample ID: (various) (copper control)
Work Order #: 212110
Start Date & Time: October 13, 2021 @ 1550h
Stop Date & Time: November 12, 2021 @ 0800h
Test Species: *Oncorhynchus mykiss*

Dechlor +20 mg/L Cu Concentration	Days													
	14		15		16		17		18		19		20	
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.5	14.0	14.0	13.5	14.0	14.0	14.0	14.0	15.0	14.5	14.0	14.0	14.5	14.0
DO (mg/L)	9.8	10.0	9.9	10.0	9.9	9.9	9.9	10.0	9.8	9.9	9.9	10.0	9.9	10.0
pH	7.1	7.2	7.0	7.1	7.1	7.2	7.0	7.1	7.0	7.0	7.1	7.1	7.2	7.3
Cond. (µS/cm)	55		54		54		54		55		55		55	
Initials	HMC		YM		HMC		JMC		HEC		HMC		HMC	

Concentration	Days													
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)														
DO (mg/L)														
pH														
Cond. (µS/cm)														
Initials														

Concentration	Days													
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)														
DO (mg/L)														
pH														
Cond. (µS/cm)														
Initials														

Concentration	Days													
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)														
DO (mg/L)														
pH														
Cond. (µS/cm)														
Initials														

Thermometer: CER#3 **DO meter/probe:** 6 / 6 **pH meter/probe:** 6 / 6 **Conductivity meter/probe:** 6 / 6

	Control			
Hardness*				
Alkalinity*				

* mg/L as CaCO3

Analysts: JMC, HEC, YM
Reviewed by:
Date reviewed: Dec 21, 2021

Sample Description: (not applicable)

Comments: used stock sol'n 210.02 (100 mg/L Cu)

Embryo-Alevin Freshwater Toxicity Test
Initial and Final Water Quality Measurements

Client: Teck
Sample ID: (various)
Work Order #: 212110

Start Date & Time: October 13, 2021 @ 1550h
Stop Date & Time: November 12, 2021 @ 0800h
Test Species: *Oncorhynchus mykiss*

Dechlor Control Concentration	Days													
	14		15		16		17		18		19		20	
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.0	14.0	14.0	13.5	14.0	14.0	14.0	14.0	15.0	14.0	14.0	14.0	14.0	14.0
DO (mg/L)	9.9	10.1	10.1	10.0	10.1	10.1	9.9	10.0	10.1	9.8	10.0	10.1	9.9	10.0
pH	7.1	7.2	7.0	7.1	7.1	7.2	7.1	7.3	7.2	6.9	7.1	7.2	7.2	7.1
Cond. (µS/cm)	54		53		52		53		53		54		54	
Initials	YM		YM		YM		IMC		HEC		YM		YM	

FR_UFR1 Concentration + 20 mg/L Cu	Days													
	14		15		16		17		18		19		20	
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.0	14.0	13.0	13.5	14.0	14.0	14.0	14.0	14.5	14.0	14.0	14.0	14.0	14.0
DO (mg/L)	10.0	10.2	10.3	10.0	10.0	10.0	10.1	10.1	9.7	9.8	9.8	10.0	9.9	10.0
pH	7.9	8.0	7.8	8.0	7.9	8.0	7.9	8.0	8.1	8.0	8.1	8.1	8.0	8.1
Cond. (µS/cm)	368		362		363		365		363		365		362	
Initials	YM		YM		YM		IMC		HEC		YM		YM	

GH_ER2 Concentration + 20 mg/L Cu	Days													
	14		15		16		17		18		19		20	
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.0	14.0	13.0	13.5	14.0	14.0	14.0	14.0	14.5	14.0	14.0	14.0	14.0	14.0
DO (mg/L)	10.0	10.2	10.2	10.0	10.0	10.0	10.1	10.0	9.7	9.8	9.8	10.0	9.9	10.1
pH	7.9	8.0	7.6	8.0	7.7	8.0	7.9	8.1	8.1	8.1	8.1	8.1	8.0	8.1
Cond. (µS/cm)	318		315		317		318		317		316		318	
Initials	YM		YM		YM		IMC		HEC		YM		YM	

CM_MC1 Concentration + 20 mg/L Cu	Days													
	14		15		16		17		18		19		20	
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.0	14.0	13.0	13.5	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0
DO (mg/L)	10.0	10.1	10.3	10.0	10.1	10.0	9.9	9.9	9.8	9.9	9.9	10.1	9.8	10.1
pH	7.9	8.0	7.7	8.0	7.8	8.0	7.8	8.0	7.9	8.0	7.9	8.0	7.9	8.0
Cond. (µS/cm)	308		292		295		294		296		294		293	
Initials	YM		YM		YM		IMC		HEC		YM		YM	

Thermometer: CER#3 **DO meter/probe:** 6 / 6 **pH meter/probe:** 6 / 6 **Conductivity meter/probe:** 6 / 6

	Dechlor Control	FR_UFR1	GH_ER2	CM_MC1
Hardness*	21	196	178	150
Alkalinity*	20	156	158	158

* mg/L as CaCO3

Analysts: IMC, HEC, YM

Reviewed by: [signature]

Date reviewed: Dec-21-2021

Sample Description: FR_UFR1, CM_MC1 - clear, no colour, no odour, few particulates
GH_ER2 - clear, faint yellow, no odour, few particulates

Comments: used stock soln 2 CuO2 (100 mg/L Cu)

Embryo-Alevin Freshwater Toxicity Test
Initial and Final Water Quality Measurements

Client: Teck
Sample ID: (various)
Work Order #: 212110

Start Date & Time: October 13, 2021 @1550h
Stop Date & Time: November 12, 2021 @ 0800h
Test Species: *Oncorhynchus mykiss*

LC_SLC Concentration + 20 mg/L Cu	Days													
	14		15		16		17		18		19		20	
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.0	14.0	13.0	13.5	14.0	14.0	14.0	14.0	14.0	14.0	14.0	13.5	14.0	14.0
DO (mg/L)	10.0	10.2	10.2	10.0	10.1	10.0	10.0	10.0	9.8	9.8	9.8	10.0	9.9	10.0
pH	7.9	8.0	7.7	8.1	7.8	8.0	7.7	8.0	8.0	7.8	8.0	8.1	7.9	8.1
Cond. (µS/cm)	392		392		391		391		393		393		391	
Initials	YM		YM		YM		IMC		HEC		YM		YM	

FR_FRABCH Concentration + 20 mg/L Cu	Days													
	14		15		16		17		18		19		20	
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.0	14.0	13.0	13.5	14.0	14.0	14.0	14.0	14.5	14.0	14.5	13.5	14.0	14.0
DO (mg/L)	10.0	10.2	10.1	10.0	10.1	10.1	9.9	10.0	9.7	10.0	9.8	10.1	9.9	10.1
pH	7.9	8.0	7.6	8.0	7.8	8.0	7.7	8.0	7.9	8.0	7.8	8.1	7.8	8.0
Cond. (µS/cm)	1206		1225		1220		1224		1195		1203		1207	
Initials	YM		YM		YM		IMC		HEC		YM		YM	

FR_FRCP1 Concentration + 20 mg/L Cu	Days													
	14		15		16		17		18		19		20	
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.0	14.0	13.0	13.5	14.0	14.0	14.0	14.0	14.5	13.5	14.5	13.5	14.0	13.5
DO (mg/L)	10.0	10.2	10.2	10.1	10.0	10.1	10.0	9.9	9.7	10.1	9.8	10.1	10.0	10.1
pH	8.2	8.3	7.9	8.2	8.0	8.3	8.0	8.2	8.3	8.3	8.3	8.3	8.2	8.3
Cond. (µS/cm)	1302		1295		1297		1298		1285		1298		1296	
Initials	YM		YM		YM		IMC		HEC		YM		YM	

GM_FR1 Concentration + 20 mg/L Cu	Days													
	14		15		16		17		18		19		20	
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.0	14.0	13.0	13.5	14.0	14.0	14.0	14.0	14.0	13.5	14.5	13.5	14.0	13.5
DO (mg/L)	9.9	10.2	10.2	10.1	10.0	10.1	10.1	10.0	9.8	10.0	9.8	10.1	9.9	10.1
pH	8.0	8.1	7.8	8.2	7.9	8.2	8.0	8.2	8.2	8.3	8.2	8.2	8.2	8.3
Cond. (µS/cm)	924		941		938		938		934		936		938	
Initials	YM		YM		YM		IMC		HEC		YM		YM	

Thermometer: CER23 **DO meter/probe:** 6 / 6 **pH meter/probe:** 6 / 6 **Conductivity meter/probe:** 6 / 6

	LC_SLC ~~Control~~	FR_FRABCH	FR_FRCP1	GM_FR1
Hardness*	214	650	800	540
Alkalinity*	154	300	290	230

* mg/L as CaCO3

Analysts: IMC, HEC, YM

Reviewed by: [signature]

Date reviewed: Dec 21, 2021

Sample Description: LC_SLC, FR_FRCP1, ~~GM_FR~~ - clear, no colour, no odour, no particulates
FR_FRABCH, GM_FR1 - clear, no colour, no odour, few particulates

Comments: used stock soln 21Cu02 (100 mg/L Cu)

Embryo-Alevin Freshwater Toxicity Test
Initial and Final Water Quality Measurements

Client: Teck
Sample ID: (various)
Work Order #: 212110

Start Date & Time: October 13, 2021 @ 1550h
Stop Date & Time: November 12, 2021 @ 0800h
Test Species: *Oncorhynchus mykiss*

GM-ERC Concentration + 20 mg/L CW

	Days													
	14		15		16		17		18		19		20	
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.0	14.0	14.0	13.5	14.0	14.0	14.0	14.0	14.0	14.0	14.5	13.5	14.0	14.0
DO (mg/L)	10.0	10.1	10.2	10.0	10.0	10.1	10.0	10.0	9.6	9.9	9.7	10.2	10.0	10.0
pH	7.9	8.0	7.6	8.1	7.9	8.1	7.9	8.1	7.9	8.2	8.0	8.2	7.9	8.2
Cond. (µS/cm)	339		339		341		340		346		336		340	
Initials	YML		YML		YML		IMC		HEC		YML		YML	

CM-MC2 Concentration + 20 mg/L CW

	Days													
	14		15		16		17		18		19		20	
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.0	14.0	13.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.5	13.5	14.0	14.0
DO (mg/L)	10.0	10.2	10.1	10.0	10.0	10.0	9.8	9.9	9.8	10.0	9.7	10.1	9.9	10.1
pH	7.9	8.0	7.8	8.0	7.9	8.2	7.9	8.1	8.0	8.2	8.0	8.2	7.9	8.2
Cond. (µS/cm)	1160		984		979		986		977		977		979	
Initials	YML		YML		YML		IMC		HEC		YML		YML	

EV_MC2 Concentration + 20 mg/L CW

	Days													
	14		15		16		17		18		19		20	
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.5	14.0	13.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.5	14.0	14.0	14.0
DO (mg/L)	9.9	10.1	10.2	10.1	10.1	10.0	9.9	10.0	9.7	10.0	9.8	10.0	9.9	10.1
pH	7.9	8.1	7.7	8.0	7.9	8.2	8.0	8.2	8.0	8.2	8.0	8.2	7.9	8.2
Cond. (µS/cm)	641		567		564		565		569		567		566	
Initials	YML		YML		YML		IMC		HEC		YML		YML	

EV-HCl Concentration + 20 mg/L CW

	Days													
	14		15		16		17		18		19		20	
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.5	14.0	13.0	14.0	14.0	14.2	14.0	14.0	14.0	14.0	14.5	14.0	14.0	14.0
DO (mg/L)	9.9	10.1	10.2	10.0	10.1	10.0	10.0	10.0	9.9	10.0	9.9	10.1	9.9	10.1
pH	8.0	8.1	7.8	8.0	7.9	8.2	8.0	8.1	8.2	8.2	8.0	8.3	8.0	8.2
Cond. (µS/cm)	739		750		748		751		753		750		752	
Initials	YML		YML		YML		IMC		HEC		YML		YML	

Thermometer: CER#3 **DO meter/probe:** 6 / 6 **pH meter/probe:** 6 / 6 **Conductivity meter/probe:** 6 / 6

	GM-ERC ~~Control~~	CM-MC2	EV-MC2	EV-HCl
Hardness*	182	570	310	450
Alkalinity*	164	240	180	250

* mg/L as $CaCO_3$

Analysts: IMC, HEC, YML
Reviewed by: [signature]
Date reviewed: Dec 21, 2021

Sample Description: GM-ERC - clear, no colour, no odour, no particulates
CM-MC2, EV-MC2 - clear, no colour, no odour, few particulates
EV-HCl - faint yellow, clear, no odour, few particulates

Comments: ① confirmed w/ 2nd C-meter; used stock soln ZiCuO2 (100 mg/L Cu)

Embryo-Alevin Freshwater Toxicity Test
Initial and Final Water Quality Measurements

Client: Teck
Sample ID: (various)
Work Order #: 212110

Start Date & Time: October 13, 2021 @ 1550h
Stop Date & Time: November 12, 2021 @ 0800h
Test Species: *Oncorhynchus mykiss*

LC-DCDS Concentration +20 mg/L Cu	Days													
	14		15		16		17		18		19		20	
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.5	14.0	13.0	14.0	14.0	14.0	14.0	14.0	14.5	13.5	14.5	14.0	14.5	14.0
DO (mg/L)	10.1	10.2	10.2	10.1	10.0	9.9	10.0	10.0	9.7	9.8	9.8	9.9	9.9	10.1
pH	7.8	8.0	7.8	7.9	7.9	8.0	7.9	8.1	8.1	8.1	8.0	8.2	7.9	8.1
Cond. (µS/cm)	1149		1163		1162		1164		1163		1168		1165	
Initials	HM		YM		YM		JMC		HEC		YM		YM	

LC-LC3 Concentration +20 mg/L Cu	Days													
	14		15		16		17		18		19		20	
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.5	14.0	13.0	14.0	14.0	14.0	14.0	14.0	14.0	13.5	14.5	13.5	14.5	14.0
DO (mg/L)	10.0	10.2	10.1	10.1	10.0	10.0	9.8	9.9	9.8	9.9	9.8	10.0	10.0	10.1
pH	8.0	8.3	7.4	8.2	7.7	8.3	7.9	8.0	8.1	8.3	7.9	8.3	7.9	8.2
Cond. (µS/cm)	1199		1221		1222		1221		1216		1218		1220	
Initials	HM		YM		YM		JMC		HEC		YM		YM	

LC-LC5 Concentration +20 mg/L Cu	Days													
	14		15		16		17		18		19		20	
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.5	14.0	13.0	14.0	14.0	14.0	14.0	14.0	14.0	13.5	14.5	14.0	14.5	14.0
DO (mg/L)	10.0	10.2	10.2	10.1	10.1	10.0	9.9	10.0	9.9	10.0	9.9	10.0	10.0	10.1
pH	8.0	8.3	7.9	8.1	7.9	8.1	8.0	8.2	8.1	8.2	8.0	8.3	8.0	8.2
Cond. (µS/cm)	852		851		851		854		880		874		871	
Initials	HM		YM		YM		JMC		HEC		YM		YM	

LC-LCDSSLCC Concentration +20 mg/L Cu	Days													
	14		15		16		17		18		19		20	
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.5	14.0	13.0	14.0	14.0	14.0	14.0	14.0	14.0	13.5	14.5	14.0	14.5	14.0
DO (mg/L)	10.1	10.2	10.2	10.0	10.0	10.0	10.0	9.9	9.9	9.8	9.9	10.0	10.0	10.1
pH	8.1	8.2	7.8	8.2	7.9	8.2	8.0	8.2	8.2	8.2	8.1	8.2	8.1	8.2
Cond. (µS/cm)	952		969		970		973		968		967		970	
Initials	HM		YM		YM		JMC		HEC		YM		YM	

Thermometer: ~~CCRT3~~ **DO meter/probe:** 6 / 6 **pH meter/probe:** 6 / 6 **Conductivity meter/probe:** 6 / 6

	LC DCDS ~~Control~~	LC-LC3	LC-LC5	LC-LCDSSLCC
Hardness*	650	710	480	560
Alkalinity*	170	250	210	240

* mg/L as CaCO3

Analysts: JMC, HEC, YM

Reviewed by: [signature]

Date reviewed: Dec 21, 2021

Sample Description: LC-DCDS - faint yellow, clear, no odour, few particulates.
LC-LC3, LC-LCDSSLCC - clear, no colour, no odour, no particulates.
LC-LC5 - clear, no colour, no odour, few particulates.

Comments: used stock soln $ZiCuO_2$ (100 mg/L Cu)

Embryo-Alevin Freshwater Toxicity Test
Initial and Final Water Quality Measurements

Client: TRCK
Sample ID: (New 208)
Work Order #: 212110

Start Date & Time: October 13, 2021 @ 1550h
Stop Date & Time: November 12, 2021 @ 0800h
Test Species: *Oncorhynchus mykiss*

FR_FR4 Concentration +20 mg/L Cu	Days													
	14		15		16		17		18		19		20	
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.5	14.0	13.0	14.0	14.0	14.0	14.0	14.0	14.0	13.5	14.5	14.0	14.5	14.0
DO (mg/L)	10.1	10.2	10.2	10.1	10.1	10.1	10.0	10.1	9.8	9.9	9.8	10.0	9.9	10.0
pH	8.1	8.3	7.9	8.2	8.0	8.3	8.0	8.2	8.3	8.3	8.1	8.3	8.0	8.2
Cond. (µS/cm)	1307		1293		1291		1294		1298		1292		1295	
Initials	MM		MM		MM		IMC		HEC		MM		MM	

FR_FRRD Concentration +20 mg/L Cu	Days													
	14		15		16		17		18		19		20	
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.5	14.0	13.0	14.0	14.0	14.0	14.0	14.0	14.0	13.5	14.5	14.0	14.5	14.0
DO (mg/L)	10.1	10.1	10.2	10.1	10.1	10.1	10.1	10.1	9.8	10.0	9.8	10.0	9.9	10.0
pH	7.8	8.2	7.4	8.0	7.7	8.1	7.9	8.1	7.9	8.2	7.8	8.2	7.8	8.2
Cond. (µS/cm)	1285		1316		1314		1318		1279		1291		1296	
Initials	MM		MM		MM		IMC		HEC		MM		MM	

FR_FR2 Concentration +20 mg/L Cu	Days													
	14		15		16		17		18		19		20	
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.5	14.0	13.0	14.0	14.0	14.0	14.0	14.0	14.0	13.5	14.5	14.0	14.5	14.0
DO (mg/L)	10.1	10.2	10.2	10.2	10.0	10.1	10.0	10.0	9.9	9.8	9.8	10.0	9.9	10.0
pH	7.9	8.3	7.9	8.0	7.9	8.1	7.8	8.0	8.0	8.1	7.8	8.2	7.9	8.2
Cond. (µS/cm)	991		1014		1014		1016		993		993		996	
Initials	MM		MM		MM		IMC		HEC		MM		MM	

FR_MULTIPLATE Concentration +20 mg/L Cu	Days													
	14		15		16		17		18		19		20	
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.5	14.0	13.0	14.0	14.0	14.0	14.0	14.0	14.0	13.5	14.5	14.0	14.5	14.0
DO (mg/L)	10.0	10.2	10.3	10.2	9.9	10.1	10.0	10.1	9.9	10.0	9.9	10.0	9.9	10.1
pH	8.0	8.2	7.7	8.1	7.8	8.1	7.8	8.0	8.2	8.2	8.0	8.3	7.9	8.2
Cond. (µS/cm)	969		972		974		977		973		970		972	
Initials	MM		MM		MM		IMC		HEC		MM		MM	

Thermometer: CER#3 **DO meter/probe:** 6 / 6 **pH meter/probe:** 6 / 6 **Conductivity meter/probe:** 6 / 6

	~~Control~~ FR_FR4	FR_FRRD	FR_FR2	FR_MULTIPLATE
Hardness*	630	710	630	530
Alkalinity*	290	290	220	180

* mg/L as CaCO3

Analysts: IMC, HEC, MM

Reviewed by: [signature]

Date reviewed: Dec 21, 2021

Sample Description: FR_FR4, FR_FRRD, FR_MULTIPLATE - clear, no colour, no odour, few particulates
FR_FR2 - clear, no colour, no odour, no particulates

Comments: used stock soln ZiCuO2 (100 mg/L Cu)

Embryo-Alevin Freshwater Toxicity Test
Initial and Final Water Quality Measurements

Client: Teck
Sample ID: (various) (copper control)
Work Order #: 212110

Start Date & Time: October 13, 2021 @ 1550h
Stop Date & Time: November 12, 2021 @ 0800h
Test Species: *Oncorhynchus mykiss*

Dechlor + 20ng/L Cu	Days													
Concentration	21		22		23		24		25		26		27	
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.5	14.0	14.0	13.5	14.0	14.0	14.0	14.0	14.0	14.0	14.5	14.0	14.0	14.0
DO (mg/L)	9.9	10.0	10.0	10.1	10.0	9.9	9.9	10.1	10.0	10.1	9.9	10.0	10.0	9.8
pH	7.1	7.2	6.9	7.0	7.0	7.1	7.0	7.0	7.3	7.1	7.3	7.2	7.1	7.1
Cond. (µS/cm)	55		53		54		54		54		54		54	
Initials	HM		HM		HM		JMC		HEC		AM		A	

Concentration	Days													
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)														
DO (mg/L)														
pH														
Cond. (µS/cm)														
Initials														

Concentration	Days													
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)														
DO (mg/L)														
pH														
Cond. (µS/cm)														
Initials														

Concentration	Days													
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)														
DO (mg/L)														
pH														
Cond. (µS/cm)														
Initials														

Thermometer: ~~GER3~~ **DO meter/probe:** 6 / 6 **pH meter/probe:** 6 / 6 **Conductivity meter/probe:** 6 / 6

	Control			
Hardness*				
Alkalinity*				

* mg/L as CaCO3

Analysts: JMC, HEC, AM, YML

Reviewed by:

Date reviewed: Dec-21, 2021

Sample Description: (not applicable)

Comments: used stock soln $2ClO_2$ (100 mg/L Cu)

Embryo-Alevin Freshwater Toxicity Test
Initial and Final Water Quality Measurements

Client: TECK
Sample ID: (various)
Work Order #: 212100

Start Date & Time: October 13, 2021 @ 1550h
Stop Date & Time: November 12, 2021 @ 0800h
Test Species: *Oncorhynchus mykiss*

Dechlor Control Concentration	Days													
	21		22		23		24		25		26		27	
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.0	14.0	14.0	13.5	14.0	14.0	14.0	14.0	14.0	14.5	14.5	14.0	14.0	14.0
DO (mg/L)	10.1	10.0	10.0	10.0	10.1	10.0	10.0	9.9	10.1	10.1	10.0	10.1	10.0	9.9
pH	6.9	7.1	6.8	7.0	7.0	7.1	7.1	7.1	7.3	6.9	7.2	7.3	7.1	7.2
Cond. (µS/cm)	53		53		54		53		52		52		53	
Initials	HM		HM		HM		IMC		HEC		HM		A	

FR_UFR1 Concentration +20 mg/L Cu	Days													
	21		22		23		24		25		26		27	
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.0	14.0	13.0	13.5	14.0	14.0	14.0	14.0	14.0	14.0	14.5	14.0	14.0	14.0
DO (mg/L)	9.9	10.0	10.2	10.1	9.9	10.0	10.0	10.0	10.2	10.0	9.9	10.0	9.9	9.7
pH	8.1	8.2	7.8	8.3	8.0	8.2	7.9	8.2	7.9	8.0	7.8	8.0	7.9	7.9
Cond. (µS/cm)	368		358		351		356		361		360		361	
Initials	HM		HM		HM		IMC		HEC		HM		A	

GH_ER2 Concentration +20 mg/L Cu	Days													
	21		22		23		24		25		26		27	
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.0	14.0	13.0	13.5	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0
DO (mg/L)	9.8	10.0	10.3	10.0	10.0	10.0	9.9	10.0	10.3	9.9	9.9	10.1	9.8	9.6
pH	8.1	8.2	7.6	8.2	7.9	8.2	7.9	8.1	8.0	8.0	7.9	8.1	8.0	8.1
Cond. (µS/cm)	317		319		315		323		320		319		326	
Initials	HM		HM		HM		IMC		HEC		HM		A	

CM_MC1 Concentration +20 mg/L Cu	Days													
	21		22		23		24		25		26		27	
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.0	14.0	13.0	13.5	14.0	14.0	14.0	14.0	14.0	14.5	14.0	14.0	14.0	14.0
DO (mg/L)	10.0	10.1	10.2	10.0	10.0	10.0	9.8	9.9	10.3	9.9	9.8	10.1	9.7	9.7
pH	8.1	8.2	7.6	8.2	7.8	8.3	7.9	8.2	8.0	8.0	7.9	8.0	8.1	8.1
Cond. (µS/cm)	297		256		251		257		257		257		257	
Initials	HM		HM		HM		IMC		HEC		HM		A	

Thermometer: CER#3 **DO meter/probe:** 6 / 6 **pH meter/probe:** 6 / 6 **Conductivity meter/probe:** 6 / 6

	Dechlor Control	FR_UFR1	GH_ER2	CM_MC1
Hardness*	20	180	164	124
Alkalinity*	18	142	160	134

* mg/L as CaCO3

Analysts: IMC, HEC, AWD, HM

Reviewed by: ELC

Date reviewed: DEC 31, 2021

Sample Description: FR_UFR1 - clear, no colour, no odour, few particulates
GH_ER2 - clear, no colour, no odour, no particulates
CM_MC1 - slightly yellow, clear, no odour, few particulates

Comments: used stock soln 21Cu02 (100 mg/L Cu)

Embryo-Alevin Freshwater Toxicity Test
Initial and Final Water Quality Measurements

Client: Teck
Sample ID: (various)
Work Order #: 212110

Start Date & Time: October 13, 2021 @ 1550h
Stop Date & Time: November 12, 2021 @ 0800h
Test Species: *Oncorhynchus mykiss*

LC-SLC Concentration +20 mg/L Cu	Days													
	21		22		23		24		25		26		27	
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.0	14.0	13.0	13.5	14.0	14.0	14.0	14.0	14.0	14.5	14.5	14.0	14.0	14.0
DO (mg/L)	10.0	10.0	10.3	10.2	10.0	10.1	10.0	10.0	10.3	9.9	10.0	10.0	9.8	9.6
pH	8.1	8.1	8.1	8.3	8.0	8.2	8.0	8.1	8.1	7.9	7.9	8.1	8.1	8.1
Cond. (µS/cm)	396		379		380		382		390		389		391	
Initials	YM		HM		HM		IMC		HEC		YM		A	

FR-FRABCH Concentration +20 mg/L Cu	Days													
	21		22		23		24		25		26		27	
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.0	14.0	13.0	13.5	14.0	14.0	14.0	14.0	14.0	14.0	14.5	13.5	14.0	14.0
DO (mg/L)	9.9	10.0	10.2	10.0	9.9	10.0	9.9	10.0	10.3	10.1	9.9	10.1	9.8	9.6
pH	8.0	8.1	8.1	8.3	8.1	8.4	8.1	8.2	7.9	8.2	7.8	8.3	8.0	8.2
Cond. (µS/cm)	1182		1235		1229		1233		1215		1219		1220	
Initials	YM		HM		HM		IMC		HEC		YM		A	

FR-FRCP1 Concentration +20 mg/L Cu	Days													
	21		22		23		24		25		26		27	
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.0	14.0	13.0	13.5	14.0	14.0	14.0	14.0	14.0	14.0	14.5	13.5	14.0	14.0
DO (mg/L)	9.9	10.1	10.2	10.1	9.9	10.0	10.0	10.1	10.1	10.2	10.0	10.0	9.8	9.5
pH	8.2	8.4	8.1	8.4	8.2	8.3	7.9	8.2	8.2	8.4	8.1	8.4	8.2	8.4
Cond. (µS/cm)	1300		1364		1355		1359		1361		1361		1379	
Initials	YM		HM		HM		IMC		HEC		HM		A	

GH-FR1 Concentration +20 mg/L Cu	Days													
	21		22		23		24		25		26		27	
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.0	14.0	13.0	13.5	14.0	14.0	14.0	14.0	14.0	13.5	14.5	14.0	14.0	14.0
DO (mg/L)	10.0	10.1	10.2	10.2	9.9	10.0	9.9	10.1	10.2	10.1	9.9	10.0	9.8	9.6
pH	8.1	8.3	8.1	8.3	8.1	8.4	8.0	8.3	8.2	8.2	8.2	8.2	8.2	8.3
Cond. (µS/cm)	938		962		954		960		958		963		962	
Initials	YM		HM		HM		IMC		HEC		HM		A	

Thermometer: ~~CFR#3~~ **DO meter/probe:** 6 / 6 **pH meter/probe:** 6 / 6 **Conductivity meter/probe:** 6 / 6

	LC-SLC ~~Control~~	FR-FRABCH	FR-FRCP1	GH-FR1
Hardness*	206	720	640	400
Alkalinity*	146	330	320	250

Analysts: IMC, HEC, AMD, YM

Reviewed by: [signature]

Date reviewed: Dec 21, 2021

* mg/L as $CaCO_3$

Sample Description: LC-SLC - clear, no colour, no odour, some particulates
FR-FRABCH - cloudy yellow, no odour, some particulates
FR-FRCP1
GH-FR1 - clear, no colour, no odour, no particulates

Comments: used stock soln 21Cu02 (100 mg/L Cu)

Embryo-Alevin Freshwater Toxicity Test
Initial and Final Water Quality Measurements

Client: Teck
Sample ID: (various)
Work Order #: 212110

Start Date & Time: October 13, 2021 @ 1550h
Stop Date & Time: November 12, 2021 @ 0900h
Test Species: *Oncorhynchus mykiss*

GH_ERC Concentration ± 20 mg/L Ca	Days													
	21		22		23		24		25		26		27	
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.0	14.0	13.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.5	14.0	14.0	14.0
DO (mg/L)	10.0	10.0	10.2	10.0	10.0	10.1	9.9	10.1	10.0	10.1	9.9	10.0	9.8	9.6
pH	8.2	8.2	8.0	8.3	8.0	8.3	8.1	8.3	8.2	8.2	8.1	8.2	8.2	8.3
Cond. (µS/cm)	341		340		334		339		342		343		342	
Initials	YM		YM		YM		DMC		HEC		YM		A	

CM_MC2 Concentration ± 20 mg/L Ca	Days													
	21		22		23		24		25		26		27	
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.0	14.0	13.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.5	13.5	14.0	14.0
DO (mg/L)	9.9	10.1	10.2	10.0	9.9	10.0	9.9	10.0	10.2	10.0	9.8	10.1	9.8	9.6
pH	8.1	8.2	8.1	8.3	8.1	8.3	8.1	8.2	8.2	8.1	8.0	8.2	8.1	8.3
Cond. (µS/cm)	977		924		916		922		924		922		923	
Initials	YM		YM		YM		DMC		HEC		YM		A	

EV_MC2 Concentration ± 20 mg/L Ca	Days													
	21		22		23		24		25		26		27	
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.0	14.0	13.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.5	14.0	14.0	14.0
DO (mg/L)	9.9	10.0	10.2	10.1	9.9	10.0	9.9	10.1	10.1	9.5	9.8	10.1	9.9	9.5
pH	8.0	8.1	7.8	8.2	7.9	8.2	7.9	8.2	8.2	8.0	8.1	8.0	8.1	8.1
Cond. (µS/cm)	571		423 ①		419		424		427		427		428	
Initials	YM		YM		YM		DMC		HEC		YM		A	

EV_HCl Concentration ± 20 mg/L Ca	Days													
	21		22		23		24		25		26		27	
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.0	14.0	13.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.5	14.0	14.0	14.0
DO (mg/L)	10.0	10.1	10.3	10.1	10.0	9.9	10.0	10.0	10.2	10.0	9.9	10.0	9.8	9.6
pH	8.1	8.1	8.1	8.2	8.0	8.2	8.1	8.2	8.2	8.3	8.1	8.3	8.1	8.2
Cond. (µS/cm)	751		804		799		803		804		807		803	
Initials	YM		YM		YM		DMC		HEC		YM		A	

Thermometer: ~~GER-3~~ GH_ERC **DO meter/probe:** 6 / 6 **pH meter/probe:** 6 / 6 **Conductivity meter/probe:** 6 / 6

	~~Control~~	CM_MC2	EV_MC2	EV_HCl
Hardness*	150	450	290	610
Alkalinity*	152	230	150	300

* mg/L as $CaCO_3$

Analysts: DMC, HEC, AMD, YM

Reviewed by: [signature]

Date reviewed: Dec 21, 2021

Sample Description: GH_ERC – clear, no colour, no odour, no particulates
CM_MC2, ~~EV_MC2~~ – yellow, clear, no odour, some particulates
EV_HCl – clear, no colour, no odour, some particulates

Comments: ① confirmed w/ 2nd C-meter; used stock soln 21Cw02 (100 mg/L Ca)

Embryo-Alevin Freshwater Toxicity Test
Initial and Final Water Quality Measurements

Client: Teck
Sample ID: (various)
Work Order #: 212110

Start Date & Time: October 13, 2021 @ 1550h
Stop Date & Time: November 12, 2021 @ 0800h
Test Species: *Oncorhynchus mykiss*

LC-DCDS Concentration ± 20 mg/L Cu	Days													
	21		22		23		24		25		26		27	
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.0	14.0	13.0	14.0	14.0	14.5	14.0	14.0	14.0	14.0	15.0	14.0	14.0	14.0
DO (mg/L)	10.0	10.0	10.2	10.1	10.0	9.9	9.9	9.9	10.0	10.0	9.8	10.1	9.7	9.6
pH	8.1	8.2	8.1	8.3	8.0	8.2	8.0	8.2	8.0	8.1	8.0	8.2	8.1	8.3
Cond. (µS/cm)	1179		1125		1121		1124		1128		1124		1126	
Initials	YM		YM		YM		IMC		HEC		YM		A	

LC-LC3 Concentration ± 20 mg/L Cu	Days													
	21		22		23		24		25		26		27	
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.0	14.0	13.0	14.0	14.0	14.5	14.0	14.0	14.0	14.0	15.0	14.0	14.0	14.0
DO (mg/L)	9.9	10.1	10.3	10.1	9.9	10.0	9.9	10.0	10.2	10.1	9.8	10.0	9.8	9.6
pH	8.1	8.2	7.9	8.3	8.0	8.3	8.1	8.3	8.1	8.3	8.0	8.3	8.1	8.3
Cond. (µS/cm)	1222		1195		1190		1194		1194		1191		1195	
Initials	YM		YM		YM		IMC		HEC		YM		A	

LC-LC5 Concentration ± 20 mg/L Cu	Days													
	21		22		23		24		25		26		27	
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.0	14.0	13.0	14.0	14.0	14.5	14.0	14.0	14.0	14.0	15.0	14.0	14.0	14.0
DO (mg/L)	9.9	10.1	10.1	10.0	9.9	10.0	9.9	10.0	10.1	9.8	9.7	10.0	9.8	9.7
pH	8.1	8.2	8.1	8.3	8.0	8.3	8.1	8.2	8.2	8.2	8.1	8.3	8.1	8.3
Cond. (µS/cm)	876		873		870		874		835		873		874	
Initials	YM		YM		YM		IMC		HEC		YM		A	

LC-LCDSSLCC Concentration ± 20 mg/L Cu	Days													
	21		22		23		24		25		26		27	
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.0	14.0	13.0	14.0	14.0	14.5	14.0	14.5	14.0	14.0	15.0	14.0	14.0	14.0
DO (mg/L)	9.9	10.1	10.2	10.0	10.0	10.1	9.9	10.0	10.3	9.9	9.8	10.1	9.8	9.6
pH	8.1	8.23	8.1	8.3	8.1	8.3	8.1	8.3	8.2	8.3	8.1	8.3	8.2	8.3
Cond. (µS/cm)	967		965		955		953		965		962		963	
Initials	YM		YM		YM		IMC		HEC		YM		A	

Thermometer: CER#3 DO meter/probe: 6 / 6 pH meter/probe: 6 / 6 Conductivity meter/probe: 6 / 6

	LC-DCDS ~~Control~~	LC-LC3	LC-LC5	LC-LCDSSLCC
Hardness*	580	850	570	560
Alkalinity*	540	240	230	210

* mg/L as $CaCO_3$

Analysts: IMC, HEC, AWD, YM

Reviewed by:

Date reviewed: Dec 21, 2021

Sample Description: LC-DCDS, LC-LC3 - clear, no colour, no odour, some particulates
LC-LC5, LC-LCDSSLCC - clear, no colour, no odour, no particulates

Comments: used stock soln 21 CuO2 (100 mg/L Cu)

Embryo-Alevin Freshwater Toxicity Test
Initial and Final Water Quality Measurements

Client: Teck
Sample ID: (various)
Work Order #: 212110

Start Date & Time: October 13, 2021 @ 1550h
Stop Date & Time: November 12, 2021 @ 0800h
Test Species: *Oncorhynchus mykiss*

FR_FR4 Concentration + 20 µg/L Cu	Days													
	21		22		23		24		25		26		27	
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.0	14.0	13.0	14.0	14.5	14.5	14.0	14.5	14.0	14.0	14.5	14.0	14.0	14.0
DO (mg/L)	10.0	10.1	10.3	10.1	9.9	10.0	9.8	10.0	10.3	10.0	9.8	10.0	9.8	9.6
pH	8.2	8.2	8.2	8.4	8.1	8.3	8.0	8.2	8.3	8.4	8.2	8.3	8.2	8.3
Cond. (µS/cm)	1290		1363		1355		1355		1364		1360		1360	
Initials	YM		YM		YM		IMC		HEC		YM		A	

FR_FRRD Concentration + 20 µg/L Cu	Days													
	21		22		23		24		25		26		27	
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.0	14.0	13.0	14.0	14.5	14.5	14.0	14.5	14.0	14.5	14.5	14.0	14.0	14.0
DO (mg/L)	9.9	10.0	10.2	10.0	9.9	10.1	9.9	10.0	10.3	6.4②	9.8	10.1	9.8	9.5
pH	7.9	8.1	7.9	8.3	8.0	8.2	8.0	8.3	8.0	8.1	7.9	8.2	8.2	8.3
Cond. (µS/cm)	1268		1327		1319		1319		1301		1305		1298	
Initials	YM		YM		YM		IMC		HEC		YM		A	

FR_FR2 Concentration + 20 µg/L Cu	Days													
	21		22		23		24		25		26		27	
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.0	14.0	13.0	14.0	14.5	14.5	14.0	14.5	14.0	14.0	14.5	14.0	14.0	14.0
DO (mg/L)	10.0	10.1	10.2	10.0	9.9	10.0	9.9	10.1	10.0	10.0	9.8	10.2	9.7	9.6
pH	8.0	8.1	8.1	8.3	8.0	8.2	8.1	8.2	8.0	8.2	7.9	8.2	8.1	8.3
Cond. (µS/cm)	988		1093①		1087		1089		1071		1070		1063	
Initials	YM		YM		YM		IMC		HEC		YM		A	

FR_MULTIPLATE Concentration + 20 µg/L Cu	Days													
	21		22		23		24		25		26		27	
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.0	14.0	13.0	14.0	14.5	14.5	14.0	14.0	14.0	14.0	14.5	14.0	14.0	14.0
DO (mg/L)	10.1	9.9	10.2	10.1	9.9	10.1	9.9	10.1	10.3	10.0	9.9	10.2	9.7	9.6
pH	8.1	8.2	8.1	8.3	8.1	8.3	8.0	8.2	8.2	8.2	8.1	8.2	8.1	8.2
Cond. (µS/cm)	973		1070		1059		1064		1068		1067		1066	
Initials	YM		YM		YM		IMC		HEC		YM		A	

Thermometer: TER#3 **DO meter/probe:** 6 / 6 **pH meter/probe:** 6 / 6 **Conductivity meter/probe:** 6 / 6

	~~Control~~ FR_FR4	FR_FRRD	FR_FR2	FR_MULTIPLATE
Hardness*	810	910	680	500
Alkalinity*	300	270	280	170

* mg/L as $CaCO_3$

Analysts: IMC, HEC, AWD, YM

Reviewed by: [signature]

Date reviewed: Dec 21, 2021

Sample Description: FR_FR4, FR_FRRD, FR_FR2 - clear, no colour, no odour, few particulates
FR_MULTIPLATE - clear, no colour, no odour, no particulates

Comments: ① confirmed w/ 2nd C-meter ② not aerating; used stock soln 21CU02 (1200 mg/L Cu)

Embryo-Alevin Freshwater Toxicity Test
Initial and Final Water Quality Measurements

Client: Teck
Sample ID: Martens (Copper Control)
Work Order #: 212110

Start Date & Time: October 13, 2021 @ 1550h
Stop Date & Time: November 12, 2021 @ 0800h
Test Species: *Oncorhynchus mykiss*

Reminder + 20 mg/L Cu Concentration	Days													
	28		29		30 final									
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.5	13.5	14.0	14.0		13.5								
DO (mg/L)	9.9	10.1	9.8	10.0		10.1								
pH	7.3	7.3	7.1	7.2		7.2								
Cond. (µS/cm)	54		54		57									
Initials	HW		IMC		HW									

Concentration	Days													
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)														
DO (mg/L)														
pH														
Cond. (µS/cm)														
Initials														

Concentration	Days													
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)														
DO (mg/L)														
pH														
Cond. (µS/cm)														
Initials														

Concentration	Days													
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)														
DO (mg/L)														
pH														
Cond. (µS/cm)														
Initials														

Thermometer: CER#3 DO meter/probe: 6 / 6 pH meter/probe: 6 / 6 Conductivity meter/probe: 6 / 6

	Control			
Hardness*				
Alkalinity*				

* mg/L as CaCO3

Analysts: IMC, HW
Reviewed by: [illegible]
Date reviewed: Dec. 21, 2021

Sample Description: (not applicable)

Comments: used stock soln 2 (CuO2 (100 mg/L Cu)

Embryo-Alevin Freshwater Toxicity Test
Initial and Final Water Quality Measurements

Client: Teck
Sample ID: (various)
Work Order #: 212110

Start Date & Time: October 13, 2021 @ 1550h
Stop Date & Time: November 12, 2021 @ 0800h
Test Species: *Oncorhynchus mykiss*

Rechlor Control Concentration	Days													
	28		29		30 final									
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.0	13.5	14.0	14.0		13.5								
DO (mg/L)	10.2	10.1	10.0	10.1		10.0								
pH	7.2	7.3	7.2	7.1	7.2	7.2								
Cond. (µS/cm)	53		53		57									
Initials	YM		IMC		YM									

FR_UTR1 Concentration +20 mg/L Cu	Days													
	28		29		30 final									
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.0	14.0	14.0	14.0		13.5								
DO (mg/L)	10.1	10.1	9.9	10.1		10.0								
pH	7.9	8.0	7.9	8.0		8.0								
Cond. (µS/cm)	362		364		363									
Initials	YM		IMC		YM									

GH_ER2 Concentration +20 mg/L Cu	Days													
	28		29		30 final									
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.0	14.0	14.0	14.0		13.5								
DO (mg/L)	12.0	10.1	9.9	10.0		10.1								
pH	7.9	8.1	7.9	8.0		8.0								
Cond. (µS/cm)	321		323		323									
Initials	YM		IMC		YM									

CM_MC1 Concentration +20 mg/L Cu	Days													
	28		29		30 final									
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.0	14.0	14.0	14.0		13.5								
DO (mg/L)	10.0	10.1	10.0	10.1		10.1								
pH	7.8	8.0	7.9	8.0		8.0								
Cond. (µS/cm)	258		256		263									
Initials	YM		IMC		YM									

Thermometer: ~~ER3~~ **DO meter/probe:** 6 / 6 **pH meter/probe:** 6 / 6 **Conductivity meter/probe:** 6 / 6

	Control	FR_UTR1	GH_ER2	CM_MC1
Hardness*	22	184	170	132
Alkalinity*	20	136	140	122

* mg/L as CaCO3

Analysts: IMC, YM
Reviewed by: [illegible]
Date reviewed: Dec. 21, 2021

Sample Description: FR_UTR1, GH_ER2 - clear, no colour, no odour, some particulates
CM_MC1 - faint yellow, clear, no odour, some particulates

Comments: used stock soln 21Cu02 (100 mg/L Cu)

Embryo-Alevin Freshwater Toxicity Test
Initial and Final Water Quality Measurements

Client: Teck
Sample ID: (various)
Work Order #: 212110

Start Date & Time: October 13, 2021 @ 1550h
Stop Date & Time: November 12, 2021 @ 0800h
Test Species: *Oncorhynchus mykiss*

LC-SLC Concentration + 20 mg/L Cu	Days													
	28		29		30 final									
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.0	14.0	14.0	14.0		13.5								
DO (mg/L)	10.0	10.1	10.0	10.2		10.1								
pH	7.9	8.0	7.8	8.0		8.0								
Cond. (µS/cm)	392		394		394									
Initials	YM		IMC		YM									

FR-FRABCH Concentration + 20 mg/L Cu	Days													
	28		29		30 final									
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.0	13.5	14.0	14.0		13.5								
DO (mg/L)	10.1	10.2	10.1	10.2		10.2								
pH	7.8	8.2	7.8	8.1		8.2								
Cond. (µS/cm)	1206		1209		1202									
Initials	YM		IMC		YM									

FR-FRCP1 Concentration + 20 mg/L Cu	Days													
	28		29		30 final									
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.0	13.5	14.0	14.0		13.5								
DO (mg/L)	10.1	10.1	9.9	10.1		10.2								
pH	8.1	8.4	8.0	8.2		8.3								
Cond. (µS/cm)	1362		1368		1359									
Initials	YM		IMC		YM									

GH-FR1 Concentration + 20 mg/L Cu	Days													
	28		29		30 final									
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.0	13.5	14.0	14.0		13.5								
DO (mg/L)	10.1	10.1	10.0	10.1		10.2								
pH	8.1	8.2	8.1	8.2		8.1								
Cond. (µS/cm)	958		952		947									
Initials	YM		IMC		YM									

Thermometer: CER#3 **DO meter/probe:** 6 / 6 **pH meter/probe:** 6 / 6 **Conductivity meter/probe:** 6 / 6

	LC-SLC Control	FR_FRABCH	FR_FRCP1	GH-FR1
Hardness*	216	890	800	630
Alkalinity*	144	280	220	220

* mg/L as CaCO3

Analysts: IMC, YM

Reviewed by:

Date reviewed: Dec 21, 2021

Sample Description: LC-SLC, GH-FR1 - clear, no colour, no odour, no particulates
FR_FRABCH - clear, no colour, no odour, some particulates
FR-FRCP1 - slight yellow, clear, no odour, some particulates

Comments: used stock soln 21Cu02 (100 mg/L Cu)

Embryo-Alevin Freshwater Toxicity Test
Initial and Final Water Quality Measurements

Client: Teck
Sample ID: (various)
Work Order #: 212110

Start Date & Time: October 13, 2021 @ 1550h
Stop Date & Time: November 12, 2021 @ 0800h
Test Species: *Oncorhynchus mykiss*

GH_ERC — Concentration ± 20 mg/L Cu

	Days													
	28		29		30 final									
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.0	14.0	14.0	14.0	\	13.5								
DO (mg/L)	10.1	10.2	10.1	10.2	\	10.1								
pH	8.0	8.2	8.0	8.1		8.2								
Cond. (µS/cm)	345		342		346									
Initials	YM		IMC		YM									

CM_MC2 — Concentration ± 20 mg/L Cu

	Days													
	28		29		30 final									
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.0	14.0	14.0	14.0	\	14.0								
DO (mg/L)	10.1	10.1	9.8	9.9	\	10.1								
pH	8.0	8.2	8.0	8.1	\	8.2								
Cond. (µS/cm)	924		924		918									
Initials	YM		IMC		YM									

EV_MC2 — Concentration ± 20 mg/L Cu

	Days													
	28		29		30 final									
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.0	14.0	14.0	14.0	\	14.0								
DO (mg/L)	10.1	10.2	10.0	10.2	\	10.2								
pH	8.0	8.0	8.1	8.1	\	8.1								
Cond. (µS/cm)	424		424		427									
Initials	YM		IMC		YM									

EV_HCl — Concentration ± 20 mg/L Cu

	Days													
	28		29		30 final									
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Temperature (°C)	14.0	14.0	14.0	14.0	\	14.0								
DO (mg/L)	10.2	10.1	10.1	10.2	\	10.1								
pH	8.0	8.3	7.9	8.1	\	8.3								
Cond. (µS/cm)	807		810		803									
Initials	YM		IMC		YM									

Thermometer: ~~CER#2~~ **DO meter/probe:** 6 / 6 **pH meter/probe:** 6 / 6 **Conductivity meter/probe:** 6 / 6

	GH_ERC ~~Control~~	CM_MC2	EV_MC2	EV_HCl
Hardness*	220	490	220	450
Alkalinity*	150	190	160	220

* mg/L as CaCO3

Analysts: IMC, YM

Reviewed by: [signature]
Date reviewed: Dec 21, 2021

Sample Description: GH_ERC, CM_MC2, EV_HCl - clear, no colour, no odour, no particulates
EV_MC2 - clear, pale yellow, no odour, no particulates

Comments: used stock soln 21Cu02 (100 mg/L Cu)

Embryo-Alevin Freshwater Toxicity Test
Initial and Final Water Quality Measurements

Client: Teck
Sample ID: (various)
Work Order #: 212110

Start Date & Time: October 13, 2021 @ 1550h
Stop Date & Time: November 12, 2021 @ 0800h
Test Species: *Oncorhynchus mykiss*

LC-DCDS Concentration + 20 mg/L Cu

	Days 28		29		30 final									
	new	old	new	old	new	~~old~~	new	old	new	old	new	old	new	old
Temperature (°C)	14.5	14.0	14.0	14.0		14.0								
DO (mg/L)	10.0	10.1	9.9	10.1		10.1								
pH	7.9	8.2	7.9	8.1		8.1								
Cond. (µS/cm)	1128		1132		1126									
Initials	YM		IMC		YM									

LC-LC3 Concentration + 20 mg/L Cu

	Days 28		29		30 final									
	new	old	new	old	new	~~old~~	new	old	new	old	new	old	new	old
Temperature (°C)	14.5	14.0	14.0	14.0		14.0								
DO (mg/L)	10.1	10.1	9.9	10.0		10.1								
pH	8.0	8.3	8.1	8.2		8.3								
Cond. (µS/cm)	1196		1193		1195									
Initials	YM		IMC		YM									

LC-LC5 Concentration + 20 mg/L Cu

	Days 28		29		30 final									
	new	old	new	old	new	~~old~~	new	old	new	old	new	old	new	old
Temperature (°C)	14.5	14.0	14.0	14.0		14.0								
DO (mg/L)	10.1	10.2	9.9	10.1		10.1								
pH	8.1	8.3	8.0	8.2		8.2								
Cond. (µS/cm)	852		859		850									
Initials	YM		IMC		YM									

LC-LCDSSLCC Concentration + 20 mg/L Cu

	Days 28		29		30 final									
	new	old	new	old	new	~~old~~	new	old	new	old	new	old	new	old
Temperature (°C)	14.5	14.0	14.0	14.0		14.0								
DO (mg/L)	10.1	10.2	10.1	10.2		10.1								
pH	8.1	8.3	8.1	8.3		8.3								
Cond. (µS/cm)	966		965		968									
Initials	YM		IMC		YM									

Thermometer: ~~CER#2~~ **DO meter/probe:** 6 / 6 **pH meter/probe:** 6 / 6 **Conductivity meter/probe:** 6 / 6

	~~Control~~ LC-DCDS	LC-LC3	LC-LC5	LC-LCDSSLCC
Hardness*	600	700	450	550
Alkalinity*	180	260	250	240

* mg/L as CaCO3

Analysts: IMC, YM

Reviewed by: [signature]

Date reviewed: Dec 31, 2021

Sample Description: LC-DCDS, LC-LC3 - clear, ~~no colour~~ yellow, no odour, some particulates
LC-LC5, LC-LCDSSLCC - clear, no colour, no odour, some particulates

Comments: used stock soln 21Cu02 (100 mg/L Cu)

Embryo-Alevin Freshwater Toxicity Test
Initial and Final Water Quality Measurements

Client: Teck
Sample ID: (various)
Work Order #: 212110

Start Date & Time: October 13, 2021 @ 1550h
Stop Date & Time: November 12, 2021 @ 0800h
Test Species: *Oncorhynchus mykiss*

FR_FR4 Concentration +20 mg/L Cu

	Days													
	28		29		30 final									
	new	old	new	old	new	~~old~~	new	old	new	old	new	old	new	old
Temperature (°C)	14.5	14.0	14.5	14.0		14.0								
DO (mg/L)	10.1	10.1	9.9	10.1		10.1								
pH	8.2	8.4	8.1	8.3		8.3								
Cond. (µS/cm)	1363		1368		1358									
Initials	MM		JMC		MM									

FR_FRRD Concentration +20 mg/L Cu

	Days													
	28		29		30 final									
	new	old	new	old	new	~~old~~	new	old	new	old	new	old	new	old
Temperature (°C)	14.5	14.0	14.5	14.0		14.0								
DO (mg/L)	10.0	10.1	10.0	10.1		10.0								
pH	7.9	8.2	8.0	8.2		8.1								
Cond. (µS/cm)	1280		1272		1267									
Initials	MM		JMC		MM									

FR_FR2 Concentration +20 mg/L Cu

	Days													
	28		29		30 final									
	new	old	new	old	new	~~old~~	new	old	new	old	new	old	new	old
Temperature (°C)	14.5	14.0	14.5	14.0		14.0								
DO (mg/L)	10.1	10.1	10.0	10.1		10.0								
pH	7.9	8.1	7.9	8.0		8.2								
Cond. (µS/cm)	1059		1062		1049									
Initials	MM		JMC		MM									

FR_MULTIPLATE Concentration +20 mg/L Cu

	Days													
	28		29		30 final									
	new	old	new	old	new	~~old~~	new	old	new	old	new	old	new	old
Temperature (°C)	14.5	14.0	14.0	14.0		14.0								
DO (mg/L)	10.1	10.1	10.1	10.1		10.1								
pH	8.0	8.2	8.0	8.1		8.3								
Cond. (µS/cm)	1071		1073		1068									
Initials	MM		JMC		MM									

Thermometer: ~~CER#3~~ **DO meter/probe:** 6 / 6 **pH meter/probe:** 6 / 6 **Conductivity meter/probe:** 6 / 6

	~~Control~~ FR_FR4	FR_FRRD	FR_FR2	FR_MULTIPLATE
Hardness*	780	1010	620	630
Alkalinity*	300	290	230	190

* mg/L as CaCO3

Analysts: JMC, MM

Reviewed by: [signature]

Date reviewed: Dec 21, 2021

Sample Description: FR_FR4 - clear, no colour, no odour, no particulates; FR_FRRD, FR_FR2, FR_MULTIPLATE - clear, no colour, no odour, some particulates.

Comments: used stock solns 21CU02 (100 mg/L Cu)

Rainbow Trout Embryo-Alevin Toxicity Test - Overall Results

Client: Teck
WO#: 212110

Test Initiation Date: October 13, 2021
Test Termination Date: November 12, 2021

	Test Conc.		Mortality Counts													
	(% v/v)	Rep	Day 1 - 12	Day 13 - 24	Day 25 - 30	Total Dead	Abnormal Alevins	Normal Alevins	Total No. Alevins	Total No. Exposed	Survival			Normal Alevins		
Dechlor	Control	1	1	0	1	2	1	26	27	29	93.1			89.7		
		2	0	2	7	9	1	22	23	32	71.9			68.8		
		3	1	4	2	7	0	22	22	29	75.9	Mean	SD	75.9	Mean	SD
		4	1	0	1	2	0	28	28	30	93.3	83.5	11.3	93.3	81.9	11.6
Dechlor	Control	1	0	1	0	1	0	29	29	30	96.7			96.7		
+ 20 µg/L Cu		2	0	0	5	5	5	20	25	30	83.3			66.7		
		3	1	1	4	6	2	21	23	29	79.3	Mean	SD	72.4	Mean	SD
		4	0	0	4	4	1	24	25	29	86.2	86.4	7.4	82.8	79.6	13.2
1	100	1	0	2	0	2	0	28	28	30	93.3			93.3		
FR_UFR1		2	0	1	2	3	1	25	26	29	89.7			86.2		
+ 20 µg/L Cu		3	1	1	7	9	2	19	21	30	70.0	Mean	SD	63.3	Mean	SD
		4	1	0	2	3	0	27	27	30	90.0	85.7	10.6	90.0	83.2	13.6
2	100	1	0	2	1	3	0	28	28	31	90.3			90.3		
GH_ER2		2	0	0	1	1	2	26	28	29	96.6			89.7		
+ 20 µg/L Cu		3	1	0	3	4	0	26	26	30	86.7	Mean	SD	86.7	Mean	SD
		4	0	2	3	5	0	25	25	30	83.3	89.2	5.7	83.3	87.5	3.2
3	100	1	0	1	0	1	0	29	29	30	96.7			96.7		
CM_MC1		2	0	0	2	2	1	28	29	31	93.5			90.3		
+ 20 µg/L Cu		3	0	2	2	4	1	25	26	30	86.7	Mean	SD	83.3	Mean	SD
		4	1	0	4	5	0	25	25	30	83.3	90.1	6.1	83.3	88.4	6.4
4	100	1	0	1	1	2	2	26	28	30	93.3			86.7		
LC_SLC		2	0	1	4	5	0	24	24	29	82.8			82.8		
+ 20 µg/L Cu		3	0	2	3	5	3	22	25	30	83.3	Mean	SD	73.3	Mean	SD
		4	0	0	5	5	3	22	25	30	83.3	85.7	5.1	73.3	79.0	6.8
5	100	1	0	4	1	5	0	24	24	29	82.8			82.8		
FR_FRABCH		2	0	3	2	5	1	26	27	32	84.4			81.3		
+ 20 µg/L Cu		3	2	3	0	5	2	23	25	30	83.3	Mean	SD	76.7	Mean	SD
		4	1	2	1	4	2	24	26	30	86.7	84.3	1.7	80.0	80.2	2.6
6	100	1	0	3	1	4	1	24	25	29	86.2			82.8		
FR_FRCP1		2	0	11	1	12	0	18	18	30	60.0			60.0		
+ 20 µg/L Cu		3	3	5	2	10	0	19	19	29	65.5	Mean	SD	65.5	Mean	SD
		4	3	6	1	10	0	19	19	29	65.5	69.3	11.6	65.5	68.4	9.9
7	100	1	0	3	3	6	0	24	24	30	80.0			80.0		
GH_FR1		2	0	0	3	3	0	27	27	30	90.0			90.0		
+ 20 µg/L Cu		3	3	3	2	8	1	22	23	31	74.2	Mean	SD	71.0	Mean	SD
		4	1	8	3	12	2	16	18	30	60.0	76.0	12.5	53.3	73.6	15.6
8	100	1	0	1	0	1	0	29	29	30	96.7			96.7		
GH_ERC		2	0	1	2	3	3	24	27	30	90.0			80.0		
+ 20 µg/L Cu		3	3	0	3	6	2	21	23	29	79.3	Mean	SD	72.4	Mean	SD
		4	0	0	7	7	0	23	23	30	76.7	85.7	9.3	76.7	81.4	10.6
9	100	1	0	3	0	3	0	27	27	30	90.0			90.0		
CM_MC2		2	0	0	2	2	0	28	28	30	93.3			93.3		
+ 20 µg/L Cu		3	0	9	1	10	0	19	19	29	65.5	Mean	SD	65.5	Mean	SD
		4	0	1	5	6	0	25	25	31	80.6	82.4	12.5	80.6	82.4	12.5
10	100	1	0	2	1	3	1	26	27	30	90.0			86.7		
EV_MC2		2	0	0	6	6	3	21	24	30	80.0			70.0		
+ 20 µg/L Cu		3	1	1	3	5	1	22	23	28	82.1	Mean	SD	78.6	Mean	SD
		4	1	3	7	11	0	19	19	30	63.3	78.9	11.2	63.3	74.6	10.2
11	100	1	0	2	0	2	1	27	28	30	93.3			90.0		
EV_HC1		2	0	1	3	4	1	25	26	30	86.7			83.3		
+ 20 µg/L Cu		3	0	2	3	5	7	17	24	29	82.8	Mean	SD	58.6	Mean	SD
		4	1	2	6	9	0	21	21	30	70.0	83.2	9.8	70.0	75.5	14.0
12	100	1	0	0	3	3	1	26	27	30	90.0			86.7		
LC_DCDS		2	0	1	2	3	0	27	27	30	90.0			90.0		
+ 20 µg/L Cu		3	1	3	1	5	2	23	25	30	83.3	Mean	SD	76.7	Mean	SD
		4	0	2	2	4	1	24	25	29	86.2	87.4	3.2	82.8	84.0	5.7
13	100	1	0	0	2	2	0	27	27	29	93.1			93.1		
LC_LC3		2	0	0	1	1	1	28	29	30	96.7			93.3		
+ 20 µg/L Cu		3	0	1	0	1	3	26	29	30	96.7	Mean	SD	86.7	Mean	SD
		4	1	1	1	3	1	26	27	30	90.0	94.1	3.2	86.7	89.9	3.8
14	100	1	0	1	0	1	1	29	30	31	96.8			93.5		
LC_LC5		2	1	0	4	5	4	21	25	30	83.3			70.0		
+ 20 µg/L Cu		3	2	2	2	6	3	22	25	31	80.6	Mean	SD	71.0	Mean	SD
		4	3	3	1	7	0	23	23	30	76.7	84.4	8.7	76.7	77.8	10.9
15	100	1	0	1	2	3	1	26	27	30	90.0			86.7		
LC_LCDSSLCC		2	0	3	6	9	1	20	21	30	70.0			66.7		
+ 20 µg/L Cu		3	1	1	3	5	1	24	25	30	83.3	Mean	SD	80.0	Mean	SD
		4	0	1	1	2	0	27	27	29	93.1	84.1	10.3	93.1	81.6	11.3
16	100	1	0	1	1	2	1	27	28	30	93.3			90.0		
FR_FR4		2	0	8	1	9	1	21	22	31	71.0			67.7		
+ 20 µg/L Cu		3	6	4	0	10	1	18	19	29	65.5	Mean	SD	62.1	Mean	SD
		4	5	0	2	7	0	23	23	30	76.7	76.6	12.0	76.7	74.1	12.2
17	100	1	0	4	0	4	0	27	27	31	87.1			87.1		
FR_FRRD		2	1	5	1	7	1	24	25	32	78.1			75.0		
+ 20 µg/L Cu		3	1	2	1	4	1	24	25	29	86.2	Mean	SD	82.8	Mean	SD
		4 ④	1	2	27	30	0	0	0	30	0.0	83.8	4.9	0.0	81.6	6.1
18	100	1	0	2	3	5	1	24	25	30	83.3			80.0		
FR_FR2		2	1	5	5	11	1	18	19	30	63.3			60.0		
+ 20 µg/L Cu		3	2	2	1	5	0	25	25	30	83.3	Mean	SD	83.3	Mean	SD
		4	1	1	5	7	0	23	23	30	76.7	76.7	9.4	76.7	75.0	10.4
19	100	1	1	8	1	10	1	19	20	30	66.7			63.3		
FR_MULTIPLATE		2	0	0	0	0	2	28	30	30	100.0			93.3		
+ 20 µg/L Cu		3	5	0	0	5	1	24	25	30	83.3	Mean	SD	80.0	Mean	SD
		4	0	3	3	6	1	22	23	29	79.3	82.3	13.8	75.9	78.1	12.4

④ replicate excluded due to technical issue

Dec 23, 2021

Embryo-Alevin Toxicity Test
Daily Mortality

Client: Teck
Sample ID: (various)
Work Order #: 212110

Start Date & Time: October 13, 2021 @ 1550h
Stop Date & Time: November 12, 2021 @ ~~0800h~~ 0800
Test Species: *Oncorhynchus mykiss*

Concentration	Rep	Day of Test - No. of Mortalities												Total Dead Eggs/Embryos/ Alevins
		1	2	3	4	5	6	7	8	9	10	11	12	
Dechlor +	1	0	0	0	0	0	0	0	0	0	0	0	0	0
20 mg/L Cu	2	↓	↓	↓	↓	↓	0	↓	↓	↓	↓	↓	↓	0
	3	↓	↓	↓	↓	↓	1	↓	↓	↓	↓	↓	↓	1
	4	↓	↓	↓	↓	↓	0	↓	↓	↓	↓	↓	↓	0
	1													
	2													
	3													
	4													
	1													
	2													
	3													
	4													
	1													
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	4													
	1													
	2													
	3													
	4													
Tech Initials		UMW	UMW	JM	HEC	CW	UMW	UMW	UMW	UMW	JM	HEC	UMW	UMW

Comments:

Reviewed by: [signature]
Date reviewed: Dec. 20, 2021

Embryo-Alevin Toxicity Test
Daily Mortality

Client: Teck
Sample ID: (various)
Work Order #: 212160

Start Date & Time: October 13, 2021 @ 1550h
Stop Date & Time: November 12, 2021 @ 0800h
Test Species: *Oncorhynchus mykiss*

Concentration	Rep	Day of Test - No. of Mortalities												Total Dead Eggs/Embryos/ Alevins
		1	2	3	4	5	6	7	8	9	10	11	12	
Dechlor Control	1	0	0	0	0	0	1	0	0	0	0	0	0	1
	2	↓	↓	↓	↓	↓	0	↓	↓	0	↓	↓	↓	0
	3	↓	↓	↓	↓	↓	0	↓	↓	1	↓	↓	↓	1
	4	↓	↓	↓	↓	↓	1	↓	↓	0	↓	↓	↓	1
FR_UTR1	1	↓	↓	↓	↓	↓	0	↓	↓	↓	↓	↓	↓	0
+20 mg/L Cu	2	↓	↓	↓	↓	↓	0	↓	↓	↓	↓	↓	↓	0
	3	↓	↓	↓	↓	↓	1	↓	↓	↓	↓	↓	↓	1
	4	↓	↓	↓	↓	↓	0	↓	↓	↓	↓	1	↓	1
GH_ER2	1	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	0	↓	0
+20 mg/L Cu	2	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	0	↓	0
	3	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	1	↓	1
	4	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	0	↓	0
CM_MC1	1	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	0
+20 mg/L Cu	2	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	0
	3	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	0
	4	1	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	1
LC_SLC	1	0	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	0
+20 mg/L Cu	2	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	0
	3	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	0
	4	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	0
FR_FRABCH	1	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	0
+20 mg/L Cu	2	↓	↓	↓	↓	↓	↓	↓	1	↓	↓	1	↓	0
	3	↓	↓	↓	↓	↓	↓	↓	1	↓	↓	1	1	2
	4	↓	↓	↓	↓	↓	↓	↓	0	↓	↓	1	↓	1
FR_FRCP1	1	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	0	↓	0
+20 mg/L Cu	2	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	0	1	0
	3	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	1	2	3
	4	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	3	0	3
GH_FR1	1	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	0	↓	0
+20 mg/L Cu	2	↓	↓	↓	↓	1	↓	↓	↓	↓	↓	0	↓	0
	3	1	↓	↓	↓	1	↓	↓	↓	↓	↓	1	↓	3
	4	0	↓	↓	↓	0	↓	↓	↓	↓	↓	1	↓	1
Tech Initials		UM	UM	TR	HEC	UM	UM	UM	UM	UM	TR	HEC	UM	UM

Comments:

Reviewed by: [signature] **Date reviewed:** Dec 20, 2021

Embryo-Alevin Toxicity Test
Daily Mortality

Client: Teck
Sample ID: (various)
Work Order #: 212110

Start Date & Time: October 13, 2021 @ 1550h
Stop Date & Time: November 12, 2021 @ 0800h
Test Species: *Oncorhynchus mykiss*

Concentration	Rep	Day of Test - No. of Mortalities												Total Dead Eggs/Embryos/ Alevins
		1	2	3	4	5	6	7	8	9	10	11	12	
GH-ERC	1	0	0	0	0	0	0	0	0	0	0	0	0	0
+20 ug/L Cu	2	↓	↓	↓	↓	0	0	0	↓	↓	↓	↓	↓	0
	3	↓	↓	↓	↓	1	1	1	↓	↓	↓	↓	↓	3
	4	↓	↓	↓	↓	0	0	0	↓	↓	↓	↓	↓	0
CM_MC2	1	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	0
+ 20 ug/L Cu	2	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	0
	3	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	0
	4	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	0
EV_MC2	1	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	0
+ 20 ug/L Cu	2	↓	↓	↓	↓	↓	↓	1	↓	↓	↓	↓	↓	0
	3	↓	↓	↓	↓	↓	↓	1	↓	↓	↓	↓	↓	1
	4	↓	↓	↓	↓	↓	↓	0	↓	↓	↓	↓	↓	1
EV_HCl	1	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	0	↓	0
+ 20 ug/L Cu	2	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	0
	3	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	0
	4	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	1	↓	1
LC-DCDS	1	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	0	↓	0
+ 20 ug/L Cu	2	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	0	↓	0
	3	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	1	↓	1
	4	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	0	↓	0
LC-LC3	1	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	0
+20 ug/L Cu	2	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	0
	3	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	0
	4	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	1	1
LC-LC5	1	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	0	0
+ 20 ug/L Cu	2	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	1
	3	↓	↓	↓	↓	0	↓	2	↓	↓	↓	↓	↓	2
	4	↓	↓	↓	↓	↓	↓	0	↓	1	↓	↓	2	3
LC-LCDSSLCC	1	↓	↓	↓	↓	↓	↓	↓	↓	0	↓	↓	0	0
+20 ug/L Cu	2	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	0
	3	↓	↓	↓	↓	↓	↓	↓	1	↓	↓	↓	↓	1
	4	↓	↓	↓	↓	↓	↓	↓	0	↓	↓	↓	↓	0
Tech Initials		HEC	HEC	HEC	HEC	HEC	HEC	HEC	HEC	HEC	HEC	HEC	HEC	HEC

Comments:

Reviewed by: [signature] **Date reviewed:** Dec 20, 2021

Embryo-Alevin Toxicity Test
Daily Mortality

Client: Teck
Sample ID: (various)
Work Order #: 212160

Start Date & Time: October 13, 2021 @ 1550h
Stop Date & Time: November 12, 2021 @ 0800h
Test Species: *Oncorhynchus mykiss*

Concentration	Rep	Day of Test - No. of Mortalities												Total Dead Eggs/Embryos/ Alevins
		1	2	3	4	5	6	7	8	9	10	11	12	
FR-FR4	1	0	0	0	0	0	0	0	0	0	0	0	0	0
+ 20 mg/L Cu	2	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	0	↓	0
	3	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	6	↓	6
	4	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	3	2	5
FR-FRRD	1	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	0	0	0
+20 mg/L Cu	2	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	1	1
	3	↓	↓	↓	↓	↓	↓	↓	↓	↓	1	↓	0	1
	4	↓	↓	↓	↓	↓	↓	↓	1	↓	0	↓	↓	1
FR-FR2	1	↓	↓	↓	↓	↓	↓	↓	0	↓	↓	↓	↓	0
+20 mg/L Cu	2	↓	1	↓	↓	↓	0	↓	↓	↓	↓	↓	1	1
	3	↓	0	↓	↓	↓	1	↓	↓	↓	↓	↓	1	2
	4	↓	↓	↓	↓	↓	1	0	↓	↓	↓	1	0	1
FR-MULTIPLATE	1	↓	↓	↓	↓	↓	0	1	↓	↓	↓	↓	1	1
+20 mg/L Cu	2	↓	↓	↓	↓	↓	↓	0	1	↓	0	↓	1	0
	3	↓	↓	↓	↓	↓	↓	1	1	↓	2	↓	1	5
	4	↓	↓	↓	↓	↓	↓	0	0	↓	0	↓	0	0
	1													
	2													
	3													
	4													
	1													
	2													
	3													
	4													
	1													
	2													
	3													
	4													
	1													
	2													
	3													
	4													
Tech Initials		UM	UM	JHC	HEC	UM	UM	UM	UM	UM	ZHE	HEC	UM	UM

Comments:

Reviewed by: [signature] **Date reviewed:** Dec 20, 2021

Embryo-Alevin Toxicity Test
Daily Mortality

Client: Teck
Sample ID: (various)
Work Order #: 212110

Start Date & Time: October 13, 2021 @ 1550h
Stop Date & Time: November 12, 2021 @ 0800h
Test Species: *Oncorhynchus mykiss*

Concentration	Rep	Day of Test - No. of Mortalities												Total Dead Eggs/Embryos/ Alevins
		13	14 ①	15	16	17	18	19	20	21	22	23	24	
Dechlor +	1	0	0	0	0	0	0	0	0	0 ②	1	0 ③	0	1
20 ug/L Cu	2	↓	↓	↓	0	↓	↓	↓	↓	②	0	③	1	0
	3	↓	↓	↓	1	↓	↓	↓	↓	↓	②	↓	③	1
	4	↓	↓	↓	0	↓	↓	↓	↓	↓	②	↓	③	0
	1													
	2													
	3													
	4													
	1													
	2													
	3													
	4													
	1													
	2													
	3													
	4													
	1													
	2													
	3													
	4													
	1													
	2													
	3													
	4													
	1													
	2													
	3													
	4													
	1													
	2													
	3													
	4													
Tech Initials		MW	MW	MW	MW	HEC	MW	MW	MW	MW	MW	MW	MW	MW

Comments: ① at eyed stage ② starting to hatch ③ >50% hatched.

Reviewed by: [signature] **Date reviewed:** Dec 20, 2021

Embryo-Alevin Toxicity Test
Daily Mortality

Client: Teck
Sample ID: (various)
Work Order #: 212110

Start Date & Time: October 13, 2021 @ 1550h
Stop Date & Time: November 12, 2021 @ 0800h
Test Species: *Oncorhynchus mykiss*

Concentration	Rep	Day of Test - No. of Mortalities												Total Dead Eggs/Embryos/ Alevins
		13	14 ①	15	16	17	18	19	20	21	22	23	24	
Dechlor Control	1	0	0	0	0	0	0	0	0	0②	0	0③	0	0
	2	↓	↓	↓	↓	↓	↓	0	↓	②	0	1③	1	2
	3	↓	↓	↓	↓	↓	↓	1	↓	↓	1②	2③	0	4
	4	↓	↓	↓	↓	↓	↓	0	↓	↓	0②	0	③	0
FR_UFR1	1	↓	↓	1	↓	↓	↓	↓	②	↓	1③	↓	↓	2
+20 mg/L Cu	2	↓	↓	0	↓	↓	↓	↓	↓	②	0	③	1	1
	3	↓	↓	↓	↓	↓	↓	↓	↓	↓	②	③	1	1
	4	↓	↓	↓	↓	↓	↓	↓	↓	↓	②	↓	0③	0
GH_ER2	1	↓	↓	↓	↓	↓	↓	↓	②	↓	1③	1	↓	2
+20 mg/L Cu	2	↓	↓	↓	↓	↓	↓	↓	↓	②	0	0③	↓	0
	3	↓	↓	↓	↓	↓	↓	↓	↓	②	↓	0③	↓	0
	4	↓	↓	↓	↓	↓	↓	✓	↓	↓	②	2③	↓	2
CM_MCI	1	↓	↓	↓	↓	↓	↓	↓	↓	②	③	0	↓	1
+20 mg/L Cu	2	↓	↓	↓	↓	↓	↓	0	↓	②	↓	↓	③	0
	3	↓	↓	↓	↓	↓	↓	↓	↓	↓	1②	↓	③	2
	4	↓	↓	↓	↓	↓	↓	↓	0	↓	0②	③	↓	0
LC_SLC	1	↓	↓	↓	↓	↓	↓	↓	↓	②	↓	③	1	1
+20 mg/L Cu	2	1	↓	↓	↓	↓	↓	↓	③	↓	③	↓	0	1
	3	0	↓	↓	↓	↓	↓	↓	↓	↓	1②	1③	↓	2
	4	↓	↓	↓	↓	↓	↓	↓	↓	↓	0	0③	↓	0
FR_FRABCH	1	↓	↓	0	↓	↓	↓	↓	↓	②	2	2③	↓	4
+20 mg/L Cu	2	1	↓	0	↓	↓	↓	↓	1	②	1③	0	↓	3
	3	0	↓	0	1	↓	↓	↓	0	↓	0②	2	③	3
	4	1	↓	0	1	↓	↓	↓	1	↓	②	0③	↓	2
FR_FRCP1	1	0	↓	1	1	↓	1	↓	↓②	0	↓	↓	③	3
+20 mg/L Cu	2	0	↓	3	2	↓	3	↓	1②	2	↓③	↓	↓	11
	3	1	↓	0	2	↓	0	↓	0	0②	1	1③	↓	5
	4	1	1	2	0	↓	1	1	↓	②	1	0③	↓	6
GH_FR1	1	0	0	0	↓	1	↓	0	②	↓	1③	1	↓	3
+20 mg/L Cu	2	0	↓	0	↓	0	↓	1	↓	②	0	0③	↓	0
	3	1	↓	1	↓	0	↓	↓	↓	↓	1②	0	③	3
	4	0	↓	1	2	1	↓	↓	2	1	0②	1③	↓	8
Tech Initials		MM	MM	MM	MM	JM	HEC	MM	MM	MM	MM	MM	JM	MM

Comments: ① at eyed stage ② starting to hatch ③ >50% hatched.

Reviewed by: [signature] **Date reviewed:** Dec 20, 2021

Embryo-Alevin Toxicity Test
Daily Mortality

Client: Teck
Sample ID: (various)
Work Order #: 212110

Start Date & Time: October 13, 2021 @ 1550h
Stop Date & Time: November 12, 2021 @ 0800h
Test Species: *Oncorhynchus mykiss*

Concentration	Rep	Day of Test - No. of Mortalities												Total Dead Eggs/Embryos/ Alevins
		13	14 ①	15	16	17	18	19	20	21	22	23	24	
GH-ERC	1	0	0	0	0	0	0	0	0	0 ②	1	0 ③	0	1
+ 20 µg/L Cu	2									②	0 ③	1		~~0~~ 1
	3										②	0 ③		0
	4										②	0 ③		0
CM_MC2	1					1			②	1	③	1		3
+ 20 µg/L Cu	2					0				0 ②	③	0		0
	3						1		3	1	4 ②		③	9
	4				1		0		0	0	0	②	③	1
EV_MC2	1				0					0 ②		2 ③		2
+ 20 µg/L Cu	2										②	0 ③		0
	3							1				0 ② ③		1
	4							0		1	②	2 ③		3
EV_HC1	1									1 ②	1 ③	0		2
+ 20 µg/L Cu	2								②	0	0	1 ③		1
	3								2	0	②	0 ③		2
	4		1						0	1	②	③		2
LC-DCDS	1		0							0	②	③		0
+ 20 µg/L Cu	2							1			②	③		1
	3					1	1	0				1 ② ③		3
	4					0	0				2	0 ②	③	2
LC-LC3	1									②	0	③		0
+ 20 µg/L Cu	2								②		③			0
	3										②	1 ③		1
	4										②	0 ③		1
LC_LC5	1			0					②		1 ③			1
+ 20 µg/L Cu	2								②		0 ③			0
	3							1	1	②	0	③		2
	4							0	0	②	1	2 ③	1	3
LC-LCDSSLCC	1									②	0	1 ③	0	1
+ 20 µg/L Cu	2									②		1 ③	2	3
	3						1				②	0	0 ③	1
	4						0			1	②	0 ③	0	1
Tech Initials		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	HEC	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Comments: ① at eyed stage ② starting to hatch ③ >50% hatched

Reviewed by: [signature]
Date reviewed: Dec. 20, 2021

Embryo-Alevin Toxicity Test
Daily Mortality

Client: Teck
Sample ID: (Various)
Work Order #: 212110

Start Date & Time: October 13, 2021 @ 1550h
Stop Date & Time: November 12, 2021 @ 0800h
Test Species: *Oncorhynchus mykiss*

Concentration	Rep	Day of Test - No. of Mortalities												Total Dead Eggs/Embryos/ Alevins
		13	14 ①	15	16	17	18	19	20	21	22	23	24	
FR_FR4	1	0	0	0	0	0	0	0	1	0 ②	0 ③	0	0	1
+20 ug/L Cu	2	1	1	0	1	1	↓	↓	1	1 ②	1	0 ③	1	8
	3	1	0	1	0	0	↓	↓	0	1 ②	0	1 ③	0	4
	4	0	↓	0	↓	↓	↓	↓	↓	0	1 ②	0	1 ③	0
FR_FRRD	1	↓	↓	↓	↓	↓	↓	↓	↓ ②	↓	↓ ③	3	↓	4
+20 ug/L Cu	2	↓	↓	↓	1	↓	0	↓	↓ ②	↓	↓ ③	4	↓	5
	3	↓	1	↓	0	↓	↑	↓	1	↓ ②	↓	0 ③	↓	2
	4	↓	0	↓	1	↓	↑	↓	0	1 ②	↓	1 ③	↓	2
FR_FR2	1	↓	↓	↓	0	↓	↓	↓	1 ②	0	1 ③	↓	1	2
+20 ug/L Cu	2	↓	↓	↓	1	↓	↓	1	↓	1 ②	0	↓ ③	2	5
	3	↓	↓	↓	0	↓	↓	0	2	0 ②	0	↓ ③	0	2
	4	↓	↓	↓	0	↓	↓	↓	0	0 ②	1	↓ ③	↓	1
FR_MULTIPLATE	1	↓	↓	↓	2	↓	↓	↓	1	3 ②	1	1 ③	↓	8
+20 ug/L Cu	2	↓	↓	↓	0	↓	↓	↓	0	0 ②	0	0	1 ③	0
	3	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓ ③	0 ③	↓	0
	4	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	3 ③	↓	3
	1													
	2													
	3													
	4													
	1													
	2													
	3													
	4													
	1													
	2													
	3													
	4													
	1													
	2													
	3													
	4													
Tech Initials		MM	MM	MM	MM	TM	HEC	MM	MM	MM	MM	MM	TM	MM

Comments: ① at eyed stage. ② starting to hatch ③ >50% hatched.

Reviewed by: [signature] **Date reviewed:** Dec 20, 2021

Embryo-Alevin Toxicity Test
Daily Mortality

Client: Teck
Sample ID: (various)
Work Order #: 212110

Start Date & Time: October 13, 2021 @ 1550h
Stop Date & Time: November 12, 2021 @ 0800h
Test Species: *Oncorhynchus mykiss*

Concentration	Rep	Day of Test - No. of Mortalities							Total Dead Embryos/ Alevins	Total ~~Undeveloped~~/ Abnormal Alevins Unhatched	Total No. Alevins – Normal	Total Exposed Eggs
		25	26	27	28	29	30	Mort-Day 25-30				
Dechlor +	1	0	0	0	0	0	0	0	1	0	29	30
20 µg/L Cu	2	~~1~~	~~0~~	0	1	1	3	5	5	5	20	30
	3	2	0	1	1	↓	0	4	6	2	21	29
	4	0	0	0	0	4	0	4	4	1	24	29
	1											
	2											
	3											
	4											
	1											
	2											
	3											
	4											
	1											
	2											
	3											
	4											
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	1											
	2											
	3											
	4											
	1											
	2											
	3											
	4											
	1											
	2											
	3											
	4											
Tech Initials		HEC	MM	MM	MM	[illegible]	MM	MM	MM	MM	MM	MM

Comments: See "Embryo-Alevin Test Termination Data Sheet" for detailed normality assessments

Reviewed by: [signature]
Date reviewed: Dec 21, 2021

Embryo-Alevin Toxicity Test
Daily Mortality

Client: Teck
Sample ID: (various)
Work Order #: 212110

Start Date & Time: October 13, 2021 @ 1550h
Stop Date & Time: November 12, 2021 @ 0800h
Test Species: *Oncorhynchus mykiss*

Concentration	Rep	Day of Test - No. of Mortalities						Mortality Day 25-30	Total Dead Embryos/ Alevins	Total Undeveloped/ Unhatched (Abnormal Alevins)	Total No. Alevins Normal	Total Exposed Eggs
		25	26	27	28	29	30					
Dechlor Control	1	0	0	0	0	0	1	1	2	1	26	29
	2	1	~~10~~	1	1	1	4	7	9	1	22	32
	3	0	0	1	1		0	2	7	0	22	29
	4				0			1	2	0	28	30
FR_UFR1	1			0				0	2	0	28	30
+20 µg/L Cu	2	1		0		1		2	3	1	25	29
	3	0	5	1	1	0		7	9	2	19	30
	4		0	0	0	1		2	3	0	27	30
GH_ER2	1			0	1	0	0	1	3	0	28	31
+20 µg/L Cu	2			1	0			1	1	2	26	29
	3		1	1	1			3	4	0	26	30
	4	1	0	0	2			3	5	0	25	30
CM_MC1	1	0		0	0			0	1	0	29	30
+20 µg/L Cu	2	~~1~~		1				2	2	1	28	31
	3	1	1	0				2	4	1	25	30
	4	0	0	1	2	1	1	4	5	0	25	30
LC_SLC	1				0	0	0	1	2	2	26	30
+20 µg/L Cu	2		0		2		2	4	5	0	24	29
	3		2		0		1	3	5	3	22	30
	4	2	2		1		0	5	5	3	22	30
FR_FRABCH1	1	0	0		1			1	5	0	24	29
+20 µg/L Cu	2	~~1~~	1		~~10~~			2	5	1	26	32
	3	~~10~~	0		0			0	5	2	23	30
	4	1						1	4	2	24	30
FR_FRCP1	1	0		1				1	4	1	24	29
+20 µg/L Cu	2			0			1	1	12	0	18	30
	3		1		1		1	2	10	0	19	29
	4	1	0		1		0	1	10	0	19	29
GH_FR1	1	3	0		0			3	6	0	24	30
+20 µg/L Cu	2	0	1	1	0	1		3	3	0	27	30
	3	1	1	0	1	0		2	8	1	22	31
	4	1	0	1	2	0		3	12	2	16	30
Tech Initials		HEC	MM	MM	MR	EM	MM	MM	MM	MM	MM	MM

Comments: See "Embryo-Alevin Test Termination Data Sheet" for detailed normality assessments.

Reviewed by: [signature]
Date reviewed: Dec. 20, 2021

Embryo-Alevin Toxicity Test
Daily Mortality

Client: Teck
Sample ID: (various)
Work Order #: 212110

Start Date & Time: October 13, 2021 @ 1550h
Stop Date & Time: November 12, 2021 @ 0800h
Test Species: *Oncorhynchus mykiss*

Concentration	Rep	Day of Test - No. of Mortalities							Total Dead Embryos/ Alevins	Total Abnormal Alevins Undeveloped/ Unhatched	Total No. Alevins – Normal	Total Exposed Eggs
		25	26	27	28	29	30	Morts Day 25-30				
GH-ERC	1	0	0	0	0	0	0	0	1	0	29	30
+20 ug/L Cu	2	0	HEC	0	↓	↓	2	2	3	3	24	30
	3	1	↓	2	↓	↓	0	3	6	2	21	29
	4	0	↓	4	2	↓	1	7	7	0	23	30
CM-MC2	1	0	↓	0	0	↓	0	0	3	0	27	30
+20 ug/L Cu	2	2	↓	↓	↓	↓	↓	2	2	0	28	30
	3	0	1	↓	↓	↓	↓	1	10	0	19	29
	4	0	1	3	1	↓	↓	5	6	0	25	31
EV-MC2	1	0	0	1	0	↓	↓	1	3	1	26	30
+20 ug/L Cu	2	2	3	1	↓	↓	↓	6	6	3	21	30
	3	1	1	1	↓	↓	↓	3	5	1	22	28
	4	4	0	2	1	↓	↓	7	11	0	19	30
EV-HCl	1	0	↓	0	0	↓	↓	0	2	1	27	30
+20 ug/L Cu	2	1	↓	↓	1	1	↓	3	4	1	25	30
	3	2	↓	↓	0	0	1	3	5	7	17	29
	4	1	1	↓	3	1	1	6	9	0	21	30
LC-DCDS	1	0	1	↓	2	↓	0	3	3	1	26	30
+20 ug/L Cu	2	↓	1	↓	1	↓	↓	2	3	0	27	30
	3	↓	0	1	0	↓	↓	1	5	2	23	30
	4	↓	↓	1	↓	↓	1	2	4	1	24	29
LC-LC3	1	↓	↓	0	1	↓	1	2	2	0	27	29
+20 ug/L Cu	2	↓	↓	↓	1	↓	0	1	1	1	28	30
	3	↓	↓	↓	0	↓	↓	0	1	3	26	30
	4	↓	1	↓	↓	↓	↓	1	3	1	26	30
LC-LC5	1	1	0	1	↓	↓	1	0	1	1	29	31
+20 ug/L Cu	2	1	1	1	1	↓	1	4	5	4	21	30
	3	0	0	1	1	↓	0	2	6	3	22	31
	4	0	1	0	0	↓	1	1	7	0	23	30
LC-LCDSSLCC	1	0	1	1	↓	↓	1	2	3	1	26	30
+20 ug/L Cu	2	1	2	0	1	↓	3	6	9	1	20	30
	3	1	1	↓	1	↓	0	3	5	1	24	30
	4	0	0	1	0	↓	1	1	2	0	27	29
Tech Initials		HEC	MW	MW	MW	MW	MW	MW	MW	MW	MW	MW

Comments: See "Embryo-Alevin Test Termination Data Sheet" for detailed normality assessments.

Reviewed by: [signature]

Date reviewed: Dec-20, 2021

Embryo-Alevin Toxicity Test
Daily Mortality

Client: Teck
Sample ID: (various)
Work Order #: 212110

Start Date & Time: October 13, 2021 @ 1550h
Stop Date & Time: November 12, 2021 @ 0800h
Test Species: *Oncorhynchus mykiss*

Concentration	Rep	Day of Test - No. of Mortalities							Total Dead Embryos/ Alevins	Total Abnormal/ Undeveloped/ Unhatched	Total No. Alevins - Normal	Total Exposed Eggs
		25	26	27	28	29	30	Morts Day 25-30				
FR-FR4	1	0	20	0	1	0	0	1	2	1	27	30
+20 µg/L Cu	2	↓	↓	↓	1	↓	↓	1	9	1	21	31
	3	↓	↓	↓	0	↓	↓	0	10	1	18	29
	4	1	↓	↓	↓	↓	1	2	7	0	23	30
FR-FRRD	1	0	↓	↓	↓	↓	0	0	4	0	27	31
+20 µg/L Cu	2	↓	·	↓	↓	↓	↓	1	7	1	24	32
	3	~~20~~	↓	1	↓	↓	↓	1	4	1	24	29
	4	27①	↓	~~0~~				27	30	0	0	30
FR-FR2	1	0	2	0	0	0	1	3	5	1	24	30
+20 µg/L Cu	2	0	3	1	↓	↓	1	5	11	1	18	30
	3	1	0	0	↓	↓	0	1	5	0	25	30
	4	2	↓	3	↓	↓	↓	5	7	0	23	30
FR_MULTIRATE	1	1	↓	0	↓	↓	↓	1	10	1	19	30
+20 µg/L Cu	2	0	↓	↓	↓	↓	↓	0	0	2	28	30
	3	↓	↓	↓	↓	↓	↓	0	5	1	24	30
	4	↓	↓	↓	3	↓	↓	3	6	1	22	29
	1											
	2											
	3											
	4											
	1											
	2											
	3											
	4											
	1											
	2											
	3											
	4											
	1											
	2											
	3											
	4											
Tech Initials		HEC	HEC	HEC	HEC	HEC	HEC	HEC	HEC	HEC	HEC	HEC

Comments: ① No aeration, the oil dead - replicate excluded from final analyses. See "Embryo Alevin Test Termination Data Sheet" for detailed normality assessments.

Reviewed by: HEC **Date reviewed:** Dec. 20, 2021

Embryo-Alevin Toxicity Test
Daily Microbial Observations

Client: Teck
Sample ID: (various)
Work Order #: 212110

Start Date & Time: October 13, 2021 @ 1550h
Stop Date & Time: November 12, 2021 @ 0800h
Test Species: *Oncorhynchus mykiss*

~~Te~~ ~~Sample ID~~ Sample ID	Rep	Day of Test													
		1		2		3		4		5		6		7	
		Live	Dead	Live	Dead	Live	Dead	Live	Dead	Live	Dead	Live	Dead	Live	Dead
Dechlor Control	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	2														
	3														
	4														
FR_UTR1	1														
+ 20 µg/L Cu	2														
	3														
	4														
GM_ER2	1														
+ 20 µg/L Cu	2														
	3														
	4														
CM_MC1	1														
+ 20 µg/L Cu	2														
	3														
	4														
LC_SLC	1														
+ 20 µg/L Cu	2														
	3														
	4														
FR_FRABCH	1														
+ 20 µg/L Cu	2														
	3														
	4														
FR_FRCP1	1														
+ 20 µg/L Cu	2														
	3														
	4														
GM_FR1	1														
+ 20 µg/L Cu	2														
	3														
	4														
Tech Initials		[illegible]	[illegible]	[illegible]	[illegible]	JMC	JMC	HEC	HEC	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Comments:

Version 1.1 Issued October 6, 2015

Reviewed by: [signature]

Date reviewed: Dec-23, 2021

Nautilus Environmental Company Inc.

Embryo-Alevin Toxicity Test
Daily Microbial Observations

Client: Teck
Sample ID: (Various)
Work Order #: 212110

Start Date & Time: October 13, 2021 @ 1550h
Stop Date & Time: November 12, 2021 @ 0800h
Test Species: *Oncorhynchus mykiss*

~~Sample ID~~ Sample ID	Rep	Day of Test													
		1		2		3		4		5		6		7	
		Live	Dead	Live	Dead	Live	Dead	Live	Dead	Live	Dead	Live	Dead	Live	Dead
GM-ERC	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+ 20 mg/L Cu	2														
	3														
	4														
CM-MC2	1														
+ 20 mg/L Cu	2														
	3														
	4														
EV-MC2	1														
+ 20 mg/L Cu	2														
	3														
	4														
EV-HC	1														
+ 20 mg/L Cu	2														
	3														
	4														
LC-DCDS	1														
+ 20 mg/L Cu	2														
	3														
	4														
LC-LC3	1														
+ 20 mg/L Cu	2														
	3														
	4														
LC-LC5	1														
+ 20 mg/L Cu	2														
	3														
	4														
LC-LCDSSECC	1														
+ 20 mg/L Cu	2														
	3														
	4	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
Tech Initials		MM	MM	MM	MM	EME	~~HEC~~ EME	HEC	HEC	MM	MM	MM	MM	MM	MM

Comments:

Reviewed by: [signature] **Date reviewed:** Dec-23-2021

Embryo-Alevin Toxicity Test
Daily Microbial Observations

Client: Teck
Sample ID: (Various)
Work Order #: 212110

Start Date & Time: October 13, 2021 @ 1550h
Stop Date & Time: November 12, 2021 @ 0800h
Test Species: *Oncorhynchus mykiss*

Sample ID	Rep	Day of Test													
		1		2		3		4		5		6		7	
		Live	Dead	Live	Dead	Live	Dead	Live	Dead	Live	Dead	Live	Dead	Live	Dead
FR-FR4 + 20 µL Cu	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	2	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
	3	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
	4	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
FR-FRRD + 20 µL Cu	1	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
	2	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
	3	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
	4	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
FR-FR2 + 20 µL Cu	1	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
	2	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
	3	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
	4	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
FR MULTIPLATE + 20 µL Cu	1	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
	2	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
	3	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
	4	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
	1														
	2														
	3														
	4														
Rechlor + 20 µL Cu	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	2	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
	3	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
	4	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
	1														
	2														
	3														
	4														
	1														
	2														
	3														
	4														
Tech Initials															

Comments:

Version 1.1 Issued October 6, 2015

Reviewed by:

Date reviewed: Dec-23, 2021

Embryo-Alevin Toxicity Test
Daily Microbial Observations

Client: Teck
Sample ID: Overlying
Work Order #: 212110

Start Date & Time: October 13, 2021 @ 1550h
Stop Date & Time: November 12, 2021 @ 0800h
Test Species: *Oncorhynchus mykiss*

Sample ID	Rep	Day of Test													
		#8		9		10		11		12		13		14	
		Live	Dead	Live	Dead	Live	Dead	Live	Dead	Live	Dead	Live	Dead	Live	Dead
Dechlor Control	1	0	0	0	0	0	0	6	0	0	0	0	0	0	0
	2	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
	3	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
	4	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
FR-UFR1 +20 mg/L Cu	1	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
	2	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
	3	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
	4	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
GH-ER2 +20 mg/L Cu	1	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
	2	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
	3	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
	4	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
CM-MC1 +20 mg/L Cu	1	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
	2	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
	3	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
	4	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
LC-SLC +20 mg/L Cu	1	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
	2	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
	3	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
	4	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
FR-FRABCH +20 mg/L Cu	1	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
	2	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
	3	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
	4	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
FR-FRCP1 +20 mg/L Cu	1	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
	2	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
	3	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
	4	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
GH-FR1 +20 mg/L Cu	1	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
	2	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
	3	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
	4	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
Tech Initials		MM	MM	MM	MM	EMC	EMC	HEC	HEC	MM	MM	MM	MM	MM	MM

Comments:

Version 1.1 Issued October 6, 2015
Reviewed by: MM **Date reviewed:** Dec 23/21

Embryo-Alevin Toxicity Test
Daily Microbial Observations

Client: Teck
Sample ID: (Various)
Work Order #: 212110

Start Date & Time: October 13, 2021 @ 1550h
Stop Date & Time: November 12, 2021 @ 0800h
Test Species: *Oncorhynchus mykiss*

Sample ID	Rep	Day of Test													
		8		9		10		11		12		13		14	
		Live	Dead	Live	Dead	Live	Dead	Live	Dead	Live	Dead	Live	Dead	Live	Dead
GH-ERC	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+20 µl/L Cu	2														
	3														
	4														
CM-MC2	1														
+20 µl/L Cu	2														
	3														
	4														
EV-MC2	1														
+20 µl/L Cu	2														
	3														
	4														
EV-HC1	1														
+20 µl/L Cu	2														
	3														
	4														
LC-DCDS	1														
+20 µl/L Cu	2														
	3														
	4														
LC-LC3	1														
+20 µl/L Cu	2														
	3														
	4														
LC-LC5	1														
+20 µl/L Cu	2														
	3														
	4														
LC-LCDSSLCC	1														
+20 µl/L Cu	2														
	3														
	4														
Tech Initials															

Comments:

Version 1.1 Issued October 6, 2015

Reviewed by: [signature]

Date reviewed: Dec 23/21

Embryo-Alevin Toxicity Test
Daily Microbial Observations

Client: Teck
Sample ID: (Various)
Work Order #: 212160

Start Date & Time: October 13, 2021 @ 1550h
Stop Date & Time: November 12, 2021 @ 0800h
Test Species: *Oncorhynchus mykiss*

Sample ID	Rep	Day of Test													
		8		9		10		11		12		13		14	
		Live	Dead	Live	Dead	Live	Dead	Live	Dead	Live	Dead	Live	Dead	Live	Dead
FR-FRC +20 mg/L Cu	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	2	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
	3	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
	4	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
FR-FRD +20 mg/L Cu	1	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
	2	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
	3	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
	4	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
FR-FRZ +20 mg/L Cu	1	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
	2	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
	3	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
	4	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
FR-MULTIPLATE +20 mg/L Cu	1	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
	2	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
	3	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
	4	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
	1														
	2						↓								
	3														
	4														
Dechlor +20 mg/L Cu	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	2	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
	3	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
	4	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
	1														
	2														
	3														
	4														
	1														
	2														
	3														
	4														
Tech Initials		MM	MM	MM	MM	JMC	JMC	HEC	HEC	MM	MM	MM	MM	MM	MM

Comments:

Version 1.1 Issued October 6, 2015

Reviewed by: MM **Date reviewed:** Dec 23/21

Embryo-Alevin Toxicity Test
Daily Microbial Observations

Client: Teck
Sample ID: (various)
Work Order #: 212110

Start Date & Time: October 13, 2021 @ 1550h
Stop Date & Time: November 12, 2021 @ 0800h
Test Species: *Oncorhynchus mykiss*

Sample ID	Rep	Day of Test													
		15		16		17		18		19		20		21	
		Live	Dead	Live	Dead	Live	Dead	Live	Dead	Live	Dead	Live	Dead	Live	Dead
Dechlor control	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	2	|	|	|	|	|	|	|	|	|	|	|	|	|	|
	3	|	|	|	|	|	|	|	|	|	|	|	|	|	|
	4	|	|	|	|	|	|	|	|	|	|	|	|	|	|
FR_UFR1 +20 µg/L Cu	1	|	|	|	|	|	|	|	|	|	|	|	|	|	|
	2	|	|	|	|	|	|	|	|	|	|	|	|	|	|
	3	|	|	|	|	|	|	|	|	|	|	|	|	|	|
	4	|	|	|	|	|	|	|	|	|	|	|	|	|	|
GH_ER2 +20 µg/L Cu	1	|	|	|	|	|	|	|	|	|	|	|	|	|	|
	2	|	|	|	|	|	|	|	|	|	|	|	|	|	|
	3	|	|	|	|	|	|	|	|	|	|	|	|	|	|
	4	|	|	|	|	|	|	|	|	|	|	|	|	|	|
CM_MC1 +20 µg/L Cu	1	|	|	|	|	|	|	|	|	|	|	|	|	|	|
	2	|	|	|	|	|	|	|	|	|	|	|	|	|	|
	3	|	|	|	|	|	|	|	|	|	|	|	|	|	|
	4	|	|	|	|	|	|	|	|	|	|	|	|	|	|
LC_SLC +20 µg/L Cu	1	|	|	|	|	|	|	|	|	|	|	|	|	|	|
	2	|	|	|	|	|	|	|	|	|	|	|	|	|	|
	3	|	|	|	|	|	|	|	|	|	|	|	|	|	|
	4	|	|	|	|	|	|	|	|	|	|	|	|	|	|
FR_FRABCM +20 µg/L Cu	1	|	|	|	|	|	|	|	|	|	|	|	|	|	|
	2	|	|	|	|	|	|	|	|	|	|	|	|	|	|
	3	|	|	|	|	|	|	|	|	|	|	|	|	|	|
	4	|	|	|	|	|	|	|	|	|	|	|	|	|	|
FR_FRCP1 +20 µg/L Cu	1	|	|	|	|	|	|	|	|	|	|	|	|	|	|
	2	|	|	|	| ①	|	|	|	|	|	|	|	| ①	|	|
	3	|	|	|	0	|	|	|	|	|	|	|	0	|	|
	4	|	|	|	|	|	|	|	|	|	|	|	|	|	|
GH_FR1 +20 µg/L Cu	1	|	|	|	|	|	|	|	|	|	|	|	|	|	|
	2	|	|	|	|	|	|	|	|	|	|	|	|	|	|
	3	|	|	|	|	|	|	|	|	|	|	|	|	|	|
	4	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
Tech Initials		MW	MW	MW	MW	JMC	JMC	HEC	HEC	MW	MW	MW	YMW	MW	MW

Comments: ① fungal growth appears hyphae!

Version 1.1 Issued October 6, 2015

Reviewed by: MW **Date reviewed:** Dec-23/21

Embryo-Alevin Toxicity Test
Daily Microbial Observations

Client: Teck
Sample ID: (various)
Work Order #: 212110

Start Date & Time: October 13, 2021 @ 1550h
Stop Date & Time: November 12, 2021 @ 0800h
Test Species: *Oncorhynchus mykiss*

Sample ID	Rep	Day of Test													
		15		16		17		18		19		20		21	
		Live	Dead	Live	Dead	Live	Dead	Live	Dead	Live	Dead	Live	Dead	Live	Dead
GH-ERC	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+ 20 µg/L Cu	2								0						
	3														
	4														
CM-MC2	1														
+ 20 µg/L Cu	2														
	3														
	4														
EV-MC2	1														
+ 20 µg/L Cu	2														
	3														
	4														
EV-HC1	1														
+ 20 µg/L Cu	2														
	3														
	4														
LC-DCDS	1														
+ 20 µg/L Cu	2														
	3														
	4														
LC-LC3	1														
+ 20 µg/L Cu	2														
	3														
	4														
LC-LC5	1														
+ 20 µg/L Cu	2														
	3														
	4														
LC-LCDSSLCC	1														
+ 20 µg/L Cu	2														
	3														
	4														
Tech Initials		UM	UM	UM	UM	JMC	JMC	HEC	HEC	UM	UM	UM	UM	UM	UM

Comments:

Version 1.1 Issued October 6, 2015

Reviewed by: [signature]

Date reviewed: Dec-23/21

Nautilus Environmental Company Inc.

Embryo-Alevin Toxicity Test
Daily Microbial Observations

Client: Teck
Sample ID: (various)
Work Order #: 212110

Start Date & Time: October 13, 2021 @ 1550h
Stop Date & Time: November 12, 2021 @ 0800h
Test Species: *Oncorhynchus mykiss*

Sample ID	Rep	Day of Test													
		15		16		17		18		19		20		21	
		Live	Dead	Live	Dead	Live	Dead	Live	Dead	Live	Dead	Live	Dead	Live	Dead
FR-FR4 +20 µg/L Cu	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	2	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
	3	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
	4	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
FR-FRD +20 µg/L Cu	1	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
	2	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
	3	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
	4	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
FR-FR2 +20 µg/L Cu	1	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
	2	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
	3	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
	4	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
FR MULTIPLATE +20 µg/L Cu	1	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
	2	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
	3	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
	4	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
	1														
	2														
	3														
	4														
Dechlor +20 µg/L Cu	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	2	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
	3	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
	4	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
	1														
	2														
	3														
	4														
	1														
	2														
	3														
	4														
Tech Initials		[illegible]	[illegible]	[illegible]	[illegible]	Jane	Jane	HEC	HEC	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Comments:

Version 1.1 Issued October 6, 2015

Reviewed by: [illegible] **Date reviewed:** Dec 23/21

Embryo-Alevin Toxicity Test
Daily Microbial Observations

Client: Teck
Sample ID: (various)
Work Order #: 212110

Start Date & Time: October 13, 2021 @ 1550h
Stop Date & Time: November 14, 2021 @ 0800h
Test Species: *Oncorhynchus mykiss*

Sample ID	Rep	Day of Test													
		22		23		24		25		26		27		28	
		Live	Dead	Live	Dead	Live	Dead	Live	Dead	Live	Dead	Live	Dead	Live	Dead
Dechlor Control	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	2														
	3														
	4														
FR-VFR1	1														
+ 20 µg/L Cu	2														
	3														
	4														
GH-ERZ	1		1 ①												
+ 20 µg/L Cu	2		0												
	3														
	4														
CH-MC1	1														
+ 20 µg/L Cu	2														
	3														
	4														
LC-SLC	1														
+ 20 µg/L Cu	2														
	3														
	4										1 ①				
FR-FRABCH	1		1 ①								0				
+ 20 µg/L Cu	2		0												
	3														
	4														
FR-FRCP1	1														
+ 20 µg/L Cu	2														
	3				1 ①										
	4				0										
GH-FR1	1										1 ①				
+ 20 µg/L Cu	2										1 ①				
	3										0				
	4										0				
Tech Initials		[illegible]	[illegible]	[illegible]	[illegible]	IMC	IMC	HEC	HEC	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Comments: ① fungal growth appears typical

Version 1.1 Issued October 6, 2015

Reviewed by: [signature]

Date reviewed: Dec-23/21

Nautilus Environmental Company Inc.

Embryo-Alevin Toxicity Test
Daily Microbial Observations

Client: Teck
Sample ID: (various)
Work Order #: 212110

Start Date & Time: October 13, 2021 @1550h
Stop Date & Time: November 12, 2021 @0800h
Test Species: *Oncorhynchus mykiss*

Sample ID	Rep	Day of Test													
		22		23		24		25		26		27		28	
		Live	Dead	Live	Dead	Live	Dead	Live	Dead	Live	Dead	Live	Dead	Live	Dead
GH_ERC + 20 µg/L Cu	1	5	0	0	0	0	0	0	0	0	0	0	0	0	0
	2														
	3												1		
	4												2 ①		
CM_MC2 + 20 µg/L Cu	1												0		
	2														
	3														
	4														
EV_MC2 + 20 µg/L Cu	1														
	2														
	3														
	4														
EV_HCl + 20 µg/L Cu	1														
	2														
	3														
	4														
LC_LCDS + 20 µg/L Cu	1														
	2														
	3		2												
	4		1 ①												
LC_LC3 + 20 µg/L Cu	1		0												
	2														
	3														
	4														
LC_LC5 + 20 µg/L Cu	1														
	2														
	3														
	4														
LC_LCDSSLCC + 20 µg/L Cu	1										1				
	2										1 ①				
	3										0				
	4	+	+	↓	↓	+	+	↓	↓	~	0	~	+	↓	↓
Tech Initials		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	HEC	HEC	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Comments: ① fungal growth appears typical

Version 1.1 Issued October 6, 2015
Reviewed by: [illegible] **Date reviewed:** Dec 23/21

Embryo-Alevin Toxicity Test
Daily Microbial Observations

Client: Teck
Sample ID: (various)
Work Order #: 212110

Start Date & Time: October 13, 2021 @ 1550h
Stop Date & Time: November 12, 2021 @ 0800h
Test Species: *Oncorhynchus mykiss*

Sample ID	Rep	Day of Test													
		22		23		24		25		26		27		28	
		Live	Dead	Live	Dead	Live	Dead	Live	Dead	Live	Dead	Live	Dead	Live	Dead
FR_FR4 + 20 mg/L Cu	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	2	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
	3	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
	4	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
FR_FRRD + 20 mg/L Cu	1	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
	2	↓	↓	↓	1	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
	3	↓	↓	↓	0	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
	4	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
FR_FR2 + 20 mg/L Cu	1	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
	2	↓	↓	↓	↓	↓	↓	↓	↓	↓	1	↓	↓	↓	↓
	3	↓	↓	↓	↓	↓	↓	↓	↓	↓	0	↓	1	↓	↓
	4	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	1	↓	↓
FR_MULTIPLATE + 20 mg/L Cu	1	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	0	↓	↓
	2	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
	3	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
	4	↓	↓	↓	1	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
	1														
	2														
	3														
	4														
Dechlor + 20 mg/L	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	2	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
	3	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
	4	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
	1														
	2														
	3														
	4														
	1														
	2														
	3														
	4														
Tech Initials		MR	MR	MR	MR	BMR	BMR	HEC	HEC	MR	MR	MR	MR	MR	MR

Comments: Dfungal growth appears typical

Version 1.1 Issued October 6, 2015

Reviewed by: [signature]

Date reviewed: Dec-23/21

Embryo-Alevin Toxicity Test
Daily Microbial Observations

Client: Teck
Sample ID: (various)
Work Order #: 212110

Start Date & Time: October 13, 2021 @ 1550h
Stop Date & Time: November 12, 2021 @ 0800h
Test Species: *Oncorhynchus mykiss*

Sample ID	Rep	Day of Test													
		29		30											
		Live	Dead	Live	Dead	Live	Dead	Live	Dead	Live	Dead	Live	Dead	Live	Dead
Dechlor control	1	0	0	0	0										
	2														
	3														
	4														
FR_UFR1	1														
+ 20 ug/L Cu	2														
	3														
	4														
GH-ER2	1														
+20 ug/L Cu	2														
	3														
	4														
GH_MC1	1														
+ 20 ug/L Cu	2														
	3														
	4														
LC-SLC	1														
+ 20 ug/L Cu	2														
	3														
	4														
FR_FRABCH	1														
	2														
	3														
	4														
FR-FRCP1	1														
+ 20 ug/L Cu	2														
	3														
	4														
GH-FR1	1														
+ 20 ug/L Cu	2														
	3														
	4	↓	↓	↓	↓										
Tech Initials		AM	AM	AM	AM										

Comments:

Version 1.1 Issued October 6, 2015

Reviewed by: [signature]

Date reviewed: Dec-23/21

Embryo-Alevin Toxicity Test
Daily Microbial Observations

Client: Teck
Sample ID: (various)
Work Order #: 212110

Start Date & Time: October 13, 2021 @ 1550h
Stop Date & Time: November 12, 2021 @ 0800h
Test Species: *Oncorhynchus mykiss*

Sample ID	Rep	Day of Test													
		29		30											
		Live	Dead	Live	Dead	Live	Dead	Live	Dead	Live	Dead	Live	Dead	Live	Dead
GM-ERC +20 µl/L Cu	1	0	0	0	0										
	2														
	3														
	4														
CM_MC2 +20 µl/L Cu	1														
	2														
	3														
	4														
EV_MC2 +20 µl/L Cu	1														
	2														
	3														
	4														
EV_MC1 +20 µl/L Cu	1														
	2														
	3														
	4														
LC-DC05 +20 µl/L Cu	1														
	2														
	3														
	4														
LC_LC3 +20 µl/L Cu	1														
	2														
	3														
	4														
LC_LC5 +20 µl/L Cu	1														
	2														
	3														
	4														
LC-LCDSSLCC +20 µl/L Cu	1														
	2														
	3														
	4	↓	↓	↓	↓										
Tech Initials		[illegible]	[illegible]	[illegible]	[illegible]										

Comments:

Reviewed by: [signature]

Date reviewed: Dec 23/21

Embryo-Alevin Toxicity Test
Daily Microbial Observations

Client: Teck
Sample ID: (Various)
Work Order #: 212110

Start Date & Time: October 13, 2021 @ 1550h
Stop Date & Time: November 12, 2021 @ 0800h
Test Species: *Oncorhynchus mykiss*

Sample ID	Rep	Day of Test													
		29		30											
		Live	Dead	Live	Dead	Live	Dead	Live	Dead	Live	Dead	Live	Dead	Live	Dead
FR-FR4	1	0	0	0	0										
+20 ug/L Cu	2														
	3														
	4														
FR-FRD	1														
+20 ug/L Cu	2														
	3														
	4														
FR-FR2	1														
+20 ug/L Cu	2														
	3														
	4														
FR MULTIPLATE	1														
+20 ug/L Cu	2														
	3														
	4	↓	↓	↓	↓										
	1														
	2														
	3														
	4														
Dichlor	1	0	0	0	0										
+20 ug/L Cu	2	↓	↓	↓	↓										
	3														
	4	↓	↓	↓	↓										
	1														
	2														
	3														
	4														
	1														
	2														
	3														
	4														
Tech Initials															

Comments: _____

Reviewed by: _____ **Date reviewed:** Dec-23/21

Embryo - Alevin Test Termination Data Sheet
Length, Wet Weight, Abnormalities

Client: **Teck**

Sample ID: **Dechlor Control**

Work Order No.: **212110**

Start Date: **October 13, 2021**

Termination Date: **November 12, 2021**

Treatment (% v/v) and Replicate	Fish	Length (mm)	Normal	Abnormal	Comments
A	1	19.5	✓		
	2	19.0	✓		
	3	19.0	✓		
	4	19.5	✓		
	5	19.5	✓		
	6	19.5	✓		
	7	19.5	✓		
	8	20.0	✓		
	9	19.5	✓		
	10	19.0	✓		
	11	19.0	✓		
	12	19.0	✓		
	13	19.0	✓		
	14	19.5	✓		
	15	19.0	✓		
	16	19.0	✓		
	17	19.5	✓		
	18	19.0	✓		
	19	19.5	✓		
	20	19.0	✓		
	21	18.5	✓		
	22	19.0	✓		
	23	19.0	✓		
	24	20.0	✓		
	25	20.0	✓		
	26	19.0	✓		
	27	17.5		✓	yolksac edema
	28				
	29				
	30				
	31				
	32				
	33				
	34				
	35				

Total wet weight (pooled): 2.33 g

Number of survivors: 27

Number of abnormal/have difficulty swimming: 1 / 0

Initials: YM

Reviewed by: [signature]

Date Reviewed: Dec. 20, 2021

Embryo - Alevin Test Termination Data Sheet
Length, Wet Weight, Abnormalities

Client: **Teck**

Start Date: **October 13, 2021**

Sample ID: **Dechlor Control**

Termination Date: **November 12, 2021**

Work Order No.: **212110**

Treatment (% v/v) and Replicate	Fish	Length (mm)	Normal	Abnormal	Comments
B	1	18.5	✓		
	2	17.5	✓		
	3	17.0	✓		
	4	17.5	✓		
	5	17.5	✓		
	6	16.5	✓		
	7	16.5	✓		
	8	16.0	✓		
	9	17.0	✓		
	10	16.5	✓		
	11	15.5	✓		
	12	16.0	✓		
	13	16.0	✓		
	14	16.0	✓		
	15	17.0	✓		
	16	17.5	✓		
	17	16.0	✓		
	18	15.0	✓		
	19	16.5	✓		
	20	17.0	✓		
	21	15.0	✓		
	22	14.0	✓		
	23	14.0		✓	Pale thin body
	24				
	25				
	26				
	27				
	28				
	29				
	30				
	31				
	32				
	33				
	34				
	35				

Total wet weight (pooled): 1.68g

Number of survivors: 23

Number of abnormal/have difficulty swimming: 1 / 0

Initials: YW

Reviewed by: [signature]

Date Reviewed: Dec-20, 2021

Embryo - Alevin Test Termination Data Sheet
Length, Wet Weight, Abnormalities

Client: **Teck**

Start Date: **October 13, 2021**

Sample ID: **Dechlor Control**

Termination Date: **November 12, 2021**

Work Order No.: **212110**

Treatment (% v/v) and Replicate	Fish	Length (mm)	Normal	Abnormal	Comments
C	1	18.5	✓		
	2	18.0	✓		
	3	19.0	✓		
	4	19.0	✓		
	5	17.0	✓		
	6	17.5	✓		
	7	19.5	✓		
	8	18.0	✓		
	9	18.0	✓		
	10	19.0	✓		
	11	19.5	✓		
	12	19.0	✓		
	13	19.0	✓		
	14	19.5	✓		
	15	18.0	✓		
	16	19.0	✓		
	17	19.0	✓		
	18	19.0	✓		
	19	18.0	✓		
	20	19.5	✓		
	21	18.5	✓		
	22	19.0	✓		
	23				
	24				
	25				
	26				
	27				
	28				
	29				
	30				
	31				
	32				
	33				
	34				
	35				

Total wet weight (pooled): 1.96 g

Number of survivors: 22

Number of abnormal/have difficulty swimming: 0 / 0

Initials: YW

Reviewed by: [signature]

Date Reviewed: Dec. 20, 2021

Embryo - Alevin Test Termination Data Sheet
Length, Wet Weight, Abnormalities

Client: **Teck**

Sample ID: **Dechlor Control**

Work Order No.: **212110**

Start Date: **October 13, 2021**

Termination Date: **November 12, 2021**

Treatment (% v/v) and Replicate	Fish	Length (mm)	Normal	Abnormal	Comments
D	1	21.5	✓		
	2	20.0	✓		
	3	20.5	✓		
	4	21.5	✓		
	5	20.5	✓		
	6	22.0	✓		
	7	21.0	✓		
	8	21.0	✓		
	9	21.0	✓		
	10	20.5	✓		
	11	21.0	✓		
	12	21.0	✓		
	13	21.0	✓		
	14	21.0	✓		
	15	21.0	✓		
	16	20.0	✓		
	17	20.5	✓		
	18	20.5	✓		
	19	21.0	✓		
	20	21.0	✓		
	21	21.0	✓		
	22	20.5	✓		
	23	21.0	✓		
	24	21.0	✓		
	25	19.5	✓		
	26	20.0	✓		
	27	20.5	✓		
	28	20.5	✓		
	29				
	30				
	31				
	32				
	33				
	34				
	35				

Total wet weight (pooled): 2.64g

Number of survivors: 28

Number of abnormal/have difficulty swimming: 0/0

Initials: YW

Reviewed by: [signature]

Date Reviewed: Dec 20, 2021

Embryo - Alevin Test Termination Data Sheet
Length, Wet Weight, Abnormalities

Client: **Teck**

Start Date: **October 13, 2021**

Sample ID: **Dechlor + 20 µg/L Cu**

Termination Date: **November 12, 2021**

Work Order No.: **212110**

Treatment (% v/v) and Replicate	Fish	Length (mm)	Normal	Abnormal	Comments
A	1	19.0	✓		
	2	18.5	✓		
	3	18.5	✓		
	4	17.5	✓		
	5	18.0	✓		
	6	19.0	✓		
	7	16.0	✓		
	8	18.0	✓		
	9	17.0	✓		
	10	19.5	✓		
	11	19.5	✓		
	12	19.0	✓		
	13	18.0	✓		
	14	19.0	✓		
	15	19.5	✓		
	16	18.5	✓		
	17	17.5	✓		
	18	19.0	✓		
	19	18.5	✓		
	20	18.5	✓		
	21	17.5	✓		
	22	18.0	✓		
	23	18.0	✓		
	24	18.0	✓		
	25	18.5	✓		
	26	18.0	✓		
	27	18.0	✓		
	28	18.5	✓		
	29	18.0	✓		
	30				
	31				
	32				
	33				
	34				
	35				

Total wet weight (pooled): 2.48 g

Number of survivors: 29

Number of abnormal/have difficulty swimming: 0 / 0

Initials: YW

Reviewed by: [signature]

Date Reviewed: Dec. 20, 2021

Embryo - Alevin Test Termination Data Sheet
Length, Wet Weight, Abnormalities

Client: **Teck**

Start Date: **October 13, 2021**

Sample ID: **Dechlor + 20 µg/L Cu**

Termination Date: **November 12, 2021**

Work Order No.: **212110**

Treatment (% v/v) and Replicate	Fish	Length (mm)	Normal	Abnormal	Comments
B	1	16.0	✓		
	2	16.0	✓		
	3	16.0	✓		
	4	17.0	✓		
	5	17.0	✓		
	6	16.5	✓		
	7	18.0	✓		
	8	17.0	✓		
	9	16.0	✓		
	10	15.5	✓		
	11	15.0	✓		
	12	16.5	✓		
	13	16.5	✓		
	14	15.5	✓		
	15	17.0	✓		
	16	17.0	✓		
	17	17.0	✓		
	18	17.5	✓		
	19	16.0	✓		
	20	15.5	✓		
	21	14.5		✓	pale thin body
	22	15.0		✓	pale thin body
	23	13.5	✓	✓	pale thin body
	24	13.0		✓	pale thin body, yolksac edema
	25	15.5		✓	pale thin body, yolksac edema.
	26				
	27				
	28				
	29				
	30				
	31				
	32				
	33				
	34				
	35				

Total wet weight (pooled): 1.77g

Number of survivors: 25

Number of abnormal/have difficulty swimming: 5 | 2

Initials: MM

Reviewed by: [signature]

Date Reviewed: Dec 20, 2021

Embryo - Alevin Test Termination Data Sheet
Length, Wet Weight, Abnormalities

Client: **Teck**

Sample ID: **Dechlor + 20 µg/L Cu**

Work Order No.: **212110**

Start Date: **October 13, 2021**

Termination Date: **November 12, 2021**

Treatment (% v/v) and Replicate	Fish	Length (mm)	Normal	Abnormal	Comments
C	1	17.5	✓		
	2	18.5	✓		
	3	17.5	✓		
	4	18.0	✓		
	5	18.5	✓		
	6	18.5	✓		
	7	18.0	✓		
	8	17.5	✓		
	9	19.0	✓		
	10	18.0	✓		
	11	18.0	✓		
	12	15.5	✓		
	13	15.0 ~~15.0~~	✓		
	14	17.5	✓		
	15	16.0	✓		
	16	17.5	✓		
	17	17.5	✓		
	18	18.5	✓		
	19	17.5	✓		
	20	19.0	✓		
	21	18.0	✓		
	22	15.0		✓	pale thin body
	23	15.5		✓	pale thin body, yolksac edema.
	24				
	25				
	26				
	27				
	28				
	29				
	30				
	31				
	32				
	33				
	34				
	35				

Total wet weight (pooled): 1.91g

Number of survivors: 23

Number of abnormal/have difficulty swimming: 2/1

Initials: HW

Reviewed by: [signature]

Date Reviewed: Dec 20, 2021

Embryo - Alevin Test Termination Data Sheet
Length, Wet Weight, Abnormalities

Client: **Teck**

Start Date: **October 13, 2021**

Sample ID: **Dechlor + 20 µg/L Cu**

Termination Date: **November 12, 2021**

Work Order No.: **212110**

Treatment (% v/v) and Replicate	Fish	Length (mm)	Normal	Abnormal	Comments
D	1	19.0	✓		
	2	19.0	✓		
	3	17.5	✓		
	4	19.0	✓		
	5	19.0	✓		
	6	18.0	✓		
	7	19.0	✓		
	8	19.5	✓		
	9	19.0	✓		
	10	18.5	✓		
	11	18.5	✓		
	12	18.0	✓		
	13	17.5	✓		
	14	17.0	✓		
	15	16.5	✓		
	16	19.0	✓		
	17	17.0	✓		
	18	17.5	✓		
	19	19.5	✓		
	20	19.5	✓		
	21	15.5	✓		
	22	19.5	✓		
	23	19.0	✓		
	24	18.5	✓		
	25	13.5		✓	pale thin body
	26				
	27				
	28				
	29				
	30				
	31				
	32				
	33				
	34				
	35				

Total wet weight (pooled): 2.10 g

Number of survivors: 25

Number of abnormal/have difficulty swimming: 1 | 0

Initials: YW

Reviewed by: [signature]

Date Reviewed: Dec 20, 2021

Embryo - Alevin Test Termination Data Sheet
Length, Wet Weight, Abnormalities

Client: **Teck**

Start Date: **October 13, 2021**

Sample ID: **FR_UFR1 + 20 µg/L Cu**

Termination Date: **November 12, 2021**

Work Order No.: **212110**

Treatment (% v/v) and Replicate	Fish	Length (mm)	Normal	Abnormal	Comments
100 A	1	19.0	✓		
	2	18.5	✓		
	3	18.0	✓		
	4	18.5	✓		
	5	18.0	✓		
	6	18.5	✓		
	7	17.5	✓		
	8	17.5	✓		
	9	18.5	✓		
	10	18.5	✓		
	11	18.5	✓		
	12	18.0	✓		
	13	17.5	✓		
	14	18.0	✓		
	15	18.5	✓		
	16	18.5	✓		
	17	18.0	✓		
	18	19.0	✓		
	19	17.5	✓		
	20	19.0	✓		
	21	18.0	✓		
	22	18.5	✓		
	23	18.5	✓		
	24	19.5	✓		
	25	16.0	✓		
	26	18.5	✓		
	27	17.5	✓		
	28	17.5	✓		
	29				
	30				
	31				
	32				
	33				
	34				
	35				

Total wet weight (pooled): 2.17g

Number of survivors: 28

Number of abnormal/have difficulty swimming: 0 | 0

Initials: YW

Reviewed by: [signature]

Date Reviewed: Dec 20, 2021

Embryo - Alevin Test Termination Data Sheet
Length, Wet Weight, Abnormalities

Client: **Teck**

Sample ID: **FR_UFR1 + 20 µg/L Cu**

Work Order No.: **212110**

Start Date: **October 13, 2021**

Termination Date: **November 12, 2021**

Treatment (% v/v) and Replicate	Fish	Length (mm)	Normal	Abnormal	Comments
100 B	1	17.5	✓		
	2	16.5	✓		
	3	18.5	✓		
	4	17.5	✓		
	5	18.0	✓		
	6	17.0	✓		
	7	16.5	✓		
	8	18.0	✓		
	9	17.0	✓		
	10	17.5	✓		
	11	18.0	✓		
	12	18.0	✓		
	13	19.0	✓		
	14	18.0	✓		
	15	17.5	✓		
	16	18.0	✓		
	17	18.5	✓		
	18	18.0	✓		
	19	19.0	✓		
	20	18.5	✓		
	21	17.5	✓		
	22	18.0	✓		
	23	18.0	✓		
	24	18.0	✓		
	25	17.5	✓		
	26	17.0		✓	abnormal jaw
	27				
	28				
	29				
	30				
	31				
	32				
	33				
	34				
	35				

Total wet weight (pooled): 1.94 g

Number of survivors: 26

Number of abnormal/have difficulty swimming: 1 / 0

Initials: YW

Reviewed by: [signature]

Date Reviewed: Dec 20, 2021

Embryo - Alevin Test Termination Data Sheet
Length, Wet Weight, Abnormalities

Client: **Teck**

Sample ID: **FR_UFR1 + 20 µg/L Cu**

Work Order No.: **212110**

Start Date: **October 13, 2021**

Termination Date: **November 12, 2021**

Treatment (% v/v) and Replicate	Fish	Length (mm)	Normal	Abnormal	Comments
100 C	1	19.0	✓		
	2	17.0	✓		
	3	19.0	✓		
	4	18.0	✓		
	5	19.5	✓		
	6	18.0	✓		
	7	20.0	✓		
	8	19.5	✓		
	9	19.5	✓		
	10	18.0	✓		
	11	17.5	✓		
	12	19.5	✓		
	13	18.5	✓		
	14	20.0	✓		
	15	18.5	✓		
	16	20.0	✓		
	17	18.5	✓		
	18	19.0	✓		
	19	19.0	✓		
	20	18.5		✓	scoliosis
	21	17.5		✓	scoliosis
	22				
	23				
	24				
	25				
	26				
	27				
	28				
	29				
	30				
	31				
	32				
	33				
	34				
	35				

Total wet weight (pooled): 1.91 g

Number of survivors: 21

Number of abnormal/have difficulty swimming: 2 | 2

Initials: YW

Reviewed by: [signature]

Date Reviewed: Dec. 20, 2021

Embryo - Alevin Test Termination Data Sheet
Length, Wet Weight, Abnormalities

Client: **Teck**

Start Date: **October 13, 2021**

Sample ID: **FR_UFR1 + 20 µg/L Cu**

Termination Date: **November 12, 2021**

Work Order No.: **212110**

Treatment (% v/v) and Replicate	Fish	Length (mm)	Normal	Abnormal	Comments
100 D	1	20.5	✓		
	2	20.0	✓		
	3	20.5	✓		
	4	20.0	✓		
	5	20.5	✓		
	6	18.5	✓		
	7	20.5	✓		
	8	20.5	✓		
	9	21.0	✓		
	10	20.0	✓		
	11	20.0	✓		
	12	20.5	✓		
	13	19.0	✓		
	14	20.0	✓		
	15	19.0	✓		
	16	18.5	✓		
	17	20.0	✓		
	18	19.5	✓		
	19	20.0	✓		
	20	19.5	✓		
	21	21.0	✓		
	22	20.0	✓		
	23	19.0	✓		
	24	19.0	✓		
	25	19.5	✓		
	26	18.0	✓		
	27	15.0	✓		
	28				
	29				
	30				
	31				
	32				
	33				
	34				
	35				

Total wet weight (pooled): 2.65 g

Number of survivors: 27

Number of abnormal/have difficulty swimming: 0 / 0

Initials: MW

Reviewed by: [signature]

Date Reviewed: Dec 20, 2021

Embryo - Alevin Test Termination Data Sheet
Length, Wet Weight, Abnormalities

Client: **Teck**

Sample ID: **GH_ER2 + 20 µg/L Cu**

Work Order No.: **212110**

Start Date: **October 13, 2021**

Termination Date: **November 12, 2021**

Treatment (% v/v) and Replicate	Fish	Length (mm)	Normal	Abnormal	Comments
100 A	1	20.0	✓		
	2	19.5	✓		
	3	19.0	✓		
	4	20.0	✓		
	5	19.5	✓		
	6	19.5	✓		
	7	19.5	✓		
	8	19.0	✓		
	9	19.0	✓		
	10	19.0	✓		
	11	19.5	✓		
	12	20.0	✓		
	13	19.0	✓		
	14	19.0	✓		
	15	20.0	✓		
	16	19.0	✓		
	17	20.0	✓		
	18	19.0	✓		
	19	19.5	✓		
	20	19.5	✓		
	21	19.0	✓		
	22	18.0	✓		
	23	20.0	✓		
	24	20.0	✓		
	25	20.0	✓		
	26	18.5	✓		
	27	19.0	✓		
	28	19.5	✓		
	29				
	30				
	31				
	32				
	33				
	34				
	35				

Total wet weight (pooled): 2.32g

Number of survivors: 28

Number of abnormal/have difficulty swimming: 0 / 0

Initials: YW

Reviewed by: [signature]

Date Reviewed: Dec 21, 2021

Embryo - Alevin Test Termination Data Sheet
Length, Wet Weight, Abnormalities

Client: **Teck**

Start Date: **October 13, 2021**

Sample ID: **GH_ER2 + 20 µg/L Cu**

Termination Date: **November 12, 2021**

Work Order No.: **212110**

Treatment (% v/v) and Replicate	Fish	Length (mm)	Normal	Abnormal	Comments
100 B	1	20.0	✓		
	2	19.0	✓		
	3	19.0	✓		
	4	19.0	✓		
	5	19.0	✓		
	6	18.5	✓		
	7	18.0	✓		
	8	20.0	✓		
	9	20.0	✓		
	10	19.0	✓		
	11	19.0	✓		
	12	19.5	✓		
	13	19.0	✓		
	14	19.5	✓		
	15	19.5	✓		
	16	19.0	✓		
	17	18.0	✓		
	18	19.0	✓		
	19	19.5	✓		
	20	19.5	✓		
	21	19.0	✓		
	22	19.0	✓		
	23	19.0	✓		
	24	20.0	✓		
	25	21.0	✓		
	26	19.5	✓		
	27	17.5		✓	yolksac edema
	28	16.5		✓	yolksac edema
	29				
	30				
	31				
	32				
	33				
	34				
	35				

Total wet weight (pooled): 2.19 g

Number of survivors: 28

Number of abnormal/have difficulty swimming: 2|0

Initials: YW

Reviewed by: [signature]

Date Reviewed: Dec 20, 2021

Embryo - Alevin Test Termination Data Sheet
Length, Wet Weight, Abnormalities

Client: **Teck**

Sample ID: **GH_ER2 + 20 µg/L Cu**

Work Order No.: **212110**

Start Date: **October 13, 2021**

Termination Date: **November 12, 2021**

Treatment (% v/v) and Replicate	Fish	Length (mm)	Normal	Abnormal	Comments
100 C	1	~~20.5~~ 20.5	✓		
	2	20.0	✓		
	3	19.5	✓		
	4	20.0	✓		
	5	19.0	✓		
	6	20.0	✓		
	7	20.0	✓		
	8	20.5	✓		
	9	20.0	✓		
	10	18.5	✓		
	11	19.0	✓		
	12	19.5	✓		
	13	19.5	✓		
	14	20.5	✓		
	15	20.0	✓		
	16	20.0	✓		
	17	20.5	✓		
	18	19.5	✓		
	19	20.0	✓		
	20	19.0	✓		
	21	18.5	✓		
	22	19.0	✓		
	23	20.0	✓		
	24	19.0	✓		
	25	19.5	✓		
	26	16.0	✓		
	27				
	28				
	29				
	30				
	31				
	32				
	33				
	34				
	35				

Total wet weight (pooled): 2.40 g

Number of survivors: 26

Number of abnormal/have difficulty swimming: 0/0

Initials: HW

Reviewed by: [signature]

Date Reviewed: Dec-20, 2021

Embryo - Alevin Test Termination Data Sheet
Length, Wet Weight, Abnormalities

Client: **Teck**

Start Date: **October 13, 2021**

Sample ID: **GH_ER2 + 20 µg/L Cu**

Termination Date: **November 12, 2021**

Work Order No.: **212110**

Treatment (% v/v) and Replicate	Fish	Length (mm)	Normal	Abnormal	Comments
100 D	1	17.5	✓		
	2	21.0	✓		
	3	20.0	✓		
	4	20.0	✓		
	5	20.0	✓		
	6	20.0	✓		
	7	19.5	✓		
	8	19.0	✓		
	9	19.0	✓		
	10	19.5	✓		
	11	19.5	✓		
	12	20.0	✓		
	13	19.5	✓		
	14	20.5	✓		
	15	21.0	✓		
	16	19.5	✓		
	17	20.0	✓		
	18	21.5	✓		
	19	19.0	✓		
	20	21.0	✓		
	21	19.5	✓		
	22	19.5	✓		
	23	20.0	✓		
	24	20.0	✓		
	25	20.0	✓		
	26				
	27				
	28				
	29				
	30				
	31				
	32				
	33				
	34				
	35				

Total wet weight (pooled): 2.47 g

Number of survivors: 25

Number of abnormal/have difficulty swimming: 0/0

Initials: YW

Reviewed by: [signature]

Date Reviewed: Dec-20, 2021

Embryo - Alevin Test Termination Data Sheet
Length, Wet Weight, Abnormalities

Client: **Teck**

Sample ID: **CM_MC1 + 20 µg/L Cu**

Work Order No.: **212110**

Start Date: **October 13, 2021**

Termination Date: **November 12, 2021**

Treatment (% v/v) and Replicate	Fish	Length (mm)	Normal	Abnormal	Comments
100 A	1	19.0	✓		
	2	19.0	✓		
	3	19.0	✓		
	4	19.5	✓		
	5	19.0	✓		
	6	19.0	✓		
	7	19.5	✓		
	8	19.0	✓		
	9	20.0	✓		
	10	19.0	✓		
	11	19.0	✓		
	12	19.5	✓		
	13	19.5	✓		
	14	19.5	✓		
	15	19.0	✓		
	16	20.0	✓		
	17	19.5	✓		
	18	19.5	✓		
	19	19.0	✓		
	20	19.0	✓		
	21	19.0	✓		
	22	19.0	✓		
	23	19.0	✓		
	24	19.5	✓		
	25	19.0	✓		
	26	18.5	✓		
	27	19.0	✓		
	28	19.5	✓		
	29	19.5	✓		
	30				
	31				
	32				
	33				
	34				
	35				

Total wet weight (pooled): 2.41 g

Number of survivors: 29

Number of abnormal/have difficulty swimming: 0 | 0

Initials: VW

Reviewed by: [signature]

Date Reviewed: Dec-20, 2021

Embryo - Alevin Test Termination Data Sheet
Length, Wet Weight, Abnormalities

Client: **Teck**

Start Date: **October 13, 2021**

Sample ID: **CM_MC1 + 20 µg/L Cu**

Termination Date: **November 12, 2021**

Work Order No.: **212110**

Treatment (% v/v) and Replicate	Fish	Length (mm)	Normal	Abnormal	Comments
100 B	1	18.5	✓		
	2	18.5	✓		
	3	17.5	✓		
	4	18.0	✓		
	5	18.5	✓		
	6	19.0	✓		
	7	19.5	✓		
	8	18.0	✓		
	9	19.0	✓		
	10	19.5	✓		
	11	17.5	✓		
	12	17.5	✓		
	13	19.0	✓		
	14	18.0	✓		
	15	18.0	✓		
	16	17.0	✓		
	17	18.5	✓		
	18	19.5	✓		
	19	17.5	✓		
	20	17.5	✓		
	21	17.0	✓		
	22	18.5	✓		
	23	18.5	✓		
	24	18.0	✓		
	25	18.5	✓		
	26	18.0	✓		
	27	17.0	✓		
	28	19.0	✓		
	29	19.5		✓	pale thin body
	30				
	31				
	32				
	33				
	34				
	35				

Total wet weight (pooled): 2.30g

Number of survivors: 29

Number of abnormal/have difficulty swimming: 1 | 0

Initials: MW

Reviewed by: [signature]

Date Reviewed: Dec 22, 2021

Embryo - Alevin Test Termination Data Sheet
Length, Wet Weight, Abnormalities

Client: **Teck**

Sample ID: **CM_MC1 + 20 µg/L Cu**

Work Order No.: **212110**

Start Date: **October 13, 2021**

Termination Date: **November 12, 2021**

Treatment (% v/v) and Replicate	Fish	Length (mm)	Normal	Abnormal	Comments
100 C	1	19.0	✓		
	2	17.5	✓		
	3	18.5	✓		
	4	19.0	✓		
	5	19.5	✓		
	6	17.0	✓		
	7	18.5	✓		
	8	20.5	✓		
	9	19.5	✓		
	10	20.0	✓		
	11	20.5	✓		
	12	20.0	✓		
	13	20.0	✓		
	14	19.0	✓		
	15	19.0	✓		
	16	21.0	✓		
	17	19.0	✓		
	18	21.0	✓		
	19	19.0	✓		
	20	19.5	✓		
	21	20.0	✓		
	22	20.0	✓		
	23	18.0	✓		
	24	19.5	✓		
	25	20.0	✓		
	26	17.5		✓	abnormal jaw.
	27				
	28				
	29				
	30				
	31				
	32				
	33				
	34				
	35				

Total wet weight (pooled): 2.40 g

Number of survivors: 26

Number of abnormal/have difficulty swimming: 1/0

Initials: HW

Reviewed by: [signature]

Date Reviewed: Dec 20, 2021

Embryo - Alevin Test Termination Data Sheet
Length, Wet Weight, Abnormalities

Client: **Teck**

Start Date: **October 13, 2021**

Sample ID: **CM_MC1 + 20 µg/L Cu**

Termination Date: **November 12, 2021**

Work Order No.: **212110**

Treatment (% v/v) and Replicate	Fish	Length (mm)	Normal	Abnormal	Comments
100 D	1	18.5	✓		
	2	19.0	✓		
	3	19.0	✓		
	4	18.0	✓		
	5	19.0	✓		
	6	18.5	✓		
	7	19.0	✓		
	8	20.0	✓		
	9	19.5	✓		
	10	19.5	✓		
	11	18.0	✓		
	12	18.5	✓		
	13	20.0	✓		
	14	19.5	✓		
	15	20.0	✓		
	16	18.5	✓		
	17	20.0	✓		
	18	20.5	✓		
	19	20.0	✓		
	20	19.5	✓		
	21	18.5	✓		
	22	18.0	✓		
	23	19.5	✓		
	24	18.0	✓		
	25	15.5	✓		
	26				
	27				
	28				
	29				
	30				
	31				
	32				
	33				
	34				
	35				

Total wet weight (pooled): 2.21g

Number of survivors: 25

Number of abnormal/have difficulty swimming: 0 | 0

Initials: YW

Reviewed by: [signature]

Date Reviewed: Dec 20, 2021

Embryo - Alevin Test Termination Data Sheet
Length, Wet Weight, Abnormalities

Client: **Teck**

Start Date: **October 13, 2021**

Sample ID: **LC_SLC + 20 µg/L Cu**

Termination Date: **November 12, 2021**

Work Order No.: **212110**

Treatment (% v/v) and Replicate	Fish	Length (mm)	Normal	Abnormal	Comments
100 A	1	18.5	✓		
	2	19.0	✓		
	3	19.0	✓		
	4	18.5	✓		
	5	18.5	✓		
	6	18.5	✓		
	7	18.5	✓		
	8	17.5	✓		
	9	18.0	✓		
	10	18.5	✓		
	11	17.5	✓		
	12	18.5	✓		
	13	18.0	✓		
	14	18.5	✓		
	15	17.0	✓		
	16	18.0	✓		
	17	18.0	✓		
	18	18.0	✓		
	19	17.5	✓		
	20	17.5	✓		
	21	18.5	✓		
	22	17.5	✓		
	23	17.5	✓		
	24	17.0	✓		
	25	18.0	✓		
	26	17.5	✓		
	27	15.5		✓	pale thin body
	28	17.0		✓	yolksac edema
	29				
	30				
	31				
	32				
	33				
	34				
	35				

Total wet weight (pooled): 2.22g

Number of survivors: 28

Number of abnormal/have difficulty swimming: 2 | 0

Initials: MW

Reviewed by: [signature]

Date Reviewed: Dec. 20, 2021

Embryo - Alevin Test Termination Data Sheet
Length, Wet Weight, Abnormalities

Client: **Teck**

Sample ID: **LC_SLC + 20 µg/L Cu**

Work Order No.: **212110**

Start Date: **October 13, 2021**

Termination Date: **November 12, 2021**

Treatment (% v/v) and Replicate	Fish	Length (mm)	Normal	Abnormal	Comments
100 B	1	16.5	✓		
	2	16.5	✓		
	3	16.0	✓		
	4	18.5	✓		
	5	18.0	✓		
	6	19.5	✓		
	7	17.0	✓		
	8	18.0	✓		
	9	18.0	✓		
	10	18.5	✓		
	11	18.5	✓		
	12	18.0	✓		
	13	18.0	✓		
	14	18.0	✓		
	15	17.5	✓		
	16	17.0	✓		
	17	18.5	✓		
	18	17.5	✓		
	19	18.5	✓		
	20	19.0	✓		
	21	17.5	✓		
	22	17.5	✓		
	23	15.5	✓		
	24	15.0	✓		
	25				
	26				
	27				
	28				
	29				
	30				
	31				
	32				
	33				
	34				
	35				

Total wet weight (pooled): 1.719

Number of survivors: 24

Number of abnormal/have difficulty swimming: 0 | 0

Initials: YW

Reviewed by: [signature]

Date Reviewed: Dec-20, 2021

Embryo - Alevin Test Termination Data Sheet
Length, Wet Weight, Abnormalities

Client: **Teck**

Sample ID: **LC_SLC + 20 µg/L Cu**

Work Order No.: **212110**

Start Date: **October 13, 2021**

Termination Date: **November 12, 2021**

Treatment (% v/v) and Replicate	Fish	Length (mm)	Normal	Abnormal	Comments
100 C	1	19.0	✓		
	2	18.5	✓		
	3	19.0	✓		
	4	19.5	✓		
	5	18.0	✓		
	6	17.0	✓		
	7	19.5	✓		
	8	19.0	✓		
	9	19.0	✓		
	10	18.5	✓		
	11	18.5	✓		
	12	18.0	✓		
	13	17.5	✓		
	14	17.5	✓		
	15	18.0	✓		
	16	18.0	✓		
	17	17.5	✓		
	18	18.5	✓		
	19	16.5	✓		
	20	18.5	✓		
	21	17.5	✓		
	22	17.5	✓		
	23	17.0		✓	yolksac edema
	24	16.0		✓	pale thin body, lordosis
	25	17.5		✓	scoliosis
	26				
	27				
	28				
	29				
	30				
	31				
	32				
	33				
	34				
	35				

Total wet weight (pooled): 2.21g

Number of survivors: 25

Number of abnormal/have difficulty swimming: 3 | 2

Initials: YML

Reviewed by: [signature]

Date Reviewed: Dec 20, 2021

Embryo - Alevin Test Termination Data Sheet
Length, Wet Weight, Abnormalities

Client: **Teck**

Start Date: **October 13, 2021**

Sample ID: **LC_SLC + 20 µg/L Cu**

Termination Date: **November 12, 2021**

Work Order No.: **212110**

Treatment (% v/v) and Replicate	Fish	Length (mm)	Normal	Abnormal	Comments
100	1	18.5	✓		
	2	19.0	✓		
	3	19.0	✓		
	4	19.5	✓		
	5	20.0	✓		
	6	19.0	✓		
	7	17.0	✓		
	8	19.0	✓		
	9	18.0	✓		
	10	19.5	✓		
	11	18.5	✓		
	12	18.0	✓		
	13	19.5	✓		
	14	18.5	✓		
	15	20.0	✓		
	16	20.0	✓		
	17	17.0	✓		
	18	20.0	✓		
	19	18.0	✓		
	20	18.5	✓		
	21	19.5	✓		
	22	18.5	✓		
	23	16.0		✓	yolksac edema
	24	15.5		✓	pale thin body
	25	17.5		✓	kyphosis
	26				
	27				
	28				
	29				
	30				
	31				
	32				
	33				
	34				
	35				

Total wet weight (pooled): 2.23g

Number of survivors: 25

Number of abnormal/have difficulty swimming: 3 | 1

Initials: UW

Reviewed by: [signature]

Date Reviewed: Dec 20, 2021

Embryo - Alevin Test Termination Data Sheet
Length, Wet Weight, Abnormalities

Client: **Teck**

Sample ID: **FR_FRABCH + 20 µg/L Cu**

Work Order No.: **212110**

Start Date: **October 13, 2021**

Termination Date: **November 12, 2021**

Treatment (% v/v) and Replicate	Fish	Length (mm)	Normal	Abnormal	Comments
100 A	1	19.0	✓		
	2	19.5	✓		
	3	19.0	✓		
	4	19.0	✓		
	5	19.5	✓		
	6	20.0	✓		
	7	19.5	✓		
	8	20.0	✓		
	9	20.0	✓		
	10	20.0	✓		
	11	19.0	✓		
	12	17.5	✓		
	13	20.5	✓		
	14	19.5	✓		
	15	20.0	✓		
	16	19.5	✓		
	17	19.5	✓		
	18	19.5	✓		
	19	19.5	✓		
	20	20.0	✓		
	21	19.5	✓		
	22	19.0	✓		
	23	18.5	✓		
	24	19.5	✓		
	25				
	26				
	27				
	28				
	29				
	30				
	31				
	32				
	33				
	34				
	35				

Total wet weight (pooled): 2.05 g

Number of survivors: 24

Number of abnormal/have difficulty swimming: 0 | 0

Initials: AWD, MM

Reviewed by: [signature]

Date Reviewed: Dec-20, 2021

Embryo - Alevin Test Termination Data Sheet
Length, Wet Weight, Abnormalities

Client: **Teck**

Sample ID: **FR_FRABCH + 20 µg/L Cu**

Work Order No.: **212110**

Start Date: **October 13, 2021**

Termination Date: **November 12, 2021**

Treatment (% v/v) and Replicate	Fish	Length (mm)	Normal	Abnormal	Comments
100	1	18.0	✓		
	2	19.5	✓		
	3	19.0	✓		
	4	18.0	✓		
B	5	19.0	✓		
	6	19.0	✓		
	7	19.0	✓		
	8	18.0	✓		
	9	19.5	✓		
	10	18.5	✓		
	11	19.0	✓		
	12	19.5	✓		
	13	18.5	✓		
	14	19.0	✓		
	15	19.5	✓		
	16	20.0	✓		
	17	19.0	✓		
	18	19.0	✓		
	19	19.5	✓		
	20	17.0	✓		
	21	19.0	✓		
	22	18.0	✓		
	23	19.0	✓		
	24	19.0	✓		
	25	18.5	✓		
	26	17.5	✓		
	27	19.0		X	yolksac edema
	28				
	29				
	30				
	31				
	32				
	33				
	34				
	35				

Total wet weight (pooled): 2.19 g

Number of survivors: 27

Number of abnormal/have difficulty swimming: 1 / 0

Initials: AWD, YW

Reviewed by: [signature]

Date Reviewed: Dec. 20, 2021

Embryo - Alevin Test Termination Data Sheet
Length, Wet Weight, Abnormalities

Client: **Teck**

Sample ID: **FR_FRABCH + 20 µg/L Cu**

Work Order No.: **212110**

Start Date: **October 13, 2021**

Termination Date: **November 12, 2021**

Treatment (% v/v) and Replicate	Fish	Length (mm)	Normal	Abnormal	Comments
100 C	1	20.5	✓		
	2	21.0	✓		
	3	20.5	✓		
	4	20.0	✓		
	5	21.0	✓		
	6	20.0	✓		
	7	19.0	✓		
	8	19.5	✓		
	9	19.5	✓		
	10	21.5	✓		
	11	18.5	✓		
	12	20.5	✓		
	13	20.0	✓		
	14	20.0	✓		
	15	21.0	✓		
	16	20.0	✓		
	17	20.5	✓		
	18	20.5	✓		
	19	19.5	✓		
	20	20.5	✓		
	21	20.5	✓		
	22	20.5	✓		
	23	20.0	✓		
	24	17.0	✓	✓	yolksac edema
	25	19.5	✓	✓	yolksac edema
	26				
	27				
	28				
	29				
	30				
	31				
	32				
	33				
	34				
	35				

Total wet weight (pooled): 2.52 g

Number of survivors: 25

Number of abnormal/have difficulty swimming: 2 ~~0~~ 10

Initials: AWD, YUL

Reviewed by: [signature]

Date Reviewed: Dec 20, 2021

Embryo - Alevin Test Termination Data Sheet
Length, Wet Weight, Abnormalities

Client: **Teck**

Start Date: **October 13, 2021**

Sample ID: **FR_FRABCH + 20 µg/L Cu**

Termination Date: **November 12, 2021**

Work Order No.: **212110**

Treatment (% v/v) and Replicate	Fish	Length (mm)	Normal	Abnormal	Comments
100 D1	1	21.0	✓		
	2	21.0	✓		
	3	21.5	✓		
	4	21.0	✓		
	5	21.5	✓		
	6	21.5	✓		
	7	21.5	✓		
	8	20.5	✓		
	9	21.5	✓		
	10	21.0	✓		
	11	22.0	✓		
	12	21.0	✓		
	13	21.0	✓		
	14	21.0	✓		
	15	20.5	✓		
	16	21.5	✓		
	17	21.0	✓		
	18	20.5	✓		
	19	21.0	✓		
	20	21.0	✓		
	21	21.0	✓		
	22	20.5	✓		
	23	20.0	✓		
	24	20.0	✓		
	25	17.0		✓	yolksac edema
	26	21.0		✓	kyphosis
	27				
	28				
	29				
	30				
	31				
	32				
	33				
	34				
	35				

Total wet weight (pooled): 2.77 g

Number of survivors: 26

Number of abnormal/have difficulty swimming: 2 | 1

Initials: AWD MML

Reviewed by: [signature]

Date Reviewed: Dec 20, 2021

Embryo - Alevin Test Termination Data Sheet
Length, Wet Weight, Abnormalities

Client: **Teck**

Start Date: **October 13, 2021**

Sample ID: **FR_FRCP1 + 20 µg/L Cu**

Termination Date: **November 12, 2021**

Work Order No.: **212110**

Treatment (% v/v) and Replicate	Fish	Length (mm)	Normal	Abnormal	Comments
100 A	1	20.0	✓		
	2	20.0	✓		
	3	20.5	✓		
	4	20 ~~20.5~~	✓		
	5	20.5	✓		
	6	19.5	✓		
	7	19.5	✓		
	8	20.0	✓		
	9	18.5	✓		
	10	20.5	✓		
	11	20.0	✓		
	12	20.0	✓		
	13	19.5	✓		
	14	20.5	✓		
	15	20.0	✓		
	16	20.0	✓		
	17	20.0	✓		
	18	19.5	✓		
	19	20.5	✓		
	20	19.5	✓		
	21	20.0	✓		
	22	20.0	✓		
	23	20.5	✓		
	24	19.5	✓		
	25	17.0		✓	yolksac edema, abnormal jaw.
	26				
	27				
	28				
	29				
	30				
	31				
	32				
	33				
	34				
	35				

Total wet weight (pooled): 2.34 g

Number of survivors: 25

Number of abnormal/have difficulty swimming: 1 | 0

Initials: AWD MW

Reviewed by: [signature]

Date Reviewed: Dec 20, 2021

Embryo - Alevin Test Termination Data Sheet
Length, Wet Weight, Abnormalities

Client: **Teck**

Start Date: **October 13, 2021**

Sample ID: **FR_FRCP1 + 20 µg/L Cu**

Termination Date: **November 12, 2021**

Work Order No.: **212110**

Treatment (% v/v) and Replicate	Fish	Length (mm)	Normal	Abnormal	Comments
100 B	1	18.5	✓		
	2	18.5	✓		
	3	18.5	✓		
	4	19.0	✓		
	5	19.0	✓		
	6	18.0	✓		
	7	18.0	✓		
	8	17.5	✓		
	9	18.0	✓		
	10	19.0	✓		
	11	18.0	✓		
	12	18.5	✓		
	13	17.0	✓		
	14	19.0	✓		
	15	18.0	✓		
	16	16.0	✓		
	17	17.0	✓		
	18	18.5	✓		
	19				
	20				
	21				
	22				
	23				
	24				
	25				
	26				
	27				
	28				
	29				
	30				
	31				
	32				
	33				
	34				
	35				

Total wet weight (pooled): 1.41g

Number of survivors: 18

Number of abnormal/have difficulty swimming: 0 / 0

Initials: YW

Reviewed by: [signature]

Date Reviewed: Dec. 20, 2021

Embryo - Alevin Test Termination Data Sheet
Length, Wet Weight, Abnormalities

Client: **Teck**

Start Date: **October 13, 2021**

Sample ID: **FR_FRCP1 + 20 µg/L Cu**

Termination Date: **November 12, 2021**

Work Order No.: **212110**

Treatment (% v/v) and Replicate	Fish	Length (mm)	Normal	Abnormal	Comments
100 C	1	21.0	✓		
	2	20.0	✓		
	3	19.5	✓		
	4	20.5	✓		
	5	21.0	✓		
	6	20.0	✓		
	7	22.0	✓		
	8	21.0	✓		
	9	21.0	✓		
	10	21.5	✓		
	11	21.5	✓		
	12	19.0	✓		
	13	20.0	✓		
	14	20.5	✓		
	15	20.5	✓		
	16	20.5	✓		
	17	19.0	✓		
	18	19.0	✓		
	19	21.0	✓		
	20				
	21				
	22				
	23				
	24				
	25				
	26				
	27				
	28				
	29				
	30				
	31				
	32				
	33				
	34				
	35				

Total wet weight (pooled): 1.943

Number of survivors: 19

Number of abnormal/have difficulty swimming: 0 | 0

Initials: VML

Reviewed by: [signature]

Date Reviewed: Dec 22, 2021

Embryo - Alevin Test Termination Data Sheet
Length, Wet Weight, Abnormalities

Client: **Teck**

Sample ID: **FR_FRCP1 + 20 µg/L Cu**

Work Order No.: **212110**

Start Date: **October 13, 2021**

Termination Date: **November 12, 2021**

Treatment (% v/v) and Replicate	Fish	Length (mm)	Normal	Abnormal	Comments
100 D	1	20.5	✓		
	2	21.0	✓		
	3	22.0	✓		
	4	21.0	✓		
	5	20.0	✓		
	6	19.0	✓		
	7	21.0	✓		
	8	20.0	✓		
	9	19.0	✓		
	10	20.0	✓		
	11	21.5	✓		
	12	21.5	✓		
	13	20.0	✓		
	14	20.0	✓		
	15	21.0	✓		
	16	21.0	✓		
	17	20.0	✓		
	18	21.0	✓		
	19	17.5	✓		
	20				
	21				
	22				
	23				
	24				
	25				
	26				
	27				
	28				
	29				
	30				
	31				
	32				
	33				
	34				
	35				

Total wet weight (pooled): 1.933

Number of survivors: 19

Number of abnormal/have difficulty swimming: 0 / 0

Initials: MM

Reviewed by: [signature]

Date Reviewed: Dec 20, 2021

Embryo - Alevin Test Termination Data Sheet
Length, Wet Weight, Abnormalities

Client: **Teck**

Start Date: **October 13, 2021**

Sample ID: **GH_FR1 + 20 µg/L Cu**

Termination Date: **November 12, 2021**

Work Order No.: **212110**

Treatment (% v/v) and Replicate	Fish	Length (mm)	Normal	Abnormal	Comments
100 A	1	19.5	✓		
	2	19.0	✓		
	3	20.0	✓		
	4	18.0	✓		
	5	20.0	✓		
	6	19.0	✓		
	7	19.0	✓		
	8	20.0	✓		
	9	20.5	✓		
	10	19.0	✓		
	11	20.5	✓		
	12	19.0	✓		
	13	19.5	✓		
	14	~~20.0~~	✓		
	15	19.5	✓		
	16	19.0	✓		
	17	19.0	✓		
	18	19.0	✓		
	19	19.5	✓		
	20	19.5	✓		
	21	19.0	✓		
	22	19.5	✓		
	23	19.0	✓		
	24	19.5	✓		
	25				
	26				
	27				
	28				
	29				
	30				
	31				
	32				
	33				
	34				
	35				

Total wet weight (pooled): 2.19 g

Number of survivors: 24

Number of abnormal/have difficulty swimming: 0/0

Initials: YW

Reviewed by: [signature]

Date Reviewed: Dec. 20, 2021

Embryo - Alevin Test Termination Data Sheet
Length, Wet Weight, Abnormalities

Client: **Teck**

Start Date: **October 13, 2021**

Sample ID: **GH_FR1 + 20 µg/L Cu**

Termination Date: **November 12, 2021**

Work Order No.: **212110**

Treatment (% v/v) and Replicate	Fish	Length (mm)	Normal	Abnormal	Comments
100 B	1	19.0	✓		
	2	19.5	✓		
	3	19.0	✓		
	4	19.5	✓		
	5	20.0	✓		
	6	19.5	✓		
	7	19.5	✓		
	8	19.5	✓		
	9	19.0	✓		
	10	18.5	✓		
	11	20.0	✓		
	12	20.0	✓		
	13	19.0	✓		
	14	19.0	✓		
	15	19.5	✓		
	16	19.5	✓		
	17	19.5	✓		
	18	20.0	✓		
	19	20.0	✓		
	20	20.0	✓		
	21	18.5	✓		
	22	19.0	✓		
	23	19.0	✓		
	24	18.5	✓		
	25	19.0	✓		
	26	19.0	✓		
	27	19.0	✓		
	28				
	29				
	30				
	31				
	32				
	33				
	34				
	35				

Total wet weight (pooled): 2.32g

Number of survivors: 27

Number of abnormal/have difficulty swimming: 0 / 0

Initials: HW

Reviewed by: [signature]

Date Reviewed: Dec-20, 2021

Embryo - Alevin Test Termination Data Sheet
Length, Wet Weight, Abnormalities

Client: **Teck**

Sample ID: **GH_FR1 + 20 µg/L Cu**

Work Order No.: **212110**

Start Date: **October 13, 2021**

Termination Date: **November 12, 2021**

Treatment (% v/v) and Replicate	Fish	Length (mm)	Normal	Abnormal	Comments
100 C	1	21.5	✓		
	2	20.0	✓		
	3	20.5	✓		
	4	20.5	✓		
	5	21.5	✓		
	6	21.0	✓		
	7	21.0	✓		
	8	22.0	✓		
	9	21.0	✓		
	10	20.5	✓		
	11	20.5	✓		
	12	20.0	✓		
	13	21.0	✓		
	14	20.5	✓		
	15	21.0	✓		
	16	21.5	✓		
	17	21.5	✓		
	18	21.0	✓		
	19	21.0	✓		
	20	21.5	✓		
	21	20.5	✓		
	22	20.5	✓		
	23	19.5		✓	Kyphosis, abnormal jaw
	24				
	25				
	26				
	27				
	28				
	29				
	30				
	31				
	32				
	33				
	34				
	35				

Total wet weight (pooled): 2.87g

Number of survivors: 23

Number of abnormal/have difficulty swimming: 1/1

Initials: VW

Reviewed by: [signature]

Date Reviewed: Dec. 20, 2021

Embryo - Alevin Test Termination Data Sheet
Length, Wet Weight, Abnormalities

Client: **Teck**

Sample ID: **GH_FR1 + 20 µg/L Cu**

Work Order No.: **212110**

Start Date: **October 13, 2021**

Termination Date: **November 12, 2021**

Treatment (% v/v) and Replicate	Fish	Length (mm)	Normal	Abnormal	Comments
100 D	1	22.0	✓		
	2	22.5	✓		
	3	21.5	✓		
	4	21.0	✓		
	5	21.0	✓		
	6	21.0	✓		
	7	21.5	✓		
	8	20.5	✓		
	9	21.5	✓		
	10	19.5	✓		
	11	21.0	✓		
	12	21.0	✓		
	13	20.5	✓		
	14	20.0	✓		
	15	21.0	✓		
	16	17.5	✓		
	17	17.5		✓	yolksac edema
	18	22.0		✓	yolksac edema
	19				
	20				
	21				
	22				
	23				
	24				
	25				
	26				
	27				
	28				
	29				
	30				
	31				
	32				
	33				
	34				
	35				

Total wet weight (pooled): 1.91 g

Number of survivors: 18

Number of abnormal/have difficulty swimming: 2/0

Initials: AWD, YHL

Reviewed by: [signature]

Date Reviewed: Dec 20, 2021

Embryo - Alevin Test Termination Data Sheet
Length, Wet Weight, Abnormalities

Client: **Teck**

Sample ID: **GH_ERC + 20 µg/L Cu**

Work Order No.: **212110**

Start Date: **October 13, 2021**

Termination Date: **November 12, 2021**

Treatment (% v/v) and Replicate	Fish	Length (mm)	Normal	Abnormal	Comments
100 A	1	19.5	✓		
	2	19.5	✓		
	3	19.5	✓		
	4	19.5	✓		
	5	18.5	✓		
	6	19.0	✓		
	7	19.0	✓		
	8	20.0	✓		
	9	20.0	✓		
	10	20.0	✓		
	11	19.5	✓		
	12	19.0	✓		
	13	19.5	✓		
	14	20.0	✓		
	15	19.5	✓		
	16	19.5	✓		
	17	19.5	✓		
	18	19.5	✓		
	19	20.0	✓		
	20	20.0	✓		
	21	19.0	✓		
	22	19.5	✓		
	23	19.0	✓		
	24	19.5	✓		
	25	19.0	✓		
	26	19.5	✓		
	27	19.0	✓		
	28	19.5	✓		
	29	19.0	✓		
	30				
	31				
	32				
	33				
	34				
	35				

Total wet weight (pooled): 2.75 g

Number of survivors: 29

Number of abnormal/have difficulty swimming: 0 / 0

Initials: AWD/MW

Reviewed by: [signature]

Date Reviewed: Dec 20, 2021

Embryo - Alevin Test Termination Data Sheet
Length, Wet Weight, Abnormalities

Client: **Teck**

Start Date: **October 13, 2021**

Sample ID: **GH_ERC + 20 µg/L Cu**

Termination Date: **November 12, 2021**

Work Order No.: **212110**

Treatment (% v/v) and Replicate	Fish	Length (mm)	Normal	Abnormal	Comments
100 B	1	19.5	✓		
	2	20.0	✓		
	3	20.0	✓		
	4	19.0	✓		
	5	19.0	✓		
	6	19.0	✓		
	7	19.5	✓		
	8	19.5	✓		
	9	19.5	✓		
	10	18.5	✓		
	11	18.5	✓		
	12	19.0	✓		
	13	18.5	✓		
	14	19.0	✓		
	15	19.0	✓		
	16	19.0	✓		
	17	19.0	✓		
	18	19.5	✓		
	19	19.0	✓		
	20	20.0	✓		
	21	20.0	✓		
	22	18.5	✓		
	23	17.0	✓		
	24	19.0	✓		
	25	16.5		X	yolksac edema
	26	17.0		X	yolksac edema
	27	16.0		X	yolksac edema.
	28				
	29				
	30				
	31				
	32				
	33				
	34				
	35				

Total wet weight (pooled): 2.42 g

Number of survivors: 27

Number of abnormal/have difficulty swimming: 3 10

Initials: AWD MM

Reviewed by: [signature]

Date Reviewed: Dec 22, 2021

Embryo - Alevin Test Termination Data Sheet
Length, Wet Weight, Abnormalities

Client: **Teck**

Sample ID: **GH_ERC + 20 µg/L Cu**

Work Order No.: **212110**

Start Date: **October 13, 2021**

Termination Date: **November 12, 2021**

Treatment (% v/v) and Replicate	Fish	Length (mm)	Normal	Abnormal	Comments
100 C	1	20.0	✓		
	2	21.0	✓		
	3	20.5	✓		
	4	20.5	✓		
	5	20.0	✓		
	6	20.5	✓		
	7	21.0	✓		
	8	21.0	✓		
	9	21.0	✓		
	10	20.5	✓		
	11	20.0	✓		
	12	21.5	✓		
	13	21.0	✓		
	14	21.0	✓		
	15	20.5	✓		
	16	21.5	✓		
	17	20.5	✓		
	18	19.0	✓		
	19	19.0	✓		
	20	21.0	✓		
	21	20.5	✓		
	22	15.5		✓	Kyphosis
	23	19.0		✓	scoliosis
	24				
	25				
	26				
	27				
	28				
	29				
	30				
	31				
	32				
	33				
	34				
	35				

Total wet weight (pooled): 2.32g

Number of survivors: 23

Number of abnormal/have difficulty swimming: 2 | 2

Initials: AWD, MM

Reviewed by: [signature]

Date Reviewed: Dec. 20, 2021

Embryo - Alevin Test Termination Data Sheet
Length, Wet Weight, Abnormalities

Client: **Teck**

Start Date: **October 13, 2021**

Sample ID: **GH_ERC + 20 µg/L Cu**

Termination Date: **November 12, 2021**

Work Order No.: **212110**

Treatment (% v/v) and Replicate	Fish	Length (mm)	Normal	Abnormal	Comments
100 D	1	21.0	✓		
	2	20.5	✓		
	3	20.5	✓		
	4	21.0	✓		
	5	20.5	✓		
	6	20.5	✓		
	7	~~21.0~~ 21.0 M	✓		
	8	22.0	✓		
	9	21.0	✓		
	10	21.5	✓		
	11	20.5	✓		
	12	21.0	✓		
	13	21.5	✓		
	14	21.0	✓		
	15	21.5	✓		
	16	21.0	✓		
	17	21.0	✓		
	18	20.5	✓		
	19	19.0	✓		
	20	22.0	✓		
	21	20.5	✓		
	22	20.0	✓		
	23	21.5	✓		
	24				
	25				
	26				
	27				
	28				
	29				
	30				
	31				
	32				
	33				
	34				
	35				

Total wet weight (pooled): 2.45 g

Number of survivors: 23

Number of abnormal/have difficulty swimming: 0/0

Initials: AWD, MM

Reviewed by: [signature]

Date Reviewed: Dec 21, 2021

Embryo - Alevin Test Termination Data Sheet
Length, Wet Weight, Abnormalities

Client: **Teck**

Sample ID: **CM_MC2 + 20 µg/L Cu**

Work Order No.: **212110**

Start Date: **October 13, 2021**

Termination Date: **November 12, 2021**

Treatment (% v/v) and Replicate	Fish	Length (mm)	Normal	Abnormal	Comments
100 A	1	19.0	✓		
	2	19.0	✓		
	3	21.0	✓		
	4	19.5	✓		
	5	19.0	✓		
	6	20.0	✓		
	7	19.0	✓		
	8	19.0	✓		
	9	20.0	✓		
	10	19.5	✓		
	11	19.0	✓		
	12	21.5	✓		
	13	20.0	✓		
	14	19.5	✓		
	15	19.5	✓		
	16	19.5	✓		
	17	19.0	✓		
	18	19.5	✓		
	19	19.0	✓		
	20	19.0	✓		
	21	19.5	✓		
	22	20.5	✓		
	23	19.0	✓		
	24	19.5	✓		
	25	19.0	✓		
	26	19.5	✓		
	27	19.0	✓		
	28				
	29				
	30				
	31				
	32				
	33				
	34				
	35				

Total wet weight (pooled): 2.62g

Number of survivors: 27

Number of abnormal/have difficulty swimming: 0/0

Initials: KB, YMM

Reviewed by: [signature]

Date Reviewed: Dec. 27, 2021

Embryo - Alevin Test Termination Data Sheet
Length, Wet Weight, Abnormalities

Client: **Teck**

Start Date: **October 13, 2021**

Sample ID: **CM_MC2 + 20 µg/L Cu**

Termination Date: **November 12, 2021**

Work Order No.: **212110**

Treatment (% v/v) and Replicate	Fish	Length (mm)	Normal	Abnormal	Comments
100 B	1	20.5	✓		
	2	21.0	✓		
	3	19.0	✓		
	4	19.5	✓		
	5	20.5	✓		
	6	20.0	✓		
	7	20.0	✓		
	8	20.0	✓		
	9	20.5	✓		
	10	20.0	✓		
	11	21.0	✓		
	12	17.5	✓		
	13	20.0	✓		
	14	20.0	✓		
	15	20.5	✓		
	16	21.0	✓		
	17	21.0	✓		
	18	19.5	✓		
	19	20.5	✓		
	20	20.5	✓		
	21	20.0	✓		
	22	20.5	✓		
	23	21.0	✓		
	24	20.0	✓		
	25	20.0	✓		
	26	19.0	✓		
	27	19.5	✓		
	28	20.5	✓		
	29				
	30				
	31				
	32				
	33				
	34				
	35				

Total wet weight (pooled): 2.22g

Number of survivors: 28

Number of abnormal/have difficulty swimming: 0/0

Initials: KB, MC

Reviewed by: [signature]

Date Reviewed: Dec. 20, 2021

Embryo - Alevin Test Termination Data Sheet
Length, Wet Weight, Abnormalities

Client: **Teck**

Sample ID: **CM_MC2 + 20 µg/L Cu**

Work Order No.: **212110**

Start Date: **October 13, 2021**

Termination Date: **November 12, 2021**

Treatment (% v/v) and Replicate	Fish	Length (mm)	Normal	Abnormal	Comments
100 C	1	21.0	✓		
	2	21.0	✓		
	3	21.0	✓		
	4	20.5	✓		
	5	19.0	✓		
	6	20.0	✓		
	7	18.0	✓		
	8	21.0	✓		
	9	20.5	✓		
	10	21.0	✓		
	11	21.0	✓		
	12	20.0	✓		
	13	21.0	✓		
	14	20.0	✓		
	15	20.5	✓		
	16	20.0	✓		
	17	21.0	✓		
	18	21.0	✓		
	19	20.5	✓		
	20				
	21				
	22				
	23				
	24				
	25				
	26				
	27				
	28				
	29				
	30				
	31				
	32				
	33				
	34				
	35				

Total wet weight (pooled): ~~1.40g~~ 2.05g

Number of survivors: 19

Number of abnormal/have difficulty swimming: 0 | 0

Initials: KB, MC

Reviewed by: [signature]

Date Reviewed: Dec-20, 2021

Embryo - Alevin Test Termination Data Sheet
Length, Wet Weight, Abnormalities

Client: **Teck**

Sample ID: **CM_MC2 + 20 µg/L Cu**

Work Order No.: **212110**

Start Date: **October 13, 2021**

Termination Date: **November 12, 2021**

Treatment (% v/v) and Replicate	Fish	Length (mm)	Normal	Abnormal	Comments
100 D1	1	20.5	✓		
	2	21.0	✓		
	3	20.5	✓		
	4	21.0	✓		
	5	21.0	✓		
	6	20.0	✓		
	7	21.0	✓		
	8	20.5	✓		
	9	21.0	✓		
	10	20.5	✓		
	11	21.5	✓		
	12	20.5	✓		
	13	20.5	✓		
	14	19.5	✓		
	15	21.0	✓		
	16	18.5	✓		
	17	22.5	✓		
	18	21.5	✓		
	19	19.5	✓		
	20	20.0	✓		
	21	20.0	✓		
	22	21.0	✓		
	23	20.5	✓		
	24	21.0	✓		
	25	19.5	✓		
	26				
	27				
	28				
	29				
	30				
	31				
	32				
	33				
	34				
	35				

Total wet weight (pooled): 2.52 g

Number of survivors: 25

Number of abnormal/have difficulty swimming: 0/0

Initials: KB, YM

Reviewed by: [signature]

Date Reviewed: Dec 20, 2021

Embryo - Alevin Test Termination Data Sheet
Length, Wet Weight, Abnormalities

Client: **Teck**

Sample ID: **EV_MC2 + 20 µg/L Cu**

Work Order No.: **212110**

Start Date: **October 13, 2021**

Termination Date: **November 12, 2021**

Treatment (% v/v) and Replicate	Fish	Length (mm)	Normal	Abnormal	Comments
100 A	1	18.0	✓		
	2	18.5	✓		
	3	18.0	✓		
	4	20.0	✓		
	5	19.5	✓		
	6	18.5	✓		
	7	18.5	✓		
	8	19.0	✓		
	9	18.0	✓		
	10	19.0	✓		
	11	19.0	✓		
	12	19.0	✓		
	13	19.0	✓		
	14	18.0	✓		
	15	19.5	✓		
	16	19.5	✓		
	17	19.5	✓		
	18	19.5	✓		
	19	19.0	✓		
	20	19.5	✓		
	21	19.0	✓		
	22	20.0	✓		
	23	19.5	✓		
	24	19.5	✓		
	25	19.0	✓		
	26	19.0	✓		
	27	18.5		✓	Kyphosis
	28				
	29				
	30				
	31				
	32				
	33				
	34				
	35				

Total wet weight (pooled): 2.41g

Number of survivors: 27

Number of abnormal/have difficulty swimming: 1/1

Initials: KB, YM

Reviewed by: [signature]

Date Reviewed: Dec-21, 2021

Embryo - Alevin Test Termination Data Sheet
Length, Wet Weight, Abnormalities

Client: **Teck**

Sample ID: **EV_MC2 + 20 µg/L Cu**

Work Order No.: **212110**

Start Date: **October 13, 2021**

Termination Date: **November 12, 2021**

Treatment (% v/v) and Replicate	Fish	Length (mm)	Normal	Abnormal	Comments
100 B	1	20.0	✓		
	2	18.5	✓		
	3	18.0	✓		
	4	19.0	✓		
	5	16.5	✓		
	6	18.0	✓		
	7	18.0	✓		
	8	18.0	✓		
	9	19.5	✓		
	10	18.0	✓		
	11	18.0	✓		
	12	19.5	✓		
	13	18.5	✓		
	14	16.5	✓		
	15	19.5	✓		
	16	19.0	✓		
	17	17.0	✓		
	18	18.0	✓		
	19	19.0	✓		
	20	19.0	✓		
	21	18.0	✓		
	22	18.5		✓	abnormal jaw
	23	17.0		✓	yolksac edema
	24	19.0		✓	yolksac edema
	25				
	26				
	27				
	28				
	29				
	30				
	31				
	32				
	33				
	34				
	35				

Total wet weight (pooled): 1.75g

Number of survivors: 24

Number of abnormal/have difficulty swimming: 3 | 1

Initials: KB, MC

Reviewed by: [signature]

Date Reviewed: Dec 20, 2021

Embryo - Alevin Test Termination Data Sheet
Length, Wet Weight, Abnormalities

Client: **Teck**

Sample ID: **EV_MC2 + 20 µg/L Cu**

Work Order No.: **212110**

Start Date: **October 13, 2021**

Termination Date: **November 12, 2021**

Treatment (% v/v) and Replicate	Fish	Length (mm)	Normal	Abnormal	Comments
100 C	1	20.0	✓		
	2	19.5	✓		
	3	20.5	✓		
	4	19.5	✓		
	5	19.5	✓		
	6	19.0	✓		
	7	19.0	✓		
	8	20.0	✓		
	9	19.5	✓		
	10	18.0	✓		
	11	19.0	✓		
	12	19.5	✓		
	13	21.0	✓		
	14	19.5	✓		
	15	19.0	✓		
	16	20.0	✓		
	17	19.5	✓		
	18	18.0	✓		
	19	20.0	✓		
	20	17.5	✓		
	21	19.5	✓		
	22	20.0	✓		
	23	17.0		✓	abnormal jaw
	24				
	25				
	26				
	27				
	28				
	29				
	30				
	31				
	32				
	33				
	34				
	35				

Total wet weight (pooled): 2.13g

Number of survivors: 23

Number of abnormal/have difficulty swimming: 1 / 0

Initials: KB, YM

Reviewed by: [signature]

Date Reviewed: Dec. 29, 2021

Embryo - Alevin Test Termination Data Sheet
Length, Wet Weight, Abnormalities

Client: **Teck**

Start Date: **October 13, 2021**

Sample ID: **EV_MC2 + 20 µg/L Cu**

Termination Date: **November 12, 2021**

Work Order No.: **212110**

Treatment (% v/v) and Replicate	Fish	Length (mm)	Normal	Abnormal	Comments
100 D	1	18.0	✓		
	2	18.0	✓		
	3	19.5	✓		
	4	18.5	✓		
	5	19.5	✓		
	6	~~18.0~~ 18.5	✓		
	7	19.0	✓		
	8	18.5	✓		
	9	16.0	✓		
	10	18.0	✓		
	11	18.0	✓		
	12	17.0	✓		
	13	17.5	✓		
	14	17.5	✓		
	15	17.5	✓		
	16	17.0	✓		
	17	17.5	✓		
	18	16.5	✓		
	19	18.5	✓		
	20				
	21				
	22				
	23				
	24				
	25				
	26				
	27				
	28				
	29				
	30				
	31				
	32				
	33				
	34				
	35				

Total wet weight (pooled): 1.75g

Number of survivors: 19

Number of abnormal/have difficulty swimming: 0/0

Initials: KB, YYL

Reviewed by: [signature]

Date Reviewed: Dec. 20, 2021

Embryo - Alevin Test Termination Data Sheet
Length, Wet Weight, Abnormalities

Client: **Teck**

Start Date: **October 13, 2021**

Sample ID: **EV_HC1 + 20 µg/L Cu**

Termination Date: **November 12, 2021**

Work Order No.: **212110**

Treatment (% v/v) and Replicate	Fish	Length (mm)	Normal	Abnormal	Comments
100 A	1	19.5	✓		
	2	20.0	✓		
	3	21.0	✓		
	4	19.5	✓		
	5	18.5	✓		
	6	18.5	✓		
	7	18.5	✓		
	8	19.0	✓		
	9	19.5	✓		
	10	19.0	✓		
	11	19.5	✓		
	12	19.0	✓		
	13	18.0	✓		
	14	19.5	✓		
	15	20.0	✓		
	16	19.0	✓		
	17	20.0	✓		
	18	20.0	✓		
	19	18.5	✓		
	20	20.0	✓		
	21	20.0	✓		
	22	19.5	✓		
	23	19.0	✓		
	24	19.0	✓		
	25	20.0	✓		
	26	20.0	✓		
	27	19.0	✓		
	28	17.0		✓	yolk sac edema
	29				
	30				
	31				
	32				
	33				
	34				
	35				

Total wet weight (pooled): 2.59g

Number of survivors: 28

Number of abnormal/have difficulty swimming: 1/0

Initials: KV, VM

Reviewed by: [signature]

Date Reviewed: Dec. 20, 2021

Embryo - Alevin Test Termination Data Sheet
Length, Wet Weight, Abnormalities

Client: **Teck**

Start Date: **October 13, 2021**

Sample ID: **EV_HC1 + 20 µg/L Cu**

Termination Date: **November 12, 2021**

Work Order No.: **212110**

Treatment (% v/v) and Replicate	Fish	Length (mm)	Normal	Abnormal	Comments
100 B	1	17.5	✓		
	2	18.5	✓		
	3	17.0	✓		
	4	17.0	✓		
	5	17.0	✓		
	6	19.0	✓		
	7	18.0	✓		
	8	19.0	✓		
	9	19.0	✓		
	10	17.0	✓		
	11	18.5	✓		
	12	19.0	✓		
	13	19.0	✓		
	14	19.0	✓		
	15	19.5	✓		
	16	20.0	✓		
	17	17.5	✓		
	18	19.0	✓		
	19	19.0	✓		
	20	18.0	✓		
	21	19.0	✓		
	22	20.0	✓		
	23	19.0	✓		
	24	19.0	✓		
	25	16.0	✓		
	26	19.0		✓	yolksac edema
	27				
	28				
	29				
	30				
	31				
	32				
	33				
	34				
	35				

Total wet weight (pooled): 2.03g

Number of survivors: 26

Number of abnormal/have difficulty swimming: 1/0

Initials: KV, MK

Reviewed by: [signature]

Date Reviewed: Dec. 20, 2021

Embryo - Alevin Test Termination Data Sheet
Length, Wet Weight, Abnormalities

Client: **Teck**

Sample ID: **EV_HC1 + 20 µg/L Cu**

Work Order No.: **212110**

Start Date: **October 13, 2021**

Termination Date: **November 12, 2021**

Treatment (% v/v) and Replicate	Fish	Length (mm)	Normal	Abnormal	Comments
100 C	1	21.0			
	2	19.0			
	3	21.0			
	4	20.0			
	5	20.0			
	6	19.0			
	7	19.5			
	8	15.5			
	9	19.0			
	10	19.0			
	11	19.5			
	12	19.0			
	13	18.5			
	14	21.5			
	15	17.5			
	16	15.0			
	17	20.0			
	18	17.0		✓	yolksac edema
	19	16.5		✓	yolksac edema
	20	20.0		✓	abnormal jaw
	21	15.0		✓	shortened tail fin
	22	18.0		✓	yolksac edema
	23	14.5		✓	missing tail fin
	24	16.5		✓	pale thin body
	25				
	26				
	27				
	28				
	29				
	30				
	31				
	32				
	33				
	34				
	35				

Total wet weight (pooled): 2.32g

Number of survivors: 24

Number of abnormal/have difficulty swimming: 7 / 2

Initials: KV [illegible]

Reviewed by: [signature]

Date Reviewed: Dec 20, 2021

Embryo - Alevin Test Termination Data Sheet

Length, Wet Weight, Abnormalities

Client: **Teck**

Sample ID: **EV_HC1 + 20 µg/L Cu**

Work Order No.: **212110**

Start Date: **October 13, 2021**

Termination Date: **November 12, 2021**

Treatment (% v/v) and Replicate	Fish	Length (mm)	Normal	Abnormal	Comments
100 D	1	20.0	✓		
	2	22.0	✓		
	3	20.0	✓		
	4	20.5	✓		
	5	21.0	✓		
	6	19.0	✓		
	7	21.0	✓		
	8	20.0	✓		
	9	21.0	✓		
	10	20.0	✓		
	11	21.0	✓		
	12	20.5	✓		
	13	21.0	✓		
	14	21.5	✓		
	15	19.0	✓		
	16	21.0	✓		
	17	20.0	✓		
	18	21.0	✓		
	19	21.0	✓		
	20	21.0	✓		
	21	20.5	✓		
	22				
	23				
	24				
	25				
	26				
	27				
	28				
	29				
	30				
	31				
	32				
	33				
	34				
	35				

Total wet weight (pooled): 2.18g

Number of survivors: 21

Number of abnormal/have difficulty swimming: 0 | 0

Initials: KV ; MM

Reviewed by: [signature]

Date Reviewed: Dec 20, 2021

Embryo - Alevin Test Termination Data Sheet
Length, Wet Weight, Abnormalities

Client: **Teck**

Start Date: **October 13, 2021**

Sample ID: **LC_DCDS + 20 µg/L Cu**

Termination Date: **November 12, 2021**

Work Order No.: **212110**

Treatment (% v/v) and Replicate	Fish	Length (mm)	Normal	Abnormal	Comments
100 A	1	20.0	✓		
	2	19.0	✓		
	3	19.0	✓		
	4	20.0	✓		
	5	19.0	✓		
	6	19.0	✓		
	7	20.0	✓		
	8	19.5	✓		
	9	19.0	✓		
	10	16.0	✓		
	11	17.5	✓		
	12	19.0	✓		
	13	19.5	✓		
	14	20.0	✓		
	15	18.5	✓		
	16	19.5	✓		
	17	20.0	✓		
	18	19.0	✓		
	19	18.0	✓		
	20	18.5	✓		
	21	18.0	✓		
	22	18.0	✓		
	23	18.0	✓		
	24	20.0	✓		
	25	19.0	✓		
	26	18.0	✓		
	27	14.5		✓	pale thin body
	28				
	29				
	30				
	31				
	32				
	33				
	34				
	35				

Total wet weight (pooled): 2.38g

Number of survivors: 27

Number of abnormal/have difficulty swimming: 1/0

Initials: KS, YW

Reviewed by: [signature]

Date Reviewed: Dec-20, 2021

Embryo - Alevin Test Termination Data Sheet
Length, Wet Weight, Abnormalities

Client: **Teck**

Sample ID: **LC_DCDS + 20 µg/L Cu**

Work Order No.: **212110**

Start Date: **October 13, 2021**

Termination Date: **November 12, 2021**

Treatment (% v/v) and Replicate	Fish	Length (mm)	Normal	Abnormal	Comments
100 B	1	19.5	✓		
	2	19.0	✓		
	3	19.0	✓		
	4	18.5	✓		
	5	19.5	✓		
	6	20.0	✓		
	7	20.0	✓		
	8	20.5	✓		
	9	18.0	✓		
	10	19.0	✓		
	11	20.0	✓		
	12	19.0	✓		
	13	19.0	✓		
	14	20.5	✓		
	15	18.5	✓		
	16	17.0	✓		
	17	20.0	✓		
	18	20.0	✓		
	19	19.5	✓		
	20	19.5	✓		
	21	20.0	✓		
	22	19.0	✓		
	23	19.0	✓		
	24	20.0	✓		
	25	19.5	✓		
	26	20.5	✓		
	27	18.5	✓		
	28				
	29				
	30				
	31				
	32				
	33				
	34				
	35				

Total wet weight (pooled): 2.21g

Number of survivors: 27

Number of abnormal/have difficulty swimming: 0 / 0

Initials: KV, YWL

Reviewed by: [signature]

Date Reviewed: Dec. 21, 2021

Embryo - Alevin Test Termination Data Sheet
Length, Wet Weight, Abnormalities

Client: **Teck**

Start Date: **October 13, 2021**

Sample ID: **LC_DCDS + 20 µg/L Cu**

Termination Date: **November 12, 2021**

Work Order No.: **212110**

Treatment (% v/v) and Replicate	Fish	Length (mm)	Normal	Abnormal	Comments
100 C	1	20.0	✓		
	2	20.5	✓		
	3	19.5	✓		
	4	20.0	✓		
	5	20.0	✓		
	6	18.5	✓		
	7	20.0	✓		
	8	20.5	✓		
	9	19.5	✓		
	10	20.5	✓		
	11	19.0	✓		
	12	20.5	✓		
	13	20.0	✓		
	14	20.0	✓		
	15	22.0	✓		
	16	22.0	✓		
	17	20.0	✓		
	18	20.0	✓		
	19	20.0	✓		
	20	20.5	✓		
	21	19.5	✓		
	22	20.0	✓		
	23	21.0	✓		
	24	16.5		✓	scoliosis
	25	17.5		✓	scoliosis
	26				
	27				
	28				
	29				
	30				
	31				
	32				
	33				
	34				
	35				

Total wet weight (pooled): 2.50g

Number of survivors: 23

Number of abnormal/have difficulty swimming: 2 | 2

Initials: KV, MM

Reviewed by: [signature]

Date Reviewed: Dec 20, 2021

Embryo - Alevin Test Termination Data Sheet
Length, Wet Weight, Abnormalities

Client: **Teck**

Sample ID: **LC_DCDS + 20 µg/L Cu**

Work Order No.: **212110**

Start Date: **October 13, 2021**

Termination Date: **November 12, 2021**

Treatment (% v/v) and Replicate	Fish	Length (mm)	Normal	Abnormal	Comments
100 D	1	20.0	✓		
	2	21.0	✓		
	3	21.5	✓		
	4	21.0	✓		
	5	21.5	✓		
	6	21.0	✓		
	7	22.0	✓		
	8	21.5	✓		
	9	22.0	✓		
	10	20.0	✓		
	11	20.5	✓		
	12	21.5	✓		
	13	21.5	✓		
	14	20.5	✓		
	15	20.0	✓		
	16	21.5	✓		
	17	21.5	✓		
	18	20.0	✓		
	19	21.5	✓		
	20	21.5	✓		
	21	21.5	✓		
	22	20.5	✓		
	23	20.5	✓		
	24	21.0	✓		
	25	21.0		✓	Kyphosis
	26				
	27				
	28				
	29				
	30				
	31				
	32				
	33				
	34				
	35				

Total wet weight (pooled): 2.44g

Number of survivors: 25

Number of abnormal/have difficulty swimming: 1/1

Initials: KW

Reviewed by: [signature]

Date Reviewed: Dec 20, 2021

Embryo - Alevin Test Termination Data Sheet
Length, Wet Weight, Abnormalities

Client: **Teck**

Start Date: **October 13, 2021**

Sample ID: **LC_LC3 + 20 µg/L Cu**

Termination Date: **November 12, 2021**

Work Order No.: **212110**

Treatment (% v/v) and Replicate	Fish	Length (mm)	Normal	Abnormal	Comments
100 A	1	20.0	✓		
	2	19.0	✓		
	3	19.5	✓		
	4	19.5	✓		
	5	19.5	✓		
	6	21.0	✓		
	7	20.0	✓		
	8	19.0	✓		
	9	18.5	✓		
	10	21.0	✓		
	11	20.0	✓		
	12	20.5	✓		
	13	20.0	✓		
	14	18.5	✓		
	15	18.5	✓		-
	16	17.5	✓		
	17	20.0	✓		
	18	19.0	✓		
	19	20.0	✓		
	20	20.0	✓		
	21	19.0	✓		
	22	19.0	✓		
	23	21.0	✓		
	24	19.0	✓		
	25	19.5	✓		
	26	17.0	✓		
	27	19.0	✓		
	28				
	29				
	30				
	31				
	32				
	33				
	34				
	35				

Total wet weight (pooled): 2.40g

Number of survivors: 27

Number of abnormal/have difficulty swimming: 0 / 0

Initials: KW, MW

Reviewed by: [signature]

Date Reviewed: Dec. 20, 2021

Embryo - Alevin Test Termination Data Sheet
Length, Wet Weight, Abnormalities

Client: **Teck**
Start Date: **October 13, 2021**
Sample ID: **LC_LC3 + 20 µg/L Cu**
Termination Date: **November 12, 2021**
Work Order No.: **212110**

Treatment (% v/v) and Replicate	Fish	Length (mm)	Normal	Abnormal	Comments
100 B	1	20.0	✓		
	2	19.0	✓		
	3	20.5	✓		
	4	20.0	✓		
	5	19.0	✓		
	6	16.5	✓		
	7	19.5	✓		
	8	19.0	✓		
	9	18.0	✓		
	10	19.0	✓		
	11	20.5	✓		
	12	18.5	✓		
	13	20.0	✓		
	14	20.0	✓		
	15	18.5	✓		
	16	19.5	✓		
	17	19.0	✓		
	18	19.0	✓		
	19	18.5	✓		
	20	20.0	✓		
	21	19.5	✓		
	22	20.0	✓		
	23	20.0	✓		
	24	18.5	✓		
	25	19.0	✓		
	26	19.5	✓		
	27	20.0	✓		
	28	18.5	✓		
	29	18.0		✓	yolksac edema
	30				
	31				
	32				
	33				
	34				
	35				

Total wet weight (pooled): 2.32g
Number of survivors: 29
Number of abnormal/have difficulty swimming: 1/0
Initials: YM

Reviewed by: [signature]
Date Reviewed: Dec. 21, 2021

Embryo - Alevin Test Termination Data Sheet
Length, Wet Weight, Abnormalities

Client: **Teck**

Sample ID: **LC_LC3 + 20 µg/L Cu**

Work Order No.: **212110**

Start Date: **October 13, 2021**

Termination Date: **November 12, 2021**

Treatment (% v/v) and Replicate	Fish	Length (mm)	Normal	Abnormal	Comments
100 C	1	20.0	✓		
	2	20.5	✓		
	3	21.0	✓		
	4	19.5	✓		
	5	21.0	✓		
	6	18.5	✓		
	7	20.0	✓		
	8	20.0	✓		
	9	20.0	✓		
	10	20.0	✓		
	11	20.0	✓		
	12	20.5	✓		
	13	19.5	✓		
	14	20.0	✓		
	15	20.0	✓		
	16	21.0	✓		
	17	19.0	✓		
	18	20.0	✓		
	19	19.5	✓		
	20	20.0	✓		
	21	20.0	✓		
	22	21.0	✓		
	23	18.0	✓		
	24	20.0	✓		
	25	19.5	✓		
	26	20.0	✓		
	27	16.0		✓	abnormal eyes
	28	17.5		✓	abnormal jaw
	29	18.5		✓	yolksac edema
	30				
	31				
	32				
	33				
	34				
	35				

Total wet weight (pooled): 2.59 g

Number of survivors: 29

Number of abnormal/have difficulty swimming: 3 / 1

Initials: YWL

Reviewed by: [signature]

Date Reviewed: Dec 20, 2021

Embryo - Alevin Test Termination Data Sheet
Length, Wet Weight, Abnormalities

Client: **Teck**

Start Date: **October 13, 2021**

Sample ID: **LC_LC3 + 20 µg/L Cu**

Termination Date: **November 12, 2021**

Work Order No.: **212110**

Treatment (% v/v) and Replicate	Fish	Length (mm)	Normal	Abnormal	Comments
100 D	1	22.0	✓		
	2	17.0	✓		
	3	21.0	✓		
	4	21.5	✓		
	5	20.5	✓		
	6	22.0	✓		
	7	21.0	✓		
	8	22.0	✓		
	9	18.5	✓		
	10	22.0	✓		
	11	22.0	✓		
	12	20.0	✓		
	13	21.5	✓		
	14	22.0	✓		
	15	21.5	✓		
	16	21.5	✓		
	17	21.0	✓		
	18	21.5	✓		
	19	18.5	✓		
	20	21.5	✓		
	21	21.5	✓		
	22	21.0	✓		
	23	21.0	✓		
	24	21.0	✓		
	25	22.0	✓		
	26	21.5	✓		
	27	22.0		✓	yolksac edema
	28				
	29				
	30				
	31				
	32				
	33				
	34				
	35				

Total wet weight (pooled): 2.67g

Number of survivors: 27

Number of abnormal/have difficulty swimming: 1 | 0

Initials: KB, MM

Reviewed by: [signature]

Date Reviewed: Dec 20, 2021

Embryo - Alevin Test Termination Data Sheet
Length, Wet Weight, Abnormalities

Client: **Teck**

Start Date: **October 13, 2021**

Sample ID: **LC_LC5 + 20 µg/L Cu**

Termination Date: **November 12, 2021**

Work Order No.: **212110**

Treatment (% v/v) and Replicate	Fish	Length (mm)	Normal	Abnormal	Comments
100 A	1	18.0	✓		
	2	20.0	✓		
	3	19.0	✓		
	4	20.0	✓		
	5	20.0	✓		
	6	18.0	✓		
	7	19.0	✓		
	8	20.0	✓		
	9	19.5	✓		
	10	19.0	✓		
	11	19.5	✓		
	12	20.5	✓		
	13	21.0	✓		
	14	20.0	✓		
	15	20.0	✓		
	16	18.5	✓		
	17	20.0	✓		
	18	19.5	✓		
	19	18.0	✓		
	20	18.0	✓		
	21	19.0	✓		
	22	20.5	✓		
	23	19.5	✓		
	24	18.5	✓		
	25	19.0	✓		
	26	19.0	✓		
	27	20.0	✓		
	28	18.5	✓		
	29	19.0	✓		
	30	21.0		✓	yolksac edema
	31				
	32				
	33				
	34				
	35				

Total wet weight (pooled): 2.42 g

Number of survivors: 30

Number of abnormal/have difficulty swimming: 1 | 0

Initials: KB, YM

Reviewed by: [signature]

Date Reviewed: Dec. 20, 2021

Embryo - Alevin Test Termination Data Sheet
Length, Wet Weight, Abnormalities

Client: **Teck**

Sample ID: **LC_LC5 + 20 µg/L Cu**

Work Order No.: **212110**

Start Date: **October 13, 2021**

Termination Date: **November 12, 2021**

Treatment (% v/v) and Replicate	Fish	Length (mm)	Normal	Abnormal	Comments
100 B	1	17.0			
	2	16.0			
	3	17.0			
	4	18.0			
	5	18.5			
	6	17.5			
	7	18.0			
	8	16.5			
	9	18.0			
	10	18.5			
	11	17.5			
	12	18.0			
	13	17.0			
	14	19.5			
	15	16.5			
	16	16.5			
	17	18.0			
	18	16.5			
	19	17.0			
	20	18.5			
	21	17.0			
	22	18.0		✓	yolksac edema
	23	14.0		✓	yolksac edema
	24	17.5		✓	yolksac edema
	25	16.5		✓	yolksac edema
	26				
	27				
	28				
	29				
	30				
	31				
	32				
	33				
	34				
	35				

Total wet weight (pooled): 1.82g

Number of survivors: 25

Number of abnormal/have difficulty swimming: 4 | 1

Initials: KB, YM

Reviewed by: [signature]

Date Reviewed: Dec. 21, 2021

Embryo - Alevin Test Termination Data Sheet
Length, Wet Weight, Abnormalities

Client: **Teck**

Sample ID: **LC_LC5 + 20 µg/L Cu**

Work Order No.: **212110**

Start Date: **October 13, 2021**

Termination Date: **November 12, 2021**

Treatment (% v/v) and Replicate	Fish	Length (mm)	Normal	Abnormal	Comments
100 C	1	18.5	✓		
	2	21.0	✓		
	3	21.0	✓		
	4	19.5	✓		
	5	20.5	✓		
	6	21.0	✓		
	7	20.0	✓		
	8	19.0	✓		
	9	19.5	✓		
	10	19.5	✓		
	11	22.0	✓		
	12	20.0	✓		
	13	19.0	✓		
	14	21.0	✓		
	15	20.0	✓		
	16	18.9	✓		
	17	19.0	✓		
	18	21.0	✓		
	19	19.0	✓		
	20	19.0	✓		
	21	19.0	✓		
	22	20.0	✓		
	23	16.0		✓	yolksac edema
	24	21.0		✓	abnormal jaw
	25	16.5		✓	yolksac edema
	26				
	27				
	28				
	29				
	30				
	31				
	32				
	33				
	34				
	35				

Total wet weight (pooled): 2.38 g

Number of survivors: 25

Number of abnormal/have difficulty swimming: 3 1 0

Initials: KB, YM

Reviewed by: [signature]

Date Reviewed: Dec. 22, 2021

Embryo - Alevin Test Termination Data Sheet
Length, Wet Weight, Abnormalities

Client: **Teck**

Start Date: **October 13, 2021**

Sample ID: **LC_LC5 + 20 µg/L Cu**

Termination Date: **November 12, 2021**

Work Order No.: **212110**

Treatment (% v/v) and Replicate	Fish	Length (mm)	Normal	Abnormal	Comments
100 D	1	20.5	✓		
	2	20.5	✓		
	3	21.0	✓		
	4	21.0	✓		
	5	20.0	✓		
	6	20.0	✓		
	7	20.5	✓		
	8	19.5	✓		
	9	20.5	✓		
	10	21.0	✓		
	11	20.0	✓		
	12	21.0	✓		
	13	20.5	✓		
	14	20.0	✓		
	15	20.0	✓		
	16	20.5	✓		
	17	20.5	✓		
	18	21.5	✓		
	19	19.5	✓		
	20	20.5	✓		
	21	20.5	✓		
	22	21.0	✓		
	23	19.5	✓		
	24				
	25				
	26				
	27				
	28				
	29				
	30				
	31				
	32				
	33				
	34				
	35				

Total wet weight (pooled): 2.18g

Number of survivors: 23

Number of abnormal/have difficulty swimming: 0/0

Initials: KB, YM

Reviewed by: [signature]

Date Reviewed: Dec 20, 2021

Embryo - Alevin Test Termination Data Sheet
Length, Wet Weight, Abnormalities

Client: **Teck**

Sample ID: **LC_LCDSSLCC + 20 µg/L Cu**

Work Order No.: **212110**

Start Date: **October 13, 2021**

Termination Date: **November 12, 2021**

Treatment (% v/v) and Replicate	Fish	Length (mm)	Normal	Abnormal	Comments
100 A	1	21.0	✓		
	2	20.5	✓		
	3	19.0	✓		
	4	19.5	✓		
	5	19.0	✓		
	6	18.5	✓		
	7	19.5	✓		
	8	20.0	✓		
	9	18.0	✓		
	10	20.5	✓		
	11	21.0	✓		
	12	20.0	✓		
	13	18.5	✓		
	14	19.5	✓		
	15	19.5	✓		
	16	20.0	✓		
	17	19.5	✓		
	18	19.5	✓		
	19	20.0	✓		
	20	21.0	✓		
	21	20.0	✓		
	22	18.5	✓		
	23	20.5	✓		
	24	20.5	✓		
	25	20.0	✓		
	26	20.0	✓		
	27	15.0		✓	yolksac edema
	28				
	29				
	30				
	31				
	32				
	33				
	34				
	35				

Total wet weight (pooled): 2.389

Number of survivors: 27

Number of abnormal/have difficulty swimming: 1 / 1

Initials: KB, MH

Reviewed by: [signature]

Date Reviewed: Dec 20, 2021

Embryo - Alevin Test Termination Data Sheet
Length, Wet Weight, Abnormalities

Client: **Teck**

Start Date: **October 13, 2021**

Sample ID: **LC_LCDSSLCC + 20 µg/L Cu**

Termination Date: **November 12, 2021**

Work Order No.: **212110**

Treatment (% v/v) and Replicate	Fish	Length (mm)	Normal	Abnormal	Comments
100 B	1	19.0	✓		
	2	19.0	✓		
	3	17.0	✓		
	4	20.0	✓		
	5	18.0	✓		
	6	20.0	✓		
	7	19.0	✓		
	8	20.0	✓		
	9	20.0	✓		
	10	19.5	✓		
	11	20.0	✓		
	12	19.5	✓		
	13	20.0	✓		
	14	20.0	✓		
	15	20.5	✓		
	16	19.0	✓		
	17	21.0	✓		
	18	19.5	✓		
	19	21.5	✓		
	20	20.5	✓		
	21	17.0		✓	yolksac edema
	22				
	23				
	24				
	25				
	26				
	27				
	28				
	29				
	30				
	31				
	32				
	33				
	34				
	35				

Total wet weight (pooled): 1.65g

Number of survivors: 21

Number of abnormal/have difficulty swimming: 1/0

Initials: KB, MC

Reviewed by: [signature]

Date Reviewed: Dec. 20, 2021

Embryo - Alevin Test Termination Data Sheet
Length, Wet Weight, Abnormalities

Client: **Teck**

Sample ID: **LC_LCDSSLCC + 20 µg/L Cu**

Work Order No.: **212110**

Start Date: **October 13, 2021**

Termination Date: **November 12, 2021**

Treatment (% v/v) and Replicate	Fish	Length (mm)	Normal	Abnormal	Comments
100 C	1	20.5	✓		
	2	20.5	✓		
	3	21.0	✓		
	4	20.5	✓		
	5	20.0	✓		
	6	20.0	✓		
	7	20.5	✓		
	8	21.5	✓		
	9	20.0	✓		
	10	20.0	✓		
	11	21.0	✓		
	12	21.5	✓		
	13	20.5	✓		
	14	20.5	✓		
	15	21.5	✓		
	16	20.0	✓		
	17	20.5	✓		
	18	20.0	✓		
	19	20.5	✓		
	20	21.5	✓		
	21	21.0	✓		
	22	21.0	✓		
	23	20.5	✓		
	24	20.5	✓		
	25	18.5		✓	abnormal jaw
	26				
	27				
	28				
	29				
	30				
	31				
	32				
	33				
	34				
	35				

Total wet weight (pooled): 2.46g

Number of survivors: 25

Number of abnormal/have difficulty swimming: 1 | 0

Initials: KB, YM

Reviewed by: [signature]

Date Reviewed: Dec 20, 2021

Embryo - Alevin Test Termination Data Sheet
Length, Wet Weight, Abnormalities

Client: **Teck**

Sample ID: **LC_LCDSSLCC + 20 µg/L Cu**

Work Order No.: **212110**

Start Date: **October 13, 2021**

Termination Date: **November 12, 2021**

Treatment (% v/v) and Replicate	Fish	Length (mm)	Normal	Abnormal	Comments
100 D	1	~~22.5~~ 22.5	✓		
	2	22.0	✓		
	3	21.5	✓		
	4	21.5	✓		
	5	22.0	✓		
	6	20.5	✓		
	7	21.5	✓		
	8	20.5	✓		
	9	22.0	✓		
	10	21.0	✓		
	11	21.5	✓		
	12	21.0	✓		
	13	21.5	✓		
	14	20.5	✓		
	15	20.5	✓		
	16	21.5	✓		
	17	21.5	✓		
	18	22.0	✓		
	19	22.0	✓		
	20	21.5	✓		
	21	21.5	✓		
	22	20.5	✓		
	23	20.5	✓		
	24	22.5	✓		
	25	21.5	✓		
	26	22.0	✓		
	27	21.5	✓		
	28				
	29				
	30				
	31				
	32				
	33				
	34				
	35				

Total wet weight (pooled): 2.73g

Number of survivors: 27

Number of abnormal/have difficulty swimming: 0/0

Initials: KB, MW

Reviewed by: [signature]

Date Reviewed: Dec. 20, 2021

Embryo - Alevin Test Termination Data Sheet
Length, Wet Weight, Abnormalities

Client: **Teck**

Start Date: **October 13, 2021**

Sample ID: **FR_FR4 + 20 µg/L Cu**

Termination Date: **November 12, 2021**

Work Order No.: **212110**

Treatment (% v/v) and Replicate	Fish	Length (mm)	Normal	Abnormal	Comments
100 A	1	19.5	✓		
	2	20.0	✓		
	3	20.5	✓		
	4	19.5	✓		
	5	20.0	✓		
	6	20.0	✓		
	7	19.5	✓		
	8	20.5	✓		
	9	20.0	✓		
	10	18.5	✓		
	11	20.5	✓		
	12	19.5	✓		
	13	20.0	✓		
	14	20.0	✓		
	15	20.0	✓		
	16	20.0	✓		
	17	20.5	✓		
	18	22.0	✓		
	19	20.0	✓		
	20	20.0	✓		
	21	19.0	✓		
	22	20.0	✓		
	23	21.0	✓		
	24	20.0	✓		
	25	20.5	✓		
	26	19.5	✓		
	27	20.0	✓		
	28	17.0		✓	yolk sac edema
	29				
	30				
	31				
	32				
	33				
	34				
	35				

Total wet weight (pooled): 2.67g

Number of survivors: 28

Number of abnormal/have difficulty swimming: 1/0

Initials: KB.MW

Reviewed by: [signature]

Date Reviewed: Dec 20, 2021

Embryo - Alevin Test Termination Data Sheet
Length, Wet Weight, Abnormalities

Client: **Teck**

Sample ID: **FR_FR4 + 20 µg/L Cu**

Work Order No.: **212110**

Start Date: **October 13, 2021**

Termination Date: **November 12, 2021**

Treatment (% v/v) and Replicate	Fish	Length (mm)	Normal	Abnormal	Comments
100 B	1	20.0	✓		
	2	17.0	✓		
	3	19.5	✓		
	4	18.0	✓		
	5	18.5	✓		
	6	18.5	✓		
	7	19.0	✓		
	8	19.0	✓		
	9	19.5	✓		
	10	20.0	✓		
	11	18.5	✓		
	12	19.5	✓		
	13	19.5	✓		
	14	18.5	✓		
	15	19.0	✓		
	16	18.5	✓		
	17	19.5	✓		
	18	18.0	✓		
	19	18.5	✓		
	20	19.5	✓		
	21	18.9	✓		
	22	16.5		✓	yolksac edema
	23				
	24				
	25				
	26				
	27				
	28				
	29				
	30				
	31				
	32				
	33				
	34				
	35				

Total wet weight (pooled): 1.849

Number of survivors: 22

Number of abnormal/have difficulty swimming: 1 | 0

Initials: KB, YM

Reviewed by: [signature]

Date Reviewed: Dec. 22, 2021

Embryo - Alevin Test Termination Data Sheet
Length, Wet Weight, Abnormalities

Client: **Teck**

Start Date: **October 13, 2021**

Sample ID: **FR_FR4 + 20 µg/L Cu**

Termination Date: **November 12, 2021**

Work Order No.: **212110**

Treatment (% v/v) and Replicate	Fish	Length (mm)	Normal	Abnormal	Comments
100 C	1	20.0	✓		
	2	20.5	✓		
	3	20.0	✓		
	4	20.5	✓		
	5	20.0	✓		
	6	19.5	✓		
	7	19.0	✓		
	8	20.0	✓		
	9	20.5	✓		
	10	20.00	✓		
	11	20.0	✓		
	12	19.5	✓		
	13	20.0	✓		
	14	20.0	✓		
	15	20.0	✓		
	16	19.5	✓		
	17	17.0	✓		
	18	19.0	✓		
	19	15.0		✓	yolksac edema
	20				
	21				
	22				
	23				
	24				
	25				
	26				
	27				
	28				
	29				
	30				
	31				
	32				
	33				
	34				
	35				

Total wet weight (pooled): 1.82g

Number of survivors: 19

Number of abnormal/have difficulty swimming: 1/0

Initials: KB, YM

Reviewed by: [signature]

Date Reviewed: Dec-20, 2021

Embryo - Alevin Test Termination Data Sheet
Length, Wet Weight, Abnormalities

Client: **Teck**

Sample ID: **FR_FR4 + 20 µg/L Cu**

Work Order No.: **212110**

Start Date: **October 13, 2021**

Termination Date: **November 12, 2021**

Treatment (% v/v) and Replicate	Fish	Length (mm)	Normal	Abnormal	Comments
100 D	1	20.5	✓		
	2	20.5	✓		
	3	20.5	✓		
	4	20.5	✓		
	5	19.5	✓		
	6	20.0	✓		
	7	18.5	✓		
	8	22.0	✓		
	9	20.0	✓		
	10	21.5	✓		
	11	20.0	✓		
	12	19.5	✓		
	13	20.5	✓		
	14	20.0	✓		
	15	20.0	✓		
	16	20.0	✓		
	17	20.5	✓		
	18	20.0	✓		
	19	20.5	✓		
	20	20.5	✓		
	21	21.0	✓		
	22	19.5	✓		
	23	19.5	✓		
	24				
	25				
	26				
	27				
	28				
	29				
	30				
	31				
	32				
	33				
	34				
	35				

Total wet weight (pooled): 2.19g

Number of survivors: 23

Number of abnormal/have difficulty swimming: 0/0

Initials: KB, YMC

Reviewed by: [signature]

Date Reviewed: Dec. 20, 2021

Embryo - Alevin Test Termination Data Sheet
Length, Wet Weight, Abnormalities

Client: **Teck**

Start Date: **October 13, 2021**

Sample ID: **FR_FRRD + 20 µg/L Cu**

Termination Date: **November 12, 2021**

Work Order No.: **212110**

Treatment (% v/v) and Replicate	Fish	Length (mm)	Normal	Abnormal	Comments
100 A	1	20.0	✓		
	2	18.5	✓		
	3	18.5	✓		
	4	19.5	✓		
	5	18.5	✓		
	6	19.5	✓		
	7	18.5	✓		
	8	20.0	✓		
	9	19.0	✓		
	10	19.5	✓		
	11	18.5	✓		
	12	19.0	✓		
	13	19.0	✓		
	14	19.5	✓		
	15	17.5	✓		
	16	17.0	✓		
	17	19.0	✓		
	18	19.0	✓		
	19	19.5	✓		
	20	19.0	✓		
	21	20.0	✓		
	22	18.0	✓		
	23	20.0	✓		
	24	18.5	✓		
	25	18.5	✓		
	26	19.5	✓		
	27	18.5	✓		
	28				
	29				
	30				
	31				
	32				
	33				
	34				
	35				

Total wet weight (pooled): 2.18g

Number of survivors: 27

Number of abnormal/have difficulty swimming: 0/0

Initials: KB, YM

Reviewed by: [signature]

Date Reviewed: Dec-20, 2021

Embryo - Alevin Test Termination Data Sheet
Length, Wet Weight, Abnormalities

Client: **Teck**

Sample ID: **FR_FRRD + 20 µg/L Cu**

Work Order No.: **212110**

Start Date: **October 13, 2021**

Termination Date: **November 12, 2021**

Treatment (% v/v) and Replicate	Fish	Length (mm)	Normal	Abnormal	Comments
100 B	1	20.0	/		
	2	18.5	/		
	3	19.0	/		
	4	18.0	/		
	5	19.0	/		
	6	19.0	/		
	7	18.0	/		
	8	16.5	/		
	9	18.5	/		
	10	17.5	/		
	11	20.0	/		
	12	19.0	/		
	13	19.0	/		
	14	19.5	/		
	15	19.0	/		
	16	19.0	/		
	17	19.5	/		
	18	20.0	/		
	19	18.5	/		
	20	19.0	/		
	21	20.0	/		
	22	20.0	/		
	23	19.0	/		
	24	18.5	/		
	25	16.0		✓	yolksac edema
	26				
	27				
	28				
	29				
	30				
	31				
	32				
	33				
	34				
	35				

Total wet weight (pooled): 1.96g

Number of survivors: 25

Number of abnormal/have difficulty swimming: 1/0

Initials: KB, YM

Reviewed by: [signature]

Date Reviewed: Dec. 20, 2021

Embryo - Alevin Test Termination Data Sheet
Length, Wet Weight, Abnormalities

Client: **Teck**

Sample ID: **FR_FRRD + 20 µg/L Cu**

Work Order No.: **212110**

Start Date: **October 13, 2021**

Termination Date: **November 12, 2021**

Treatment (% v/v) and Replicate	Fish	Length (mm)	Normal	Abnormal	Comments
100 C	1	20.0	/		
	2	19.0	/		
	3	20.0	/		
	4	20.0	/		
	5	20.0	/		
	6	18.5	/		
	7	20.0	/		
	8	19.0	/		
	9	18.5	/		
	10	18.5	/		
	11	20.0	/		
	12	19.0	/		
	13	17.0	/		
	14	20.0	/		
	15	20.0	/		
	16	20.0	/		
	17	20.0	/		
	18	20.0	/		
	19	20.00	/		
	20	20.0	/		
	21	19.0	/		
	22	20.0	/		
	23	20.0	/		
	24	20.0	/	GSX	
	25	19.0		✓	~~Yolk sac edema~~ scoliosis
	26				
	27				
	28				
	29				
	30				
	31				
	32				
	33				
	34				
	35				

Total wet weight (pooled): 2.41g

Number of survivors: 25

Number of abnormal/have difficulty swimming: 1/0

Initials: KB, YML

Reviewed by: [signature]

Date Reviewed: Dec. 20, 2021

Embryo - Alevin Test Termination Data Sheet
Length, Wet Weight, Abnormalities

Client: **Teck**

Sample ID: **FR_FR2 + 20 µg/L Cu**

Work Order No.: **212110**

Start Date: **October 13, 2021**

Termination Date: **November 12, 2021**

Treatment (% v/v) and Replicate	Fish	Length (mm)	Normal	Abnormal	Comments
100 A	1	19.5	✓		
	2	19.5	✓		
	3	18.5	✓		
	4	19.5	✓		
	5	19.5	✓		
	6	19.5	✓		
	7	19.0	✓		
	8	19.0	✓		
	9	20.0	✓		
	10	20.0	✓		
	11	20.0	✓		
	12	19.0	✓		
	13	19.5	✓		
	14	20.0	✓		
	15	19.5	✓		
	16	19.0	✓		
	17	19.5	✓		
	18	19.5	✓		
	19	20.5	✓		
	20	21.0	✓		
	21	21.0	✓		
	22	20.0	✓		
	23	19.5	✓		
	24	21.0	✓		
	25	18.0		✓	Kyphosis
	26				
	27				
	28				
	29				
	30				
	31				
	32				
	33				
	34				
	35				

Total wet weight (pooled): 2.180 g (25)

Number of survivors: 25

Number of abnormal/have difficulty swimming: 1/1

Initials: KB, YW

Reviewed by: [signature]

Date Reviewed: Dec 20, 2021

Embryo - Alevin Test Termination Data Sheet
Length, Wet Weight, Abnormalities

Client: **Teck**

Start Date: **October 13, 2021**

Sample ID: **FR_FR2 + 20 µg/L Cu**

Termination Date: **November 12, 2021**

Work Order No.: **212110**

Treatment (% v/v) and Replicate	Fish	Length (mm)	Normal	Abnormal	Comments
100 B	1	17.5	/		
	2	18.5	/		
	3	18.0	/		
	4	19.0	/		
	5	18.5	/		
	6	18.0	/		
	7	19.0	/		
	8	17.5	/		
	9	17.0	/		
	10	18.0	/		
	11	17.5	/		
	12	17.0	/		
	13	18.5	/		
	14	18.5	/		
	15	19.0	/		
	16	19.0	/		
	17	19.0	/		
	18	19.0	/		
	19	19.0		✓	yolksac edema
	20				
	21				
	22				
	23				
	24				
	25				
	26				
	27				
	28				
	29				
	30				
	31				
	32				
	33				
	34				
	35				

Total wet weight (pooled): 1.469

Number of survivors: 19

Number of abnormal/have difficulty swimming: 1/0

Initials: KB, YM

Reviewed by: [signature]

Date Reviewed: Dec 20, 2021

Embryo - Alevin Test Termination Data Sheet
Length, Wet Weight, Abnormalities

Client: **Teck**

Start Date: **October 13, 2021**

Sample ID: **FR_FR2 + 20 µg/L Cu**

Termination Date: **November 12, 2021**

Work Order No.: **212110**

Treatment (% v/v) and Replicate	Fish	Length (mm)	Normal	Abnormal	Comments
100 C	1	20.0	✓		
	2	21.0	✓		
	3	20.0	✓		
	4	20.0	✓		
	5	19.5	✓		
	6	20.0	✓		
	7	20.0	✓		
	8	20.5	✓		
	9	21.5	✓		
	10	20.0	✓		
	11	20.5	✓		
	12	21.5	✓		
	13	21.5	✓		
	14	20.5	✓		
	15	20.0	✓		
	16	20.5	✓		
	17	19.0	✓		
	18	21.0	✓		
	19	21.0	✓		
	20	20.0	✓		
	21	21.0	✓		
	22	21.0	✓		
	23	20.0	✓		
	24	20.5	✓		
	25	20.5	✓		
	26				
	27				
	28				
	29				
	30				
	31				
	32				
	33				
	34				
	35				

Total wet weight (pooled): 2.51g

Number of survivors: 25

Number of abnormal/have difficulty swimming: 0/0

Initials: KB, YW

Reviewed by: [signature]

Date Reviewed: Dec 20, 2021

Embryo - Alevin Test Termination Data Sheet
Length, Wet Weight, Abnormalities

Client: **Teck**

Start Date: **October 13, 2021**

Sample ID: **FR_FR2 + 20 µg/L Cu**

Termination Date: **November 12, 2021**

Work Order No.: **212110**

Treatment (% v/v) and Replicate	Fish	Length (mm)	Normal	Abnormal	Comments
100 D	1	21.0	/		
	2	21.0	/		
	3	21.0	/		
	4	20.0	/		
	5	20.5	/		
	6	21.5	/		
	7	21.5	/		
	8	20.5	/		
	9	20.5	/		
	10	21.0	/		
	11	20.0	/		
	12	20.0	/		
	13	21.5	/		
	14	22.0	/		
	15	20.0	/		
	16	21.0	/		
	17	21.0	/		
	18	20.0	/		
	19	21.0	/		
	20	21.5	/		
	21	18.0	/		
	22	21.0	/		
	23	20.0	/		
	24				
	25				
	26				
	27				
	28				
	29				
	30				
	31				
	32				
	33				
	34				
	35				

Total wet weight (pooled): 2.240

Number of survivors: 23

Number of abnormal/have difficulty swimming: 0 / 0

Initials: KB, YW

Reviewed by: [signature]

Date Reviewed: Dec-20, 2021

Embryo - Alevin Test Termination Data Sheet
Length, Wet Weight, Abnormalities

Client: **Teck**
Start Date: **October 13, 2021**
Sample ID: **FR_MULTIPLATE + 20 µg/L Cu**
Termination Date: **November 12, 2021**
Work Order No.: **212110**

Treatment (% v/v) and Replicate	Fish	Length (mm)	Normal	Abnormal	Comments
100 A	1	20.0	✓		
	2	20.0	✓		
	3	19.5	✓		
	4	19.0	✓		
	5	19.0	✓		
	6	19.0	✓		
	7	19.5	✓		
	8	19.0	✓		
	9	19.0	✓		
	10	20.0	✓		
	11	19.0	✓		
	12	19.5	✓		
	13	17.5	✓		
	14	18.5	✓		
	15	18.0	✓		
	16	20.0	✓		
	17	19.5	✓		
	18	18.5	✓		
	19	19.0	✓		
	20	17.5		✓	yolksac edema
	21				
	22				
	23				
	24				
	25				
	26				
	27				
	28				
	29				
	30				
	31				
	32				
	33				
	34				
	35				

Total wet weight (pooled): 1.89g
Number of survivors: 20
Number of abnormal/have difficulty swimming: 1/20
Initials: KB, VM

Reviewed by: [signature]
Date Reviewed: Dec 20, 2021

Embryo - Alevin Test Termination Data Sheet
Length, Wet Weight, Abnormalities

Client: **Teck**

Start Date: **October 13, 2021**

Sample ID: **FR_MULTIPLATE + 20 µg/L Cu**

Termination Date: **November 12, 2021**

Work Order No.: **212110**

Treatment (% v/v) and Replicate	Fish	Length (mm)	Normal	Abnormal	Comments
100 B	1	18.5	✓		
	2	18.5	✓		
	3	18.5	✓		
	4	18.0	✓		
	5	18.5	✓		
	6	19.0	✓		
	7	18.0	✓		
	8	19.0	✓		
	9	18.0	✓		
	10	18.0	✓		
	11	19.0	✓		
	12	18.0	✓		
	13	19.0	✓		
	14	19.0	✓		
	15	18.0	✓		
	16	18.0	✓		
	17	20.0	✓		
	18	16.0	✓		
	19	17.5	✓		
	20	17.5	✓		
	21	18.0	✓		
	22	18.0 ~~19.0~~	✓		
	23	18.5	✓		
	24	18.0	✓		
	25	19.0	✓		
	26	19.5	✓		
	27	18.0	✓		
	28	16.0	✓		
	29	17.5		✓	½ lordosis edema
	30	17.0		✓	½ lordosis edema
	31				
	32				
	33				
	34				
	35				

Total wet weight (pooled): 2.30g

Number of survivors: 30

Number of abnormal/have difficulty swimming: 2 | 0

Initials: KB, MC

Reviewed by: [signature]

Date Reviewed: Dec-20, 2021

Embryo-Alevin Test - Lengths, Wet Weights, Normality Assessment

Client: Teck WO#:212110

	DECHLOR CONTROL				DECHLOR + 20 µg/L Cu			
Fish #	**A**	**B**	**C**	**D**	**A**	**B**	**C**	**D**
1	19.5	18.5	18.5	21.5	19.0	16.0	17.5	19.0
2	19.0	17.5	18.0	20.0	18.5	16.0	18.5	19.0
3	19.0	17.0	19.0	20.5	18.5	16.0	17.5	17.5
4	19.5	17.5	19.0	21.5	17.5	17.0	18.0	19.0
5	19.5	17.5	17.0	20.5	18.0	17.0	18.5	19.0
6	19.5	16.5	17.5	22.0	19.0	16.5	18.5	18.0
7	19.5	16.5	19.5	21.0	16.0	18.0	18.0	19.0
8	20.0	16.0	18.0	21.0	18.0	17.0	17.5	19.5
9	19.5	17.0	18.0	21.0	17.0	16.0	19.0	19.0
10	19.0	16.5	19.0	20.5	19.5	15.5	18.0	18.5
11	19.0	15.5	19.5	21.0	19.5	15.0	18.0	18.5
12	19.0	16.0	19.0	21.0	19.0	16.5	15.5	18.0
13	19.0	16.0	19.0	21.0	18.0	16.5	15.0	17.5
14	19.5	16.0	19.5	21.0	19.0	15.5	17.5	17.0
15	19.0	17.0	18.0	21.0	19.5	17.0	16.0	16.5
16	19.0	17.5	19.0	20.0	18.5	17.0	17.5	19.0
17	19.5	16.0	19.0	20.5	17.5	17.0	17.5	17.0
18	19.0	15.0	19.0	20.5	19.0	17.5	18.5	17.5
19	19.5	16.5	18.0	21.0	18.5	16.0	17.5	19.5
20	19.0	17.0	19.5	21.0	18.5	15.5	19.0	19.5
21	18.5	15.0	18.5	21.0	17.5	14.5	18.0	15.5
22	18.0	14.0	19.0	20.5	18.0	15.0	15.0	19.5
23	19.0	14.0		21.0	18.0	13.5	15.5	19.0
24	20.0			21.0	18.0	13.0		18.5
25	20.0			19.5	18.5	15.5		13.5
26	19.0			20.0	18.0			
27	17.5			20.5	18.0			
28				20.5	18.5			
29					18.0			
30								
31								
# Survivors	27	23	22	28	29	25	23	25
Average Length (mm)	**19.167**	**16.348**	**18.659**	**20.768**	**18.293**	**16.000**	**17.457**	**18.140**
Pooled Weight (g)	2.33	1.68	1.96	2.64	2.48	1.77	1.91	2.10
Pooled Weight (mg)	**2330**	**1680**	**1960**	**2640**	**2480**	**1770**	**1910**	**2100**
Average Weight (g)	0.086	0.073	0.089	0.094	0.086	0.071	0.083	0.084
= abnormal								

Dec 20, 2021

Embryo - Alevin Test - Lengths, Wet Weights, Normality Assessment

Client: Teck WO#: 212110

	FR_UFR1 + 20 µg/L Cu				GH_ER2 + 20 µg/L Cu			
Fish #	**100 A**	**100 B**	**100 C**	**100 D**	**100 A**	**100 B**	**100 C**	**100 D**
1	19.0	17.5	19.0	20.5	20.0	20.0	20.5	17.5
2	18.5	16.5	17.0	20.0	19.5	19.0	20.0	21.0
3	18.0	18.5	19.0	20.5	19.0	19.0	19.5	20.0
4	18.5	17.5	18.0	20.0	20.0	19.0	20.0	20.0
5	18.0	18.0	19.5	20.5	19.5	19.0	19.0	20.0
6	18.5	17.0	18.0	18.5	19.5	18.5	20.0	20.0
7	17.5	16.5	20.0	20.5	19.5	18.0	20.0	19.5
8	17.5	18.0	19.5	20.5	19.0	20.0	20.5	19.0
9	18.5	17.0	19.5	21.0	19.0	20.0	22.0	19.0
10	18.5	17.5	18.0	20.0	19.0	19.0	18.5	19.5
11	18.5	18.0	17.5	20.0	19.5	19.0	19.0	19.5
12	18.0	18.0	19.5	20.5	20.0	19.5	19.5	20.0
13	17.5	19.0	18.5	19.0	19.0	19.0	19.5	19.5
14	18.0	18.0	20.0	20.0	19.0	19.5	20.5	20.5
15	18.5	17.5	18.5	19.0	20.0	19.5	20.0	21.0
16	18.5	18.0	20.0	18.5	19.0	19.0	20.0	19.5
17	18.0	18.5	18.5	20.0	20.0	18.0	20.5	20.0
18	19.0	18.0	19.0	19.5	19.0	19.0	19.5	21.5
19	17.5	19.0	19.0	20.0	19.5	19.5	20.0	19.0
20	19.0	18.5	18.5	19.5	19.5	19.5	19.0	21.0
21	18.0	17.5	17.5	21.0	19.0	19.0	18.5	19.5
22	18.5	18.0		20.0	18.0	19.0	19.0	19.5
23	18.5	18.0		19.0	20.0	19.0	20.0	20.0
24	19.5	18.0		19.0	20.0	20.0	19.0	20.0
25	16.0	17.5		19.5	20.0	21.0	19.5	20.0
26	18.5	17.0		18.0	18.5	19.5	16.0	
27	17.5			15.0	19.0	17.5		
28	17.5				18.5	16.5		
29								
30								
31								
# Survivors	28	26	21	27	28	28	26	25
Average Length (mm)	**18.179**	**17.788**	**18.762**	**19.611**	**19.339**	**19.089**	**19.596**	**19.840**
Pooled Weight (g)	2.17	1.94	1.91	2.65	2.32	2.19	2.40	2.47
Pooled Weight (mg)	**2170**	**1940**	**1910**	**2650**	**2320**	**2190**	**2400**	**2470**
Average Weight (g)	0.078	0.075	0.091	0.098	0.083	0.078	0.092	0.099

= abnormal

Dec. 20, 2021

Embryo-Alevin Test - Lengths, Wet Weights, Normality Assessment

Client: Teck WO#: 212110

	CM_MC1 + 20 µg/L Cu				LC_SLC + 20 µg/L Cu			
Fish #	**100 A**	**100 B**	**100 C**	**100 D**	**100 A**	**100 B**	**100 C**	**100 D**
1	19.0	18.5	19.0	18.5	18.5	16.5	19.0	18.5
2	19.0	18.5	17.5	19.0	19.0	16.5	18.5	19.0
3	19.0	17.5	18.5	19.0	19.0	16.0	19.0	19.0
4	19.5	18.0	19.0	18.0	18.5	18.5	19.5	19.5
5	19.0	18.5	19.5	19.0	18.5	18.0	18.0	20.0
6	19.0	19.0	17.0	18.5	18.5	19.5	17.0	19.0
7	19.5	19.5	18.5	19.0	18.5	17.0	19.5	17.0
8	19.0	18.0	20.5	20.0	17.5	18.0	19.0	19.0
9	20.0	19.0	19.5	19.5	18.0	18.0	19.0	18.0
10	19.0	19.5	20.0	18.5	18.5	18.5	18.5	19.5
11	19.0	17.5	20.5	18.0	17.5	18.5	18.5	18.5
12	19.5	17.5	20.0	18.5	18.5	18.0	18.0	18.0
13	19.5	19.0	20.0	20.0	18.0	18.0	17.5	19.5
14	19.5	18.0	19.0	19.5	18.5	18.0	17.5	18.5
15	19.0	18.0	19.0	20.0	17.0	17.5	18.0	20.0
16	20.0	17.0	21.0	18.5	18.0	17.0	18.0	20.0
17	19.5	18.5	19.0	20.0	18.0	18.5	17.5	17.0
18	19.5	19.5	21.0	20.5	18.0	17.5	18.5	20.0
19	19.0	17.5	19.0	20.0	17.5	18.5	16.5	18.0
20	19.0	17.5	19.5	19.5	17.5	19.0	18.5	18.5
21	19.0	17.0	20.0	18.5	18.5	17.5	17.5	19.5
22	19.0	18.5	20.0	18.0	17.5	17.5	17.5	18.5
23	19.0	18.5	18.0	19.5	17.5	15.5	17.0	16.0
24	19.5	18.0	19.5	18.0	17.0	15.0	16.0	15.5
25	19.0	18.5	20.0	15.5	18.0		17.5	17.5
26	18.5	18.0	17.5		17.5			
27	19.0	17.0			15.5			
28	19.5	19.0			17.0			
29	19.5	14.5						
30								
31								
# Survivors	29	29	26	25	28	24	25	25
Average Length (mm)	**19.224**	**18.103**	**19.308**	**18.920**	**17.911**	**17.604**	**18.040**	**18.540**
Pooled Weight (g)	2.41	2.30	2.40	2.21	2.22	1.71	2.21	2.23
Pooled Weight (mg)	**2410**	**2300**	**2400**	**2210**	**2220**	**1710**	**2210**	**2230**
Average Weight (g)	0.083	0.079	0.092	0.088	0.079	0.071	0.088	0.089
= abnormal								

Dec 20, 2021

Embryo-Alevin Test - Lengths, Wet Weights, Normality Assessment

Client: Teck WO#: 212110

	FR_FRABCH + 20 µg/L Cu				FR_FRCP1 + 20 µg/L Cu			
Fish #	**100 A**	**100 B**	**100 C**	**100 D**	**100 A**	**100 B**	**100 C**	**100 D**
1	19.0	18.0	20.5	21.0	20.0	18.5	21.0	20.5
2	19.5	19.5	21.0	21.0	20.0	18.5	20.0	21.0
3	19.0	19.0	20.5	21.5	20.5	18.5	19.5	22.0
4	19.0	18.0	20.0	21.0	20.0	19.0	20.5	21.0
5	19.5	19.0	21.0	21.5	20.0	19.0	21.0	20.0
6	20.0	19.0	20.0	21.5	19.5	18.0	20.0	19.0
7	19.5	19.0	19.0	21.5	19.5	18.0	22.0	21.0
8	20.0	18.0	19.5	20.5	20.0	17.5	21.0	20.0
9	20.0	19.5	19.5	21.5	18.5	18.0	21.0	19.0
10	20.0	18.5	21.5	21.0	20.5	19.0	21.5	20.0
11	19.0	19.0	18.5	22.0	20.0	18.0	21.5	21.5
12	17.5	19.5	20.5	21.0	20.0	18.5	19.0	21.5
13	20.5	18.5	20.0	21.0	19.5	17.0	20.0	20.0
14	19.5	19.0	20.0	21.0	20.5	18.0	20.5	20.0
15	20.0	19.5	21.0	20.5	20.0	18.0	20.5	21.0
16	19.5	20.0	20.0	21.5	20.0	16.0	20.5	21.0
17	19.5	19.0	20.5	21.0	20.0	17.0	19.0	20.0
18	19.5	19.0	20.5	20.5	19.5	18.5	18.0	21.0
19	19.5	19.5	19.5	21.0	20.0		21.0	17.5
20	20.0	17.0	20.5	21.0	19.5			
21	19.5	19.0	20.5	21.0	20.0			
22	19.0	18.0	20.5	20.5	20.0			
23	18.5	19.0	20.0	20.0	20.5			
24	19.5	19.0	17.0	20.0	19.5			
25		18.5	19.5	17.0	17.0			
26		17.5		21.0				
27		19.0						
28								
29								
30								
31								
# Survivors	24	27	25	26	25	18	19	19
Average Length (mm)	**19.438**	**18.796**	**20.040**	**20.846**	**19.780**	**18.056**	**20.395**	**20.368**
Pooled Weight (g)	2.05	2.19	2.52	2.77	2.34	1.41	1.94	1.93
Pooled Weight (mg)	**2050**	**2190**	**2520**	**2770**	**2340**	**1410**	**1940**	**1930**
Average Weight (g)	0.085	0.081	0.101	0.107	0.094	0.078	0.102	0.102

= abnormal

Dec. 20, 2021

Embryo-Alevin Test - Lengths, Wet Weights, Normality Assessment

Client: Teck WO#: 212110

	GH_FR1 + 20 µg/L Cu				GH_ERC + 20 µg/L Cu			
Fish #	**100 A**	**100 B**	**100 C**	**100 D**	**100 A**	**100 B**	**100 C**	**100 D**
1	19.5	19.0	21.5	22.0	19.5	19.5	20.0	21.0
2	19.0	19.5	20.0	22.0	19.5	20.0	21.0	20.5
3	20.0	19.0	20.5	21.5	19.5	20.0	20.5	20.5
4	18.0	19.5	20.5	21.0	19.5	19.0	20.5	21.0
5	20.0	20.0	21.5	21.0	18.5	19.0	20.0	20.5
6	19.0	19.5	21.0	21.0	19.0	19.0	20.5	20.5
7	19.0	19.5	21.0	21.5	19.0	19.5	21.0	21.0
8	20.0	19.5	22.0	20.5	20.0	19.5	21.0	22.0
9	20.5	19.0	21.0	21.5	20.0	19.5	21.0	21.0
10	19.0	18.5	20.5	19.5	20.0	18.5	20.5	21.5
11	20.5	20.0	20.5	21.0	19.5	18.5	20.0	20.5
12	19.0	20.0	20.0	21.0	19.0	19.0	21.5	21.0
13	19.5	19.0	21.0	20.5	19.5	18.5	21.0	21.5
14	20.0	19.0	20.5	20.0	20.0	19.0	21.0	21.0
15	19.5	19.5	21.0	21.0	19.5	19.0	20.5	21.5
16	19.0	19.5	21.5	17.5	19.5	19.0	21.5	21.0
17	19.0	19.5	21.5	17.5	19.5	19.0	20.5	21.0
18	19.0	20.0	21.0	22.0	19.5	19.5	19.0	20.5
19	19.5	20.0	21.0		20.0	19.0	19.0	19.0
20	19.5	20.0	21.5		20.0	20.0	21.0	22.0
21	19.0	18.5	20.5		19.0	20.0	20.5	20.5
22	19.5	19.0	20.5		19.5	18.5	18.5	20.0
23	19.0	19.0	19.5		19.0	17.0	19.0	21.5
24	19.5	18.5			19.5	19.0		
25		19.0			19.0	16.5		
26		19.0			19.5	17.0		
27		19.0			19.0	16.0		
28					19.5			
29					19.0			
30								
31								
# Survivors	24	27	23	18	29	27	23	23
Average Length (mm)	**19.396**	**19.315**	**20.848**	**20.667**	**19.431**	**18.815**	**20.391**	**20.891**
Pooled Weight (g)	2.19	2.32	2.87	1.91	2.75	2.42	2.32	2.45
Pooled Weight (mg)	**2190**	**2320**	**2870**	**1910**	**2750**	**2420**	**2320**	**2450**
Average Weight (g)	0.091	0.086	0.125	0.106	0.095	0.090	0.101	0.107
= abnormal								

Dec. 20, 2021

Embryo-Alevin Test - Lengths, Wet Weights, Normality Assessment

Client: Teck WO#: 212110

	CM_MC2 + 20 µg/L Cu				EV_MC2 + 20 µg/L Cu			
Fish #	**100 A**	**100 B**	**100 C**	**100 D**	**100 A**	**100 B**	**100 C**	**100 D**
1	19.0	20.5	21.0	20.5	18.0	20.0	20.0	18.0
2	19.0	21.0	21.0	21.0	18.5	18.5	19.5	18.0
3	21.0	19.0	21.0	20.5	18.0	18.0	20.5	19.5
4	19.5	19.5	20.5	21.0	20.0	19.0	19.5	18.5
5	19.0	20.5	19.0	21.0	19.5	16.5	19.5	18.5
6	20.0	20.0	20.0	20.0	18.5	18.0	19.0	18.0
7	19.0	20.0	18.0	21.0	18.5	18.0	19.0	19.0
8	19.0	20.0	21.0	20.5	19.0	18.0	20.0	18.5
9	20.0	20.5	20.5	21.0	18.0	19.5	19.5	16.0
10	19.5	20.0	21.0	20.5	19.0	18.0	18.0	18.0
11	19.0	21.0	21.0	21.5	19.0	18.0	19.0	18.0
12	21.5	17.5	20.0	20.5	19.0	19.5	19.5	17.0
13	20.0	20.0	21.0	20.5	19.0	18.5	21.0	17.5
14	19.5	20.0	20.0	19.5	18.0	16.5	19.5	17.5
15	19.5	20.5	20.5	21.0	18.5	18.5	19.0	17.5
16	19.5	21.0	20.0	18.5	19.5	19.0	20.0	17.0
17	19.0	21.0	21.0	22.5	19.5	17.0	19.5	17.5
18	19.5	19.5	21.0	21.5	19.5	18.0	18.0	16.5
19	18.0	20.5	20.5	19.5	19.0	19.0	20.0	18.5
20	19.0	20.5		20.0	18.5	19.0	17.5	
21	19.5	20.0		20.0	19.0	18.0	19.5	
22	20.5	20.5		21.0	20.0	18.5	20.0	
23	19.0	21.0		20.5	19.5	17.0	17.0	
24	19.5	20.0		21.0	19.5	19.0		
25	19.0	20.0		19.5	19.0			
26	19.5	19.0			19.0			
27	19.0	19.5			18.5			
28		20.5						
29								
30								
31								
# Survivors	27	28	19	25	27	24	23	19
Average Length (mm)	**19.463**	**20.107**	**20.421**	**20.560**	**18.926**	**18.292**	**19.304**	**17.842**
Pooled Weight (g)	2.62	2.22	2.05	2.52	2.41	1.75	2.13	1.75
Pooled Weight (mg)	**2620**	**2220**	**2050**	**2520**	**2410**	**1750**	**2130**	**1750**
Average Weight (g)	0.097	0.079	0.108	0.101	0.089	0.073	0.093	0.092

= abnormal

Dec. 20, 2024

Embryo-Alevin Test - Lengths, Wet Weights, Normality Assessment

Client: Teck WO#: 212110

	EV_HC1 + 20 µg/L Cu				LC_DCDS + 20 µg/L Cu			
Fish #	**100 A**	**100 B**	**100 C**	**100 D**	**100 A**	**100 B**	**100 C**	**100 D**
1	19.5	17.5	21.0	20.0	20.0	19.5	20.0	20.0
2	20.0	18.5	19.0	22.0	19.0	18.0	20.5	21.0
3	21.0	17.0	21.0	20.0	19.0	19.0	19.5	21.5
4	19.5	17.0	20.0	20.5	20.0	18.5	20.0	21.0
5	18.5	17.0	20.0	21.0	19.0	19.5	20.0	21.5
6	18.5	19.0	19.0	19.0	19.0	20.0	18.5	21.0
7	18.5	18.0	19.5	21.0	20.0	20.0	20.0	22.0
8	19.0	19.0	15.5	20.0	19.5	20.5	20.5	21.5
9	19.5	19.0	19.0	21.0	19.0	18.0	19.5	22.0
10	19.0	17.0	19.0	20.0	16.0	19.0	20.5	20.0
11	19.5	18.5	19.5	21.0	17.5	20.0	19.0	20.5
12	19.0	19.0	19.0	20.5	19.0	19.0	20.5	21.5
13	18.0	19.0	18.5	21.0	19.5	19.0	20.0	21.5
14	19.5	19.0	21.5	21.5	20.0	20.5	20.0	20.5
15	20.0	19.5	17.5	19.0	18.5	18.5	22.0	20.0
16	19.0	20.0	15.0	21.0	19.5	17.0	22.0	21.5
17	20.0	17.5	20.0	20.0	20.0	20.0	20.0	21.5
18	20.0	19.0	17.0	21.0	19.0	20.0	20.0	20.0
19	18.5	19.0	16.5	21.0	18.0	19.5	20.0	21.5
20	20.0	18.0	20.0	21.0	18.5	19.5	20.5	21.5
21	20.0	19.0	15.0	20.5	18.0	20.0	19.5	21.5
22	19.5	20.0	18.0		18.0	19.0	20.0	20.5
23	19.0	19.0	14.5		18.0	19.0	21.0	20.5
24	19.0	19.0	16.5		20.0	20.0	16.5	21.0
25	20.0	16.0			19.0	19.5	17.5	21.0
26	20.0	19.0			18.0	20.5		
27	19.0				14.5	18.5		
28	17.0							
29								
30								
31								
# Survivors	28	26	24	21	27	27	25	25
Average Length (mm)	**19.286**	**18.442**	**18.396**	**20.571**	**18.722**	**19.315**	**19.900**	**21.040**
Pooled Weight (g)	2.59	2.03	2.32	2.18	2.38	2.21	2.50	2.44
Pooled Weight (mg)	**2590**	**2030**	**2320**	**2180**	**2380**	**2210**	**2500**	**2440**
Average Weight (g)	0.093	0.078	0.097	0.104	0.088	0.082	0.100	0.098
= abnormal								

Dec. 22/21

Embryo-Alevin Test - Lengths, Wet Weights, Normality Assessment

Client: Teck WO#: 212110

	LC_LC3 + 20 µg/L Cu				LC_LC5 + 20 µg/L Cu			
Fish #	**100 A**	**100 B**	**100 C**	**100 D**	**100 A**	**100 B**	**100 C**	**100 D**
1	20.0	20.0	20.0	22.0	18.0	17.0	18.5	20.5
2	19.0	19.0	20.5	17.0	20.0	16.0	21.0	20.5
3	19.5	20.5	21.0	21.0	19.0	17.0	21.0	21.0
4	19.5	20.0	19.5	21.5	20.0	18.0	19.5	21.0
5	19.5	19.0	21.0	20.5	20.0	18.5	20.5	20.0
6	21.0	16.5	18.5	22.0	18.0	17.5	21.0	20.0
7	20.0	19.5	20.0	21.0	19.0	18.0	20.0	20.5
8	19.0	19.0	20.0	22.0	20.0	16.5	19.0	19.5
9	18.5	18.0	20.0	18.5	19.5	18.0	19.5	20.5
10	21.0	19.0	20.0	22.0	19.0	18.5	19.5	21.0
11	20.0	20.5	20.0	22.0	19.5	17.5	22.0	20.0
12	20.5	18.5	20.5	20.0	20.5	18.0	20.0	21.0
13	20.0	20.0	19.5	21.5	21.0	17.0	19.0	20.5
14	18.5	20.0	20.0	22.0	20.0	19.5	21.0	20.0
15	18.5	18.5	20.0	21.5	20.0	16.5	20.0	20.0
16	17.5	19.5	21.0	21.5	18.5	16.5	18.0	20.5
17	20.0	19.0	19.0	21.0	20.0	18.0	19.0	20.5
18	19.0	19.0	20.0	21.5	19.5	16.5	21.0	21.5
19	20.0	18.5	19.5	18.5	18.0	17.0	19.0	19.5
20	20.0	20.0	20.0	21.5	18.0	18.5	19.0	20.5
21	19.0	19.5	20.0	21.5	19.0	17.0	19.0	20.5
22	19.0	20.0	21.0	21.0	20.5	18.0	20.0	21.0
23	21.0	20.0	18.0	21.0	19.5	14.0	16.0	19.5
24	19.0	18.5	20.0	21.0	18.5	17.5	21.0	
25	19.5	19.0	19.5	22.0	19.0	16.5	16.5	
26	17.0	19.5	20.0	21.5	19.0			
27	19.0	20.0	16.0	22.0	20.0			
28		18.5	17.5		18.5			
29		18.0	18.5		19.0			
30					21.0			
31								
# Survivors	27	29	29	27	30	25	25	23
Average Length (mm)	**19.426**	**19.207**	**19.672**	**21.056**	**19.383**	**17.320**	**19.600**	**20.413**
Pooled Weight (g)	2.40	2.32	2.59	2.67	2.42	1.82	2.38	2.18
Pooled Weight (mg)	**2400**	**2320**	**2590**	**2670**	**2420**	**1820**	**2380**	**2180**
Average Weight (g)	0.089	0.080	0.089	0.099	0.081	0.073	0.095	0.095
= abnormal								

Dec. 20, 2021

Embryo-Alevin Test - Lengths, Wet Weights, Normality Assessment

Client: Teck WO#: 212110

	LC_LCDSSLCC + 20 µg/L Cu				FR_FR4 + 20 µg/L Cu			
Fish #	**100 A**	**100 B**	**100 C**	**100 D**	**100 A**	**100 B**	**100 C**	**100 D**
1	21.0	19.0	20.5	22.5	19.5	20.0	20.0	20.5
2	20.5	19.0	20.5	22.0	20.0	17.0	20.5	20.5
3	19.0	17.0	21.0	21.5	20.5	19.5	20.0	20.5
4	19.5	20.0	20.5	21.5	19.5	18.0	20.5	20.5
5	19.0	18.0	20.0	22.0	20.0	18.5	20.0	19.5
6	18.5	20.0	20.0	20.5	20.0	18.5	19.5	20.0
7	19.5	19.0	20.5	21.5	19.5	19.0	19.0	18.5
8	20.0	20.0	21.5	20.5	20.5	19.0	20.0	22.0
9	18.0	20.0	20.0	22.0	20.0	19.5	20.5	20.0
10	20.5	19.5	20.0	21.0	18.5	20.0	20.0	21.5
11	21.0	20.0	21.0	21.5	20.5	18.5	20.0	20.0
12	20.0	19.5	21.5	21.0	19.5	19.5	19.5	19.5
13	18.5	20.0	20.5	21.5	20.0	19.5	20.0	20.5
14	19.5	20.0	20.5	20.5	20.0	18.5	20.0	20.0
15	19.5	20.5	21.5	20.5	20.0	19.0	20.0	20.0
16	20.0	19.0	20.0	21.5	20.0	18.5	19.5	20.0
17	19.5	21.0	20.5	21.5	20.5	19.5	17.0	20.5
18	19.5	19.5	20.0	22.0	22.0	18.0	19.0	20.0
19	20.0	21.5	20.5	22.0	20.0	18.5	15.0	20.5
20	21.0	20.5	21.5	21.5	20.0	19.5		20.5
21	20.0	17.0	21.0	21.5	19.0	18.0		21.0
22	18.5		21.0	20.5	20.0	16.5		19.5
23	20.5		20.5	20.5	21.0			19.5
24	20.5		20.5	22.5	20.0			
25	20.0		18.5	21.5	20.5			
26	20.0			22.0	19.5			
27	15.0			21.5	20.0			
28					17.0			
29								
30								
31								
# Survivors	27	21	25	27	28	22	19	23
Average Length (mm)	**19.574**	**19.524**	**20.540**	**21.426**	**19.911**	**18.750**	**19.474**	**20.217**
Pooled Weight (g)	2.38	1.65	2.46	2.73	2.67	1.84	1.82	2.19
Pooled Weight (mg)	**2380**	**1650**	**2460**	**2730**	**2670**	**1840**	**1820**	**2190**
Average Weight (g)	0.088	0.079	0.098	0.101	0.095	0.084	0.096	0.095
= abnormal								

Dec 20, 2021

Embryo-Alevin Test - Lengths, Wet Weights, Normality Assessment

Client: Teck WO#: 212110

	FR_FRRD + 20 µg/L Cu				FR_FR2 + 20 µg/L Cu			
Fish #	**100 A**	**100 B**	**100 C**	**100 D**	**100 A**	**100 B**	**100 C**	**100 D**
1	20.0	20.0	20.0		19.5	17.5	20.0	21.0
2	18.5	18.5	19.0		19.5	18.5	21.0	21.0
3	18.5	19.0	20.0		18.5	18.0	20.0	21.0
4	19.5	18.0	20.0		19.5	19.0	20.0	20.0
5	18.5	19.0	20.0		19.5	18.5	19.5	20.5
6	19.5	19.0	18.5		19.5	18.0	20.0	21.5
7	18.5	18.0	20.0		19.0	19.0	20.0	21.5
8	20.0	16.5	19.0		19.0	17.5	20.5	20.5
9	19.0	18.5	18.5		20.0	17.0	21.5	20.5
10	19.5	17.5	18.5		20.0	18.0	20.0	21.0
11	18.5	20.0	20.0		20.0	17.5	20.5	20.0
12	19.0	19.0	19.0		19.0	17.0	21.5	20.0
13	19.0	19.0	17.0		19.5	18.5	21.5	21.5
14	19.5	19.5	20.0		20.0	18.5	20.5	22.0
15	17.5	19.0	20.0		19.5	19.0	20.0	20.0
16	17.0	19.0	20.0		19.0	19.0	20.5	21.0
17	19.0	19.5	20.0		19.5	19.0	19.0	21.0
18	19.0	20.0	20.0		19.5	19.0	21.0	20.0
19	19.5	18.5	20.0		20.5	19.0	21.0	21.0
20	19.0	19.0	20.0		21.0		20.0	21.5
21	20.0	20.0	19.0		21.0		21.0	18.0
22	18.0	20.0	20.0		20.0		21.0	21.0
23	20.0	19.0	20.0		19.5		20.0	20.0
24	18.5	18.5	20.0		21.0		20.5	
25	18.5	16.0	19.0		18.0		20.5	
26	19.5							
27	18.5							
28								
29								
30								
31								
# Survivors	27	25	25		25	19	25	23
Average Length (mm)	**18.944**	**18.800**	**19.500**	**#DIV/0!**	**19.640**	**18.289**	**20.440**	**20.674**
Pooled Weight (g)	2.18	1.96	2.41		2.18	1.46	2.51	2.24
Pooled Weight (mg)	**2180**	**1960**	**2410**	**0**	**2180**	**1460**	**2510**	**2240**
Average Weight (g)	0.081	0.078	0.096	#DIV/0!	0.087	0.077	0.100	0.097
= abnormal								

Dec 27, 2024

Embryo-Alevin Test - Lengths, Wet Weights, Normality Assessment

Client: Teck WO#: 212110

	FR_MULTIPLATE + 20 µg/L Cu			
Fish #	**100 A**	**100 B**	**100 C**	**100 D**
1	20.0	18.5	20.0	19.0
2	20.0	18.5	20.5	19.5
3	19.5	18.5	19.0	21.0
4	19.0	18.0	20.0	21.5
5	19.0	18.5	20.5	20.5
6	19.0	19.0	20.5	20.0
7	19.5	18.0	20.5	21.0
8	19.0	19.0	20.0	18.5
9	19.0	18.0	20.5	21.0
10	20.0	18.0	21.0	20.5
11	19.0	19.0	21.0	19.5
12	19.5	18.0	21.0	21.0
13	17.5	19.0	21.0	20.5
14	18.5	19.0	20.5	21.5
15	18.0	18.0	20.5	20.5
16	20.0	18.0	21.0	19.5
17	19.5	20.0	20.0	20.0
18	18.5	16.0	21.0	20.0
19	19.0	17.5	19.5	20.5
20	17.5	17.5	20.0	21.0
21		18.0	20.0	20.5
22		18.0	20.5	21.0
23		18.5	20.5	17.0
24		18.0	17.5	
25		19.0	21.0	
26		19.5		
27		18.0		
28		16.0		
29		17.5		
30		17.0		
31				
# Survivors	20	30	25	23
Average Length (mm)	**19.050**	**18.183**	**20.300**	**20.217**
Pooled Weight (g)	1.89	2.30	2.66	2.22
Pooled Weight (mg)	**1890**	**2300**	**2660**	**2220**
Average Weight (g)	0.095	0.077	0.106	0.097
= abnormal				

Dec. 20, 2024

Salmonid Embryo-Alevin Survival and Development Test — **Nautilus Environmental**

Batch ID:	04-8984-4677	**Test Type:**	Survival-Development	**Analyst:**	Yvonne Lam
Start Date:	13 Oct-21 15:50	**Protocol:**	EC/EPS 1/RM/28	**Diluent:**	Dechlorinated Tap Water
Ending Date:	12 Nov-21 08:00	**Species:**	Oncorhynchus mykiss	**Brine:**	
Test Length:	29d 16h	**Taxon:**	Actinopterygii	**Source:**	Lyndon Fish Hatcheries **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
Dechlor Control	16-7987-2727	12 Oct-21	12 Oct-21	40h	Teck Coal	
Dechlor + Cu	15-4969-1985	12 Oct-21	12 Oct-21	40h		
FR_UFR1	19-8746-8946	12 Oct-21 11:07	13 Oct-21 11:53	29h (0 °C)		
GH_ER2	20-2628-4137	12 Oct-21 10:50	13 Oct-21 11:30	29h (0 °C)		
CM_MC1	18-3559-2852	12 Oct-21 13:20	13 Oct-21 11:30	26h (0.1 °C)		
LC_SLC	08-7937-3726	12 Oct-21 11:00	13 Oct-21 11:30	29h (2.9 °C)		
FR_FRABCH	18-7592-7020	12 Oct-21 11:20	13 Oct-21 11:53	28h (0 °C)		
FR_FRCP1	10-3969-8000	12 Oct-21 11:48	13 Oct-21 11:53	28h (1.3 °C)		
GH_FR1	11-8224-4576	12 Oct-21 10:00	13 Oct-21 11:30	30h (0 °C)		
GH_ERC	00-1276-7572	12 Oct-21 11:50	13 Oct-21 11:30	28h (0 °C)		
CM_MC2	03-9569-8600	12 Oct-21 12:47	13 Oct-21 11:30	27h (1.3 °C)		
EV_MC2	13-1923-7722	12 Oct-21 11:38	13 Oct-21 11:30	28h (0.2 °C)		
EV_HC1	18-6648-8827	12 Oct-21 10:33	13 Oct-21 11:30	29h (0 °C)		
LC_DCDS	17-4710-4100	12 Oct-21	13 Oct-21 11:30	40h (1.7 °C)		
LC_LC3	20-0894-5906	12 Oct-21 12:00	13 Oct-21 11:30	28h (8.8 °C)		
LC_LC5	14-5637-1032	12 Oct-21 13:30	13 Oct-21 11:30	26h (2.6 °C)		
LC_LCDSSLCC	06-4184-4349	12 Oct-21 12:30	13 Oct-21 11:30	27h (4.7 °C)		
FR_FR4	16-7272-1140	12 Oct-21 11:05	13 Oct-21 11:30	29h (0 °C)		
FR_FRRD	04-7874-3326	12 Oct-21 11:45	13 Oct-21 11:30	28h (0 °C)		
FR_FR2	09-1936-7906	12 Oct-21 10:25	13 Oct-21 11:30	29h (0 °C)		
FR_MULTIPLATE	07-2028-3040	12 Oct-21 09:45	13 Oct-21 11:30	30h (0 °C)		

Aside from Dechlor Control, all samples spiked with 20 ug/L Cu

① reference sites

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
Dechlor Control	Control water	Teck Coal	Dechlor Control	
Dechlor + Cu	Contol+Cu	Teck Coal	Dechlor + 20 ug/L Cu	
FR_UFR1	Water Sample	Teck Coal	FR_UFR1_WEK_2021-09-1	
GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-10-12_	
CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-10-12	
LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-10-19_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_WEK_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_WEK_2021-09	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-10-12_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-10-12	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-10-12	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2021_Q4_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2021_Q4_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-10-19	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-10-19_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-10-19_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	
FR_FR4	Water Sample	Teck Coal	FR_FR4_WS_2021-10-12_	
FR_FRRD	Water Sample	Teck Coal	FR_FRRD_WS_2021-10-12	
FR_FR2	Water Sample	Teck Coal	FR_FR2_WS_2021-10-12_	
FR_MULTIPLATE	Water Sample	Teck Coal	FR_MULTIPLATE_WS_202	

SIngle Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed proportion normal	1

Salmonid Embryo-Alevin Survival and Development Test **Nautilus Environmental**

SIngle Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed proportion norm	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	Dechlor + Cu passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	Dechlor Control passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed proportion norm	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	Dechlor + Cu passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	Dechlor Control passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	Dechlor Control passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	Dechlor + Cu passed proportion normal	1

Salmonid Embryo-Alevin Survival and Development Test **Nautilus Environmental**

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed proportion norm	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	Dechlor + Cu passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	Dechlor Control passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed proportion norm	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	Dechlor + Cu passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed proportion norm	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	Dechlor Control passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed proportion normal	1

Salmonid Embryo-Alevin Survival and Development Test **Nautilus Environmental**

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	Dechlor + Cu passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	Dechlor Control passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed proportion norm	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	0.2632	GH_FR1 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	0.2632	GH_ER2 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	0.2632	CM_MC2 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	0.2632	LC_LCDSSLCC passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	0.2632	Dechlor + Cu passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	0.2632	FR_FRRD passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	0.2632	LC_DCDS passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	0.2632	FR_MULTIPLATE passed proportion norm	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	0.2632	FR_FRCP1 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	0.2632	LC_LC5 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	0.2632	EV_MC2 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	0.2632	EV_HC1 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	0.2632	FR_FR4 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	0.2632	FR_FR2 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	0.2632	CM_MC1 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	0.2632	FR_UFR1 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	0.2632	LC_SLC passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	0.2632	Dechlor Control passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	0.2632	LC_LC3 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	0.2632	GH_ERC passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	0.2632	FR_FRABCH passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	Dechlor Control passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	Dechlor + Cu passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed proportion norm	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed proportion normal	1

Salmonid Embryo-Alevin Survival and Development Test **Nautilus Environmental**

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	Dechlor + Cu passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	Dechlor Control passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed proportion norm	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	Dechlor Control passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	Dechlor + Cu passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed proportion norm	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	Dechlor Control passed proportion normal	1

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed proportion norm	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	Dechlor + Cu passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	Dechlor + Cu passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	Dechlor Control passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed proportion norm	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	Dechlor + Cu passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed proportion normal	1

Salmonid Embryo-Alevin Survival and Development Test **Nautilus Environmental**

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	Dechlor Control passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed proportion norm	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	0.9784	LC_SLC passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	0.9784	Dechlor Control passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	0.9784	LC_LCDSSLCC passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	0.9784	EV_HC1 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	0.9784	FR_FR4 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	0.9784	CM_MC1 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	0.9784	FR_FRRD passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	0.9784	GH_ER2 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	0.9784	FR_MULTIPLATE passed proportion norm	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	0.9784	CM_MC2 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	0.9784	FR_FR2 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	0.9784	FR_UFR1 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	0.9784	GH_ERC passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	0.9784	Dechlor + Cu passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	0.9784	EV_MC2 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	0.9784	GH_FR1 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	0.9784	FR_FRABCH passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	0.9784	FR_FRCP1 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	0.9784	LC_LC5 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	0.9784	LC_DCDS passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	0.9784	LC_LC3 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed proportion norm	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	Dechlor + Cu passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	Dechlor Control passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	Dechlor + Cu passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed proportion normal	1

Salmonid Embryo-Alevin Survival and Development Test **Nautilus Environmental**

SIngle Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed proportion norm	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	Dechlor Control passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed proportion norm	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	Dechlor Control passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	Dechlor + Cu passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed proportion norm	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	Dechlor + Cu passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	Dechlor Control passed proportion normal	1

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	Dechlor + Cu passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed proportion norm	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	Dechlor Control passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	Dechlor + Cu passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	Dechlor Control passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed proportion norm	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed proportion normal	1
08-5449-9168	Proportion Normal	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed proportion normal	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed survival rate	1

Salmonid Embryo-Alevin Survival and Development Test **Nautilus Environmental**

SIngle Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Dechlor + Cu passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Dechlor Control passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Dechlor + Cu passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Dechlor Control passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Dechlor Control passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Dechlor + Cu passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed survival rate	1

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Dechlor Control passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Dechlor + Cu passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Dechlor + Cu passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Dechlor Control passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed survival rate	1

Salmonid Embryo-Alevin Survival and Development Test **Nautilus Environmental**

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Dechlor + Cu passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Dechlor Control passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.1591	LC_DCDS passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.1591	FR_FR2 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.1591	Dechlor + Cu passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.1591	Dechlor Control passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.1591	GH_FR1 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.1591	GH_ERC passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.1591	FR_FRABCH passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.1591	FR_UFR1 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.1591	CM_MC2 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.1591	FR_MULTIPLATE passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.1591	FR_FRRD passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.1591	LC_LCDSSLCC passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.1591	FR_FRCP1 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.1591	EV_MC2 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.1591	LC_LC5 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.1591	LC_LC3 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.1591	LC_SLC passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.1591	EV_HC1 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.1591	GH_ER2 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.1591	CM_MC1 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.1591	FR_FR4 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Dechlor Control passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Dechlor + Cu passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed survival rate	1

Salmonid Embryo-Alevin Survival and Development Test **Nautilus Environmental**

SIngle Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Dechlor + Cu passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Dechlor Control passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Dechlor + Cu passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Dechlor Control passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Dechlor Control passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Dechlor + Cu passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed survival rate	1

SIngle Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Dechlor + Cu passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Dechlor Control passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Dechlor + Cu passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Dechlor Control passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed survival rate	1

SIngle Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.9981	LC_SLC passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.9981	Dechlor Control passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.9981	LC_LCDSSLCC passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.9981	EV_HC1 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.9981	FR_FR4 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.9981	CM_MC1 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.9981	FR_FRRD passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.9981	GH_ER2 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.9981	FR_MULTIPLATE passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.9981	CM_MC2 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.9981	FR_FR2 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.9981	FR_UFR1 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.9981	GH_ERC passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.9981	Dechlor + Cu passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.9981	EV_MC2 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.9981	GH_FR1 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.9981	FR_FRABCH passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.9981	FR_FRCP1 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.9981	LC_LC5 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.9981	LC_DCDS passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.9981	LC_LC3 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Dechlor + Cu passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Dechlor Control passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Dechlor + Cu passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed survival rate	1

Salmonid Embryo-Alevin Survival and Development Test **Nautilus Environmental**

SIngle Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Dechlor Control passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Dechlor Control passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Dechlor + Cu passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Dechlor + Cu passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Dechlor Control passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Dechlor + Cu passed survival rate	1

Salmonid Embryo-Alevin Survival and Development Test **Nautilus Environmental**

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Dechlor Control passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Dechlor + Cu passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Dechlor Control passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed survival rate	1
06-0206-2957	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed survival rate	1

Salmonid Embryo-Alevin Survival and Development Test **Nautilus Environmental**

Proportion Normal Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
Dechlor Control	N	4	0.8190	0.6352	1.0000	0.6875	0.9333	0.0578	0.1155	14.10%	0.00%
Dechlor + Cu	L	4	0.7963	0.5867	1.0000	0.6667	0.9667	0.0658	0.1317	16.54%	2.78%
FR_UFR1	U	4	0.8322	0.6162	1.0000	0.6333	0.9333	0.0679	0.1357	16.31%	-1.61%
GH_ER2	R	4	0.8749	0.8241	0.9258	0.8333	0.9032	0.0160	0.0320	3.65%	-6.83%
CM_MC1	XC	4	0.8841	0.7821	0.9862	0.8333	0.9667	0.0321	0.0641	7.25%	-7.95%
LC_SLC	US	4	0.7902	0.6827	0.8978	0.7333	0.8667	0.0338	0.0676	8.56%	3.51%
FR_FRABCH		4	0.8017	0.7604	0.8429	0.7667	0.8276	0.0130	0.0259	3.23%	2.11%
FR_FRCP1		4	0.6845	0.5271	0.8418	0.6000	0.8276	0.0494	0.0989	14.45%	16.42%
GH_FR1		4	0.7358	0.4879	0.9836	0.5333	0.9000	0.0779	0.1557	21.17%	10.16%
GH_ERC		4	0.8144	0.6454	0.9833	0.7241	0.9667	0.0531	0.1062	13.04%	0.57%
CM_MC2		4	0.8237	0.6255	1.0000	0.6552	0.9333	0.0623	0.1246	15.12%	-0.58%
EV_MC2		4	0.7464	0.5848	0.9080	0.6333	0.8667	0.0508	0.1016	13.61%	8.86%
EV_HC1		4	0.7549	0.5323	0.9774	0.5862	0.9000	0.0699	0.1399	18.53%	7.83%
LC_DCDS		4	0.8402	0.7491	0.9314	0.7667	0.9000	0.0286	0.0573	6.82%	-2.59%
LC_LC3		4	0.8994	0.8392	0.9596	0.8667	0.9333	0.0189	0.0378	4.21%	-9.82%
LC_LC5		4	0.7780	0.6044	0.9515	0.7000	0.9355	0.0545	0.1091	14.02%	5.01%
LC_LCDSSLCC		4	0.8161	0.6362	0.9960	0.6667	0.9310	0.0565	0.1131	13.86%	0.36%
FR_FR4		4	0.7412	0.5475	0.9349	0.6207	0.9000	0.0609	0.1217	16.42%	9.50%
FR_FRRD		3	0.8162	0.6639	0.9684	0.7500	0.8710	0.0354	0.0613	7.51%	0.34%
FR_FR2		4	0.7500	0.5851	0.9149	0.6000	0.8333	0.0518	0.1036	13.82%	8.43%
FR_MULTIPLATE		4	0.7813	0.5846	0.9781	0.6333	0.9333	0.0618	0.1237	15.83%	4.60%

Survival Rate Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
Dechlor Control	N	4	0.8354	0.6558	1.0000	0.7188	0.9333	0.0565	0.1129	13.51%	0.00%
Dechlor + Cu	L	4	0.8638	0.7457	0.9818	0.7931	0.9667	0.0371	0.0742	8.59%	-3.39%
FR_UFR1	U	4	0.8575	0.6884	1.0000	0.7000	0.9333	0.0531	0.1063	12.39%	-2.64%
GH_ER2	R	4	0.8922	0.8021	0.9823	0.8333	0.9655	0.0283	0.0566	6.35%	-6.79%
CM_MC1	XC	4	0.9005	0.8031	0.9980	0.8333	0.9667	0.0306	0.0613	6.80%	-7.79%
LC_SLC	US	4	0.8569	0.7757	0.9381	0.8276	0.9333	0.0255	0.0510	5.96%	-2.57%
FR_FRABCH		4	0.8428	0.8154	0.8703	0.8276	0.8667	0.0086	0.0172	2.05%	-0.89%
FR_FRCP1		4	0.6931	0.5091	0.8771	0.6000	0.8621	0.0578	0.1156	16.68%	17.04%
GH_FR1		4	0.7605	0.5611	0.9599	0.6000	0.9000	0.0627	0.1253	16.48%	8.97%
GH_ERC		4	0.8566	0.7081	1.0000	0.7667	0.9667	0.0467	0.0933	10.89%	-2.53%
CM_MC2		4	0.8237	0.6255	1.0000	0.6552	0.9333	0.0623	0.1246	15.12%	1.40%
EV_MC2		4	0.7887	0.6103	0.9671	0.6333	0.9000	0.0561	0.1121	14.22%	5.60%
EV_HC1		4	0.8319	0.6757	0.9881	0.7000	0.9333	0.0491	0.0982	11.80%	0.42%
LC_DCDS		4	0.8739	0.8223	0.9254	0.8333	0.9000	0.0162	0.0324	3.71%	-4.60%
LC_LC3		4	0.9411	0.8900	0.9922	0.9000	0.9667	0.0161	0.0321	3.41%	-12.65%
LC_LC5		4	0.8435	0.7048	0.9823	0.7667	0.9677	0.0436	0.0872	10.34%	-0.97%
LC_LCDSSLCC		4	0.8411	0.6780	1.0000	0.7000	0.9310	0.0513	0.1025	12.19%	-0.68%
FR_FR4		4	0.7662	0.5747	0.9577	0.6552	0.9333	0.0602	0.1204	15.71%	8.29%
FR_FRRD		3	0.8381	0.7153	0.9609	0.7812	0.8710	0.0285	0.0494	5.90%	-0.32%
FR_FR2		4	0.7667	0.6166	0.9167	0.6333	0.8333	0.0471	0.0943	12.30%	8.23%
FR_MULTIPLATE		4	0.8233	0.6044	1.0000	0.6667	1.0000	0.0688	0.1376	16.71%	1.46%

① Reference sites

Salmonid Embryo-Alevin Survival and Development Test **Nautilus Environmental**

Proportion Normal Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Dechlor Control	N	0.8966	0.6875	0.7586	0.9333
Dechlor + Cu	L	0.9667	0.6667	0.7241	0.8276
① FR_UFR1	U	0.9333	0.8621	0.6333	0.9000
① GH_ER2	R	0.9032	0.8966	0.8667	0.8333
① CM_MC1	XC	0.9667	0.9032	0.8333	0.8333
① LC_SLC	US	0.8667	0.8276	0.7333	0.7333
FR_FRABCH		0.8276	0.8125	0.7667	0.8000
FR_FRCP1		0.8276	0.6000	0.6552	0.6552
GH_FR1		0.8000	0.9000	0.7097	0.5333
GH_ERC		0.9667	0.8000	0.7241	0.7667
CM_MC2		0.9000	0.9333	0.6552	0.8065
EV_MC2		0.8667	0.7000	0.7857	0.6333
EV_HC1		0.9000	0.8333	0.5862	0.7000
LC_DCDS		0.8667	0.9000	0.7667	0.8276
LC_LC3		0.9310	0.9333	0.8667	0.8667
LC_LC5		0.9355	0.7000	0.7097	0.7667
LC_LCDSSLCC		0.8667	0.6667	0.8000	0.9310
FR_FR4		0.9000	0.6774	0.6207	0.7667
FR_FRRD		0.8710	0.7500	0.8276	
FR_FR2		0.8000	0.6000	0.8333	0.7667
FR_MULTIPLATE		0.6333	0.9333	0.8000	0.7586

Survival Rate Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Dechlor Control	N	0.9310	0.7188	0.7586	0.9333
Dechlor + Cu	L	0.9667	0.8333	0.7931	0.8621
① FR_UFR1	U	0.9333	0.8966	0.7000	0.9000
① GH_ER2	R	0.9032	0.9655	0.8667	0.8333
① CM_MC1	XC	0.9667	0.9355	0.8667	0.8333
① LC_SLC	US	0.9333	0.8276	0.8333	0.8333
FR_FRABCH		0.8276	0.8438	0.8333	0.8667
FR_FRCP1		0.8621	0.6000	0.6552	0.6552
GH_FR1		0.8000	0.9000	0.7419	0.6000
GH_ERC		0.9667	0.9000	0.7931	0.7667
CM_MC2		0.9000	0.9333	0.6552	0.8065
EV_MC2		0.9000	0.8000	0.8214	0.6333
EV_HC1		0.9333	0.8667	0.8276	0.7000
LC_DCDS		0.9000	0.9000	0.8333	0.8621
LC_LC3		0.9310	0.9667	0.9667	0.9000
LC_LC5		0.9677	0.8333	0.8065	0.7667
LC_LCDSSLCC		0.9000	0.7000	0.8333	0.9310
FR_FR4		0.9333	0.7097	0.6552	0.7667
FR_FRRD		0.8710	0.7812	0.8621	
FR_FR2		0.8333	0.6333	0.8333	0.7667
FR_MULTIPLATE		0.6667	1.0000	0.8333	0.7931

① Reference sites

Salmonid Embryo-Alevin Survival and Development Test — **Nautilus Environmental**

Proportion Normal Binomials

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Dechlor Control	N	26/29	22/32	22/29	28/30
Dechlor + Cu	L	29/30	20/30	21/29	24/29
FR_UFR1	U	28/30	25/29	19/30	27/30
GH_ER2	R	28/31	26/29	26/30	25/30
CM_MC1	XC	29/30	28/31	25/30	25/30
LC_SLC	US	26/30	24/29	22/30	22/30
FR_FRABCH		24/29	26/32	23/30	24/30
FR_FRCP1		24/29	18/30	19/29	19/29
GH_FR1		24/30	27/30	22/31	16/30
GH_ERC		29/30	24/30	21/29	23/30
CM_MC2		27/30	28/30	19/29	25/31
EV_MC2		26/30	21/30	22/28	19/30
EV_HC1		27/30	25/30	17/29	21/30
LC_DCDS		26/30	27/30	23/30	24/29
LC_LC3		27/29	28/30	26/30	26/30
LC_LC5		29/31	21/30	22/31	23/30
LC_LCDSSLCC		26/30	20/30	24/30	27/29
FR_FR4		27/30	21/31	18/29	23/30
FR_FRRD		27/31	24/32	24/29	
FR_FR2		24/30	18/30	25/30	23/30
FR_MULTIPLATE		19/30	28/30	24/30	22/29

Survival Rate Binomials

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Dechlor Control	N	27/29	23/32	22/29	28/30
Dechlor + Cu	L	29/30	25/30	23/29	25/29
FR_UFR1	U	28/30	26/29	21/30	27/30
GH_ER2	R	28/31	28/29	26/30	25/30
CM_MC1	XC	29/30	29/31	26/30	25/30
LC_SLC	US	28/30	24/29	25/30	25/30
FR_FRABCH		24/29	27/32	25/30	26/30
FR_FRCP1		25/29	18/30	19/29	19/29
GH_FR1		24/30	27/30	23/31	18/30
GH_ERC		29/30	27/30	23/29	23/30
CM_MC2		27/30	28/30	19/29	25/31
EV_MC2		27/30	24/30	23/28	19/30
EV_HC1		28/30	26/30	24/29	21/30
LC_DCDS		27/30	27/30	25/30	25/29
LC_LC3		27/29	29/30	29/30	27/30
LC_LC5		30/31	25/30	25/31	23/30
LC_LCDSSLCC		27/30	21/30	25/30	27/29
FR_FR4		28/30	22/31	19/29	23/30
FR_FRRD		27/31	25/32	25/29	
FR_FR2		25/30	19/30	25/30	23/30
FR_MULTIPLATE		20/30	30/30	25/30	23/29

5 reference sites

Analyst: UW QA: DLE-21/21

CETIS Analytical Report

Salmonid Embryo-Alevin Survival and Development Test — **Nautilus Environmental**

Analysis ID:	06-0206-2957	**Endpoint:**	Survival Rate	**CETIS Version:**	CETISv1.9.4
Analyzed:	20 Dec-21 15:45	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1
Batch ID:	04-8984-4677	**Test Type:**	Survival-Development	**Analyst:**	Yvonne Lam
Start Date:	13 Oct-21 15:50	**Protocol:**	EC/EPS 1/RM/28	**Diluent:**	Dechlorinated Tap Water
Ending Date:	12 Nov-21 08:00	**Species:**	Oncorhynchus mykiss	**Brine:**	
Test Length:	29d 16h	**Taxon:**	Actinopterygii	**Source:**	Lyndon Fish Hatcheries **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
Dechlor Control	16-7987-2727	12 Oct-21	12 Oct-21	40h	Teck Coal	
Dechlor + Cu	15-4969-1985	12 Oct-21	12 Oct-21	40h		
③ FR_UFR1	19-8746-8946	12 Oct-21 11:07	13 Oct-21 11:53	29h (0 °C)		
③ GH_ER2	20-2628-4137	12 Oct-21 10:50	13 Oct-21 11:30	29h (0 °C)		
③ CM_MC1	18-3559-2852	12 Oct-21 13:20	13 Oct-21 11:30	26h (0.1 °C)		
③ LC_SLC	08-7937-3726	12 Oct-21 11:00	13 Oct-21 11:30	29h (2.9 °C)		
FR_FRABCH	18-7592-7020	12 Oct-21 11:20	13 Oct-21 11:53	28h (0 °C)		
FR_FRCP1	10-3969-8000	12 Oct-21 11:48	13 Oct-21 11:53	28h (1.3 °C)		
GH_FR1	11-8224-4576	12 Oct-21 10:00	13 Oct-21 11:30	30h (0 °C)		
GH_ERC	00-1276-7572	12 Oct-21 11:50	13 Oct-21 11:30	28h (0 °C)		
CM_MC2	03-9569-8600	12 Oct-21 12:47	13 Oct-21 11:30	27h (1.3 °C)		
EV_MC2	13-1923-7722	12 Oct-21 11:38	13 Oct-21 11:30	28h (0.2 °C)		
EV_HC1	18-6648-8827	12 Oct-21 10:33	13 Oct-21 11:30	29h (0 °C)		
LC_DCDS	17-4710-4100	12 Oct-21	13 Oct-21 11:30	40h (1.7 °C)		
LC_LC3	20-0894-5906	12 Oct-21 12:00	13 Oct-21 11:30	28h (8.8 °C)		
LC_LC5	14-5637-1032	12 Oct-21 13:30	13 Oct-21 11:30	26h (2.6 °C)		
LC_LCDSSLCC	06-4184-4349	12 Oct-21 12:30	13 Oct-21 11:30	27h (4.7 °C)		
FR_FR4	16-7272-1140	12 Oct-21 11:05	13 Oct-21 11:30	29h (0 °C)		
FR_FRRD	04-7874-3326	12 Oct-21 11:45	13 Oct-21 11:30	28h (0 °C)		
FR_FR2	09-1936-7906	12 Oct-21 10:25	13 Oct-21 11:30	29h (0 °C)		
FR_MULTIPLATE	07-2028-3040	12 Oct-21 09:45	13 Oct-21 11:30	30h (0 °C)		

Aside from Dechlor Control, all samples spiked with 20 ug/L Cu

③ Reference Sites

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
Dechlor Control	Control water	Teck Coal	Dechlor Control	
Dechlor + Cu	Contol+Cu	Teck Coal	Dechlor + 20 ug/L Cu	
③ FR_UFR1	Water Sample	Teck Coal	FR_UFR1_WEK_2021-09-1	
③ GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-10-12_	
③ CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-10-12	
③ LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-10-19_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_WEK_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_WEK_2021-09	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-10-12_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-10-12	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-10-12	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2021_Q4_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2021_Q4_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-10-19	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-10-19_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-10-19_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	
FR_FR4	Water Sample	Teck Coal	FR_FR4_WS_2021-10-12_	
FR_FRRD	Water Sample	Teck Coal	FR_FRRD_WS_2021-10-12	
FR_FR2	Water Sample	Teck Coal	FR_FR2_WS_2021-10-12_	
FR_MULTIPLATE	Water Sample	Teck Coal	FR_MULTIPLATE_WS_202	

Fisher Exact/Bonferroni-Holm Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
Negative Control		Dechlor + Cu	0.8021	Exact	1.0000	Non-Significant Effect
		① FR_UFR1	0.7539	Exact	1.0000	Non-Significant Effect

Analyst: YW QA: Dec-21/21

Salmonid Embryo-Alevin Survival and Development Test **Nautilus Environmental**

Analysis ID: 06-0206-2957 **Endpoint:** Survival Rate **CETIS Version:** CETISv1.9.4
Analyzed: 20 Dec-21 15:45 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Fisher Exact/Bonferroni-Holm Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
		GH_ER2	0.9336	Exact	1.0000	Non-Significant Effect
		CM_MC1	0.9591	Exact	1.0000	Non-Significant Effect
		LC_SLC	0.7539	Exact	1.0000	Non-Significant Effect
		FR_FRABCH	0.6472	Exact	1.0000	Non-Significant Effect
		FR_FRCP1	0.0080	Exact	0.1591	Non-Significant Effect
		GH_FR1	0.1059	Exact	1.0000	Non-Significant Effect
		GH_ERC	0.7539	Exact	1.0000	Non-Significant Effect
		CM_MC2	0.5000	Exact	1.0000	Non-Significant Effect
		EV_MC2	0.2344	Exact	1.0000	Non-Significant Effect
		EV_HC1	0.5572	Exact	1.0000	Non-Significant Effect
		LC_DCDS	0.8580	Exact	1.0000	Non-Significant Effect
		LC_LC3	0.9981	Exact	0.9981	Non-Significant Effect
		LC_LC5	0.6575	Exact	1.0000	Non-Significant Effect
		LC_LCDSSLCC	0.6259	Exact	1.0000	Non-Significant Effect
		FR_FR4	0.1293	Exact	1.0000	Non-Significant Effect
		FR_FRRD	0.5992	Exact	1.0000	Non-Significant Effect
		FR_FR2	0.1293	Exact	1.0000	Non-Significant Effect
		FR_MULTIPLATE	0.4882	Exact	1.0000	Non-Significant Effect

Data Summary

Sample	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
Dechlor Control	N	100	20	120	0.8333	0.1667	2.78%
Dechlor + Cu		102	16	118	0.8644	0.1356	-0.85%
FR_UFR1		102	17	119	0.8571	0.1429	0.0%
GH_ER2		107	13	120	0.8917	0.1083	-4.03%
CM_MC1		109	12	121	0.9008	0.09917	-5.1%
LC_SLC		102	17	119	0.8571	0.1429	0.0%
FR_FRABCH		102	19	121	0.843	0.157	1.65%
FR_FRCP1		81	36	117	0.6923	0.3077	19.23%
GH_FR1		92	29	121	0.7603	0.2397	11.29%
GH_ERC		102	17	119	0.8571	0.1429	0.0%
CM_MC2		99	21	120	0.825	0.175	3.75%
EV_MC2		93	25	118	0.7881	0.2119	8.05%
EV_HC1		99	20	119	0.8319	0.1681	2.94%
LC_DCDS		104	15	119	0.8739	0.1261	-1.96%
LC_LC3		112	7	119	0.9412	0.05882	-9.8%
LC_LC5		103	19	122	0.8443	0.1557	1.5%
LC_LCDSSLCC		100	19	119	0.8403	0.1597	1.96%
FR_FR4		92	28	120	0.7667	0.2333	10.56%
FR_FRRD		77	15	92	0.837	0.163	2.36%
FR_FR2		92	28	120	0.7667	0.2333	10.56%
FR_MULTIPLATE		98	21	119	0.8235	0.1765	3.92%

① Reference sites

Salmonid Embryo-Alevin Survival and Development Test — **Nautilus Environmental**

Analysis ID: 06-0206-2957 **Endpoint:** Survival Rate **CETIS Version:** CETISv1.9.4
Analyzed: 20 Dec-21 15:45 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Survival Rate Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Dechlor Control	N	0.9310	0.7188	0.7586	0.9333
Dechlor + Cu		0.9667	0.8333	0.7931	0.8621
① FR_UFR1		0.9333	0.8966	0.7000	0.9000
① GH_ER2		0.9032	0.9655	0.8667	0.8333
① CM_MC1		0.9667	0.9355	0.8667	0.8333
① LC_SLC		0.9333	0.8276	0.8333	0.8333
FR_FRABCH		0.8276	0.8438	0.8333	0.8667
FR_FRCP1		0.8621	0.6000	0.6552	0.6552
GH_FR1		0.8000	0.9000	0.7419	0.6000
GH_ERC		0.9667	0.9000	0.7931	0.7667
CM_MC2		0.9000	0.9333	0.6552	0.8065
EV_MC2		0.9000	0.8000	0.8214	0.6333
EV_HC1		0.9333	0.8667	0.8276	0.7000
LC_DCDS		0.9000	0.9000	0.8333	0.8621
LC_LC3		0.9310	0.9667	0.9667	0.9000
LC_LC5		0.9677	0.8333	0.8065	0.7667
LC_LCDSSLCC		0.9000	0.7000	0.8333	0.9310
FR_FR4		0.9333	0.7097	0.6552	0.7667
FR_FRRD		0.8710	0.7812	0.8621	
FR_FR2		0.8333	0.6333	0.8333	0.7667
FR_MULTIPLATE		0.6667	1.0000	0.8333	0.7931

Survival Rate Binomials

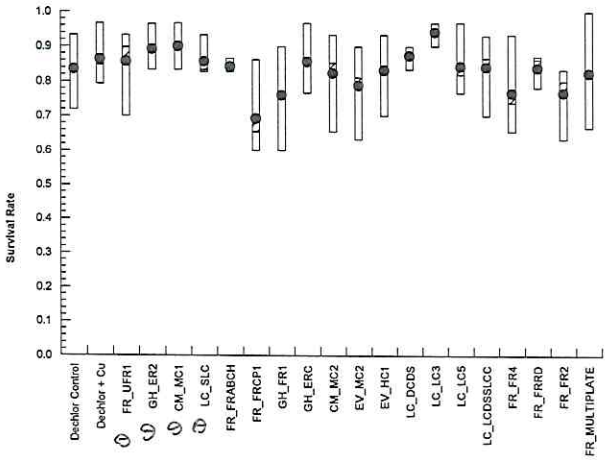
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Dechlor Control	N	27/29	23/32	22/29	28/30
Dechlor + Cu		29/30	25/30	23/29	25/29
① FR_UFR1		28/30	26/29	21/30	27/30
① GH_ER2		28/31	28/29	26/30	25/30
① CM_MC1		29/30	29/31	26/30	25/30
① LC_SLC		28/30	24/29	25/30	25/30
FR_FRABCH		24/29	27/32	25/30	26/30
FR_FRCP1		25/29	18/30	19/29	19/29
GH_FR1		24/30	27/30	23/31	18/30
GH_ERC		29/30	27/30	23/29	23/30
CM_MC2		27/30	28/30	19/29	25/31
EV_MC2		27/30	24/30	23/28	19/30
EV_HC1		28/30	26/30	24/29	21/30
LC_DCDS		27/30	27/30	25/30	25/29
LC_LC3		27/29	29/30	29/30	27/30
LC_LC5		30/31	25/30	25/31	23/30
LC_LCDSSLCC		27/30	21/30	25/30	27/29
FR_FR4		28/30	22/31	19/29	23/30
FR_FRRD		27/31	25/32	25/29	
FR_FR2		25/30	19/30	25/30	23/30
FR_MULTIPLATE		20/30	30/30	25/30	23/29

① Reference Sites

Salmonid Embryo-Alevin Survival and Development Test — **Nautilus Environmental**

Analysis ID:	06-0206-2957	**Endpoint:**	Survival Rate	**CETIS Version:**	CETISv1.9.4
Analyzed:	20 Dec-21 15:45	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1

Graphics



① Reference sites

CETIS Analytical Report

Salmonid Embryo-Alevin Survival and Development Test — **Nautilus Environmental**

Analysis ID:	08-5449-9168	**Endpoint:**	Proportion Normal	**CETIS Version:**	CETISv1.9.4
Analyzed:	20 Dec-21 15:45	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1
Batch ID:	04-8984-4677	**Test Type:**	Survival-Development	**Analyst:**	Yvonne Lam
Start Date:	13 Oct-21 15:50	**Protocol:**	EC/EPS 1/RM/28	**Diluent:**	Dechlorinated Tap Water
Ending Date:	12 Nov-21 08:00	**Species:**	Oncorhynchus mykiss	**Brine:**	
Test Length:	29d 16h	**Taxon:**	Actinopterygii	**Source:**	Lyndon Fish Hatcheries **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
Dechlor Control	16-7987-2727	12 Oct-21	12 Oct-21	40h	Teck Coal	
Dechlor + Cu	15-4969-1985	12 Oct-21	12 Oct-21	40h		
① FR_UFR1	19-8746-8946	12 Oct-21 11:07	13 Oct-21 11:53	29h (0 °C)		
① GH_ER2	20-2628-4137	12 Oct-21 10:50	13 Oct-21 11:30	29h (0 °C)		
① CM_MC1	18-3559-2852	12 Oct-21 13:20	13 Oct-21 11:30	26h (0.1 °C)		
① LC_SLC	08-7937-3726	12 Oct-21 11:00	13 Oct-21 11:30	29h (2.9 °C)		
FR_FRABCH	18-7592-7020	12 Oct-21 11:20	13 Oct-21 11:53	28h (0 °C)		
FR_FRCP1	10-3969-8000	12 Oct-21 11:48	13 Oct-21 11:53	28h (1.3 °C)		
GH_FR1	11-8224-4576	12 Oct-21 10:00	13 Oct-21 11:30	30h (0 °C)		
GH_ERC	00-1276-7572	12 Oct-21 11:50	13 Oct-21 11:30	28h (0 °C)		
CM_MC2	03-9569-8600	12 Oct-21 12:47	13 Oct-21 11:30	27h (1.3 °C)		
EV_MC2	13-1923-7722	12 Oct-21 11:38	13 Oct-21 11:30	28h (0.2 °C)		
EV_HC1	18-6648-8827	12 Oct-21 10:33	13 Oct-21 11:30	29h (0 °C)		
LC_DCDS	17-4710-4100	12 Oct-21	13 Oct-21 11:30	40h (1.7 °C)		
LC_LC3	20-0894-5906	12 Oct-21 12:00	13 Oct-21 11:30	28h (8.8 °C)		
LC_LC5	14-5637-1032	12 Oct-21 13:30	13 Oct-21 11:30	26h (2.6 °C)		
LC_LCDSSLCC	06-4184-4349	12 Oct-21 12:30	13 Oct-21 11:30	27h (4.7 °C)		
FR_FR4	16-7272-1140	12 Oct-21 11:05	13 Oct-21 11:30	29h (0 °C)		
FR_FRRD	04-7874-3326	12 Oct-21 11:45	13 Oct-21 11:30	28h (0 °C)		
FR_FR2	09-1936-7906	12 Oct-21 10:25	13 Oct-21 11:30	29h (0 °C)		
FR_MULTIPLATE	07-2028-3040	12 Oct-21 09:45	13 Oct-21 11:30	30h (0 °C)		

Aside from Dechlor Control, all samples spiked with 20 ug/L Cu

① Reference sites

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
Dechlor Control	Control water	Teck Coal	Dechlor Control	
Dechlor + Cu	Contol+Cu	Teck Coal	Dechlor + 20 ug/L Cu	
① FR_UFR1	Water Sample	Teck Coal	FR_UFR1_WEK_2021-09-1	
① GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-10-12_	
① CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-10-12	
① LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-10-19_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_WEK_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_WEK_2021-09	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-10-12_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-10-12	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-10-12	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2021_Q4_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2021_Q4_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-10-19	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-10-19_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-10-19_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	
FR_FR4	Water Sample	Teck Coal	FR_FR4_WS_2021-10-12_	
FR_FRRD	Water Sample	Teck Coal	FR_FRRD_WS_2021-10-12	
FR_FR2	Water Sample	Teck Coal	FR_FR2_WS_2021-10-12_	
FR_MULTIPLATE	Water Sample	Teck Coal	FR_MULTIPLATE_WS_202	

Fisher Exact/Bonferroni-Holm Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
Negative Control		Dechlor + Cu	0.4100	Exact	1.0000	Non-Significant Effect
		① FR_UFR1	0.6842	Exact	1.0000	Non-Significant Effect

Analyst: [signature] QA: Dec. 21/21

Salmonid Embryo-Alevin Survival and Development Test — **Nautilus Environmental**

Analysis ID: 08-5449-9168 **Endpoint:** Proportion Normal **CETIS Version:** CETISv1.9.4
Analyzed: 20 Dec-21 15:45 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Fisher Exact/Bonferroni-Holm Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
		① GH_ER2	0.9240	Exact	1.0000	Non-Significant Effect
		① CM_MC1	0.9513	Exact	1.0000	Non-Significant Effect
		① LC_SLC	0.3605	Exact	1.0000	Non-Significant Effect
		FR_FRABCH	0.4474	Exact	1.0000	Non-Significant Effect
		FR_FRCP1	0.0132	Exact	0.2632	Non-Significant Effect
		GH_FR1	0.0874	Exact	1.0000	Non-Significant Effect
		GH_ERC	0.5540	Exact	1.0000	Non-Significant Effect
		CM_MC2	0.6317	Exact	1.0000	Non-Significant Effect
		EV_MC2	0.1216	Exact	1.0000	Non-Significant Effect
		EV_HC1	0.1633	Exact	1.0000	Non-Significant Effect
		LC_DCDS	0.7442	Exact	1.0000	Non-Significant Effect
		LC_LC3	0.9784	Exact	0.9784	Non-Significant Effect
		LC_LC5	0.2828	Exact	1.0000	Non-Significant Effect
		LC_LCDSSLCC	0.5540	Exact	1.0000	Non-Significant Effect
		FR_FR4	0.1065	Exact	1.0000	Non-Significant Effect
		FR_FRRD	0.5583	Exact	1.0000	Non-Significant Effect
		FR_FR2	0.1363	Exact	1.0000	Non-Significant Effect
		FR_MULTIPLATE	0.3028	Exact	1.0000	Non-Significant Effect

Data Summary

Sample	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
Dechlor Control	N	98	22	120	0.8167	0.1833	-0.19%
Dechlor + Cu		94	24	118	0.7966	0.2034	2.27%
① FR_UFR1		99	20	119	0.8319	0.1681	-2.06%
① GH_ER2		105	15	120	0.875	0.125	-7.35%
① CM_MC1		107	14	121	0.8843	0.1157	-8.49%
① LC_SLC		94	25	119	0.7899	0.2101	3.09%
FR_FRABCH		97	24	121	0.8017	0.1983	1.65%
FR_FRCP1		80	37	117	0.6838	0.3162	16.12%
GH_FR1		89	32	121	0.7355	0.2645	9.76%
GH_ERC		97	22	119	0.8151	0.1849	0.0%
CM_MC2		99	21	120	0.825	0.175	-1.21%
EV_MC2		88	30	118	0.7458	0.2542	8.51%
EV_HC1		90	29	119	0.7563	0.2437	7.22%
LC_DCDS		100	19	119	0.8403	0.1597	-3.09%
LC_LC3		107	12	119	0.8992	0.1008	-10.31%
LC_LC5		95	27	122	0.7787	0.2213	4.47%
LC_LCDSSLCC		97	22	119	0.8151	0.1849	0.0%
FR_FR4		89	31	120	0.7417	0.2583	9.01%
FR_FRRD		75	17	92	0.8152	0.1848	-0.01%
FR_FR2		90	30	120	0.75	0.25	7.99%
FR_MULTIPLATE		93	26	119	0.7815	0.2185	4.12%

① Reference sites

Salmonid Embryo-Alevin Survival and Development Test — **Nautilus Environmental**

Analysis ID: 08-5449-9168 **Endpoint:** Proportion Normal **CETIS Version:** CETISv1.9.4
Analyzed: 20 Dec-21 15:45 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Proportion Normal Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Dechlor Control	N	0.8966	0.6875	0.7586	0.9333
Dechlor + Cu		0.9667	0.6667	0.7241	0.8276
① FR_UFR1		0.9333	0.8621	0.6333	0.9000
① GH_ER2		0.9032	0.8966	0.8667	0.8333
① CM_MC1		0.9667	0.9032	0.8333	0.8333
① LC_SLC		0.8667	0.8276	0.7333	0.7333
FR_FRABCH		0.8276	0.8125	0.7667	0.8000
FR_FRCP1		0.8276	0.6000	0.6552	0.6552
GH_FR1		0.8000	0.9000	0.7097	0.5333
GH_ERC		0.9667	0.8000	0.7241	0.7667
CM_MC2		0.9000	0.9333	0.6552	0.8065
EV_MC2		0.8667	0.7000	0.7857	0.6333
EV_HC1		0.9000	0.8333	0.5862	0.7000
LC_DCDS		0.8667	0.9000	0.7667	0.8276
LC_LC3		0.9310	0.9333	0.8667	0.8667
LC_LC5		0.9355	0.7000	0.7097	0.7667
LC_LCDSSLCC		0.8667	0.6667	0.8000	0.9310
FR_FR4		0.9000	0.6774	0.6207	0.7667
FR_FRRD		0.8710	0.7500	0.8276	
FR_FR2		0.8000	0.6000	0.8333	0.7667
FR_MULTIPLATE		0.6333	0.9333	0.8000	0.7586

Proportion Normal Binomials

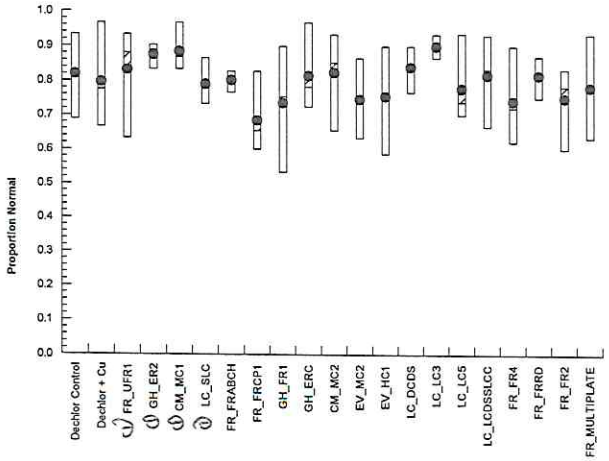
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Dechlor Control	N	26/29	22/32	22/29	28/30
Dechlor + Cu		29/30	20/30	21/29	24/29
① FR_UFR1		28/30	25/29	19/30	27/30
① GH_ER2		28/31	26/29	26/30	25/30
① CM_MC1		29/30	28/31	25/30	25/30
① LC_SLC		26/30	24/29	22/30	22/30
FR_FRABCH		24/29	26/32	23/30	24/30
FR_FRCP1		24/29	18/30	19/29	19/29
GH_FR1		24/30	27/30	22/31	16/30
GH_ERC		29/30	24/30	21/29	23/30
CM_MC2		27/30	28/30	19/29	25/31
EV_MC2		26/30	21/30	22/28	19/30
EV_HC1		27/30	25/30	17/29	21/30
LC_DCDS		26/30	27/30	23/30	24/29
LC_LC3		27/29	28/30	26/30	26/30
LC_LC5		29/31	21/30	22/31	23/30
LC_LCDSSLCC		26/30	20/30	24/30	27/29
FR_FR4		27/30	21/31	18/29	23/30
FR_FRRD		27/31	24/32	24/29	
FR_FR2		24/30	18/30	25/30	23/30
FR_MULTIPLATE		19/30	28/30	24/30	22/29

① Reference Sites

Salmonid Embryo-Alevin Survival and Development Test — **Nautilus Environmental**

Analysis ID:	08-5449-9168	**Endpoint:**	Proportion Normal	**CETIS Version:**	CETISv1.9.4
Analyzed:	20 Dec-21 15:45	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1

Graphics



3 reference sites

Analyst: UW QA: Dec 21/21

Salmonid Embryo-Alevin Survival and Development Test — **Nautilus Environmental**

Analysis ID:	02-8454-4930	**Endpoint:**	Survival Rate	**CETIS Version:**	CETISv1.9.4
Analyzed:	20 Dec-21 15:45	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1
Batch ID:	04-8984-4677	**Test Type:**	Survival-Development	**Analyst:**	Yvonne Lam
Start Date:	13 Oct-21 15:50	**Protocol:**	EC/EPS 1/RM/28	**Diluent:**	Dechlorinated Tap Water
Ending Date:	12 Nov-21 08:00	**Species:**	Oncorhynchus mykiss	**Brine:**	
Test Length:	29d 16h	**Taxon:**	Actinopterygii	**Source:**	Lyndon Fish Hatcheries **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
Dechlor + Cu	15-4969-1985	12 Oct-21	12 Oct-21	40h	Teck Coal	
FR_UFR1	19-8746-8946	12 Oct-21 11:07	13 Oct-21 11:53	29h (0 °C)		
GH_ER2	20-2628-4137	12 Oct-21 10:50	13 Oct-21 11:30	29h (0 °C)		
CM_MC1	18-3559-2852	12 Oct-21 13:20	13 Oct-21 11:30	26h (0.1 °C)		
LC_SLC	08-7937-3726	12 Oct-21 11:00	13 Oct-21 11:30	29h (2.9 °C)		
FR_FRABCH	18-7592-7020	12 Oct-21 11:20	13 Oct-21 11:53	28h (0 °C)		
FR_FRCP1	10-3969-8000	12 Oct-21 11:48	13 Oct-21 11:53	28h (1.3 °C)		
GH_FR1	11-8224-4576	12 Oct-21 10:00	13 Oct-21 11:30	30h (0 °C)		
GH_ERC	00-1276-7572	12 Oct-21 11:50	13 Oct-21 11:30	28h (0 °C)		
CM_MC2	03-9569-8600	12 Oct-21 12:47	13 Oct-21 11:30	27h (1.3 °C)		
EV_MC2	13-1923-7722	12 Oct-21 11:38	13 Oct-21 11:30	28h (0.2 °C)		
EV_HC1	18-6648-8827	12 Oct-21 10:33	13 Oct-21 11:30	29h (0 °C)		
LC_DCDS	17-4710-4100	12 Oct-21	13 Oct-21 11:30	40h (1.7 °C)		
LC_LC3	20-0894-5906	12 Oct-21 12:00	13 Oct-21 11:30	28h (8.8 °C)		
LC_LC5	14-5637-1032	12 Oct-21 13:30	13 Oct-21 11:30	26h (2.6 °C)		
LC_LCDSSLCC	06-4184-4349	12 Oct-21 12:30	13 Oct-21 11:30	27h (4.7 °C)		
FR_FR4	16-7272-1140	12 Oct-21 11:05	13 Oct-21 11:30	29h (0 °C)		
FR_FRRD	04-7874-3326	12 Oct-21 11:45	13 Oct-21 11:30	28h (0 °C)		
FR_FR2	09-1936-7906	12 Oct-21 10:25	13 Oct-21 11:30	29h (0 °C)		
FR_MULTIPLATE	07-2028-3040	12 Oct-21 09:45	13 Oct-21 11:30	30h (0 °C)		

~~Aside from Dechlor Control~~, All samples spiked with 20 ug/L Cu.

① reference sites

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
Dechlor + Cu	Contol+Cu	Teck Coal	Dechlor + 20 ug/L Cu	
FR_UFR1	Water Sample	Teck Coal	FR_UFR1_WEK_2021-09-1	
GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-10-12_	
CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-10-12	
LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-10-19_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_WEK_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_WEK_2021-09	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-10-12_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-10-12	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-10-12	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2021_Q4_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2021_Q4_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-10-19	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-10-19_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-10-19_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	
FR_FR4	Water Sample	Teck Coal	FR_FR4_WS_2021-10-12_	
FR_FRRD	Water Sample	Teck Coal	FR_FRRD_WS_2021-10-12	
FR_FR2	Water Sample	Teck Coal	FR_FR2_WS_2021-10-12_	
FR_MULTIPLATE	Water Sample	Teck Coal	FR_MULTIPLATE_WS_202	

Fisher Exact/Bonferroni-Holm Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
Lab Water (Dechlor + 20 ug/L Cu)		FR_UFR1	0.5105	Exact	1.0000	Non-Significant Effect
		GH_ER2	0.7997	Exact	1.0000	Non-Significant Effect
		CM_MC1	0.8592	Exact	1.0000	Non-Significant Effect
		LC_SLC	0.5105	Exact	1.0000	Non-Significant Effect

Salmonid Embryo-Alevin Survival and Development Test — **Nautilus Environmental**

Analysis ID: 02-8454-4930 **Endpoint:** Survival Rate **CETIS Version:** CETISv1.9.4
Analyzed: 20 Dec-21 15:45 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Fisher Exact/Bonferroni-Holm Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
		FR_FRABCH	0.3880	Exact	1.0000	Non-Significant Effect
		FR_FRCP1*	0.0012	Exact	0.0221	Significant Effect
		GH_FR1	0.0288	Exact	0.5175	Non-Significant Effect
		GH_ERC	0.5105	Exact	1.0000	Non-Significant Effect
		CM_MC2	0.2549	Exact	1.0000	Non-Significant Effect
		EV_MC2	0.0844	Exact	1.0000	Non-Significant Effect
		EV_HC1	0.3034	Exact	1.0000	Non-Significant Effect
		LC_DCDS	0.6591	Exact	1.0000	Non-Significant Effect
		LC_LC3	0.9875	Exact	0.9875	Non-Significant Effect
		LC_LC5	0.3982	Exact	1.0000	Non-Significant Effect
		LC_LCDSSLCC	0.3675	Exact	1.0000	Non-Significant Effect
		FR_FR4	0.0375	Exact	0.6373	Non-Significant Effect
		FR_FRRD	0.3577	Exact	1.0000	Non-Significant Effect
		FR_FR2	0.0375	Exact	0.6373	Non-Significant Effect
		FR_MULTIPLATE	0.2460	Exact	1.0000	Non-Significant Effect

Data Summary

Sample	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
Dechlor + Cu	L	102	16	118	0.8644	0.1356	-0.85%
① FR_UFR1		102	17	119	0.8571	0.1429	0.0%
① GH_ER2		107	13	120	0.8917	0.1083	-4.03%
① CM_MC1		109	12	121	0.9008	0.09917	-5.1%
① LC_SLC		102	17	119	0.8571	0.1429	0.0%
FR_FRABCH		102	19	121	0.843	0.157	1.65%
FR_FRCP1		81	36	117	0.6923	0.3077	19.23%
GH_FR1		92	29	121	0.7603	0.2397	11.29%
GH_ERC		102	17	119	0.8571	0.1429	0.0%
CM_MC2		99	21	120	0.825	0.175	3.75%
EV_MC2		93	25	118	0.7881	0.2119	8.05%
EV_HC1		99	20	119	0.8319	0.1681	2.94%
LC_DCDS		104	15	119	0.8739	0.1261	-1.96%
LC_LC3		112	7	119	0.9412	0.05882	-9.8%
LC_LC5		103	19	122	0.8443	0.1557	1.5%
LC_LCDSSLCC		100	19	119	0.8403	0.1597	1.96%
FR_FR4		92	28	120	0.7667	0.2333	10.56%
FR_FRRD		77	15	92	0.837	0.163	2.36%
FR_FR2		92	28	120	0.7667	0.2333	10.56%
FR_MULTIPLATE		98	21	119	0.8235	0.1765	3.92%

① Reference Sites

Salmonid Embryo-Alevin Survival and Development Test — **Nautilus Environmental**

Analysis ID: 02-8454-4930 **Endpoint:** Survival Rate **CETIS Version:** CETISv1.9.4
Analyzed: 20 Dec-21 15:45 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Survival Rate Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Dechlor + Cu	L	0.9667	0.8333	0.7931	0.8621
FR_UFR1		0.9333	0.8966	0.7000	0.9000
GH_ER2		0.9032	0.9655	0.8667	0.8333
CM_MC1		0.9667	0.9355	0.8667	0.8333
LC_SLC		0.9333	0.8276	0.8333	0.8333
FR_FRABCH		0.8276	0.8438	0.8333	0.8667
FR_FRCP1		0.8621	0.6000	0.6552	0.6552
GH_FR1		0.8000	0.9000	0.7419	0.6000
GH_ERC		0.9667	0.9000	0.7931	0.7667
CM_MC2		0.9000	0.9333	0.6552	0.8065
EV_MC2		0.9000	0.8000	0.8214	0.6333
EV_HC1		0.9333	0.8667	0.8276	0.7000
LC_DCDS		0.9000	0.9000	0.8333	0.8621
LC_LC3		0.9310	0.9667	0.9667	0.9000
LC_LC5		0.9677	0.8333	0.8065	0.7667
LC_LCDSSLCC		0.9000	0.7000	0.8333	0.9310
FR_FR4		0.9333	0.7097	0.6552	0.7667
FR_FRRD		0.8710	0.7812	0.8621	
FR_FR2		0.8333	0.6333	0.8333	0.7667
FR_MULTIPLATE		0.6667	1.0000	0.8333	0.7931

Survival Rate Binomials

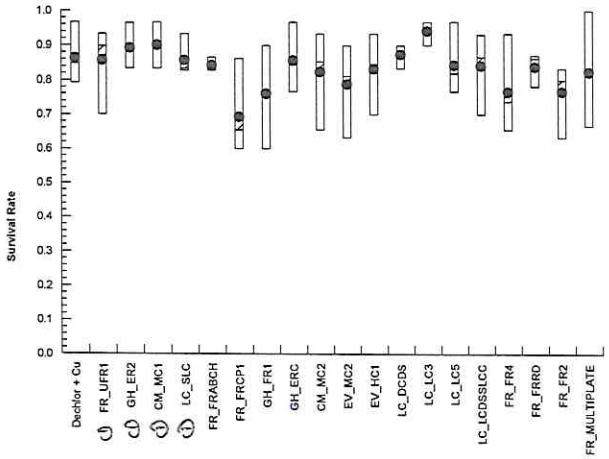
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Dechlor + Cu	L	29/30	25/30	23/29	25/29
FR_UFR1		28/30	26/29	21/30	27/30
GH_ER2		28/31	28/29	26/30	25/30
CM_MC1		29/30	29/31	26/30	25/30
LC_SLC		28/30	24/29	25/30	25/30
FR_FRABCH		24/29	27/32	25/30	26/30
FR_FRCP1		25/29	18/30	19/29	19/29
GH_FR1		24/30	27/30	23/31	18/30
GH_ERC		29/30	27/30	23/29	23/30
CM_MC2		27/30	28/30	19/29	25/31
EV_MC2		27/30	24/30	23/28	19/30
EV_HC1		28/30	26/30	24/29	21/30
LC_DCDS		27/30	27/30	25/30	25/29
LC_LC3		27/29	29/30	29/30	27/30
LC_LC5		30/31	25/30	25/31	23/30
LC_LCDSSLCC		27/30	21/30	25/30	27/29
FR_FR4		28/30	22/31	19/29	23/30
FR_FRRD		27/31	25/32	25/29	
FR_FR2		25/30	19/30	25/30	23/30
FR_MULTIPLATE		20/30	30/30	25/30	23/29

① Reference sites

Salmonid Embryo-Alevin Survival and Development Test — **Nautilus Environmental**

Analysis ID:	02-8454-4930	**Endpoint:**	Survival Rate	**CETIS Version:**	CETISv1.9.4
Analyzed:	20 Dec-21 15:45	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1

Graphics



① Reference Sites

Analyst: UW QA: Dec-21/21

CETIS Analytical Report

Salmonid Embryo-Alevin Survival and Development Test

Nautilus Environmental

Analysis ID:	02-0902-9561	**Endpoint:**	Proportion Normal	**CETIS Version:**	CETISv1.9.4
Analyzed:	20 Dec-21 15:45	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1
Batch ID:	04-8984-4677	**Test Type:**	Survival-Development	**Analyst:**	Yvonne Lam
Start Date:	13 Oct-21 15:50	**Protocol:**	EC/EPS 1/RM/28	**Diluent:**	Dechlorinated Tap Water
Ending Date:	12 Nov-21 08:00	**Species:**	Oncorhynchus mykiss	**Brine:**	
Test Length:	29d 16h	**Taxon:**	Actinopterygii	**Source:**	Lyndon Fish Hatcheries **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
Dechlor + Cu	15-4969-1985	12 Oct-21	12 Oct-21	40h	Teck Coal	
① FR_UFR1	19-8746-8946	12 Oct-21 11:07	13 Oct-21 11:53	29h (0 °C)		
① GH_ER2	20-2628-4137	12 Oct-21 10:50	13 Oct-21 11:30	29h (0 °C)		
① CM_MC1	18-3559-2852	12 Oct-21 13:20	13 Oct-21 11:30	26h (0.1 °C)		
① LC_SLC	08-7937-3726	12 Oct-21 11:00	13 Oct-21 11:30	29h (2.9 °C)		
FR_FRABCH	18-7592-7020	12 Oct-21 11:20	13 Oct-21 11:53	28h (0 °C)		
FR_FRCP1	10-3969-8000	12 Oct-21 11:48	13 Oct-21 11:53	28h (1.3 °C)		
GH_FR1	11-8224-4576	12 Oct-21 10:00	13 Oct-21 11:30	30h (0 °C)		
GH_ERC	00-1276-7572	12 Oct-21 11:50	13 Oct-21 11:30	28h (0 °C)		
CM_MC2	03-9569-8600	12 Oct-21 12:47	13 Oct-21 11:30	27h (1.3 °C)		
EV_MC2	13-1923-7722	12 Oct-21 11:38	13 Oct-21 11:30	28h (0.2 °C)		
EV_HC1	18-6648-8827	12 Oct-21 10:33	13 Oct-21 11:30	29h (0 °C)		
LC_DCDS	17-4710-4100	12 Oct-21	13 Oct-21 11:30	40h (1.7 °C)		
LC_LC3	20-0894-5906	12 Oct-21 12:00	13 Oct-21 11:30	28h (8.8 °C)		
LC_LC5	14-5637-1032	12 Oct-21 13:30	13 Oct-21 11:30	26h (2.6 °C)		
LC_LCDSSLCC	06-4184-4349	12 Oct-21 12:30	13 Oct-21 11:30	27h (4.7 °C)		
FR_FR4	16-7272-1140	12 Oct-21 11:05	13 Oct-21 11:30	29h (0 °C)		
FR_FRRD	04-7874-3326	12 Oct-21 11:45	13 Oct-21 11:30	28h (0 °C)		
FR_FR2	09-1936-7906	12 Oct-21 10:25	13 Oct-21 11:30	29h (0 °C)		
FR_MULTIPLATE	07-2028-3040	12 Oct-21 09:45	13 Oct-21 11:30	30h (0 °C)		

All samples spiked with 20 ug/L Cu

① Reference sites

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
Dechlor + Cu	Contol+Cu	Teck Coal	Dechlor + 20 ug/L Cu	
① FR_UFR1	Water Sample	Teck Coal	FR_UFR1_WEK_2021-09-1	
① GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-10-12_	
① CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-10-12	
① LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-10-19_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_WEK_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_WEK_2021-09	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-10-12_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-10-12	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-10-12	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2021_Q4_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2021_Q4_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-10-19	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-10-19_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-10-19_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	
FR_FR4	Water Sample	Teck Coal	FR_FR4_WS_2021-10-12_	
FR_FRRD	Water Sample	Teck Coal	FR_FRRD_WS_2021-10-12	
FR_FR2	Water Sample	Teck Coal	FR_FR2_WS_2021-10-12_	
FR_MULTIPLATE	Water Sample	Teck Coal	FR_MULTIPLATE_WS_202	

Fisher Exact/Bonferroni-Holm Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
Lab Water (Dechlor + 20 ug/L Cu)		① FR_UFR1	0.8068	Exact	1.0000	Non-Significant Effect
		① GH_ER2	0.9652	Exact	1.0000	Non-Significant Effect
		① CM_MC1	0.9793	Exact	1.0000	Non-Significant Effect
		① LC_SLC	0.5133	Exact	1.0000	Non-Significant Effect

Analyst: YW QA: Dec 21/21

Salmonid Embryo-Alevin Survival and Development Test **Nautilus Environmental**

Analysis ID: 02-0902-9561 **Endpoint:** Proportion Normal **CETIS Version:** CETISv1.9.4
Analyzed: 20 Dec-21 15:45 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Fisher Exact/Bonferroni-Holm Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
		FR_FRABCH	0.6021	Exact	1.0000	Non-Significant Effect
		FR_FRCP1	0.0338	Exact	0.6427	Non-Significant Effect
		GH_FR1	0.1681	Exact	1.0000	Non-Significant Effect
		GH_ERC	0.6999	Exact	1.0000	Non-Significant Effect
		CM_MC2	0.7656	Exact	1.0000	Non-Significant Effect
		EV_MC2	0.2193	Exact	1.0000	Non-Significant Effect
		EV_HC1	0.2782	Exact	1.0000	Non-Significant Effect
		LC_DCDS	0.8513	Exact	1.0000	Non-Significant Effect
		LC_LC3	0.9918	Exact	0.9918	Non-Significant Effect
		LC_LC5	0.4283	Exact	1.0000	Non-Significant Effect
		LC_LCDSSLCC	0.6999	Exact	1.0000	Non-Significant Effect
		FR_FR4	0.1973	Exact	1.0000	Non-Significant Effect
		FR_FRRD	0.6947	Exact	1.0000	Non-Significant Effect
		FR_FR2	0.2410	Exact	1.0000	Non-Significant Effect
		FR_MULTIPLATE	0.4501	Exact	1.0000	Non-Significant Effect

Data Summary

Sample	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
Dechlor + Cu	L	94	24	118	0.7966	0.2034	2.27%
① FR_UFR1		99	20	119	0.8319	0.1681	-2.06%
① GH_ER2		105	15	120	0.875	0.125	-7.35%
① CM_MC1		107	14	121	0.8843	0.1157	-8.49%
① LC_SLC		94	25	119	0.7899	0.2101	3.09%
FR_FRABCH		97	24	121	0.8017	0.1983	1.65%
FR_FRCP1		80	37	117	0.6838	0.3162	16.12%
GH_FR1		89	32	121	0.7355	0.2645	9.76%
GH_ERC		97	22	119	0.8151	0.1849	0.0%
CM_MC2		99	21	120	0.825	0.175	-1.21%
EV_MC2		88	30	118	0.7458	0.2542	8.51%
EV_HC1		90	29	119	0.7563	0.2437	7.22%
LC_DCDS		100	19	119	0.8403	0.1597	-3.09%
LC_LC3		107	12	119	0.8992	0.1008	-10.31%
LC_LC5		95	27	122	0.7787	0.2213	4.47%
LC_LCDSSLCC		97	22	119	0.8151	0.1849	0.0%
FR_FR4		89	31	120	0.7417	0.2583	9.01%
FR_FRRD		75	17	92	0.8152	0.1848	-0.01%
FR_FR2		90	30	120	0.75	0.25	7.99%
FR_MULTIPLATE		93	26	119	0.7815	0.2185	4.12%

① Reference sites

Salmonid Embryo-Alevin Survival and Development Test — **Nautilus Environmental**

Analysis ID: 02-0902-9561 **Endpoint:** Proportion Normal **CETIS Version:** CETISv1.9.4
Analyzed: 20 Dec-21 15:45 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Proportion Normal Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Dechlor + Cu	L	0.9667	0.6667	0.7241	0.8276
① FR_UFR1		0.9333	0.8621	0.6333	0.9000
① GH_ER2		0.9032	0.8966	0.8667	0.8333
① CM_MC1		0.9667	0.9032	0.8333	0.8333
① LC_SLC		0.8667	0.8276	0.7333	0.7333
FR_FRABCH		0.8276	0.8125	0.7667	0.8000
FR_FRCP1		0.8276	0.6000	0.6552	0.6552
GH_FR1		0.8000	0.9000	0.7097	0.5333
GH_ERC		0.9667	0.8000	0.7241	0.7667
CM_MC2		0.9000	0.9333	0.6552	0.8065
EV_MC2		0.8667	0.7000	0.7857	0.6333
EV_HC1		0.9000	0.8333	0.5862	0.7000
LC_DCDS		0.8667	0.9000	0.7667	0.8276
LC_LC3		0.9310	0.9333	0.8667	0.8667
LC_LC5		0.9355	0.7000	0.7097	0.7667
LC_LCDSSLCC		0.8667	0.6667	0.8000	0.9310
FR_FR4		0.9000	0.6774	0.6207	0.7667
FR_FRRD		0.8710	0.7500	0.8276	
FR_FR2		0.8000	0.6000	0.8333	0.7667
FR_MULTIPLATE		0.6333	0.9333	0.8000	0.7586

Proportion Normal Binomials

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Dechlor + Cu	L	29/30	20/30	21/29	24/29
① FR_UFR1		28/30	25/29	19/30	27/30
① GH_ER2		28/31	26/29	26/30	25/30
① CM_MC1		29/30	28/31	25/30	25/30
① LC_SLC		26/30	24/29	22/30	22/30
FR_FRABCH		24/29	26/32	23/30	24/30
FR_FRCP1		24/29	18/30	19/29	19/29
GH_FR1		24/30	27/30	22/31	16/30
GH_ERC		29/30	24/30	21/29	23/30
CM_MC2		27/30	28/30	19/29	25/31
EV_MC2		26/30	21/30	22/28	19/30
EV_HC1		27/30	25/30	17/29	21/30
LC_DCDS		26/30	27/30	23/30	24/29
LC_LC3		27/29	28/30	26/30	26/30
LC_LC5		29/31	21/30	22/31	23/30
LC_LCDSSLCC		26/30	20/30	24/30	27/29
FR_FR4		27/30	21/31	18/29	23/30
FR_FRRD		27/31	24/32	24/29	
FR_FR2		24/30	18/30	25/30	23/30
FR_MULTIPLATE		19/30	28/30	24/30	22/29

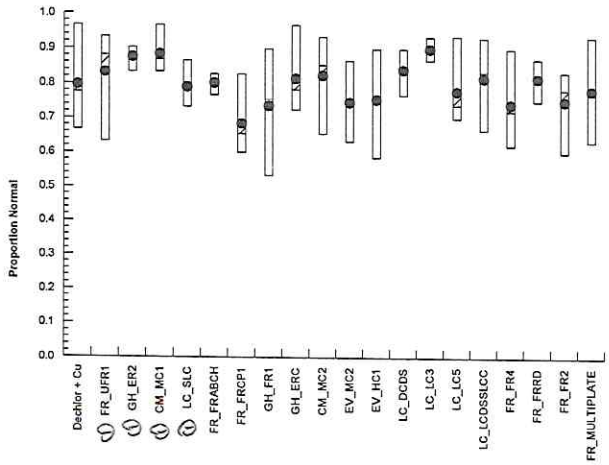
① Reference sites

Analyst: UW QA: Dec-21/21

Salmonid Embryo-Alevin Survival and Development Test — **Nautilus Environmental**

Analysis ID:	02-0902-9561	**Endpoint:**	Proportion Normal	**CETIS Version:**	CETISv1.9.4
Analyzed:	20 Dec-21 15:45	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1

Graphics



① Reference sites

Analyst: UW QA: Dec 21/21

CETIS Analytical Report

Test Code/ID: 212110a / 17-6168-8991

Salmonid Embryo-Alevin Survival and Development Test — **Nautilus Environmental**

Analysis ID:	02-6402-3111	**Endpoint:**	Survival Rate	**CETIS Version:**	CETISv1.9.4
Analyzed:	20 Dec-21 15:46	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1
Batch ID:	04-8984-4677	**Test Type:**	Survival-Development	**Analyst:**	Yvonne Lam
Start Date:	13 Oct-21 15:50	**Protocol:**	EC/EPS 1/RM/28	**Diluent:**	Dechlorinated Tap Water
Ending Date:	12 Nov-21 08:00	**Species:**	Oncorhynchus mykiss	**Brine:**	
Test Length:	29d 16h	**Taxon:**	Actinopterygii	**Source:**	Lyndon Fish Hatcheries **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
① FR_UFR1	19-8746-8946	12 Oct-21 11:07	13 Oct-21 11:53	29h (0 °C)	Teck Coal	
③ GH_ER2	20-2628-4137	12 Oct-21 10:50	13 Oct-21 11:30	29h (0 °C)		
⑤ CM_MC1	18-3559-2852	12 Oct-21 13:20	13 Oct-21 11:30	26h (0.1 °C)		
⑦ LC_SLC	08-7937-3726	12 Oct-21 11:00	13 Oct-21 11:30	29h (2.9 °C)		
FR_FRABCH	18-7592-7020	12 Oct-21 11:20	13 Oct-21 11:53	28h (0 °C)		
FR_FRCP1	10-3969-8000	12 Oct-21 11:48	13 Oct-21 11:53	28h (1.3 °C)		
GH_FR1	11-8224-4576	12 Oct-21 10:00	13 Oct-21 11:30	30h (0 °C)		
GH_ERC	00-1276-7572	12 Oct-21 11:50	13 Oct-21 11:30	28h (0 °C)		
CM_MC2	03-9569-8600	12 Oct-21 12:47	13 Oct-21 11:30	27h (1.3 °C)		
EV_MC2	13-1923-7722	12 Oct-21 11:38	13 Oct-21 11:30	28h (0.2 °C)		
EV_HC1	18-6648-8827	12 Oct-21 10:33	13 Oct-21 11:30	29h (0 °C)		
LC_DCDS	17-4710-4100	12 Oct-21	13 Oct-21 11:30	40h (1.7 °C)		
LC_LC3	20-0894-5906	12 Oct-21 12:00	13 Oct-21 11:30	28h (8.8 °C)		
LC_LC5	14-5637-1032	12 Oct-21 13:30	13 Oct-21 11:30	26h (2.6 °C)		
LC_LCDSSLCC	06-4184-4349	12 Oct-21 12:30	13 Oct-21 11:30	27h (4.7 °C)		
FR_FR4	16-7272-1140	12 Oct-21 11:05	13 Oct-21 11:30	29h (0 °C)		
FR_FRRD	04-7874-3326	12 Oct-21 11:45	13 Oct-21 11:30	28h (0 °C)		
FR_FR2	09-1936-7906	12 Oct-21 10:25	13 Oct-21 11:30	29h (0 °C)		
FR_MULTIPLATE	07-2028-3040	12 Oct-21 09:45	13 Oct-21 11:30	30h (0 °C)		

All samples spiked with 20 mg/L Cu

① Reference sites

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
① FR_UFR1	Water Sample	Teck Coal	FR_UFR1_WEK_2021-09-1	
③ GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-10-12_	
⑤ CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-10-12	
⑦ LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-10-19_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_WEK_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_WEK_2021-09	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-10-12_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-10-12	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-10-12	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2021_Q4_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2021_Q4_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-10-19	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-10-19_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-10-19_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	
FR_FR4	Water Sample	Teck Coal	FR_FR4_WS_2021-10-12_	
FR_FRRD	Water Sample	Teck Coal	FR_FRRD_WS_2021-10-12	
FR_FR2	Water Sample	Teck Coal	FR_FR2_WS_2021-10-12_	
FR_MULTIPLATE	Water Sample	Teck Coal	FR_MULTIPLATE_WS_202	

Fisher Exact/Bonferroni-Holm Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
① Upstream Control (FR_UFR1)		③ GH_ER2	0.8415	Exact	1.0000	Non-Significant Effect
		⑤ CM_MC1	0.8920	Exact	1.0000	Non-Significant Effect
		⑦ LC_SLC	0.5733	Exact	1.0000	Non-Significant Effect
		FR_FRABCH	0.4499	Exact	1.0000	Non-Significant Effect
		FR_FRCP1*	0.0019	Exact	0.0339	Significant Effect
		GH_FR1	0.0404	Exact	0.6870	Non-Significant Effect

Analyst: YL QA: DEC 21/21

Salmonid Embryo-Alevin Survival and Development Test — **Nautilus Environmental**

Analysis ID: 02-6402-3111 **Endpoint:** Survival Rate **CETIS Version:** CETISv1.9.4
Analyzed: 20 Dec-21 15:46 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Fisher Exact/Bonferroni-Holm Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
		GH_ERC	0.5733	Exact	1.0000	Non-Significant Effect
		CM_MC2	0.3079	Exact	1.0000	Non-Significant Effect
		EV_MC2	0.1109	Exact	1.0000	Non-Significant Effect
		EV_HC1	0.3605	Exact	1.0000	Non-Significant Effect
		LC_DCDS	0.7154	Exact	1.0000	Non-Significant Effect
		LC_LC3	0.9918	Exact	0.9918	Non-Significant Effect
		LC_LC5	0.4606	Exact	1.0000	Non-Significant Effect
		LC_LCDSSLCC	0.4283	Exact	1.0000	Non-Significant Effect
		FR_FR4	0.0519	Exact	0.8300	Non-Significant Effect
		FR_FRRD	0.4141	Exact	1.0000	Non-Significant Effect
		FR_FR2	0.0519	Exact	0.8300	Non-Significant Effect
		FR_MULTIPLATE	0.2980	Exact	1.0000	Non-Significant Effect

Data Summary

Sample	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
① FR_UFR1	U	102	17	119	0.8571	0.1429	0.0%
① GH_ER2		107	13	120	0.8917	0.1083	-4.03%
① CM_MC1		109	12	121	0.9008	0.09917	-5.1%
① LC_SLC		102	17	119	0.8571	0.1429	0.0%
FR_FRABCH		102	19	121	0.843	0.157	1.65%
FR_FRCP1		81	36	117	0.6923	0.3077	19.23%
GH_FR1		92	29	121	0.7603	0.2397	11.29%
GH_ERC		102	17	119	0.8571	0.1429	0.0%
CM_MC2		99	21	120	0.825	0.175	3.75%
EV_MC2		93	25	118	0.7881	0.2119	8.05%
EV_HC1		99	20	119	0.8319	0.1681	2.94%
LC_DCDS		104	15	119	0.8739	0.1261	-1.96%
LC_LC3		112	7	119	0.9412	0.05882	-9.8%
LC_LC5		103	19	122	0.8443	0.1557	1.5%
LC_LCDSSLCC		100	19	119	0.8403	0.1597	1.96%
FR_FR4		92	28	120	0.7667	0.2333	10.56%
FR_FRRD		77	15	92	0.837	0.163	2.36%
FR_FR2		92	28	120	0.7667	0.2333	10.56%
FR_MULTIPLATE		98	21	119	0.8235	0.1765	3.92%

① Reference sites

Salmonid Embryo-Alevin Survival and Development Test — **Nautilus Environmental**

Analysis ID: 02-6402-3111 **Endpoint:** Survival Rate **CETIS Version:** CETISv1.9.4
Analyzed: 20 Dec-21 15:46 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Survival Rate Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
① FR_UFR1	U	0.9333	0.8966	0.7000	0.9000
① GH_ER2		0.9032	0.9655	0.8667	0.8333
① CM_MC1		0.9667	0.9355	0.8667	0.8333
① LC_SLC		0.9333	0.8276	0.8333	0.8333
FR_FRABCH		0.8276	0.8438	0.8333	0.8667
FR_FRCP1		0.8621	0.6000	0.6552	0.6552
GH_FR1		0.8000	0.9000	0.7419	0.6000
GH_ERC		0.9667	0.9000	0.7931	0.7667
CM_MC2		0.9000	0.9333	0.6552	0.8065
EV_MC2		0.9000	0.8000	0.8214	0.6333
EV_HC1		0.9333	0.8667	0.8276	0.7000
LC_DCDS		0.9000	0.9000	0.8333	0.8621
LC_LC3		0.9310	0.9667	0.9667	0.9000
LC_LC5		0.9677	0.8333	0.8065	0.7667
LC_LCDSSLCC		0.9000	0.7000	0.8333	0.9310
FR_FR4		0.9333	0.7097	0.6552	0.7667
FR_FRRD		0.8710	0.7812	0.8621	
FR_FR2		0.8333	0.6333	0.8333	0.7667
FR_MULTIPLATE		0.6667	1.0000	0.8333	0.7931

Survival Rate Binomials

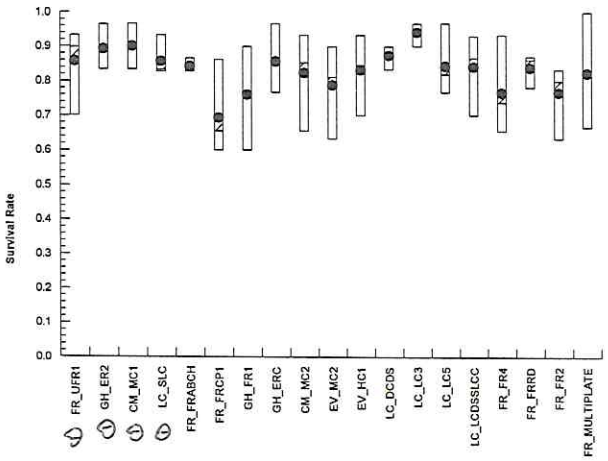
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
① FR_UFR1	U	28/30	26/29	21/30	27/30
① GH_ER2		28/31	28/29	26/30	25/30
① CM_MC1		29/30	29/31	26/30	25/30
① LC_SLC		28/30	24/29	25/30	25/30
FR_FRABCH		24/29	27/32	25/30	26/30
FR_FRCP1		25/29	18/30	19/29	19/29
GH_FR1		24/30	27/30	23/31	18/30
GH_ERC		29/30	27/30	23/29	23/30
CM_MC2		27/30	28/30	19/29	25/31
EV_MC2		27/30	24/30	23/28	19/30
EV_HC1		28/30	26/30	24/29	21/30
LC_DCDS		27/30	27/30	25/30	25/29
LC_LC3		27/29	29/30	29/30	27/30
LC_LC5		30/31	25/30	25/31	23/30
LC_LCDSSLCC		27/30	21/30	25/30	27/29
FR_FR4		28/30	22/31	19/29	23/30
FR_FRRD		27/31	25/32	25/29	
FR_FR2		25/30	19/30	25/30	23/30
FR_MULTIPLATE		20/30	30/30	25/30	23/29

① Reference sites

Salmonid Embryo-Alevin Survival and Development Test — **Nautilus Environmental**

Analysis ID:	02-6402-3111	**Endpoint:**	Survival Rate	**CETIS Version:**	CETISv1.9.4
Analyzed:	20 Dec-21 15:46	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1

Graphics



① Reference Sites

Analyst: UM QA: Dec 21/21

CETIS Analytical Report

Salmonid Embryo-Alevin Survival and Development Test — **Nautilus Environmental**

Analysis ID:	17-6701-9529	**Endpoint:**	Proportion Normal	**CETIS Version:**	CETISv1.9.4
Analyzed:	20 Dec-21 15:46	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1
Batch ID:	04-8984-4677	**Test Type:**	Survival-Development	**Analyst:**	Yvonne Lam
Start Date:	13 Oct-21 15:50	**Protocol:**	EC/EPS 1/RM/28	**Diluent:**	Dechlorinated Tap Water
Ending Date:	12 Nov-21 08:00	**Species:**	Oncorhynchus mykiss	**Brine:**	
Test Length:	29d 16h	**Taxon:**	Actinopterygii	**Source:**	Lyndon Fish Hatcheries **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
① FR_UFR1	19-8746-8946	12 Oct-21 11:07	13 Oct-21 11:53	29h (0 °C)	Teck Coal	
① GH_ER2	20-2628-4137	12 Oct-21 10:50	13 Oct-21 11:30	29h (0 °C)		
① CM_MC1	18-3559-2852	12 Oct-21 13:20	13 Oct-21 11:30	26h (0.1 °C)		
① LC_SLC	08-7937-3726	12 Oct-21 11:00	13 Oct-21 11:30	29h (2.9 °C)		
FR_FRABCH	18-7592-7020	12 Oct-21 11:20	13 Oct-21 11:53	28h (0 °C)		
FR_FRCP1	10-3969-8000	12 Oct-21 11:48	13 Oct-21 11:53	28h (1.3 °C)		
GH_FR1	11-8224-4576	12 Oct-21 10:00	13 Oct-21 11:30	30h (0 °C)		
GH_ERC	00-1276-7572	12 Oct-21 11:50	13 Oct-21 11:30	28h (0 °C)		
CM_MC2	03-9569-8600	12 Oct-21 12:47	13 Oct-21 11:30	27h (1.3 °C)		
EV_MC2	13-1923-7722	12 Oct-21 11:38	13 Oct-21 11:30	28h (0.2 °C)		
EV_HC1	18-6648-8827	12 Oct-21 10:33	13 Oct-21 11:30	29h (0 °C)		
LC_DCDS	17-4710-4100	12 Oct-21	13 Oct-21 11:30	40h (1.7 °C)		
LC_LC3	20-0894-5906	12 Oct-21 12:00	13 Oct-21 11:30	28h (8.8 °C)		
LC_LC5	14-5637-1032	12 Oct-21 13:30	13 Oct-21 11:30	26h (2.6 °C)		
LC_LCDSSLCC	06-4184-4349	12 Oct-21 12:30	13 Oct-21 11:30	27h (4.7 °C)		
FR_FR4	16-7272-1140	12 Oct-21 11:05	13 Oct-21 11:30	29h (0 °C)		
FR_FRRD	04-7874-3326	12 Oct-21 11:45	13 Oct-21 11:30	28h (0 °C)		
FR_FR2	09-1936-7906	12 Oct-21 10:25	13 Oct-21 11:30	29h (0 °C)		
FR_MULTIPLATE	07-2028-3040	12 Oct-21 09:45	13 Oct-21 11:30	30h (0 °C)		

All samples spiked with 20 ug/L Cu

① Reference Sites

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
① FR_UFR1	Water Sample	Teck Coal	FR_UFR1_WEK_2021-09-1	
① GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-10-12_	
① CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-10-12	
① LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-10-19_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_WEK_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_WEK_2021-09	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-10-12_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-10-12	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-10-12	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2021_Q4_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2021_Q4_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-10-19	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-10-19_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-10-19_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	
FR_FR4	Water Sample	Teck Coal	FR_FR4_WS_2021-10-12_	
FR_FRRD	Water Sample	Teck Coal	FR_FRRD_WS_2021-10-12	
FR_FR2	Water Sample	Teck Coal	FR_FR2_WS_2021-10-12_	
FR_MULTIPLATE	Water Sample	Teck Coal	FR_MULTIPLATE_WS_202	

Fisher Exact/Bonferroni-Holm Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
① Upstream Control (FR_UFR1)		① GH_ER2	0.8697	Exact	1.0000	Non-Significant Effect
		① CM_MC1	0.9115	Exact	1.0000	Non-Significant Effect
		① LC_SLC	0.2541	Exact	1.0000	Non-Significant Effect
		FR_FRABCH	0.3305	Exact	1.0000	Non-Significant Effect
		FR_FRCP1	0.0059	Exact	0.1064	Non-Significant Effect
		GH_FR1	0.0486	Exact	0.8255	Non-Significant Effect

Analyst: YY QA: Dec-21/21

Salmonid Embryo-Alevin Survival and Development Test **Nautilus Environmental**

Analysis ID: 17-6701-9529 **Endpoint:** Proportion Normal **CETIS Version:** CETISv1.9.4
Analyzed: 20 Dec-21 15:46 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Fisher Exact/Bonferroni-Holm Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
		GH_ERC	0.4326	Exact	1.0000	Non-Significant Effect
		CM_MC2	0.5118	Exact	1.0000	Non-Significant Effect
		EV_MC2	0.0710	Exact	1.0000	Non-Significant Effect
		EV_HC1	0.0997	Exact	1.0000	Non-Significant Effect
		LC_DCDS	0.6367	Exact	1.0000	Non-Significant Effect
		LC_LC3	0.9570	Exact	0.9570	Non-Significant Effect
		LC_LC5	0.1894	Exact	1.0000	Non-Significant Effect
		LC_LCDSSLCC	0.4326	Exact	1.0000	Non-Significant Effect
		FR_FR4	0.0609	Exact	0.9739	Non-Significant Effect
		FR_FRRD	0.4448	Exact	1.0000	Non-Significant Effect
		FR_FR2	0.0808	Exact	1.0000	Non-Significant Effect
		FR_MULTIPLATE	0.2060	Exact	1.0000	Non-Significant Effect

Data Summary

Sample	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
① FR_UFR1	U	99	20	119	0.8319	0.1681	-2.06%
① GH_ER2		105	15	120	0.875	0.125	-7.35%
① CM_MC1		107	14	121	0.8843	0.1157	-8.49%
① LC_SLC		94	25	119	0.7899	0.2101	3.09%
FR_FRABCH		97	24	121	0.8017	0.1983	1.65%
FR_FRCP1		80	37	117	0.6838	0.3162	16.12%
GH_FR1		89	32	121	0.7355	0.2645	9.76%
GH_ERC		97	22	119	0.8151	0.1849	0.0%
CM_MC2		99	21	120	0.825	0.175	-1.21%
EV_MC2		88	30	118	0.7458	0.2542	8.51%
EV_HC1		90	29	119	0.7563	0.2437	7.22%
LC_DCDS		100	19	119	0.8403	0.1597	-3.09%
LC_LC3		107	12	119	0.8992	0.1008	-10.31%
LC_LC5		95	27	122	0.7787	0.2213	4.47%
LC_LCDSSLCC		97	22	119	0.8151	0.1849	0.0%
FR_FR4		89	31	120	0.7417	0.2583	9.01%
FR_FRRD		75	17	92	0.8152	0.1848	-0.01%
FR_FR2		90	30	120	0.75	0.25	7.99%
FR_MULTIPLATE		93	26	119	0.7815	0.2185	4.12%

① Reference sites

Salmonid Embryo-Alevin Survival and Development Test — **Nautilus Environmental**

Analysis ID: 17-6701-9529 **Endpoint:** Proportion Normal **CETIS Version:** CETISv1.9.4
Analyzed: 20 Dec-21 15:46 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Proportion Normal Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
FR_UFR1	U	0.9333	0.8621	0.6333	0.9000
GH_ER2		0.9032	0.8966	0.8667	0.8333
CM_MC1		0.9667	0.9032	0.8333	0.8333
LC_SLC		0.8667	0.8276	0.7333	0.7333
FR_FRABCH		0.8276	0.8125	0.7667	0.8000
FR_FRCP1		0.8276	0.6000	0.6552	0.6552
GH_FR1		0.8000	0.9000	0.7097	0.5333
GH_ERC		0.9667	0.8000	0.7241	0.7667
CM_MC2		0.9000	0.9333	0.6552	0.8065
EV_MC2		0.8667	0.7000	0.7857	0.6333
EV_HC1		0.9000	0.8333	0.5862	0.7000
LC_DCDS		0.8667	0.9000	0.7667	0.8276
LC_LC3		0.9310	0.9333	0.8667	0.8667
LC_LC5		0.9355	0.7000	0.7097	0.7667
LC_LCDSSLCC		0.8667	0.6667	0.8000	0.9310
FR_FR4		0.9000	0.6774	0.6207	0.7667
FR_FRRD		0.8710	0.7500	0.8276	
FR_FR2		0.8000	0.6000	0.8333	0.7667
FR_MULTIPLATE		0.6333	0.9333	0.8000	0.7586

Proportion Normal Binomials

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
FR_UFR1	U	28/30	25/29	19/30	27/30
GH_ER2		28/31	26/29	26/30	25/30
CM_MC1		29/30	28/31	25/30	25/30
LC_SLC		26/30	24/29	22/30	22/30
FR_FRABCH		24/29	26/32	23/30	24/30
FR_FRCP1		24/29	18/30	19/29	19/29
GH_FR1		24/30	27/30	22/31	16/30
GH_ERC		29/30	24/30	21/29	23/30
CM_MC2		27/30	28/30	19/29	25/31
EV_MC2		26/30	21/30	22/28	19/30
EV_HC1		27/30	25/30	17/29	21/30
LC_DCDS		26/30	27/30	23/30	24/29
LC_LC3		27/29	28/30	26/30	26/30
LC_LC5		29/31	21/30	22/31	23/30
LC_LCDSSLCC		26/30	20/30	24/30	27/29
FR_FR4		27/30	21/31	18/29	23/30
FR_FRRD		27/31	24/32	24/29	
FR_FR2		24/30	18/30	25/30	23/30
FR_MULTIPLATE		19/30	28/30	24/30	22/29

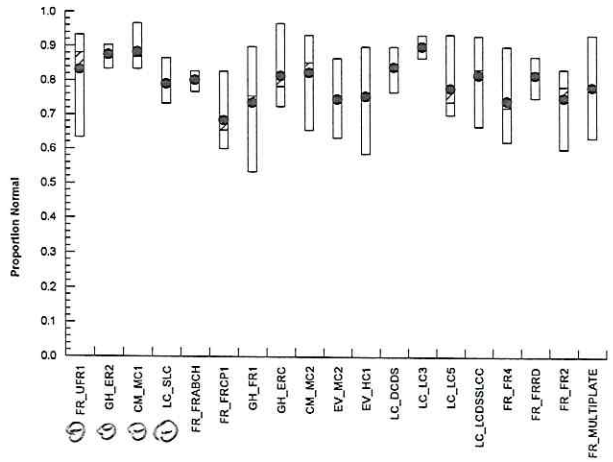
D Reference sites

Analyst: UWE QA: Dec 21/21

Salmonid Embryo-Alevin Survival and Development Test — **Nautilus Environmental**

Analysis ID:	17-6701-9529	**Endpoint:**	Proportion Normal	**CETIS Version:**	CETISv1.9.4
Analyzed:	20 Dec-21 15:46	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1

Graphics



① Reference sites

CETIS Analytical Report

Salmonid Embryo-Alevin Survival and Development Test — **Nautilus Environmental**

Analysis ID:	04-4517-0618	**Endpoint:**	Survival Rate	**CETIS Version:**	CETISv1.9.4
Analyzed:	20 Dec-21 15:46	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1
Batch ID:	04-8984-4677	**Test Type:**	Survival-Development	**Analyst:**	Yvonne Lam
Start Date:	13 Oct-21 15:50	**Protocol:**	EC/EPS 1/RM/28	**Diluent:**	Dechlorinated Tap Water
Ending Date:	12 Nov-21 08:00	**Species:**	Oncorhynchus mykiss	**Brine:**	
Test Length:	29d 16h	**Taxon:**	Actinopterygii	**Source:**	Lyndon Fish Hatcheries **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
FR_UFR1	19-8746-8946	12 Oct-21 11:07	13 Oct-21 11:53	29h (0 °C)	Teck Coal	
GH_ER2	20-2628-4137	12 Oct-21 10:50	13 Oct-21 11:30	29h (0 °C)		
CM_MC1	18-3559-2852	12 Oct-21 13:20	13 Oct-21 11:30	26h (0.1 °C)		
LC_SLC	08-7937-3726	12 Oct-21 11:00	13 Oct-21 11:30	29h (2.9 °C)		
FR_FRABCH	18-7592-7020	12 Oct-21 11:20	13 Oct-21 11:53	28h (0 °C)		
FR_FRCP1	10-3969-8000	12 Oct-21 11:48	13 Oct-21 11:53	28h (1.3 °C)		
GH_FR1	11-8224-4576	12 Oct-21 10:00	13 Oct-21 11:30	30h (0 °C)		
GH_ERC	00-1276-7572	12 Oct-21 11:50	13 Oct-21 11:30	28h (0 °C)		
CM_MC2	03-9569-8600	12 Oct-21 12:47	13 Oct-21 11:30	27h (1.3 °C)		
EV_MC2	13-1923-7722	12 Oct-21 11:38	13 Oct-21 11:30	28h (0.2 °C)		
EV_HC1	18-6648-8827	12 Oct-21 10:33	13 Oct-21 11:30	29h (0 °C)		
LC_DCDS	17-4710-4100	12 Oct-21	13 Oct-21 11:30	40h (1.7 °C)		
LC_LC3	20-0894-5906	12 Oct-21 12:00	13 Oct-21 11:30	28h (8.8 °C)		
LC_LC5	14-5637-1032	12 Oct-21 13:30	13 Oct-21 11:30	26h (2.6 °C)		
LC_LCDSSLCC	06-4184-4349	12 Oct-21 12:30	13 Oct-21 11:30	27h (4.7 °C)		
FR_FR4	16-7272-1140	12 Oct-21 11:05	13 Oct-21 11:30	29h (0 °C)		
FR_FRRD	04-7874-3326	12 Oct-21 11:45	13 Oct-21 11:30	28h (0 °C)		
FR_FR2	09-1936-7906	12 Oct-21 10:25	13 Oct-21 11:30	29h (0 °C)		
FR_MULTIPLATE	07-2028-3040	12 Oct-21 09:45	13 Oct-21 11:30	30h (0 °C)		

All samples spiked with 20 mg/L Cu

Reference Sites

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_UFR1	Water Sample	Teck Coal	FR_UFR1_WEK_2021-09-1	
GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-10-12_	
CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-10-12	
LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-10-19_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_WEK_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_WEK_2021-09	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-10-12_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-10-12	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-10-12	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2021_Q4_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2021_Q4_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-10-19	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-10-19_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-10-19_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	
FR_FR4	Water Sample	Teck Coal	FR_FR4_WS_2021-10-12_	
FR_FRRD	Water Sample	Teck Coal	FR_FRRD_WS_2021-10-12	
FR_FR2	Water Sample	Teck Coal	FR_FR2_WS_2021-10-12_	
FR_MULTIPLATE	Water Sample	Teck Coal	FR_MULTIPLATE_WS_202	

Fisher Exact/Bonferroni-Holm Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
Receiving Water (GH_ER2)		FR_UFR1	0.2711	Exact	1.0000	Non-Significant Effect
		CM_MC1	0.6713	Exact	1.0000	Non-Significant Effect
		LC_SLC	0.2711	Exact	1.0000	Non-Significant Effect
		FR_FRABCH	0.1779	Exact	1.0000	Non-Significant Effect
		FR_FRCP1*	0.0001	Exact	0.0021	Significant Effect
		GH_FR1	0.0056	Exact	0.0949	Non-Significant Effect

Analyst: YL QA: Dec-21/21

Salmonid Embryo-Alevin Survival and Development Test — **Nautilus Environmental**

Analysis ID: 04-4517-0618 **Endpoint:** Survival Rate **CETIS Version:** CETISv1.9.4
Analyzed: 20 Dec-21 15:46 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Fisher Exact/Bonferroni-Holm Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
		GH_ERC	0.2711	Exact	1.0000	Non-Significant Effect
		CM_MC2	0.0973	Exact	1.0000	Non-Significant Effect
		EV_MC2	0.0221	Exact	0.3098	Non-Significant Effect
		EV_HC1	0.1248	Exact	1.0000	Non-Significant Effect
		LC_DCDS	0.4112	Exact	1.0000	Non-Significant Effect
		LC_LC3	0.9479	Exact	0.9479	Non-Significant Effect
		LC_LC5	0.1845	Exact	1.0000	Non-Significant Effect
		LC_LCDSSLCC	0.1648	Exact	1.0000	Non-Significant Effect
		FR_FR4	0.0078	Exact	0.1249	Non-Significant Effect
		FR_FRRD	0.1681	Exact	1.0000	Non-Significant Effect
		FR_FR2	0.0078	Exact	0.1249	Non-Significant Effect
		FR_MULTIPLATE	0.0927	Exact	1.0000	Non-Significant Effect

Data Summary

Sample	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
① FR_UFR1		102	17	119	0.8571	0.1429	0.0%
① GH_ER2	R	107	13	120	0.8917	0.1083	-4.03%
① CM_MC1		109	12	121	0.9008	0.09917	-5.1%
① LC_SLC		102	17	119	0.8571	0.1429	0.0%
FR_FRABCH		102	19	121	0.843	0.157	1.65%
FR_FRCP1		81	36	117	0.6923	0.3077	19.23%
GH_FR1		92	29	121	0.7603	0.2397	11.29%
GH_ERC		102	17	119	0.8571	0.1429	0.0%
CM_MC2		99	21	120	0.825	0.175	3.75%
EV_MC2		93	25	118	0.7881	0.2119	8.05%
EV_HC1		99	20	119	0.8319	0.1681	2.94%
LC_DCDS		104	15	119	0.8739	0.1261	-1.96%
LC_LC3		112	7	119	0.9412	0.05882	-9.8%
LC_LC5		103	19	122	0.8443	0.1557	1.5%
LC_LCDSSLCC		100	19	119	0.8403	0.1597	1.96%
FR_FR4		92	28	120	0.7667	0.2333	10.56%
FR_FRRD		77	15	92	0.837	0.163	2.36%
FR_FR2		92	28	120	0.7667	0.2333	10.56%
FR_MULTIPLATE		98	21	119	0.8235	0.1765	3.92%

① Reference sites

Salmonid Embryo-Alevin Survival and Development Test — **Nautilus Environmental**

Analysis ID:	04-4517-0618	**Endpoint:**	Survival Rate	**CETIS Version:**	CETISv1.9.4
Analyzed:	20 Dec-21 15:46	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1

Survival Rate Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
FR_UFR1		0.9333	0.8966	0.7000	0.9000
GH_ER2	R	0.9032	0.9655	0.8667	0.8333
CM_MC1		0.9667	0.9355	0.8667	0.8333
LC_SLC		0.9333	0.8276	0.8333	0.8333
FR_FRABCH		0.8276	0.8438	0.8333	0.8667
FR_FRCP1		0.8621	0.6000	0.6552	0.6552
GH_FR1		0.8000	0.9000	0.7419	0.6000
GH_ERC		0.9667	0.9000	0.7931	0.7667
CM_MC2		0.9000	0.9333	0.6552	0.8065
EV_MC2		0.9000	0.8000	0.8214	0.6333
EV_HC1		0.9333	0.8667	0.8276	0.7000
LC_DCDS		0.9000	0.9000	0.8333	0.8621
LC_LC3		0.9310	0.9667	0.9667	0.9000
LC_LC5		0.9677	0.8333	0.8065	0.7667
LC_LCDSSLCC		0.9000	0.7000	0.8333	0.9310
FR_FR4		0.9333	0.7097	0.6552	0.7667
FR_FRRD		0.8710	0.7812	0.8621	
FR_FR2		0.8333	0.6333	0.8333	0.7667
FR_MULTIPLATE		0.6667	1.0000	0.8333	0.7931

Survival Rate Binomials

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
FR_UFR1		28/30	26/29	21/30	27/30
GH_ER2	R	28/31	28/29	26/30	25/30
CM_MC1		29/30	29/31	26/30	25/30
LC_SLC		28/30	24/29	25/30	25/30
FR_FRABCH		24/29	27/32	25/30	26/30
FR_FRCP1		25/29	18/30	19/29	19/29
GH_FR1		24/30	27/30	23/31	18/30
GH_ERC		29/30	27/30	23/29	23/30
CM_MC2		27/30	28/30	19/29	25/31
EV_MC2		27/30	24/30	23/28	19/30
EV_HC1		28/30	26/30	24/29	21/30
LC_DCDS		27/30	27/30	25/30	25/29
LC_LC3		27/29	29/30	29/30	27/30
LC_LC5		30/31	25/30	25/31	23/30
LC_LCDSSLCC		27/30	21/30	25/30	27/29
FR_FR4		28/30	22/31	19/29	23/30
FR_FRRD		27/31	25/32	25/29	
FR_FR2		25/30	19/30	25/30	23/30
FR_MULTIPLATE		20/30	30/30	25/30	23/29

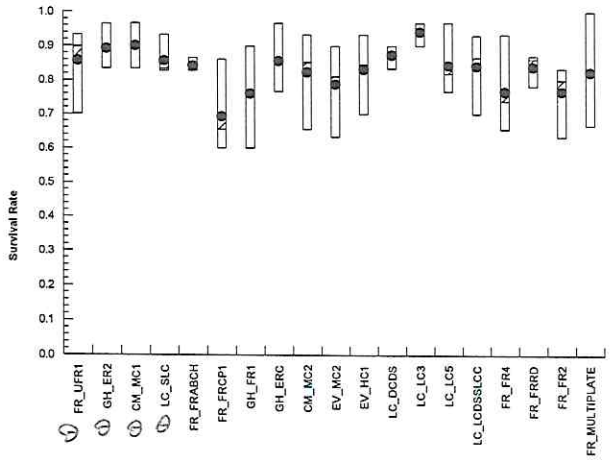
8 Reference sites

Analyst: WM QA: Dec-21 | 21

Salmonid Embryo-Alevin Survival and Development Test — **Nautilus Environmental**

Analysis ID:	04-4517-0618	**Endpoint:**	Survival Rate	**CETIS Version:**	CETISv1.9.4
Analyzed:	20 Dec-21 15:46	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1

Graphics



Reference sites

Analyst: YM QA: Dec 21/21

CETIS Analytical Report

Salmonid Embryo-Alevin Survival and Development Test — **Nautilus Environmental**

Analysis ID:	06-2585-8924	**Endpoint:**	Proportion Normal	**CETIS Version:**	CETISv1.9.4
Analyzed:	20 Dec-21 15:46	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1
Batch ID:	04-8984-4677	**Test Type:**	Survival-Development	**Analyst:**	Yvonne Lam
Start Date:	13 Oct-21 15:50	**Protocol:**	EC/EPS 1/RM/28	**Diluent:**	Dechlorinated Tap Water
Ending Date:	12 Nov-21 08:00	**Species:**	Oncorhynchus mykiss	**Brine:**	
Test Length:	29d 16h	**Taxon:**	Actinopterygii	**Source:**	Lyndon Fish Hatcheries **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
FR_UFR1	19-8746-8946	12 Oct-21 11:07	13 Oct-21 11:53	29h (0 °C)	Teck Coal	
GH_ER2	20-2628-4137	12 Oct-21 10:50	13 Oct-21 11:30	29h (0 °C)		
CM_MC1	18-3559-2852	12 Oct-21 13:20	13 Oct-21 11:30	26h (0.1 °C)		
LC_SLC	08-7937-3726	12 Oct-21 11:00	13 Oct-21 11:30	29h (2.9 °C)		
FR_FRABCH	18-7592-7020	12 Oct-21 11:20	13 Oct-21 11:53	28h (0 °C)		
FR_FRCP1	10-3969-8000	12 Oct-21 11:48	13 Oct-21 11:53	28h (1.3 °C)		
GH_FR1	11-8224-4576	12 Oct-21 10:00	13 Oct-21 11:30	30h (0 °C)		
GH_ERC	00-1276-7572	12 Oct-21 11:50	13 Oct-21 11:30	28h (0 °C)		
CM_MC2	03-9569-8600	12 Oct-21 12:47	13 Oct-21 11:30	27h (1.3 °C)		
EV_MC2	13-1923-7722	12 Oct-21 11:38	13 Oct-21 11:30	28h (0.2 °C)		
EV_HC1	18-6648-8827	12 Oct-21 10:33	13 Oct-21 11:30	29h (0 °C)		
LC_DCDS	17-4710-4100	12 Oct-21	13 Oct-21 11:30	40h (1.7 °C)		
LC_LC3	20-0894-5906	12 Oct-21 12:00	13 Oct-21 11:30	28h (8.8 °C)		
LC_LC5	14-5637-1032	12 Oct-21 13:30	13 Oct-21 11:30	26h (2.6 °C)		
LC_LCDSSLCC	06-4184-4349	12 Oct-21 12:30	13 Oct-21 11:30	27h (4.7 °C)		
FR_FR4	16-7272-1140	12 Oct-21 11:05	13 Oct-21 11:30	29h (0 °C)		
FR_FRRD	04-7874-3326	12 Oct-21 11:45	13 Oct-21 11:30	28h (0 °C)		
FR_FR2	09-1936-7906	12 Oct-21 10:25	13 Oct-21 11:30	29h (0 °C)		
FR_MULTIPLATE	07-2028-3040	12 Oct-21 09:45	13 Oct-21 11:30	30h (0 °C)		

All samples spiked with 20 mg/L Cu

Reference sites

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_UFR1	Water Sample	Teck Coal	FR_UFR1_WEK_2021-09-1	
GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-10-12_	
CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-10-12	
LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-10-19_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_WEK_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_WEK_2021-09	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-10-12_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-10-12	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-10-12	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2021_Q4_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2021_Q4_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-10-19	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-10-19_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-10-19_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	
FR_FR4	Water Sample	Teck Coal	FR_FR4_WS_2021-10-12_	
FR_FRRD	Water Sample	Teck Coal	FR_FRRD_WS_2021-10-12	
FR_FR2	Water Sample	Teck Coal	FR_FR2_WS_2021-10-12_	
FR_MULTIPLATE	Water Sample	Teck Coal	FR_MULTIPLATE_WS_202	

Fisher Exact/Bonferroni-Holm Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
Receiving Water (~~ENVIRO~~ GH-ER2)		FR_UFR1	0.2242	Exact	0.8968	Non-Significant Effect
		CM_MC1	0.6624	Exact	1.0000	Non-Significant Effect
		LC_SLC	0.0557	Exact	0.5572	Non-Significant Effect
		FR_FRABCH	0.0849	Exact	0.7641	Non-Significant Effect
		FR_FRCP1*	0.0003	Exact	0.0054	Significant Effect
		GH_FR1	0.0048	Exact	0.0821	Non-Significant Effect

Analyst: YL QA: Dec-21/21

Salmonid Embryo-Alevin Survival and Development Test — **Nautilus Environmental**

Analysis ID:	06-2585-8924	**Endpoint:**	Proportion Normal	**CETIS Version:**	CETISv1.9.4
Analyzed:	20 Dec-21 15:46	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1

Fisher Exact/Bonferroni-Holm Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
		GH_ERC	0.1355	Exact	1.0000	Non-Significant Effect
		CM_MC2	0.1831	Exact	0.9156	Non-Significant Effect
		EV_MC2	0.0084	Exact	0.1254	Non-Significant Effect
		EV_HC1	0.0135	Exact	0.1758	Non-Significant Effect
		LC_DCDS	0.2805	Exact	0.8416	Non-Significant Effect
		LC_LC3	0.7862	Exact	0.7862	Non-Significant Effect
		LC_LC5	0.0348	Exact	0.4175	Non-Significant Effect
		LC_LCDSSLCC	0.1355	Exact	1.0000	Non-Significant Effect
		FR_FR4	0.0067	Exact	0.1065	Non-Significant Effect
		FR_FRRD	0.1559	Exact	0.9354	Non-Significant Effect
		FR_FR2	0.0100	Exact	0.1393	Non-Significant Effect
		FR_MULTIPLATE	0.0401	Exact	0.4407	Non-Significant Effect

Data Summary

Sample	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
FR_UFR1		99	20	119	0.8319	0.1681	-2.06%
GH_ER2	R	105	15	120	0.875	0.125	-7.35%
CM_MC1		107	14	121	0.8843	0.1157	-8.49%
LC_SLC		94	25	119	0.7899	0.2101	3.09%
FR_FRABCH		97	24	121	0.8017	0.1983	1.65%
FR_FRCP1		80	37	117	0.6838	0.3162	16.12%
GH_FR1		89	32	121	0.7355	0.2645	9.76%
GH_ERC		97	22	119	0.8151	0.1849	0.0%
CM_MC2		99	21	120	0.825	0.175	-1.21%
EV_MC2		88	30	118	0.7458	0.2542	8.51%
EV_HC1		90	29	119	0.7563	0.2437	7.22%
LC_DCDS		100	19	119	0.8403	0.1597	-3.09%
LC_LC3		107	12	119	0.8992	0.1008	-10.31%
LC_LC5		95	27	122	0.7787	0.2213	4.47%
LC_LCDSSLCC		97	22	119	0.8151	0.1849	0.0%
FR_FR4		89	31	120	0.7417	0.2583	9.01%
FR_FRRD		75	17	92	0.8152	0.1848	-0.01%
FR_FR2		90	30	120	0.75	0.25	7.99%
FR_MULTIPLATE		93	26	119	0.7815	0.2185	4.12%

Reference sites

Salmonid Embryo-Alevin Survival and Development Test — **Nautilus Environmental**

Analysis ID: 06-2585-8924 **Endpoint:** Proportion Normal **CETIS Version:** CETISv1.9.4
Analyzed: 20 Dec-21 15:46 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Proportion Normal Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
FR_UFR1		0.9333	0.8621	0.6333	0.9000
GH_ER2	R	0.9032	0.8966	0.8667	0.8333
CM_MC1		0.9667	0.9032	0.8333	0.8333
LC_SLC		0.8667	0.8276	0.7333	0.7333
FR_FRABCH		0.8276	0.8125	0.7667	0.8000
FR_FRCP1		0.8276	0.6000	0.6552	0.6552
GH_FR1		0.8000	0.9000	0.7097	0.5333
GH_ERC		0.9667	0.8000	0.7241	0.7667
CM_MC2		0.9000	0.9333	0.6552	0.8065
EV_MC2		0.8667	0.7000	0.7857	0.6333
EV_HC1		0.9000	0.8333	0.5862	0.7000
LC_DCDS		0.8667	0.9000	0.7667	0.8276
LC_LC3		0.9310	0.9333	0.8667	0.8667
LC_LC5		0.9355	0.7000	0.7097	0.7667
LC_LCDSSLCC		0.8667	0.6667	0.8000	0.9310
FR_FR4		0.9000	0.6774	0.6207	0.7667
FR_FRRD		0.8710	0.7500	0.8276	
FR_FR2		0.8000	0.6000	0.8333	0.7667
FR_MULTIPLATE		0.6333	0.9333	0.8000	0.7586

Proportion Normal Binomials

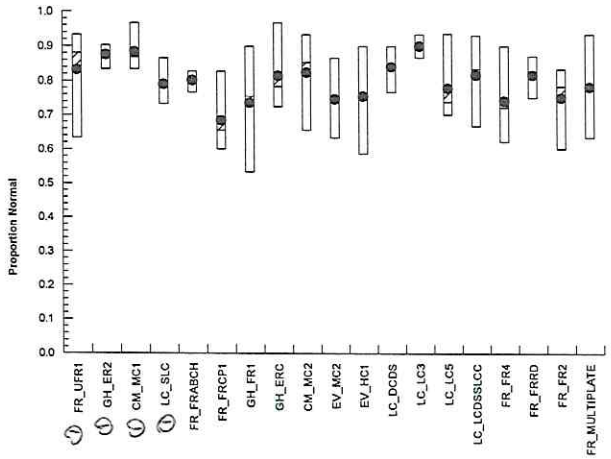
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
FR_UFR1		28/30	25/29	19/30	27/30
GH_ER2	R	28/31	26/29	26/30	25/30
CM_MC1		29/30	28/31	25/30	25/30
LC_SLC		26/30	24/29	22/30	22/30
FR_FRABCH		24/29	26/32	23/30	24/30
FR_FRCP1		24/29	18/30	19/29	19/29
GH_FR1		24/30	27/30	22/31	16/30
GH_ERC		29/30	24/30	21/29	23/30
CM_MC2		27/30	28/30	19/29	25/31
EV_MC2		26/30	21/30	22/28	19/30
EV_HC1		27/30	25/30	17/29	21/30
LC_DCDS		26/30	27/30	23/30	24/29
LC_LC3		27/29	28/30	26/30	26/30
LC_LC5		29/31	21/30	22/31	23/30
LC_LCDSSLCC		26/30	20/30	24/30	27/29
FR_FR4		27/30	21/31	18/29	23/30
FR_FRRD		27/31	24/32	24/29	
FR_FR2		24/30	18/30	25/30	23/30
FR_MULTIPLATE		19/30	28/30	24/30	22/29

Reference Sites

Salmonid Embryo-Alevin Survival and Development Test — **Nautilus Environmental**

Analysis ID:	06-2585-8924	**Endpoint:**	Proportion Normal	**CETIS Version:**	CETISv1.9.4
Analyzed:	20 Dec-21 15:46	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1

Graphics



① Reference sites

CETIS Analytical Report

Salmonid Embryo-Alevin Survival and Development Test — **Nautilus Environmental**

Analysis ID:	00-9434-2758	**Endpoint:**	Survival Rate	**CETIS Version:**	CETISv1.9.4
Analyzed:	20 Dec-21 15:47	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1
Batch ID:	04-8984-4677	**Test Type:**	Survival-Development	**Analyst:**	Yvonne Lam
Start Date:	13 Oct-21 15:50	**Protocol:**	EC/EPS 1/RM/28	**Diluent:**	Dechlorinated Tap Water
Ending Date:	12 Nov-21 08:00	**Species:**	Oncorhynchus mykiss	**Brine:**	
Test Length:	29d 16h	**Taxon:**	Actinopterygii	**Source:**	Lyndon Fish Hatcheries **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
FR_UFR1	19-8746-8946	12 Oct-21 11:07	13 Oct-21 11:53	29h (0 °C)	Teck Coal	
GH_ER2	20-2628-4137	12 Oct-21 10:50	13 Oct-21 11:30	29h (0 °C)		
CM_MC1	18-3559-2852	12 Oct-21 13:20	13 Oct-21 11:30	26h (0.1 °C)		
LC_SLC	08-7937-3726	12 Oct-21 11:00	13 Oct-21 11:30	29h (2.9 °C)		
FR_FRABCH	18-7592-7020	12 Oct-21 11:20	13 Oct-21 11:53	28h (0 °C)		
FR_FRCP1	10-3969-8000	12 Oct-21 11:48	13 Oct-21 11:53	28h (1.3 °C)		
GH_FR1	11-8224-4576	12 Oct-21 10:00	13 Oct-21 11:30	30h (0 °C)		
GH_ERC	00-1276-7572	12 Oct-21 11:50	13 Oct-21 11:30	28h (0 °C)		
CM_MC2	03-9569-8600	12 Oct-21 12:47	13 Oct-21 11:30	27h (1.3 °C)		
EV_MC2	13-1923-7722	12 Oct-21 11:38	13 Oct-21 11:30	28h (0.2 °C)		
EV_HC1	18-6648-8827	12 Oct-21 10:33	13 Oct-21 11:30	29h (0 °C)		
LC_DCDS	17-4710-4100	12 Oct-21	13 Oct-21 11:30	40h (1.7 °C)		
LC_LC3	20-0894-5906	12 Oct-21 12:00	13 Oct-21 11:30	28h (8.8 °C)		
LC_LC5	14-5637-1032	12 Oct-21 13:30	13 Oct-21 11:30	26h (2.6 °C)		
LC_LCDSSLCC	06-4184-4349	12 Oct-21 12:30	13 Oct-21 11:30	27h (4.7 °C)		
FR_FR4	16-7272-1140	12 Oct-21 11:05	13 Oct-21 11:30	29h (0 °C)		
FR_FRRD	04-7874-3326	12 Oct-21 11:45	13 Oct-21 11:30	28h (0 °C)		
FR_FR2	09-1936-7906	12 Oct-21 10:25	13 Oct-21 11:30	29h (0 °C)		
FR_MULTIPLATE	07-2028-3040	12 Oct-21 09:45	13 Oct-21 11:30	30h (0 °C)		

All samples spiked with 20 ug/L Cu

① Reference sites

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_UFR1	Water Sample	Teck Coal	FR_UFR1_WEK_2021-09-1	
GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-10-12_	
CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-10-12	
LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-10-19_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_WEK_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_WEK_2021-09	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-10-12_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-10-12	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-10-12	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2021_Q4_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2021_Q4_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-10-19	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-10-19_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-10-19_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	
FR_FR4	Water Sample	Teck Coal	FR_FR4_WS_2021-10-12_	
FR_FRRD	Water Sample	Teck Coal	FR_FRRD_WS_2021-10-12	
FR_FR2	Water Sample	Teck Coal	FR_FR2_WS_2021-10-12_	
FR_MULTIPLATE	Water Sample	Teck Coal	FR_MULTIPLATE_WS_202	

Fisher Exact/Bonferroni-Holm Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
① Site Control (CM_MC1)		① FR_UFR1	0.2006	Exact	1.0000	Non-Significant Effect
		① GH_ER2	0.4912	Exact	0.9824	Non-Significant Effect
		① LC_SLC	0.2006	Exact	1.0000	Non-Significant Effect
		FR_FRABCH	0.1241	Exact	0.9928	Non-Significant Effect
		FR_FRCP1*	0.0000	Exact	8.5E-04	Significant Effect
		GH_FR1*	0.0028	Exact	0.0479	Significant Effect

Analyst: YL QA: Dec 21/21

Salmonid Embryo-Alevin Survival and Development Test — **Nautilus Environmental**

Analysis ID: 00-9434-2758 **Endpoint:** Survival Rate **CETIS Version:** CETISv1.9.4
Analyzed: 20 Dec-21 15:47 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Fisher Exact/Bonferroni-Holm Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
		GH_ERC	0.2006	Exact	1.0000	Non-Significant Effect
		CM_MC2	0.0632	Exact	0.7588	Non-Significant Effect
		EV_MC2	0.0125	Exact	0.1749	Non-Significant Effect
		EV_HC1	0.0835	Exact	0.9185	Non-Significant Effect
		LC_DCDS	0.3249	Exact	0.9748	Non-Significant Effect
		LC_LC3	0.9195	Exact	0.9195	Non-Significant Effect
		LC_LC5	0.1293	Exact	0.9050	Non-Significant Effect
		LC_LCDSSLCC	0.1140	Exact	1.0000	Non-Significant Effect
		FR_FR4	0.0040	Exact	0.0647	Non-Significant Effect
		FR_FRRD	0.1193	Exact	1.0000	Non-Significant Effect
		FR_FR2	0.0040	Exact	0.0647	Non-Significant Effect
		FR_MULTIPLATE	0.0600	Exact	0.7802	Non-Significant Effect

Data Summary

Sample	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
① FR_UFR1		102	17	119	0.8571	0.1429	0.0%
② GH_ER2		107	13	120	0.8917	0.1083	-4.03%
③ CM_MC1	XC	109	12	121	0.9008	0.09917	-5.1%
④ LC_SLC		102	17	119	0.8571	0.1429	0.0%
FR_FRABCH		102	19	121	0.843	0.157	1.65%
FR_FRCP1		81	36	117	0.6923	0.3077	19.23%
GH_FR1		92	29	121	0.7603	0.2397	11.29%
GH_ERC		102	17	119	0.8571	0.1429	0.0%
CM_MC2		99	21	120	0.825	0.175	3.75%
EV_MC2		93	25	118	0.7881	0.2119	8.05%
EV_HC1		99	20	119	0.8319	0.1681	2.94%
LC_DCDS		104	15	119	0.8739	0.1261	-1.96%
LC_LC3		112	7	119	0.9412	0.05882	-9.8%
LC_LC5		103	19	122	0.8443	0.1557	1.5%
LC_LCDSSLCC		100	19	119	0.8403	0.1597	1.96%
FR_FR4		92	28	120	0.7667	0.2333	10.56%
FR_FRRD		77	15	92	0.837	0.163	2.36%
FR_FR2		92	28	120	0.7667	0.2333	10.56%
FR_MULTIPLATE		98	21	119	0.8235	0.1765	3.92%

① Reference sites

Salmonid Embryo-Alevin Survival and Development Test — **Nautilus Environmental**

Analysis ID: 00-9434-2758 **Endpoint:** Survival Rate **CETIS Version:** CETISv1.9.4
Analyzed: 20 Dec-21 15:47 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Survival Rate Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
FR_UFR1		0.9333	0.8966	0.7000	0.9000
GH_ER2		0.9032	0.9655	0.8667	0.8333
CM_MC1	XC	0.9667	0.9355	0.8667	0.8333
LC_SLC		0.9333	0.8276	0.8333	0.8333
FR_FRABCH		0.8276	0.8438	0.8333	0.8667
FR_FRCP1		0.8621	0.6000	0.6552	0.6552
GH_FR1		0.8000	0.9000	0.7419	0.6000
GH_ERC		0.9667	0.9000	0.7931	0.7667
CM_MC2		0.9000	0.9333	0.6552	0.8065
EV_MC2		0.9000	0.8000	0.8214	0.6333
EV_HC1		0.9333	0.8667	0.8276	0.7000
LC_DCDS		0.9000	0.9000	0.8333	0.8621
LC_LC3		0.9310	0.9667	0.9667	0.9000
LC_LC5		0.9677	0.8333	0.8065	0.7667
LC_LCDSSLCC		0.9000	0.7000	0.8333	0.9310
FR_FR4		0.9333	0.7097	0.6552	0.7667
FR_FRRD		0.8710	0.7812	0.8621	
FR_FR2		0.8333	0.6333	0.8333	0.7667
FR_MULTIPLATE		0.6667	1.0000	0.8333	0.7931

Survival Rate Binomials

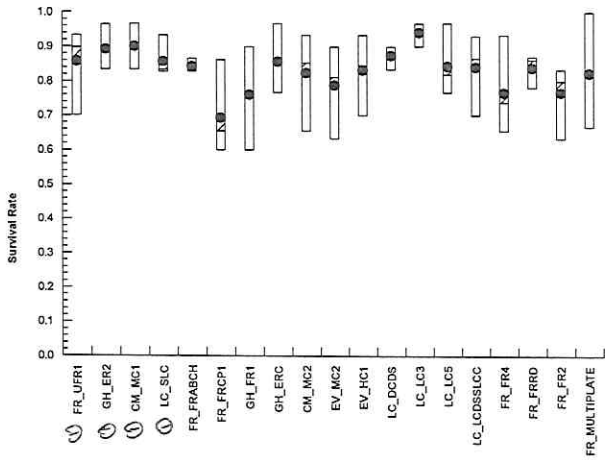
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
FR_UFR1		28/30	26/29	21/30	27/30
GH_ER2		28/31	28/29	26/30	25/30
CM_MC1	XC	29/30	29/31	26/30	25/30
LC_SLC		28/30	24/29	25/30	25/30
FR_FRABCH		24/29	27/32	25/30	26/30
FR_FRCP1		25/29	18/30	19/29	19/29
GH_FR1		24/30	27/30	23/31	18/30
GH_ERC		29/30	27/30	23/29	23/30
CM_MC2		27/30	28/30	19/29	25/31
EV_MC2		27/30	24/30	23/28	19/30
EV_HC1		28/30	26/30	24/29	21/30
LC_DCDS		27/30	27/30	25/30	25/29
LC_LC3		27/29	29/30	29/30	27/30
LC_LC5		30/31	25/30	25/31	23/30
LC_LCDSSLCC		27/30	21/30	25/30	27/29
FR_FR4		28/30	22/31	19/29	23/30
FR_FRRD		27/31	25/32	25/29	
FR_FR2		25/30	19/30	25/30	23/30
FR_MULTIPLATE		20/30	30/30	25/30	23/29

① Reference sites

Salmonid Embryo-Alevin Survival and Development Test — **Nautilus Environmental**

Analysis ID:	00-9434-2758	**Endpoint:**	Survival Rate	**CETIS Version:**	CETISv1.9.4
Analyzed:	20 Dec-21 15:47	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1

Graphics



① Reference sites

Analyst: WM QA: Dec-21/21

Salmonid Embryo-Alevin Survival and Development Test

Nautilus Environmental

Analysis ID:	20-1357-4339	**Endpoint:**	Proportion Normal	**CETIS Version:**	CETISv1.9.4
Analyzed:	20 Dec-21 15:47	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1
Batch ID:	04-8984-4677	**Test Type:**	Survival-Development	**Analyst:**	Yvonne Lam
Start Date:	13 Oct-21 15:50	**Protocol:**	EC/EPS 1/RM/28	**Diluent:**	Dechlorinated Tap Water
Ending Date:	12 Nov-21 08:00	**Species:**	Oncorhynchus mykiss	**Brine:**	
Test Length:	29d 16h	**Taxon:**	Actinopterygii	**Source:**	Lyndon Fish Hatcheries **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
FR_UFR1	19-8746-8946	12 Oct-21 11:07	13 Oct-21 11:53	29h (0 °C)	Teck Coal	
GH_ER2	20-2628-4137	12 Oct-21 10:50	13 Oct-21 11:30	29h (0 °C)		
CM_MC1	18-3559-2852	12 Oct-21 13:20	13 Oct-21 11:30	26h (0.1 °C)		
LC_SLC	08-7937-3726	12 Oct-21 11:00	13 Oct-21 11:30	29h (2.9 °C)		
FR_FRABCH	18-7592-7020	12 Oct-21 11:20	13 Oct-21 11:53	28h (0 °C)		
FR_FRCP1	10-3969-8000	12 Oct-21 11:48	13 Oct-21 11:53	28h (1.3 °C)		
GH_FR1	11-8224-4576	12 Oct-21 10:00	13 Oct-21 11:30	30h (0 °C)		
GH_ERC	00-1276-7572	12 Oct-21 11:50	13 Oct-21 11:30	28h (0 °C)		
CM_MC2	03-9569-8600	12 Oct-21 12:47	13 Oct-21 11:30	27h (1.3 °C)		
EV_MC2	13-1923-7722	12 Oct-21 11:38	13 Oct-21 11:30	28h (0.2 °C)		
EV_HC1	18-6648-8827	12 Oct-21 10:33	13 Oct-21 11:30	29h (0 °C)		
LC_DCDS	17-4710-4100	12 Oct-21	13 Oct-21 11:30	40h (1.7 °C)		
LC_LC3	20-0894-5906	12 Oct-21 12:00	13 Oct-21 11:30	28h (8.8 °C)		
LC_LC5	14-5637-1032	12 Oct-21 13:30	13 Oct-21 11:30	26h (2.6 °C)		
LC_LCDSSLCC	06-4184-4349	12 Oct-21 12:30	13 Oct-21 11:30	27h (4.7 °C)		
FR_FR4	16-7272-1140	12 Oct-21 11:05	13 Oct-21 11:30	29h (0 °C)		
FR_FRRD	04-7874-3326	12 Oct-21 11:45	13 Oct-21 11:30	28h (0 °C)		
FR_FR2	09-1936-7906	12 Oct-21 10:25	13 Oct-21 11:30	29h (0 °C)		
FR_MULTIPLATE	07-2028-3040	12 Oct-21 09:45	13 Oct-21 11:30	30h (0 °C)		

All samples spiked with 20 mg/L Cu

Reformed slopes.

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_UFR1	Water Sample	Teck Coal	FR_UFR1_WEK_2021-09-1	
GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-10-12_	
CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-10-12	
LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-10-19_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_WEK_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_WEK_2021-09	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-10-12_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-10-12	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-10-12	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2021_Q4_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2021_Q4_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-10-19	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-10-19_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-10-19_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	
FR_FR4	Water Sample	Teck Coal	FR_FR4_WS_2021-10-12_	
FR_FRRD	Water Sample	Teck Coal	FR_FRRD_WS_2021-10-12	
FR_FR2	Water Sample	Teck Coal	FR_FR2_WS_2021-10-12_	
FR_MULTIPLATE	Water Sample	Teck Coal	FR_MULTIPLATE_WS_202	

Fisher Exact/Bonferroni-Holm Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
Site Control (CM_MC1)		FR_UFR1	0.1641	Exact	0.6563	Non-Significant Effect
		GH_ER2	0.4904	Exact	0.9809	Non-Significant Effect
		LC_SLC	0.0350	Exact	0.3498	Non-Significant Effect
		FR_FRABCH	0.0555	Exact	0.4993	Non-Significant Effect
		FR_FRCP1*	0.0001	Exact	0.0023	Significant Effect
		GH_FR1*	0.0025	Exact	0.0423	Significant Effect

Salmonid Embryo-Alevin Survival and Development Test — **Nautilus Environmental**

Analysis ID: 20-1357-4339 **Endpoint:** Proportion Normal **CETIS Version:** CETISv1.9.4
Analyzed: 20 Dec-21 15:47 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Fisher Exact/Bonferroni-Holm Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
		GH_ERC	0.0932	Exact	0.7460	Non-Significant Effect
		CM_MC2	0.1305	Exact	0.6526	Non-Significant Effect
		EV_MC2	0.0045	Exact	0.0673	Non-Significant Effect
		EV_HC1	0.0075	Exact	0.0978	Non-Significant Effect
		LC_DCDS	0.2116	Exact	0.6348	Non-Significant Effect
		LC_LC3	0.7179	Exact	0.7179	Non-Significant Effect
		LC_LC5	0.0209	Exact	0.2504	Non-Significant Effect
		LC_LCDSSLCC	0.0932	Exact	0.7460	Non-Significant Effect
		FR_FR4	0.0035	Exact	0.0561	Non-Significant Effect
		FR_FRRD	0.1116	Exact	0.6695	Non-Significant Effect
		FR_FR2	0.0054	Exact	0.0756	Non-Significant Effect
		FR_MULTIPLATE	0.0244	Exact	0.2684	Non-Significant Effect

Data Summary

Sample	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
① FR_UFR1		99	20	119	0.8319	0.1681	-2.06%
① GH_ER2		105	15	120	0.875	0.125	-7.35%
① CM_MC1	XC	107	14	121	0.8843	0.1157	-8.49%
① LC_SLC		94	25	119	0.7899	0.2101	3.09%
FR_FRABCH		97	24	121	0.8017	0.1983	1.65%
FR_FRCP1		80	37	117	0.6838	0.3162	16.12%
GH_FR1		89	32	121	0.7355	0.2645	9.76%
GH_ERC		97	22	119	0.8151	0.1849	0.0%
CM_MC2		99	21	120	0.825	0.175	-1.21%
EV_MC2		88	30	118	0.7458	0.2542	8.51%
EV_HC1		90	29	119	0.7563	0.2437	7.22%
LC_DCDS		100	19	119	0.8403	0.1597	-3.09%
LC_LC3		107	12	119	0.8992	0.1008	-10.31%
LC_LC5		95	27	122	0.7787	0.2213	4.47%
LC_LCDSSLCC		97	22	119	0.8151	0.1849	0.0%
FR_FR4		89	31	120	0.7417	0.2583	9.01%
FR_FRRD		75	17	92	0.8152	0.1848	-0.01%
FR_FR2		90	30	120	0.75	0.25	7.99%
FR_MULTIPLATE		93	26	119	0.7815	0.2185	4.12%

① Reference Sites

Salmonid Embryo-Alevin Survival and Development Test — **Nautilus Environmental**

Analysis ID: 20-1357-4339 **Endpoint:** Proportion Normal **CETIS Version:** CETISv1.9.4
Analyzed: 20 Dec-21 15:47 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Proportion Normal Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
① FR_UFR1		0.9333	0.8621	0.6333	0.9000
② GH_ER2		0.9032	0.8966	0.8667	0.8333
③ CM_MC1	XC	0.9667	0.9032	0.8333	0.8333
④ LC_SLC		0.8667	0.8276	0.7333	0.7333
FR_FRABCH		0.8276	0.8125	0.7667	0.8000
FR_FRCP1		0.8276	0.6000	0.6552	0.6552
GH_FR1		0.8000	0.9000	0.7097	0.5333
GH_ERC		0.9667	0.8000	0.7241	0.7667
CM_MC2		0.9000	0.9333	0.6552	0.8065
EV_MC2		0.8667	0.7000	0.7857	0.6333
EV_HC1		0.9000	0.8333	0.5862	0.7000
LC_DCDS		0.8667	0.9000	0.7667	0.8276
LC_LC3		0.9310	0.9333	0.8667	0.8667
LC_LC5		0.9355	0.7000	0.7097	0.7667
LC_LCDSSLCC		0.8667	0.6667	0.8000	0.9310
FR_FR4		0.9000	0.6774	0.6207	0.7667
FR_FRRD		0.8710	0.7500	0.8276	
FR_FR2		0.8000	0.6000	0.8333	0.7667
FR_MULTIPLATE		0.6333	0.9333	0.8000	0.7586

Proportion Normal Binomials

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
① FR_UFR1		28/30	25/29	19/30	27/30
② GH_ER2		28/31	26/29	26/30	25/30
③ CM_MC1	XC	29/30	28/31	25/30	25/30
④ LC_SLC		26/30	24/29	22/30	22/30
FR_FRABCH		24/29	26/32	23/30	24/30
FR_FRCP1		24/29	18/30	19/29	19/29
GH_FR1		24/30	27/30	22/31	16/30
GH_ERC		29/30	24/30	21/29	23/30
CM_MC2		27/30	28/30	19/29	25/31
EV_MC2		26/30	21/30	22/28	19/30
EV_HC1		27/30	25/30	17/29	21/30
LC_DCDS		26/30	27/30	23/30	24/29
LC_LC3		27/29	28/30	26/30	26/30
LC_LC5		29/31	21/30	22/31	23/30
LC_LCDSSLCC		26/30	20/30	24/30	27/29
FR_FR4		27/30	21/31	18/29	23/30
FR_FRRD		27/31	24/32	24/29	
FR_FR2		24/30	18/30	25/30	23/30
FR_MULTIPLATE		19/30	28/30	24/30	22/29

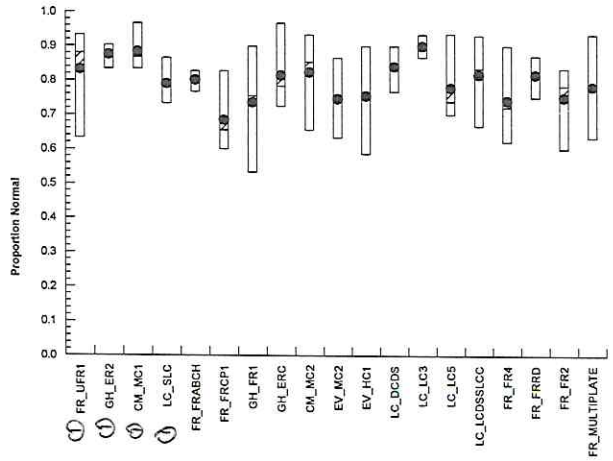
① Reference STRS

Analyst: UW QA: Dec 21/21

Salmonid Embryo-Alevin Survival and Development Test — **Nautilus Environmental**

Analysis ID:	20-1357-4339	**Endpoint:**	Proportion Normal	**CETIS Version:**	CETISv1.9.4
Analyzed:	20 Dec-21 15:47	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1

Graphics



① Reference sites

CETIS Analytical Report

Salmonid Embryo-Alevin Survival and Development Test — **Nautilus Environmental**

Analysis ID:	09-1616-0788	**Endpoint:**	Survival Rate	**CETIS Version:**	CETISv1.9.4
Analyzed:	20 Dec-21 15:48	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1
Batch ID:	04-8984-4677	**Test Type:**	Survival-Development	**Analyst:**	Yvonne Lam
Start Date:	13 Oct-21 15:50	**Protocol:**	EC/EPS 1/RM/28	**Diluent:**	Dechlorinated Tap Water
Ending Date:	12 Nov-21 08:00	**Species:**	Oncorhynchus mykiss	**Brine:**	
Test Length:	29d 16h	**Taxon:**	Actinopterygii	**Source:**	Lyndon Fish Hatcheries **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
FR_UFR1	19-8746-8946	12 Oct-21 11:07	13 Oct-21 11:53	29h (0 °C)	Teck Coal	
GH_ER2	20-2628-4137	12 Oct-21 10:50	13 Oct-21 11:30	29h (0 °C)		
CM_MC1	18-3559-2852	12 Oct-21 13:20	13 Oct-21 11:30	26h (0.1 °C)		
LC_SLC	08-7937-3726	12 Oct-21 11:00	13 Oct-21 11:30	29h (2.9 °C)		
FR_FRABCH	18-7592-7020	12 Oct-21 11:20	13 Oct-21 11:53	28h (0 °C)		
FR_FRCP1	10-3969-8000	12 Oct-21 11:48	13 Oct-21 11:53	28h (1.3 °C)		
GH_FR1	11-8224-4576	12 Oct-21 10:00	13 Oct-21 11:30	30h (0 °C)		
GH_ERC	00-1276-7572	12 Oct-21 11:50	13 Oct-21 11:30	28h (0 °C)		
CM_MC2	03-9569-8600	12 Oct-21 12:47	13 Oct-21 11:30	27h (1.3 °C)		
EV_MC2	13-1923-7722	12 Oct-21 11:38	13 Oct-21 11:30	28h (0.2 °C)		
EV_HC1	18-6648-8827	12 Oct-21 10:33	13 Oct-21 11:30	29h (0 °C)		
LC_DCDS	17-4710-4100	12 Oct-21	13 Oct-21 11:30	40h (1.7 °C)		
LC_LC3	20-0894-5906	12 Oct-21 12:00	13 Oct-21 11:30	28h (8.8 °C)		
LC_LC5	14-5637-1032	12 Oct-21 13:30	13 Oct-21 11:30	26h (2.6 °C)		
LC_LCDSSLCC	06-4184-4349	12 Oct-21 12:30	13 Oct-21 11:30	27h (4.7 °C)		
FR_FR4	16-7272-1140	12 Oct-21 11:05	13 Oct-21 11:30	29h (0 °C)		
FR_FRRD	04-7874-3326	12 Oct-21 11:45	13 Oct-21 11:30	28h (0 °C)		
FR_FR2	09-1936-7906	12 Oct-21 10:25	13 Oct-21 11:30	29h (0 °C)		
FR_MULTIPLATE	07-2028-3040	12 Oct-21 09:45	13 Oct-21 11:30	30h (0 °C)		

All samples spiked with 20 mg/L Cu

① Reference sites

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_UFR1	Water Sample	Teck Coal	FR_UFR1_WEK_2021-09-1	
GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-10-12_	
CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-10-12	
LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-10-19_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_WEK_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_WEK_2021-09	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-10-12_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-10-12	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-10-12	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2021_Q4_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2021_Q4_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-10-19	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-10-19_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-10-19_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	
FR_FR4	Water Sample	Teck Coal	FR_FR4_WS_2021-10-12_	
FR_FRRD	Water Sample	Teck Coal	FR_FRRD_WS_2021-10-12	
FR_FR2	Water Sample	Teck Coal	FR_FR2_WS_2021-10-12_	
FR_MULTIPLATE	Water Sample	Teck Coal	FR_MULTIPLATE_WS_202	

Fisher Exact/Bonferroni-Holm Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
Unamended Sample (LC_SLC)		① FR_UFR1	0.5733	Exact	1.0000	Non-Significant Effect
		① GH_ER2	0.8415	Exact	1.0000	Non-Significant Effect
		① CM_MC1	0.8920	Exact	1.0000	Non-Significant Effect
		FR_FRABCH	0.4499	Exact	1.0000	Non-Significant Effect
		FR_FRCP1*	0.0019	Exact	0.0339	Significant Effect
		GH_FR1	0.0404	Exact	0.6870	Non-Significant Effect

Analyst: YL QA: Dec. 21/21

Salmonid Embryo-Alevin Survival and Development Test — **Nautilus Environmental**

Analysis ID: 09-1616-0788 **Endpoint:** Survival Rate **CETIS Version:** CETISv1.9.4
Analyzed: 20 Dec-21 15:48 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Fisher Exact/Bonferroni-Holm Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
		GH_ERC	0.5733	Exact	1.0000	Non-Significant Effect
		CM_MC2	0.3079	Exact	1.0000	Non-Significant Effect
		EV_MC2	0.1109	Exact	1.0000	Non-Significant Effect
		EV_HC1	0.3605	Exact	1.0000	Non-Significant Effect
		LC_DCDS	0.7154	Exact	1.0000	Non-Significant Effect
		LC_LC3	0.9918	Exact	0.9918	Non-Significant Effect
		LC_LC5	0.4606	Exact	1.0000	Non-Significant Effect
		LC_LCDSSLCC	0.4283	Exact	1.0000	Non-Significant Effect
		FR_FR4	0.0519	Exact	0.8300	Non-Significant Effect
		FR_FRRD	0.4141	Exact	1.0000	Non-Significant Effect
		FR_FR2	0.0519	Exact	0.8300	Non-Significant Effect
		FR_MULTIPLATE	0.2980	Exact	1.0000	Non-Significant Effect

Data Summary

Sample	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
FR_UFR1		102	17	119	0.8571	0.1429	0.0%
GH_ER2		107	13	120	0.8917	0.1083	-4.03%
CM_MC1		109	12	121	0.9008	0.09917	-5.1%
LC_SLC	US	102	17	119	0.8571	0.1429	0.0%
FR_FRABCH		102	19	121	0.843	0.157	1.65%
FR_FRCP1		81	36	117	0.6923	0.3077	19.23%
GH_FR1		92	29	121	0.7603	0.2397	11.29%
GH_ERC		102	17	119	0.8571	0.1429	0.0%
CM_MC2		99	21	120	0.825	0.175	3.75%
EV_MC2		93	25	118	0.7881	0.2119	8.05%
EV_HC1		99	20	119	0.8319	0.1681	2.94%
LC_DCDS		104	15	119	0.8739	0.1261	-1.96%
LC_LC3		112	7	119	0.9412	0.05882	-9.8%
LC_LC5		103	19	122	0.8443	0.1557	1.5%
LC_LCDSSLCC		100	19	119	0.8403	0.1597	1.96%
FR_FR4		92	28	120	0.7667	0.2333	10.56%
FR_FRRD		77	15	92	0.837	0.163	2.36%
FR_FR2		92	28	120	0.7667	0.2333	10.56%
FR_MULTIPLATE		98	21	119	0.8235	0.1765	3.92%

Reference sites

Salmonid Embryo-Alevin Survival and Development Test — **Nautilus Environmental**

Analysis ID: 09-1616-0788 **Endpoint:** Survival Rate **CETIS Version:** CETISv1.9.4
Analyzed: 20 Dec-21 15:48 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Survival Rate Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
① FR_UFR1		0.9333	0.8966	0.7000	0.9000
① GH_ER2		0.9032	0.9655	0.8667	0.8333
① CM_MC1		0.9667	0.9355	0.8667	0.8333
① LC_SLC	US	0.9333	0.8276	0.8333	0.8333
FR_FRABCH		0.8276	0.8438	0.8333	0.8667
FR_FRCP1		0.8621	0.6000	0.6552	0.6552
GH_FR1		0.8000	0.9000	0.7419	0.6000
GH_ERC		0.9667	0.9000	0.7931	0.7667
CM_MC2		0.9000	0.9333	0.6552	0.8065
EV_MC2		0.9000	0.8000	0.8214	0.6333
EV_HC1		0.9333	0.8667	0.8276	0.7000
LC_DCDS		0.9000	0.9000	0.8333	0.8621
LC_LC3		0.9310	0.9667	0.9667	0.9000
LC_LC5		0.9677	0.8333	0.8065	0.7667
LC_LCDSSLCC		0.9000	0.7000	0.8333	0.9310
FR_FR4		0.9333	0.7097	0.6552	0.7667
FR_FRRD		0.8710	0.7812	0.8621	
FR_FR2		0.8333	0.6333	0.8333	0.7667
FR_MULTIPLATE		0.6667	1.0000	0.8333	0.7931

Survival Rate Binomials

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
① FR_UFR1		28/30	26/29	21/30	27/30
① GH_ER2		28/31	28/29	26/30	25/30
① CM_MC1		29/30	29/31	26/30	25/30
① LC_SLC	US	28/30	24/29	25/30	25/30
FR_FRABCH		24/29	27/32	25/30	26/30
FR_FRCP1		25/29	18/30	19/29	19/29
GH_FR1		24/30	27/30	23/31	18/30
GH_ERC		29/30	27/30	23/29	23/30
CM_MC2		27/30	28/30	19/29	25/31
EV_MC2		27/30	24/30	23/28	19/30
EV_HC1		28/30	26/30	24/29	21/30
LC_DCDS		27/30	27/30	25/30	25/29
LC_LC3		27/29	29/30	29/30	27/30
LC_LC5		30/31	25/30	25/31	23/30
LC_LCDSSLCC		27/30	21/30	25/30	27/29
FR_FR4		28/30	22/31	19/29	23/30
FR_FRRD		27/31	25/32	25/29	
FR_FR2		25/30	19/30	25/30	23/30
FR_MULTIPLATE		20/30	30/30	25/30	23/29

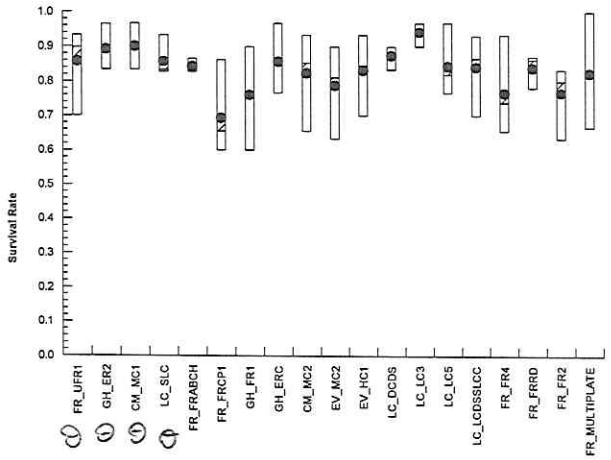
① Reference sites

Analyst: UW QA: Dec-21/21

Salmonid Embryo-Alevin Survival and Development Test — **Nautilus Environmental**

Analysis ID:	09-1616-0788	**Endpoint:**	Survival Rate	**CETIS Version:**	CETISv1.9.4
Analyzed:	20 Dec-21 15:48	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1

Graphics



① Reference ST#25

Analyst: UM QA: Dec-21/21

CETIS Analytical Report

Salmonid Embryo-Alevin Survival and Development Test — **Nautilus Environmental**

Analysis ID:	20-2565-2664	**Endpoint:**	Proportion Normal	**CETIS Version:**	CETISv1.9.4
Analyzed:	20 Dec-21 15:48	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1
Batch ID:	04-8984-4677	**Test Type:**	Survival-Development	**Analyst:**	Yvonne Lam
Start Date:	13 Oct-21 15:50	**Protocol:**	EC/EPS 1/RM/28	**Diluent:**	Dechlorinated Tap Water
Ending Date:	12 Nov-21 08:00	**Species:**	Oncorhynchus mykiss	**Brine:**	
Test Length:	29d 16h	**Taxon:**	Actinopterygii	**Source:**	Lyndon Fish Hatcheries **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
FR_UFR1	19-8746-8946	12 Oct-21 11:07	13 Oct-21 11:53	29h (0 °C)	Teck Coal	
GH_ER2	20-2628-4137	12 Oct-21 10:50	13 Oct-21 11:30	29h (0 °C)		
CM_MC1	18-3559-2852	12 Oct-21 13:20	13 Oct-21 11:30	26h (0.1 °C)		
LC_SLC	08-7937-3726	12 Oct-21 11:00	13 Oct-21 11:30	29h (2.9 °C)		
FR_FRABCH	18-7592-7020	12 Oct-21 11:20	13 Oct-21 11:53	28h (0 °C)		
FR_FRCP1	10-3969-8000	12 Oct-21 11:48	13 Oct-21 11:53	28h (1.3 °C)		
GH_FR1	11-8224-4576	12 Oct-21 10:00	13 Oct-21 11:30	30h (0 °C)		
GH_ERC	00-1276-7572	12 Oct-21 11:50	13 Oct-21 11:30	28h (0 °C)		
CM_MC2	03-9569-8600	12 Oct-21 12:47	13 Oct-21 11:30	27h (1.3 °C)		
EV_MC2	13-1923-7722	12 Oct-21 11:38	13 Oct-21 11:30	28h (0.2 °C)		
EV_HC1	18-6648-8827	12 Oct-21 10:33	13 Oct-21 11:30	29h (0 °C)		
LC_DCDS	17-4710-4100	12 Oct-21	13 Oct-21 11:30	40h (1.7 °C)		
LC_LC3	20-0894-5906	12 Oct-21 12:00	13 Oct-21 11:30	28h (8.8 °C)		
LC_LC5	14-5637-1032	12 Oct-21 13:30	13 Oct-21 11:30	26h (2.6 °C)		
LC_LCDSSLCC	06-4184-4349	12 Oct-21 12:30	13 Oct-21 11:30	27h (4.7 °C)		
FR_FR4	16-7272-1140	12 Oct-21 11:05	13 Oct-21 11:30	29h (0 °C)		
FR_FRRD	04-7874-3326	12 Oct-21 11:45	13 Oct-21 11:30	28h (0 °C)		
FR_FR2	09-1936-7906	12 Oct-21 10:25	13 Oct-21 11:30	29h (0 °C)		
FR_MULTIPLATE	07-2028-3040	12 Oct-21 09:45	13 Oct-21 11:30	30h (0 °C)		

All samples spiked with 20 mg/L Cu

① Reference sites

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_UFR1	Water Sample	Teck Coal	FR_UFR1_WEK_2021-09-1	
GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-10-12_	
CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-10-12	
LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-10-19_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_WEK_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_WEK_2021-09	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-10-12_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-10-12	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-10-12	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2021_Q4_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2021_Q4_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-10-19	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-10-19_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-10-19_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	
FR_FR4	Water Sample	Teck Coal	FR_FR4_WS_2021-10-12_	
FR_FRRD	Water Sample	Teck Coal	FR_FRRD_WS_2021-10-12	
FR_FR2	Water Sample	Teck Coal	FR_FR2_WS_2021-10-12_	
FR_MULTIPLATE	Water Sample	Teck Coal	FR_MULTIPLATE_WS_202	

Fisher Exact/Bonferroni-Holm Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
Unamended Sample (LC-SLC)		① FR_UFR1	0.8397	Exact	1.0000	Non-Significant Effect
		① GH_ER2	0.9740	Exact	1.0000	Non-Significant Effect
		① CM_MC1	0.9849	Exact	1.0000	Non-Significant Effect
		FR_FRABCH	0.6501	Exact	1.0000	Non-Significant Effect
		FR_FRCP1	0.0439	Exact	0.7907	Non-Significant Effect
		GH_FR1	0.2011	Exact	1.0000	Non-Significant Effect

Analyst: YW QA: Dec 21/21

Salmonid Embryo-Alevin Survival and Development Test — **Nautilus Environmental**

Analysis ID: 20-2565-2664 **Endpoint:** Proportion Normal **CETIS Version:** CETISv1.9.4
Analyzed: 20 Dec-21 15:48 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Fisher Exact/Bonferroni-Holm Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
		GH_ERC	0.7424	Exact	1.0000	Non-Significant Effect
		CM_MC2	0.8028	Exact	1.0000	Non-Significant Effect
		EV_MC2	0.2576	Exact	1.0000	Non-Significant Effect
		EV_HC1	0.3213	Exact	1.0000	Non-Significant Effect
		LC_DCDS	0.8789	Exact	1.0000	Non-Significant Effect
		LC_LC3	0.9942	Exact	0.9942	Non-Significant Effect
		LC_LC5	0.4781	Exact	1.0000	Non-Significant Effect
		LC_LCDSSLCC	0.7424	Exact	1.0000	Non-Significant Effect
		FR_FR4	0.2335	Exact	1.0000	Non-Significant Effect
		FR_FRRD	0.7347	Exact	1.0000	Non-Significant Effect
		FR_FR2	0.2813	Exact	1.0000	Non-Significant Effect
		FR_MULTIPLATE	0.5000	Exact	1.0000	Non-Significant Effect

Data Summary

Sample	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
⑤ FR_UFR1		99	20	119	0.8319	0.1681	-2.06%
④ GH_ER2		105	15	120	0.875	0.125	-7.35%
⑥ CM_MC1		107	14	121	0.8843	0.1157	-8.49%
① LC_SLC	US	94	25	119	0.7899	0.2101	3.09%
FR_FRABCH		97	24	121	0.8017	0.1983	1.65%
FR_FRCP1		80	37	117	0.6838	0.3162	16.12%
GH_FR1		89	32	121	0.7355	0.2645	9.76%
GH_ERC		97	22	119	0.8151	0.1849	0.0%
CM_MC2		99	21	120	0.825	0.175	-1.21%
EV_MC2		88	30	118	0.7458	0.2542	8.51%
EV_HC1		90	29	119	0.7563	0.2437	7.22%
LC_DCDS		100	19	119	0.8403	0.1597	-3.09%
LC_LC3		107	12	119	0.8992	0.1008	-10.31%
LC_LC5		95	27	122	0.7787	0.2213	4.47%
LC_LCDSSLCC		97	22	119	0.8151	0.1849	0.0%
FR_FR4		89	31	120	0.7417	0.2583	9.01%
FR_FRRD		75	17	92	0.8152	0.1848	-0.01%
FR_FR2		90	30	120	0.75	0.25	7.99%
FR_MULTIPLATE		93	26	119	0.7815	0.2185	4.12%

① Reference sites

Salmonid Embryo-Alevin Survival and Development Test — **Nautilus Environmental**

Analysis ID:	20-2565-2664	**Endpoint:**	Proportion Normal	**CETIS Version:**	CETISv1.9.4
Analyzed:	20 Dec-21 15:48	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1

Proportion Normal Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
FR_UFR1		0.9333	0.8621	0.6333	0.9000
GH_ER2		0.9032	0.8966	0.8667	0.8333
CM_MC1		0.9667	0.9032	0.8333	0.8333
LC_SLC	US	0.8667	0.8276	0.7333	0.7333
FR_FRABCH		0.8276	0.8125	0.7667	0.8000
FR_FRCP1		0.8276	0.6000	0.6552	0.6552
GH_FR1		0.8000	0.9000	0.7097	0.5333
GH_ERC		0.9667	0.8000	0.7241	0.7667
CM_MC2		0.9000	0.9333	0.6552	0.8065
EV_MC2		0.8667	0.7000	0.7857	0.6333
EV_HC1		0.9000	0.8333	0.5862	0.7000
LC_DCDS		0.8667	0.9000	0.7667	0.8276
LC_LC3		0.9310	0.9333	0.8667	0.8667
LC_LC5		0.9355	0.7000	0.7097	0.7667
LC_LCDSSLCC		0.8667	0.6667	0.8000	0.9310
FR_FR4		0.9000	0.6774	0.6207	0.7667
FR_FRRD		0.8710	0.7500	0.8276	
FR_FR2		0.8000	0.6000	0.8333	0.7667
FR_MULTIPLATE		0.6333	0.9333	0.8000	0.7586

Proportion Normal Binomials

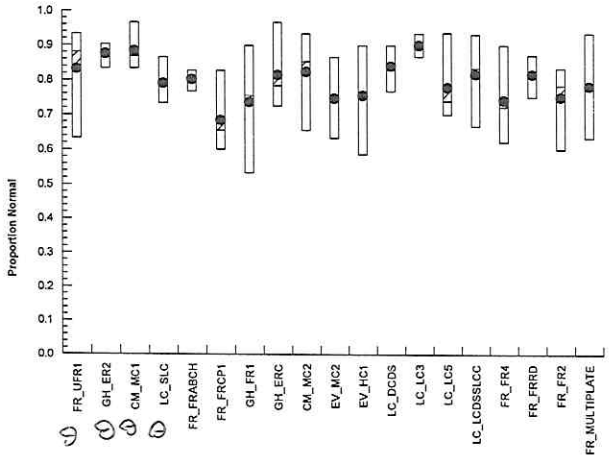
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
FR_UFR1		28/30	25/29	19/30	27/30
GH_ER2		28/31	26/29	26/30	25/30
CM_MC1		29/30	28/31	25/30	25/30
LC_SLC	US	26/30	24/29	22/30	22/30
FR_FRABCH		24/29	26/32	23/30	24/30
FR_FRCP1		24/29	18/30	19/29	19/29
GH_FR1		24/30	27/30	22/31	16/30
GH_ERC		29/30	24/30	21/29	23/30
CM_MC2		27/30	28/30	19/29	25/31
EV_MC2		26/30	21/30	22/28	19/30
EV_HC1		27/30	25/30	17/29	21/30
LC_DCDS		26/30	27/30	23/30	24/29
LC_LC3		27/29	28/30	26/30	26/30
LC_LC5		29/31	21/30	22/31	23/30
LC_LCDSSLCC		26/30	20/30	24/30	27/29
FR_FR4		27/30	21/31	18/29	23/30
FR_FRRD		27/31	24/32	24/29	
FR_FR2		24/30	18/30	25/30	23/30
FR_MULTIPLATE		19/30	28/30	24/30	22/29

① Reference sites

Salmonid Embryo-Alevin Survival and Development Test — **Nautilus Environmental**

Analysis ID:	20-2565-2664	**Endpoint:**	Proportion Normal	**CETIS Version:**	CETISv1.9.4
Analyzed:	20 Dec-21 15:48	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1

Graphics



9 Reference sites

Analyst: [signature] QA: Dec-21/21

CETIS Summary Report

Salmonid Embryo-Alevin-~~Fry~~ Survival Development and Growth Test — **Nautilus Environmental**

Batch ID:	00-9465-4096	**Test Type:**	Survival-Development-Growth	**Analyst:**	Yvonne Lam
Start Date:	13 Oct-21 15:50	**Protocol:**	EC/EPS 1/RM/28	**Diluent:**	Dechlorinated Tap Water
Ending Date:	12 Nov-21 08:00	**Species:**	Oncorhynchus mykiss	**Brine:**	
Test Length:	29d 16h	**Taxon:**	Actinopterygii	**Source:**	Lyndon Fish Hatcheries **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
Dechlor Control	16-7987-2727	12 Oct-21	12 Oct-21	40h	Teck Coal	
Dechlor + Cu	15-4969-1985	12 Oct-21	12 Oct-21	40h		
① FR_UFR1	19-8746-8946	12 Oct-21 11:07	13 Oct-21 11:53	29h (0 °C)		
① GH_ER2	20-2628-4137	12 Oct-21 10:50	13 Oct-21 11:30	29h (0 °C)		
① CM_MC1	18-3559-2852	12 Oct-21 13:20	13 Oct-21 11:30	26h (0.1 °C)		
① LC_SLC	08-7937-3726	12 Oct-21 11:00	13 Oct-21 11:30	29h (2.9 °C)		
FR_FRABCH	18-7592-7020	12 Oct-21 11:20	13 Oct-21 11:53	28h (0 °C)		
FR_FRCP1	10-3969-8000	12 Oct-21 11:48	13 Oct-21 11:53	28h (1.3 °C)		
GH_FR1	11-8224-4576	12 Oct-21 10:00	13 Oct-21 11:30	30h (0 °C)		
GH_ERC	00-1276-7572	12 Oct-21 11:50	13 Oct-21 11:30	28h (0 °C)		
CM_MC2	03-9569-8600	12 Oct-21 12:47	13 Oct-21 11:30	27h (1.3 °C)		
EV_MC2	13-1923-7722	12 Oct-21 11:38	13 Oct-21 11:30	28h (0.2 °C)		
EV_HC1	18-6648-8827	12 Oct-21 10:33	13 Oct-21 11:30	29h (0 °C)		
LC_DCDS	17-4710-4100	12 Oct-21	13 Oct-21 11:30	40h (1.7 °C)		
LC_LC3	20-0894-5906	12 Oct-21 12:00	13 Oct-21 11:30	28h (8.8 °C)		
LC_LC5	14-5637-1032	12 Oct-21 13:30	13 Oct-21 11:30	26h (2.6 °C)		
LC_LCDSSLCC	06-4184-4349	12 Oct-21 12:30	13 Oct-21 11:30	27h (4.7 °C)		
FR_FR4	16-7272-1140	12 Oct-21 11:05	13 Oct-21 11:30	29h (0 °C)		
FR_FRRD	04-7874-3326	12 Oct-21 11:45	13 Oct-21 11:30	28h (0 °C)		
FR_FR2	09-1936-7906	12 Oct-21 10:25	13 Oct-21 11:30	29h (0 °C)		
FR_MULTIPLATE	07-2028-3040	12 Oct-21 09:45	13 Oct-21 11:30	30h (0 °C)		

Aside from Dechlor Control, all samples spiked with 20 ug/L Cu

① Reference sites

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
Dechlor Control	Control water	Teck Coal	Dechlor Control	
Dechlor + Cu	Contol+Cu	Teck Coal	Dechlor + 20 ug/L Cu	
① FR_UFR1	Water Sample	Teck Coal	FR_UFR1_WEK_2021-09-1	
① GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-10-12_	
① CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-10-12	
① LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-10-19_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_WEK_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_WEK_2021-09	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-10-12_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-10-12	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-10-12	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2021_Q4_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2021_Q4_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-10-19	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-10-19_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-10-19_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	
FR_FR4	Water Sample	Teck Coal	FR_FR4_WS_2021-10-12_	
FR_FRRD	Water Sample	Teck Coal	FR_FRRD_WS_2021-10-12	
FR_FR2	Water Sample	Teck Coal	FR_FR2_WS_2021-10-12_	
FR_MULTIPLATE	Water Sample	Teck Coal	FR_MULTIPLATE_WS_202	

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.2312	LC_SLC passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.2312	LC_DCDS passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.2312	Dechlor Control passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.2312	FR_FRCP1 passed length-mm	1

Salmonid Embryo-Alevin-Fry Survival Development and Growth Test **Nautilus Environmental**

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.2312	FR_UFR1 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.2312	LC_LC5 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.2312	FR_FR2 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.2312	FR_FR4 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.2312	GH_ERC passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.2312	CM_MC1 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.2312	EV_HC1 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.2312	Dechlor + Cu passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.2312	GH_ER2 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.2312	CM_MC2 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.2312	LC_LCDSSLCC passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.2312	LC_LC3 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.2312	GH_FR1 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.2312	FR_MULTIPLATE passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.2312	FR_FRRD passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.2312	FR_FRABCH passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.2312	EV_MC2 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9170	FR_FR4 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9170	EV_MC2 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9170	FR_FRCP1 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9170	LC_LC3 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9170	FR_UFR1 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9170	CM_MC2 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9170	FR_MULTIPLATE passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9170	LC_LC5 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9170	Dechlor Control passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9170	GH_ERC passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9170	FR_FRRD passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9170	Dechlor + Cu passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9170	LC_SLC passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9170	GH_ER2 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9170	CM_MC1 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9170	GH_FR1 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9170	EV_HC1 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9170	LC_DCDS passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9170	FR_FRABCH passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9170	LC_LCDSSLCC passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9170	FR_FR2 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9990	GH_ER2 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9990	FR_FR2 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9990	CM_MC1 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9990	FR_FRCP1 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9990	FR_FR4 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9990	LC_LC3 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9990	Dechlor + Cu passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9990	EV_MC2 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9990	LC_LCDSSLCC passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9990	FR_MULTIPLATE passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9990	FR_FRABCH passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9990	CM_MC2 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9990	LC_SLC passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9990	GH_ERC passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9990	LC_DCDS passed length-mm	1

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Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9990	EV_HC1 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9990	LC_LC5 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9990	GH_FR1 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9990	Dechlor Control passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9990	FR_FRRD passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9990	FR_UFR1 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9761	FR_FRCP1 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9761	LC_LC5 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9761	FR_FR4 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9761	LC_SLC passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9761	CM_MC1 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9761	FR_FRABCH passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9761	LC_LCDSSLCC passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9761	LC_LC3 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9761	FR_MULTIPLATE passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9761	CM_MC2 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9761	GH_ER2 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9761	FR_FRRD passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9761	EV_MC2 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9761	GH_ERC passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9761	Dechlor + Cu passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9761	GH_FR1 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9761	FR_FR2 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9761	FR_UFR1 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9761	Dechlor Control passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9761	EV_HC1 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9761	LC_DCDS passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.6165	GH_FR1 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.6165	EV_HC1 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.6165	LC_LC5 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.6165	Dechlor + Cu passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.6165	GH_ERC passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.6165	LC_SLC passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.6165	FR_FRABCH passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.6165	CM_MC2 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.6165	FR_FR2 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.6165	Dechlor Control passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.6165	FR_UFR1 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.6165	CM_MC1 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.6165	LC_DCDS passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.6165	FR_MULTIPLATE passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.6165	LC_LCDSSLCC passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.6165	FR_FRCP1 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.6165	EV_MC2 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.6165	LC_LC3 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.6165	FR_FRRD passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.6165	GH_ER2 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.6165	FR_FR4 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9999	FR_MULTIPLATE passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9999	CM_MC2 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9999	FR_FRABCH passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9999	LC_LC5 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9999	Dechlor Control passed length-mm	1

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SIngle Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9999	LC_DCDS passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9999	GH_FR1 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9999	FR_FRCP1 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9999	LC_LC3 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9999	EV_HC1 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9999	Dechlor + Cu passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9999	FR_UFR1 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9999	FR_FR4 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9999	CM_MC1 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9999	FR_FR2 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9999	LC_LCDSSLCC passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9999	GH_ERC passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9999	LC_SLC passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9999	EV_MC2 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9999	GH_ER2 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9999	FR_FRRD passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9997	GH_FR1 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9997	FR_UFR1 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9997	FR_FRCP1 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9997	FR_FR4 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9997	EV_MC2 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9997	CM_MC1 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9997	FR_MULTIPLATE passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9997	FR_FR2 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9997	GH_ER2 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9997	Dechlor + Cu passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9997	LC_LC3 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9997	LC_SLC passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9997	EV_HC1 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9997	LC_DCDS passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9997	Dechlor Control passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9997	LC_LC5 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9997	FR_FRRD passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9997	GH_ERC passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9997	FR_FRABCH passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9997	LC_LCDSSLCC passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9997	CM_MC2 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	1.0000	FR_FRRD passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	1.0000	LC_DCDS passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	1.0000	GH_FR1 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	1.0000	FR_UFR1 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	1.0000	Dechlor Control passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	1.0000	EV_HC1 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	1.0000	Dechlor + Cu passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	1.0000	GH_ERC passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	1.0000	CM_MC2 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	1.0000	FR_MULTIPLATE passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	1.0000	EV_MC2 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	1.0000	FR_FR2 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	1.0000	FR_FRABCH passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	1.0000	LC_SLC passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	1.0000	FR_FR4 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	1.0000	CM_MC1 passed length-mm	1

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SIngle Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	1.0000	LC_LC3 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	1.0000	LC_LC5 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	1.0000	FR_FRCP1 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	1.0000	LC_LCDSSLCC passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	1.0000	GH_ER2 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	1.0000	CM_MC1 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	1.0000	FR_FRABCH passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	1.0000	GH_FR1 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	1.0000	Dechlor + Cu passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	1.0000	FR_FR2 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	1.0000	EV_HC1 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	1.0000	LC_LC3 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	1.0000	LC_LCDSSLCC passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	1.0000	GH_ERC passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	1.0000	FR_FR4 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	1.0000	Dechlor Control passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	1.0000	LC_SLC passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	1.0000	CM_MC2 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	1.0000	FR_MULTIPLATE passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	1.0000	LC_DCDS passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	1.0000	FR_UFR1 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	1.0000	GH_ER2 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	1.0000	FR_FRCP1 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	1.0000	FR_FRRD passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	1.0000	LC_LC5 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	1.0000	EV_MC2 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	1.0000	LC_LCDSSLCC passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	1.0000	LC_LC5 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	1.0000	FR_FRABCH passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	1.0000	CM_MC2 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	1.0000	GH_ERC passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	1.0000	FR_MULTIPLATE passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	1.0000	EV_MC2 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	1.0000	FR_FR2 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	1.0000	FR_FRCP1 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	1.0000	FR_FRRD passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	1.0000	EV_HC1 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	1.0000	LC_SLC passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	1.0000	Dechlor + Cu passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	1.0000	FR_FR4 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	1.0000	GH_FR1 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	1.0000	LC_LC3 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	1.0000	FR_UFR1 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	1.0000	GH_ER2 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	1.0000	LC_DCDS passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	1.0000	Dechlor Control passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	1.0000	CM_MC1 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9188	LC_DCDS passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9188	LC_LC5 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9188	FR_FR4 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9188	FR_FRRD passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9188	EV_HC1 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9188	GH_ERC passed length-mm	1

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SIngle Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9188	LC_LC3 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9188	LC_LCDSSLCC passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9188	FR_FR2 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9188	FR_MULTIPLATE passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9188	CM_MC2 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9188	EV_MC2 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9188	GH_ER2 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9188	LC_SLC passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9188	Dechlor Control passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9188	FR_UFR1 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9188	CM_MC1 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9188	FR_FRCP1 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9188	Dechlor + Cu passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9188	GH_FR1 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9188	FR_FRABCH passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9943	LC_DCDS passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9943	LC_SLC passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9943	LC_LC3 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9943	FR_FR2 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9943	Dechlor Control passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9943	FR_FRRD passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9943	EV_HC1 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9943	GH_ER2 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9943	FR_FRCP1 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9943	FR_FR4 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9943	CM_MC1 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9943	Dechlor + Cu passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9943	EV_MC2 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9943	FR_FRABCH passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9943	FR_MULTIPLATE passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9943	GH_ERC passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9943	LC_LC5 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9943	FR_UFR1 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9943	LC_LCDSSLCC passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9943	CM_MC2 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9943	GH_FR1 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9998	FR_FRRD passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9998	LC_DCDS passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9998	GH_ER2 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9998	FR_FRCP1 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9998	GH_FR1 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9998	FR_FR4 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9998	FR_FRABCH passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9998	CM_MC1 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9998	LC_LC5 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9998	LC_LCDSSLCC passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9998	LC_SLC passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9998	LC_LC3 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9998	FR_MULTIPLATE passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9998	Dechlor Control passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9998	FR_FR2 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9998	EV_HC1 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9998	EV_MC2 passed length-mm	1

Analyst: WM QA: Dec-23/21

Salmonid Embryo-Alevin-~~Fry~~ Survival Development and Growth Test **Nautilus Environmental**

SIngle Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9998	Dechlor + Cu passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9998	GH_ERC passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9998	FR_UFR1 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9998	CM_MC2 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9999	FR_FRABCH passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9999	LC_SLC passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9999	FR_FR2 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9999	FR_FR4 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9999	GH_ERC passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9999	FR_MULTIPLATE passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9999	EV_MC2 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9999	CM_MC2 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9999	GH_ER2 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9999	LC_LCDSSLCC passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9999	LC_LC3 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9999	CM_MC1 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9999	LC_LC5 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9999	LC_DCDS passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9999	EV_HC1 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9999	Dechlor + Cu passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9999	FR_UFR1 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9999	FR_FRRD passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9999	FR_FRCP1 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9999	GH_FR1 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9999	Dechlor Control passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9945	CM_MC2 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9945	FR_FRRD passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9945	LC_LCDSSLCC passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9945	FR_MULTIPLATE passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9945	GH_ERC passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9945	LC_SLC passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9945	Dechlor + Cu passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9945	CM_MC1 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9945	LC_LC3 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9945	EV_HC1 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9945	LC_LC5 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9945	FR_FRCP1 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9945	FR_FR4 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9945	FR_FR2 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9945	LC_DCDS passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9945	GH_FR1 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9945	Dechlor Control passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9945	GH_ER2 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9945	EV_MC2 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9945	FR_FRABCH passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9945	FR_UFR1 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	1.0000	GH_ER2 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	1.0000	EV_MC2 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	1.0000	LC_LCDSSLCC passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	1.0000	FR_UFR1 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	1.0000	Dechlor + Cu passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	1.0000	CM_MC1 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	1.0000	FR_FRRD passed length-mm	1

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SIngle Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	1.0000	FR_FR4 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	1.0000	GH_ERC passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	1.0000	FR_FR2 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	1.0000	LC_SLC passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	1.0000	FR_FRABCH passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	1.0000	LC_DCDS passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	1.0000	EV_HC1 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	1.0000	Dechlor Control passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	1.0000	GH_FR1 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	1.0000	LC_LC5 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	1.0000	FR_FRCP1 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	1.0000	FR_MULTIPLATE passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	1.0000	CM_MC2 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	1.0000	LC_LC3 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9996	EV_HC1 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9996	FR_FRCP1 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9996	FR_FR4 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9996	LC_DCDS passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9996	FR_UFR1 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9996	FR_FRRD passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9996	LC_LC3 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9996	Dechlor + Cu passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9996	Dechlor Control passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9996	FR_FR2 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9996	EV_MC2 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9996	FR_MULTIPLATE passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9996	CM_MC2 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9996	GH_ERC passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9996	GH_FR1 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9996	LC_SLC passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9996	FR_FRABCH passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9996	CM_MC1 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9996	LC_LC5 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9996	GH_ER2 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9996	LC_LCDSSLCC passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9894	GH_FR1 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9894	EV_MC2 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9894	LC_LCDSSLCC passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9894	LC_DCDS passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9894	FR_FRRD passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9894	LC_LC3 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9894	LC_SLC passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9894	LC_LC5 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9894	FR_FR2 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9894	EV_HC1 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9894	Dechlor Control passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9894	FR_FRCP1 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9894	GH_ERC passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9894	FR_FRABCH passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9894	CM_MC2 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9894	FR_FR4 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9894	CM_MC1 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9894	GH_ER2 passed length-mm	1

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SIngle Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9894	Dechlor + Cu passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9894	FR_MULTIPLATE passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9894	FR_UFR1 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9999	FR_MULTIPLATE passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9999	EV_MC2 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9999	FR_FR2 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9999	CM_MC1 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9999	Dechlor Control passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9999	EV_HC1 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9999	LC_LC5 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9999	CM_MC2 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9999	GH_ERC passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9999	FR_FRRD passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9999	LC_LCDSSLCC passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9999	GH_ER2 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9999	FR_UFR1 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9999	LC_SLC passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9999	LC_DCDS passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9999	FR_FRABCH passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9999	GH_FR1 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9999	LC_LC3 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9999	Dechlor + Cu passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9999	FR_FRCP1 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9999	FR_FR4 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9988	CM_MC1 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9988	LC_LC3 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9988	FR_FR4 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9988	GH_ERC passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9988	FR_FRABCH passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9988	CM_MC2 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9988	FR_UFR1 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9988	FR_MULTIPLATE passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9988	GH_ER2 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9988	EV_MC2 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9988	EV_HC1 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9988	Dechlor Control passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9988	LC_SLC passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9988	FR_FR2 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9988	LC_LC5 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9988	FR_FRCP1 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9988	FR_FRRD passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9988	LC_LCDSSLCC passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9988	GH_FR1 passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9988	Dechlor + Cu passed length-mm	1
10-2445-4773	Length-mm	Dunnett Multiple Comparison Test	0.9988	LC_DCDS passed length-mm	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.7942	FR_FRCP1 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.7942	GH_ERC passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.7942	Dechlor Control passed mean dry weight-	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.7942	LC_DCDS passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.7942	FR_UFR1 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.7942	LC_LC3 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.7942	LC_SLC passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.7942	Dechlor + Cu passed mean dry weight-mg	1

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SIngle Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.7942	GH_ER2 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.7942	GH_FR1 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.7942	LC_LC5 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.7942	FR_FRRD passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.7942	FR_FRABCH passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.7942	LC_LCDSSLCC passed mean dry weight-	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.7942	CM_MC1 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.7942	FR_MULTIPLATE passed mean dry weight	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.7942	FR_FR4 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.7942	FR_FR2 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.7942	EV_MC2 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.7942	CM_MC2 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.7942	EV_HC1 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9466	FR_MULTIPLATE passed mean dry weight	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9466	LC_LC3 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9466	FR_FR2 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9466	GH_ER2 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9466	CM_MC2 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9466	GH_FR1 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9466	LC_LC5 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9466	FR_UFR1 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9466	FR_FRRD passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9466	FR_FRABCH passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9466	FR_FRCP1 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9466	LC_LCDSSLCC passed mean dry weight-	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9466	EV_HC1 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9466	CM_MC1 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9466	Dechlor Control passed mean dry weight-	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9466	GH_ERC passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9466	LC_SLC passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9466	Dechlor + Cu passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9466	EV_MC2 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9466	LC_DCDS passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9466	FR_FR4 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9821	FR_FRRD passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9821	FR_FRCP1 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9821	GH_ER2 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9821	FR_FR4 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9821	FR_MULTIPLATE passed mean dry weight	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9821	LC_LC5 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9821	EV_MC2 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9821	LC_LCDSSLCC passed mean dry weight-	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9821	CM_MC1 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9821	FR_FRABCH passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9821	GH_ERC passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9821	LC_SLC passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9821	GH_FR1 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9821	Dechlor + Cu passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9821	LC_LC3 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9821	FR_FR2 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9821	FR_UFR1 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9821	CM_MC2 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9821	LC_DCDS passed mean dry weight-mg	1

Salmonid Embryo-Alevin-~~Fry~~ Survival Development and Growth Test **Nautilus Environmental**

SIngle Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9821	EV_HC1 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9821	Dechlor Control passed mean dry weight-	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9552	FR_FRCP1 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9552	LC_DCDS passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9552	EV_MC2 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9552	FR_FR2 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9552	Dechlor Control passed mean dry weight-	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9552	FR_FRABCH passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9552	LC_SLC passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9552	FR_FR4 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9552	EV_HC1 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9552	Dechlor + Cu passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9552	GH_ERC passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9552	CM_MC1 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9552	GH_ER2 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9552	LC_LC3 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9552	FR_MULTIPLATE passed mean dry weight	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9552	CM_MC2 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9552	LC_LC5 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9552	FR_UFR1 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9552	GH_FR1 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9552	FR_FRRD passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9552	LC_LCDSSLCC passed mean dry weight-	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.8490	FR_FRCP1 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.8490	CM_MC2 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.8490	EV_HC1 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.8490	LC_SLC passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.8490	GH_FR1 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.8490	Dechlor Control passed mean dry weight-	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.8490	LC_LC3 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.8490	FR_MULTIPLATE passed mean dry weight	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.8490	LC_LC5 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.8490	LC_DCDS passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.8490	FR_FRABCH passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.8490	LC_LCDSSLCC passed mean dry weight-	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.8490	FR_UFR1 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.8490	FR_FR4 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.8490	CM_MC1 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.8490	GH_ER2 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.8490	FR_FR2 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.8490	GH_ERC passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.8490	Dechlor + Cu passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.8490	EV_MC2 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.8490	FR_FRRD passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9989	CM_MC2 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9989	FR_FRABCH passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9989	FR_FR2 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9989	LC_LC3 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9989	FR_FRCP1 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9989	LC_LC5 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9989	GH_FR1 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9989	FR_FRRD passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9989	GH_ER2 passed mean dry weight-mg	1

Salmonid Embryo-Alevin-~~Fry~~ Survival Development and Growth Test **Nautilus Environmental**

SIngle Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9989	LC_DCDS passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9989	FR_UFR1 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9989	Dechlor Control passed mean dry weight-	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9989	FR_FR4 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9989	CM_MC1 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9989	LC_LCDSSLCC passed mean dry weight-	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9989	GH_ERC passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9989	Dechlor + Cu passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9989	LC_SLC passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9989	EV_HC1 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9989	FR_MULTIPLATE passed mean dry weight	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9989	EV_MC2 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9991	EV_HC1 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9991	Dechlor Control passed mean dry weight-	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9991	FR_FRRD passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9991	FR_FRCP1 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9991	CM_MC2 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9991	LC_LC3 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9991	LC_DCDS passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9991	FR_UFR1 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9991	FR_FR2 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9991	GH_FR1 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9991	GH_ERC passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9991	Dechlor + Cu passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9991	CM_MC1 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9991	LC_LCDSSLCC passed mean dry weight-	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9991	GH_ER2 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9991	EV_MC2 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9991	LC_SLC passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9991	LC_LC5 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9991	FR_FR4 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9991	FR_FRABCH passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9991	FR_MULTIPLATE passed mean dry weight	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	FR_MULTIPLATE passed mean dry weight	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	FR_FR4 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	FR_FRRD passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	GH_FR1 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	LC_DCDS passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	LC_LC5 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	EV_MC2 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	LC_SLC passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	CM_MC1 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	Dechlor + Cu passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	Dechlor Control passed mean dry weight-	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	LC_LCDSSLCC passed mean dry weight-	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	FR_FR2 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	GH_ER2 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	GH_ERC passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	FR_UFR1 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	LC_LC3 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	FR_FRCP1 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	CM_MC2 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	EV_HC1 passed mean dry weight-mg	1

Salmonid Embryo-Alevin-Fry Survival Development and Growth Test **Nautilus Environmental**

SIngle Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	1.0000	FR_FRABCH passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9999	GH_ER2 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9999	Dechlor + Cu passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9999	LC_SLC passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9999	LC_DCDS passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9999	FR_FR2 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9999	CM_MC2 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9999	Dechlor Control passed mean dry weight-	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9999	EV_HC1 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9999	CM_MC1 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9999	FR_FR4 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9999	FR_FRCP1 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9999	FR_MULTIPLATE passed mean dry weight	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9999	FR_FRABCH passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9999	LC_LC5 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9999	FR_FRRD passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9999	GH_FR1 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9999	FR_UFR1 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9999	LC_LCDSSLCC passed mean dry weight-	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9999	LC_LC3 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9999	GH_ERC passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9999	EV_MC2 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9998	EV_MC2 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9998	GH_ERC passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9998	FR_MULTIPLATE passed mean dry weight	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9998	FR_FRRD passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9998	LC_LCDSSLCC passed mean dry weight-	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9998	CM_MC1 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9998	CM_MC2 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9998	LC_LC5 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9998	FR_FR4 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9998	FR_FRABCH passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9998	GH_ER2 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9998	FR_FRCP1 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9998	Dechlor Control passed mean dry weight-	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9998	GH_FR1 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9998	Dechlor + Cu passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9998	EV_HC1 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9998	LC_LC3 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9998	FR_FR2 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9998	FR_UFR1 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9998	LC_SLC passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9998	LC_DCDS passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9689	LC_LC3 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9689	FR_MULTIPLATE passed mean dry weight	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9689	LC_DCDS passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9689	EV_HC1 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9689	LC_LC5 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9689	FR_FRRD passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9689	FR_FR2 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9689	LC_LCDSSLCC passed mean dry weight-	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9689	GH_ERC passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9689	FR_FR4 passed mean dry weight-mg	1

Salmonid Embryo-Alevin-Fry Survival Development and Growth Test — **Nautilus Environmental**

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9689	GH_ER2 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9689	FR_FRABCH passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9689	FR_FRCP1 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9689	EV_MC2 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9689	GH_FR1 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9689	CM_MC1 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9689	CM_MC2 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9689	Dechlor + Cu passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9689	LC_SLC passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9689	FR_UFR1 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9689	Dechlor Control passed mean dry weight-	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9983	FR_FR4 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9983	CM_MC1 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9983	Dechlor Control passed mean dry weight-	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9983	Dechlor + Cu passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9983	EV_HC1 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9983	FR_FR2 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9983	LC_DCDS passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9983	FR_FRRD passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9983	GH_FR1 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9983	FR_UFR1 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9983	EV_MC2 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9983	FR_FRABCH passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9983	LC_LC5 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9983	LC_LCDSSLCC passed mean dry weight-	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9983	LC_LC3 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9983	GH_ERC passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9983	LC_SLC passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9983	FR_MULTIPLATE passed mean dry weight	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9983	GH_ER2 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9983	FR_FRCP1 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9983	CM_MC2 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9973	FR_FRABCH passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9973	GH_FR1 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9973	LC_LC5 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9973	FR_FR4 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9973	LC_SLC passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9973	LC_LC3 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9973	LC_LCDSSLCC passed mean dry weight-	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9973	CM_MC1 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9973	FR_FRCP1 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9973	GH_ER2 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9973	LC_DCDS passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9973	EV_MC2 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9973	FR_FR2 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9973	Dechlor Control passed mean dry weight-	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9973	FR_MULTIPLATE passed mean dry weight	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9973	Dechlor + Cu passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9973	CM_MC2 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9973	GH_ERC passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9973	FR_FRRD passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9973	FR_UFR1 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9973	EV_HC1 passed mean dry weight-mg	1

Salmonid Embryo-Alevin-~~Fry~~ Survival Development and Growth Test **Nautilus Environmental**

SIngle Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9897	CM_MC2 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9897	LC_LC5 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9897	FR_FRCP1 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9897	LC_LC3 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9897	FR_MULTIPLATE passed mean dry weight	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9897	FR_FRABCH passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9897	EV_MC2 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9897	FR_FR2 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9897	GH_ERC passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9897	GH_FR1 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9897	GH_ER2 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9897	FR_UFR1 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9897	FR_FR4 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9897	FR_FRRD passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9897	Dechlor + Cu passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9897	LC_DCDS passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9897	LC_SLC passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9897	Dechlor Control passed mean dry weight-	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9897	CM_MC1 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9897	LC_LCDSSLCC passed mean dry weight-	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9897	EV_HC1 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9566	EV_MC2 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9566	GH_ER2 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9566	CM_MC1 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9566	FR_FR2 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9566	Dechlor + Cu passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9566	FR_FRRD passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9566	LC_SLC passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9566	LC_LC5 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9566	LC_LCDSSLCC passed mean dry weight-	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9566	FR_FR4 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9566	FR_UFR1 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9566	GH_ERC passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9566	EV_HC1 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9566	GH_FR1 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9566	LC_LC3 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9566	FR_FRABCH passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9566	LC_DCDS passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9566	Dechlor Control passed mean dry weight-	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9566	CM_MC2 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9566	FR_FRCP1 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9566	FR_MULTIPLATE passed mean dry weight	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9967	GH_ER2 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9967	CM_MC2 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9967	FR_FRCP1 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9967	FR_FR2 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9967	EV_HC1 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9967	CM_MC1 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9967	EV_MC2 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9967	LC_DCDS passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9967	FR_UFR1 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9967	FR_FR4 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9967	GH_FR1 passed mean dry weight-mg	1

Salmonid Embryo-Alevin-Fry Survival Development and Growth Test **Nautilus Environmental**

SIngle Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9967	FR_MULTIPLATE passed mean dry weight	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9967	Dechlor + Cu passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9967	LC_LCDSSLCC passed mean dry weight-	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9967	LC_SLC passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9967	LC_LC3 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9967	FR_FRABCH passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9967	Dechlor Control passed mean dry weight-	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9967	GH_ERC passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9967	FR_FRRD passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9967	LC_LC5 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9980	FR_FR2 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9980	GH_ER2 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9980	GH_ERC passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9980	LC_LC5 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9980	FR_MULTIPLATE passed mean dry weight	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9980	LC_SLC passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9980	FR_FR4 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9980	LC_DCDS passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9980	FR_UFR1 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9980	EV_MC2 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9980	GH_FR1 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9980	FR_FRCP1 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9980	Dechlor Control passed mean dry weight-	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9980	LC_LCDSSLCC passed mean dry weight-	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9980	LC_LC3 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9980	Dechlor + Cu passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9980	FR_FRABCH passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9980	FR_FRRD passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9980	CM_MC2 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9980	CM_MC1 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9980	EV_HC1 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9449	FR_UFR1 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9449	GH_FR1 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9449	EV_HC1 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9449	FR_FRRD passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9449	EV_MC2 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9449	Dechlor Control passed mean dry weight-	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9449	LC_DCDS passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9449	LC_SLC passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9449	GH_ERC passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9449	LC_LC5 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9449	LC_LC3 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9449	CM_MC2 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9449	CM_MC1 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9449	LC_LCDSSLCC passed mean dry weight-	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9449	FR_MULTIPLATE passed mean dry weight	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9449	GH_ER2 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9449	Dechlor + Cu passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9449	FR_FRCP1 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9449	FR_FR4 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9449	FR_FR2 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9449	FR_FRABCH passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9942	EV_MC2 passed mean dry weight-mg	1

Salmonid Embryo-Alevin-Fry Survival Development and Growth Test **Nautilus Environmental**

SIngle Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9942	Dechlor Control passed mean dry weight-	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9942	FR_FR2 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9942	CM_MC2 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9942	FR_MULTIPLATE passed mean dry weight	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9942	GH_ERC passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9942	FR_UFR1 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9942	LC_DCDS passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9942	LC_LCDSSLCC passed mean dry weight-	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9942	Dechlor + Cu passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9942	FR_FRCP1 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9942	FR_FR4 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9942	CM_MC1 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9942	GH_ER2 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9942	LC_LC5 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9942	EV_HC1 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9942	FR_FRRD passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9942	LC_LC3 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9942	GH_FR1 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9942	LC_SLC passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9942	FR_FRABCH passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9989	CM_MC2 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9989	CM_MC1 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9989	LC_LCDSSLCC passed mean dry weight-	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9989	FR_FRABCH passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9989	GH_ERC passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9989	Dechlor Control passed mean dry weight-	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9989	LC_LC3 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9989	LC_DCDS passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9989	FR_UFR1 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9989	EV_MC2 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9989	FR_FR2 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9989	FR_FRCP1 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9989	FR_FR4 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9989	LC_SLC passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9989	LC_LC5 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9989	FR_MULTIPLATE passed mean dry weight	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9989	EV_HC1 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9989	FR_FRRD passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9989	GH_FR1 passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9989	Dechlor + Cu passed mean dry weight-mg	1
00-1734-5983	Mean Dry Weight-mg	Dunnett Multiple Comparison Test	0.9989	GH_ER2 passed mean dry weight-mg	1

Salmonid Embryo-Alevin-Fry Survival Development and Growth Test — Nautilus Environmental

Length-mm Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
Dechlor Control	N	4	18.74	15.83	21.64	16.35	20.77	0.9139	1.828	9.76%	0.00%
Dechlor + Cu	L	4	17.47	15.81	19.14	16	18.29	0.5234	1.047	5.99%	6.74%
FR_UFR1	U	4	18.59	17.32	19.85	17.79	19.61	0.3962	0.7925	4.26%	0.80%
GH_ER2	R	4	19.47	18.95	19.98	19.09	19.84	0.162	0.3241	1.66%	-3.90%
CM_MC1	XC	4	18.89	18.01	19.76	18.1	19.31	0.2749	0.5497	2.91%	-0.82%
LC_SLC	US	4	18.02	17.4	18.64	17.6	18.54	0.1949	0.3897	2.16%	3.80%
FR_FRABCH		4	19.78	18.39	21.17	18.8	20.85	0.4368	0.8735	4.42%	-5.57%
FR_FRCP1		4	19.65	17.9	21.4	18.06	20.4	0.5499	1.1	5.60%	-4.88%
GH_FR1		4	20.06	18.76	21.35	19.32	20.85	0.4067	0.8135	4.06%	-7.05%
GH_ERC		4	19.88	18.4	21.37	18.82	20.89	0.4672	0.9344	4.70%	-6.12%
CM_MC2		4	20.14	19.36	20.91	19.46	20.56	0.2441	0.4881	2.42%	-7.48%
EV_MC2		4	18.59	17.56	19.63	17.84	19.3	0.3254	0.6509	3.50%	0.77%
EV_HC1		4	19.17	17.55	20.79	18.4	20.57	0.5087	1.017	5.31%	-2.34%
LC_DCDS		4	19.74	18.17	21.32	18.72	21.04	0.4943	0.9887	5.01%	-5.38%
LC_LC3		4	19.84	18.52	21.16	19.21	21.06	0.4162	0.8325	4.20%	-5.90%
LC_LC5		4	19.18	17.08	21.27	17.32	20.41	0.6581	1.316	6.86%	-2.37%
LC_LCDSSLCC		4	20.27	18.83	21.7	19.52	21.43	0.4519	0.9037	4.46%	-8.17%
FR_FR4		4	19.59	18.58	20.6	18.75	20.22	0.3182	0.6365	3.25%	-4.55%
FR_FRRD		3	19.08	18.16	20	18.8	19.5	0.2134	0.3697	1.94%	-1.85%
FR_FR2		4	19.76	18.05	21.47	18.29	20.67	0.5382	1.076	5.45%	-5.47%
FR_MULTIPLATE		4	19.44	17.83	21.05	18.18	20.3	0.5062	1.012	5.21%	-3.75%

Mean Dry Weight-mg Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
Dechlor Control	N	4	85.68	71.28	100.1	73.04	94.29	4.525	9.051	10.56%	0.00%
Dechlor + Cu	L	4	80.84	70.07	91.61	70.8	85.52	3.385	6.771	8.38%	5.65%
FR_UFR1	U	4	85.3	67.58	103	74.62	98.15	5.568	11.14	13.05%	0.44%
GH_ER2	R	4	88.04	73.31	102.8	78.21	98.8	4.631	9.263	10.52%	-2.76%
CM_MC1	XC	4	85.78	76.66	94.9	79.31	92.31	2.865	5.73	6.68%	-0.12%
LC_SLC	US	4	82.03	68.54	95.53	71.25	89.2	4.24	8.48	10.34%	4.25%
FR_FRABCH		4	93.47	74.15	112.8	81.11	106.5	6.07	12.14	12.99%	-9.09%
FR_FRCP1		4	93.9	76.26	111.5	78.33	102.1	5.543	11.09	11.81%	-9.60%
GH_FR1		4	102	74.31	129.7	85.93	124.8	8.708	17.42	17.07%	-19.07%
GH_ERC		4	97.96	86.31	109.6	89.63	106.5	3.663	7.325	7.48%	-14.34%
CM_MC2		4	96.25	76.88	115.6	79.29	107.9	6.088	12.18	12.65%	-12.34%
EV_MC2		4	86.72	71.89	101.6	72.92	92.61	4.661	9.321	10.75%	-1.22%
EV_HC1		4	92.76	75.5	110	78.08	103.8	5.424	10.85	11.69%	-8.27%
LC_DCDS		4	91.9	78.49	105.3	81.85	100	4.214	8.429	9.17%	-7.26%
LC_LC3		4	89.27	76.99	101.5	80	98.89	3.858	7.716	8.64%	-4.19%
LC_LC5		4	85.86	68.33	103.4	72.8	95.2	5.51	11.02	12.84%	-0.21%
LC_LCDSSLCC		4	91.56	75.17	107.9	78.57	101.1	5.151	10.3	11.25%	-6.86%
FR_FR4		4	92.5	83.09	101.9	83.64	95.79	2.957	5.914	6.39%	-7.96%
FR_FRRD		3	85.18	60.87	109.5	78.4	96.4	5.65	9.787	11.49%	0.58%
FR_FR2		4	90.46	73.45	107.5	76.84	100.4	5.346	10.69	11.82%	-5.58%
FR_MULTIPLATE		4	93.52	73.82	113.2	76.67	106.4	6.191	12.38	13.24%	-9.15%

Reference sites

Salmonid Embryo-Alevin-~~Fry~~ Survival Development and Growth Test **Nautilus Environmental**

Length-mm Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Dechlor Control	N	19.17	16.35	18.66	20.77
Dechlor + Cu	L	18.29	16	17.46	18.14
① FR_UFR1	U	18.18	17.79	18.76	19.61
① GH_ER2	R	19.34	19.09	19.6	19.84
① CM_MC1	XC	19.22	18.1	19.31	18.92
① LC_SLC	US	17.91	17.6	18.04	18.54
FR_FRABCH		19.44	18.8	20.04	20.85
FR_FRCP1		19.78	18.06	20.4	20.37
GH_FR1		19.4	19.32	20.85	20.67
GH_ERC		19.43	18.82	20.39	20.89
CM_MC2		19.46	20.11	20.42	20.56
EV_MC2		18.93	18.29	19.3	17.84
EV_HC1		19.29	18.44	18.4	20.57
LC_DCDS		18.72	19.32	19.9	21.04
LC_LC3		19.43	19.21	19.67	21.06
LC_LC5		19.38	17.32	19.6	20.41
LC_LCDSSLCC		19.57	19.52	20.54	21.43
FR_FR4		19.91	18.75	19.47	20.22
FR_FRRD		18.94	18.8	19.5	
FR_FR2		19.64	18.29	20.44	20.67
FR_MULTIPLATE		19.05	18.18	20.3	20.22

Mean ~~Dry~~ Weight-mg Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Dechlor Control	N	86.3	73.04	89.09	94.29
Dechlor + Cu	L	85.52	70.8	83.04	84
① FR_UFR1	U	77.5	74.62	90.95	98.15
① GH_ER2	R	82.86	78.21	92.31	98.8
① CM_MC1	XC	83.1	79.31	92.31	88.4
① LC_SLC	US	79.29	71.25	88.4	89.2
FR_FRABCH		85.42	81.11	100.8	106.5
FR_FRCP1		93.6	78.33	102.1	101.6
GH_FR1		91.25	85.93	124.8	106.1
GH_ERC		94.83	89.63	100.9	106.5
CM_MC2		97.04	79.29	107.9	100.8
EV_MC2		89.26	72.92	92.61	92.11
EV_HC1		92.5	78.08	96.67	103.8
LC_DCDS		88.15	81.85	100	97.6
LC_LC3		88.89	80	89.31	98.89
LC_LC5		80.67	72.8	95.2	94.78
LC_LCDSSLCC		88.15	78.57	98.4	101.1
FR_FR4		95.36	83.64	95.79	95.22
FR_FRRD		80.74	78.4	96.4	
FR_FR2		87.2	76.84	100.4	97.39
FR_MULTIPLATE		94.5	76.67	106.4	96.52

① Reference sites

CETIS Analytical Report

Salmonid Embryo-Alevin-~~Fry~~ Survival Development and Growth Test — **Nautilus Environmental**

Analysis ID:	10-2445-4773	**Endpoint:**	Length-mm	**CETIS Version:**	CETISv1.9.4
Analyzed:	20 Dec-21 15:55	**Analysis:**	Parametric-Control vs Treatments	**Status Level:**	1
Batch ID:	00-9465-4096	**Test Type:**	Survival-Development-Growth	**Analyst:**	Yvonne Lam
Start Date:	13 Oct-21 15:50	**Protocol:**	EC/EPS 1/RM/28	**Diluent:**	Dechlorinated Tap Water
Ending Date:	12 Nov-21 08:00	**Species:**	Oncorhynchus mykiss	**Brine:**	
Test Length:	29d 16h	**Taxon:**	Actinopterygii	**Source:**	Lyndon Fish Hatcheries **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
Dechlor Control	16-7987-2727	12 Oct-21	12 Oct-21	40h	Teck Coal	
Dechlor + Cu	15-4969-1985	12 Oct-21	12 Oct-21	40h		
① FR_UFR1	19-8746-8946	12 Oct-21 11:07	13 Oct-21 11:53	29h (0 °C)		
① GH_ER2	20-2628-4137	12 Oct-21 10:50	13 Oct-21 11:30	29h (0 °C)		
① CM_MC1	18-3559-2852	12 Oct-21 13:20	13 Oct-21 11:30	26h (0.1 °C)		
① LC_SLC	08-7937-3726	12 Oct-21 11:00	13 Oct-21 11:30	29h (2.9 °C)		
FR_FRABCH	18-7592-7020	12 Oct-21 11:20	13 Oct-21 11:53	28h (0 °C)		
FR_FRCP1	10-3969-8000	12 Oct-21 11:48	13 Oct-21 11:53	28h (1.3 °C)		
GH_FR1	11-8224-4576	12 Oct-21 10:00	13 Oct-21 11:30	30h (0 °C)		
GH_ERC	00-1276-7572	12 Oct-21 11:50	13 Oct-21 11:30	28h (0 °C)		
CM_MC2	03-9569-8600	12 Oct-21 12:47	13 Oct-21 11:30	27h (1.3 °C)		
EV_MC2	13-1923-7722	12 Oct-21 11:38	13 Oct-21 11:30	28h (0.2 °C)		
EV_HC1	18-6648-8827	12 Oct-21 10:33	13 Oct-21 11:30	29h (0 °C)		
LC_DCDS	17-4710-4100	12 Oct-21	13 Oct-21 11:30	40h (1.7 °C)		
LC_LC3	20-0894-5906	12 Oct-21 12:00	13 Oct-21 11:30	28h (8.8 °C)		
LC_LC5	14-5637-1032	12 Oct-21 13:30	13 Oct-21 11:30	26h (2.6 °C)		
LC_LCDSSLCC	06-4184-4349	12 Oct-21 12:30	13 Oct-21 11:30	27h (4.7 °C)		
FR_FR4	16-7272-1140	12 Oct-21 11:05	13 Oct-21 11:30	29h (0 °C)		
FR_FRRD	04-7874-3326	12 Oct-21 11:45	13 Oct-21 11:30	28h (0 °C)		
FR_FR2	09-1936-7906	12 Oct-21 10:25	13 Oct-21 11:30	29h (0 °C)		
FR_MULTIPLATE	07-2028-3040	12 Oct-21 09:45	13 Oct-21 11:30	30h (0 °C)		

Aside from Dechlor Control, all samples spiked with 20 ug/L Cu

① Reference sites

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
Dechlor Control	Control water	Teck Coal	Dechlor Control	
Dechlor + Cu	Contol+Cu	Teck Coal	Dechlor + 20 ug/L Cu	
① FR_UFR1	Water Sample	Teck Coal	FR_UFR1_WEK_2021-09-1	
① GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-10-12_	
① CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-10-12	
① LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-10-19_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_WEK_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_WEK_2021-09	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-10-12_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-10-12	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-10-12	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2021_Q4_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2021_Q4_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-10-19	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-10-19_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-10-19_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	
FR_FR4	Water Sample	Teck Coal	FR_FR4_WS_2021-10-12_	
FR_FRRD	Water Sample	Teck Coal	FR_FRRD_WS_2021-10-12	
FR_FR2	Water Sample	Teck Coal	FR_FR2_WS_2021-10-12_	
FR_MULTIPLATE	Water Sample	Teck Coal	FR_MULTIPLATE_WS_202	

Analyst: YL QA: Dec 23/21

Salmonid Embryo-Alevin-~~Fry~~ Survival Development and Growth Test — **Nautilus Environmental**

Analysis ID: 10-2445-4773 **Endpoint:** Length-mm **CETIS Version:** CETISv1.9.4
Analyzed: 20 Dec-21 15:55 **Analysis:** Parametric-Control vs Treatments **Status Level:** 1

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	Dechlor + Cu passed length-mm	9.50%
		FR_UFR1 passed length-mm	9.50%
		GH_ER2 passed length-mm	9.50%
		CM_MC1 passed length-mm	9.50%
		LC_SLC passed length-mm	9.50%
		FR_FRABCH passed length-mm	9.50%
		FR_FRCP1 passed length-mm	9.50%
		GH_FR1 passed length-mm	9.50%
		GH_ERC passed length-mm	9.50%
		CM_MC2 passed length-mm	9.50%
		EV_MC2 passed length-mm	9.50%
		EV_HC1 passed length-mm	9.50%
		LC_DCDS passed length-mm	9.50%
		LC_LC3 passed length-mm	9.50%
		LC_LC5 passed length-mm	9.50%
		LC_LCDSSLCC passed length-mm	9.50%
		FR_FR4 passed length-mm	9.50%
		FR_FRRD passed length-mm	9.50%
		FR_FR2 passed length-mm	9.50%
		FR_MULTIPLATE passed length-mm	9.50%

Reference sites

Dunnett Multiple Comparison Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Negative Control		Dechlor + Cu	1.929	2.716	1.779	6	CDF	0.2312	Non-Significant Effect
		FR_UFR1	0.2298	2.716	1.779	6	CDF	0.9170	Non-Significant Effect
		GH_ER2	-1.115	2.716	1.779	6	CDF	0.9990	Non-Significant Effect
		CM_MC1	-0.234	2.716	1.779	6	CDF	0.9761	Non-Significant Effect
		LC_SLC	1.087	2.716	1.779	6	CDF	0.6165	Non-Significant Effect
		FR_FRABCH	-1.595	2.716	1.779	6	CDF	0.9999	Non-Significant Effect
		FR_FRCP1	-1.396	2.716	1.779	6	CDF	0.9997	Non-Significant Effect
		GH_FR1	-2.017	2.716	1.779	6	CDF	1.0000	Non-Significant Effect
		GH_ERC	-1.751	2.716	1.779	6	CDF	1.0000	Non-Significant Effect
		CM_MC2	-2.141	2.716	1.779	6	CDF	1.0000	Non-Significant Effect
		EV_MC2	0.2206	2.716	1.779	6	CDF	0.9188	Non-Significant Effect
		EV_HC1	-0.6692	2.716	1.779	6	CDF	0.9943	Non-Significant Effect
		LC_DCDS	-1.54	2.716	1.779	6	CDF	0.9998	Non-Significant Effect
		LC_LC3	-1.687	2.716	1.779	6	CDF	0.9999	Non-Significant Effect
		LC_LC5	-0.6772	2.716	1.779	6	CDF	0.9945	Non-Significant Effect
		LC_LCDSSLCC	-2.337	2.716	1.779	6	CDF	1.0000	Non-Significant Effect
		FR_FR4	-1.302	2.716	1.779	6	CDF	0.9996	Non-Significant Effect
		FR_FRRD	-0.4889	2.716	1.922	5	CDF	0.9894	Non-Significant Effect
		FR_FR2	-1.565	2.716	1.779	6	CDF	0.9999	Non-Significant Effect
		FR_MULTIPLATE	-1.072	2.716	1.779	6	CDF	0.9988	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	41.0637	2.05319	20	2.394	0.0046	Significant Effect
Error	53.1837	0.857801	62			
Total	94.2474		82			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance Test	16.94	37.57	0.6566	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9903	0.9592	0.7972	Normal Distribution

Analyst: WW QA: Dec 23/21

Salmonid Embryo-Alevin-~~Fry~~ Survival Development and Growth Test **Nautilus Environmental**

Analysis ID: 10-2445-4773 **Endpoint:** Length-mm **CETIS Version:** CETISv1.9.4
Analyzed: 20 Dec-21 15:55 **Analysis:** Parametric-Control vs Treatments **Status Level:** 1

Length-mm Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
Dechlor Control	N	4	18.74	15.83	21.64	18.91	16.35	20.77	0.9139	9.76%	0.00%
Dechlor + Cu		4	17.47	15.81	19.14	17.8	16	18.29	0.5234	5.99%	6.74%
FR_UFR1		4	18.59	17.32	19.85	18.47	17.79	19.61	0.3962	4.26%	0.80%
GH_ER2		4	19.47	18.95	19.98	19.47	19.09	19.84	0.162	1.66%	-3.90%
CM_MC1		4	18.89	18.01	19.76	19.07	18.1	19.31	0.2749	2.91%	-0.82%
LC_SLC		4	18.02	17.4	18.64	17.98	17.6	18.54	0.1949	2.16%	3.80%
FR_FRABCH		4	19.78	18.39	21.17	19.74	18.8	20.85	0.4368	4.42%	-5.57%
FR_FRCP1		4	19.65	17.9	21.4	20.07	18.06	20.4	0.5499	5.60%	-4.88%
GH_FR1		4	20.06	18.76	21.35	20.03	19.32	20.85	0.4067	4.06%	-7.05%
GH_ERC		4	19.88	18.4	21.37	19.91	18.82	20.89	0.4672	4.70%	-6.12%
CM_MC2		4	20.14	19.36	20.91	20.26	19.46	20.56	0.2441	2.42%	-7.48%
EV_MC2		4	18.59	17.56	19.63	18.61	17.84	19.3	0.3255	3.50%	0.77%
EV_HC1		4	19.17	17.55	20.79	18.86	18.4	20.57	0.5087	5.31%	-2.34%
LC_DCDS		4	19.74	18.17	21.32	19.61	18.72	21.04	0.4943	5.01%	-5.38%
LC_LC3		4	19.84	18.52	21.16	19.55	19.21	21.06	0.4162	4.20%	-5.90%
LC_LC5		4	19.18	17.08	21.27	19.49	17.32	20.41	0.6581	6.86%	-2.37%
LC_LCDSSLCC		4	20.27	18.83	21.7	20.06	19.52	21.43	0.4519	4.46%	-8.17%
FR_FR4		4	19.59	18.58	20.6	19.69	18.75	20.22	0.3182	3.25%	-4.55%
FR_FRRD		3	19.08	18.16	20	18.94	18.8	19.5	0.2134	1.94%	-1.85%
FR_FR2		4	19.76	18.05	21.47	20.04	18.29	20.67	0.5382	5.45%	-5.47%
FR_MULTIPLATE		4	19.44	17.83	21.05	19.63	18.18	20.3	0.5062	5.21%	-3.75%

Length-mm Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Dechlor Control	N	19.17	16.35	18.66	20.77
Dechlor + Cu		18.29	16	17.46	18.14
FR_UFR1		18.18	17.79	18.76	19.61
GH_ER2		19.34	19.09	19.6	19.84
CM_MC1		19.22	18.1	19.31	18.92
LC_SLC		17.91	17.6	18.04	18.54
FR_FRABCH		19.44	18.8	20.04	20.85
FR_FRCP1		19.78	18.06	20.4	20.37
GH_FR1		19.4	19.32	20.85	20.67
GH_ERC		19.43	18.82	20.39	20.89
CM_MC2		19.46	20.11	20.42	20.56
EV_MC2		18.93	18.29	19.3	17.84
EV_HC1		19.29	18.44	18.4	20.57
LC_DCDS		18.72	19.32	19.9	21.04
LC_LC3		19.43	19.21	19.67	21.06
LC_LC5		19.38	17.32	19.6	20.41
LC_LCDSSLCC		19.57	19.52	20.54	21.43
FR_FR4		19.91	18.75	19.47	20.22
FR_FRRD		18.94	18.8	19.5	
FR_FR2		19.64	18.29	20.44	20.67
FR_MULTIPLATE		19.05	18.18	20.3	20.22

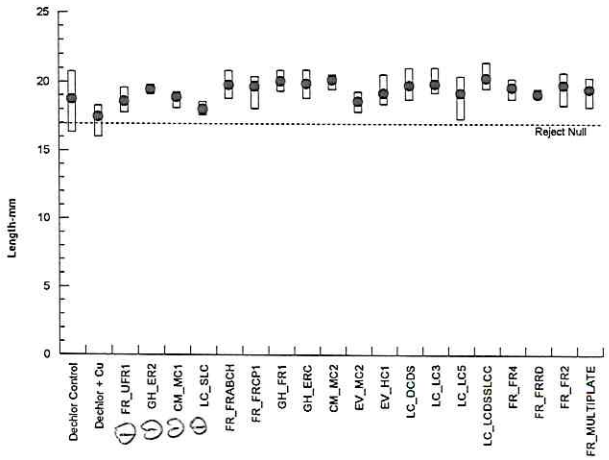
Reference sites

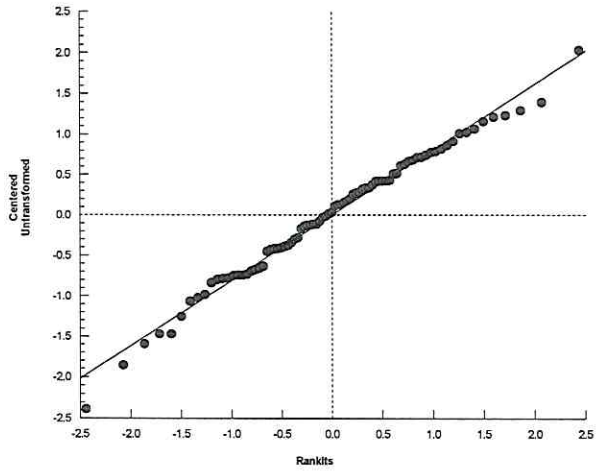
Analyst: WM QA: Dec-23/21

Salmonid Embryo-Alevin-~~Fry~~ Survival Development and Growth Test **Nautilus Environmental**

Analysis ID:	10-2445-4773	**Endpoint:**	Length-mm	**CETIS Version:**	CETISv1.9.4
Analyzed:	20 Dec-21 15:55	**Analysis:**	Parametric-Control vs Treatments	**Status Level:**	1

Graphics





① Reference Sites

Analyst: _____ QA: Dec. 23/21

CETIS Analytical Report

Salmonid Embryo-Alevin ~~Fry~~ Survival Development and Growth Test — **Nautilus Environmental**

Analysis ID:	00-1734-5983	**Endpoint:**	Mean ~~Dry~~ Wet Weight-mg	**CETIS Version:**	CETISv1.9.4
Analyzed:	20 Dec-21 15:55	**Analysis:**	Parametric-Control vs Treatments	**Status Level:**	1
Batch ID:	00-9465-4096	**Test Type:**	Survival-Development-Growth	**Analyst:**	Yvonne Lam
Start Date:	13 Oct-21 15:50	**Protocol:**	EC/EPS 1/RM/28	**Diluent:**	Dechlorinated Tap Water
Ending Date:	12 Nov-21 08:00	**Species:**	Oncorhynchus mykiss	**Brine:**	
Test Length:	29d 16h	**Taxon:**	Actinopterygii	**Source:**	Lyndon Fish Hatcheries **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
Dechlor Control	16-7987-2727	12 Oct-21	12 Oct-21	40h	Teck Coal	
Dechlor + Cu	15-4969-1985	12 Oct-21	12 Oct-21	40h		
① FR_UFR1	19-8746-8946	12 Oct-21 11:07	13 Oct-21 11:53	29h (0 °C)		
② GH_ER2	20-2628-4137	12 Oct-21 10:50	13 Oct-21 11:30	29h (0 °C)		
③ CM_MC1	18-3559-2852	12 Oct-21 13:20	13 Oct-21 11:30	26h (0.1 °C)		
④ LC_SLC	08-7937-3726	12 Oct-21 11:00	13 Oct-21 11:30	29h (2.9 °C)		
FR_FRABCH	18-7592-7020	12 Oct-21 11:20	13 Oct-21 11:53	28h (0 °C)		
FR_FRCP1	10-3969-8000	12 Oct-21 11:48	13 Oct-21 11:53	28h (1.3 °C)		
GH_FR1	11-8224-4576	12 Oct-21 10:00	13 Oct-21 11:30	30h (0 °C)		
GH_ERC	00-1276-7572	12 Oct-21 11:50	13 Oct-21 11:30	28h (0 °C)		
CM_MC2	03-9569-8600	12 Oct-21 12:47	13 Oct-21 11:30	27h (1.3 °C)		
EV_MC2	13-1923-7722	12 Oct-21 11:38	13 Oct-21 11:30	28h (0.2 °C)		
EV_HC1	18-6648-8827	12 Oct-21 10:33	13 Oct-21 11:30	29h (0 °C)		
LC_DCDS	17-4710-4100	12 Oct-21	13 Oct-21 11:30	40h (1.7 °C)		
LC_LC3	20-0894-5906	12 Oct-21 12:00	13 Oct-21 11:30	28h (8.8 °C)		
LC_LC5	14-5637-1032	12 Oct-21 13:30	13 Oct-21 11:30	26h (2.6 °C)		
LC_LCDSSLCC	06-4184-4349	12 Oct-21 12:30	13 Oct-21 11:30	27h (4.7 °C)		
FR_FR4	16-7272-1140	12 Oct-21 11:05	13 Oct-21 11:30	29h (0 °C)		
FR_FRRD	04-7874-3326	12 Oct-21 11:45	13 Oct-21 11:30	28h (0 °C)		
FR_FR2	09-1936-7906	12 Oct-21 10:25	13 Oct-21 11:30	29h (0 °C)		
FR_MULTIPLATE	07-2028-3040	12 Oct-21 09:45	13 Oct-21 11:30	30h (0 °C)		

Aside from Dechlor Control, all samples spiked with 20 ug/L Cu

① Reference sites

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
Dechlor Control	Control water	Teck Coal	Dechlor Control	
Dechlor + Cu	Contol+Cu	Teck Coal	Dechlor + 20 ug/L Cu	
② FR_UFR1	Water Sample	Teck Coal	FR_UFR1_WEK_2021-09-1	
② GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-10-12_	
③ CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-10-12	
① LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-10-19_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_WEK_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_WEK_2021-09	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-10-12_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-10-12	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-10-12	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2021_Q4_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2021_Q4_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-10-19	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-10-19_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-10-19_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	
FR_FR4	Water Sample	Teck Coal	FR_FR4_WS_2021-10-12_	
FR_FRRD	Water Sample	Teck Coal	FR_FRRD_WS_2021-10-12	
FR_FR2	Water Sample	Teck Coal	FR_FR2_WS_2021-10-12_	
FR_MULTIPLATE	Water Sample	Teck Coal	FR_MULTIPLATE_WS_202	

Analyst: YW QA: Dec 23/21

Salmonid Embryo-Alevin-Fry Survival Development and Growth Test — **Nautilus Environmental**

Analysis ID: 00-1734-5983 **Endpoint:** Mean Dry Weight-mg **CETIS Version:** CETISv1.9.4
Analyzed: 20 Dec-21 15:55 **Analysis:** Parametric-Control vs Treatments **Status Level:** 1

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	Dechlor + Cu passed mean dry weight-mg	22.85%
		FR_UFR1 passed mean dry weight-mg	22.85%
		GH_ER2 passed mean dry weight-mg	22.85%
		CM_MC1 passed mean dry weight-mg	22.85%
		LC_SLC passed mean dry weight-mg	22.85%
		FR_FRABCH passed mean dry weight-mg	22.85%
		FR_FRCP1 passed mean dry weight-mg	22.85%
		GH_FR1 passed mean dry weight-mg	22.85%
		GH_ERC passed mean dry weight-mg	22.85%
		CM_MC2 passed mean dry weight-mg	22.85%
		EV_MC2 passed mean dry weight-mg	22.85%
		EV_HC1 passed mean dry weight-mg	22.85%
		LC_DCDS passed mean dry weight-mg	22.85%
		LC_LC3 passed mean dry weight-mg	22.85%
		LC_LC5 passed mean dry weight-mg	22.85%
		LC_LCDSSLCC passed mean dry weight-mg	22.85%
		FR_FR4 passed mean dry weight-mg	22.85%
		FR_FRRD passed mean dry weight-mg	22.85%
		FR_FR2 passed mean dry weight-mg	22.85%
		FR_MULTIPLATE passed mean dry weight-m	22.85%

REFERENCE SITES

Dunnett Multiple Comparison Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Negative Control		Dechlor + Cu	0.6714	2.716	19.58	6	CDF	0.7942	Non-Significant Effect
		FR_UFR1	0.05205	2.716	19.58	6	CDF	0.9466	Non-Significant Effect
		GH_ER2	-0.3282	2.716	19.58	6	CDF	0.9821	Non-Significant Effect
		CM_MC1	-0.01405	2.716	19.58	6	CDF	0.9552	Non-Significant Effect
		LC_SLC	0.5058	2.716	19.58	6	CDF	0.8490	Non-Significant Effect
		FR_FRABCH	-1.081	2.716	19.58	6	CDF	0.9989	Non-Significant Effect
		FR_FRCP1	-1.141	2.716	19.58	6	CDF	0.9991	Non-Significant Effect
		GH_FR1	-2.267	2.716	19.58	6	CDF	1.0000	Non-Significant Effect
		GH_ERC	-1.704	2.716	19.58	6	CDF	0.9999	Non-Significant Effect
		CM_MC2	-1.467	2.716	19.58	6	CDF	0.9998	Non-Significant Effect
		EV_MC2	-0.1448	2.716	19.58	6	CDF	0.9689	Non-Significant Effect
		EV_HC1	-0.9829	2.716	19.58	6	CDF	0.9983	Non-Significant Effect
		LC_DCDS	-0.8632	2.716	19.58	6	CDF	0.9973	Non-Significant Effect
		LC_LC3	-0.4985	2.716	19.58	6	CDF	0.9897	Non-Significant Effect
		LC_LC5	-0.02542	2.716	19.58	6	CDF	0.9566	Non-Significant Effect
		LC_LCDSSLCC	-0.8157	2.716	19.58	6	CDF	0.9967	Non-Significant Effect
		FR_FR4	-0.9464	2.716	19.58	6	CDF	0.9980	Non-Significant Effect
		FR_FRRD	0.06408	2.716	21.15	5	CDF	0.9449	Non-Significant Effect
		FR_FR2	-0.6631	2.716	19.58	6	CDF	0.9942	Non-Significant Effect
		FR_MULTIPLATE	-1.088	2.716	19.58	6	CDF	0.9989	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	2248.07	112.403	20	1.082	0.3901	Non-Significant Effect
Error	6440.77	103.883	62			
Total	8688.84		82			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance Test	7.443	37.57	0.9950	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.961	0.9592	0.0129	Normal Distribution

Salmonid Embryo-Alevin-Fry Survival Development and Growth Test — **Nautilus Environmental**

Analysis ID:	00-1734-5983	**Endpoint:**	Mean Dry Weight-mg
Analyzed:	20 Dec-21 15:55	**Analysis:**	Parametric-Control vs Treatments
CETIS Version:	CETISv1.9.4		
Status Level:	1		

Mean Dry Weight-mg Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
Dechlor Control	N	4	85.68	71.28	100.1	87.69	73.04	94.29	4.525	10.56%	0.00%
Dechlor + Cu		4	80.84	70.07	91.61	83.52	70.8	85.52	3.385	8.38%	5.65%
FR_UFR1		4	85.3	67.58	103	84.23	74.62	98.15	5.568	13.05%	0.44%
GH_ER2		4	88.04	73.31	102.8	87.58	78.21	98.8	4.631	10.52%	-2.76%
CM_MC1		4	85.78	76.66	94.9	85.75	79.31	92.31	2.865	6.68%	-0.12%
LC_SLC		4	82.03	68.54	95.53	83.84	71.25	89.2	4.24	10.34%	4.25%
FR_FRABCH		4	93.47	74.15	112.8	93.11	81.11	106.5	6.07	12.99%	-9.09%
FR_FRCP1		4	93.9	76.26	111.5	97.59	78.33	102.1	5.543	11.81%	-9.60%
GH_FR1		4	102	74.31	129.7	98.68	85.93	124.8	8.708	17.07%	-19.07%
GH_ERC		4	97.96	86.31	109.6	97.85	89.63	106.5	3.663	7.48%	-14.34%
CM_MC2		4	96.25	76.88	115.6	98.92	79.29	107.9	6.088	12.65%	-12.34%
EV_MC2		4	86.72	71.89	101.6	90.68	72.92	92.61	4.661	10.75%	-1.22%
EV_HC1		4	92.76	75.5	110	94.58	78.08	103.8	5.424	11.69%	-8.27%
LC_DCDS		4	91.9	78.49	105.3	92.87	81.85	100	4.214	9.17%	-7.26%
LC_LC3		4	89.27	76.99	101.5	89.1	80	98.89	3.858	8.64%	-4.19%
LC_LC5		4	85.86	68.33	103.4	87.72	72.8	95.2	5.51	12.84%	-0.21%
LC_LCDSSLCC		4	91.56	75.17	107.9	93.27	78.57	101.1	5.151	11.25%	-6.86%
FR_FR4		4	92.5	83.09	101.9	95.29	83.64	95.79	2.957	6.39%	-7.96%
FR_FRRD		3	85.18	60.87	109.5	80.74	78.4	96.4	5.65	11.49%	0.58%
FR_FR2		4	90.46	73.45	107.5	92.3	76.84	100.4	5.346	11.82%	-5.58%
FR_MULTIPLATE		4	93.52	73.82	113.2	95.51	76.67	106.4	6.191	13.24%	-9.15%

Mean Dry Weight-mg Detail

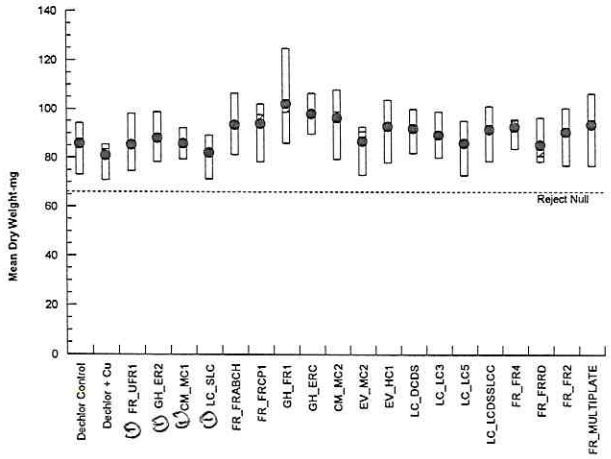
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Dechlor Control	N	86.3	73.04	89.09	94.29
Dechlor + Cu		85.52	70.8	83.04	84
FR_UFR1		77.5	74.62	90.95	98.15
GH_ER2		82.86	78.21	92.31	98.8
CM_MC1		83.1	79.31	92.31	88.4
LC_SLC		79.29	71.25	88.4	89.2
FR_FRABCH		85.42	81.11	100.8	106.5
FR_FRCP1		93.6	78.33	102.1	101.6
GH_FR1		91.25	85.93	124.8	106.1
GH_ERC		94.83	89.63	100.9	106.5
CM_MC2		97.04	79.29	107.9	100.8
EV_MC2		89.26	72.92	92.61	92.11
EV_HC1		92.5	78.08	96.67	103.8
LC_DCDS		88.15	81.85	100	97.6
LC_LC3		88.89	80	89.31	98.89
LC_LC5		80.67	72.8	95.2	94.78
LC_LCDSSLCC		88.15	78.57	98.4	101.1
FR_FR4		95.36	83.64	95.79	95.22
FR_FRRD		80.74	78.4	96.4	
FR_FR2		87.2	76.84	100.4	97.39
FR_MULTIPLATE		94.5	76.67	106.4	96.52

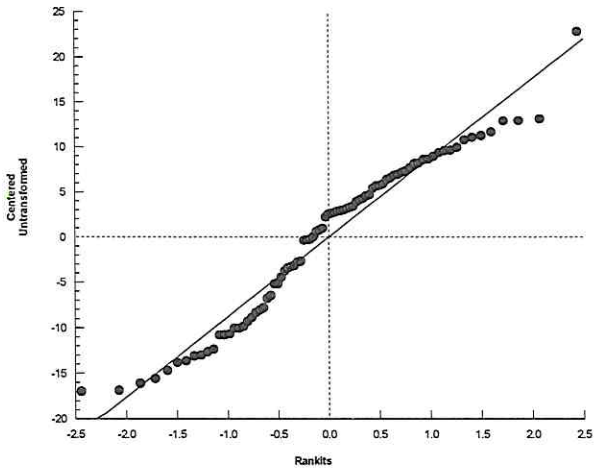
Reference sites

Salmonid Embryo-Alevin-~~Fry~~ Survival Development and Growth Test **Nautilus Environmental**

Analysis ID:	00-1734-5983	**Endpoint:**	Mean Dry Weight-mg	**CETIS Version:**	CETISv1.9.4
Analyzed:	20 Dec-21 15:55	**Analysis:**	Parametric-Control vs Treatments	**Status Level:**	1

Graphics





① Reference sites

Salmonid Embryo-Alevin-Fry Survival Development and Growth Test — **Nautilus Environmental**

Analysis ID:	14-6247-9480	**Endpoint:**	Length-mm	**CETIS Version:**	CETISv1.9.4
Analyzed:	20 Dec-21 15:55	**Analysis:**	Parametric-Control vs Treatments	**Status Level:**	1
Batch ID:	00-9465-4096	**Test Type:**	Survival-Development-Growth	**Analyst:**	Yvonne Lam
Start Date:	13 Oct-21 15:50	**Protocol:**	EC/EPS 1/RM/28	**Diluent:**	Dechlorinated Tap Water
Ending Date:	12 Nov-21 08:00	**Species:**	Oncorhynchus mykiss	**Brine:**	
Test Length:	29d 16h	**Taxon:**	Actinopterygii	**Source:**	Lyndon Fish Hatcheries **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
Dechlor + Cu	15-4969-1985	12 Oct-21	12 Oct-21	40h	Teck Coal	
FR_UFR1	19-8746-8946	12 Oct-21 11:07	13 Oct-21 11:53	29h (0 °C)		
GH_ER2	20-2628-4137	12 Oct-21 10:50	13 Oct-21 11:30	29h (0 °C)		
CM_MC1	18-3559-2852	12 Oct-21 13:20	13 Oct-21 11:30	26h (0.1 °C)		
LC_SLC	08-7937-3726	12 Oct-21 11:00	13 Oct-21 11:30	29h (2.9 °C)		
FR_FRABCH	18-7592-7020	12 Oct-21 11:20	13 Oct-21 11:53	28h (0 °C)		
FR_FRCP1	10-3969-8000	12 Oct-21 11:48	13 Oct-21 11:53	28h (1.3 °C)		
GH_FR1	11-8224-4576	12 Oct-21 10:00	13 Oct-21 11:30	30h (0 °C)		
GH_ERC	00-1276-7572	12 Oct-21 11:50	13 Oct-21 11:30	28h (0 °C)		
CM_MC2	03-9569-8600	12 Oct-21 12:47	13 Oct-21 11:30	27h (1.3 °C)		
EV_MC2	13-1923-7722	12 Oct-21 11:38	13 Oct-21 11:30	28h (0.2 °C)		
EV_HC1	18-6648-8827	12 Oct-21 10:33	13 Oct-21 11:30	29h (0 °C)		
LC_DCDS	17-4710-4100	12 Oct-21	13 Oct-21 11:30	40h (1.7 °C)		
LC_LC3	20-0894-5906	12 Oct-21 12:00	13 Oct-21 11:30	28h (8.8 °C)		
LC_LC5	14-5637-1032	12 Oct-21 13:30	13 Oct-21 11:30	26h (2.6 °C)		
LC_LCDSSLCC	06-4184-4349	12 Oct-21 12:30	13 Oct-21 11:30	27h (4.7 °C)		
FR_FR4	16-7272-1140	12 Oct-21 11:05	13 Oct-21 11:30	29h (0 °C)		
FR_FRRD	04-7874-3326	12 Oct-21 11:45	13 Oct-21 11:30	28h (0 °C)		
FR_FR2	09-1936-7906	12 Oct-21 10:25	13 Oct-21 11:30	29h (0 °C)		
FR_MULTIPLATE	07-2028-3040	12 Oct-21 09:45	13 Oct-21 11:30	30h (0 °C)		

All samples spiked with 20 ug/L Cu

5 Reference sites

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
Dechlor + Cu	Contol+Cu	Teck Coal	Dechlor + 20 ug/L Cu	
FR_UFR1	Water Sample	Teck Coal	FR_UFR1_WEK_2021-09-1	
GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-10-12_	
CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-10-12	
LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-10-19_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_WEK_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_WEK_2021-09	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-10-12_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-10-12	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-10-12	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2021_Q4_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2021_Q4_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-10-19	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-10-19_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-10-19_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	
FR_FR4	Water Sample	Teck Coal	FR_FR4_WS_2021-10-12_	
FR_FRRD	Water Sample	Teck Coal	FR_FRRD_WS_2021-10-12	
FR_FR2	Water Sample	Teck Coal	FR_FR2_WS_2021-10-12_	
FR_MULTIPLATE	Water Sample	Teck Coal	FR_MULTIPLATE_WS_202	

Analyst: YL QA: Dec 23/21

Salmonid Embryo-Alevin-~~Fry~~ Survival Development and Growth Test — **Nautilus Environmental**

Analysis ID:	14-6247-9480	**Endpoint:**	Length-mm	**CETIS Version:**	CETISv1.9.4
Analyzed:	20 Dec-21 15:55	**Analysis:**	Parametric-Control vs Treatments	**Status Level:**	1

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	① FR_UFR1 passed length-mm	9.36%
		① GH_ER2 passed length-mm	9.36%
		① CM_MC1 passed length-mm	9.36%
		① LC_SLC passed length-mm	9.36%
		FR_FRABCH passed length-mm	9.36%
		FR_FRCP1 passed length-mm	9.36%
		GH_FR1 passed length-mm	9.36%
		GH_ERC passed length-mm	9.36%
		CM_MC2 passed length-mm	9.36%
		EV_MC2 passed length-mm	9.36%
		EV_HC1 passed length-mm	9.36%
		LC_DCDS passed length-mm	9.36%
		LC_LC3 passed length-mm	9.36%
		LC_LC5 passed length-mm	9.36%
		LC_LCDSSLCC passed length-mm	9.36%
		FR_FR4 passed length-mm	9.36%
		FR_FRRD passed length-mm	9.36%
		FR_FR2 passed length-mm	9.36%
		FR_MULTIPLATE passed length-mm	9.36%

① Reference sites

Dunnett Multiple Comparison Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Lab Water (Dechlor + 20 mgICa)		① FR_UFR1	-1.839	2.705	1.636	6	CDF	1.0000	Non-Significant Effect
		① GH_ER2	-3.296	2.705	1.636	6	CDF	1.0000	Non-Significant Effect
		① CM_MC1	-2.342	2.705	1.636	6	CDF	1.0000	Non-Significant Effect
		① LC_SLC	-0.9115	2.705	1.636	6	CDF	0.9975	Non-Significant Effect
		FR_FRABCH	-3.815	2.705	1.636	6	CDF	1.0000	Non-Significant Effect
		FR_FRCP1	-3.6	2.705	1.636	6	CDF	1.0000	Non-Significant Effect
		GH_FR1	-4.273	2.705	1.636	6	CDF	1.0000	Non-Significant Effect
		GH_ERC	-3.984	2.705	1.636	6	CDF	1.0000	Non-Significant Effect
		CM_MC2	-4.407	2.705	1.636	6	CDF	1.0000	Non-Significant Effect
		EV_MC2	-1.849	2.705	1.636	6	CDF	1.0000	Non-Significant Effect
		EV_HC1	-2.813	2.705	1.636	6	CDF	1.0000	Non-Significant Effect
		LC_DCDS	-3.756	2.705	1.636	6	CDF	1.0000	Non-Significant Effect
		LC_LC3	-3.915	2.705	1.636	6	CDF	1.0000	Non-Significant Effect
		LC_LC5	-2.822	2.705	1.636	6	CDF	1.0000	Non-Significant Effect
		LC_LCDSSLCC	-4.619	2.705	1.636	6	CDF	1.0000	Non-Significant Effect
		FR_FR4	-3.498	2.705	1.636	6	CDF	1.0000	Non-Significant Effect
		FR_FRRD	-2.463	2.705	1.767	5	CDF	1.0000	Non-Significant Effect
		FR_FR2	-3.784	2.705	1.636	6	CDF	1.0000	Non-Significant Effect
		FR_MULTIPLATE	-3.249	2.705	1.636	6	CDF	1.0000	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	39.7029	2.08963	19	2.857	0.0011	Significant Effect
Error	43.1604	0.731532	59			
Total	82.8633		78			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance Test	12.19	36.19	0.8773	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9835	0.9574	0.4030	Normal Distribution

Analyst: _____ QA: Dec 23/21

Salmonid Embryo-Alevin-Fry Survival Development and Growth Test **Nautilus Environmental**

Analysis ID: 14-6247-9480 **Endpoint:** Length-mm **CETIS Version:** CETISv1.9.4
Analyzed: 20 Dec-21 15:55 **Analysis:** Parametric-Control vs Treatments **Status Level:** 1

Length-mm Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
Dechlor + Cu	L	4	17.47	15.81	19.14	17.8	16	18.29	0.5234	5.99%	0.00%
FR_UFR1		4	18.59	17.32	19.85	18.47	17.79	19.61	0.3962	4.26%	-6.37%
GH_ER2		4	19.47	18.95	19.98	19.47	19.09	19.84	0.162	1.66%	-11.41%
CM_MC1		4	18.89	18.01	19.76	19.07	18.1	19.31	0.2749	2.91%	-8.11%
LC_SLC		4	18.02	17.4	18.64	17.98	17.6	18.54	0.1949	2.16%	-3.15%
FR_FRABCH		4	19.78	18.39	21.17	19.74	18.8	20.85	0.4368	4.42%	-13.21%
FR_FRCP1		4	19.65	17.9	21.4	20.07	18.06	20.4	0.5499	5.60%	-12.46%
GH_FR1		4	20.06	18.76	21.35	20.03	19.32	20.85	0.4067	4.06%	-14.79%
GH_ERC		4	19.88	18.4	21.37	19.91	18.82	20.89	0.4672	4.70%	-13.79%
CM_MC2		4	20.14	19.36	20.91	20.26	19.46	20.56	0.2441	2.42%	-15.25%
EV_MC2		4	18.59	17.56	19.63	18.61	17.84	19.3	0.3255	3.50%	-6.40%
EV_HC1		4	19.17	17.55	20.79	18.86	18.4	20.57	0.5087	5.31%	-9.74%
LC_DCDS		4	19.74	18.17	21.32	19.61	18.72	21.04	0.4943	5.01%	-13.00%
LC_LC3		4	19.84	18.52	21.16	19.55	19.21	21.06	0.4162	4.20%	-13.55%
LC_LC5		4	19.18	17.08	21.27	19.49	17.32	20.41	0.6581	6.86%	-9.77%
LC_LCDSSLCC		4	20.27	18.83	21.7	20.06	19.52	21.43	0.4519	4.46%	-15.99%
FR_FR4		4	19.59	18.58	20.6	19.69	18.75	20.22	0.3182	3.25%	-12.11%
FR_FRRD		3	19.08	18.16	20	18.94	18.8	19.5	0.2134	1.94%	-9.21%
FR_FR2		4	19.76	18.05	21.47	20.04	18.29	20.67	0.5382	5.45%	-13.10%
FR_MULTIPLATE		4	19.44	17.83	21.05	19.63	18.18	20.3	0.5062	5.21%	-11.25%

Length-mm Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Dechlor + Cu	L	18.29	16	17.46	18.14
FR_UFR1		18.18	17.79	18.76	19.61
GH_ER2		19.34	19.09	19.6	19.84
CM_MC1		19.22	18.1	19.31	18.92
LC_SLC		17.91	17.6	18.04	18.54
FR_FRABCH		19.44	18.8	20.04	20.85
FR_FRCP1		19.78	18.06	20.4	20.37
GH_FR1		19.4	19.32	20.85	20.67
GH_ERC		19.43	18.82	20.39	20.89
CM_MC2		19.46	20.11	20.42	20.56
EV_MC2		18.93	18.29	19.3	17.84
EV_HC1		19.29	18.44	18.4	20.57
LC_DCDS		18.72	19.32	19.9	21.04
LC_LC3		19.43	19.21	19.67	21.06
LC_LC5		19.38	17.32	19.6	20.41
LC_LCDSSLCC		19.57	19.52	20.54	21.43
FR_FR4		19.91	18.75	19.47	20.22
FR_FRRD		18.94	18.8	19.5	
FR_FR2		19.64	18.29	20.44	20.67
FR_MULTIPLATE		19.05	18.18	20.3	20.22

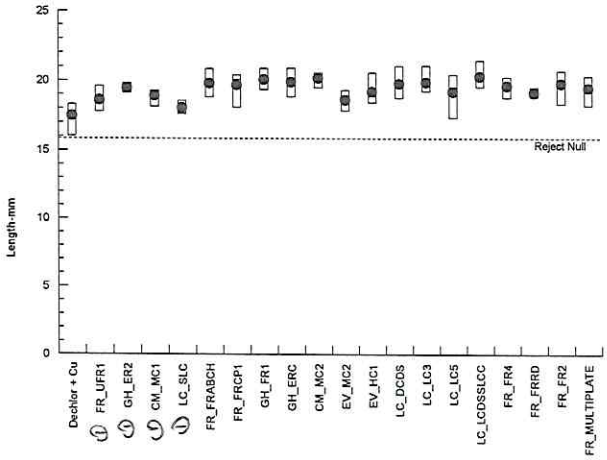
Reference sites

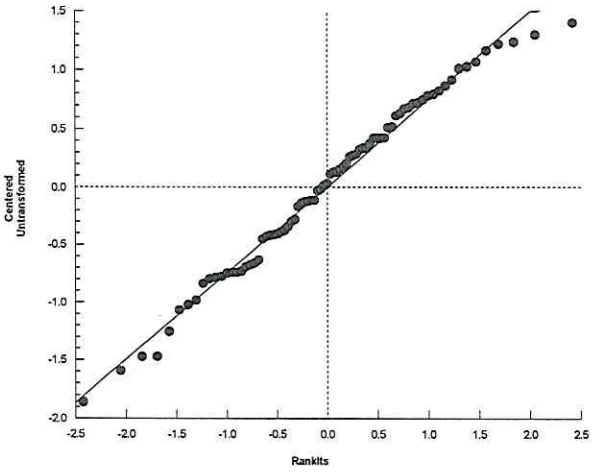
Analyst: VW QA: Dec-23/21

Salmonid Embryo-Alevin-~~Fry~~ Survival Development and Growth Test **Nautilus Environmental**

Analysis ID:	14-6247-9480	**Endpoint:**	Length-mm	**CETIS Version:**	CETISv1.9.4
Analyzed:	20 Dec-21 15:55	**Analysis:**	Parametric-Control vs Treatments	**Status Level:**	1

Graphics





① Reference sites

Analyst: KM QA: Dec 23/21

CETIS Analytical Report

Salmonid Embryo-Alevin-~~Fry~~ Survival Development and Growth Test — **Nautilus Environmental**

Analysis ID:	09-9717-7733	**Endpoint:**	Mean-~~Dry~~ Wet Weight-mg	**CETIS Version:**	CETISv1.9.4
Analyzed:	20 Dec-21 15:55	**Analysis:**	Parametric-Control vs Treatments	**Status Level:**	1
Batch ID:	00-9465-4096	**Test Type:**	Survival-Development-Growth	**Analyst:**	Yvonne Lam
Start Date:	13 Oct-21 15:50	**Protocol:**	EC/EPS 1/RM/28	**Diluent:**	Dechlorinated Tap Water
Ending Date:	12 Nov-21 08:00	**Species:**	Oncorhynchus mykiss	**Brine:**	
Test Length:	29d 16h	**Taxon:**	Actinopterygii	**Source:**	Lyndon Fish Hatcheries **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
Dechlor + Cu	15-4969-1985	12 Oct-21	12 Oct-21	40h	Teck Coal	
① FR_UFR1	19-8746-8946	12 Oct-21 11:07	13 Oct-21 11:53	29h (0 °C)		
② GH_ER2	20-2628-4137	12 Oct-21 10:50	13 Oct-21 11:30	29h (0 °C)		
③ CM_MC1	18-3559-2852	12 Oct-21 13:20	13 Oct-21 11:30	26h (0.1 °C)		
④ LC_SLC	08-7937-3726	12 Oct-21 11:00	13 Oct-21 11:30	29h (2.9 °C)		
FR_FRABCH	18-7592-7020	12 Oct-21 11:20	13 Oct-21 11:53	28h (0 °C)		
FR_FRCP1	10-3969-8000	12 Oct-21 11:48	13 Oct-21 11:53	28h (1.3 °C)		
GH_FR1	11-8224-4576	12 Oct-21 10:00	13 Oct-21 11:30	30h (0 °C)		
GH_ERC	00-1276-7572	12 Oct-21 11:50	13 Oct-21 11:30	28h (0 °C)		
CM_MC2	03-9569-8600	12 Oct-21 12:47	13 Oct-21 11:30	27h (1.3 °C)		
EV_MC2	13-1923-7722	12 Oct-21 11:38	13 Oct-21 11:30	28h (0.2 °C)		
EV_HC1	18-6648-8827	12 Oct-21 10:33	13 Oct-21 11:30	29h (0 °C)		
LC_DCDS	17-4710-4100	12 Oct-21	13 Oct-21 11:30	40h (1.7 °C)		
LC_LC3	20-0894-5906	12 Oct-21 12:00	13 Oct-21 11:30	28h (8.8 °C)		
LC_LC5	14-5637-1032	12 Oct-21 13:30	13 Oct-21 11:30	26h (2.6 °C)		
LC_LCDSSLCC	06-4184-4349	12 Oct-21 12:30	13 Oct-21 11:30	27h (4.7 °C)		
FR_FR4	16-7272-1140	12 Oct-21 11:05	13 Oct-21 11:30	29h (0 °C)		
FR_FRRD	04-7874-3326	12 Oct-21 11:45	13 Oct-21 11:30	28h (0 °C)		
FR_FR2	09-1936-7906	12 Oct-21 10:25	13 Oct-21 11:30	29h (0 °C)		
FR_MULTIPLATE	07-2028-3040	12 Oct-21 09:45	13 Oct-21 11:30	30h (0 °C)		

All Samples spiked with 20 ug/L Cu

① Reference sites

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
Dechlor + Cu	Contol+Cu	Teck Coal	Dechlor + 20 ug/L Cu	
① FR_UFR1	Water Sample	Teck Coal	FR_UFR1_WEK_2021-09-1	
② GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-10-12_	
③ CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-10-12	
④ LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-10-19_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_WEK_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_WEK_2021-09	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-10-12_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-10-12	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-10-12	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2021_Q4_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2021_Q4_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-10-19	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-10-19_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-10-19_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	
FR_FR4	Water Sample	Teck Coal	FR_FR4_WS_2021-10-12_	
FR_FRRD	Water Sample	Teck Coal	FR_FRRD_WS_2021-10-12	
FR_FR2	Water Sample	Teck Coal	FR_FR2_WS_2021-10-12_	
FR_MULTIPLATE	Water Sample	Teck Coal	FR_MULTIPLATE_WS_202	

Analyst: YVL QA: Dec 23/21

Salmonid Embryo-Alevin-~~Fry~~ Survival Development and Growth Test — **Nautilus Environmental**

Analysis ID:	09-9717-7733	**Endpoint:**	Mean-~~Dry~~ Weight-mg	**CETIS Version:**	CETISv1.9.4
Analyzed:	20 Dec-21 15:55	**Analysis:**	Parametric-Control vs Treatments	**Status Level:**	1

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	FR_UFR1 passed mean dry weight-mg	24.25%
		GH_ER2 passed mean dry weight-mg	24.25%
		CM_MC1 passed mean dry weight-mg	24.25%
		LC_SLC passed mean dry weight-mg	24.25%
		FR_FRABCH passed mean dry weight-mg	24.25%
		FR_FRCP1 passed mean dry weight-mg	24.25%
		GH_FR1 passed mean dry weight-mg	24.25%
		GH_ERC passed mean dry weight-mg	24.25%
		CM_MC2 passed mean dry weight-mg	24.25%
		EV_MC2 passed mean dry weight-mg	24.25%
		EV_HC1 passed mean dry weight-mg	24.25%
		LC_DCDS passed mean dry weight-mg	24.25%
		LC_LC3 passed mean dry weight-mg	24.25%
		LC_LC5 passed mean dry weight-mg	24.25%
		LC_LCDSSLCC passed mean dry weight-mg	24.25%
		FR_FR4 passed mean dry weight-mg	24.25%
		FR_FRRD passed mean dry weight-mg	24.25%
		FR_FR2 passed mean dry weight-mg	24.25%
		FR_MULTIPLATE passed mean dry weight-m	24.25%

Reference sites

Dunnett Multiple Comparison Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Lab Water (Bachler & 20 mS/cm)		FR_UFR1	-0.6161	2.705	19.6	6	CDF	0.9927	Non-Significant Effect
		GH_ER2	-0.9943	2.705	19.6	6	CDF	0.9982	Non-Significant Effect
		CM_MC1	-0.6818	2.705	19.6	6	CDF	0.9942	Non-Significant Effect
		LC_SLC	-0.1648	2.705	19.6	6	CDF	0.9690	Non-Significant Effect
		FR_FRABCH	-1.743	2.705	19.6	6	CDF	1.0000	Non-Significant Effect
		FR_FRCP1	-1.803	2.705	19.6	6	CDF	1.0000	Non-Significant Effect
		GH_FR1	-2.923	2.705	19.6	6	CDF	1.0000	Non-Significant Effect
		GH_ERC	-2.363	2.705	19.6	6	CDF	1.0000	Non-Significant Effect
		CM_MC2	-2.127	2.705	19.6	6	CDF	1.0000	Non-Significant Effect
		EV_MC2	-0.8118	2.705	19.6	6	CDF	0.9964	Non-Significant Effect
		EV_HC1	-1.646	2.705	19.6	6	CDF	0.9999	Non-Significant Effect
		LC_DCDS	-1.526	2.705	19.6	6	CDF	0.9998	Non-Significant Effect
		LC_LC3	-1.164	2.705	19.6	6	CDF	0.9991	Non-Significant Effect
		LC_LC5	-0.6931	2.705	19.6	6	CDF	0.9946	Non-Significant Effect
		LC_LCDSSLCC	-1.479	2.705	19.6	6	CDF	0.9998	Non-Significant Effect
		FR_FR4	-1.609	2.705	19.6	6	CDF	0.9999	Non-Significant Effect
		FR_FRRD	-0.5546	2.705	21.17	5	CDF	0.9909	Non-Significant Effect
		FR_FR2	-1.327	2.705	19.6	6	CDF	0.9996	Non-Significant Effect
		FR_MULTIPLATE	-1.75	2.705	19.6	6	CDF	1.0000	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	2165.65	113.982	19	1.086	0.3882	Non-Significant Effect
Error	6195.02	105	59			
Total	8360.67		78			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance Test	7.367	36.19	0.9920	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9626	0.9574	0.0207	Normal Distribution

Analyst: UW QA: Dec 23/21

Salmonid Embryo-Alevin ~~Fry~~ Survival Development and Growth Test — Nautilus Environmental

Analysis ID: 09-9717-7733 Endpoint: Mean ~~Dry~~ Weight-mg CETIS Version: CETISv1.9.4
Analyzed: 20 Dec-21 15:55 Analysis: Parametric-Control vs Treatments Status Level: 1

Mean ~~Dry~~ Weight-mg Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
Dechlor + Cu	L	4	80.84	70.07	91.61	83.52	70.8	85.52	3.385	8.38%	0.00%
① FR_UFR1		4	85.3	67.58	103	84.23	74.62	98.15	5.568	13.05%	-5.52%
① GH_ER2		4	88.04	73.31	102.8	87.58	78.21	98.8	4.631	10.52%	-8.91%
① CM_MC1		4	85.78	76.66	94.9	85.75	79.31	92.31	2.865	6.68%	-6.11%
① LC_SLC		4	82.03	68.54	95.53	83.84	71.25	89.2	4.24	10.34%	-1.48%
FR_FRABCH		4	93.47	74.15	112.8	93.11	81.11	106.5	6.07	12.99%	-15.62%
FR_FRCP1		4	93.9	76.26	111.5	97.59	78.33	102.1	5.543	11.81%	-16.16%
GH_FR1		4	102	74.31	129.7	98.68	85.93	124.8	8.708	17.07%	-26.20%
GH_ERC		4	97.96	86.31	109.6	97.85	89.63	106.5	3.663	7.48%	-21.18%
CM_MC2		4	96.25	76.88	115.6	98.92	79.29	107.9	6.088	12.65%	-19.07%
EV_MC2		4	86.72	71.89	101.6	90.68	72.92	92.61	4.661	10.75%	-7.28%
EV_HC1		4	92.76	75.5	110	94.58	78.08	103.8	5.424	11.69%	-14.75%
LC_DCDS		4	91.9	78.49	105.3	92.87	81.85	100	4.214	9.17%	-13.68%
LC_LC3		4	89.27	76.99	101.5	89.1	80	98.89	3.858	8.64%	-10.43%
LC_LC5		4	85.86	68.33	103.4	87.72	72.8	95.2	5.51	12.84%	-6.21%
LC_LCDSSLCC		4	91.56	75.17	107.9	93.27	78.57	101.1	5.151	11.25%	-13.26%
FR_FR4		4	92.5	83.09	101.9	95.29	83.64	95.79	2.957	6.39%	-14.42%
FR_FRRD		3	85.18	60.87	109.5	80.74	78.4	96.4	5.65	11.49%	-5.37%
FR_FR2		4	90.46	73.45	107.5	92.3	76.84	100.4	5.346	11.82%	-11.90%
FR_MULTIPLATE		4	93.52	73.82	113.2	95.51	76.67	106.4	6.191	13.24%	-15.69%

Mean ~~Dry~~ Weight-mg Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
Dechlor + Cu	L	85.52	70.8	83.04	84
① FR_UFR1		77.5	74.62	90.95	98.15
① GH_ER2		82.86	78.21	92.31	98.8
① CM_MC1		83.1	79.31	92.31	88.4
① LC_SLC		79.29	71.25	88.4	89.2
FR_FRABCH		85.42	81.11	100.8	106.5
FR_FRCP1		93.6	78.33	102.1	101.6
GH_FR1		91.25	85.93	124.8	106.1
GH_ERC		94.83	89.63	100.9	106.5
CM_MC2		97.04	79.29	107.9	100.8
EV_MC2		89.26	72.92	92.61	92.11
EV_HC1		92.5	78.08	96.67	103.8
LC_DCDS		88.15	81.85	100	97.6
LC_LC3		88.89	80	89.31	98.89
LC_LC5		80.67	72.8	95.2	94.78
LC_LCDSSLCC		88.15	78.57	98.4	101.1
FR_FR4		95.36	83.64	95.79	95.22
FR_FRRD		80.74	78.4	96.4	
FR_FR2		87.2	76.84	100.4	97.39
FR_MULTIPLATE		94.5	76.67	106.4	96.52

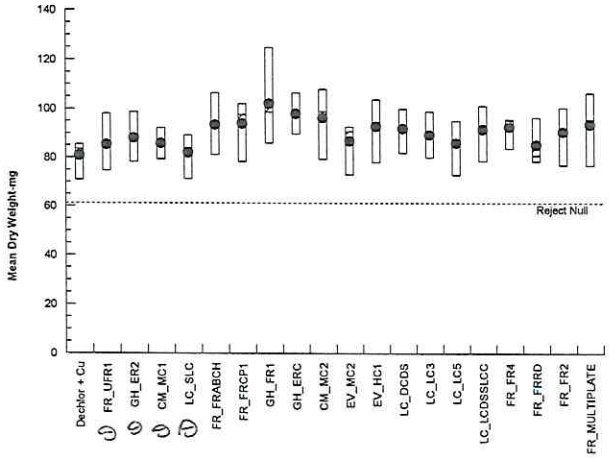
① Reference STEs

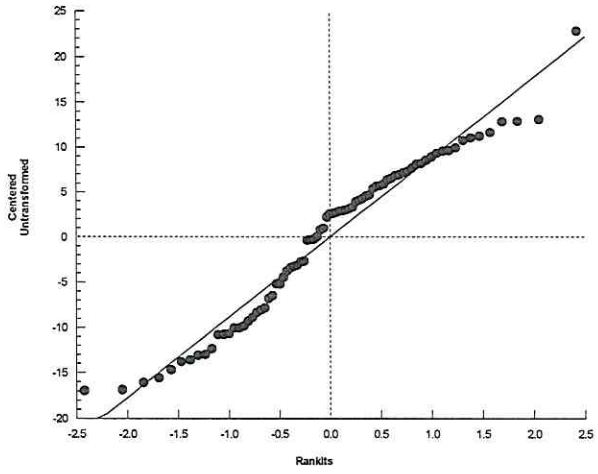
Analyst: UW QA: Dec 23/21

Salmonid Embryo-Alevin-~~Fry~~ Survival Development and Growth Test **Nautilus Environmental**

Analysis ID:	09-9717-7733	**Endpoint:**	Mean Dry Weight-mg	**CETIS Version:**	CETISv1.9.4
Analyzed:	20 Dec-21 15:55	**Analysis:**	Parametric-Control vs Treatments	**Status Level:**	1

Graphics





0 Reference sites

Analyst: [signature] QA: [signature] Dec 23/21

Salmonid Embryo-Alevin-~~Fry~~ Survival Development and Growth Test — **Nautilus Environmental**

Analysis ID:	13-1024-8221	**Endpoint:**	Length-mm	**CETIS Version:**	CETISv1.9.4
Analyzed:	20 Dec-21 15:56	**Analysis:**	Parametric-Control vs Treatments	**Status Level:**	1
Batch ID:	00-9465-4096	**Test Type:**	Survival-Development-Growth	**Analyst:**	Yvonne Lam
Start Date:	13 Oct-21 15:50	**Protocol:**	EC/EPS 1/RM/28	**Diluent:**	Dechlorinated Tap Water
Ending Date:	12 Nov-21 08:00	**Species:**	Oncorhynchus mykiss	**Brine:**	
Test Length:	29d 16h	**Taxon:**	Actinopterygii	**Source:**	Lyndon Fish Hatcheries **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
FR_UFR1	19-8746-8946	12 Oct-21 11:07	13 Oct-21 11:53	29h (0 °C)	Teck Coal	
GH_ER2	20-2628-4137	12 Oct-21 10:50	13 Oct-21 11:30	29h (0 °C)		
CM_MC1	18-3559-2852	12 Oct-21 13:20	13 Oct-21 11:30	26h (0.1 °C)		
LC_SLC	08-7937-3726	12 Oct-21 11:00	13 Oct-21 11:30	29h (2.9 °C)		
FR_FRABCH	18-7592-7020	12 Oct-21 11:20	13 Oct-21 11:53	28h (0 °C)		
FR_FRCP1	10-3969-8000	12 Oct-21 11:48	13 Oct-21 11:53	28h (1.3 °C)		
GH_FR1	11-8224-4576	12 Oct-21 10:00	13 Oct-21 11:30	30h (0 °C)		
GH_ERC	00-1276-7572	12 Oct-21 11:50	13 Oct-21 11:30	28h (0 °C)		
CM_MC2	03-9569-8600	12 Oct-21 12:47	13 Oct-21 11:30	27h (1.3 °C)		
EV_MC2	13-1923-7722	12 Oct-21 11:38	13 Oct-21 11:30	28h (0.2 °C)		
EV_HC1	18-6648-8827	12 Oct-21 10:33	13 Oct-21 11:30	29h (0 °C)		
LC_DCDS	17-4710-4100	12 Oct-21	13 Oct-21 11:30	40h (1.7 °C)		
LC_LC3	20-0894-5906	12 Oct-21 12:00	13 Oct-21 11:30	28h (8.8 °C)		
LC_LC5	14-5637-1032	12 Oct-21 13:30	13 Oct-21 11:30	26h (2.6 °C)		
LC_LCDSSLCC	06-4184-4349	12 Oct-21 12:30	13 Oct-21 11:30	27h (4.7 °C)		
FR_FR4	16-7272-1140	12 Oct-21 11:05	13 Oct-21 11:30	29h (0 °C)		
FR_FRRD	04-7874-3326	12 Oct-21 11:45	13 Oct-21 11:30	28h (0 °C)		
FR_FR2	09-1936-7906	12 Oct-21 10:25	13 Oct-21 11:30	29h (0 °C)		
FR_MULTIPLATE	07-2028-3040	12 Oct-21 09:45	13 Oct-21 11:30	30h (0 °C)		

All samples spiked with 20 ug/L Cu

10 Reference sites

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_UFR1	Water Sample	Teck Coal	FR_UFR1_WEK_2021-09-1	
GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-10-12_	
CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-10-12	
LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-10-19_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_WEK_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_WEK_2021-09	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-10-12_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-10-12	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-10-12	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2021_Q4_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2021_Q4_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-10-19	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-10-19_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-10-19_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	
FR_FR4	Water Sample	Teck Coal	FR_FR4_WS_2021-10-12_	
FR_FRRD	Water Sample	Teck Coal	FR_FRRD_WS_2021-10-12	
FR_FR2	Water Sample	Teck Coal	FR_FR2_WS_2021-10-12_	
FR_MULTIPLATE	Water Sample	Teck Coal	FR_MULTIPLATE_WS_202	

Analyst: YL QA: Dec 23/21

Salmonid Embryo-Alevin-~~Fry~~ Survival Development and Growth Test **Nautilus Environmental**

Analysis ID: 13-1024-8221 **Endpoint:** Length-mm **CETIS Version:** CETISv1.9.4
Analyzed: 20 Dec-21 15:56 **Analysis:** Parametric-Control vs Treatments **Status Level:** 1

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	GH_ER2 passed length-mm	8.65%
		CM_MC1 passed length-mm	8.65%
		LC_SLC passed length-mm	8.65%
		FR_FRABCH passed length-mm	8.65%
		FR_FRCP1 passed length-mm	8.65%
		GH_FR1 passed length-mm	8.65%
		GH_ERC passed length-mm	8.65%
		CM_MC2 passed length-mm	8.65%
		EV_MC2 passed length-mm	8.65%
		EV_HC1 passed length-mm	8.65%
		LC_DCDS passed length-mm	8.65%
		LC_LC3 passed length-mm	8.65%
		LC_LC5 passed length-mm	8.65%
		LC_LCDSSLCC passed length-mm	8.65%
		FR_FR4 passed length-mm	8.65%
		FR_FRRD passed length-mm	8.65%
		FR_FR2 passed length-mm	8.65%
		FR_MULTIPLATE passed length-mm	8.65%

① Reference sites

Dunnett Multiple Comparison Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Upstream Control (FR_UFRI)		GH_ER2	-1.477	2.694	1.607	6	CDF	0.9997	Non-Significant Effect
		CM_MC1	-0.5091	2.694	1.607	6	CDF	0.9887	Non-Significant Effect
		LC_SLC	0.9406	2.694	1.607	6	CDF	0.6689	Non-Significant Effect
		FR_FRABCH	-2.003	2.694	1.607	6	CDF	1.0000	Non-Significant Effect
		FR_FRCP1	-1.785	2.694	1.607	6	CDF	0.9999	Non-Significant Effect
		GH_FR1	-2.466	2.694	1.607	6	CDF	1.0000	Non-Significant Effect
		GH_ERC	-2.174	2.694	1.607	6	CDF	1.0000	Non-Significant Effect
		CM_MC2	-2.602	2.694	1.607	6	CDF	1.0000	Non-Significant Effect
		EV_MC2	-0.01006	2.694	1.607	6	CDF	0.9500	Non-Significant Effect
		EV_HC1	-0.9867	2.694	1.607	6	CDF	0.9980	Non-Significant Effect
		LC_DCDS	-1.943	2.694	1.607	6	CDF	1.0000	Non-Significant Effect
		LC_LC3	-2.104	2.694	1.607	6	CDF	1.0000	Non-Significant Effect
		LC_LC5	-0.9955	2.694	1.607	6	CDF	0.9981	Non-Significant Effect
		LC_LCDSSLCC	-2.817	2.694	1.607	6	CDF	1.0000	Non-Significant Effect
		FR_FR4	-1.681	2.694	1.607	6	CDF	0.9999	Non-Significant Effect
		FR_FRRD	-0.7701	2.694	1.736	5	CDF	0.9956	Non-Significant Effect
		FR_FR2	-1.971	2.694	1.607	6	CDF	1.0000	Non-Significant Effect
		FR_MULTIPLATE	-1.429	2.694	1.607	6	CDF	0.9997	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	25.1133	1.39518	18	1.959	0.0288	Significant Effect
Error	39.8731	0.71202	56			
Total	64.9864		74			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance Test	11.92	34.81	0.8516	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9853	0.9554	0.5407	Normal Distribution

Salmonid Embryo-Alevin-~~Fry~~ Survival Development and Growth Test — **Nautilus Environmental**

Analysis ID: 13-1024-8221 **Endpoint:** Length-mm **CETIS Version:** CETISv1.9.4
Analyzed: 20 Dec-21 15:56 **Analysis:** Parametric-Control vs Treatments **Status Level:** 1

Length-mm Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
FR_UFR1	U	4	18.59	17.32	19.85	18.47	17.79	19.61	0.3962	4.26%	0.00%
GH_ER2		4	19.47	18.95	19.98	19.47	19.09	19.84	0.162	1.66%	-4.74%
CM_MC1		4	18.89	18.01	19.76	19.07	18.1	19.31	0.2749	2.91%	-1.63%
LC_SLC		4	18.02	17.4	18.64	17.98	17.6	18.54	0.1949	2.16%	3.02%
FR_FRABCH		4	19.78	18.39	21.17	19.74	18.8	20.85	0.4368	4.42%	-6.43%
FR_FRCP1		4	19.65	17.9	21.4	20.07	18.06	20.4	0.5499	5.60%	-5.73%
GH_FR1		4	20.06	18.76	21.35	20.03	19.32	20.85	0.4067	4.06%	-7.92%
GH_ERC		4	19.88	18.4	21.37	19.91	18.82	20.89	0.4672	4.70%	-6.98%
CM_MC2		4	20.14	19.36	20.91	20.26	19.46	20.56	0.2441	2.42%	-8.35%
EV_MC2		4	18.59	17.56	19.63	18.61	17.84	19.3	0.3255	3.50%	-0.03%
EV_HC1		4	19.17	17.55	20.79	18.86	18.4	20.57	0.5087	5.31%	-3.17%
LC_DCDS		4	19.74	18.17	21.32	19.61	18.72	21.04	0.4943	5.01%	-6.24%
LC_LC3		4	19.84	18.52	21.16	19.55	19.21	21.06	0.4162	4.20%	-6.75%
LC_LC5		4	19.18	17.08	21.27	19.49	17.32	20.41	0.6581	6.86%	-3.20%
LC_LCDSSLCC		4	20.27	18.83	21.7	20.06	19.52	21.43	0.4519	4.46%	-9.04%
FR_FR4		4	19.59	18.58	20.6	19.69	18.75	20.22	0.3182	3.25%	-5.40%
FR_FRRD		3	19.08	18.16	20	18.94	18.8	19.5	0.2134	1.94%	-2.67%
FR_FR2		4	19.76	18.05	21.47	20.04	18.29	20.67	0.5382	5.45%	-6.33%
FR_MULTIPLATE		4	19.44	17.83	21.05	19.63	18.18	20.3	0.5062	5.21%	-4.59%

Length-mm Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
FR_UFR1	U	18.18	17.79	18.76	19.61
GH_ER2		19.34	19.09	19.6	19.84
CM_MC1		19.22	18.1	19.31	18.92
LC_SLC		17.91	17.6	18.04	18.54
FR_FRABCH		19.44	18.8	20.04	20.85
FR_FRCP1		19.78	18.06	20.4	20.37
GH_FR1		19.4	19.32	20.85	20.67
GH_ERC		19.43	18.82	20.39	20.89
CM_MC2		19.46	20.11	20.42	20.56
EV_MC2		18.93	18.29	19.3	17.84
EV_HC1		19.29	18.44	18.4	20.57
LC_DCDS		18.72	19.32	19.9	21.04
LC_LC3		19.43	19.21	19.67	21.06
LC_LC5		19.38	17.32	19.6	20.41
LC_LCDSSLCC		19.57	19.52	20.54	21.43
FR_FR4		19.91	18.75	19.47	20.22
FR_FRRD		18.94	18.8	19.5	
FR_FR2		19.64	18.29	20.44	20.67
FR_MULTIPLATE		19.05	18.18	20.3	20.22

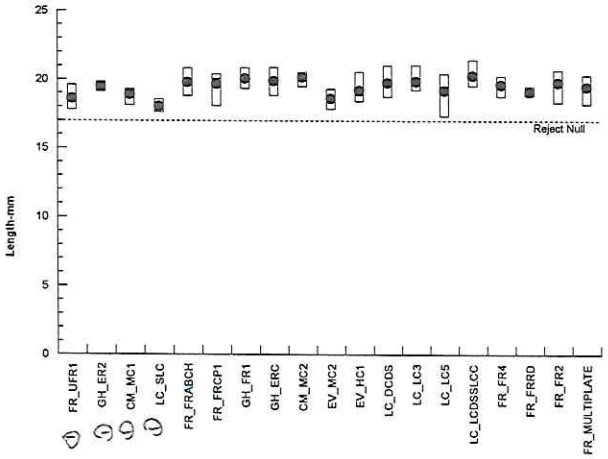
Preferred sites

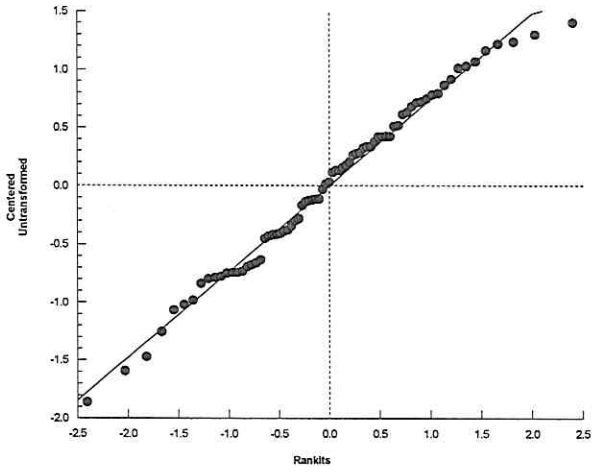
Analyst: UW QA: DEC 23/21

Salmonid Embryo-Alevin-~~Fry~~ Survival Development and Growth Test **Nautilus Environmental**

Analysis ID:	13-1024-8221	**Endpoint:**	Length-mm	**CETIS Version:**	CETISv1.9.4
Analyzed:	20 Dec-21 15:56	**Analysis:**	Parametric-Control vs Treatments	**Status Level:**	1

Graphics





① Reference sites

CETIS Analytical Report

Salmonid Embryo-Alevin ~~Fry~~ wet Survival Development and Growth Test — **Nautilus Environmental**

Analysis ID:	20-0566-4991	**Endpoint:**	Mean ~~Dry~~ wet Weight-mg	**CETIS Version:**	CETISv1.9.4
Analyzed:	20 Dec-21 15:56	**Analysis:**	Parametric-Control vs Treatments	**Status Level:**	1
Batch ID:	00-9465-4096	**Test Type:**	Survival-Development-Growth	**Analyst:**	Yvonne Lam
Start Date:	13 Oct-21 15:50	**Protocol:**	EC/EPS 1/RM/28	**Diluent:**	Dechlorinated Tap Water
Ending Date:	12 Nov-21 08:00	**Species:**	Oncorhynchus mykiss	**Brine:**	
Test Length:	29d 16h	**Taxon:**	Actinopterygii	**Source:**	Lyndon Fish Hatcheries **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
FR_UFR1	19-8746-8946	12 Oct-21 11:07	13 Oct-21 11:53	29h (0 °C)	Teck Coal	
GH_ER2	20-2628-4137	12 Oct-21 10:50	13 Oct-21 11:30	29h (0 °C)		
CM_MC1	18-3559-2852	12 Oct-21 13:20	13 Oct-21 11:30	26h (0.1 °C)		
LC_SLC	08-7937-3726	12 Oct-21 11:00	13 Oct-21 11:30	29h (2.9 °C)		
FR_FRABCH	18-7592-7020	12 Oct-21 11:20	13 Oct-21 11:53	28h (0 °C)		
FR_FRCP1	10-3969-8000	12 Oct-21 11:48	13 Oct-21 11:53	28h (1.3 °C)		
GH_FR1	11-8224-4576	12 Oct-21 10:00	13 Oct-21 11:30	30h (0 °C)		
GH_ERC	00-1276-7572	12 Oct-21 11:50	13 Oct-21 11:30	28h (0 °C)		
CM_MC2	03-9569-8600	12 Oct-21 12:47	13 Oct-21 11:30	27h (1.3 °C)		
EV_MC2	13-1923-7722	12 Oct-21 11:38	13 Oct-21 11:30	28h (0.2 °C)		
EV_HC1	18-6648-8827	12 Oct-21 10:33	13 Oct-21 11:30	29h (0 °C)		
LC_DCDS	17-4710-4100	12 Oct-21	13 Oct-21 11:30	40h (1.7 °C)		
LC_LC3	20-0894-5906	12 Oct-21 12:00	13 Oct-21 11:30	28h (8.8 °C)		
LC_LC5	14-5637-1032	12 Oct-21 13:30	13 Oct-21 11:30	26h (2.6 °C)		
LC_LCDSSLCC	06-4184-4349	12 Oct-21 12:30	13 Oct-21 11:30	27h (4.7 °C)		
FR_FR4	16-7272-1140	12 Oct-21 11:05	13 Oct-21 11:30	29h (0 °C)		
FR_FRRD	04-7874-3326	12 Oct-21 11:45	13 Oct-21 11:30	28h (0 °C)		
FR_FR2	09-1936-7906	12 Oct-21 10:25	13 Oct-21 11:30	29h (0 °C)		
FR_MULTIPLATE	07-2028-3040	12 Oct-21 09:45	13 Oct-21 11:30	30h (0 °C)		

All samples spiked with 20 mg/L Cu

Reference sites

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_UFR1	Water Sample	Teck Coal	FR_UFR1_WEK_2021-09-1	
GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-10-12_	
CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-10-12	
LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-10-19_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_WEK_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_WEK_2021-09	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-10-12_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-10-12	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-10-12	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2021_Q4_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2021_Q4_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-10-19	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-10-19_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-10-19_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	
FR_FR4	Water Sample	Teck Coal	FR_FR4_WS_2021-10-12_	
FR_FRRD	Water Sample	Teck Coal	FR_FRRD_WS_2021-10-12	
FR_FR2	Water Sample	Teck Coal	FR_FR2_WS_2021-10-12_	
FR_MULTIPLATE	Water Sample	Teck Coal	FR_MULTIPLATE_WS_202	

 Analyst: YL QA: Dec 23/21

Salmonid Embryo-Alevin-~~Fry~~ Survival Development and Growth Test **Nautilus Environmental**

Analysis ID: 20-0566-4991 **Endpoint:** Mean ~~Dry~~ Weight-mg **CETIS Version:** CETISv1.9.4
Analyzed: 20 Dec-21 15:56 **Analysis:** Parametric-Control vs Treatments **Status Level:** 1

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	GH_ER2 passed mean dry weight-mg	23.22%
		CM_MC1 passed mean dry weight-mg	23.22%
		LC_SLC passed mean dry weight-mg	23.22%
		FR_FRABCH passed mean dry weight-mg	23.22%
		FR_FRCP1 passed mean dry weight-mg	23.22%
		GH_FR1 passed mean dry weight-mg	23.22%
		GH_ERC passed mean dry weight-mg	23.22%
		CM_MC2 passed mean dry weight-mg	23.22%
		EV_MC2 passed mean dry weight-mg	23.22%
		EV_HC1 passed mean dry weight-mg	23.22%
		LC_DCDS passed mean dry weight-mg	23.22%
		LC_LC3 passed mean dry weight-mg	23.22%
		LC_LC5 passed mean dry weight-mg	23.22%
		LC_LCDSSLCC passed mean dry weight-mg	23.22%
		FR_FR4 passed mean dry weight-mg	23.22%
		FR_FRRD passed mean dry weight-mg	23.22%
		FR_FR2 passed mean dry weight-mg	23.22%
		FR_MULTIPLATE passed mean dry weight-m	23.22%

Reference sites

Dunnett Multiple Comparison Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Upstream Control (FR_UFR1)		GH_ER2	-0.3727	2.694	19.81	6	CDF	0.9824	Non-Significant Effect
		CM_MC1	-0.06478	2.694	19.81	6	CDF	0.9568	Non-Significant Effect
		LC_SLC	0.4446	2.694	19.81	6	CDF	0.8564	Non-Significant Effect
		FR_FRABCH	-1.11	2.694	19.81	6	CDF	0.9988	Non-Significant Effect
		FR_FRCP1	-1.169	2.694	19.81	6	CDF	0.9990	Non-Significant Effect
		GH_FR1	-2.273	2.694	19.81	6	CDF	1.0000	Non-Significant Effect
		GH_ERC	-1.721	2.694	19.81	6	CDF	0.9999	Non-Significant Effect
		CM_MC2	-1.489	2.694	19.81	6	CDF	0.9998	Non-Significant Effect
		EV_MC2	-0.1929	2.694	19.81	6	CDF	0.9698	Non-Significant Effect
		EV_HC1	-1.014	2.694	19.81	6	CDF	0.9982	Non-Significant Effect
		LC_DCDS	-0.8969	2.694	19.81	6	CDF	0.9972	Non-Significant Effect
		LC_LC3	-0.5396	2.694	19.81	6	CDF	0.9898	Non-Significant Effect
		LC_LC5	-0.07592	2.694	19.81	6	CDF	0.9581	Non-Significant Effect
		LC_LCDSSLCC	-0.8504	2.694	19.81	6	CDF	0.9966	Non-Significant Effect
		FR_FR4	-0.9785	2.694	19.81	6	CDF	0.9979	Non-Significant Effect
		FR_FRRD	0.01558	2.694	21.4	5	CDF	0.9465	Non-Significant Effect
		FR_FR2	-0.7009	2.694	19.81	6	CDF	0.9942	Non-Significant Effect
		FR_MULTIPLATE	-1.117	2.694	19.81	6	CDF	0.9988	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	1786.08	99.2264	18	0.9173	0.5619	Non-Significant Effect
Error	6057.5	108.17	56			
Total	7843.57		74			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance Test	6.631	34.81	0.9929	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9624	0.9554	0.0252	Normal Distribution

Salmonid Embryo-Alevin-~~Fry~~ Survival Development and Growth Test **Nautilus Environmental**

Analysis ID: 20-0566-4991 **Endpoint:** Mean ~~Dry~~ Weight-mg **CETIS Version:** CETISv1.9.4
Analyzed: 20 Dec-21 15:56 **Analysis:** Parametric-Control vs Treatments **Status Level:** 1

Mean ~~Dry~~ Weight-mg Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
FR_UFR1	U	4	85.3	67.58	103	84.23	74.62	98.15	5.568	13.05%	0.00%
GH_ER2		4	88.04	73.31	102.8	87.58	78.21	98.8	4.631	10.52%	-3.21%
CM_MC1		4	85.78	76.66	94.9	85.75	79.31	92.31	2.865	6.68%	-0.56%
LC_SLC		4	82.03	68.54	95.53	83.84	71.25	89.2	4.24	10.34%	3.83%
FR_FRABCH		4	93.47	74.15	112.8	93.11	81.11	106.5	6.07	12.99%	-9.57%
FR_FRCP1		4	93.9	76.26	111.5	97.59	78.33	102.1	5.543	11.81%	-10.08%
GH_FR1		4	102	74.31	129.7	98.68	85.93	124.8	8.708	17.07%	-19.59%
GH_ERC		4	97.96	86.31	109.6	97.85	89.63	106.5	3.663	7.48%	-14.84%
CM_MC2		4	96.25	76.88	115.6	98.92	79.29	107.9	6.088	12.65%	-12.84%
EV_MC2		4	86.72	71.89	101.6	90.68	72.92	92.61	4.661	10.75%	-1.66%
EV_HC1		4	92.76	75.5	110	94.58	78.08	103.8	5.424	11.69%	-8.74%
LC_DCDS		4	91.9	78.49	105.3	92.87	81.85	100	4.214	9.17%	-7.73%
LC_LC3		4	89.27	76.99	101.5	89.1	80	98.89	3.858	8.64%	-4.65%
LC_LC5		4	85.86	68.33	103.4	87.72	72.8	95.2	5.51	12.84%	-0.65%
LC_LCDSSLCC		4	91.56	75.17	107.9	93.27	78.57	101.1	5.151	11.25%	-7.33%
FR_FR4		4	92.5	83.09	101.9	95.29	83.64	95.79	2.957	6.39%	-8.44%
FR_FRRD		3	85.18	60.87	109.5	80.74	78.4	96.4	5.65	11.49%	0.15%
FR_FR2		4	90.46	73.45	107.5	92.3	76.84	100.4	5.346	11.82%	-6.04%
FR_MULTIPLATE		4	93.52	73.82	113.2	95.51	76.67	106.4	6.191	13.24%	-9.63%

Mean ~~Dry~~ Weight-mg Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
FR_UFR1	U	77.5	74.62	90.95	98.15
GH_ER2		82.86	78.21	92.31	98.8
CM_MC1		83.1	79.31	92.31	88.4
LC_SLC		79.29	71.25	88.4	89.2
FR_FRABCH		85.42	81.11	100.8	106.5
FR_FRCP1		93.6	78.33	102.1	101.6
GH_FR1		91.25	85.93	124.8	106.1
GH_ERC		94.83	89.63	100.9	106.5
CM_MC2		97.04	79.29	107.9	100.8
EV_MC2		89.26	72.92	92.61	92.11
EV_HC1		92.5	78.08	96.67	103.8
LC_DCDS		88.15	81.85	100	97.6
LC_LC3		88.89	80	89.31	98.89
LC_LC5		80.67	72.8	95.2	94.78
LC_LCDSSLCC		88.15	78.57	98.4	101.1
FR_FR4		95.36	83.64	95.79	95.22
FR_FRRD		80.74	78.4	96.4	
FR_FR2		87.2	76.84	100.4	97.39
FR_MULTIPLATE		94.5	76.67	106.4	96.52

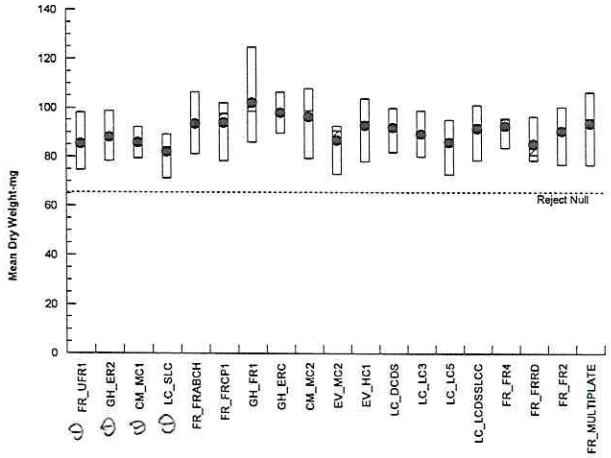
Reference sites

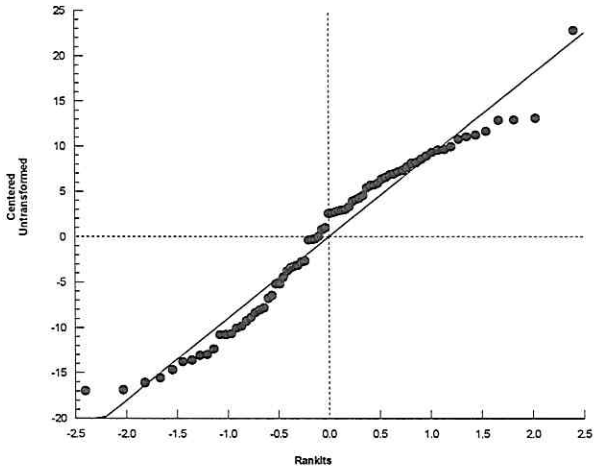
Analyst: UW QA: Dec 23/21

Salmonid Embryo-Alevin ~~Fry~~ Survival Development and Growth Test **Nautilus Environmental**

Analysis ID:	20-0566-4991	**Endpoint:**	Mean ~~Dry~~ Weight-mg	**CETIS Version:**	CETISv1.9.4
Analyzed:	20 Dec-21 15:56	**Analysis:**	Parametric-Control vs Treatments	**Status Level:**	1

Graphics





Reference sites

Salmonid Embryo-Alevin~~-Fry~~ Survival Development and Growth Test — **Nautilus Environmental**

Analysis ID:	11-3714-3390	**Endpoint:**	Length-mm	**CETIS Version:**	CETISv1.9.4
Analyzed:	20 Dec-21 15:57	**Analysis:**	Parametric-Control vs Treatments	**Status Level:**	1
Batch ID:	00-9465-4096	**Test Type:**	Survival-Development-Growth	**Analyst:**	Yvonne Lam
Start Date:	13 Oct-21 15:50	**Protocol:**	EC/EPS 1/RM/28	**Diluent:**	Dechlorinated Tap Water
Ending Date:	12 Nov-21 08:00	**Species:**	Oncorhynchus mykiss	**Brine:**	
Test Length:	29d 16h	**Taxon:**	Actinopterygii	**Source:**	Lyndon Fish Hatcheries **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
① FR_UFR1	19-8746-8946	12 Oct-21 11:07	13 Oct-21 11:53	29h (0 °C)	Teck Coal	
⑥ GH_ER2	20-2628-4137	12 Oct-21 10:50	13 Oct-21 11:30	29h (0 °C)		
⑤ CM_MC1	18-3559-2852	12 Oct-21 13:20	13 Oct-21 11:30	26h (0.1 °C)		
④ LC_SLC	08-7937-3726	12 Oct-21 11:00	13 Oct-21 11:30	29h (2.9 °C)		
FR_FRABCH	18-7592-7020	12 Oct-21 11:20	13 Oct-21 11:53	28h (0 °C)		
FR_FRCP1	10-3969-8000	12 Oct-21 11:48	13 Oct-21 11:53	28h (1.3 °C)		
GH_FR1	11-8224-4576	12 Oct-21 10:00	13 Oct-21 11:30	30h (0 °C)		
GH_ERC	00-1276-7572	12 Oct-21 11:50	13 Oct-21 11:30	28h (0 °C)		
CM_MC2	03-9569-8600	12 Oct-21 12:47	13 Oct-21 11:30	27h (1.3 °C)		
EV_MC2	13-1923-7722	12 Oct-21 11:38	13 Oct-21 11:30	28h (0.2 °C)		
EV_HC1	18-6648-8827	12 Oct-21 10:33	13 Oct-21 11:30	29h (0 °C)		
LC_DCDS	17-4710-4100	12 Oct-21	13 Oct-21 11:30	40h (1.7 °C)		
LC_LC3	20-0894-5906	12 Oct-21 12:00	13 Oct-21 11:30	28h (8.8 °C)		
LC_LC5	14-5637-1032	12 Oct-21 13:30	13 Oct-21 11:30	26h (2.6 °C)		
LC_LCDSSLCC	06-4184-4349	12 Oct-21 12:30	13 Oct-21 11:30	27h (4.7 °C)		
FR_FR4	16-7272-1140	12 Oct-21 11:05	13 Oct-21 11:30	29h (0 °C)		
FR_FRRD	04-7874-3326	12 Oct-21 11:45	13 Oct-21 11:30	28h (0 °C)		
FR_FR2	09-1936-7906	12 Oct-21 10:25	13 Oct-21 11:30	29h (0 °C)		
FR_MULTIPLATE	07-2028-3040	12 Oct-21 09:45	13 Oct-21 11:30	30h (0 °C)		

All samples spiked with 20 ug/L Cu

① Reference sites

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
① FR_UFR1	Water Sample	Teck Coal	FR_UFR1_WEK_2021-09-1	
⑥ GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-10-12_	
⑤ CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-10-12	
④ LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-10-19_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_WEK_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_WEK_2021-09	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-10-12_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-10-12	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-10-12	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2021_Q4_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2021_Q4_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-10-19	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-10-19_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-10-19_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	
FR_FR4	Water Sample	Teck Coal	FR_FR4_WS_2021-10-12_	
FR_FRRD	Water Sample	Teck Coal	FR_FRRD_WS_2021-10-12	
FR_FR2	Water Sample	Teck Coal	FR_FR2_WS_2021-10-12_	
FR_MULTIPLATE	Water Sample	Teck Coal	FR_MULTIPLATE_WS_202	

Salmonid Embryo-Alevin-~~Fry~~ Survival Development and Growth Test — **Nautilus Environmental**

Analysis ID: 11-3714-3390 **Endpoint:** Length-mm **CETIS Version:** CETISv1.9.4
Analyzed: 20 Dec-21 15:57 **Analysis:** Parametric-Control vs Treatments **Status Level:** 1

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	① FR_UFR1 passed length-mm	8.26%
		① CM_MC1 passed length-mm	8.26%
		① LC_SLC passed length-mm	8.26%
		FR_FRABCH passed length-mm	8.26%
		FR_FRCP1 passed length-mm	8.26%
		GH_FR1 passed length-mm	8.26%
		GH_ERC passed length-mm	8.26%
		CM_MC2 passed length-mm	8.26%
		EV_MC2 passed length-mm	8.26%
		EV_HC1 passed length-mm	8.26%
		LC_DCDS passed length-mm	8.26%
		LC_LC3 passed length-mm	8.26%
		LC_LC5 passed length-mm	8.26%
		LC_LCDSSLCC passed length-mm	8.26%
		FR_FR4 passed length-mm	8.26%
		FR_FRRD passed length-mm	8.26%
		FR_FR2 passed length-mm	8.26%
		FR_MULTIPLATE passed length-mm	8.26%

① Reference Sites

Dunnett Multiple Comparison Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
① Receiving Water (GH_ERC)		① FR_UFR1	1.477	2.694	1.607	6	CDF	0.4102	Non-Significant Effect
		① CM_MC1	0.9675	2.694	1.607	6	CDF	0.6566	Non-Significant Effect
		① LC_SLC	2.417	2.694	1.607	6	CDF	0.0908	Non-Significant Effect
		FR_FRABCH	-0.5263	2.694	1.607	6	CDF	0.9893	Non-Significant Effect
		FR_FRCP1	-0.308	2.694	1.607	6	CDF	0.9785	Non-Significant Effect
		GH_FR1	-0.9897	2.694	1.607	6	CDF	0.9980	Non-Significant Effect
		GH_ERC	-0.6972	2.694	1.607	6	CDF	0.9941	Non-Significant Effect
		CM_MC2	-1.126	2.694	1.607	6	CDF	0.9989	Non-Significant Effect
		EV_MC2	1.466	2.694	1.607	6	CDF	0.4150	Non-Significant Effect
		EV_HC1	0.4898	2.694	1.607	6	CDF	0.8430	Non-Significant Effect
		LC_DCDS	-0.4663	2.694	1.607	6	CDF	0.9870	Non-Significant Effect
		LC_LC3	-0.6272	2.694	1.607	6	CDF	0.9924	Non-Significant Effect
		LC_LC5	0.481	2.694	1.607	6	CDF	0.8457	Non-Significant Effect
		LC_LCDSSLCC	-1.341	2.694	1.607	6	CDF	0.9995	Non-Significant Effect
		FR_FR4	-0.2045	2.694	1.607	6	CDF	0.9708	Non-Significant Effect
		FR_FRRD	0.5969	2.694	1.736	5	CDF	0.8081	Non-Significant Effect
		FR_FR2	-0.494	2.694	1.607	6	CDF	0.9881	Non-Significant Effect
		FR_MULTIPLATE	0.04777	2.694	1.607	6	CDF	0.9419	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	25.1133	1.39518	18	1.959	0.0288	Significant Effect
Error	39.8731	0.71202	56			
Total	64.9864		74			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance Test	11.92	34.81	0.8516	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9853	0.9554	0.5407	Normal Distribution

Salmonid Embryo-Alevin-~~Fry~~ Survival Development and Growth Test **Nautilus Environmental**

Analysis ID: 11-3714-3390 **Endpoint:** Length-mm **CETIS Version:** CETISv1.9.4
Analyzed: 20 Dec-21 15:57 **Analysis:** Parametric-Control vs Treatments **Status Level:** 1

Length-mm Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
FR_UFR1		4	18.59	17.32	19.85	18.47	17.79	19.61	0.3962	4.26%	0.00%
GH_ER2	R	4	19.47	18.95	19.98	19.47	19.09	19.84	0.162	1.66%	-4.74%
CM_MC1		4	18.89	18.01	19.76	19.07	18.1	19.31	0.2749	2.91%	-1.63%
LC_SLC		4	18.02	17.4	18.64	17.98	17.6	18.54	0.1949	2.16%	3.02%
FR_FRABCH		4	19.78	18.39	21.17	19.74	18.8	20.85	0.4368	4.42%	-6.43%
FR_FRCP1		4	19.65	17.9	21.4	20.07	18.06	20.4	0.5499	5.60%	-5.73%
GH_FR1		4	20.06	18.76	21.35	20.03	19.32	20.85	0.4067	4.06%	-7.92%
GH_ERC		4	19.88	18.4	21.37	19.91	18.82	20.89	0.4672	4.70%	-6.98%
CM_MC2		4	20.14	19.36	20.91	20.26	19.46	20.56	0.2441	2.42%	-8.35%
EV_MC2		4	18.59	17.56	19.63	18.61	17.84	19.3	0.3255	3.50%	-0.03%
EV_HC1		4	19.17	17.55	20.79	18.86	18.4	20.57	0.5087	5.31%	-3.17%
LC_DCDS		4	19.74	18.17	21.32	19.61	18.72	21.04	0.4943	5.01%	-6.24%
LC_LC3		4	19.84	18.52	21.16	19.55	19.21	21.06	0.4162	4.20%	-6.75%
LC_LC5		4	19.18	17.08	21.27	19.49	17.32	20.41	0.6581	6.86%	-3.20%
LC_LCDSSLCC		4	20.27	18.83	21.7	20.06	19.52	21.43	0.4519	4.46%	-9.04%
FR_FR4		4	19.59	18.58	20.6	19.69	18.75	20.22	0.3182	3.25%	-5.40%
FR_FRRD		3	19.08	18.16	20	18.94	18.8	19.5	0.2134	1.94%	-2.67%
FR_FR2		4	19.76	18.05	21.47	20.04	18.29	20.67	0.5382	5.45%	-6.33%
FR_MULTIPLATE		4	19.44	17.83	21.05	19.63	18.18	20.3	0.5062	5.21%	-4.59%

Length-mm Detail

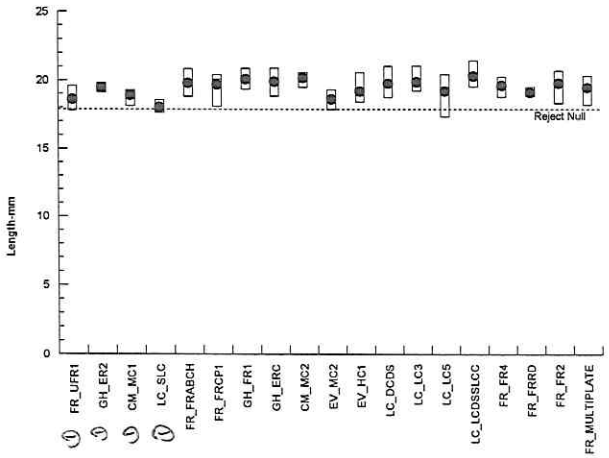
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
FR_UFR1		18.18	17.79	18.76	19.61
GH_ER2	R	19.34	19.09	19.6	19.84
CM_MC1		19.22	18.1	19.31	18.92
LC_SLC		17.91	17.6	18.04	18.54
FR_FRABCH		19.44	18.8	20.04	20.85
FR_FRCP1		19.78	18.06	20.4	20.37
GH_FR1		19.4	19.32	20.85	20.67
GH_ERC		19.43	18.82	20.39	20.89
CM_MC2		19.46	20.11	20.42	20.56
EV_MC2		18.93	18.29	19.3	17.84
EV_HC1		19.29	18.44	18.4	20.57
LC_DCDS		18.72	19.32	19.9	21.04
LC_LC3		19.43	19.21	19.67	21.06
LC_LC5		19.38	17.32	19.6	20.41
LC_LCDSSLCC		19.57	19.52	20.54	21.43
FR_FR4		19.91	18.75	19.47	20.22
FR_FRRD		18.94	18.8	19.5	
FR_FR2		19.64	18.29	20.44	20.67
FR_MULTIPLATE		19.05	18.18	20.3	20.22

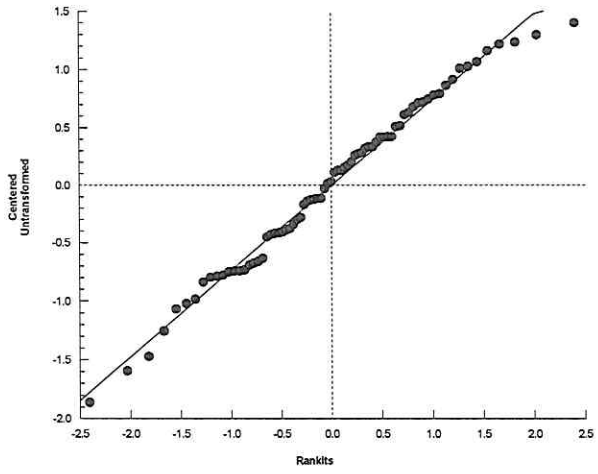
Reference sites

Salmonid Embryo-Alevin-~~Fry~~ Survival Development and Growth Test **Nautilus Environmental**

Analysis ID:	11-3714-3390	**Endpoint:**	Length-mm	**CETIS Version:**	CETISv1.9.4
Analyzed:	20 Dec-21 15:57	**Analysis:**	Parametric-Control vs Treatments	**Status Level:**	1

Graphics





① Reference sites

CETIS Analytical Report

Salmonid Embryo-Alevin-~~Fry~~ Survival Development and Growth Test — **Nautilus Environmental**

Analysis ID:	00-1977-5202	**Endpoint:**	Mean Dry Weight-mg	**CETIS Version:**	CETISv1.9.4
Analyzed:	20 Dec-21 15:57	**Analysis:**	Parametric-Control vs Treatments	**Status Level:**	1
Batch ID:	00-9465-4096	**Test Type:**	Survival-Development-Growth	**Analyst:**	Yvonne Lam
Start Date:	13 Oct-21 15:50	**Protocol:**	EC/EPS 1/RM/28	**Diluent:**	Dechlorinated Tap Water
Ending Date:	12 Nov-21 08:00	**Species:**	Oncorhynchus mykiss	**Brine:**	
Test Length:	29d 16h	**Taxon:**	Actinopterygii	**Source:**	Lyndon Fish Hatcheries **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
FR_UFR1	19-8746-8946	12 Oct-21 11:07	13 Oct-21 11:53	29h (0 °C)	Teck Coal	
GH_ER2	20-2628-4137	12 Oct-21 10:50	13 Oct-21 11:30	29h (0 °C)		
CM_MC1	18-3559-2852	12 Oct-21 13:20	13 Oct-21 11:30	26h (0.1 °C)		
LC_SLC	08-7937-3726	12 Oct-21 11:00	13 Oct-21 11:30	29h (2.9 °C)		
FR_FRABCH	18-7592-7020	12 Oct-21 11:20	13 Oct-21 11:53	28h (0 °C)		
FR_FRCP1	10-3969-8000	12 Oct-21 11:48	13 Oct-21 11:53	28h (1.3 °C)		
GH_FR1	11-8224-4576	12 Oct-21 10:00	13 Oct-21 11:30	30h (0 °C)		
GH_ERC	00-1276-7572	12 Oct-21 11:50	13 Oct-21 11:30	28h (0 °C)		
CM_MC2	03-9569-8600	12 Oct-21 12:47	13 Oct-21 11:30	27h (1.3 °C)		
EV_MC2	13-1923-7722	12 Oct-21 11:38	13 Oct-21 11:30	28h (0.2 °C)		
EV_HC1	18-6648-8827	12 Oct-21 10:33	13 Oct-21 11:30	29h (0 °C)		
LC_DCDS	17-4710-4100	12 Oct-21	13 Oct-21 11:30	40h (1.7 °C)		
LC_LC3	20-0894-5906	12 Oct-21 12:00	13 Oct-21 11:30	28h (8.8 °C)		
LC_LC5	14-5637-1032	12 Oct-21 13:30	13 Oct-21 11:30	26h (2.6 °C)		
LC_LCDSSLCC	06-4184-4349	12 Oct-21 12:30	13 Oct-21 11:30	27h (4.7 °C)		
FR_FR4	16-7272-1140	12 Oct-21 11:05	13 Oct-21 11:30	29h (0 °C)		
FR_FRRD	04-7874-3326	12 Oct-21 11:45	13 Oct-21 11:30	28h (0 °C)		
FR_FR2	09-1936-7906	12 Oct-21 10:25	13 Oct-21 11:30	29h (0 °C)		
FR_MULTIPLATE	07-2028-3040	12 Oct-21 09:45	13 Oct-21 11:30	30h (0 °C)		

All samples spiked with 20 µg/L Cu

D Reference sites

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_UFR1	Water Sample	Teck Coal	FR_UFR1_WEK_2021-09-1	
GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-10-12_	
CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-10-12	
LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-10-19_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_WEK_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_WEK_2021-09	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-10-12_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-10-12	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-10-12	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2021_Q4_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2021_Q4_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-10-19	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-10-19_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-10-19_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	
FR_FR4	Water Sample	Teck Coal	FR_FR4_WS_2021-10-12_	
FR_FRRD	Water Sample	Teck Coal	FR_FRRD_WS_2021-10-12	
FR_FR2	Water Sample	Teck Coal	FR_FR2_WS_2021-10-12_	
FR_MULTIPLATE	Water Sample	Teck Coal	FR_MULTIPLATE_WS_202	

Salmonid Embryo-Alevin-~~Fry~~ Survival Development and Growth Test **Nautilus Environmental**

Analysis ID: 00-1977-5202 **Endpoint:** Mean Dry Weight-mg **CETIS Version:** CETISv1.9.4
Analyzed: 20 Dec-21 15:57 **Analysis:** Parametric-Control vs Treatments **Status Level:** 1

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	① FR_UFR1 passed mean dry weight-mg	22.50%
		① CM_MC1 passed mean dry weight-mg	22.50%
		① LC_SLC passed mean dry weight-mg	22.50%
		FR_FRABCH passed mean dry weight-mg	22.50%
		FR_FRCP1 passed mean dry weight-mg	22.50%
		GH_FR1 passed mean dry weight-mg	22.50%
		GH_ERC passed mean dry weight-mg	22.50%
		CM_MC2 passed mean dry weight-mg	22.50%
		EV_MC2 passed mean dry weight-mg	22.50%
		EV_HC1 passed mean dry weight-mg	22.50%
		LC_DCDS passed mean dry weight-mg	22.50%
		LC_LC3 passed mean dry weight-mg	22.50%
		LC_LC5 passed mean dry weight-mg	22.50%
		LC_LCDSSLCC passed mean dry weight-mg	22.50%
		FR_FR4 passed mean dry weight-mg	22.50%
		FR_FRRD passed mean dry weight-mg	22.50%
		FR_FR2 passed mean dry weight-mg	22.50%
		FR_MULTIPLATE passed mean dry weight-m	22.50%

① Reference Stats

Dunnett Multiple Comparison Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
① Receiving Water (GH-ER2)		① FR_UFR1	0.3727	2.694	19.81	6	CDF	0.8762	Non-Significant Effect
		① CM_MC1	0.3079	2.694	19.81	6	CDF	0.8923	Non-Significant Effect
		① LC_SLC	0.8173	2.694	19.81	6	CDF	0.7231	Non-Significant Effect
		FR_FRABCH	-0.7372	2.694	19.81	6	CDF	0.9949	Non-Significant Effect
		FR_FRCP1	-0.7968	2.694	19.81	6	CDF	0.9959	Non-Significant Effect
		GH_FR1	-1.9	2.694	19.81	6	CDF	1.0000	Non-Significant Effect
		GH_ERC	-1.349	2.694	19.81	6	CDF	0.9996	Non-Significant Effect
		CM_MC2	-1.116	2.694	19.81	6	CDF	0.9988	Non-Significant Effect
		EV_MC2	0.1798	2.694	19.81	6	CDF	0.9196	Non-Significant Effect
		EV_HC1	-0.6416	2.694	19.81	6	CDF	0.9928	Non-Significant Effect
		LC_DCDS	-0.5242	2.694	19.81	6	CDF	0.9892	Non-Significant Effect
		LC_LC3	-0.1669	2.694	19.81	6	CDF	0.9674	Non-Significant Effect
		LC_LC5	0.2968	2.694	19.81	6	CDF	0.8949	Non-Significant Effect
		LC_LCDSSLCC	-0.4777	2.694	19.81	6	CDF	0.9874	Non-Significant Effect
		FR_FR4	-0.6058	2.694	19.81	6	CDF	0.9918	Non-Significant Effect
		FR_FRRD	0.3606	2.694	21.4	5	CDF	0.8793	Non-Significant Effect
		FR_FR2	-0.3282	2.694	19.81	6	CDF	0.9798	Non-Significant Effect
		FR_MULTIPLATE	-0.7448	2.694	19.81	6	CDF	0.9950	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	1786.08	99.2264	18	0.9173	0.5619	Non-Significant Effect
Error	6057.5	108.17	56			
Total	7843.57		74			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance Test	6.631	34.81	0.9929	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9624	0.9554	0.0252	Normal Distribution

Analyst: _____ QA: Dec 23/21

Salmonid Embryo-Alevin-~~Fry~~ Survival Development and Growth Test **Nautilus Environmental**

Analysis ID:	00-1977-5202	**Endpoint:**	Mean ~~Dry~~ Weight-mg	**CETIS Version:**	CETISv1.9.4
Analyzed:	20 Dec-21 15:57	**Analysis:**	Parametric-Control vs Treatments	**Status Level:**	1

Mean ~~Dry~~ Weight-mg Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
FR_UFR1		4	85.3	67.58	103	84.23	74.62	98.15	5.568	13.05%	0.00%
GH_ER2	R	4	88.04	73.31	102.8	87.58	78.21	98.8	4.631	10.52%	-3.21%
CM_MC1		4	85.78	76.66	94.9	85.75	79.31	92.31	2.865	6.68%	-0.56%
LC_SLC		4	82.03	68.54	95.53	83.84	71.25	89.2	4.24	10.34%	3.83%
FR_FRABCH		4	93.47	74.15	112.8	93.11	81.11	106.5	6.07	12.99%	-9.57%
FR_FRCP1		4	93.9	76.26	111.5	97.59	78.33	102.1	5.543	11.81%	-10.08%
GH_FR1		4	102	74.31	129.7	98.68	85.93	124.8	8.708	17.07%	-19.59%
GH_ERC		4	97.96	86.31	109.6	97.85	89.63	106.5	3.663	7.48%	-14.84%
CM_MC2		4	96.25	76.88	115.6	98.92	79.29	107.9	6.088	12.65%	-12.84%
EV_MC2		4	86.72	71.89	101.6	90.68	72.92	92.61	4.661	10.75%	-1.66%
EV_HC1		4	92.76	75.5	110	94.58	78.08	103.8	5.424	11.69%	-8.74%
LC_DCDS		4	91.9	78.49	105.3	92.87	81.85	100	4.214	9.17%	-7.73%
LC_LC3		4	89.27	76.99	101.5	89.1	80	98.89	3.858	8.64%	-4.65%
LC_LC5		4	85.86	68.33	103.4	87.72	72.8	95.2	5.51	12.84%	-0.65%
LC_LCDSSLCC		4	91.56	75.17	107.9	93.27	78.57	101.1	5.151	11.25%	-7.33%
FR_FR4		4	92.5	83.09	101.9	95.29	83.64	95.79	2.957	6.39%	-8.44%
FR_FRRD		3	85.18	60.87	109.5	80.74	78.4	96.4	5.65	11.49%	0.15%
FR_FR2		4	90.46	73.45	107.5	92.3	76.84	100.4	5.346	11.82%	-6.04%
FR_MULTIPLATE		4	93.52	73.82	113.2	95.51	76.67	106.4	6.191	13.24%	-9.63%

Mean ~~Dry~~ Weight-mg Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
FR_UFR1		77.5	74.62	90.95	98.15
GH_ER2	R	82.86	78.21	92.31	98.8
CM_MC1		83.1	79.31	92.31	88.4
LC_SLC		79.29	71.25	88.4	89.2
FR_FRABCH		85.42	81.11	100.8	106.5
FR_FRCP1		93.6	78.33	102.1	101.6
GH_FR1		91.25	85.93	124.8	106.1
GH_ERC		94.83	89.63	100.9	106.5
CM_MC2		97.04	79.29	107.9	100.8
EV_MC2		89.26	72.92	92.61	92.11
EV_HC1		92.5	78.08	96.67	103.8
LC_DCDS		88.15	81.85	100	97.6
LC_LC3		88.89	80	89.31	98.89
LC_LC5		80.67	72.8	95.2	94.78
LC_LCDSSLCC		88.15	78.57	98.4	101.1
FR_FR4		95.36	83.64	95.79	95.22
FR_FRRD		80.74	78.4	96.4	
FR_FR2		87.2	76.84	100.4	97.39
FR_MULTIPLATE		94.5	76.67	106.4	96.52

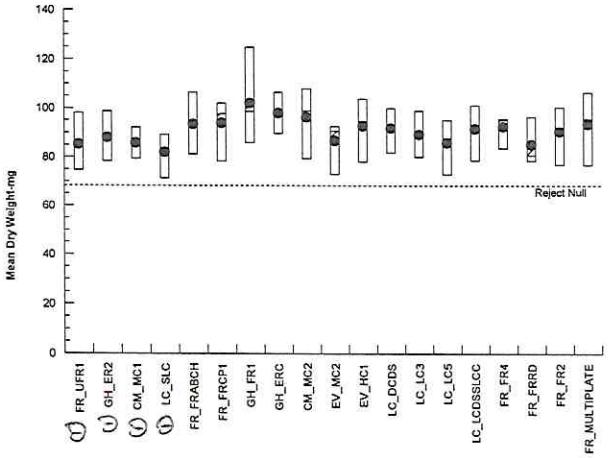
Reference Sites

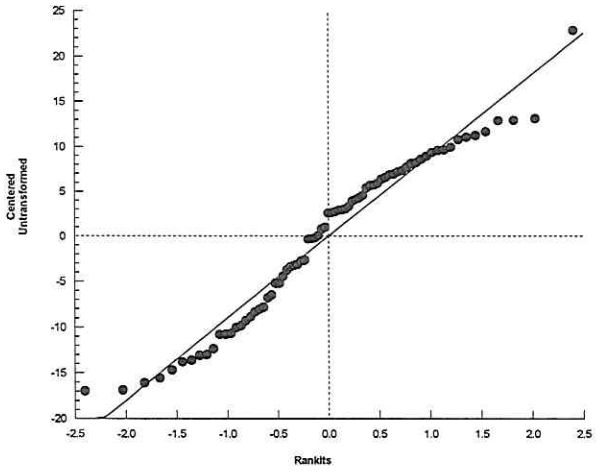
Analyst: UW QA: Dec 23/21

Salmonid Embryo-Alevin-~~Fry~~ Survival Development and Growth Test **Nautilus Environmental**

Analysis ID:	00-1977-5202	**Endpoint:**	Mean ~~Dry~~ WW Weight-mg	**CETIS Version:**	CETISv1.9.4
Analyzed:	20 Dec-21 15:57	**Analysis:**	Parametric-Control vs Treatments	**Status Level:**	1

Graphics





D REFERENCE STATS

CETIS Analytical Report

Salmonid Embryo-Alevin-~~Fry~~ Survival Development and Growth Test — **Nautilus Environmental**

Analysis ID:	03-3693-2269	**Endpoint:**	Length-mm	**CETIS Version:**	CETISv1.9.4
Analyzed:	20 Dec-21 15:59	**Analysis:**	Parametric-Control vs Treatments	**Status Level:**	1
Batch ID:	00-9465-4096	**Test Type:**	Survival-Development-Growth	**Analyst:**	Yvonne Lam
Start Date:	13 Oct-21 15:50	**Protocol:**	EC/EPS 1/RM/28	**Diluent:**	Dechlorinated Tap Water
Ending Date:	12 Nov-21 08:00	**Species:**	Oncorhynchus mykiss	**Brine:**	
Test Length:	29d 16h	**Taxon:**	Actinopterygii	**Source:**	Lyndon Fish Hatcheries **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
FR_UFR1	19-8746-8946	12 Oct-21 11:07	13 Oct-21 11:53	29h (0 °C)	Teck Coal	
GH_ER2	20-2628-4137	12 Oct-21 10:50	13 Oct-21 11:30	29h (0 °C)		
CM_MC1	18-3559-2852	12 Oct-21 13:20	13 Oct-21 11:30	26h (0.1 °C)		
LC_SLC	08-7937-3726	12 Oct-21 11:00	13 Oct-21 11:30	29h (2.9 °C)		
FR_FRABCH	18-7592-7020	12 Oct-21 11:20	13 Oct-21 11:53	28h (0 °C)		
FR_FRCP1	10-3969-8000	12 Oct-21 11:48	13 Oct-21 11:53	28h (1.3 °C)		
GH_FR1	11-8224-4576	12 Oct-21 10:00	13 Oct-21 11:30	30h (0 °C)		
GH_ERC	00-1276-7572	12 Oct-21 11:50	13 Oct-21 11:30	28h (0 °C)		
CM_MC2	03-9569-8600	12 Oct-21 12:47	13 Oct-21 11:30	27h (1.3 °C)		
EV_MC2	13-1923-7722	12 Oct-21 11:38	13 Oct-21 11:30	28h (0.2 °C)		
EV_HC1	18-6648-8827	12 Oct-21 10:33	13 Oct-21 11:30	29h (0 °C)		
LC_DCDS	17-4710-4100	12 Oct-21	13 Oct-21 11:30	40h (1.7 °C)		
LC_LC3	20-0894-5906	12 Oct-21 12:00	13 Oct-21 11:30	28h (8.8 °C)		
LC_LC5	14-5637-1032	12 Oct-21 13:30	13 Oct-21 11:30	26h (2.6 °C)		
LC_LCDSSLCC	06-4184-4349	12 Oct-21 12:30	13 Oct-21 11:30	27h (4.7 °C)		
FR_FR4	16-7272-1140	12 Oct-21 11:05	13 Oct-21 11:30	29h (0 °C)		
FR_FRRD	04-7874-3326	12 Oct-21 11:45	13 Oct-21 11:30	28h (0 °C)		
FR_FR2	09-1936-7906	12 Oct-21 10:25	13 Oct-21 11:30	29h (0 °C)		
FR_MULTIPLATE	07-2028-3040	12 Oct-21 09:45	13 Oct-21 11:30	30h (0 °C)		

All samples spiked with 20 mg/L Cu

5 Reference sites

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_UFR1	Water Sample	Teck Coal	FR_UFR1_WEK_2021-09-1	
GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-10-12_	
CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-10-12	
LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-10-19_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_WEK_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_WEK_2021-09	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-10-12_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-10-12	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-10-12	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2021_Q4_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2021_Q4_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-10-19	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-10-19_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-10-19_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	
FR_FR4	Water Sample	Teck Coal	FR_FR4_WS_2021-10-12_	
FR_FRRD	Water Sample	Teck Coal	FR_FRRD_WS_2021-10-12	
FR_FR2	Water Sample	Teck Coal	FR_FR2_WS_2021-10-12_	
FR_MULTIPLATE	Water Sample	Teck Coal	FR_MULTIPLATE_WS_202	

Analyst: [signature] QA: Dec 23/21

Salmonid Embryo-Alevin-Early Survival Development and Growth Test — **Nautilus Environmental**

Analysis ID: 03-3693-2269 **Endpoint:** Length-mm **CETIS Version:** CETISv1.9.4
Analyzed: 20 Dec-21 15:59 **Analysis:** Parametric-Control vs Treatments **Status Level:** 1

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	FR_UFR1 passed length-mm	8.51%
		GH_ER2 passed length-mm	8.51%
		LC_SLC passed length-mm	8.51%
		FR_FRABCH passed length-mm	8.51%
		FR_FRCP1 passed length-mm	8.51%
		GH_FR1 passed length-mm	8.51%
		GH_ERC passed length-mm	8.51%
		CM_MC2 passed length-mm	8.51%
		EV_MC2 passed length-mm	8.51%
		EV_HC1 passed length-mm	8.51%
		LC_DCDS passed length-mm	8.51%
		LC_LC3 passed length-mm	8.51%
		LC_LC5 passed length-mm	8.51%
		LC_LCDSSLCC passed length-mm	8.51%
		FR_FR4 passed length-mm	8.51%
		FR_FRRD passed length-mm	8.51%
		FR_FR2 passed length-mm	8.51%
		FR_MULTIPLATE passed length-mm	8.51%

Reference sites

Dunnett Multiple Comparison Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Site Control (CM_MC1)		FR_UFR1	0.5091	2.694	1.607	6	CDF	0.8370	Non-Significant Effect
		GH_ER2	-0.9675	2.694	1.607	6	CDF	0.9978	Non-Significant Effect
		LC_SLC	1.45	2.694	1.607	6	CDF	0.4230	Non-Significant Effect
		FR_FRABCH	-1.494	2.694	1.607	6	CDF	0.9998	Non-Significant Effect
		FR_FRCP1	-1.275	2.694	1.607	6	CDF	0.9994	Non-Significant Effect
		GH_FR1	-1.957	2.694	1.607	6	CDF	1.0000	Non-Significant Effect
		GH_ERC	-1.665	2.694	1.607	6	CDF	0.9999	Non-Significant Effect
		CM_MC2	-2.093	2.694	1.607	6	CDF	1.0000	Non-Significant Effect
		EV_MC2	0.499	2.694	1.607	6	CDF	0.8402	Non-Significant Effect
		EV_HC1	-0.4777	2.694	1.607	6	CDF	0.9874	Non-Significant Effect
		LC_DCDS	-1.434	2.694	1.607	6	CDF	0.9997	Non-Significant Effect
		LC_LC3	-1.595	2.694	1.607	6	CDF	0.9999	Non-Significant Effect
		LC_LC5	-0.4865	2.694	1.607	6	CDF	0.9878	Non-Significant Effect
		LC_LCDSSLCC	-2.308	2.694	1.607	6	CDF	1.0000	Non-Significant Effect
		FR_FR4	-1.172	2.694	1.607	6	CDF	0.9991	Non-Significant Effect
		FR_FRRD	-0.2988	2.694	1.736	5	CDF	0.9779	Non-Significant Effect
		FR_FR2	-1.461	2.694	1.607	6	CDF	0.9997	Non-Significant Effect
		FR_MULTIPLATE	-0.9197	2.694	1.607	6	CDF	0.9974	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	25.1133	1.39518	18	1.959	0.0288	Significant Effect
Error	39.8731	0.71202	56			
Total	64.9864		74			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance Test	11.92	34.81	0.8516	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9853	0.9554	0.5407	Normal Distribution

Analyst: _____ QA: Dec-23/21

Salmonid Embryo-Alevin-Fry Survival Development and Growth Test — Nautilus Environmental

Analysis ID: 03-3693-2269 Endpoint: Length-mm CETIS Version: CETISv1.9.4
Analyzed: 20 Dec-21 15:59 Analysis: Parametric-Control vs Treatments Status Level: 1

Length-mm Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
① FR_UFR1		4	18.59	17.32	19.85	18.47	17.79	19.61	0.3962	4.26%	0.00%
① GH_ER2		4	19.47	18.95	19.98	19.47	19.09	19.84	0.162	1.66%	-4.74%
① CM_MC1	XC	4	18.89	18.01	19.76	19.07	18.1	19.31	0.2749	2.91%	-1.63%
① LC_SLC		4	18.02	17.4	18.64	17.98	17.6	18.54	0.1949	2.16%	3.02%
FR_FRABCH		4	19.78	18.39	21.17	19.74	18.8	20.85	0.4368	4.42%	-6.43%
FR_FRCP1		4	19.65	17.9	21.4	20.07	18.06	20.4	0.5499	5.60%	-5.73%
GH_FR1		4	20.06	18.76	21.35	20.03	19.32	20.85	0.4067	4.06%	-7.92%
GH_ERC		4	19.88	18.4	21.37	19.91	18.82	20.89	0.4672	4.70%	-6.98%
CM_MC2		4	20.14	19.36	20.91	20.26	19.46	20.56	0.2441	2.42%	-8.35%
EV_MC2		4	18.59	17.56	19.63	18.61	17.84	19.3	0.3255	3.50%	-0.03%
EV_HC1		4	19.17	17.55	20.79	18.86	18.4	20.57	0.5087	5.31%	-3.17%
LC_DCDS		4	19.74	18.17	21.32	19.61	18.72	21.04	0.4943	5.01%	-6.24%
LC_LC3		4	19.84	18.52	21.16	19.55	19.21	21.06	0.4162	4.20%	-6.75%
LC_LC5		4	19.18	17.08	21.27	19.49	17.32	20.41	0.6581	6.86%	-3.20%
LC_LCDSSLCC		4	20.27	18.83	21.7	20.06	19.52	21.43	0.4519	4.46%	-9.04%
FR_FR4		4	19.59	18.58	20.6	19.69	18.75	20.22	0.3182	3.25%	-5.40%
FR_FRRD		3	19.08	18.16	20	18.94	18.8	19.5	0.2134	1.94%	-2.67%
FR_FR2		4	19.76	18.05	21.47	20.04	18.29	20.67	0.5382	5.45%	-6.33%
FR_MULTIPLATE		4	19.44	17.83	21.05	19.63	18.18	20.3	0.5062	5.21%	-4.59%

Length-mm Detail

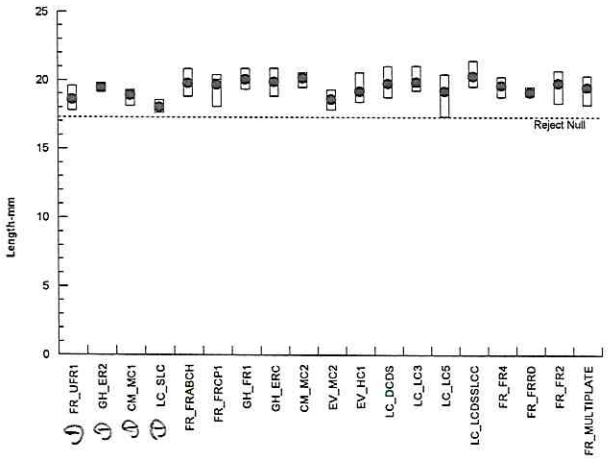
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
① FR_UFR1		18.18	17.79	18.76	19.61
① GH_ER2		19.34	19.09	19.6	19.84
① CM_MC1	XC	19.22	18.1	19.31	18.92
① LC_SLC		17.91	17.6	18.04	18.54
FR_FRABCH		19.44	18.8	20.04	20.85
FR_FRCP1		19.78	18.06	20.4	20.37
GH_FR1		19.4	19.32	20.85	20.67
GH_ERC		19.43	18.82	20.39	20.89
CM_MC2		19.46	20.11	20.42	20.56
EV_MC2		18.93	18.29	19.3	17.84
EV_HC1		19.29	18.44	18.4	20.57
LC_DCDS		18.72	19.32	19.9	21.04
LC_LC3		19.43	19.21	19.67	21.06
LC_LC5		19.38	17.32	19.6	20.41
LC_LCDSSLCC		19.57	19.52	20.54	21.43
FR_FR4		19.91	18.75	19.47	20.22
FR_FRRD		18.94	18.8	19.5	
FR_FR2		19.64	18.29	20.44	20.67
FR_MULTIPLATE		19.05	18.18	20.3	20.22

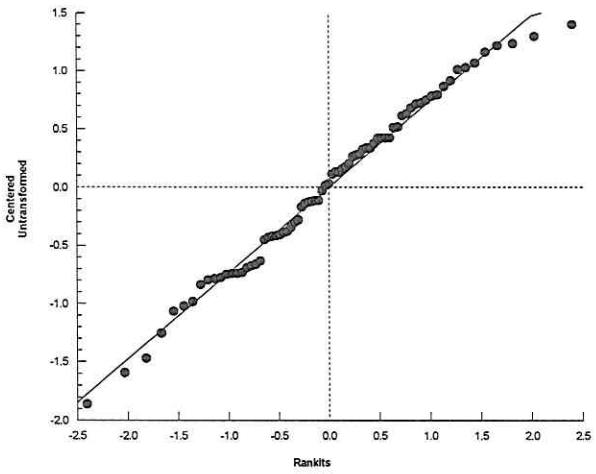
① REFERENCE SITES

Salmonid Embryo-Alevin-Fry Survival Development and Growth Test **Nautilus Environmental**

Analysis ID:	03-3693-2269	**Endpoint:**	Length-mm	**CETIS Version:**	CETISv1.9.4
Analyzed:	20 Dec-21 15:59	**Analysis:**	Parametric-Control vs Treatments	**Status Level:**	1

Graphics





D Reference sites

Salmonid Embryo-Alevin ~~Fry~~ Survival Development and Growth Test — **Nautilus Environmental**

Analysis ID:	19-9744-2565	**Endpoint:**	Mean ~~Dry~~ Weight-mg	**CETIS Version:**	CETISv1.9.4
Analyzed:	20 Dec-21 15:59	**Analysis:**	Parametric-Control vs Treatments	**Status Level:**	1
Batch ID:	00-9465-4096	**Test Type:**	Survival-Development-Growth	**Analyst:**	Yvonne Lam
Start Date:	13 Oct-21 15:50	**Protocol:**	EC/EPS 1/RM/28	**Diluent:**	Dechlorinated Tap Water
Ending Date:	12 Nov-21 08:00	**Species:**	Oncorhynchus mykiss	**Brine:**	
Test Length:	29d 16h	**Taxon:**	Actinopterygii	**Source:**	Lyndon Fish Hatcheries **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
① FR_UFR1	19-8746-8946	12 Oct-21 11:07	13 Oct-21 11:53	29h (0 °C)	Teck Coal	
① GH_ER2	20-2628-4137	12 Oct-21 10:50	13 Oct-21 11:30	29h (0 °C)		
① CM_MC1	18-3559-2852	12 Oct-21 13:20	13 Oct-21 11:30	26h (0.1 °C)		
① LC_SLC	08-7937-3726	12 Oct-21 11:00	13 Oct-21 11:30	29h (2.9 °C)		
FR_FRABCH	18-7592-7020	12 Oct-21 11:20	13 Oct-21 11:53	28h (0 °C)		
FR_FRCP1	10-3969-8000	12 Oct-21 11:48	13 Oct-21 11:53	28h (1.3 °C)		
GH_FR1	11-8224-4576	12 Oct-21 10:00	13 Oct-21 11:30	30h (0 °C)		
GH_ERC	00-1276-7572	12 Oct-21 11:50	13 Oct-21 11:30	28h (0 °C)		
CM_MC2	03-9569-8600	12 Oct-21 12:47	13 Oct-21 11:30	27h (1.3 °C)		
EV_MC2	13-1923-7722	12 Oct-21 11:38	13 Oct-21 11:30	28h (0.2 °C)		
EV_HC1	18-6648-8827	12 Oct-21 10:33	13 Oct-21 11:30	29h (0 °C)		
LC_DCDS	17-4710-4100	12 Oct-21	13 Oct-21 11:30	40h (1.7 °C)		
LC_LC3	20-0894-5906	12 Oct-21 12:00	13 Oct-21 11:30	28h (8.8 °C)		
LC_LC5	14-5637-1032	12 Oct-21 13:30	13 Oct-21 11:30	26h (2.6 °C)		
LC_LCDSSLCC	06-4184-4349	12 Oct-21 12:30	13 Oct-21 11:30	27h (4.7 °C)		
FR_FR4	16-7272-1140	12 Oct-21 11:05	13 Oct-21 11:30	29h (0 °C)		
FR_FRRD	04-7874-3326	12 Oct-21 11:45	13 Oct-21 11:30	28h (0 °C)		
FR_FR2	09-1936-7906	12 Oct-21 10:25	13 Oct-21 11:30	29h (0 °C)		
FR_MULTIPLATE	07-2028-3040	12 Oct-21 09:45	13 Oct-21 11:30	30h (0 °C)		

All samples spiked with 20 ug/L Cu

① Reference Sites

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
① FR_UFR1	Water Sample	Teck Coal	FR_UFR1_WEK_2021-09-1	
① GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-10-12_	
① CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-10-12	
① LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-10-19_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_WEK_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_WEK_2021-09	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-10-12_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-10-12	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-10-12	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2021_Q4_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2021_Q4_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-10-19	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-10-19_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-10-19_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	
FR_FR4	Water Sample	Teck Coal	FR_FR4_WS_2021-10-12_	
FR_FRRD	Water Sample	Teck Coal	FR_FRRD_WS_2021-10-12	
FR_FR2	Water Sample	Teck Coal	FR_FR2_WS_2021-10-12_	
FR_MULTIPLATE	Water Sample	Teck Coal	FR_MULTIPLATE_WS_202	

Analyst: YL QA: Dec 23/21

Salmonid Embryo-Alevin-~~Fry~~ Survival Development and Growth Test **Nautilus Environmental**

Analysis ID: 19-9744-2565 **Endpoint:** Mean Dry Weight-mg **CETIS Version:** CETISv1.9.4
Analyzed: 20 Dec-21 15:59 **Analysis:** Parametric-Control vs Treatments **Status Level:** 1

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	FR_UFR1 passed mean dry weight-mg	23.09%
		GH_ER2 passed mean dry weight-mg	23.09%
		LC_SLC passed mean dry weight-mg	23.09%
		FR_FRABCH passed mean dry weight-mg	23.09%
		FR_FRCP1 passed mean dry weight-mg	23.09%
		GH_FR1 passed mean dry weight-mg	23.09%
		GH_ERC passed mean dry weight-mg	23.09%
		CM_MC2 passed mean dry weight-mg	23.09%
		EV_MC2 passed mean dry weight-mg	23.09%
		EV_HC1 passed mean dry weight-mg	23.09%
		LC_DCDS passed mean dry weight-mg	23.09%
		LC_LC3 passed mean dry weight-mg	23.09%
		LC_LC5 passed mean dry weight-mg	23.09%
		LC_LCDSSLCC passed mean dry weight-mg	23.09%
		FR_FR4 passed mean dry weight-mg	23.09%
		FR_FRRD passed mean dry weight-mg	23.09%
		FR_FR2 passed mean dry weight-mg	23.09%
		FR_MULTIPLATE passed mean dry weight-m	23.09%

Reference Sites

Dunnett Multiple Comparison Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Site Control (CM_MC1)		FR_UFR1	0.06478	2.694	19.81	6	CDF	0.9393	Non-Significant Effect
		GH_ER2	-0.3079	2.694	19.81	6	CDF	0.9785	Non-Significant Effect
		LC_SLC	0.5094	2.694	19.81	6	CDF	0.8369	Non-Significant Effect
		FR_FRABCH	-1.045	2.694	19.81	6	CDF	0.9984	Non-Significant Effect
		FR_FRCP1	-1.105	2.694	19.81	6	CDF	0.9988	Non-Significant Effect
		GH_FR1	-2.208	2.694	19.81	6	CDF	1.0000	Non-Significant Effect
		GH_ERC	-1.656	2.694	19.81	6	CDF	0.9999	Non-Significant Effect
		CM_MC2	-1.424	2.694	19.81	6	CDF	0.9997	Non-Significant Effect
		EV_MC2	-0.1281	2.694	19.81	6	CDF	0.9637	Non-Significant Effect
		EV_HC1	-0.9495	2.694	19.81	6	CDF	0.9977	Non-Significant Effect
		LC_DCDS	-0.8321	2.694	19.81	6	CDF	0.9964	Non-Significant Effect
		LC_LC3	-0.4748	2.694	19.81	6	CDF	0.9873	Non-Significant Effect
		LC_LC5	-0.01114	2.694	19.81	6	CDF	0.9501	Non-Significant Effect
		LC_LCDSSLCC	-0.7856	2.694	19.81	6	CDF	0.9957	Non-Significant Effect
		FR_FR4	-0.9137	2.694	19.81	6	CDF	0.9973	Non-Significant Effect
		FR_FRRD	0.07555	2.694	21.4	5	CDF	0.9376	Non-Significant Effect
		FR_FR2	-0.6361	2.694	19.81	6	CDF	0.9927	Non-Significant Effect
		FR_MULTIPLATE	-1.053	2.694	19.81	6	CDF	0.9985	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	1786.08	99.2264	18	0.9173	0.5619	Non-Significant Effect
Error	6057.5	108.17	56			
Total	7843.57		74			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance Test	6.631	34.81	0.9929	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9624	0.9554	0.0252	Normal Distribution

Salmonid Embryo-Alevin-Fry Survival Development and Growth Test **Nautilus Environmental**

Analysis ID: 19-9744-2565 **Endpoint:** Mean Dry Weight-mg **CETIS Version:** CETISv1.9.4
Analyzed: 20 Dec-21 15:59 **Analysis:** Parametric-Control vs Treatments **Status Level:** 1

Mean Dry Weight-mg Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
FR_UFR1		4	85.3	67.58	103	84.23	74.62	98.15	5.568	13.05%	0.00%
GH_ER2		4	88.04	73.31	102.8	87.58	78.21	98.8	4.631	10.52%	-3.21%
CM_MC1	XC	4	85.78	76.66	94.9	85.75	79.31	92.31	2.865	6.68%	-0.56%
LC_SLC		4	82.03	68.54	95.53	83.84	71.25	89.2	4.24	10.34%	3.83%
FR_FRABCH		4	93.47	74.15	112.8	93.11	81.11	106.5	6.07	12.99%	-9.57%
FR_FRCP1		4	93.9	76.26	111.5	97.59	78.33	102.1	5.543	11.81%	-10.08%
GH_FR1		4	102	74.31	129.7	98.68	85.93	124.8	8.708	17.07%	-19.59%
GH_ERC		4	97.96	86.31	109.6	97.85	89.63	106.5	3.663	7.48%	-14.84%
CM_MC2		4	96.25	76.88	115.6	98.92	79.29	107.9	6.088	12.65%	-12.84%
EV_MC2		4	86.72	71.89	101.6	90.68	72.92	92.61	4.661	10.75%	-1.66%
EV_HC1		4	92.76	75.5	110	94.58	78.08	103.8	5.424	11.69%	-8.74%
LC_DCDS		4	91.9	78.49	105.3	92.87	81.85	100	4.214	9.17%	-7.73%
LC_LC3		4	89.27	76.99	101.5	89.1	80	98.89	3.858	8.64%	-4.65%
LC_LC5		4	85.86	68.33	103.4	87.72	72.8	95.2	5.51	12.84%	-0.65%
LC_LCDSSLCC		4	91.56	75.17	107.9	93.27	78.57	101.1	5.151	11.25%	-7.33%
FR_FR4		4	92.5	83.09	101.9	95.29	83.64	95.79	2.957	6.39%	-8.44%
FR_FRRD		3	85.18	60.87	109.5	80.74	78.4	96.4	5.65	11.49%	0.15%
FR_FR2		4	90.46	73.45	107.5	92.3	76.84	100.4	5.346	11.82%	-6.04%
FR_MULTIPLATE		4	93.52	73.82	113.2	95.51	76.67	106.4	6.191	13.24%	-9.63%

Mean Dry Weight-mg Detail

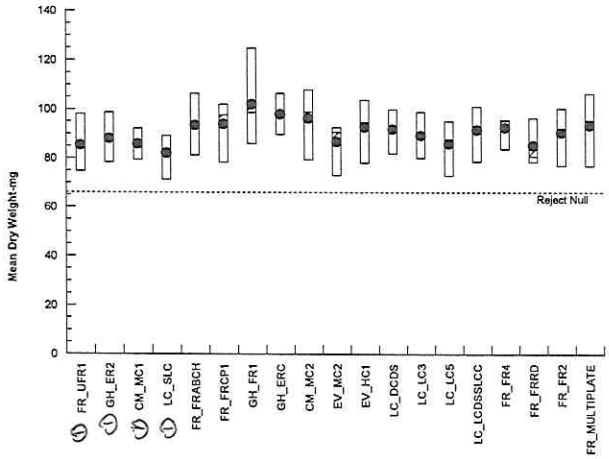
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
FR_UFR1		77.5	74.62	90.95	98.15
GH_ER2		82.86	78.21	92.31	98.8
CM_MC1	XC	83.1	79.31	92.31	88.4
LC_SLC		79.29	71.25	88.4	89.2
FR_FRABCH		85.42	81.11	100.8	106.5
FR_FRCP1		93.6	78.33	102.1	101.6
GH_FR1		91.25	85.93	124.8	106.1
GH_ERC		94.83	89.63	100.9	106.5
CM_MC2		97.04	79.29	107.9	100.8
EV_MC2		89.26	72.92	92.61	92.11
EV_HC1		92.5	78.08	96.67	103.8
LC_DCDS		88.15	81.85	100	97.6
LC_LC3		88.89	80	89.31	98.89
LC_LC5		80.67	72.8	95.2	94.78
LC_LCDSSLCC		88.15	78.57	98.4	101.1
FR_FR4		95.36	83.64	95.79	95.22
FR_FRRD		80.74	78.4	96.4	
FR_FR2		87.2	76.84	100.4	97.39
FR_MULTIPLATE		94.5	76.67	106.4	96.52

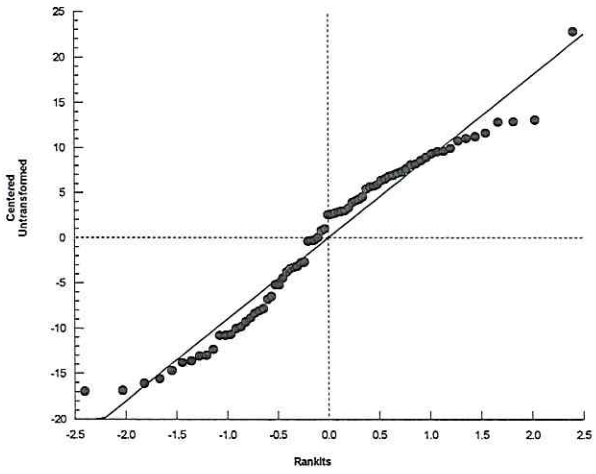
Reference sites

Salmonid Embryo-Alevin-~~Fry~~ Survival Development and Growth Test **Nautilus Environmental**

Analysis ID:	19-9744-2565	**Endpoint:**	Mean Dry Weight-mg	**CETIS Version:**	CETISv1.9.4
Analyzed:	20 Dec-21 15:59	**Analysis:**	Parametric-Control vs Treatments	**Status Level:**	1

Graphics





① Reference sites

Salmonid Embryo-Alevin-~~Fry~~ Survival Development and Growth Test — **Nautilus Environmental**

Analysis ID:	15-3535-6577	**Endpoint:**	Length-mm	**CETIS Version:**	CETISv1.9.4
Analyzed:	20 Dec-21 16:00	**Analysis:**	Parametric-Control vs Treatments	**Status Level:**	1
Batch ID:	00-9465-4096	**Test Type:**	Survival-Development-Growth	**Analyst:**	Yvonne Lam
Start Date:	13 Oct-21 15:50	**Protocol:**	EC/EPS 1/RM/28	**Diluent:**	Dechlorinated Tap Water
Ending Date:	12 Nov-21 08:00	**Species:**	Oncorhynchus mykiss	**Brine:**	
Test Length:	29d 16h	**Taxon:**	Actinopterygii	**Source:**	Lyndon Fish Hatcheries **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
FR_UFR1	19-8746-8946	12 Oct-21 11:07	13 Oct-21 11:53	29h (0 °C)	Teck Coal	
GH_ER2	20-2628-4137	12 Oct-21 10:50	13 Oct-21 11:30	29h (0 °C)		
CM_MC1	18-3559-2852	12 Oct-21 13:20	13 Oct-21 11:30	26h (0.1 °C)		
LC_SLC	08-7937-3726	12 Oct-21 11:00	13 Oct-21 11:30	29h (2.9 °C)		
FR_FRABCH	18-7592-7020	12 Oct-21 11:20	13 Oct-21 11:53	28h (0 °C)		
FR_FRCP1	10-3969-8000	12 Oct-21 11:48	13 Oct-21 11:53	28h (1.3 °C)		
GH_FR1	11-8224-4576	12 Oct-21 10:00	13 Oct-21 11:30	30h (0 °C)		
GH_ERC	00-1276-7572	12 Oct-21 11:50	13 Oct-21 11:30	28h (0 °C)		
CM_MC2	03-9569-8600	12 Oct-21 12:47	13 Oct-21 11:30	27h (1.3 °C)		
EV_MC2	13-1923-7722	12 Oct-21 11:38	13 Oct-21 11:30	28h (0.2 °C)		
EV_HC1	18-6648-8827	12 Oct-21 10:33	13 Oct-21 11:30	29h (0 °C)		
LC_DCDS	17-4710-4100	12 Oct-21	13 Oct-21 11:30	40h (1.7 °C)		
LC_LC3	20-0894-5906	12 Oct-21 12:00	13 Oct-21 11:30	28h (8.8 °C)		
LC_LC5	14-5637-1032	12 Oct-21 13:30	13 Oct-21 11:30	26h (2.6 °C)		
LC_LCDSSLCC	06-4184-4349	12 Oct-21 12:30	13 Oct-21 11:30	27h (4.7 °C)		
FR_FR4	16-7272-1140	12 Oct-21 11:05	13 Oct-21 11:30	29h (0 °C)		
FR_FRRD	04-7874-3326	12 Oct-21 11:45	13 Oct-21 11:30	28h (0 °C)		
FR_FR2	09-1936-7906	12 Oct-21 10:25	13 Oct-21 11:30	29h (0 °C)		
FR_MULTIPLATE	07-2028-3040	12 Oct-21 09:45	13 Oct-21 11:30	30h (0 °C)		

All samples spiked with 20 mg/L Cu

Reference Sites.

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_UFR1	Water Sample	Teck Coal	FR_UFR1_WEK_2021-09-1	
GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-10-12_	
CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-10-12	
LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-10-19_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_WEK_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_WEK_2021-09	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-10-12_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-10-12	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-10-12	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2021_Q4_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2021_Q4_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-10-19	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-10-19_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-10-19_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	
FR_FR4	Water Sample	Teck Coal	FR_FR4_WS_2021-10-12_	
FR_FRRD	Water Sample	Teck Coal	FR_FRRD_WS_2021-10-12	
FR_FR2	Water Sample	Teck Coal	FR_FR2_WS_2021-10-12_	
FR_MULTIPLATE	Water Sample	Teck Coal	FR_MULTIPLATE_WS_202	

Salmonid Embryo-Alevin-~~Fry~~ Survival Development and Growth Test — **Nautilus Environmental**

Analysis ID: 15-3535-6577 **Endpoint:** Length-mm **CETIS Version:** CETISv1.9.4
Analyzed: 20 Dec-21 16:00 **Analysis:** Parametric-Control vs Treatments **Status Level:** 1

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	⑤ FR_UFR1 passed length-mm	8.92%
		⑤ GH_ER2 passed length-mm	8.92%
		① CM_MC1 passed length-mm	8.92%
		FR_FRABCH passed length-mm	8.92%
		FR_FRCP1 passed length-mm	8.92%
		GH_FR1 passed length-mm	8.92%
		GH_ERC passed length-mm	8.92%
		CM_MC2 passed length-mm	8.92%
		EV_MC2 passed length-mm	8.92%
		EV_HC1 passed length-mm	8.92%
		LC_DCDS passed length-mm	8.92%
		LC_LC3 passed length-mm	8.92%
		LC_LC5 passed length-mm	8.92%
		LC_LCDSSLCC passed length-mm	8.92%
		FR_FR4 passed length-mm	8.92%
		FR_FRRD passed length-mm	8.92%
		FR_FR2 passed length-mm	8.92%
		FR_MULTIPLATE passed length-mm	8.92%

① Reference Sites

Dunnett Multiple Comparison Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
① Unamended Sampl		⑤ FR_UFR1	-0.9406	2.694	1.607	6	CDF	0.9976	Non-Significant Effect
(LC_SLC)		⑤ GH_ER2	-2.417	2.694	1.607	6	CDF	1.0000	Non-Significant Effect
		① CM_MC1	-1.45	2.694	1.607	6	CDF	0.9997	Non-Significant Effect
		FR_FRABCH	-2.943	2.694	1.607	6	CDF	1.0000	Non-Significant Effect
		FR_FRCP1	-2.725	2.694	1.607	6	CDF	1.0000	Non-Significant Effect
		GH_FR1	-3.407	2.694	1.607	6	CDF	1.0000	Non-Significant Effect
		GH_ERC	-3.114	2.694	1.607	6	CDF	1.0000	Non-Significant Effect
		CM_MC2	-3.543	2.694	1.607	6	CDF	1.0000	Non-Significant Effect
		EV_MC2	-0.9507	2.694	1.607	6	CDF	0.9977	Non-Significant Effect
		EV_HC1	-1.927	2.694	1.607	6	CDF	1.0000	Non-Significant Effect
		LC_DCDS	-2.884	2.694	1.607	6	CDF	1.0000	Non-Significant Effect
		LC_LC3	-3.044	2.694	1.607	6	CDF	1.0000	Non-Significant Effect
		LC_LC5	-1.936	2.694	1.607	6	CDF	1.0000	Non-Significant Effect
		LC_LCDSSLCC	-3.758	2.694	1.607	6	CDF	1.0000	Non-Significant Effect
		FR_FR4	-2.622	2.694	1.607	6	CDF	1.0000	Non-Significant Effect
		FR_FRRD	-1.641	2.694	1.736	5	CDF	0.9999	Non-Significant Effect
		FR_FR2	-2.911	2.694	1.607	6	CDF	1.0000	Non-Significant Effect
		FR_MULTIPLATE	-2.369	2.694	1.607	6	CDF	1.0000	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	25.1133	1.39518	18	1.959	0.0288	Significant Effect
Error	39.8731	0.71202	56			
Total	64.9864		74			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance Test	11.92	34.81	0.8516	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9853	0.9554	0.5407	Normal Distribution

Analyst: [illegible] QA: Dec 23/21

Salmonid Embryo-Alevin-~~Fry~~ Survival Development and Growth Test **Nautilus Environmental**

Analysis ID: 15-3535-6577 **Endpoint:** Length-mm **CETIS Version:** CETISv1.9.4
Analyzed: 20 Dec-21 16:00 **Analysis:** Parametric-Control vs Treatments **Status Level:** 1

Length-mm Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
① FR_UFR1		4	18.59	17.32	19.85	18.47	17.79	19.61	0.3962	4.26%	0.00%
① GH_ER2		4	19.47	18.95	19.98	19.47	19.09	19.84	0.162	1.66%	-4.74%
① CM_MC1		4	18.89	18.01	19.76	19.07	18.1	19.31	0.2749	2.91%	-1.63%
① LC_SLC	US	4	18.02	17.4	18.64	17.98	17.6	18.54	0.1949	2.16%	3.02%
FR_FRABCH		4	19.78	18.39	21.17	19.74	18.8	20.85	0.4368	4.42%	-6.43%
FR_FRCP1		4	19.65	17.9	21.4	20.07	18.06	20.4	0.5499	5.60%	-5.73%
GH_FR1		4	20.06	18.76	21.35	20.03	19.32	20.85	0.4067	4.06%	-7.92%
GH_ERC		4	19.88	18.4	21.37	19.91	18.82	20.89	0.4672	4.70%	-6.98%
CM_MC2		4	20.14	19.36	20.91	20.26	19.46	20.56	0.2441	2.42%	-8.35%
EV_MC2		4	18.59	17.56	19.63	18.61	17.84	19.3	0.3255	3.50%	-0.03%
EV_HC1		4	19.17	17.55	20.79	18.86	18.4	20.57	0.5087	5.31%	-3.17%
LC_DCDS		4	19.74	18.17	21.32	19.61	18.72	21.04	0.4943	5.01%	-6.24%
LC_LC3		4	19.84	18.52	21.16	19.55	19.21	21.06	0.4162	4.20%	-6.75%
LC_LC5		4	19.18	17.08	21.27	19.49	17.32	20.41	0.6581	6.86%	-3.20%
LC_LCDSSLCC		4	20.27	18.83	21.7	20.06	19.52	21.43	0.4519	4.46%	-9.04%
FR_FR4		4	19.59	18.58	20.6	19.69	18.75	20.22	0.3182	3.25%	-5.40%
FR_FRRD		3	19.08	18.16	20	18.94	18.8	19.5	0.2134	1.94%	-2.67%
FR_FR2		4	19.76	18.05	21.47	20.04	18.29	20.67	0.5382	5.45%	-6.33%
FR_MULTIPLATE		4	19.44	17.83	21.05	19.63	18.18	20.3	0.5062	5.21%	-4.59%

Length-mm Detail

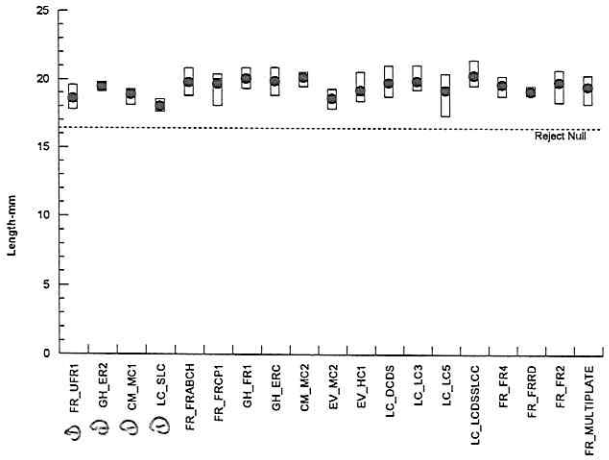
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
① FR_UFR1		18.18	17.79	18.76	19.61
① GH_ER2		19.34	19.09	19.6	19.84
① CM_MC1		19.22	18.1	19.31	18.92
① LC_SLC	US	17.91	17.6	18.04	18.54
FR_FRABCH		19.44	18.8	20.04	20.85
FR_FRCP1		19.78	18.06	20.4	20.37
GH_FR1		19.4	19.32	20.85	20.67
GH_ERC		19.43	18.82	20.39	20.89
CM_MC2		19.46	20.11	20.42	20.56
EV_MC2		18.93	18.29	19.3	17.84
EV_HC1		19.29	18.44	18.4	20.57
LC_DCDS		18.72	19.32	19.9	21.04
LC_LC3		19.43	19.21	19.67	21.06
LC_LC5		19.38	17.32	19.6	20.41
LC_LCDSSLCC		19.57	19.52	20.54	21.43
FR_FR4		19.91	18.75	19.47	20.22
FR_FRRD		18.94	18.8	19.5	
FR_FR2		19.64	18.29	20.44	20.67
FR_MULTIPLATE		19.05	18.18	20.3	20.22

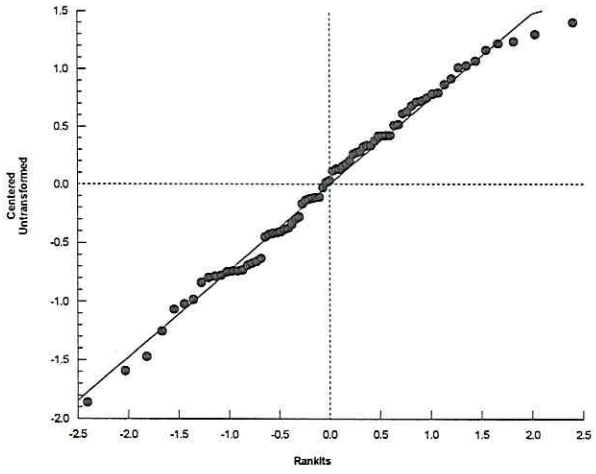
① Reference sites

Salmonid Embryo-Alevin-~~Fry~~ Survival Development and Growth Test **Nautilus Environmental**

Analysis ID:	15-3535-6577	**Endpoint:**	Length-mm	**CETIS Version:**	CETISv1.9.4
Analyzed:	20 Dec-21 16:00	**Analysis:**	Parametric-Control vs Treatments	**Status Level:**	1

Graphics





① Reference Sites

CETIS Analytical Report

Salmonid Embryo-Alevin ~~Fry~~ Survival Development and Growth Test — **Nautilus Environmental**

Analysis ID:	05-9315-4301	**Endpoint:**	Mean ~~Dry~~ Weight-mg	**CETIS Version:**	CETISv1.9.4
Analyzed:	20 Dec-21 16:00	**Analysis:**	Parametric-Control vs Treatments	**Status Level:**	1
Batch ID:	00-9465-4096	**Test Type:**	Survival-Development-Growth	**Analyst:**	Yvonne Lam
Start Date:	13 Oct-21 15:50	**Protocol:**	EC/EPS 1/RM/28	**Diluent:**	Dechlorinated Tap Water
Ending Date:	12 Nov-21 08:00	**Species:**	Oncorhynchus mykiss	**Brine:**	
Test Length:	29d 16h	**Taxon:**	Actinopterygii	**Source:**	Lyndon Fish Hatcheries **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
① FR_UFR1	19-8746-8946	12 Oct-21 11:07	13 Oct-21 11:53	29h (0 °C)	Teck Coal	
① GH_ER2	20-2628-4137	12 Oct-21 10:50	13 Oct-21 11:30	29h (0 °C)		
① CM_MC1	18-3559-2852	12 Oct-21 13:20	13 Oct-21 11:30	26h (0.1 °C)		
① LC_SLC	08-7937-3726	12 Oct-21 11:00	13 Oct-21 11:30	29h (2.9 °C)		
FR_FRABCH	18-7592-7020	12 Oct-21 11:20	13 Oct-21 11:53	28h (0 °C)		
FR_FRCP1	10-3969-8000	12 Oct-21 11:48	13 Oct-21 11:53	28h (1.3 °C)		
GH_FR1	11-8224-4576	12 Oct-21 10:00	13 Oct-21 11:30	30h (0 °C)		
GH_ERC	00-1276-7572	12 Oct-21 11:50	13 Oct-21 11:30	28h (0 °C)		
CM_MC2	03-9569-8600	12 Oct-21 12:47	13 Oct-21 11:30	27h (1.3 °C)		
EV_MC2	13-1923-7722	12 Oct-21 11:38	13 Oct-21 11:30	28h (0.2 °C)		
EV_HC1	18-6648-8827	12 Oct-21 10:33	13 Oct-21 11:30	29h (0 °C)		
LC_DCDS	17-4710-4100	12 Oct-21	13 Oct-21 11:30	40h (1.7 °C)		
LC_LC3	20-0894-5906	12 Oct-21 12:00	13 Oct-21 11:30	28h (8.8 °C)		
LC_LC5	14-5637-1032	12 Oct-21 13:30	13 Oct-21 11:30	26h (2.6 °C)		
LC_LCDSSLCC	06-4184-4349	12 Oct-21 12:30	13 Oct-21 11:30	27h (4.7 °C)		
FR_FR4	16-7272-1140	12 Oct-21 11:05	13 Oct-21 11:30	29h (0 °C)		
FR_FRRD	04-7874-3326	12 Oct-21 11:45	13 Oct-21 11:30	28h (0 °C)		
FR_FR2	09-1936-7906	12 Oct-21 10:25	13 Oct-21 11:30	29h (0 °C)		
FR_MULTIPLATE	07-2028-3040	12 Oct-21 09:45	13 Oct-21 11:30	30h (0 °C)		

All samples spiked with 20 mg/L Cu

① reference sites

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
① FR_UFR1	Water Sample	Teck Coal	FR_UFR1_WEK_2021-09-1	
① GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-10-12_	
① CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-10-12	
① LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-10-19_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_WEK_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_WEK_2021-09	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-10-12_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-10-12	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-10-12	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2021_Q4_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2021_Q4_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-10-19	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-10-19_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-10-19_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	
FR_FR4	Water Sample	Teck Coal	FR_FR4_WS_2021-10-12_	
FR_FRRD	Water Sample	Teck Coal	FR_FRRD_WS_2021-10-12	
FR_FR2	Water Sample	Teck Coal	FR_FR2_WS_2021-10-12_	
FR_MULTIPLATE	Water Sample	Teck Coal	FR_MULTIPLATE_WS_202	

Analyst: YL QA: Dec 23/21

Salmonid Embryo-Alevin ~~Fry~~ Survival Development and Growth Test — **Nautilus Environmental**

Analysis ID: 05-9315-4301 **Endpoint:** Mean ~~Dry~~ WF Weight-mg **CETIS Version:** CETISv1.9.4
Analyzed: 20 Dec-21 16:00 **Analysis:** Parametric-Control vs Treatments **Status Level:** 1

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	① FR_UFR1 passed mean dry weight-mg	24.15%
		② GH_ER2 passed mean dry weight-mg	24.15%
		③ CM_MC1 passed mean dry weight-mg	24.15%
		FR_FRABCH passed mean dry weight-mg	24.15%
		FR_FRCP1 passed mean dry weight-mg	24.15%
		GH_FR1 passed mean dry weight-mg	24.15%
		GH_ERC passed mean dry weight-mg	24.15%
		CM_MC2 passed mean dry weight-mg	24.15%
		EV_MC2 passed mean dry weight-mg	24.15%
		EV_HC1 passed mean dry weight-mg	24.15%
		LC_DCDS passed mean dry weight-mg	24.15%
		LC_LC3 passed mean dry weight-mg	24.15%
		LC_LC5 passed mean dry weight-mg	24.15%
		LC_LCDSSLCC passed mean dry weight-mg	24.15%
		FR_FR4 passed mean dry weight-mg	24.15%
		FR_FRRD passed mean dry weight-mg	24.15%
		FR_FR2 passed mean dry weight-mg	24.15%
		FR_MULTIPLATE passed mean dry weight-m	24.15%

① Reference STats

Dunnett Multiple Comparison Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
① Unamended Sampl (LC-SLC)		① FR_UFR1	-0.4446	2.694	19.81	6	CDF	0.9860	Non-Significant Effect
		② GH_ER2	-0.8173	2.694	19.81	6	CDF	0.9962	Non-Significant Effect
		③ CM_MC1	-0.5094	2.694	19.81	6	CDF	0.9887	Non-Significant Effect
		FR_FRABCH	-1.555	2.694	19.81	6	CDF	0.9999	Non-Significant Effect
		FR_FRCP1	-1.614	2.694	19.81	6	CDF	0.9999	Non-Significant Effect
		GH_FR1	-2.717	2.694	19.81	6	CDF	1.0000	Non-Significant Effect
		GH_ERC	-2.166	2.694	19.81	6	CDF	1.0000	Non-Significant Effect
		CM_MC2	-1.934	2.694	19.81	6	CDF	1.0000	Non-Significant Effect
		EV_MC2	-0.6375	2.694	19.81	6	CDF	0.9927	Non-Significant Effect
		EV_HC1	-1.459	2.694	19.81	6	CDF	0.9997	Non-Significant Effect
		LC_DCDS	-1.342	2.694	19.81	6	CDF	0.9995	Non-Significant Effect
		LC_LC3	-0.9842	2.694	19.81	6	CDF	0.9980	Non-Significant Effect
		LC_LC5	-0.5206	2.694	19.81	6	CDF	0.9891	Non-Significant Effect
		LC_LCDSSLCC	-1.295	2.694	19.81	6	CDF	0.9994	Non-Significant Effect
		FR_FR4	-1.423	2.694	19.81	6	CDF	0.9997	Non-Significant Effect
		FR_FRRD	-0.3961	2.694	21.4	5	CDF	0.9837	Non-Significant Effect
		FR_FR2	-1.146	2.694	19.81	6	CDF	0.9989	Non-Significant Effect
		FR_MULTIPLATE	-1.562	2.694	19.81	6	CDF	0.9999	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	1786.08	99.2264	18	0.9173	0.5619	Non-Significant Effect
Error	6057.5	108.17	56			
Total	7843.57		74			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance Test	6.631	34.81	0.9929	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9624	0.9554	0.0252	Normal Distribution

Salmonid Embryo-Alevin-~~Fry~~ Survival Development and Growth Test — Nautilus Environmental

Analysis ID: 05-9315-4301 Endpoint: Mean ~~Dry~~ Weight-mg CETIS Version: CETISv1.9.4
Analyzed: 20 Dec-21 16:00 Analysis: Parametric-Control vs Treatments Status Level: 1

Mean ~~Dry~~ Weight-mg Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
① FR_UFR1		4	85.3	67.58	103	84.23	74.62	98.15	5.568	13.05%	0.00%
② GH_ER2		4	88.04	73.31	102.8	87.58	78.21	98.8	4.631	10.52%	-3.21%
③ CM_MC1		4	85.78	76.66	94.9	85.75	79.31	92.31	2.865	6.68%	-0.56%
④ LC_SLC	US	4	82.03	68.54	95.53	83.84	71.25	89.2	4.24	10.34%	3.83%
FR_FRABCH		4	93.47	74.15	112.8	93.11	81.11	106.5	6.07	12.99%	-9.57%
FR_FRCP1		4	93.9	76.26	111.5	97.59	78.33	102.1	5.543	11.81%	-10.08%
GH_FR1		4	102	74.31	129.7	98.68	85.93	124.8	8.708	17.07%	-19.59%
GH_ERC		4	97.96	86.31	109.6	97.85	89.63	106.5	3.663	7.48%	-14.84%
CM_MC2		4	96.25	76.88	115.6	98.92	79.29	107.9	6.088	12.65%	-12.84%
EV_MC2		4	86.72	71.89	101.6	90.68	72.92	92.61	4.661	10.75%	-1.66%
EV_HC1		4	92.76	75.5	110	94.58	78.08	103.8	5.424	11.69%	-8.74%
LC_DCDS		4	91.9	78.49	105.3	92.87	81.85	100	4.214	9.17%	-7.73%
LC_LC3		4	89.27	76.99	101.5	89.1	80	98.89	3.858	8.64%	-4.65%
LC_LC5		4	85.86	68.33	103.4	87.72	72.8	95.2	5.51	12.84%	-0.65%
LC_LCDSSLCC		4	91.56	75.17	107.9	93.27	78.57	101.1	5.151	11.25%	-7.33%
FR_FR4		4	92.5	83.09	101.9	95.29	83.64	95.79	2.957	6.39%	-8.44%
FR_FRRD		3	85.18	60.87	109.5	80.74	78.4	96.4	5.65	11.49%	0.15%
FR_FR2		4	90.46	73.45	107.5	92.3	76.84	100.4	5.346	11.82%	-6.04%
FR_MULTIPLATE		4	93.52	73.82	113.2	95.51	76.67	106.4	6.191	13.24%	-9.63%

Mean ~~Dry~~ Weight-mg Detail

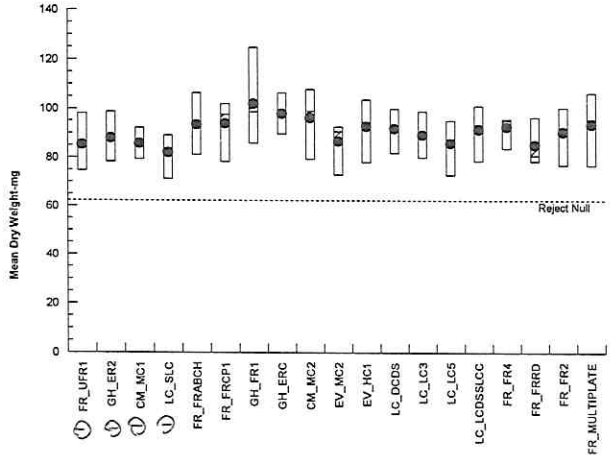
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4
① FR_UFR1		77.5	74.62	90.95	98.15
② GH_ER2		82.86	78.21	92.31	98.8
③ CM_MC1		83.1	79.31	92.31	88.4
④ LC_SLC	US	79.29	71.25	88.4	89.2
FR_FRABCH		85.42	81.11	100.8	106.5
FR_FRCP1		93.6	78.33	102.1	101.6
GH_FR1		91.25	85.93	124.8	106.1
GH_ERC		94.83	89.63	100.9	106.5
CM_MC2		97.04	79.29	107.9	100.8
EV_MC2		89.26	72.92	92.61	92.11
EV_HC1		92.5	78.08	96.67	103.8
LC_DCDS		88.15	81.85	100	97.6
LC_LC3		88.89	80	89.31	98.89
LC_LC5		80.67	72.8	95.2	94.78
LC_LCDSSLCC		88.15	78.57	98.4	101.1
FR_FR4		95.36	83.64	95.79	95.22
FR_FRRD		80.74	78.4	96.4	
FR_FR2		87.2	76.84	100.4	97.39
FR_MULTIPLATE		94.5	76.67	106.4	96.52

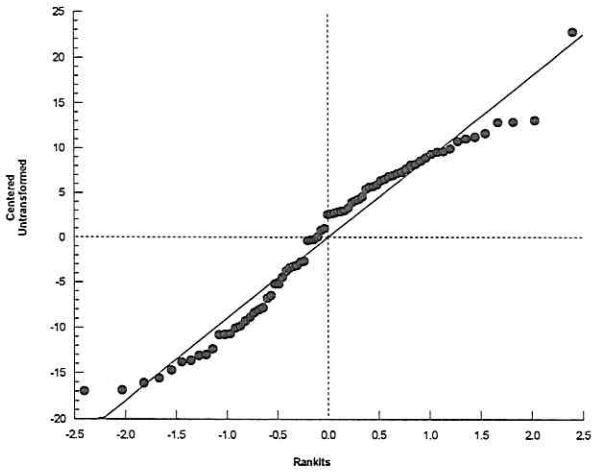
① Reference sites

Salmonid Embryo-Alevin ~~Fry~~ Survival Development and Growth Test **Nautilus Environmental**

Analysis ID:	05-9315-4301	**Endpoint:**	Mean ~~Dry~~ Weight-mg	**CETIS Version:**	CETISv1.9.4
Analyzed:	20 Dec-21 16:00	**Analysis:**	Parametric-Control vs Treatments	**Status Level:**	1

Graphics





① Reference Sites

Client: Took

W.O.#: ~~213107~~ 212110

Hardness and Alkalinity Datasheet

Day 0

Sample ID	Subsample Date	Date Measured	Alkalinity: Sample Volume (mL)	Alkalinity: (mL) 0.02N HCL/H_2SO_4 used to pH 4.5	Alkalinity: (mL) of 0.02N HCL/H_2SO_4 used to pH 4.2	Alkalinity: Total Alkalinity ($mg/LCaCO_3$)	Hardness: Sample Volume (mL)	Hardness: Volume of 0.01M EDTA Used (mL)	Hardness: Total Hardness ($mg/L\ CaCO_3$)	Technician
(Dechlor) Control	Oct. 13/21	Oct. 14/21	~~50~~ 100	~~3.5~~ 2.0	~~3.6~~ 2.1	~~68~~ 19	~~50~~ 100	~~6.5~~ 3.0	~~130~~ 20	~~RB~~ MM
FR-UFR1		Oct. 14/21	50	7.9	8.0	156	50	9.3	186	RB/EC
GH-ER2		Oct 14/21	50	7.6	7.8	148	50	8.0	160	RB/EC
CM-MC1		Oct 14/21	50	8.0	8.1	158	50	8.0	160	RB/EC
LC-SLC		Oct 14/21	50	6.2	6.3	122	50	10.1	202	RB/EC
FR-FRABCH		~~Oct 14/21~~	10 D	2.4 ~~2.7~~ EC	3.1	5 EE 270	10 D	6.8	680	RB/EC
FR-FRCPI		Oct 14/21	10 D	2.7	2.9	250	10 D	6.6	660	RB/EC
GH-ER1		Oct 14/21	10 D	2.5	2.6	240	10 D	4.8	480	RB/EC
GH-ERC		Oct 14/21	50	7.2	7.4	140	50	8.3	166	RB/EC
CM-MC2		Oct 14/21	10 D	2.9	3.0	280	10 D	6.5	650	RB/EC
EV-HC1		Oct 14/21	10 D	2.3	2.5	210	10 D	4.8	480	RB/EC
LC-DCDS		Oct 14/21	10 D	1.7	1.9	150	10 D	5.8	580	RB/EC
LC-LC3		Oct 15/21	10 D	2.6	2.7	250	10 D	6.0	600	RB
LC-LC5		Oct 15/21	10 D	2.3	2.4	220	10 D	4.5	450	RB
LC-LCDSSLCC		Oct 15/21	10 D	2.4	2.5	230	10 D	5.5	550	RB
~~RG-MIDAC~~		~~Oct 15/21~~	~~10 D~~	~~2.2~~	~~2.4~~	~~200~~	~~10 D~~	~~3.6~~	~~360~~	~~RB~~
ER-FR4		Oct 15/21	10 D	2.8	2.9	270	10 D	6.8	680	RB
ER-FRBD		Oct 15/21	10 D	3.4	3.6	320	10 D	6.4	640	RB
FR-FR2		Oct 15/21	10 D	2.1	2.2	200	10 D	5.6	560	RB
EV-MC2		Oct 15/21	10 D	2.4	2.5	230	10 D	3.3	330	RB
Notes: FR MULTIPLATE		Oct 15/21	10 D	2.4	2.5	230	10 D	5.0	500	RB

D Diluted to 100 mL w/ DI water.

Reviewed by: [signature]

Date Reviewed: Dec. 14, 2021

Client: Teck 04 Week 2

W.O.#: ~~212109~~ 212110

Hardness and Alkalinity Datasheet

	Alkalinity						Hardness			
Sample ID	Subsample Date	Date Measured	Sample Volume (mL)	(mL) 0.02N HCL/H_2SO_4 used to pH 4.5	(mL) of 0.02N HCL/H_2SO_4 used to pH 4.2	Total Alkalinity ($mg/LCaCO_3$)	Sample Volume (mL)	Volume of 0.01M EDTA Used (mL)	Total Hardness ($mg/L\ CaCO_3$)	Technician
~~Dechlor~~ ~~Lab~~ Ctrl	Oct.20/21	Oct.25/21	100	~~0.9~~ 2.1	2.2	~~80.0~~ 20	100	~~7.4~~ 2.3	~~2402~~ 23	~~EC~~ MV
FR-UFR1	Oct20/21	Oct.25/21	100	1.7	1.9	150	100	2.0	200	EC
GH-ER2	Oct 20/21	Oct.25/21	100	1.7	1.8	160	100	2.0	200	
CM-MC1	Oct 20/21	Oct.25/21	100	1.5	1.7	130	100	1.7	170	
LC-SLC	Oct.20/21	Oct.25/21	100	2.2	2.4	200	100	2.3	230	EC
FR-FRABCH	Oct.20/21	Oct.25/21	100	2.1	2.2	200	100	8.0	800	
FR-FREP1	Oct.20/21	Oct.25/21	100	2.5	2.7	230	100	6.6	660	
GH-ER1	Oct.20/21	Oct.25/21	100	3.1	3.3	240	100	4.8	480	
GH-ERC	Oct.20/21	Oct.25/21	100	1.8	2.0	160	100	2.2	220	
CM-MC2	Oct.20/21	Oct.25/21	100	2.4	2.6	220	100	6.0	600	
EV-MC2	Oct.20/21	Oct.25/21	100	2.0	2.1	190	100	3.8	380	
EV-HC1	Oct.20/21	Oct.25/21	100	2.3	2.5	210	100	4.5	450	
LC-DCDS	Oct.20/21	Oct.25/21	100	1.5	1.7	130	100	5.4	540	EC
LC-LCS	Oct.20/21	Oct.25/21	100	2.3	2.5	210	100	4.3	430	EC
LC-LCDSSLCC	Oct.20/21	Oct.25/21	100	2.5	2.7	230	100	6.5	650	
~~RG-MIDAG~~	~~Oct.20/21~~	~~Oct.25/21~~	~~100~~	~~2.2~~	~~2.4~~	~~200~~	~~100~~	~~3.5~~	~~350~~	
FR-FR4	Oct.20/21	Oct.25/21	100	3.2	3.4	300	100	~~7.3~~	730	
FR-FR2	Oct.20/21	Oct.25/21	100	3.1	3.2	300	100	6.7	670	
FR-MULTPLATE	Oct.20/21	Oct.25/21	100	2.2	2.3	210	100	4.6	460	
FR-FRRD	Oct.20/21	Oct.25/21	100	3.5	3.7	330	100	9.0	900	
Notes: LC-LC3	Oct.20/21	Oct.25/21	100	3.0	3.2	280	100	6.0	600	

① diluted to 100mL with DI

Reviewed by: [signature]

Date Reviewed: Dec. 14, 2021

Client: Teck Q4 Week 3

W.O.#: Week 3 212109 212110

Hardness and Alkalinity Datasheet

Sample ID	Subsample Date	Date Measured	Alkalinity: Sample Volume (mL)	Alkalinity: (mL) 0.02N HCL/H_2SO_4 used to pH 4.5	Alkalinity: (mL) of 0.02N HCL/H_2SO_4 used to pH 4.2	Alkalinity: Total Alkalinity ($mg/LCaCO_3$)	Hardness: Sample Volume (mL)	Hardness: Volume of 0.01M EDTA Used (mL)	Hardness: Total Hardness ($mg/L\ CaCO_3$)	Technician
~~FR-~~ Dechlor Control	Oct. 27/21	NOV 1/21	~~50~~ 100	~~3.9~~ 2.1	2.2 ~~4.0~~	~~7620~~	~~50~~ 100	~~7.4~~ 2.1	~~148~~ 21	~~YM~~ YM
FR-UFR1		Nov 1/21	50	7.9	8.0	156	50	9.8	196	
GH-ER2		Nov 1/21	50	8.0	8.1	158	50	8.9	178	
CM-MC1		Nov 1/21	50	8.0	8.1	158	50	7.5	150	
LC-SLC		Nov 1/21	50	7.8	7.9	154	50	10.7	214	
FR-FRABCH		Nov 1/21	10①	3.2	3.4	300	10①	6.5	650	
FR-FRCP1		Nov 1/21	10①	3.1	3.3	290	10①	8.0	800	
GH-FR1		Nov 1/21	10①	2.6	2.9	230	10①	5.4	540	
GH-ERC		Nov 1/21	50	8.3	8.4	164	50	9.1	182	
CM-MC2		Nov 1/21	10①	2.6	2.8	240	10①	5.7	570	
EV-MC2		Nov 1/21	10①	2.0	2.2	180	10①	3.1	310	
EV-HC1		Nov 1/21	10①	2.7	2.9	250	10①	4.5	450	
LC-DCDS		Nov 1/21	10①	1.8	1.9	170	10①	6.5	650	
LC-LC3		Nov 1/21	10①	2.7	2.9	250	10①	7.1	710	
LC-LC5		Nov 1/21	10①	2.3	2.5	210	10①	4.8	480	
LC-LCDSSLCC		Nov 1/21	10①	2.6	2.8	240	10①	5.6	560	
~~RG-~~ MIDA6		~~Nov 1/21~~	~~10①~~	~~2.0~~	~~2.1~~	~~190~~	~~10①~~	~~4.3~~	~~430~~	~~YM~~
FR-FR4		Nov 1/21	10①	3.0	3.1	290	10①	6.3	630	
FR-FR2		Nov 1/21	10①	2.3	2.4	220	10①	6.3	630	
FR-MULTPLATE		Nov 1/21	10①	2.0	2.2	180	10①	5.3	530	
FR-FRRD		NOV 1/21	10①	3.2	3.5	290	10①	7.1	710	

Notes:

① Diluted to 100mL w/ DI water.

Reviewed by: [signature]

Date Reviewed: Dec 14, 2021

Client: Teck 04 week 4

W.O.#: ~~Week 4~~ ~~212109~~ 212110 RCJ

Hardness and Alkalinity Datasheet

Sample ID	Alkalinity: Subsample Date	Alkalinity: Date Measured	Alkalinity: Sample Volume (mL)	Alkalinity: (mL) 0.02N HCL/H_2SO_4 used to pH 4.5	Alkalinity: (mL) of 0.02N HCL/H_2SO_4 used to pH 4.2	Alkalinity: Total Alkalinity (mg/L$CaCO_3$)	Hardness: Sample Volume (mL)	Hardness: Volume of 0.01M EDTA Used (mL)	Hardness: Total Hardness (mg/L $CaCO_3$)	Technician
Dechlor Control	Nov. 3/21	Nov. 15/21	~~50~~ 100	~~3.5~~ 2.0	~~3.6~~ 2.2	~~68~~ 18	~~50~~	~~5.5~~ 20	~~5~~ EC ~~110~~ 20	~~EC~~
FR-UFR1			50	7.3	7.5	142	50	9.0	180	EC
GH-ER2			50	8.2	8.4	160	50	8.2	~~820~~ 164 EC	
CM-MC1			50	6.9	7.1	134	50	6.2	EC ~~62~~ 124	
LC-SLC		Nov. 10/21	50	7.4	7.5	146	50	10.3	~~1030~~ EC 206	EC
FR-FRABCH		Nov. 15/21	10(1)	3.4	3.5	330	10(1)	7.2	720	EC
FR-FRCP1			10(1)	3.4	3.6	320	10(1)	6.4	640	EC
GH-FR1			10(1)	2.6	2.7	250	10(1)	4.0	400	EC
GH-ERC		Nov. 10/21	50	7.8	8.0	~~760~~ EC 152	10(1)	~~8.8~~ 1.5 EC	150	EC
CM-MC2		Nov. 10/21	10(1)	2.5	2.7	230	10(1)	4.5	450	EC
EV-MC2		Nov. 15/21	10(1)	1.7	1.9	150	10(1)	2.9	290	EC
EV-HC1		Nov. 15/21	10(1)	3.2	3.4	300	10(1)	6.1	610	EC
LC-DCDS		Nov. 16/21	10(1)	5.6	5.8	540	10(1)	5.8	580	
LC-LC3		Nov 10/21	10(1)	2.6	2.8	240	10(1)	8.5	850	EC
LC-LC5		Nov. 16/21	10(1)	2.4	2.5	230	10(1)	5.7	570	
LC-LCDSSLCC			10(1)	2.3	2.5	210	10(1)	5.6	560	
~~RG-MIDAG~~		~~Nov. 15/21~~	~~10(1)~~	~~2.3~~	~~2.5~~	~~210~~	~~10(1)~~	~~3.3~~	~~330~~	~~EC~~
FR-FR4		Nov. 10/21	10(1)	3.2	3.4	300	10(1)	8.1	810	EC
FR-FR2		Nov. 15/21	10(1)	2.9	3.0	280	10(1)	6.8	680	
FR-MULTIPLATE			10(1)	1.9	2.1	170	10(1)	5.0	500	
Notes: FR-FRRD			10(1)	2.8	2.9	270	10(1)	9.1	910	

(1) diluted to 100mL w/ DI water

Reviewed by: [signature] Date Reviewed: Dec. 14, 2021

Client: Teck Q4 week 5

W.O.#: week 5 ~~212109~~ 212160
R2 v

Hardness and Alkalinity Datasheet

		Alkalinity						Hardness			
	Sample ID	Subsample Date	Date Measured	Sample Volume (mL)	(mL) 0.02N HCL/H_2SO_4 used to pH 4.5	(mL) of 0.02N HCL/H_2SO_4 used to pH 4.2	Total Alkalinity ($mg/LCaCO_3$)	Sample Volume (mL)	Volume of 0.01M EDTA Used (mL)	Total Hardness ($mg/L\ CaCO_3$)	Technician
BS	~~Lab Ctrl~~	~~Nov. 22/21~~		50				50			
	FR-UFR1	Nov. 22/21	Nov. 22/21		7.0	7.2	136	50	9.2	184	EC
	GH-ER2				7.2	7.4	140		8.5	170	
	CM-MC1				6.3	6.5	122		6.6	132	
	LC-SLC			↓	7.3	7.4	144	↓	10.8	216	
	~~FR-FRARCH~~			100	2.9	3.0	280	100	8.9	890	
	FR-FRCP1				2.4	2.6	220		8.0	800	
	GH-FR1				2.4	2.6	220		6.3	630	
	GH-ERC				1.7	1.9	150		2.2	220	
	CM-MC2				2.1	2.3	190		4.9	490	
	EV-HC1				2.4	2.6	220		4.5	450	
	LC-DCDS				2.0	2.2	180		6.0	600	
	LC-LC3				2.8	3.0	260		7.0	700	
	LC-LC5				2.7	2.9	250		4.5	450	
	LC-LCDSSLCC		↓	↓	2.6	2.8	240	↓	5.5	550	
Rechlor control	~~RC-MED AG 225~~			~~100~~	2.1	2.2	20	~~100~~	2.2	22	~~WM~~
	FR-FR4			~~100~~	3.1	3.2	300	~~100~~	7.8	780	EC
	FR-FRRD				3.1	3.3	290		10.1	1010	
	FR-FR2				2.4	2.5	230		6.2	620	
	FR-MULTIPATE	↓	↓	↓	2.1	2.3	190		6.3	630	
					1.8	2.0	160	↓	2.2	220	

Notes: EV-MC2 Nov. 22/21

Diluted to 100mL w/ DI water

Reviewed by: [signature]

Date Reviewed: Dec. 14, 2021

APPENDIX E – Chain-of-Custody Forms

Teck

COC ID:	Q4_CHRONIC_10122021_Burn	TURNAROUND TIME:	Regular	RUSH:	No

PROJECT/CLIENT INFO				LABORATORY				OTHER INFO				
Facility Name / Job#	Coal Mountain Operations			Lab Name	Nautilus Environmental			Report Format / Distribution		Excel	PDF	EDD
Project Manager	Victoria Sharpe			Lab Contact	Armando Tang			Email 1:	Jay.jones@teck.com	X	X	X
Email	Victoria.Sharpe@teck.com			Email	armando@nautilusenvironmental.ca			Email 2:	teckcoal@equisonline.com			X
								Email 3:	Victoria.Sharpe@teck.com	X	X	X
								Email 4	Don.Sacino@teck.com	X	X	X
Address	PO Box 3000			Address	8664 commerce Court			Email 5:	Shelby.Holden@teck.com	X	X	X
City	Sparwood	Province	BC	City	Burnaby	Province	BC	PO number				
Postal Code	V0B 2G0	Country	Canada	Postal Code	V5A 4N7	Country	Canada					
Phone Number	1-250-425-7522			Phone Number	604-420-8773							

SAMPLE DETAILS								ANALYSIS REQUESTED												Filtered - F: Field, L: Lab, FL: Field & Lab, N: None	
							Filt.														
							PRESERV.														
Sample ID	Sample Location	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	ANALYSIS 212108 7-d C.dubia P/F	212111 (EDTA) 7-d C.dubia P/F	212107 72-hr P. subcapitata P/F	212110 30-d embryo EA P/F	212109 28-d Hyalella P/F	212112 28-d Hyalella P/F (EDTA)								
CM_MC2_WS_2021-10-12_N	CM_MC2	WS	No	10/12/2021	12:47	G	5	x	x	x	x	x	x					1.3 - 2.2			
CM_MC1_WS_2021-10-12_N	CM_MC1	WS	No	10/12/2021	13:20	G	5	x		x	x	x						0.1 - 3.4			
RG_MIDAG_WS_2021-10-12_N	RG_MIDAG	WS	No	10/12/2021	12:24	G	2	x	x			x	x					3.9 - 4.1			

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
			Tyrone Hamilton	Oct 13/21 @ 11:30
			Nautilus - Burnaby	Q4-W1

NB OF BOTTLES RETURNED/DESCRIPTION	
Regular (default)	X
Priority (2-3 business days) - 50% surcharge	
Emergency (1 Business Day) - 100% surcharge	
For Emergency <1 Day, ASAP or Weekend - Contact ALS	

Sampler's Name	SH/DS/KS	Mobile #	250 425 7522
Sampler's Signature		Date/Time	October 12, 2021

Teck

COC ID:	20211012CRN4B	TURNAROUND TIME:		RUSH:	

PROJECT/CLIENT INFO

Facility Name / Job#	Elkview Operations		
Job Description	Q4 Chronic Toxicity Sampling		
Project Manager	Jennifer Dane		
Email	jennifer.dane@teck.com		
Address	RR#1 HWY# 3		
City	Sparwood	Province	BC
Postal Code	V1C 4C3	Country	Canada
Phone Number	1-250-425-8137		

LABORATORY

Lab Name	Nautilus Environmental		
Lab Contact	Jeslin Wijaya		
Email	[redacted]		
Address	8664 Commerce Court		
	Imperial Square Lake City		
City	Burnaby	Province	BC
Postal Code	V5A 4N7	Country	Canada
Phone Number	604-420-8773		

OTHER INFO

Report Format / Distribution		Excel	PDF	EDD
Email 1:				
Email 2:	teckcoal@equisonline.com			X
Email 3:	chris.emslie@teck.com	X	X	X
Email 4:	Teck.Lab.Results@teck.com	X	X	X
Email 5:	jennifer.dane@teck.com	X	X	X
Email 6:	colby.bracken@teck.com	X	X	X
PO number	VPO00678876			

SAMPLE DETAILS

ANALYSIS REQUESTED

Filtered - F: Field, L: Lab, FL: Field & Lab, N: None

Sample ID	Sample Location	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	ANALYSIS	7-d C.dubia P/F	72-hr P. subcapitata P/F	30-d embryo EA P/F	28-d Hyalella P/F						
FILTERED									No	No	No	No						
PRESERVED									No	No	No	No						
EV_HC1_WS_2021_Q4_WK1_N	EV_HC1	WS	N	10/12/2021	10:33	G	4		1	1	1	1					0.0 - 0.0	
EV_MC2_WS_2021_Q4_WK1_N	EV_MC2	WS	N	10/12/2021	11:38	G	4		1	1	1	1					0.2 - 1.3	
									212108	212107	212110	212109						
					Total		8											

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
Toxicity 96-Hr/48-HR = 96 Hr Rainbow Trout pass/fail & 48 Hr Daphnia pass/fail (Daphinia testing to occur at 20 degrees)	S.Hansen/B.Clarke	12-Oct-21	Tyrone Hamilton Nautilus - Burnaby	Oct 13/21 @ 11:30 Q4-W1

NB OF BOTTLES RETURNED/DESCRIPTION

Regular (default)	X
Priority (2-3 business days) - 50% surcharge	
Emergency (1 Business Day) - 100% surcharge	
For Emergency <1 Day, ASAP or Weekend - Contact ALS	

Sampler's Name	S.Hansen/B.Clarke	Mobile #	1-250-423-0826
Sampler's Signature	[signature]	Date/Time	October 12, 2021

Teck

COC ID: UFR_TOX_Q4-WEEK-1 | TURNAROUND TIME: | RUSH:

PROJECT/CLIENT INFO				LABORATORY				OTHER INFO				
Facility Name / Job#	Fording River Operation			Lab Name	Nautilus Environmental - BC			Report Format / Distribution		Excel	PDF	EDD
Project Manager	Scott Roughead			Lab Contact				Email 1:	david.burroughs@teck.com	X	X	X
Email	scott.roughead@teck.com			Email	BCinfo@nautilusenvironmental.ca			Email 2:	cruz.canlas@teck.com	X	X	X
Address				Address	8664 Commerce Court			Email 3:	scott.roughead@teck.com	X	X	X
								Email 4:	teckcoal@equisonline.com			X
City	Elkford	Province	BC	City	Burnaby	Province	BC	Email 5:	jessica.ritz@teck.com	X	X	X
Postal Code		Country	Canada	Postal Code	V5A 4N7	Country	Can	Email 6:	cait.good@teck.com	X	X	X
Phone Number	1-250-433-6976			Phone Number	604-420-8773			Email 7:	jamie.walsh@teck.com	X	X	X

SAMPLE DETAILS / ANALYSIS REQUESTED (Filtered - F: Field, L: Lab, FL: Field & Lab, N: None)

Sample ID	Sample Location (sys loc code)	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	FIL.	N	N	N	N								
								PRESERV.	NONE	NONE	NONE	NONE								
								ANALYSIS	7-d C.dubia P/F	30-d embryo EA P/F	28-d Hyalella P/F									
FR_FR4_WS_2021-10-12_N	FR_FR4	WS	NO	12-Oct-21	1105	G	4		X	X	X								0.0	0.0
FR_FRRD_WS_2021-10-12_N	FR_FRRD	WS	NO	12-Oct-21	1145	G	4		X	X	X								0.0	0.0
FR_FR2_WS_2021-10-12_N	FR_FR2	WS	NO	12-Oct-21	1025	G	4		X	X	X								0.0	0.0
FR_MULTIPLATE_WS_2021-10-12_NP	FR_MULTIPLATE	WS	NO	12-Oct-21	945	G	4		X	X	X								0.0	0.0
									212103	212110	212109									

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
			Tyrone Hamilton	Oct 13/21 @ 11:30
			Nautilus - Burnaby	Q4-W1

SERVICE REQUEST (rush - subject to availability)

Regular (default)	X
Priority (2-3 business days) - 50% surcharge	
Emergency (1 Business Day) - 100% surcharge	
For Emergency <1 Day, ASAP or Weekend - Contact ALS	

Sampler's Name	Tyler Fortin	Mobile #	250 464 5914
Sampler's Signature		Date/Time	2021-10-12

Teck

COC ID:	10/12/2021	TURNAROUND TIME:		RUSH:	

PROJECT/CLIENT INFO				LABORATORY				OTHER INFO				
Facility Name / Job#	Fording River Operation			Lab Name	Nautilus Environmental - BC			Report Format / Distribution		Excel	PDF	EDD
Project Manager	Scott Roughead			Lab Contact				Email 1:	david.burroughs@teck.com	X	X	X
Email	scott.roughead@teck.com			Email	BCinfo@nautilusenvironmental.ca			Email 2:	britt.anderson@teck.com	X	X	X
Address				Address	8664 Commerce Court			Email 3:	scott.roughead@teck.com	X	X	X
								Email 4:	cruz.canlas@teck.com	X	X	X
City	Elkford	Province	BC	City	Burnaby	Province	BC	Email 5:	jamie.walsh@teck.com	X	X	X
Postal Code		Country	Canada	Postal Code	V5A 4N7	Country	Canada	Email 6:	teckcoal@equisonline.com			X
Phone Number	1-250-433-6976			Phone Number	604-420-8773			VPO00741382				

SAMPLE DETAILS / **ANALYSIS REQUESTED** (Filtered - F: Field, L: Lab, FL: Field & Lab, N: None)

Sample ID (2021-09-12_N)	Sample Location (sys_loc_code)	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	FIL	PRESERV.	ANALYSIS: 7-d C.dubia P/F	7-d C.dubia P/F (EDTA)	72-hr P. subcapitata P/F	30-d embryo EA P/F	28-d Hyalella P/F	28-d Hyalella P/F (EDTA)						
								NO	NO												
								NO	NO												
FR_FRCP1_WEK_2021-10-12_N	FR_FRCP1	WS	NO	10/12/2021	11:48	G	2			X	X	X	X	X	X						1.3-3.1
FR_FRABCH_WEK_2021-10-12_N	FR_FRABCH	WS	NO	10/12/2021	11:20	G	1			X		X	X	X							2.0-2.0
FR_UFR1_WEK_2021-10-12_N	FR_UFR1	WS	NO	10/12/2021	11:07	G	1			X		X	X	X							0.0-0.0
										212103	212111	212107	212110	212109	212112						

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
2 COOLERS TOTAL	Cruz Canlas	October 12, 2021	Tyrone Hamilton	Nautilus - Burnaby
			Oct. 13/21 @ 11:53	Q4-W1

SERVICE REQUEST (rush - subject to availability)

Regular (default)	X
Priority (2-3 business days) - 50% surcharge	
Emergency (1 Business Day) - 100% surcharge	
For Emergency <1 Day, ASAP or Weekend - Contact ALS	

Sampler's Name	Cruz Canlas	Mobile #	250 433 6166
Sampler's Signature		Date/Time	October 12, 2021

Teck

COC ID:	2021-10-12 CHRONIC TOX	TURNAROUND TIME:	regular	RUSH:	

PROJECT/CLIENT INFO				LABORATORY				OTHER INFO				
Facility Name	Greenhills Operations			Lab Name	Nautilus Environmental			EDD delivery:				
Project Manager	Jeremy Enns			Lab Contact	Armando			Email 1:				
Email	jeremy.enns@teck.com			Email				Email 2:				
Address	PO Box 5000			Address	8664 Commerce Court			Email 3:	teckcoal@equisonline.com	x	x	X
								Email 4:				
City	Elkford	Province	BC	City	Burnaby	Province	BC	Email 5:				
Postal Code	V0B 1H0	Country	Canada	Postal Code	V5A 4N7	Country	Can	Email 6:	DL-Equis-GHO-Field@teck.com	X	X	X
Phone Number	250 865 3274			Phone Number	403.253.7121			PO number	610307			

SAMPLE DETAILS / ANALYSIS REQUESTED

Please indicate below Filtered, Perserved or both (F, P, F/P)

Sample ID	Sample Location	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	ANALYSIS: 7-d C.dubia P/F (212108)	72-hr P. subcapitata P/F (212107)	30-d embryo EA P/F (212110)	28-d Hyalella P/F (212109)	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
GH_ER2_WS_2021-10-12_N	GH_ER2	WS	N	12-Oct	10:50	G	4	X	X	X	X							0.0	0.0
GH_ERC_WS_2021-10-12_N	GH_ERC	WS	N	12-Oct	11:50	G	4	X	X	X	X							0.0	0.0
GH_FR1_WS_2021-10-12_N	GH_FR1	WS	N	12-Oct	10:00	G	4	X	X	X	X							0.0	0.0

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	Date	Time	Accepted By/Affiliation	Date	Time
				Tyrone Hamilton	Oct 13/21	@ 11:30
				Nautilus - Burnaby	Q4-W1	

SERVICE REQUEST (rush - subject to availability)

Regular (default)	X	Sampler's Name	JM	Mobile #	
Priority (2-3 business days) - 50% surcharge					
Emergency (1 Business Day) - 100% surcharge		Sampler's Signature		Date/Time	OCT 12 2021
For Emergency <1 Day, ASAP or Weekend - Contact ALS					

NAUTILUS ENVIRONMENTAL

TESTING LOCATION (Please Circle)

Burnaby (●)
8664 Commerce Court
Burnaby, British Columbia, Canada
V5A 4N7
Phone 604.420.8773

Calgary ( )
10823 27 Street SE
Calgary, Alberta, Canada
T2Z 3V9
Phone 403.253.7121

Chain of Custody

Date 2021/10/19 Page 1 of 1

Report to:		**Invoice To:**	
Company	Nautilus Environmnetal	**Company**	Line Creek Operations
Address	8664 Commerce Court	**Address**	15 km North Hwy 43
City/Prov/PC	Burnaby, BC, V5A 4N7	**City/Prov/PC**	Sparwood, BC,
Contact	Armando Tang	**Contact**	Tom Jeffery
Phone	604-420-8773	**Phone**	250-425-6111
Email	armando@nautilusenvironmental.ca	**Email**	tom.jeffery@teck.com
		PO No.	VPO00741384

Sample Collection By: S. Fossen/ D. Tymstra **Sample Type:** Grab (●) OR Composite ( )

	SAMPLE ID	DATE (DD/MM/YY)	TIME	MATRIX	# OF CONTAINERS AND VOLUME (e.g. 1 x 20 L)	COMMENTS	7-d C.dubia P/F	72-hr P. subcapitata P/F	30-d embryo EA P/F	28-d Hyalella P/F	Receipt Temperature (°C)
1	LC_SLC_WS_2021-10-19_N	19/10/21	11:00	WS	4 x 20L				✓	✓	2.9 - 2.8
2	LC_LC3_WS_2021-10-19_N	19/10/21	12:00	WS	4 x 20L				✓	✓	8.8 - 7.3
3	LC_LCDSSLCC_WS_2021-10-19_N	19/10/21	12:30	WS	4 x 20L				✓	✓	4.7 - 4.8
4	LC_LC5_WS_2021-10-19_N	19/10/21	13:30	WS	4 x 20L				✓	✓	2.6 - 2.8
5	LC_DCDS_WS_2021-10-19_N	19/10/21		WS	4 x 20L				2	2	1.7 - 1.8
6		M/h							1	1	
7									1	1	
8									2	2	
9									1	1	
10									2	2	

SPECIAL INSTRUCTIONS/COMMENTS (CLIENT)

Please provide preliminary update as results are available.
Report Format / Distribution List:
Email 1: tom.jeffery@teck.com (Excel/PDF)
Email 2 : teckcoal@equisonline.com (EDD)
Email 3: drake.tymstra@teck.com (Excel/PDF)
Email 4: shanise.fossen@teck.com (Excel/PDF)
Email 5: tanya.dick@teck.com (Excel/PDF)

SAMPLE RECEIPT DETAILS (LABORATORY)

1. Total No. of Containers	20	4. Ice Present in Cooler?	(Y) / N
2. Courier	Bears Paw	5. Seal Present?	Y / (N)
3. Good Condition?	(Y) / N	6. Initials Present on Seal?	Y / (N)

SAMPLE DESCRIPTION AND COMMENTS (LABORATORY)

Q4-W1

RELINQUISHED BY (CLIENT)

(Printed Name) (Signature)

(Company) (Date DD/MM/YY and Time)

RECEIVED BY (LABORATORY)

Tyrone (Printed Name) TH (Signature)

Nautilus - Burnaby (Company) Oct. 13/21 @ 11:30 (Date DD/MM/YY and Time)

Our liability is limited to the cost of the test requested. The test results only relate to the sample as received. No liability in whole or in part is assumed for the collection, handling, or transport of the sample, application or interpretation of the test data or results in part or in whole.

Additional costs may be required for sample disposal or storage. Payment net 30 unless otherwise contracted.

Form 020; Revised by TP 2021/09/19

Teck

COC ID:	Q4_CHRONIC_10192021_Burn	TURNAROUND TIME:	Regular	RUSH:	No

PROJECT/CLIENT INFO				LABORATORY				OTHER INFO				
Facility Name / Job#	Coal Mountain Operations			Lab Name	Nautilus Environmental			Report Format / Distribution		Excel	PDF	EDD
Project Manager	Victoria Sharpe			Lab Contact	Armando Tang			Email 1:	Jay.jones@teck.com	X	X	X
Email	Victoria.Sharpe@teck.com			Email	armando@nautilusenvironmental.ca			Email 2:	teckcoal@equisonline.com			X
								Email 3:	Victoria.Sharpe@teck.com	X	X	X
								Email 4	Don.Sacino@teck.com	X	X	X
Address	PO Box 3000			Address	8664 commerce Court			Email 5:	Shelby.Holden@teck.com	X	X	X
City	Sparwood	Province	BC	City	Burnaby	Province	BC	PO number				
Postal Code	V0B 2G0	Country	Canada	Postal Code	V5A 4N7	Country	Canada					
Phone Number	1-250-425-7522			Phone Number	604-420-8773							

SAMPLE DETAILS / ANALYSIS REQUESTED — Filtered - F: Field, L: Lab, FL: Field & Lab, N: None

Sample ID	Sample Location	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	7-d C.dubia P/F	7-d C.dubia P/F (EDTA)	72-hr P. subcapitata P/F	30-d embryo EA P/F 212110	28-d Hyalella P/F 212109	28-d Hyalella P/F (EDTA) 212112						
CM_MC2_WS_2021-10-19_N	CM_MC2	WS	No	10/19/2021	11:59	G	5				x	x	x					4.6	5.8
CM_MC1_WS_2021-10-19_N	CM_MC1	WS	No	10/19/2021	10:52	G	5				x	x						4.8	4.1
RG_MIDAG_WS_2021-10-19_N	RG_MIDAG	WS	No	10/19/2021	11:26	G	2					x	x					4.6	4.7

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
			Tyrone Hamilton	Oct. 20/21 @11:52
			Nautilus - Burnaby	Q4-W2

NB OF BOTTLES RETURNED/DESCRIPTION					
Regular (default)	X	Sampler's Name	SH/DS/KS	Mobile #	250 425 7522
Priority (2-3 business days) - 50% surcharge					
Emergency (1 Business Day) - 100% surcharge		Sampler's Signature	[signature]	Date/Time	October 19, 2021
For Emergency <1 Day, ASAP or Weekend - Contact ALS					

Teck

COC ID:	20211019CRN4B	TURNAROUND TIME:		RUSH:	

PROJECT/CLIENT INFO				LABORATORY				OTHER INFO				
Facility Name / Job#	Elkview Operations			Lab Name	Nautilus Environmental			Report Format / Distribution		Excel	PDF	EDD
Job Description	Q4 Chronic Toxicity Sampling			Lab Contact	Jeslin Wijaya			Email 1:				
Project Manager	Jennifer Dane			Email	jeslin@nautilusenvironmental.ca			Email 2:	teckcoal@equisonline.com			X
Email	jennifer.dane@teck.com			Address	8664 Commerce Court			Email 3:	chris.emslie@teck.com	X	X	X
Address	RR#1 HWY# 3				Imperial Square Lake City			Email 4:	Teck.Lab.Results@teck.com	X	X	X
								Email 5:	jennifer.dane@teck.com	X	X	X
City	Sparwood	Province	BC	City	Burnaby	Province	BC	Email 6:	colby.bracken@teck.com	X	X	X
Postal Code	V1C 4C3	Country	Canada	Postal Code	V5A 4N7	Country	Canada	PO number	VPO00678876			
Phone Number	1-250-425-8137			Phone Number	604-420-8773							

SAMPLE DETAILS								ANALYSIS REQUESTED											Filtered - F: Field, L: Lab, FL: Field & Lab, N: None
FILTERED									No	No	No	No							
PRESERVED									No	No	No	No							
Sample ID	Sample Location	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	ANALYSIS	7-d C.dubia P/F	72-hr P. subcapitata P/F	30-d embryo EA P/F	28-d Hyalella P/F							
EV_HC1_WS_2021_Q4_WK2_N	EV_HC1	WS	N	10/19/2021	8:14	G	2				1	1					2.9 - 3.1		
EV_MC2_WS_2021_Q4_WK2_N	EV_MC2	WS	N	10/19/2021	10:15	G	2				1	1					3.8 - 4.2		
											21/21/01	21/21/01							
					Total		4												

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
Toxicity 96-Hr/48-HR = 96 Hr Rainbow Trout pass/fail & 48 Hr Daphnia pass/fail (Daphinia testing to occur at 20 degrees)	J.batstone/ B. Clarke	19-Oct-21	Tyrone Hamilton Nautilus - Burnaby	Oct. 20/21 @ 11:52 Q4-W2

NB OF BOTTLES RETURNED/DESCRIPTION					
Regular (default)	X	Sampler's Name	J.batstone/ B. Clarke	Mobile #	1-250-423-0826
Priority (2-3 business days) - 50% surcharge		Sampler's Signature		Date/Time	October 19, 2021
Emergency (1 Business Day) - 100% surcharge					
For Emergency <1 Day, ASAP or Weekend - Contact ALS					

Teck

COC ID: LIFR TOX | TURNAROUND TIME: | RUSH:

PROJECT/CLIENT INFO				LABORATORY				OTHER INFO			
Facility Name / Job#	Fording River Operation			Lab Name	Nautilus Environmental Labs Calgary			Report Format / Distribution		Excel	PDF	EDD
Project Manager	Scott Roughead			Lab Contact				Email 1:	david.burroughs@teck.com	X	X	X
Email	Scott.Roughead@teck.com			Email	ABinfo@nautilusenvironmental.ca			Email 2:	cruz.canlas@teck.com	X	X	X
Address	PO Box 100			Address	10823 27th Street SE			Email 3:	scott.roughead@teck.com	X	X	X
								Email 4:	teckcoal@equisonline.com			X
City	Elkford	Province	BC	City	Calgary	Province	AB	Email 5:	jessica.ritz@teck.com	X	X	X
Postal Code	V0B 1H0	Country	Canada	Postal Code	T2Z 3V9	Country	Canada	Email 6:	cait.good@teck.com	X	X	X
Phone Number	1-250-865-5195			Phone Number	403-253-7121			Email 7:	jamie.walsh@teck.com	X	X	X

SAMPLE DETAILS / ANALYSIS REQUESTED (Filtered - F: Field, L: Lab, FL: Field & Lab, N: None)

Sample ID	Sample Location (sys loc code)	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	Filt	N	N	N	N								
								PRESERV.	NONE	NONE	NONE	NONE								
								ANALYSIS	30-d embryo EA P/F	28-d Hyalella P/F										
FR_FR4_WS_2021-10-19_N	FR_FR4	WS	NO	19-Oct-21		G	4		X	X									3.3-3.4	
FR_FRRD_WS_2021-10-19_N	FR_FRRD	WS	NO	19-Oct-21		G	4		X	X									4.3-3.4	
FR_FR2_WS_2021-10-19_N	FR_FR2	WS	NO	19-Oct-21		G	4		X	X									2.7-3.1	
FR_MULTIPLATE_WS_2021-10-19_NP	FR_MULTIPLATE	WS	NO	19-Oct-21		G	4		X	X									3.6-3.9	
									212110	212109										

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
			Tyrone Hamilton	Oct 20/21 @ 11:53
			Nautilus - Burnaby	Q4-W2

SERVICE REQUEST (rush - subject to availability)

Regular (default)	X
Priority (2-3 business days) - 50% surcharge	
Emergency (1 Business Day) - 100% surcharge	
For Emergency <1 Day, ASAP or Weekend - Contact ALS	

Sampler's Name	Ashlea Barrows / Jeff Dehmer	Mobile #	519-386-5764
Sampler's Signature		Date/Time	Oct 19/2021 13:20

Teck

COC ID: 10/19/2021 | TURNAROUND TIME: | RUSH:

PROJECT/CLIENT INFO				LABORATORY				OTHER INFO			
Facility Name / Job#	Fording River Operation			Lab Name	Nautilus Environmental - BC			Report Format / Distribution		Excel	PDF	EDD
Project Manager	Scott Roughead			Lab Contact				Email 1:	david.burroughs@teck.com	X	X	X
Email	scott.roughead@teck.com			Email	BCinfo@nautilusenvironmental.ca			Email 2:	britt.anderson@teck.com	X	X	X
Address				Address	8664 Commerce Court			Email 3:	scott.roughead@teck.com	X	X	X
								Email 4:	cruz.canlas@teck.com	X	X	X
City	Elkford	Province	BC	City	Burnaby	Province	BC	Email 5:	jamie.walsh@teck.com	X	X	X
Postal Code		Country	Canada	Postal Code	V5A 4N7	Country	Canada	Email 6:	teckcoal@equisonline.com			X
Phone Number	1-250-433-6976			Phone Number	604-420-8773			VPO00741382				

SAMPLE DETAILS / ANALYSIS REQUESTED (Filtered - F: Field, L: Lab, FL: Field & Lab, N: None)

Sample ID	Sample Location (sys loc code)	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	Filt.	PRESERV.	ANALYSIS: 7-d C.dubia P/F	7-d C.dubia P/F (EDTA)	72-hr P. subcapitata P/F	30-d embryo EA P/F	28-d Hyalella P/F	28-d Hyalella P/F (EDTA)	
								NO	NO	NO	NO	NO	NO	NO	NO	
FR_FRABCH_WS_2021-10-19_N	FR_FRABCH	WS	no	19-Oct	11:19	G	4						x	x	x	2.1-2.4
FR_FRCP1_WS_2021-10-19_N	FR_FRCP1	WS	no	19-Oct	12:08	G	5						x	x		2.8-2.8
FR_UFR1_WS_2021-10-19_N	FR_UFR1	WS	no	19-Oct	09:37	G	4						x	x		0.9-2.8
												212119		212109	212112	

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS

2 COOLERS TOTAL

1 container arrived leaking: FRABCH

RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
Cruz Canlas	October 19, 2021	Tyme Hamilton	Oct. 20/21 @11:52
		Nautilus - Burnaby	Q4-W2

SERVICE REQUEST (rush - subject to availability)

Regular (default)	X
Priority (2-3 business days) - 50% surcharge	
Emergency (1 Business Day) - 100% surcharge	
For Emergency <1 Day, ASAP or Weekend - Contact ALS	

Sampler's Name	Cruz Canlas	Mobile #	250 433 6166
Sampler's Signature		Date/Time	October 19, 2021

Teck

COC ID:	2021-10-19 CHRONIC TOX	TURNAROUND TIME:	regular	RUSH:	

PROJECT/CLIENT INFO				LABORATORY				OTHER INFO				
Facility Name	Greenhills Operations			Lab Name	Nautilus Environmental			EDD delivery:				
Project Manager	Jeremy Enns			Lab Contact	Armando			Email 1:				
Email	jeremy.enns@teck.com			Email				Email 2:				
Address	PO Box 5000			Address	8664 Commerce Court			Email 3:	teckcoal@equisonline.com	x	x	X
								Email 4:				
City	Elkford	Province	BC	City	Burnaby	Province	BC	Email 5:				
Postal Code	V0B 1H0	Country	Canada	Postal Code	V5A 4N7	Country	Can	Email 6:	DL-Equis-GHO-Field@teck.com	X	X	X
Phone Number	250 865 3274			Phone Number	403.253.7121			PO number	610307			

SAMPLE DETAILS / **ANALYSIS REQUESTED**

Please indicate below Filtered, Perserved or both (F, P, F/P)

Sample ID	Sample Location	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	ANALYSIS	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
									212110 30-d embryo EA P/F	212109 28-d Hyalella P/F										
GH_ER2_WS_2021-10-19_N	GH_ER2	WS	N	19-Oct	10:15	G	4		X	X										8.6-6.8
GH_ERC_WS_2021-10-19_N	GH_ERC	WS	N	19-Oct	13:35	G	4		X	X										8.7-9.0
GH_FR1_WS_2021-10-19_N	GH_FR1	WS	N	19-Oct	12:46	G	4		X	X										7.2-7.5

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	Date	Time	Accepted By/Affiliation	Date	Time
				Tyrone Hamilton	0.9.20/21	@11:52
				Nautilus - Burnaby	Nautilus - Burnaby	

SERVICE REQUEST (rush - subject to availability)

Regular (default)	X	Sampler's Name	JM/SS	Mobile #	
Priority (2-3 business days) - 50% surcharge					
Emergency (1 Business Day) - 100% surcharge		Sampler's Signature		Date/Time	OCT 19 2021
For Emergency <1 Day, ASAP or Weekend - Contact ALS					

NAUTILUS ENVIRONMENTAL

TESTING LOCATION (Please Circle)

Burnaby (●)
8664 Commerce Court
Burnaby, British Columbia, Canada
V5A 4N7
Phone 604.420.8773

Calgary ( )
10823 27 Street SE
Calgary, Alberta, Canada
T2Z 3V9
Phone 403.253.7121

Chain of Custody

Date 2021/10/19 Page 1 of 1

Report to:

Company	Nautilus Environmnetal
Address	8664 Commerce Court
City/Prov/PC	Burnaby, BC, V5A 4N7
Contact	Armando Tang
Phone	604-420-8773
Email	armando@nautilusenvironmental.ca

Invoice To:

Company	Line Creek Operations
Address	15 km North Hwy 43
City/Prov/PC	Sparwood, BC,
Contact	Tom Jeffery
Phone	250-425-6111
Email	tom.jeffery@teck.com
PO No.	VPO00741384

Sample Collection By: S. Fossen/ D. Tymstra **Sample Type:** Grab (●) OR Composite ( )

	SAMPLE ID	DATE (DD/MM/YY)	TIME	MATRIX	# OF CONTAINERS AND VOLUME (e.g. 1 x 20 L)	COMMENTS	7-d C.dubia P/F	72-hr P. subcapitata P/F	30-d embryo EA P/F	28-d Hyalella P/F	Receipt Temperature (°C)
1	LC_SLC_WS_2021-10-19_N	19/10/21	10:30	WS	4 x 20L				✓	✓	0.3-0.4
2	LC_LC3_WS_2021-10-19_N	19/10/21	11:30	WS	4 x 20L				✓	✓	0.4-0.5
3	LC_LCDSSLCC_WS_2021-10-19_N	19/10/21	12:00	WS	4 x 20L				✓	✓	1.1-1.2
4	LC_LC5_WS_2021-10-19_N	19/10/21		WS	4 x 20L				✓	✓	0.9-1.1
5	LC_DCDS_WS_2021-10-19_N	19/10/21	11.00	WS	4 x 20L				0	0	0.2-0.9
6									1	0	
7									2	1	
8									1	1	
9									2	2	
10											

ANALYSES REQUIRED

SPECIAL INSTRUCTIONS/COMMENTS (CLIENT)

Please provide preliminary update as results are available.
Report Format / Distribution List:
Email 1: tom.jeffery@teck.com (Excel/PDF)
Email 2 : teckcoal@equisonline.com (EDD)
Email 3: drake.tymstra@teck.com (Excel/PDF)
Email 4: shanise.fossen@teck.com (Excel/PDF)
Email 5: tanya.dick@teck.com (Excel/PDF)

SAMPLE RECEIPT DETAILS (LABORATORY)

1. Total No. of Containers	20	4. Ice Present in Cooler?	(Y) / N
2. Courier	Bears Paw	5. Seal Present?	Y / (N)
3. Good Condition?	Y / N	6. Initials Present on Seal?	Y / (N)

SAMPLE DESCRIPTION AND COMMENTS (LABORATORY)

Q4-W2

RELINQUISHED BY (CLIENT)

(Printed Name) (Signature)

(Company) (Date DD/MM/YY and Time)

RECEIVED BY (LABORATORY)

Tyrone (Printed Name) TH (Signature)

Nautilus (Company) Oct 20/21 @11:53 (Date DD/MM/YY and Time)

Our liability is limited to the cost of the test requested. The test results only relate to the sample as received. No liability in whole or in part is assumed for the collection, handling, or transport of the sample, application or interpretation of the test data or results in part or in whole.

Additional costs may be required for sample disposal or storage. Payment net 30 unless otherwise contracted.

Form 020; Revised by TP 2021/09/19

Teck

COC ID:	Q4_CHRONIC_10262021_Burn	TURNAROUND TIME:	Regular	RUSH:	No

PROJECT/CLIENT INFO				LABORATORY				OTHER INFO				
Facility Name / Job#	Coal Mountain Operations			Lab Name	Nautilus Environmental			Report Format / Distribution		Excel	PDF	EDD
Project Manager	Victoria Sharpe			Lab Contact	Armando Tang			Email 1:	Jay.jones@teck.com	X	X	X
Email	Victoria.Sharpe@teck.com			Email	armando@nautilusenvironmental.ca			Email 2:	teckcoal@equisonline.com			X
								Email 3:	Victoria.Sharpe@teck.com	X	X	X
								Email 4	Don.Sacino@teck.com	X	X	X
Address	PO Box 3000			Address	8664 commerce Court			Email 5:	Shelby.Holden@teck.com	X	X	X
City	Sparwood	Province	BC	City	Burnaby	Province	BC	PO number				
Postal Code	V0B 2G0	Country	Canada	Postal Code	V5A 4N7	Country	Canada					
Phone Number	1-250-425-7522			Phone Number	604-420-8773							

SAMPLE DETAILS								ANALYSIS REQUESTED												Filtered - F: Field, L: Lab, FL: Field & Lab, N: None
								FIL.												
								PRESERV.												
Sample ID	Sample Location	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	ANALYSIS	7-d C.dubia P/F	7-d C.dubia P/F (EDTA)	72-hr P. subcapitata P/F	30-d embryo EA P/F 212119	28-d Hyalella P/F 212109	28-d Hyalella P/F (EDTA) 212112						
CM_MC2_WS_2021-10-26_N	CM_MC2	WS	No	10/26/2021	11:53	G	5					x	x	x					6.6-6.8	
CM_MC1_WS_2021-10-26_N	CM_MC1	WS	No	10/26/2021	10:45	G	5					x	x						8.0-8.1	
RG_MIDAG_WS_2021-10-26_N	RG_MIDAG	WS	No	10/26/2021	11:24	G	2						x	x					9.1-9.6	

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
			Tyrone Hamilton	Oct. 27/21 @ 11:39
			Nautilus - Burnaby	Q4-W3

NB OF BOTTLES RETURNED/DESCRIPTION	
Regular (default)	X
Priority (2-3 business days) - 50% surcharge	
Emergency (1 Business Day) - 100% surcharge	
For Emergency <1 Day, ASAP or Weekend - Contact ALS	

Sampler's Name	SH/DS/KS	Mobile #	250 425 7522
Sampler's Signature	Kirby Shantz	Date/Time	October 26, 2021

Teck

COC ID:	20211026CRN4B	TURNAROUND TIME:		RUSH:	

PROJECT/CLIENT INFO				LABORATORY				OTHER INFO				
Facility Name / Job#	Elkview Operations			Lab Name	Nautilus Environmental			Report Format / Distribution		Excel	PDF	EDD
Job Description	Q4 Chronic Toxicity Sampling			Lab Contact	Jeslin Wijaya			Email 1:				
Project Manager	Jennifer Dane			Email	jeslin@nautilusenvironmental.ca			Email 2:	teckcoal@equisonline.com			X
Email	jennifer.dane@teck.com			Address	8664 Commerce Court			Email 3:	chris.emslie@teck.com	X	X	X
Address	RR#1 HWY# 3				Imperial Square Lake City			Email 4:	Teck.Lab.Results@teck.com	X	X	X
								Email 5:	jennifer.dane@teck.com	X	X	X
City	Sparwood	Province	BC	City	Burnaby	Province	BC	Email 6:	colby.bracken@teck.com	X	X	X
Postal Code	V1C 4C3	Country	Canada	Postal Code	V5A 4N7	Country	Canada	PO number	VPO00678876			
Phone Number	1-250-425-8137			Phone Number	604-420-8773							

SAMPLE DETAILS								ANALYSIS REQUESTED											Filtered - F: Field, L: Lab, FL: Field & Lab, N: None
								FILTERED	No	No	No	No							
								PRESERVED	No	No	No	No							
Sample ID	Sample Location	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	ANALYSIS	7-d C.dubia P/F	72-hr P. subcapitata P/F	30-d embryo EA P/F	28-d Hyalella P/F							
EV_HC1_WS_2021_Q4_WK3_N	EV_HC1	WS	N	10/26/2021	8:41	G	2				1	1					0.1-	2.0	
EV_MC2_WS_2021_Q4_WK3_N	EV_MC2	WS	N	10/26/2021	10:52	G	2				1	1					1.4-	2.0	
											212110	212108							
					Total		4												

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
Toxicity 96-Hr/48-HR = 96 Hr Rainbow Trout pass/fail & 48 Hr Daphnia pass/fail (Daphinia testing to occur at 20 degrees)	J.batstone/ B. Clarke	26-Oct-21	Tyrone Hamilton Nautilus - Burnaby	Oct 27/21 1630 Q4-W3

NB OF BOTTLES RETURNED/DESCRIPTION	
Regular (default)	X
Priority (2-3 business days) - 50% surcharge	
Emergency (1 Business Day) - 100% surcharge	
For Emergency <1 Day, ASAP or Weekend - Contact ALS	

Sampler's Name	J.batstone/ B. Clarke	Mobile #	1-250-423-0826
Sampler's Signature		Date/Time	October 26, 2021

Teck

COC ID:	10/26/2021	TURNAROUND TIME:		RUSH:	

PROJECT/CLIENT INFO				LABORATORY				OTHER INFO				
Facility Name / Job#	Fording River Operation			Lab Name	Nautilus Environmental - BC			Report Format / Distribution		Excel	PDF	EDD
Project Manager	Scott Roughead			Lab Contact				Email 1:	david.burroughs@teck.com	X	X	X
Email	scott.roughead@teck.com			Email	BCinfo@nautilusenvironmental.ca			Email 2:	britt.anderson@teck.com	X	X	X
Address				Address	8664 Commerce Court			Email 3:	scott.roughead@teck.com	X	X	X
								Email 4:	cruz.canlas@teck.com	X	X	X
City	Elkford	Province	BC	City	Burnaby	Province	BC	Email 5:	jamie.walsh@teck.com	X	X	X
Postal Code		Country	Canada	Postal Code	V5A 4N7	Country	Canada	Email 6:	teckcoal@equisonline.com			X
Phone Number	1-250-433-6976			Phone Number	604-420-8773			VPO00741382				

SAMPLE DETAILS								ANALYSIS REQUESTED												Filtered - F: Field, L: Lab, FL: Field & Lab, N: None
							FIL	NO	NO	NO	NO	NO	NO							
							PRESERV.	NO	NO	NO	NO	NO	NO							
							ANALYSES	7-d C.dubia P/F	7-d C.dubia P/F (EDTA)	72-hr P. subcapitata P/F	30-d embryo EA P/F	28-d Hyalella P/F	28-d Hyalella P/F (EDTA)							
Sample ID	Sample Location (sys_loc_code)	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.													
FR_FRABCH_WS_2021-10-26_N	FR_FRABCH	WS	no	26-Oct		G	4				X	X	X					1.2	1.4	
FR_FRCP1_WS_2021-10-26_N	FR_FRCP1	WS	no	26-Oct		G	4				X	X						0.2	0.1	
FR_UFR1_WS_2021-10-26_N	FR_UFR1	WS	no	26-Oct		G	5				X	X						0.0	0.0	
											212110	212109	212112							

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
2 COOLERS TOTAL	Aric Keane	October 26, 2021	Tyme Nanton	Oct 27/21 @ 11:32
			Nautilus - Burnaby	Q4-W3

SERVICE REQUEST (rush - subject to availability)					
Regular (default)	X	Sampler's Name	Aric Keane	Mobile #	250 433 6166
Priority (2-3 business days) - 50% surcharge					
Emergency (1 Business Day) - 100% surcharge		Sampler's Signature		Date/Time	October 26, 2021
For Emergency <1 Day, ASAP or Weekend - Contact ALS					

Teck

Page 1 of 1

COC ID:

TURNAROUND TIME:

RUSH:

PROJECT/CLIENT INFO

Facility Name / Job#	Fording River Operation		
Project Manager	Scott Roughead		
Email	Scott.Roughead@teck.com		
Address	PO Box 100		
City	Elkford	Province	BC
Postal Code	V0B 1H0	Country	Canada
Phone Number	1-250-865-5195		

LABORATORY

Lab Name	Nautilus Environmental Labs C[redacted] Burnaby		
Lab Contact			
Email	ABinfo@nautilusenvironmental.ca		
Address	[redacted]		
City	[redacted]	Province	[redacted]
Postal Code	T[redacted]9	Country	Canada
Phone Number	403[redacted]7121		

OTHER INFO

Report Format / Distribution		Excel	PDF	EDD
Email 1:	david.burroughs@teck.com	X	X	X
Email 2:	cruz.canlas@teck.com	X	X	X
Email 3:	scott.roughead@teck.com	X	X	X
Email 4:	teckcoal@equisonline.com			X
Email 5:	jessica.ritz@teck.com	X	X	X
Email 6:	cait.good@teck.com	X	X	X
Email 7:	jamie.walsh@teck.com	X	X	X

SAMPLE DETAILS

ANALYSIS REQUESTED

Filtered - F: Field, L: Lab, FL: Field & Lab, N: None

Sample ID	Sample Location (sys_loc_code)	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	Filt.	PRESERV.	ANALYSIS: 30-d embryo EA P/F	ANALYSIS: 28-d Hyalella P/F										
								N	NONE												
FR_FR4_WS_2021-10-26_N	FR_FR4	WS	NO	26-Oct-21	10:30	G	4			X	X										6.8-7.2
FR_FRRD_WS_2021-10-26_N	FR_FRRD	WS	NO	26-Oct-21	9:30	G	4			X	X										6.6-6.8
FR_FR2_WS_2021-10-26_N	FR_FR2	WS	NO	26-Oct-21	11:30	G	4			X	X										6.3-6.4
FR_MULTIPLATE_WS_2021-10-26_NP	FR_MULTIPLATE	WS	NO	26-Oct-21	12:30	G	4			X	X										6.8-8.2
										21210	21210										

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS

RELINQUISHED BY/AFFILIATION

DATE/TIME

10/26/21

ACCEPTED BY/AFFILIATION

Tyson Hamilton

Nautilus - Burnaby

DATE/TIME

Oct 27/21 @ 11:30

04-W3

SERVICE REQUEST (rush - subject to availability)

Regular (default)	X
Priority (2-3 business days) - 50% surcharge	
Emergency (1 Business Day) - 100% surcharge	
For Emergency <1 Day, ASAP or Weekend - Contact ALS	

Sampler's Name	S.H / A.B	Mobile #	
Sampler's Signature		Date/Time	

Teck

COC ID:	2021-10-26 CHRONIC TOX	TURNAROUND TIME:	regular	RUSH:	

PROJECT/CLIENT INFO				LABORATORY				OTHER INFO				
Facility Name	Greenhills Operations			Lab Name	Nautilus Environmental			EDD delivery:				
Project Manager	Jeremy Enns			Lab Contact	Armando			Email 1:				
Email	jeremy.enns@teck.com			Email				Email 2:				
Address	PO Box 5000			Address	8664 Commerce Court			Email 3:	teckcoal@equisonline.com	x	x	X
								Email 4:				
City	Elkford	Province	BC	City	Burnaby	Province	BC	Email 5:				
Postal Code	V0B 1H0	Country	Canada	Postal Code	V5A 4N7	Country	Can	Email 6:	DL-Equis-GHO-Field@teck.com	X	X	X
Phone Number	250 865 3274			Phone Number	403.253.7121			PO number		610307		

SAMPLE DETAILS / **ANALYSIS REQUESTED**

Please indicate below Filtered, Preserved or both (F, P, F/P)

Sample ID	Sample Location	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	ANALYSIS	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
									212110 30-d embryo EA P/F	212109 28-d Hyalella P/F										
GH_ER2_WS_2021-10-26_N	GH_ER2	WS	N	26-Oct	1100	G	4		X	X										
GH_ERC_WS_2021-10-26_N	GH_ERC	WS	N	26-Oct	1200	G	4		X	X										
GH_FR1_WS_2021-10-26_N	GH_FR1	WS	N	26-Oct	1300	G	4		X	X										

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	Date	Time	Accepted By/Affiliation	Date	Time
				Tyne Hamilton	Oct 27/21	0 11:30
				Nautilus - Burnaby	Q4-W3	

SERVICE REQUEST (rush - subject to availability)

Regular (default)	X
Priority (2-3 business days) - 50% surcharge	
Emergency (1 Business Day) - 100% surcharge	
For Emergency <1 Day, ASAP or Weekend - Contact ALS	

Sampler's Name	/SS	Mobile #	
Sampler's Signature		Date/Time	OCT 26 2021

NAUTILUS ENVIRONMENTAL

TESTING LOCATION (Please Circle)

Burnaby (●)
8664 Commerce Court
Burnaby, British Columbia, Canada
V5A 4N7
Phone 604.420.8773

Calgary ( )
10823 27 Street SE
Calgary, Alberta, Canada
T2Z 3V9
Phone 403.253.7121

Chain of Custody

Date 2021/10/26 Page 1 of 1

Report to:		**Invoice To:**	
Company	Nautilus Environmnetal	**Company**	Line Creek Operations
Address	8664 Commerce Court	**Address**	15 km North Hwy 43
City/Prov/PC	Burnaby, BC, V5A 4N7	**City/Prov/PC**	Sparwood, BC,
Contact	Armando Tang	**Contact**	Tom Jeffery
Phone	604-420-8773	**Phone**	250-425-6111
Email	armando@nautilusenvironmental.ca	**Email**	tom.jeffery@teck.com
		PO No.	VPO00741384

Sample Collection By: T. Dick/ D. Tymstra **Sample Type:** Grab (●) OR Composite ( )

	SAMPLE ID	DATE (DD/MM/YY)	TIME	MATRIX	# OF CONTAINERS AND VOLUME (e.g. 1 x 20 L)	COMMENTS	ANALYSES REQUIRED: 7-d C.dubia P/F	72-hr P. subcapitata P/F	30-d embryo EA P/F	28-d Hyalella P/F							Receipt Temperature (°C)
1	LC_SLC_WS_2021-10-26-N	26/10/21	8:45	WS	4 x 20L				✓	✓						7.4	2.8
2	LC_LC3_WS_2021-10-26_N	26/10/21	9:20	WS	4 x 20L				✓	✓						4.4	5.8
3	LC_LCDSSLCC_WS_2021-10-26_N	26/10/21	9:40	WS	4 x 20L				✓	✓						5.8	6.2
4	LC_LC5_WS_2021-10-26_N	26/10/21	10:25	WS	4 x 20L				✓	✓						4.3	4.4
5	LC_DCDS_WS_2021-10-26_N	26/10/21	11:50	WS	4 x 20L				✓	✓						8.9	1.1
6									10	09							
7									1	1							
8									2	2							
9									1	1							
10									2	2							

SPECIAL INSTRUCTIONS/COMMENTS (CLIENT)

Please provide preliminary update as results are available.
Report Format / Distribution List:
Email 1: tom.jeffery@teck.com (Excel/PDF)
Email 2 : teckcoal@equisonline.com (EDD)
Email 3: drake.tymstra@teck.com (Excel/PDF)
Email 4: shanise.fossen@teck.com (Excel/PDF)
Email 5: tanya.dick@teck.com (Excel/PDF)

SAMPLE RECEIPT DETAILS (LABORATORY)

1. Total No. of Containers	20	4. Ice Present in Cooler?	(Y) / N
2. Courier	Bear Paw	5. Seal Present?	Y / (N)
3. Good Condition?	(Y) / N	6. Initials Present on Seal?	Y / (N)

SAMPLE DESCRIPTION AND COMMENTS (LABORATORY)

Q4-W3

RELINQUISHED BY (CLIENT)

(Printed Name)	(Signature)	(Company)	(Date DD/MM/YY and Time)
Tanya Dick		Teck	26/10/21

RECEIVED BY (LABORATORY)

(Printed Name)	(Signature)	(Company)	(Date DD/MM/YY and Time)
Tyrae	TH	Nautilus	Oct 27/21 @11:30

Our liability is limited to the cost of the test requested. The test results only relate to the sample as received. No liability in whole or in part is assumed for the collection, handling, or transport of the sample, application or interpretation of the test data or results in part or in whole.

Additional costs may be required for sample disposal or storage. Payment net 30 unless otherwise contracted.

Teck

COC ID:	Q4_CHRONIC_11022021_Burn	TURNAROUND TIME:	Regular	RUSH:	No

PROJECT/CLIENT INFO				LABORATORY				OTHER INFO				
Facility Name / Job#	Coal Mountain Operations			Lab Name	Nautilus Environmental			Report Format / Distribution		Excel	PDF	EDD
Project Manager	Victoria Sharpe			Lab Contact	Armando Tang			Email 1:	Jay.jones@teck.com	X	X	X
Email	Victoria.Sharpe@teck.com			Email	armando@nautilusenvironmental.ca			Email 2:	teckcoal@equisonline.com			X
								Email 3:	Victoria.Sharpe@teck.com	X	X	X
								Email 4	Don.Sacino@teck.com	X	X	X
Address	PO Box 3000			Address	8664 commerce Court			Email 5:	Shelby.Holden@teck.com	X	X	X
City	Sparwood	Province	BC	City	Burnaby	Province	BC	PO number				
Postal Code	V0B 2G0	Country	Canada	Postal Code	V5A 4N7	Country	Canada					
Phone Number	1-250-425-7522			Phone Number	604-420-8773							

SAMPLE DETAILS								ANALYSIS REQUESTED												Filtered - F: Field, L: Lab, FL: Field & Lab, N: None
								Filt.												
								PRESERV.				212110	212109	212112						
								ANALYSIS	7-d C.dubia P/F	7-d C.dubia P/F (EDTA)	72-hr P. subcapitata P/F	30-d embryo EA P/F	28-d Hyalella P/F	28-d Hyalella P/F (EDTA)						
Sample ID	Sample Location	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.													
CM_MC2_WS_2021-11-02_N	CM_MC2	WS	No	11/2/2021	11:09	G	5					X	X	X					0.0-0.0	
CM_MC1_WS_2021-11-02_N	CM_MC1	WS	No	11/2/2021	10:00	G	5					X	X						0.0-0.0	
RG_MIDAG_WS_2021-11-02_N	RG_MIDAG	WS	No	11/2/2021	10:30	G	2						X	X					0.0-0.0	

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
			Tyrone Hamilton	Q4-CM4
			Nautilus-Burnaby	Nov. 3/21 @ 11:46

NB OF BOTTLES RETURNED/DESCRIPTION	
Regular (default)	X
Priority (2-3 business days) - 50% surcharge	
Emergency (1 Business Day) - 100% surcharge	
For Emergency <1 Day, ASAP or Weekend - Contact ALS	

Sampler's Name	SH/DS	Mobile #	250 425 7529
Sampler's Signature		Date/Time	11/2/2021 14:00:00 PM

① Slight yellow, clear, odourless, few small black particulates

Teck

COC ID: 20211102CRNWK4 | TURNAROUND TIME: | RUSH:

PROJECT/CLIENT INFO				LABORATORY				OTHER INFO			
Facility Name / Job#	Elkview Operations			Lab Name	Nautilus Environmental			Report Format / Distribution		Excel	PDF	EDD
Job Description	Q4 Chronic Toxicity Sampling			Lab Contact	Jeslin Wijaya			Email 1:				
Project Manager	Jennifer Dane			Email	jeslin@nautilusenvironmental.ca			Email 2:	teckcoal@equisonline.com			X
Email	jennifer.dane@teck.com			Address	8664 Commerce Court			Email 3:	chris.emslie@teck.com	X	X	X
Address	RR#1 HWY# 3				Imperial Square Lake City			Email 4:	Teck.Lab.Results@sharepoint.teck.com	X	X	X
								Email 5:	jennifer.dane@teck.com	X	X	X
City	Sparwood	Province	BC	City	Burnaby	Province	BC	Email 6:	colby.bracken@teck.com	X	X	X
Postal Code	V1C 4C3	Country	Canada	Postal Code	V5A 4N7	Country	Canada	PO number	VPO00678876			
Phone Number	1-250-425-8137			Phone Number	604-420-8773							

SAMPLE DETAILS / **ANALYSIS REQUESTED** (Filtered - F: Field, L: Lab, FL: Field & Lab, N: None)

Sample ID	Sample Location	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	ANALYSIS	7-d C.dubia P/F	72-hr P. subcapitata P/F	30-d embryo EA P/F	28-d Hyalella P/F						
FILTERED									No	No	No	No						
PRESERVED									No	No	No	No						
EV_HC1_WS_2021_Q4_WK4_N	EV_HC1	WS	N	11/2/2021	11:10	G	4				1	1					0.0	0.0
EV_MC2_WS_2021_Q4_WK4_N	EV_MC2	WS	N	11/2/2021	12:35	G	4				1	1					0.0	0.0
											212110	212109						
					Total		8											

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
Toxicity 96-Hr/48-HR = 96 Hr Rainbow Trout pass/fail & 48 Hr Daphnia pass/fail (Daphinia testing to occur at 20 degrees)	J.Batstone/C. Bracken	2-Nov-21	Tyrone Hamilton Nautilus - Burnaby	Q4-WK4 Nov. 3/21 @ 11:46

NB OF BOTTLES RETURNED/DESCRIPTION					
Regular (default)	X	Sampler's Name	J.Batstone/C. Bracken	Mobile #	1-250-423-0826
Priority (2-3 business days) - 50% surcharge		Sampler's Signature		Date/Time	November 2, 2021
Emergency (1 Business Day) - 100% surcharge					
For Emergency <1 Day, ASAP or Weekend - Contact ALS					

① Slight yellow, clear, odourless, slight in particulates

② clear odourless, small black particulates

Teck

Page 1 of 1

COC ID:	11/2/2021	TURNAROUND TIME:		RUSH:	

PROJECT/CLIENT INFO				LABORATORY				OTHER INFO				
Facility Name / Job#	Fording River Operation			Lab Name	Nautilus Environmental - BC			Report Format / Distribution		Excel	PDF	EDD
Project Manager	Scott Roughead			Lab Contact				Email 1:	david.burroughs@teck.com	X	X	X
Email	scott.roughead@teck.com			Email	BCinfo@nautilusenvironmental.ca			Email 2:	britt.anderson@teck.com	X	X	X
Address				Address	8664 Commerce Court			Email 3:	scott.roughead@teck.com	X	X	X
								Email 4:	cruz.canlas@teck.com	X	X	X
City	Elkford	Province	BC	City	Burnaby	Province	BC	Email 5:	jamie.walsh@teck.com	X	X	X
Postal Code		Country	Canada	Postal Code	V5A 4N7	Country	Canada	Email 6:	teckcoal@equisonline.com			X
Phone Number	1-250-433-6976			Phone Number	604-420-8773			VPO00741382				

SAMPLE DETAILS / ANALYSIS REQUESTED

Filtered - F: Field, L: Lab, FL: Field & Lab, N: None

	Sample ID	Sample Location (sys loc code)	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	7-d C.dubia P/F	7-d C.dubia P/F (EDTA)	72-hr P. subcapitata P/F	30-d embryo EA P/F	28-d Hyalella P/F	28-d Hyalella P/F (EDTA)						
									Filt.	NO	NO	NO	NO	NO	NO						
									PRESERV.	NO	NO	NO	NO	NO	NO						
②	FR_FRABCH_MON_2021-11-01_N	FR_FRABCH	WS	no	2-Nov		G	4				x	x	x						2.2-2.4
①	FR_FRCP1_MON_2021-11-01_N	FR_FRCP1	WS	no	2-Nov		G	4				x	x							0.8-1.2
①	FR_UFR1_MON_2021-11-01_N	FR_UFR1	WS	no	2-Nov		G	5				x	x							0.2-0.7
												212110	212109	212112						

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
	Cruz Canlas	November 2, 2021	Tyrone Hamilton	Nov. 3/21 @ 11:46
			Nautilus - Burnaby	Q4-W4

SERVICE REQUEST (rush - subject to availability)					
Regular (default)	X	Sampler's Name	Cruz Canlas	Mobile #	250 433 6166
Priority (2-3 business days) - 50% surcharge					
Emergency (1 Business Day) - 100% surcharge		Sampler's Signature	[signature]	Date/Time	November 2, 2021
For Emergency <1 Day, ASAP or Weekend - Contact ALS					

① clear, odourless, few small black particulates

② very yellow, large particulates, clear, odourless

Teck

COC ID: | TURNAROUND TIME: | RUSH:

PROJECT/CLIENT INFO				LABORATORY				OTHER INFO				
Facility Name / Job#	Fording River Operation			Lab Name	Nautilus Environmental Labs Calgary			Report Format / Distribution		Excel	PDF	EDD
Project Manager	Scott Roughead			Lab Contact				Email 1:	david.burroughs@teck.com	X	X	X
Email	Scott.Roughead@teck.com			Email	ABinfo@nautilusenvironmental.ca			Email 2:	cruz.canlas@teck.com	X	X	X
Address	PO Box 100			Address	10823 27th Street SE			Email 3:	scott.roughead@teck.com	X	X	X
								Email 4:	teckcoal@equisonline.com			X
City	Elkford	Province	BC	City	Calgary	Province	AB	Email 5:	jessica.ritz@teck.com	X	X	X
Postal Code	V0B 1H0	Country	Canada	Postal Code	T2Z 3V9	Country	Canada	Email 6:	cait.good@teck.com	X	X	X
Phone Number	1-250-865-5195			Phone Number	403-253-7121			Email 7:	jamie.walsh@teck.com	X	X	X

SAMPLE DETAILS / ANALYSIS REQUESTED (Filtered - F: Field, L: Lab, FL: Field & Lab, N: None)

Sample ID	Sample Location (sys loc code)	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	FIL	N	N	N	N								
								PRESERV.	NONE	NONE	NONE	NONE								
								ANALYSIS	30-d embryo EA P/F	28-d Hyalella P/F										
FR_FR4_WS_2021-11-02_N	FR_FR4	WS	NO	2-Nov-21	1030	G	4		X	X									0.0	0.0
FR_FRRD_WS_2021-11-02_N	FR_FRRD	WS	NO	2-Nov-21	0930	G	4		X	X									0.0	0.0
FR_FR2_WS_2021-11-02_N	FR_FR2	WS	NO	2-Nov-21	1130	G	4		X	X									0.2	0.4
FR_MULTIPLATE_WS_2021-11-02_NP	FR_MULTIPLATE	WS	NO	2-Nov-21	1215	G	4		X	X									0.0	0.0
									2121110	2121109										

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
			Tyrone Hamilton	Q4.Nov
			Nautilus - Burnaby	Nov. 3/21 @ 11:46

SERVICE REQUEST (rush - subject to availability)	
Regular (default)	X
Priority (2-3 business days) - 50% surcharge	
Emergency (1 Business Day) - 100% surcharge	
For Emergency <1 Day, ASAP or Weekend - Contact ALS	

Sampler's Name	A. Barnes	Mobile #	
Sampler's Signature	A. Barnes	Date/Time	Nov 2, 2021

② Clear, odourless, few small black particulates

③ Clear, odourless, No particulates

Teck

COC ID:	2021-11-02 CHRONIC TOX	TURNAROUND TIME:	regular	RUSH:	

PROJECT/CLIENT INFO				LABORATORY				OTHER INFO				
Facility Name	Greenhills Operations			Lab Name	Nautilus Environmental			EDD delivery:				
Project Manager	Jeremy Enns			Lab Contact	Armando			Email 1:				
Email	jeremy.enns@teck.com			Email				Email 2:				
Address	PO Box 5000			Address	8664 Commerce Court			Email 3:	teckcoal@equisonline.com	x	x	x
								Email 4:				
City	Elkford	Province	BC	City	Burnaby	Province	BC	Email 5:				
Postal Code	V0B 1H0	Country	Canada	Postal Code	V5A 4N7	Country	Can	Email 6:	DL-Equis-GHO-Field@teck.com	x	x	x
Phone Number	250 865 3274			Phone Number	403.253.7121			PO number	610307			

SAMPLE DETAILS / **ANALYSIS REQUESTED**

Please indicate below Filtered, Perserved or both (F, P, F/P)

Sample ID	Sample Location	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	ANALYSIS: 212110 30-d embryo EA P/F	212109 28-d Hyalella P/F	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
GH_ER2_WS_2021-11-01_N	GH_ER2	WS	N	2-Nov		G	4	X	X													4.0-4.3
GH_ERC_WS_2021-2021-11-01_N	GH_ERC	WS	N	2-Nov		G	4	X	X													6.9-7.4
GH_FR1_WS_20212021-11-01_N	GH_FR1	WS	N	2-Nov		G	4	X	X													2.4-3.8

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	Date	Time	Accepted By/Affiliation	Date	Time
				Tyme Wanstall	Nautilus - Burnaby	
				Q4-W4	Nov. 4/21 @ 11:46	

SERVICE REQUEST (rush - subject to availability)					
Regular (default)	X	Sampler's Name	HS	Mobile #	
Priority (2-3 business days) - 50% surcharge		Sampler's Signature		Date/Time	November 2 2021
Emergency (1 Business Day) - 100% surcharge					
For Emergency <1 Day, ASAP or Weekend - Contact ALS					

① clear, odourless, no particulates

NAUTILUS ENVIRONMENTAL

TESTING LOCATION (Please Circle)

Burnaby (●)
8664 Commerce Court
Burnaby, British Columbia, Canada
V5A 4N7
Phone 604.420.8773

Calgary ( )
10823 27 Street SE
Calgary, Alberta, Canada
T2Z 3V9
Phone 403.253.7121

Chain of Custody

Date 2021/11/02 Page 1 of 1

Report to:		**Invoice To:**	
Company	Nautilus Environmnetal	**Company**	Line Creek Operations
Address	8664 Commerce Court	**Address**	15 km North Hwy 43
City/Prov/PC	Burnaby, BC, V5A 4N7	**City/Prov/PC**	Sparwood, BC,
Contact	Armando Tang	**Contact**	Tom Jeffery
Phone	604-420-8773	**Phone**	250-425-6111
Email	armando@nautilusenvironmental.ca	**Email**	tom.jeffery@teck.com
		PO No.	VPO00741384

Sample Collection By: T. Dick/ D. Tymstra **Sample Type:** Grab (●) OR Composite ( )

	SAMPLE ID	DATE (DD/MM/YY)	TIME	MATRIX	# OF CONTAINERS AND VOLUME (e.g. 1 x 20 L)	COMMENTS	7-d C.dubia P/F	72-hr P. subcapitata P/F	30-d embryo EA P/F 212110	28-d Hyalella P/F 212109							Receipt Temperature (°C)
1	LC_SLC_WS_2021-11-02-N	02/11/21	10:30	WS	4 x 20L	(2)			✓	✓							0.0 -0.0
2	LC_LC3_WS_2021-11-02_N	02/11/21	14:00	WS	4 x 20L	(1)			✓	✓							2.6-2.9
3	LC_LCDSSLCC_WS_2021-11-02_N	02/11/21	11:20	WS	4 x 20L	(2)			✓	✓							0.0-0.7
4	LC_LC5_WS_2021-11-02_N	02/11/21	13:00	WS	4 x 20L	(2)			✓	✓							0.0-0.0
5	LC_DCDS_WS_2021-11-02_N	02/11/21	11:30	WS	4 x 20L	(1)			✓	✓							0.0-0.0
6																	
7						(1) Clear, odourless, some black particulate												
8						(2) clear, odourless, no particulate												
9																	
10																	

SPECIAL INSTRUCTIONS/COMMENTS (CLIENT)

Please provide preliminary update as results are available.
Report Format / Distribution List:
Email 1: tom.jeffery@teck.com (Excel/PDF)
Email 2 : teckcoal@equisonline.com (EDD)
Email 3: drake.tymstra@teck.com (Excel/PDF)
Email 4: shanise.fossen@teck.com (Excel/PDF)
Email 5: tanya.dick@teck.com (Excel/PDF)

SAMPLE RECEIPT DETAILS (LABORATORY)

1. Total No. of Containers	20	4. Ice Present in Cooler?	(Y) N
2. Courier	Bears Paw	5. Seal Present?	Y (N)
3. Good Condition?	(Y) / N	6. Initials Present on Seal?	Y (N)

SAMPLE DESCRIPTION AND COMMENTS (LABORATORY)

RELINQUISHED BY (CLIENT)

(Printed Name) (Signature)

(Company) (Date DD/MM/YY and Time)

RECEIVED BY (LABORATORY)

Tyrone Hamilton TH
(Printed Name) (Signature)

Nautilus Nov. 3/21 @ 11:46
(Company) (Date DD/MM/YY and Time)

Our liability is limited to the cost of the test requested. The test results only relate to the sample as received. No liability in whole or in part is assumed for the collection, handling, or transport of the sample, application or interpretation of the test data or results in part or in whole.

Additional costs may be required for sample disposal or storage. Payment net 30 unless otherwise contracted.

Teck

COC ID:	Q4_CHRONIC_11092021_Burn	TURNAROUND TIME:	Regular	RUSH:	No

PROJECT/CLIENT INFO				LABORATORY				OTHER INFO				
Facility Name / Job#	Coal Mountain Operations			Lab Name	Nautilus Environmental			Report Format / Distribution		Excel	PDF	EDD
Project Manager	Victoria Sharpe			Lab Contact	Armando Tang			Email 1:	Jay.Jones@teck.com	X	X	X
Email	Victoria.Sharpe@teck.com			Email	armando@nautilusenvironmental.ca			Email 2:	teckcoal@equisonline.com			X
								Email 3:	Victoria.Sharpe@teck.com	X	X	X
								Email 4	Don.Sacino@teck.com	X	X	X
Address	PO Box 3000			Address	8664 commerce Court			Email 5:	Shelby.Holden@teck.com	X	X	X
City	Sparwood	Province	BC	City	Burnaby	Province	BC	PO number				
Postal Code	V0B 2G0	Country	Canada	Postal Code	V5A 4N7	Country	Canada					
Phone Number	1-250-425-7522			Phone Number	604-420-8773							

SAMPLE DETAILS								ANALYSIS REQUESTED											Filtered - F: Field, L: Lab, FL: Field & Lab, N: None
								Filt.											
								PRESERV.											
								ANALYSIS	7-d C.dubia P/F	7-d C.dubia P/F (EDTA)	72-hr P. subcapitata P/F	30-d embryo EA P/F 21210	28-d Hyalella P/F	28-d Hyalella P/F (EDTA)					
Sample ID	Sample Location	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.												
(2) CM_MC2_WS_2021-11-09_N	CM_MC2	WS	No	11/9/2021	10:58	G	2					X							1.8-2.9
(1) CM_MC1_WS_2021-11-09_N	CM_MC1	WS	No	11/9/2021	10:21	G	2					X							2.1-2.9

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
			Tyrone Hamilton	Nov. 10/21 @11:30
			Nautilus - Burnaby	Q4-WS

NB OF BOTTLES RETURNED/DESCRIPTION	
Regular (default)	X
Priority (2-3 business days) - 50% surcharge	
Emergency (1 Business Day) - 100% surcharge	
For Emergency <1 Day, ASAP or Weekend - Contact ALS	

Sampler's Name	SH/DS/KS	Mobile #	250 425 7522
Sampler's Signature		Date/Time	11/9/2021 14:00:00 PM

(1) Faint Yellow, black particulates, odourless, clear

(2) clear, odourless, no particulates

Teck

COC ID: 20211102CRNWK5 | TURNAROUND TIME: | RUSH:

PROJECT/CLIENT INFO

Facility Name / Job#	Elkview Operations
Job Description	Q4 Chronic Toxicity Sampling
Project Manager	Jennifer Dane
Email	jennifer.dane@teck.com
Address	RR#1 HWY# 3
City	Sparwood
Province	BC
Postal Code	V1C 4C3
Country	Canada
Phone Number	1-250-425-8137

LABORATORY

Lab Name	Nautilus Environmental
Lab Contact	Jeslin Wijaya
Email	jeslin@nautilusenvironmental.ca
Address	8664 Commerce Court
	Imperial Square Lake City
City	Burnaby
Province	BC
Postal Code	V5A 4N7
Country	Canada
Phone Number	604-420-8773

OTHER INFO

Report Format / Distribution		Excel	PDF	EDD
Email 1:				
Email 2:	teckcoal@equisonline.com			X
Email 3:	chris.emslie@teck.com	X	X	X
Email 4:	Teck.Lab.Results@sharepoint.teck.com	X	X	X
Email 5:	jennifer.dane@teck.com	X	X	X
Email 6:	colby.bracken@teck.com	X	X	X
PO number	VPO00678876			

SAMPLE DETAILS / **ANALYSIS REQUESTED**

Filtered - F: Field, L: Lab, FL: Field & Lab, N: None

Sample ID	Sample Location	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	ANALYSIS	7-d C.dubia P/F	72-hr P. subcapiata P/F	30-d embryo EA P/F	28-d Hyalella P/F						
FILTERED									No	No	No	No						
PRESERVED									No	No	No	No						
(2) EV_HC1_WS_2021_Q4_WK5_N	EV_HC1	WS	N	11/9/2021	10:17	G	2				1							0.0-0.0
(1) EV_MC2_WS_2021_Q4_WK5_N	EV_MC2	WS	N	11/9/2021	11:26	G	2				1							0.0-0.2
											21 21 10							
					Total		4				21							

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS

Toxicity 96-Hr/48-HR = 96 Hr Rainbow Trout pass/fail & 48 Hr Daphnia pass/fail
(Daphinia testing to occur at 20 degrees)

RELINQUISHED BY/AFFILIATION

J.Batstone/C. Bracken

DATE/TIME

9-Nov-21

ACCEPTED BY/AFFILIATION

Tyrone Hamilton
Nautilus - Burnaby

DATE/TIME

Nov. 10/21 @11:30
Q4-WS

NB OF BOTTLES RETURNED/DESCRIPTION

Regular (default)	X
Priority (2-3 business days) - 50% surcharge	
Emergency (1 Business Day) - 100% surcharge	
For Emergency <1 Day, ASAP or Weekend - Contact ALS	

Sampler's Name	J.Batstone/C. Bracken	Mobile #	1-250-423-0826
Sampler's Signature		Date/Time	November 9, 2021

(1) Faint yellow, clear, odourless, no particulates

(2) Clear, odourless, No particulates

Teck

Page 1

COC ID:	11/9/2021	TURNAROUND TIME:		RUSH:	

PROJECT/CLIENT INFO				LABORATORY				OTHER INFO			
Facility Name / Job#	Fording River Operation			Lab Name	Nautilus Environmental - BC			Report Format / Distribution		Excel	PDF	EDD
Project Manager	Scott Roughead			Lab Contact				Email 1:	david.burroughs@teck.com	X	X	X
Email	scott.roughead@teck.com			Email	BCinfo@nautilusenvironmental.ca			Email 2:	britt.anderson@teck.com	X	X	X
Address				Address	8664 Commerce Court			Email 3:	scott.roughead@teck.com	X	X	X
								Email 4:	cruz.canlas@teck.com	X	X	X
City	Elkford	Province	BC	City	Burnaby	Province	BC	Email 5:	jamie.walsh@teck.com	X	X	X
Postal Code		Country	Canada	Postal Code	V5A 4N7	Country	Canada	Email 6:	teckcoal@equisonline.com			X
Phone Number	1-250-433-6976			Phone Number	604-420-8773			VPO00741382				

SAMPLE DETAILS								ANALYSIS REQUESTED														
								FIR:	NO	NO	NO	NO	NO	NO								
								PRESERV:	NO	NO	NO	NO	NO	NO								
								ANALYSIS:	7-d C.dubia P/F	7-d C.dubia P/F (EDTA)	72-hr P. subcapitata P/F	30-d embryo EA P/F	28-d Hyalella P/F	28-d Hyalella P/F (EDTA)								
	Sample ID	Sample Location (sys_loc_code)	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.														
(1)	FR_FRABCH_MON_2021-11-09_N	FR_FRABCH	WS	no	9-Nov		G	2				X									0.5-0.9	
(2)	FR_FRCP1_MON_2021-11-09_N	FR_FRCP1	WS	no	9-Nov		G	2				X									0.4-0.8	
(1)	FR_UFR1_MON_2021-11-09_N	FR_UFR1	WS	no	9-Nov		G	2				X									0.1-0.3	
												10										
												12 21										

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
	Cruz Canlas	November 9, 2021	Tyrone Harm / Teck	Nov 10/21 @11:30
			Nautilus - Burnaby	Q4 - batch W5

SERVICE REQUEST (rush - subject to availability)					
Regular (default)	X	Sampler's Name	Cruz Canlas	Mobile #	250 433 6166
Priority (2-3 business days) - 50% surcharge					
Emergency (1 Business Day) - 100% surcharge		Sampler's Signature		Date/Time	November 9, 2021
For Emergency <1 Day, ASAP or Weekend - Contact ALS					

(1) clear, odourless, black particulates

(2) slight yellow, clear, odourless, black particulates

Teck

COC ID: UFR Chronic Tox Q4 | TURNAROUND TIME: Regular | RUSH:

PROJECT/CLIENT INFO				LABORATORY				OTHER INFO				
Facility Name / Job#	Fording River Operation			Lab Name	Nautilus Environmental - BC			Report Format / Distribution		Excel	PDF	EDD
Project Manager	Scott Roughead			Lab Contact				Email 1:	david.burroughs@teck.com	X	X	X
Email	Scott.Roughead@teck.com			Email	BCinfo@nautilusenvironmental.ca			Email 2:	cruz.canlas@teck.com	X	X	X
Address	PO Box 100			Address	8664 Commerce Court			Email 3:	scott.roughead@teck.com	X	X	X
								Email 4:	teckcoal@equisonline.com			X
City	Elkford	Province	BC	City	Burnaby	Province	BC	Email 5:	jessica.ritz@teck.com	X	X	X
Postal Code	V0B 1H0	Country	Canada	Postal Code	V5A 4N7	Country	Can	Email 6:	cait.good@teck.com	X	X	X
Phone Number	1-250-865-5195			Phone Number	604-420-8773			Email 7:	jamie.walsh@teck.com	X	X	X

SAMPLE DETAILS								ANALYSIS REQUESTED (Filtered - F: Field, L: Lab, FL: Field & Lab, N: None)												
								Filt.	N	N	N	N									
								PRESERV.	NONE	NONE	NONE	NONE									
								ANALYSIS	30-d embryo EA P/F											
Sample ID	Sample Location (sys_loc_code)	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.													
(2) FR_FR4_WS_2021-11-09_N	FR_FR4	WS	NO	9-Nov-21	10:30	G	2		X										0.0	0.0
(1) FR_FRRD_WS_2021-11-09_N	FR_FRRD	WS	NO	9-Nov-21	9:40	G	2		X										0.0	0.0
(1) FR_FR2_WS_2021-11-09_N	FR_FR2	WS	NO	9-Nov-21	11:30	G	2		X										0.0	0.4
(1) FR_MULTIPLATE_WS_2021-11-09_NP	FR_MULTIPLATE	WS	NO	9-Nov-21	17:45	G	2		X										0.0	0.0
									10											
									21											
									21											

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
		13:22	Tyrone Hamilton	Nov 10/21 @ 14:30
			Nautilus - Burnaby	Q4-WS

SERVICE REQUEST (rush - subject to availability)	
Regular (default)	X
Priority (2-3 business days) - 50% surcharge	
Emergency (1 Business Day) - 100% surcharge	
For Emergency <1 Day, ASAP or Weekend - Contact ALS	

Sampler's Name	J. Schneider S. Housen	Mobile #	
Sampler's Signature		Date/Time	Nov 9/21

(1) Clear, odourless, black particulates

(2) clear, odourless, no particulates

Teck

COC ID:	2021-11-09 CHRONIC TOX	TURNAROUND TIME:	regular	RUSH:	

PROJECT/CLIENT INFO				LABORATORY				OTHER INFO				
Facility Name	Greenhills Operations			Lab Name	Nautilus Environmental			EDD delivery:				
Project Manager	Jeremy Enns			Lab Contact	Armando			Email 1:				
Email	jeremy.enns@teck.com			Email				Email 2:				
Address	PO Box 5000			Address	8664 Commerce Court			Email 3:	teckcoal@equisonline.com	x	x	x
								Email 4:				
City	Elkford	Province	BC	City	Burnaby	Province	BC	Email 5:				
Postal Code	V0B 1H0	Country	Canada	Postal Code	V5A 4N7	Country	Can	Email 6:	DL-Equis-GHO-Field@teck.com	x	x	x
Phone Number	250 865 3274			Phone Number	403.253.7121			PO number	610307			

SAMPLE DETAILS								ANALYSIS REQUESTED											
								Please indicate below Filtered, Perserved or both (F, P, F/P)											
								#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
	Sample ID	Sample Location	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	ANALYSIS 2/2/10 30-d embryo EA P/F										
(1)	GH_ER2_WS_2021-11-09_N	GH_ER2	WS	N	9-Nov	11:30	G	2	X										0.0-0.0
(2)	GH_ERC_WS_2021-2021-11-09_N	GH_ERC	WS	N	9-Nov	12:20	G	2	X										0.0-0.6
(3)	GH_FR1_WS_20212021-11-09_N	GH_FR1	WS	N	9-Nov	13:20	G	2	X										0.0-0.0

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	Date	Time	Accepted By/Affiliation	Date	Time
				Tyrone Hamilton	Nov. 10/21	11:30
				Nautilus - Burnaby	Q4-W5	

SERVICE REQUEST (rush - subject to availability)					
Regular (default)	X	Sampler's Name	EO/ID	Mobile #	
Priority (2-3 business days) - 50% surcharge					
Emergency (1 Business Day) - 100% surcharge		Sampler's Signature		Date/Time	November 9 2021
For Emergency <1 Day, ASAP or Weekend - Contact ALS					

(1) Clear, odourless, black particulates

(2) clear, odourless, no particulates

NAUTILUS ENVIRONMENTAL

TESTING LOCATION (Please Circle)

Burnaby (●)
8664 Commerce Court
Burnaby, British Columbia, Canada
V5A 4N7
Phone 604.420.8773

Calgary ( )
10823 27 Street SE
Calgary, Alberta, Canada
T2Z 3V9
Phone 403.253.7121

Chain of Custody

Date 2021/11/09 Page 1 of 1

Report to:		**Invoice To:**	
Company	Nautilus Environmnetal	**Company**	Line Creek Operations
Address	8664 Commerce Court	**Address**	15 km North Hwy 43
City/Prov/PC	Burnaby, BC, V5A 4N7	**City/Prov/PC**	Sparwood, BC,
Contact	Armando Tang	**Contact**	Tom Jeffery
Phone	604-420-8773	**Phone**	250-425-6111
Email	armando@nautilusenvironmental.ca	**Email**	tom.jeffery@teck.com
		PO No.	VPO00741384

Sample Collection By: T. Dick/ D. Tymstra **Sample Type:** Grab (●) OR Composite ( )

	SAMPLE ID	DATE (DD/MM/YY)	TIME	MATRIX	# OF CONTAINERS AND VOLUME (e.g. 1 x 20 L)	COMMENTS	7-d C.dubia P/F	72-hr P. subcapitata P/F	30-d embryo EA P/F	28-d Hyalella P/F	Receipt Temperature (°C)
1	LC_SLC_WS_2021-11-09-N	09/11/21	10:20	WS	2 x 20L	③			✓		0.0 - 0.0
2	LC_LC3_WS_2021-11-09_N	09/11/21	11:00	WS	2 x 20L	①			✓		0.0 - 0.8
3	LC_LCDSSLCC_WS_2021-11-09_N	09/11/21	11:20	WS	2 x 20L	②			✓		0.0 - 0.4
4	LC_LC5_WS_2021-11-09_N	09/11/21	11:30	WS	2 x 20L	②			✓		0.2 - 0.8
5	LC_DCDS_WS_2021-11-09_N	09/11/21	12:40	WS	2 x 20L	①			✓		0.0 - 0.0
6						①clear, odourless, blackparticulate lay					
7						yellow					
8						②clear, odourless, blackparticulate			10		
9						③clear, odourless, no particulates			21		
10									21		

SPECIAL INSTRUCTIONS/COMMENTS (CLIENT)

Please provide preliminary update as results are available.
Report Format / Distribution List:
Email 1: tom.jeffery@teck.com (Excel/PDF)
Email 2 : teckcoal@equisonline.com (EDD)
Email 3: drake.tymstra@teck.com (Excel/PDF)
Email 4: shanise.fossen@teck.com (Excel/PDF)
Email 5: tanya.dick@teck.com (Excel/PDF)

SAMPLE RECEIPT DETAILS (LABORATORY)

1. Total No. of Containers	10	4. Ice Present in Cooler?	(Y) / N
2. Courier	Bear Paw	5. Seal Present?	Y / (N)
3. Good Condition?	(Y) / N	6. Initials Present on Seal?	Y / (N)

SAMPLE DESCRIPTION AND COMMENTS (LABORATORY)

Q4-W5

RELINQUISHED BY (CLIENT)

(Printed Name) (Signature)

(Company) (Date DD/MM/YY and Time)

RECEIVED BY (LABORATORY)

Tyrone Hamilton (Printed Name) TH (Signature)

Nautilus - Burnaby (Company) Nov. 10/21 @11:30 (Date DD/MM/YY and Time)

Our liability is limited to the cost of the test requested. The test results only relate to the sample as received. No liability in whole or in part is assumed for the collection, handling, or transport of the sample, application or interpretation of the test data or results in part or in whole.

Additional costs may be required for sample disposal or storage. Payment net 30 unless otherwise contracted.

END OF REPORT

Toxicity testing on Elk Valley samples with *Hyalella azteca*

Second Quarter 2021

Supplementary Report

Revised – July 5, 2022

December 7, 2021

Submitted to: **Teck Coal Ltd.**
Sparwood, BC

8664 Commerce Court, Burnaby, BC V5A 4N7

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APPENDIX B - Chain-of-custody forms

SIGNATURE PAGE

Report By:
Émilie Viczko, M.Sc.
Project Biologist

Reviewed By:
Melanie Gallant, Ph.D.
Environmental Toxicologist

This report has been prepared by Nautilus Environmental Company Inc. based on data and/or samples provided by our client and the results of this study are for their sole benefit. Any reliance on the data by a third party is at the sole and exclusive risk of that party. The results presented here relate only to the samples tested.

1.0 INTRODUCTION

Nautilus Environmental conducted toxicity tests for Teck Coal Ltd. (Teck) on samples collected from various locations in the Elk Valley as part of a quarterly toxicity testing program required under the BC Ministry of Environment and Climate Change Strategy permit number 107517.

Stations sampled in the third quarter of 2021 are shown in Figure 1; stations shown as green symbols align with the integrated chronic toxicity testing program, which was designed to eliminate redundancy between Permit 107517 Section 9.8 (ii) and Permit 106970 toxicity testing programs. The integrated program was approved by BC Ministry of Environment and Climate Change Strategy on March 4, 2019 (BC ENV 2019). Species requiring quarterly testing include a include a cladoceran (*Ceriodaphnia dubia*) and a unicellular green alga (*Pseudokirchneriella subcapitata*). On a semi-annual basis, tests using rainbow trout (*Oncorhynchus mykiss*; Q2 and Q4), an amphipod (*Hyalella azteca*; Q2 and Q4), and fathead minnows (*Pimephales promelas*; Q1 and Q3) are also required. Due to the technical laboratory error from the second quarter, the hyalella test was re-initiated in Q3. Figure 1 stations shown as orange symbols align with the upper Fording River chronic toxicity testing program, which is a supplemental study for 2021 to satisfy Section 4D3.6 of Permit 107517. The upper Fording River program includes the same test species and testing frequency as the regional program, except that green alga is not tested.

This supplementary report includes the results of the *Hyalella azteca* toxicity tests alone. These tests were initiated with samples from all stations and were successfully terminated. However, a technical laboratory error rendered the organisms collected at termination unusable and final dry weight measurements could not be collected. Therefore, only survival results are included in this supplementary report. Testing for stations associated with the UFR program (including the upstream reference station on the Fording) were re-initiated right away and were included in the previously submitted Q2 2021 report. Re-testing for stations associated with the regional program occurred in the third quarter.

Water samples used for testing were transported in 20-L plastic containers in coolers containing ice packs. Samples were received at temperatures ranging from 0.0 to 20.6°C and were stored in the dark at 4 ± 2°C prior to testing. Table 1 summarizes the toxicity tests that were conducted on each sample as well as weekly sample collection dates for the duration of the *H. azteca* tests. All toxicity tests were conducted at the Nautilus Environmental laboratory in Burnaby, BC.

Copies of laboratory data sheets and printouts of statistical analyses are provided in Appendix A. The chain-of-custody forms are provided in Appendix B. Results of analytical chemistry that was performed on the samples tested in this program are uploaded by Teck to the Environmental

Management System database. Analytical chemistry samples were collected by Teck personnel at the same time the samples were collected for toxicity testing.

Figure 1. Chronic toxicity monitoring locations.

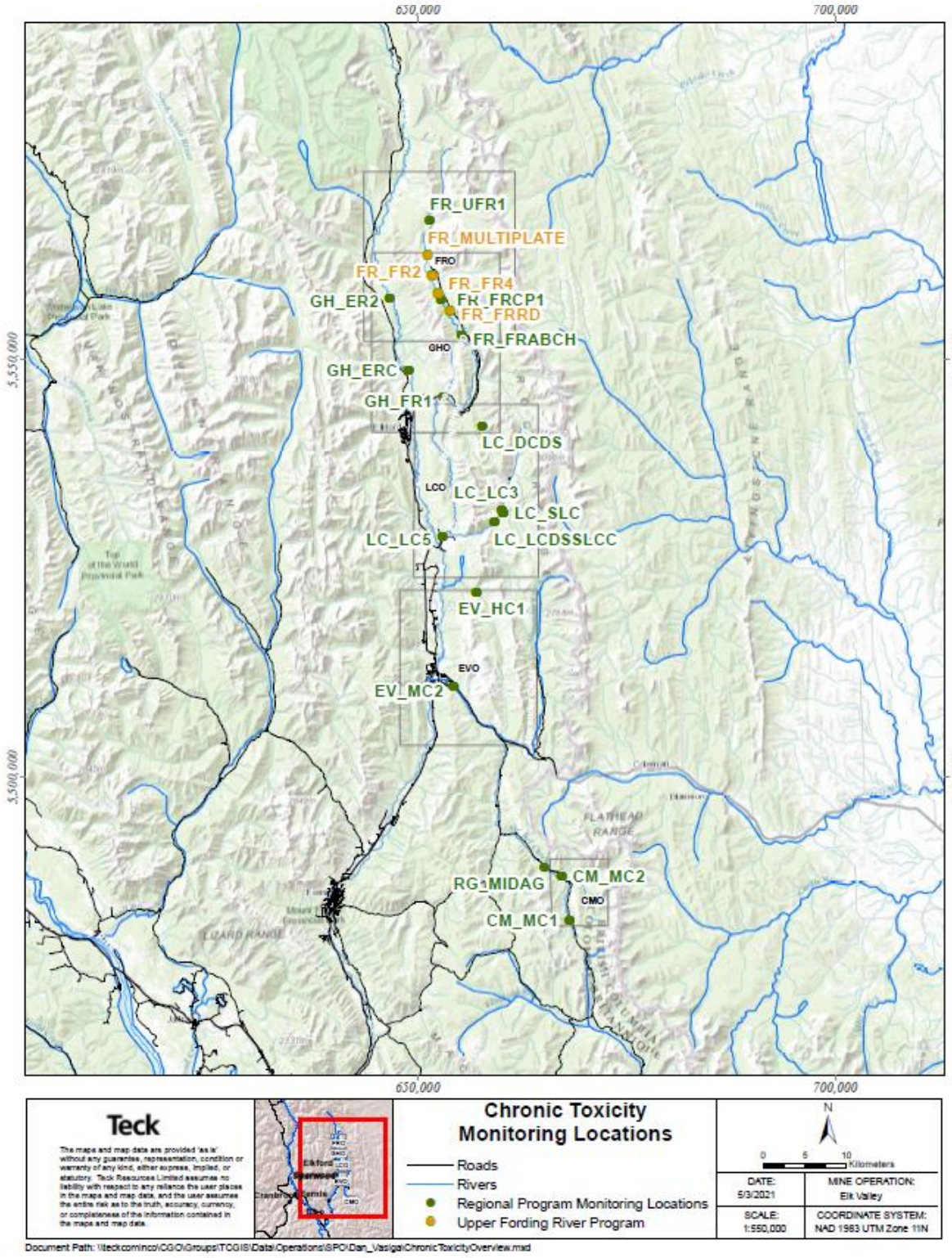

Table 1. Summary of *Hyalella azteca* toxicity testing.

Sample ID	EMS Location ID	Sample Collection Dates
FR_UFR1 *	E300071	May 18, 25, and June 1, 8; 2021
GH_ER2 *	E300090	May 18, 25, and June 1, 8; 2021
CM_MC1 *	E258937	May 18, 25, and June 1, 8; 2021
LC_SLC *	E282149	May 18, 25, and June 1, 8; 2021
FR_FRABCH	E223753	May 18, 25, and June 1, 8; 2021
FR_FRCP1	E299272	May 18, 25, and June 1, 8; 2021
GH_FR1	E200028	May 18, 25, and June 1, 8; 2021
GH_ERC	E258175	May 18, 25, and June 1, 8; 2021
CM_MC2	E300091	May 18, 25, and June 1, 8; 2021
RG_MIDAG	-	May 18, 25, and June 1, 8; 2021
EV_MC2	E102682	May 18, 25, and June 1, 8; 2021
EV_HC1	E299270	May 18, 25, and June 1, 8; 2021
LC_DCDS	E291569	May 18, 25, and June 1, 8; 2021
LC_LC3	E297110	May 18, 25, and June 1, 8; 2021
LC_LC5	0200389	May 18, 25, and June 1, 8; 2021
LC_LCDSSLCC	E282149	May 18, 25, and June 1, 8; 2021
FR_FR4#	0200311	May 18, 25, and June 1, 8; 2021
FR_FRRD#	E300097	May 18, 25, and June 1, 8; 2021
FR_FR2#	200201	May 18, 25, and June 1, 8; 2021
FR_MULTIPLATE#	--	May 18, 25, and June 1, 8; 2021

***** Site water controls; # Upper Fording River samples from the supplemental study for 2021

2.0 METHODS

Methods for the toxicity tests using *H. azteca* in Table 2. Laboratory control water for *H. azteca* was reconstituted water prepared by addition of reagent grade salts to dechlorinated Metro Vancouver municipal tap water for *H. azteca* according to a recipe provided in Environment Canada (2013). The laboratory control water contained approximately 75 mg/L chloride and 0.8 mg/L bromide. All site waters were supplemented with 25 mg/L chloride and 0.02 mg/L bromide using NaCl and NaBr, respectively, in accordance with recommendations by the *Hyalella* Advisory Group (chaired by Chris Ingersoll, USGS; Norberg-King et al., 2014). Insufficient concentrations of these halides are known to impair growth of this species.

Statistical analyses were performed using CETIS (Tidepool Scientific Software, 2013), and involved comparison of results to both the laboratory and site water controls.

Table 2. Test conditions: *Hyalella azteca* survival and growth test.

Test species	*Hyalella azteca*
Organism source	Aquatic Biosystems, CO
Organism age	7- to 8-days old
Test type	Static-renewal
Test duration	28 days
Test vessel	375-mL glass container
Test volume	300 mL
Test concentrations	100% (undiluted) samples amended with 25 mg/L Cl and 0.02 mg/L Br, plus laboratory control
Test replicates	5 per treatment
Number of organisms	10 per replicate
Control water	Reconstituted water containing ~75 mg/L Cl and 0.8 mg/L Br (Environment Canada 2013). Samples were supplemented with 25 mg/L Cl and 0.02 mg/L Br.
Test solution renewal	Twice daily (~80% renewal)
Test temperature	23 ± 1°C
Feeding	1 mL of YCT daily to each container. Tetramin daily, with amounts increasing weekly; Week 1: 0.25 mg, Week 2: 0.5 mg, Week 3: 1 mg, Week 4: 1.5 mg in each test container.
Light intensity	500 to 1000 lux at water surface
Photoperiod	16 hours light / 8 hours dark
Aeration	None
Test measurements	Temperature, dissolved oxygen, pH and conductivity measured daily; hardness and alkalinity measured upon arrival; hardness and alkalinity measured at test termination; total ammonia measured at test initiation and termination
Test protocol	Modified from US EPA (2000), as described in Norberg-King et al. (2014)
Statistical software	CETIS Version 1.9.4
Test endpoints	Survival and dry weight
Test acceptability criteria for controls	Mean control survival of ≥80%, dry weight ≥0.10 mg
Reference toxicant	Sodium chloride (NaCl)

3.0 RESULTS

3.1 *Hyalella azteca*

Results of the *H. azteca* toxicity tests are provided in Table 3. The data included here are derived from the group of samples originally intended for Q2 testing (see introduction for clarification). Due to a technical laboratory error, only survival results are available.

The survival of the site controls did not differ from the laboratory control. Adverse effects on survival were observed in CM_MC2 and FR_FR2 when compared to one or more controls.

Table 3. Results: *Hyalella azteca* survival and growth test.

Sample ID	(Mean ± SD)
	Survival (%)
Laboratory Control	94.0 ± 8.9
FR_UFR1 (Site Control)	96.0 ± 5.5
GH_ER2 (Site Control)	92.0 ± 13.0
CM_MC1 (Site Control)	100.0 ± 0.0
LC_SLC (Site Control)	100.0 ± 0.0
FR_FRABCH	96.0 ± 8.9
FR_FRCP1	98.0 ± 4.5
GH_FR1	96.0 ± 5.5
GH_ERC	94.0 ± 8.9
CM_MC2	70.0 ± 12.2 *#‡§
RG_MIDAG	100.0 ± 0.0
EV_MC2	96.0 ± 5.5
EV_HC1	100.0 ± 0.0
LC_DCDS	92.0 ± 8.4
LC_LC3	98.0 ± 4.5
LC_LC5	100.0 ± 0.0
LC_LCDSSLCC	98.0 ± 4.5
FR_FR4	100.0 ± 0.0
FR_FR2	82.0 ± 17.9 ‡§
FR_MULTIPLATE	98.0 ± 4.5
FR_FRRD	96.0 ± 5.5

SD = Standard Deviation
* Result was significantly lower than the laboratory control
# Result was significantly lower than the FR_UFR1 site control
† Result was significantly lower than the GH_ER2 site control
‡ Result was significantly lower than the CM_MC1 site control
§ Result was significantly lower than the LC_SLC site control

4.0 QA/QC

The health histories of the test organisms used in the exposures were acceptable and met the requirements of the test protocols. All tests met control acceptability criteria. Water quality parameters remained within the ranges specified in the protocols throughout the tests and uncertainty associated with these tests is best described by the standard deviations around the means. There were no deviations from the test methodology with the exception of the planned modifications described in Section 2.0. Uncertainty associated with the test is best described by the standard deviation around the mean.

Results of the reference toxicant tests conducted during the testing program are summarized in Table 4. Results for this test fell within the acceptable range for organism performance of two standard deviations around the mean, based on historical results obtained by the laboratory. Thus, the sensitivity of the organisms used in these tests was appropriate. The reference toxicant tests were performed under the same conditions as those used for the samples.

Table 4. Reference toxicant test results.

Test species	Endpoint	Historical mean (2 SD Range)	CV (%)	Test date
H. azteca	Survival (LC50): 8.5 g/L NaCl	5.9 (3.7-9.5)	24	May 20, 2021

SD = Standard Deviation, CV = Coefficient of Variation, LC = Lethal Concentration, IC = Inhibition Concentration, EC = Effective Concentration

REVISION 1 UPDATES

Previously missing dissolved oxygen and pH values (Day 28) for sites EV_MC2 through FR_FR2 in the *H. azteca* test has been added to the appendix.

5.0 REFERENCES

BC Ministry of Environment and Sustainability (BC ENV). Re: Approval of the request to integrate the chronic toxicity test requirements of Permit 107517 Section 9.8 (ii) and Permit 106970. Letter from Douglas Hills (BC ENV) to Carla Fraser (Teck) dated March 4, 2019.

Environment Canada. 2013. Biological test method: test for survival and growth in sediment and water using the freshwater amphipod, *Hyalella azteca*. EPS 1/RM/33, Second Edition, January 2013.

Norberg-King TJ, Hockett R, Mount DR, Ivey C, Ingersoll C, Kemble N, Brumbaugh B, Hammer E, Soucek D, Taylor L. 2014. Inter-lab testing of *Hyalella azteca* water and sediment methods: 3. Results from 10- to 42-d tests conducted with the new water-only method. Proceedings of SETAC, Vancouver, BC, Canada, November 09 - 13, 2014.

Tidepool Scientific Software. 2013. CETIS comprehensive environmental toxicity information system, version 1.9.4.11 Tidepool Scientific Software, McKinleyville, CA. 275 pp.

US EPA. 2000. Methods for measuring the toxicity and bioaccumulation of sediment-associated contaminants with freshwater invertebrates. EPA 600/R-99/064. March 2000.

APPENDIX A – *Hyalella azteca* toxicity test data

Hyalella azteca Water-only Test Summary Sheet

Client: Teck
Work Order No.: 210964

Start Date: May 20/21
Set up by: KJL/RZJ

Sample Information:

Sample ID: Various - see below
Sample Date: May 18, 25, June 1, 8, 2021
Date Received: May 19, 26, June 2, 9, 2021
Sample Volume: 2-5 x 20L per sample/refresh

Test Organism Information:

Species: *Hyalella azteca*
Supplier: Aquatic Biosystems, CO
Date received: May 19/21
Age or size (Day 0): 7-8d
% Mortality in 24 h prior to testing 0%.

NaCl Reference Toxicant Results:

Reference Toxicant ID: HA199
Stock Solution ID: n/a
Date Initiated: May 20/21

96-h LC50 (95% CL): 8.5(6.0-12.0) g/L NaCl

96-h LC50 Reference Toxicant Mean and Range: 5.9 (3.7-9.5) CV (%): 24

Test Results:

Sample ID	Survival ± SD (%)	Average Dry Wt. ± SD (mg)
Lab Control	94.0 ± 8.9	±
FR_UFR1	96.0 ± 5.5	±
GH_ER2	92.0 ± 13.0	±
CM_MC1	100 ± 0.0	±
LC_SLC	100 ± 0.0	±
FR_FRARCH	96.0 ± 8.9	±
FR_FRC1	98.0 ± 4.5	±
GH_FR1	96.0 ± 5.5	±

Reviewed by: MG
Date reviewed: 2021/11/10

Hyalella azteca Water-only Test Summary Sheet

Client: Teck
Work Order No.: 210964

Start Date: May 20/21
Set up by: KJL/RZL

Sample Information:

Sample ID: Various - see below
Sample Date: May 18, 25, June 1, 8, 2021
Date Received: May 19, 26, June 2, 9, 2021
Sample Volume: 2-5 x 20L per sample; refresh

Test Organism Information:

Species: *Hyalella azteca*
Supplier: Aquatic Biosystems, CO
Date received: May 19/21
Age or size (Day 0): 7-8d
% Mortality in 24 h prior to testing 0%.

NaCl Reference Toxicant Results:

Reference Toxicant ID: HA199
Stock Solution ID: n/a
Date Initiated: May 20/21

96-h LC50 (95% CL): 8.5 (6.0 - 12.0) g/L NaCl

96-h LC50 Reference Toxicant Mean and Range: 5.9 (3.7 - 9.5) CV (%): 24

Test Results:

Sample ID	Survival ± SD (%)	Average Dry Wt. ± SD (mg)
GH_ERC	94.0 ± 8.9	±
CM_MC2	70.0 ± 12.2 *,α,β,+	±
EV_MC2	96.0 ± 5.5	±
EV_HCl	100 ± 0.0	±
LC_DCDS	92.0 ± 8.4	±
LC_LC3	98.0 ± 4.5	±
LC_LC5	100 ± 0.0	±
LC_LCDSSLCC	98.0 ± 4.5	±

*significantly different from Lab Control
α significantly different compared to site control FR_UFR1

Reviewed by: MG
Date reviewed: 2021/11/10

β significantly different compared to site control CM_MC1
+ significantly different compared to site control LC_SLC

Hyalella azteca Water-only Test Summary Sheet

Client: Teck
Work Order No.: 210964

Start Date: May 20/21
Set up by: KDL/RZJ

Sample Information:

Sample ID: Various - see below
Sample Date: May 18, 25, June 1, 8, 2021
Date Received: May 19, 26, June 2, 9, 2021
Sample Volume: 2-5 x 2L per sample/refresh

Test Organism Information:

Species: *Hyalella azteca*
Supplier: Aquatic Biosystems, CO
Date received: May 6/21
Age or size (Day 0): 7-8d
% Mortality in 24 h prior to testing 0%

NaCl Reference Toxicant Results:

Reference Toxicant ID: HA199
Stock Solution ID: n/a
Date Initiated: May 20/21

96-h LC50 (95% CL): 8.5 (6.0-12.0) g/L NaCl

96-h LC50 Reference Toxicant Mean and Range: 5.9 (3.7-9.5) CV (%): 24

Test Results:

Sample ID	Survival ± SD (%)	Average Dry Wt. ± SD (mg)
RG_MIDAG	100 ± 0.0	±
FR-FR4	100 ± 0.0	±
FR-FRRD	96.0 ± 5.5	±
FR_FR2	52.0 ± 17.9 β,†	±
FR-MULTIPLATE	98.0 ± 4.5	±
	±	±
	±	±
	±	±

β significantly different compared to site control CM_MC1
† significantly different compared to site control LC-SLC

Reviewed by: MG

Date reviewed: 7/2021/11/10

Chronic *H. azteca* Water-Only Toxicity Test Data Sheet
Water Quality

Client: TECK
Work Order No.: 20964
Sample ID: Various - see below

Start Date: May 20/2021
Termination Date: June 17/2021
CER #: 6
Test Organism: *Hyalella azteca*

Temperature (°C)

Sample ID/Conc.	Day													
	0	1		2		3		4		5		6		7
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Lab Control	22.0	22.5	23.0	22.5	22.0	①~~22.5~~	22.0	23.0	22.5	23.0	22.5	23.0	RS ~~23.5~~ 22.5	22.5
FR-UFR1	22.0	22.5	23.0	22.5	22.5	22.5	21.5	23.0	23.5	22.5	23.0	23.0	23.5	22.5
GH-ER2	22.5	22.5	23.0	22.5	22.5	22.5	22.5	23.0	23.5	22.5	23.5	23.0	23.5	22.5
CM-MC1	23.0	22.5	23.0	22.0	22.5	22.5	22.5	23.0	23.5	23.0	23.5	23.0	23.5	22.5
LC-SLC	22.0	22.5	23.0	22.0	22.5	22.5	22.5	23.0	23.5	23.0	23.5	23.0	23.5	22.5
FR-FRABCH	22.0	22.5	23.0	22.0	22.5	22.5	22.5	23.0	23.5	23.0	23.5	23.0	23.5	22.5
FR-FRCP1	22.0	22.5	23.0	22.0	22.5	22.5	22.5	23.0	23.5	23.0	23.5	23.0	23.5	22.5
GH-FR1	22.0	22.5	23.0	22.5	22.0	22.5	22.0	23.0	23.5	23.0	23.5	23.0	23.0	22.5
GH-ERC	22.0	22.5	23.0	22.5	22.0	22.5	22.0	23.0	23.5	23.0	23.0	23.0	23.0	22.5
CM-MC2	22.0	22.5	23.0	22.5	22.0	22.5	22.0	23.0	23.5	23.0	23.0	23.0	23.0	22.5
Technician Initials	RZS	JZL	JZL	JZL	JZL	RZS	RZS	RZS	RZS	RZS	RZ/	RZ	RZS	JZL

Thermometer: 6

Conductivity (µS)

Sample ID/Conc.	Day													
	0	1		2		3		4		5		6		7
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Lab Control	428	455	430	436	427	437	427	445	436	444	429	435	~~429~~	429
FR-UFR1	286	311	291	295	293	307	295	309	295	306	292	295	291	300
GH-ER2	348	377	349	356	353	357	353	366	360	363	356	358	355	363
CM-MC1	256	292	257	260	259	263	260	273	265	270	262	266	262	270
LC-SLC	294	323	296	303	296	302	299	312	304	307	301	303	300	307
FR-FRABCH	667	687	669	675	672	674	674	691	672	668	664	661	662	665
FR-FRCP1	563	587	567	574	569	573	572	587	583	579	575	575	575	579
GH-FR1	571	591	569	580	575	579	576	596	588	583	581	581	581	580
GH-ERC	368	396	370	377	370	376	371	386	381	380	377	379	376	381
CM-MC2	580	597	582	585	582	585	584	603	592	585	583	585	583	588
Technician Initials	RZS	JZL	JZL	JZL	JZL	RZS	RZS	RZS	RZS	RZS	RZS	RZS	RZS	JZL

Conductivity meter: 3/3

Comments: ① 22.5

Reviewed by: MG

Date Reviewed: NOV 09 2021

Chronic *H. azteca* Water-Only Toxicity Test Data Sheet
Water Quality

Client: TECK
Work Order No.: 210964
Sample ID: Various - see below

Start Date: May 20/2021
Termination Date: June 17/2021
CER #: 6
Test Organism: *Hyalella azteca*

Temperature (°C)

Sample ID/Conc.	Day													
	0	1		2		3		4		5		6		7
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
EV-MC2	22.0	22.5	23.0	22.5	22.0	22.5	22.0	23.0	23.5	23.0	23.5	23.0	23.0	22.5
EV-MC1	22.0	22.5	23.0	22.5	22.0	22.5	22.0	23.0	23.5	23.0	23.5	23.0	23.5	22.5
LC-DCDS	22.0	22.5	23.0	22.5	22.0	22.5	22.0	23.0	23.5	23.0	23.5	23.0	23.0	22.5
LC-LC3	22.0	22.5	23.0	22.5	22.0	22.5	22.0	23.0	23.5	23.0	23.5	23.0	23.0	22.5
LC-LC5	22.0	22.5	23.0	22.5	22.0	22.5	22.0	23.0	23.5	22.5	23.5	23.0	23.0	22.5
LC-LCDSSLCC	22.0	22.5	23.0	22.5	22.0	22.5	22.0	23.0	23.5	22.5	23.5	23.0	23.0	22.5
RG-MIDAG	22.0	22.5	23.0	22.5	22.0	22.5	22.0	23.0	23.5	22.5	23.5	23.0	23.0	22.5
FR-FR4	22.5	22.5	22.0	22.5	22.0	22.5	22.0	23.0	22.0	23.0	22.5	23.0	22.0	22.5
FR-FRRD	23.0	22.5	22.0	22.5	22.0	22.5	22.0	23.0	22.0	23.0	22.5	23.0	22.0	22.5
FR-FR2	22.0	22.5	22.0	22.5	22.0	22.5	22.0	23.0	22.0	23.0	22.5	23.0	22.0	22.5
Technician Initials	RZJ	JZL	JZL	JZL	JZL	RZJ	RZJ	RZJ	RZJ	RZJ	RZJ	RZJ	RZJ	JZL

Thermometer: 6

Conductivity (µS)

Sample ID/Conc.	Day													
	0	1		2		3		4		5		6		7
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
EV-MC2	297	332	298	308	298	307	300	315	308	314	305	313	305	313
EV-MC1	478	502	478	484	480	481	480	497	489	484	483	484	482	486
LC-DCDS	534	564	537	543	539	543	541	557	550	546	543	544	543	544
LC-LC3	807	820	811	815	815	806	810	825	823	811	811	807	807	814
LC-LC5	577	605	580	590	580	591	583	605	592	591	583	588	584	590
LC-LCDSSLCC	547	576	549	558	550	557	552	570	562	562	554	556	555	559
RG-MIDAG	399	432	401	408	401	405	403	419	416	417	411	414	411	417
FR-FR4	506	527	505	512	507	511	509	522	517	515	507	513	511	516
FR-FRRD	711	735	709	735	712	720	714	738	730	725	715	722	719	718
FR-FR2	469	491	468	474	472	477	477	494	483	482	476	480	477	483
Technician Initials	RZJ	JZL	JZL	JZL	JZL	RZJ	RZJ	RZJ	RZJ	RZJ	RZJ	RZJ	RZJ	JZL

Conductivity meter: 3/3

Comments:

Reviewed by: MG

Date Reviewed: NOV 0 9 2021

Chronic *H. azteca* Water-Only Toxicity Test Data Sheet
Water Quality

Client: TECK
Work Order No.: 210964
Sample ID: Various - see below

Start Date: May 20/2021
Termination Date: June 17/21
CER #: 6
Test Organism: *Hyalella azteca*

Temperature (°C)

Sample ID/Conc.	Day													
	0	1		2		3		4		5		6		7
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
FR-MULTIPLATE	22.0	22.5	22.0	22.5	22.0	22.5	22.0	23.0	22.0	23.0	22.0	22.5	22.0	22.5
Technician Initials	RZJ	JZL	JZL	JZL	JZL	RZJ	RZJ	RZJ	RZJ	RZJ	RZJ	RZS	RZS	JZL

Thermometer: 6

Conductivity (µS)

Sample ID/Conc.	Day													
	0	1		2		3		4		5		6		7
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
FR-MULTIPLATE	455	483	457	464	458	463	462	479	472	470	464	468	465	470
Technician Initials	RZJ	JZL	JZL	JZL	JZL	RZJ	RZJ	RZJ	RZJ	RZJ	RZJ	RZS	RZS	JZL

Conductivity meter: 3/3

Comments:

Reviewed by: MG

Date Reviewed: NOV 09 2021

Chronic *H. azteca* Water-Only Toxicity Test Data Sheet
Water Quality

Client: TECK
Work Order No.: 210964
Sample ID: Various-see below

Start Date: May 20/2021
Termination Date: June 17/21
Test Organism: *Hyalella azteca*

Dissolved Oxygen (mg/L)

Sample ID/Conc.	Day													
	0	1		2		3		4		5		6		7
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Lab Control	8.3	7.0	8.5	6.8	8.6	7.1	8.5	6.8	8.3	6.6	8.0	6.3	7.9	6.2
FR-UFR1	8.3	6.8	8.3	6.8	7.9	6.7	7.8	6.7	8.3	7.1	8.5	6.7	7.6	6.1
GH-ER2	8.6	6.9	8.4	6.6	7.9	6.6	7.9	6.4	8.3	6.6	8.5	6.7	7.6	6.5
CM-MC1	8.3	6.8	8.5	6.8	7.9	6.7	7.9	6.4	8.3	6.4	8.5	6.8	7.6	6.7
LC-SLC	8.3	6.7	8.4	6.7	7.9	6.6	7.9	6.3	8.3	6.1	8.5	6.2	7.6	6.7
FR-FRABCH	8.1	6.2	8.2	6.1	7.9	6.1	7.8	6.3	8.2	6.2	8.4	5.7	7.6	6.4
FR-FRCP1	8.5	6.9	8.3	6.6	7.9	6.7	7.9	6.3	8.3	6.1	8.4	6.0	7.6	6.0
GH-FR1	8.4	6.9	8.3	6.5	8.0	6.6	8.2	6.5	8.3	6.3	8.4	6.5	7.5	6.8
GH-ERC	8.3	6.9	8.3	6.8	8.0	6.6	8.2	6.3	8.3	6.5	8.5	6.7	7.6	6.7
CM-MC2	8.3	6.9	8.4	6.7	7.9	6.5	8.3	6.6	8.4	6.6	8.4	6.3	7.6	6.8
Technician Initials	RZS	JZL	JZL	JZL	JZL	RZS	RZS	RZS	RZS	RZS	RZS	RZS	RZS	JZL

DO meter: 3/3

pH

Sample ID/Conc.	Day													
	0	1		2		3		4		5		6		7
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Lab Control	7.9	7.7	8.0	7.7	8.0	7.7	8.1	7.7	8.1	7.7	8.1	7.6	8.1	7.6
FR-UFR1	8.2	7.9	8.1	7.9	8.1	7.9	8.2	7.9	8.2	8.0	8.2	8.0	8.2	7.9
GH-ER2	8.2	8.0	8.2	8.1	8.2	8.1	8.3	8.1	8.3	8.1	8.3	8.1	8.3	8.1
CM-MC1	8.0	7.8	8.0	7.8	8.0	7.8	8.1	7.8	8.1	7.8	8.1	7.9	8.1	8.0
LC-SLC	8.1	7.9	8.1	7.9	8.1	7.9	8.2	7.9	8.2	7.8	8.2	7.8	8.2	7.9
FR-FRABCH	8.3	8.1	8.3	8.1	8.3	8.1	8.4	8.2	8.3	8.1	8.3	8.1	8.3	8.0
FR-FRCP1	8.1	8.1	8.1	8.0	8.2	8.1	8.3	8.1	8.3	8.0	8.3	8.0	8.3	8.0
GH-FR1	8.2	8.1	8.2	8.1	8.2	8.1	8.4	8.2	8.3	8.1	8.3	8.1	8.3	8.1
GH-ERC	8.1	8.1	8.2	8.1	8.2	8.0	8.3	8.1	8.2	8.1	8.3	8.1	8.3	8.2
CM-MC2	8.1	8.1	8.2	8.1	8.2	8.1	8.3	8.1	8.3	8.1	8.3	8.1	8.3	8.0
Technician Initials	RZS	JZL	JZL	JZL	JZL	RZS	RZS	RZS	RZS	RZS	RZS	RZS	RZS	JZL

pH meter: 3/3

Light meter: lit-1
Light intensity (Lux): 400-1000

Comments:

Reviewed by: MC
Date Reviewed: NOV 09 2021

Chronic *H. azteca* Water-Only Toxicity Test Data Sheet
Water Quality

Client: TECK
Work Order No.: 210964
Sample ID: Various - see below

Start Date: May 20/2021
Termination Date: June 17/21
Test Organism: *Hyalella azteca*

Dissolved Oxygen (mg/L)

Sample ID/Conc.	Day													
	0	1		2		3		4		5		6		7
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
EV-MC2	8.2	6.6	8.3	6.4	8.0	6.4	8.1	6.5	8.0	6.6	8.5	6.5	7.7	6.7
EV-HC1	8.2	6.9	8.4	6.9	8.0	6.6	8.1	6.6	8.3	6.2	8.5	6.3	7.6	6.0
LC-DCDS	8.2	6.9	8.4	6.3	7.8	6.4	8.2	6.4	8.2	6.1	8.5	6.3	7.7	6.3
LC-LC3	8.3	6.7	8.3	6.6	7.9	6.6	8.1	6.4	8.5	6.4	8.7	6.5	7.7	6.3
LC-LC5	8.3	6.7	8.3	6.5	7.9	6.5	8.1	6.6	8.3	6.4	8.4	6.0	7.6	6.3
LC-LCDSSLCC	8.3	6.7	8.4	6.9	7.9	6.7	8.2	6.5	8.5	6.2	8.5	6.5	7.6	6.5
RG-MIDAG	8.3	6.8	8.3	6.7	8.0	6.7	8.2	6.5	8.2	6.7	8.5	6.4	7.6	6.7
FR-FR4	8.2	7.9	8.4	6.8	8.0	6.7	8.1	6.4	8.2	6.2	8.7	6.2	7.8	6.8
FR-FRD	8.2	6.9	8.4	6.6	8.0	6.5	8.1	6.3	8.4	6.3	8.7	6.3	7.8	6.7
FR-FR2	8.4	7.1	8.4	6.7	8.1	6.5	8.1	6.4	8.5	6.2	8.7	6.5	7.8	6.4
Technician Initials	RZJ	JZL	JZL	JZL	JZL	RZJ	RZJ	RZJ	RZJ	RZJ	RZJ	RZJ	RZJ	JZL

DO meter: 3/3

pH

Sample ID/Conc.	Day													
	0	1		2		3		4		5		6		7
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
EV-MC2	7.9	7.8	7.9	7.8	8.0	7.7	8.0	7.9	8.0	7.9	8.0	7.9	8.1	7.8
EV-HC1	8.2	8.1	8.2	8.1	8.3	8.1	8.3	8.2	8.3	8.1	8.4	8.2	8.4	8.1
LC-DCDS	8.1	7.9	8.1	7.9	8.1	7.9	8.2	7.9	8.2	7.9	8.2	7.9	8.2	8.0
LC-LC3	8.0	8.1	8.1	8.1	8.2	8.2	8.4	8.3	8.3	8.2	8.4	8.3	8.4	8.1
LC-LC5	8.2	8.2	8.3	8.2	8.3	8.2	8.4	8.2	8.3	8.2	8.4	8.1	8.4	8.1
LC-LCDSSLCC	8.2	8.1	8.2	8.2	8.2	8.2	8.3	8.2	8.3	8.1	8.3	8.1	8.4	8.1
RG-MIDAG	8.0	8.0	8.1	8.0	8.1	8.0	8.2	8.0	8.2	8.1	8.3	8.0	8.3	8.0
FR-FR4	8.1	8.1	8.1	8.0	8.1	8.0	8.3	8.1	8.2	8.0	8.3	8.0	8.3	7.9
FR-FRD	8.1	8.1	8.1	8.1	8.2	8.2	8.4	8.2	8.2	8.2	8.3	8.1	8.4	8.0
FR-FR2	8.1	8.0	8.1	8.0	8.1	8.0	8.2	8.0	8.2	8.0	8.2	8.1	8.3	8.0
Technician Initials	RZJ	JZL	JZL	JZL	JZL	RZJ	RZJ	RZJ	RZJ	RZJ	RZJ	RZJ	RZJ	JZL

pH meter: 3/3

Light meter: Li-1

Light intensity (Lux): 400-1010

Comments:

Reviewed by: MG

Date Reviewed: NOV 09 2021

Chronic *H. azteca* Water-Only Toxicity Test Data Sheet
Water Quality

Client: TECK
Work Order No.: 210964
Sample ID: Various - see below

Start Date: May 20/2021
Termination Date: June 17/21
Test Organism: *Hyalella azteca*

Dissolved Oxygen (mg/L)

Sample ID/Conc.	Day													
	0	1		2		3		4		5		6		7
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
FR-MULTIPLATE	8.3	6.9	8.4	6.6	8.0	6.5	8.1	6.4	8.6	6.4	8.7	6.3	7.8	6.5
Technician Initials	RZJ	JZL	JZL	JZL	JZL	RZJ	RZJ	RZJ	RZJ	RZJ	RZJ	RZJ	RZJ	JZL

DO meter: 3/3

pH

Sample ID/Conc.	Day													
	0	1		2		3		4		5		6		7
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
FR-MULTIPLATE	8.1	8.0	8.1	7.9	8.1	8.0	8.2	8.0	8.2	8.0	8.2	8.0	8.2	7.9
Technician Initials	RZJ	JZL	JZL	JZL	JZL	RZJ	RZJ	RZJ	RZJ	RZJ	RZJ	RZJ	RZJ	JZL

pH meter: 3/3

Light meter: 1.7-1
Light intensity (Lux): 400-1010

Comments:

Reviewed by: MG
Date Reviewed: NOV 0 9 2021

Chronic *H. azteca* Water-Only Toxicity Test Data Sheet
Water Quality

Client: Teck
Work Order No.: 210164
Sample ID: Various - see below

Start Date: May 20/21
Termination Date: June 17/21
CER #: 6
Test Organism: *Hyalella azteca*

Temperature (°C)

Sample ID/Conc.	Day													
	7	8		9		10		11		12		13		14
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Lab Control	22.5	23.0	22.0	23.0	22.5	23.0	22.0	23.0	22.5	23.0	22.5	23.0	22.5	23.0
FR-UFR1	22.5	23.0	23.0	23.0	22.5	23.0	22.5	23.0	23.0	23.0	23.5	23.0	23.0	23.0
GH-ERZ	22.5	23.0	23.0	22.5	22.5	23.0	22.5	23.0	23.0	23.0	23.5	23.0	23.0	23.0
CM-MC1	22.5	22.5	23.0	22.5	22.5	22.5	22.5	22.5	23.0	23.0	23.5	23.0	23.0	23.0
LC-SLC	22.5	22.5	23.0	22.5	22.5	22.5	22.5	22.5	23.0	23.0	23.0	23.0	23.0	23.0
FR-FRABCH	22.5	22.5	23.0	22.5	22.5	22.5	22.5	22.5	23.0	23.0	23.0	23.0	23.0	23.0
FR-FRCP1	22.5	23.0	23.5	22.5	22.5	23.0	22.5	22.5	23.5	23.0	23.5	23.0	23.0	23.0
GH-FR1	23.5	22.5	23.0	22.5	22.0	23.0	22.0	22.5	23.5	23.0	23.5	23.0	23.5	23.0
GH-ERC	23.5	22.5	23.0	22.5	22.5	23.0	22.0	22.5	23.0	23.0	23.0	23.0	23.0	23.0
CM-MC2	23.5	22.5	23.0	22.5	22.0	23.0	22.0	22.5	23.0	23.0	23.0	23.0	23.0	23.0
Technician Initials	JZL	JZL	JZL	JZL	JZL	RZS	RZS	RZS	RZS	RZS	RZS	RZS	RZS	RZS

Thermometer: 6

Conductivity (µS)

Sample ID/Conc.	Day													
	7	8		9		10		11		12		13		14
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Lab Control	429	434	429	435	430	431	428	430	427	430	425	430	426	429
FR-UFR1	309	316	311	316	319	319	313	320	300	307	300	305	301	307
GH-ERZ	355	360	358	362	358	363	359	363	350	357	350	358	350	357
CM-MC1	274	280	276	282	277	283	277	282	272	278	273	279	274	279
LC-SLC	328	327	330	333	330	334	329	333	327	331	328	333	328	336
FR-FRABCH	881	850	882	869	883	877	880	877	877	879	877	878	877	879
FR-FRCP1	784	755	785	784	788	785	786	788	780	781	780	783	780	784
GH-FR1	728	695	731	720	719	729	717	727	721	724	712	716	721	715
GH-ERC	375	377	374	380	371	377	372	377	369	374	369	374	369	372
CM-MC2	682	658	680	677	683	681	683	682	681	682	681	689	681	680
Technician Initials	JZL	JZL	JZL	JZL	JZL	RZS	RZS	RZS	RZS	RZS	RZS	RZS	RZS	RZS

Conductivity meter: 313

Comments:

Reviewed by: MG

Date Reviewed: NOV 09 2021

Chronic *H. azteca* Water-Only Toxicity Test Data Sheet
Water Quality

Client: Teck
Work Order No.: 210164
Sample ID: Various - see below

Start Date: May 20 / 2021
Termination Date: June 17/21
CER #: 6
Test Organism: *Hyalella azteca*

Temperature (°C)

Sample ID/Conc.	Day													
	7	8		9		10		11		12		13		14
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
EV_MC2	23.5	23.0	23.0	22.5	22.0	23.0	22.0	22.5	23.0	23.0	23.0	23.0	23.0	23.0
EV_HC1	23.0	22.5	23.0	22.5	22.0	23.0	22.0	22.5	23.0	23.0	23.5	23.0	23.5	23.0
LC_DCDS	23.0	22.5	23.0	22.5	22.0	23.0	22.0	23.0	23.5	23.0	23.0	23.0	23.0	23.0
LC_LC3	22.5	22.5	23.0	22.5	22.0	23.0	22.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0
LC_LC5	22.0	23.0	23.0	22.5	22.0	22.5	22.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0
LC_LCDSSLCC	22.0	23.0	23.0	22.5	22.0	22.5	22.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0
RG_MIDAG	22.5	23.0	23.0	22.5	22.0	22.5	22.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0
FR_FR4	23.5	23.0	22.0	22.5	22.0	22.5	22.0	22.5	22.0	23.0	22.0	23.0	22.0	22.5
FR_FRRD	23.0	22.5	22.0	22.5	22.0	22.5	22.0	22.5	22.0	23.0	22.0	23.0	22.0	22.5
FR_FR2	23.0	22.5	22.0	22.5	22.0	22.5	22.0	22.5	22.0	23.0	22.0	23.0	22.0	22.5
Technician Initials	JZL	JZL	JZL	JZL	JZL	RZS	RZS	RZS	RZS	RZS	RZS	RZS	RZS	RZS

Thermometer: 6

Conductivity (µS)

Sample ID/Conc.	Day													
	7	8		9		10		11		12		13		14
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
EV-MC2	382	379	381	409	382	393	382	387	376	382	376	380	376	382
EV-HC1	574	558	575	576	572	569	570	572	568	571	568	572	568	573
LC_DCDS	573	571	575	580	576	575	576	576	571	575	572	575	572	576
LC-LC3	826	817	827	832	825	822	822	825	823	824	823	825	823	825
LC_LC5	653	641	662	659	655	662	649	656	650	653	651	655	652	656
LC-LCDSSLCC	596	591	598	597	598	598	596	600	598	599	598	602	599	604
RG-MIDAG	489	478	488	492	488	489	487	491	486	488	487	490	487	490
FR_FR4	711	659	689	689	691	686	688	689	682	684	682	685	683	684
FR_FRRD	945	894	936	936	941	935	939	936	933	941	932	934	93	934
FR_FR2	581	567	582	580	584	586	583	586	577	583	577	580	577	578
Technician Initials	JZL	JZL	JZL	JZL	JZL	RZS	RZS	RZS	RZS	RZS	RZS	RZS	RZS	RZS

Conductivity meter: 3/3

Comments:

Reviewed by: ML

Date Reviewed: NOV 09 2021

Chronic *H. azteca* Water-Only Toxicity Test Data Sheet
Water Quality

Client: Teck
Work Order No.: 210964
Sample ID: Various - see below

Start Date: May 20/2021
Termination Date: June 17/21
CER #: 6
Test Organism: *Hyalella azteca*

Temperature (°C)

Sample ID/Conc.	Day													
	7	8		9		10		11		12		13		14
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
FR_MULTIPLATE	22.0	22.5	22.0	22.5	22.0	22.5	22.0	22.5	22.0	23.0	22.0	23.0	22.0	22.5
Technician Initials	JBL	JBL	JBL	JBL	JBL	RZS	RZS	RZS	RZS	RZS	RZS	RZS	RZS	RZS

Thermometer: 6

Conductivity (µS)

Sample ID/Conc.	Day													
	7	8		9		10		11		12		13		14
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
FR - MULTIPLATE	555	543	556	559	556	560	557	558	553	555	553	558	553	554
Technician Initials	JBL	JBL	JBL	JBL	JBL	RZS	RZS	RZS	RZS	RZS	RZS	RZS	RZS	RZS

Conductivity meter: 3 / 3

Comments:

Reviewed by: MC Date Reviewed: NOV 0 9 2021

Chronic *H. azteca* Water-Only Toxicity Test Data Sheet
Water Quality

Client: Teck
Work Order No.: 2209b4
Sample ID: Various - see below

Start Date: May 20 / 2021
Termination Date: June 17/21
Test Organism: *Hyalella azteca*

Dissolved Oxygen (mg/L)

Sample ID/Conc.	Day													
	7	8		9		10		11		12		13		14
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Lab Control	8.3	6.1	8.4	6.3	7.9 8.3	6.8	8.4	6.2	8.2	6.2	8.5	8.3 5.9	8.3	6.2
FR-UFR1	8.1	6.3	8.3	6.2	7.9	6.0	8.3	5.7	8.4	5.8	8.2	5.6	8.0	5.3
GH-ER2	8.1	6.2	8.4	5.7	8.3 7.9	5.7	8.3	5.4	8.4	5.9	8.3	5.9	8.0	4.7
CM-MC1	8.0	6.3	8.4	6.0	8.0	6.1	8.2	5.9	8.4	5.8	8.3	5.4	8.0	5.3
LC-SLC	8.4	6.3	8.5	6.2	7.9	6.4	8.3	6.5	8.4	6.2	8.3	5.9	8.0	6.0
FR-FRABCH	8.3	6.2	8.4	6.2	7.9	5.9	8.3	6.1	8.4	5.8	8.3	5.2	8.0	4.8
FR-FRCP1	8.3	5.7	8.2	5.7	7.9	5.7	8.3	5.7	8.4	5.4	8.2	5.3	8.0	4.7
GH-FR1	8.1	6.0	8.3	5.7	8.1	5.6	8.4	5.8	8.2	5.6	8.2	5.6	7.9	5.4
GH-ERC	8.2	6.5	8.4	6.5	7.9	6.6	8.4	6.4	8.3	6.4	8.2	6.2	8.0	6.0
CM-MC2	8.0	6.3	8.4	6.4	8.1	6.3	8.4	5.9	8.4	5.8	8.3	5.3	8.0	5.0
Technician Initials	JBL	JBL	JBL	JBL	JBL	RZS	RZS	RZS	RZS	RZS	RZS	RZS	RZS	RZS

DO meter: 3/3

pH

Sample ID/Conc.	Day													
	7	8		9		10		11		12		13		14
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Lab Control	8.1	7.5	8.1	7.4	8.0	7.4	7.9	7.4	7.9	7.3	7.9	7.3	7.8	7.3
FR-UFR1	8.2	7.9	8.2	7.7	8.1	7.5	8.1	7.6	8.0	7.5	8.0	7.5	8.1	7.4
GH-ER2	8.2	8.0	8.3	7.8	8.1	7.7	8.2	7.7	8.1	7.7	8.1	7.7	8.2	7.5
CM-MC1	8.0	7.8	8.0	7.8	8.0	7.5	8.0	7.5	8.0	7.4	8.0	7.4	8.0	7.5 7.3
LC-SLC	8.2	7.9	8.2	7.8	8.1	7.7	8.1	7.8	8.1	7.6	8.1	7.7	8.1	7.6
FR-FRABCH	8.1	8.0	8.2	8.0	8.2	8.0	8.3	8.1	8.2	8.0	8.3	8.0	8.3	7.8
FR-FRCP1	8.2	8.0	8.2	8.0	8.2	7.9	8.3	8.0	8.2	7.9	8.3	7.9	8.3	7.8
GH-FR1	8.3	8.1	8.3	8.0	8.2	7.9	8.3	8.0	8.2	7.9	8.3	7.9	8.3	7.9
GH-ERC	8.2	8.1	8.1	8.1	8.1	7.9	8.1	7.9	8.1	7.8	8.2	7.8	8.2	7.8
CM-MC2	8.3	8.0	8.2	8.0	8.2	7.9	8.2	7.9	8.2	7.8	8.2	7.8	8.3	7.7
Technician Initials	JBL	JBL	JBL	JBL	JBL	RZS	RZS	RZS	RZS	RZS	RZS	RZS	RZS	RZS

pH meter: 3/3

Light meter: Int-1

Light intensity (Lux): 400-1000

Comments:

Reviewed by: MG

Date Reviewed: NOV 09 2021

Chronic *H. azteca* Water-Only Toxicity Test Data Sheet
Water Quality

Client: Teck
Work Order No.: 210969
Sample ID: Various – see below
Start Date: May 20 / 2021
Termination Date: June 17/21
Test Organism: *Hyalella azteca*

Dissolved Oxygen (mg/L)

Sample ID/Conc.	Day													
	7	8		9		10		11		12		13		14
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
EV-MC2	8.4	6.5	8.4	6.3	8.2	6.3	8.4	6.4	8.5	6.0	8.3	5.8	8.0	5.5
EV-HC1	8.3	6.1	8.4	6.4	8.1	6.3	8.3	6.3	8.4	6.3	8.3	5.7	8.0	5.4
LC-DCDS	8.4	5.9	8.4	6.3	7.8	5.5	8.3	5.6	8.3	5.2	8.2	5.2	8.0	4.8
LC-LC3	8.2	6.1	8.5	6.4	7.9	6.3	8.4	6.2	8.4	6.3	8.3	6.0	8.0	5.8
LC-LC5	8.3	5.8	8.5	5.9	8.0	6.4	8.3	5.4	8.5	5.7	8.2	5.8	7.9	5.8
LC-LCDSLCC	8.2	6.4	8.4	6.3	8.2	6.1	8.3	6.3	8.5	6.4	8.3	6.2	8.0	6.1
RG-MIDAG	8.3	6.3	8.2	5.9	8.0	6.0	8.3	6.1	8.4	5.8	8.2	5.6	7.9	5.5
FR-FR4	8.3	6.3	8.4	6.2	8.0	6.4	8.4	6.0	8.7	6.2	8.4	6.1	8.1	5.3
FR-FRRD	8.2	6.3	8.3	6.2	8.2	6.3	8.4	5.8	8.7	5.5	8.4	5.6	8.2	5.3
FR-FR2	8.2	6.5	8.2	6.3	8.2	6.4	8.4	6.0	8.7	5.8	8.5	5.6	8.2	5.2
Technician Initials	JZL	JZL	JZL	JZL	JZL	RZS	RZS	RZS	RZS	RZS	RZS	RZS	RZS	RZS

DO meter: 3/3

pH

Sample ID/Conc.	Day													
	7	8		9		10		11		12		13		14
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
EV-MC2	8.1	7.8	8.1	7.7	8.0	7.7	8.0	7.7	8.0	7.6	8.0	7.6	8.1	7.5
EV-HC1	8.2	8.1	8.3	8.0	8.2	8.0	8.3	8.1	8.2	8.0	8.3	8.0	8.3	7.9
LC-DCDS	8.1	7.8	8.1	7.6	8.0	7.5	8.1	7.6	8.1	7.5	8.1	7.5	8.1	7.5
LC-LC3	8.1	8.1	8.1	8.1	8.2	8.1	8.3	8.1	8.2	8.0	8.3	8.1	8.3	8.0
LC-LC5	8.3	8.0	8.3	7.9	8.3	7.8	8.3	7.9	8.3	7.9	8.3	7.9	8.3	7.8
LC-LCDSSLSC	8.2	8.2	8.2	8.0	8.2	7.9	8.3	8.0	8.2	8.0	8.3	8.0	8.3	7.9
RG-MIDAG	8.1	8.0	8.2	7.8	8.1	7.8	8.2	7.8	8.1	7.7	8.2	7.7	8.2	7.6
FR-FR4	8.1	8.0	8.2	7.9	8.2	8.0	8.2	8.0	8.2	7.9	8.2	7.9	8.2	7.8
FR-FRRD	8.1	8.1	8.1	8.1	8.2	8.1	8.3	8.1	8.2	8.0	8.2	8.0	8.3	8.0
FR-FR2	8.2	7.9	8.2	7.9	8.2	7.9	8.2	7.8	8.2	7.8	8.2	7.7	8.2	7.7
Technician Initials	JZL	JZL	JZL	JZL	JZL	RZS	RZS	RZS	RZS	RZS	RZS	RZS	RZS	RZS

pH meter: 3/3

Light meter: lt-1
Light intensity (Lux): 400-1010

Comments:

Reviewed by: MG
Date Reviewed: NOV 09 2021

Chronic *H. azteca* Water-Only Toxicity Test Data Sheet
Water Quality

Client: Teck
Work Order No.: 216364
Sample ID: Various - See below
Start Date: May 20/2021
Termination Date: June 17/21
Test Organism: *Hyalella azteca*

Dissolved Oxygen (mg/L)

Sample ID/Conc.	Day													
	7	8		9		10		11		12		13		14
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
ER_MULTIPLATE	8.3	6.0	8.3	6.5	8.2	5.7	8.4	5.5	8.7	5.5	8.5	5.7	8.2	5.5
Technician Initials	JZL	JZL	JZL	JZL	JZL	RZS	RZS	RZS	RZS	RZS	RZS	RZS	RZS	RZS

DO meter: 3/3

pH

Sample ID/Conc.	Day													
	7	8		9		10		11		12		13		14
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
ER_MULTIPLATE	8.1	7.9	8.1	7.8	8.1	7.7	8.2	7.7	8.1	7.7	8.2	7.7	8.1	7.6
Technician Initials	JZL	JZL	JZL	JZL	JZL	RZS	RZS	RZS	RZS	RZS	RZS	RZS	RZS	RZS

pH meter: 3/3

Light meter: int-1
Light intensity (Lux): 400-1010

Comments:

Reviewed by: MC
Date Reviewed: NOV 09 2021

Chronic *H. azteca* Water-Only Toxicity Test Data Sheet
Water Quality

Client: TECK
Work Order No.: 210964
Sample ID: Various - see below

Start Date: May 20/21
Termination Date: June 17/21
CER #: 6
Test Organism: *Hyalella azteca*

Temperature (°C)

Sample ID/Conc.	Day													
	14	15		16		17		18		19		20		21
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Lab Control	22.5	22.0	22.5	23.0	23.0	22.5	22.0	23.0	22.5	23.0	22.5	23.0	22.5	22.5
FR-UFR1	22.5	22.0	22.0	22.5	23.0	22.5	22.5	22.5	23.0	22.5	23.0	23.0	23.0	22.5
GH-FR2	22.5	22.0	22.0	22.5	22.5	22.5	22.5	22.5	23.0	22.5	23.0	23.0	23.0	22.5
CM-MC1	23.0	22.0	22.0	22.5	22.5	22.5	22.5	22.5	23.0	22.5	23.0	23.0	23.0	22.5
LC-SLC	23.0	22.0	22.0	22.5	22.5	22.5	22.5	22.5	23.0	22.5	23.0	23.0	23.0	22.5
FR-FRABCH	23.0	22.0	22.0	22.5	23.0	22.5	22.5	22.5	23.0	22.5	23.0	22.5	23.0	22.5
FR-FRCP1	23.0	22.0	22.0	22.5	22.5	22.5	22.5	22.5	23.0	22.5	23.0	22.5	23.0	22.5
GH-FR1	22.5	22.0	22.0	22.5	22.5	22.5	22.0	22.5	23.0	22.5	23.0	22.5	23.0	22.5
GH-ERC	22.0	22.0	22.0	22.5	22.5	22.5	22.0	22.5	23.0	22.5	23.0	22.5	23.0	22.5
CM-MC2	22.0	22.0	22.0	22.5	22.0	22.5	22.0	22.5	23.0	22.5	23.0	23.0	23.0	22.5
Technician Initials	RZS	KJL	KJL	JZL	JZL	RZS	RZS	RZS	RZS	RZS	RZS	RZS	RZS	RZS

Thermometer: 6

Conductivity (µS)

Sample ID/Conc.	Day													
	14	15		16		17		18		19		20		21
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Lab Control	427	432	424	430	426	433	427	432	428	434	429	432	429	434
FR-UFR1	289	292	294	295	292	296	294	301	291	297	292	299	293	299
GH-FR2	341	342	342	347	345	349	345	348	342	347	344	348	343	350
CM-MC1	247	251	249	253	250	254	250	255	249	254	249	252	249	254
LC-SLC	284	290	289	290	287	291	288	291	287	294	289	294	288	292
FR-FRABCH	583	689	683	693	685	692	686	684	686	688	~~744~~ 688	687	687	687
FR-FRCP1	610	618	614	614	611	616	614	616	611	616	614	617	614	617
GH-FR1	579	586	578	584	573	584	582	585	580	585	582	584	581	583
GH-ERC	355	358	357	358	353	361	357	363	360	366	361	365	362	367
CM-MC2	536	546	545	544	538	546	541	543	540	546	541	543	541	543
Technician Initials	RZS	KJL	KJL	JZL	JZL	RZS	RZS	RZS	RZS	RZS	RZS	RZS	RZS	RZS

Conductivity meter: 3/3

Comments:

Reviewed by: MG

Date Reviewed: NOV 09 2021

Chronic *H. azteca* Water-Only Toxicity Test Data Sheet
Water Quality

Client: TECK
Work Order No.: 210964
Sample ID: Various - see below

Start Date: May 20/21
Termination Date: June 17/21
CER #: 6
Test Organism: *Hyalella azteca*

Temperature (°C)

Sample ID/Conc.	Day													
	14	15		16		17		18		19		20		21
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
EV-MC2	22.0	22.5	22.0	22.5	22.0	22.5	22.0	22.5	23.0	22.5	23.0	23.0	23.0	22.5
EV-HC1	22.0	22.5	22.0	22.5	22.0	22.5	22.0	22.5	23.0	22.5	23.0	23.0	23.0	22.5
LC-DCDS	22.0	22.5	22.0	22.5	22.0	22.5	22.0	22.5	23.0	22.5	23.0	23.0	23.0	22.5
LC-LC3	22.0	22.5	22.0	22.5	22.0	22.5	22.0	23.0	23.0	22.5	23.0	23.0	23.0	22.5
LC-LC5	22.0	22.5	22.0	23.0	22.0	22.5	22.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0
LC-LCDSSLCC	22.0	22.5	22.0	22.5	22.0	22.5	22.0	22.5	23.0	22.5	23.0	23.0	23.0	22.5
RG_MIDAG	22.0	22.5	22.0	22.5	22.0	22.5	22.0	22.5	23.0	22.5	23.0	23.0	23.0	22.5
FR-FR4	22.0	22.5	22.0	22.5	22.0	22.5	22.6	22.5	23.0	22.5	23.0	23.0	23.0	22.5
FR-FRRD	22.0	22.5	22.0	22.5	22.0	22.5	22.0	22.5	23.0	22.5	23.0	22.5	23.0	22.5
FR-FR2	22.0	22.5	22.0	22.5	22.0	22.5	22.0	22.5	23.0	22.5	23.0	22.5	23.0	22.5
Technician Initials	RZS	KJL	KJL	JJL	JJL	RZS	RZS	RZS	RZS	RZS	RZS	RZS	RZS	RZS

Thermometer: 6

Conductivity (µS)

Sample ID/Conc.	Day													
	14	15		16		17		18		19		20		21
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
EV-MC2	506	505	509	509	507	511	510	511	509	513	511	513	510	513
EV-HC1	478	484	481	482	474	486	481	485	480	485	481	486	482	486
LC-DCDS	481	490	489	486	482	488	487	488	509	511	512	514	513	516
LC-LC3	700	701	703	702	700	703	705	703	703	707	705	709	704	707
LC-LC5	562	578	567	571	567	575	574	576	571	579	575	580	576	580
LC-LCDSSLCC	495	504	502	501	498	502	501	505	499	504	501	505	502	506
RG-MIDAG	389	401	399	395	395	402	399	405	394	402	397	399	396	400
FR-FR4	508	512	514	515	513	520	511	514	509	514	511	514	511	515
FR-FRRD	761	768	784	767	760	773	761	759	762	766	764	766	765	766
FR-FR2	442	461	442	443	444	447	451	454	447	452	450	453	450	456
Technician Initials	RZS	KJL	KJL	JJL	JJL	RZS	RZS	RZS	RZS	RZS	RZS	RZS	RZS	RZS

Conductivity meter: 3/3

Comments:

Reviewed by: ML

Date Reviewed: NOV 09 2021

Chronic *H. azteca* Water-Only Toxicity Test Data Sheet
Water Quality

Client: TECK
Work Order No.: 210964
Sample ID: Various - see below

Start Date: May 20/21
Termination Date: June 17/21
CER #: 6
Test Organism: *Hyalella azteca*

Temperature (°C)

Sample ID/Conc.	Day													
	14	15		16		17		18		19		20		21
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
FR-MULTIPLATE	22.0	22.0	22.0	22.0	22.0	22.5	22.0	22.5	22.0	22.5	22.0	22.5	22.0	22.5
Technician Initials	RZS	KJL	KJV	JBL	JBL	RZJ	RZJ	RZS	RZS	RZS	RZS	RZS	RZJ	RZS

Thermometer: 6

Conductivity (µS)

Sample ID/Conc.	Day													
	14	15		16		17		18		19		20		21
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
FR-MULTIPLATE	443	457	444	449	449	459	451	455	452	459	454	459	454	459
Technician Initials	RZS	KJL	KJV	JBL	JBL	RZJ	RZJ	RZS	RZS	RZS	RZJ	RZS	RZS	RZS

Conductivity meter: 3/3

Comments:

Reviewed by: MG

Date Reviewed: NOV 0 9 2021

Chronic *H. azteca* Water-Only Toxicity Test Data Sheet
Water Quality

Client: TECK
Work Order No.: 20964
Sample ID: Various - see below

Start Date: May 20/21
Termination Date: June 17/21
Test Organism: *Hyalella azteca*

Dissolved Oxygen (mg/L)

Sample ID/Conc.	Day 14	15		16		17		18		19		20		21
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Lab Control	8.4	8.0	8.3	6.4	8.3	6.2	8.5	6.5	8.5	6.2	8.4	6.4	8.4	5.8
FR-UFR1	8.5	7.9	8.3	6.5	8.1	5.5	8.0	5.8	8.5	6.0	8.3	5.9	8.3	5.5
GH-ER2	8.4	8.1	8.3	6.0	8.2	5.8	8.0	6.1	8.4	6.2	8.3	6.0	8.3	5.2
CM-MC1	8.4	8.0	8.3	6.4	8.0	5.5	8.0	5.8	8.5	6.2	8.4	6.2	8.3	5.9
LC-SLC	8.3	8.0	8.3	6.0	8.2	5.5	8.0	6.0	8.5	6.1	8.3	6.3	8.3	6.1
FR-FRABCH	8.4	8.0	8.3	6.2	8.0	5.4	8.1	6.0	8.4	6.3	8.3	6.2	8.3	5.9
FR-FRCP1	8.3	7.9	8.2	6.8	8.0	5.9	8.1	6.3	8.4	6.2	8.3	6.2	8.3	5.8
GH-FR1	8.4	8.0	8.1	5.8	8.4	5.6	8.2	6.4	8.4	6.1	8.3	6.0	8.3	5.5
GH-ERC	8.5	8.0	8.0	6.4	8.4	5.7	8.2	6.3	8.5	6.2	8.4	6.2	8.3	6.0
CM-MC2	8.5	7.9	8.0	6.6	8.4	5.6	8.1	6.1	8.4	6.5	8.3	6.4	8.4	5.9
Technician Initials	RZS	KJL	KJL	JRL	JRL	RZS	RZS	RZS	RZS	RZS	RZS	RZS	RZS	RZS

DO meter: 3/3

pH

Sample ID/Conc.	Day 14	15		16		17		18		19		20		21
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Lab Control	7.9	7.4	7.6	7.3	7.9	7.3	7.9	7.3	7.9	7.2	7.8	7.2	7.8	7.1
FR-UFR1	7.9	7.6	8.1	7.5	8.0	7.4	8.0	7.5	7.9	7.4	7.9	7.4	7.9	7.3
GH-ER2	7.9	7.7	8.1	7.6	8.0	7.6	8.1	7.7	8.1	7.6	8.0	7.6	8.0	7.5
CM-MC1	7.8	7.6	7.9	7.4	7.8	7.3	7.8	7.4	7.8	7.3	7.8	7.3	7.8	7.3
LC-SLC	7.9	7.6	8.0	7.4	7.9	7.4	8.0	7.5	8.0	7.5	7.9	7.5	7.9	7.5
FR-FRABCH	7.9	8.0	8.1	7.9	8.1	7.8	8.2	8.0	8.2	7.8	8.0	7.8	8.1	7.8
FR-FRCP1	8.0	7.9	8.2	7.8	8.1	7.9	8.2	8.0	8.2	7.7	8.0	7.8	8.1	7.7
GH-FR1	8.0	7.9	8.0	7.8	8.0	7.8	8.2	8.0	8.2	7.8	8.0	7.7	8.1	7.7
GH-ERC	8.0	7.8	8.0	7.8	8.0	7.8	8.2	7.8	8.1	7.7	8.0	7.7	8.0	7.7
CM-MC2	8.1	7.9	8.1	7.8	8.0	7.8	8.1	7.8	8.1	7.7	8.0	7.7	8.0	7.7
Technician Initials	RZS	KJL	KJL	JRL	JRL	RZS	RZS	RZS	RZS	RZS	RZS	RZS	RZS	RZS

pH meter: 3/3

Light meter: 1.7-1

Light intensity (Lux): 400-1000

Comments:

Reviewed by: MG

Date Reviewed: NOV 09 2021

Chronic *H. azteca* Water-Only Toxicity Test Data Sheet
Water Quality

Client: Teck
Work Order No.: 210964
Sample ID: Various - see below
Start Date: May 20/21
Termination Date: June 17/21
Test Organism: *Hyalella azteca*

Dissolved Oxygen (mg/L)

Sample ID/Conc.	Day													
	14	15		16		17		18		19		20		21
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
EV-MC2	8.5	7.7	8.2	5.4	8.0	5.5	8.2	6.5	8.4	6.2	8.3	6.5	8.3	6.1
EV-HC1	8.4	7.6	8.3	5.6	8.2	5.7	8.2	6.0	8.4	6.0	8.4	6.2	8.3	5.7
LC-DCDS	8.4	7.8	8.3	6.1	8.1	5.5	8.2	5.9	8.4	6.0	8.4	6.3	8.3	5.6
LC-LC3	8.6	7.9	8.3	6.2	8.4	5.5	8.1	5.9	8.5	6.2	8.4	5.9	8.3	5.5
LC-LC5	8.5	7.9	8.4	5.4	8.2	5.6	8.0	6.1	8.4	6.2	8.3	6.7	8.3	6.2
LC-LCDSLCC	8.5	8.0	8.3	5.9	8.4	5.6	8.2	6.6	8.4	6.4	8.4	6.2	8.3	5.7
RG-MIDAG	8.5	8.1	8.3	6.5	8.1	5.5	8.1	5.9	8.4	6.4	8.4	6.4	8.3	6.0
FR-FR4	8.6	8.1	8.3	6.0	8.4	5.6	8.1	6.1	8.3	6.2	8.3	6.3	8.3	5.6
FR-FRRD	8.6	8.1	8.4	6.1	8.4	5.9	8.2	6.6	8.4	6.5	8.4	6.5	8.2	6.2
FR-FR2	8.5	8.3	8.3	6.3	8.2	5.5	8.2	6.3	8.4	6.2	8.3	6.1	8.2	5.6
Technician Initials	RZS	KJL	KJL	JZL	JZL	RZS	RZS	RZS	RZS	RZS	RZS	RZS	RZS	RZS

DO meter: 3|3

pH

Sample ID/Conc.	Day													
	14	15		16		17		18		19		20		21
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
EV-MC2	7.5	7.7	7.8	7.6	7.9	7.7	8.0	7.8	8.0	7.7	7.9	7.7	8.0	7.7
EV-HC1	8.1	7.9	8.1	7.8	8.1	7.8	8.2	7.9	8.2	7.7	8.1	7.7	8.1	7.7
LC-DCDS	8.0	7.7	8.0	7.6	8.0	7.6	8.1	7.6	8.0	7.5	7.9	7.6	7.9	7.5
LC-LC3	7.8	8.0	7.9	7.9	8.1	7.9	8.2	8.0	8.1	7.9	8.1	7.8	8.1	7.8
LC-LC5	8.1	7.9	8.1	7.7	8.2	7.8	8.2	7.9	8.2	7.8	8.1	7.8	8.1	7.8
LC-LCDSSLCC	8.0	7.9	8.0	7.7	8.1	7.7	8.2	7.9	8.1	7.7	8.0	7.7	8.1	7.6
RG-MIDAG	7.9	7.7	8.0	7.6	8.0	7.6	8.1	7.7	8.1	7.6	8.0	7.6	8.0	7.6
FR-FR4	8.0	7.8	8.0	7.7	8.0	7.7	8.1	7.8	8.1	7.7	8.0	7.7	8.0	7.6
FR-FRRD	7.9	7.9	8.1	7.8	8.1	8.0	8.3	8.1	8.2	7.9	8.1	7.9	8.1	7.9
FR-FR2	8.0	7.9	8.0	7.8	8.0	7.7	8.1	7.8	8.1	7.6	8.0	7.6	8.0	7.6
Technician Initials	RZS	KJL	KJL	JZL	JZL	RZS	RZS	RZS	RZS	RZS	RZS	RZS	RZS	RZS

pH meter: 3|3

Light meter: 17-1
Light intensity (Lux): 400-1040

Comments:

Reviewed by: MG
Date Reviewed: NOV 09 2021

Chronic *H. azteca* Water-Only Toxicity Test Data Sheet
Water Quality

Client: TECK
Work Order No.: 210964
Sample ID: Various - see below

Start Date: May 20/21
Termination Date: June 17/21
Test Organism: *Hyalella azteca*

Dissolved Oxygen (mg/L)

Sample ID/Conc.	Day													
	14	15		16		17		18		19		20		21
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
FR-MULTIPLATE	8.6	8.1	8.2	6.3	8.3	5.4	8.1	6.0	8.6	6.1	8.5	5.8	8.5	5.4
Technician Initials	RZS	KJV	KJV	JRV	JRV	RZS	RZS	RZS	RZS	RZS	RZS	RZS	RZS	RZS

DO meter: 3|3

pH

Sample ID/Conc.	Day													
	14	15		16		17		18		19		20		21
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
FR-MULTIPLATE	8.0	7.8	8.0	7.7	8.0	7.6	8.1	7.7	8.1	7.6	7.9	7.6	8.0	7.5
Technician Initials	RZS	KJV	KJV	JRV	JRV	RZS	RZS	RZS	RZS	RZS	RZS	RZS	RZS	RZS

pH meter: 3|3

Light meter: lit-1

Light intensity (Lux): 400-1010

Comments:

Reviewed by: MG

Date Reviewed: NOV 09 2021

Chronic *H. azteca* Water-Only Toxicity Test Data Sheet
Water Quality

Client: TECK
Work Order No.: 210964
Sample ID: Various - see below

Start Date: May 20/21
Termination Date: June 17/21
CER #: 6
Test Organism: *Hyalella azteca*

Temperature (°C)

Sample ID/Conc.	Day													
	21	22		23		24		25		26		27		28
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Lab Control	22.5	23.0	22.5	23.0	22.5	23.0	22.5	23.0	22.5	23.0	22.0	23.0	22.0	22.5
FR-UFR1	22.5	23.0	22.5	23.0	23.0	22.5	22.5	23.0	23.5	23.0	23.0	23.0	23.0	22.5
GH-ER2	22.5	23.0	22.5	23.0	23.0	23.0	22.5	23.0	23.5	23.0	23.0	23.0	23.0	22.5
CM-MC1	22.0	23.0	22.5	23.0	23.0	23.0	22.5	23.0	23.5	23.0	23.0	23.0	23.0	22.5
LC-SLC	22.0	23.0	22.5	23.0	23.0	23.0	22.5	23.0	23.5	23.0	23.0	23.0	23.0	22.5
FR-FRABCH	22.0	23.0	22.5	23.0	22.5	23.0	22.5	23.0	23.5	23.0	23.0	23.0	23.0	22.5
FR-FRCP1	22.5	23.0	22.5	23.0	23.0	23.0	22.5	23.0	23.5	23.0	23.0	23.0	23.0	22.5
GH-FR1	22.0	23.0	22.5	23.0	22.0	23.0	22.0	23.0	23.5	23.0	23.5	23.0	23.0	22.5
GH-ERC	22.0	23.0	22.5	23.0	22.0	23.0	22.0	23.0	23.5	23.0	23.0	23.0	23.0	22.5
CM-MC2	22.0	23.0	22.5	23.0	22.0	22.5	22.0	23.0	23.5	23.0	23.0	23.0	23.0	22.5
Technician Initials	RZS	KJL	KJL	JRL	JRL	RZS	RZS	RZS	RZS	RZS	RZS	RZS	RZS	RZS

Thermometer: 6

Conductivity (µS)

Sample ID/Conc.	Day													
	21	22		23		24		25		26		27		28
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Lab Control	429	436	430	433	428	430	428	435	429	434	429	435	428	436
FR-UFR1	296	307	300	302	297	306	300	307	295	301	295	302	296	303
GH-ER2	327	338	335	335	331	335	330	337	329	337	329	338	329	337
CM-MC1	255	261	261	261	258	263	258	265	254	261	254	260	255	259
LC-SLC	310	313	317	316	314	316	314	320	307	313	307	313	307	313
FR-FRABCH	824	805	814	829	828	821	824	830	824	827	821	829	821	823
FR-FRCP1	744	711	737	746	747	746	744	751	746	749	744	750	742	745
GH-FR1	656	649	664	660	660	665	664	667	657	661	656	664	657	658
GH-ERC	344	356	349	351	348	353	347	356	344	351	343	351	343	350
CM-MC2	601	600	602	608	617	590	602	605	600	605	599	606	600	601
Technician Initials	RZS	KJL	KJL	JRL	JRL	RZS	RZS	RZS	RZS	RZS	RZS	RZS	RZS	RZS

Conductivity meter: 3/3

Comments:

Reviewed by: MG

Date Reviewed: NOV 0 9 2021

Chronic *H. azteca* Water-Only Toxicity Test Data Sheet
Water Quality

Client: TECK
Work Order No.: 210964
Sample ID: Various - see below

Start Date: May 20/21
Termination Date: June 17/21
CER #: 6
Test Organism: *Hyalella azteca*

Temperature (°C)

Sample ID/Conc.	Day													
	21	22		23		24		25		26		27		28
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
EV-MC2	22.0	23.0	22.5	23.0	22.5	23.0	22.0	23.0	23.5	23.0	23.0	23.0	23.0	22.5
EV-MC1	22.0	23.0	22.5	23.0	22.0	23.0	22.0	23.0	23.5	23.0	23.0	23.0	23.0	22.5
LC-DCDS	22.0	23.0	22.5	23.0	22.0	22.5	22.0	23.0	23.5	23.0	23.0	23.0	23.0	22.5
LC-LC3	22.0	23.0	22.5	23.0	22.0	22.5	22.0	23.0	23.5	23.0	23.0	23.0	23.0	22.5
LC-LC5	22.0	23.0	22.5	23.0	22.5	23.0	22.0	23.0	23.0	23.0	23.0	23.0	23.0	22.5
LC-LCDSSLCC	22.5	23.0	22.5	23.0	22.5	23.0	22.0	23.0	23.0	23.0	23.0	23.0	23.0	22.5
RG-MIDAG	22.0	23.0	22.5	23.0	22.0	23.0	22.0	23.0	23.5	22.5	23.0	22.5	23.0	22.5
FR-FR4	22.0	23.0	22.5	23.0	22.0	23.0	22.0	23.0	23.5	22.5	23.0	22.5	23.0	22.5
FR-FRRD	22.0	23.0	22.5	23.0	22.0	22.5	22.0	23.0	23.5	22.5	23.0	22.5	23.0	22.5
FR-FR2	22.0	23.0	22.5	23.0	22.0	22.5	22.0	23.0	23.5	22.5	23.0	22.5	23.0	22.5
Technician Initials	RZS	KDL	KDL	JRL	JRL	RZS	RZS	RZS	RZS	RZS	RZS	RZS	RZS	RZS

Thermometer: 6

Conductivity (µS)

Sample ID/Conc.	Day													
	21	22		23		24		25		26		27		28
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
EV-MC2	365	285	367	368	369	370	366	372	363	369	362	369	363	369
EV-MC1	508	503	513	518	513	516	512	516	508	512	508	514	509	514
LC-DCDS	529	533	539	537	534	536	533	541	529	533	528	532	530	532
LC-LC3	642	652	651	651	645	647	645	650	644	649	643	651	643	646
LC-LC5	604	607	616	613	612	611	607	609	604	606	604	608	606	610
LC-LCDSSLCC	542	545	548	546	553	550	546	546	546	549	546	553	547	553
RG-MIDAG	461	458	464	466	464	467	463	468	462	465	462	466	463	468
FR-FR4	626	618	637	649	630	632	630	631	629	630	628	632	630	629
FR-FRRD	916	891	920	918	919	916	919	912	927	919	924	924	925	922
FR-FR2	519	516	523	520	521	524	521	524	516	518	516	520	517	520
Technician Initials	RZS	KDL	KDL	JRL	JRL	RZS	RZS	RZS	RZS	RZS	RZS	RZS	RZS	RZS

Conductivity meter: 3/3

Comments:

Reviewed by: MG

Date Reviewed: NOV 09 2021

Chronic *H. azteca* Water-Only Toxicity Test Data Sheet
Water Quality

Client: TECK
Work Order No.: 210964
Sample ID: Various - see below

Start Date: May 20/21
Termination Date: June 17/21
CER #: 6
Test Organism: *Hyalella azteca*

Temperature (°C)

Sample ID/Conc.	Day													
	21	22		23		24		25		26		27		28
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
FR-MULTIPLATE	22.0	22.0	22.0	23.0	22.0	23.0	22.0	23.0	23.5	22.5	23.0	22.5	23.0	22.5
Technician Initials	RZS	KDL	KDL	JRL	JRL	RZS	RZS	RZS	RZS	RZS	RZS	RZS	RZS	RZS

Thermometer: 6

Conductivity (µS)

Sample ID/Conc.	Day													
	21	22		23		24		25		26		27		28
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
FR-MULTIPLATE	474	~~477~~ 476	477	480	477	481	478	479	477	478	477	481	478	480
Technician Initials	RZS	KDL	KDL	JRL	JRL	RZS	RZS	RZS	RZS	RZS	RZS	RZS	RZS	RZS

Conductivity meter: 3/3

Comments:

Reviewed by: MG

Date Reviewed: NOV 0 9 2021

Chronic *H. azteca* Water-Only Toxicity Test Data Sheet
Water Quality

Client: TECK
Work Order No.: 210964
Sample ID: Various - see below

Start Date: May 20/21
Termination Date: June 17/21
Test Organism: *Hyalella azteca*

Dissolved Oxygen (mg/L)

Sample ID/Conc.	Day													
	21	22		23		24		25		26		27		28
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Lab Control	8.4	7.6	8.4	6.0	8.4	5.2	8.3	4.7	8.3	4.5	8.5	4.8	8.3	4.7
FR-UFR1	8.4	7.3	8.2	5.7	7.8	4.8	7.9	5.4	8.4	5.3	8.0	5.3	8.2	5.3
GH-FR2	8.4	7.4	8.3	5.7	7.8	4.4	7.8	4.3	8.3	4.6	8.1	4.6	8.0	5.1
CM-MC2	8.5	7.4	8.3	5.7	7.5	4.5	7.9	4.4	8.4	4.9	8.1	4.7	8.0	5.6
LC-SLC	8.6	7.2	8.3	5.6	8.0	5.0	7.9	4.9	8.4	4.9	8.2	5.3	8.0	5.5
FR-FRABCH	8.5	7.2	8.3	5.5	7.9	4.4	7.9	5.1	8.4	5.3	8.1	5.1	8.0	4.8
FR-FRCP1	8.5	7.1	8.2	5.3	7.9	4.5	7.9	4.8	8.3	4.8	8.1	4.7	8.0	4.4
GH-FR1	8.5	7.1	8.2	5.4	8.0	5.1	8.0	5.6	8.3	5.7	8.1	5.4	8.0	5.2
GH-ERC	8.5	7.2	8.2	5.5	7.9	5.0	7.9	5.1	8.4	5.0	8.1	5.1	7.9	5.0
CM-MC2	8.7	7.3	8.2	5.5	7.9	4.6	7.9	4.5	8.4	4.8	8.0	4.8	7.9	4.5
Technician Initials	RZS	KR	KR	JR	JR	RZJ	RZS	RZS	RZS	RZS	RZJ	RZJ	RZJ	RZS

DO meter: 3/3

pH

Sample ID/Conc.	Day													
	21	22		23		24		25		26		27		28
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
Lab Control	7.8	7.1	7.7	7.2	7.7	6.9	7.8	7.0	7.7	6.9	7.7	7.0	7.7	6.9
FR-UFR1	7.8	7.2	7.9	7.3	7.8	7.1	7.7	7.3	7.8	7.2	7.7	7.3	7.7	7.2
GH-FR2	7.8	7.4	8.0	7.4	7.9	7.2	7.8	7.3	7.8	7.3	7.8	7.3	7.8	7.4
CM-MC1	7.7	7.4	7.9	7.4	7.8	7.0	7.7	7.1	7.7	7.1	7.6	7.1	7.6	7.2
LC-SLC	7.9	7.5	7.9	7.4	7.9	7.2	7.8	7.3	7.8	7.3	7.8	7.4	7.8	7.3
FR-FRABCH	8.0	7.7	7.9	7.8	8.1	7.7	8.1	7.8	8.0	7.8	8.0	7.8	8.1	7.7
FR-FRCP1	8.0	7.7	8.0	7.8	8.1	7.6	8.1	7.8	8.0	7.7	8.0	7.7	8.1	7.7
GH-FR1	8.0	7.6	7.9	7.8	8.0	7.7	8.0	7.8	7.9	7.8	8.0	7.8	8.1	7.7
GH-ERC	7.9	7.6	7.9	7.6	7.9	7.4	7.9	7.5	7.9	7.4	7.9	7.5	7.9	7.4
CM-MC2	7.9	7.5	7.9	7.5	8.0	7.5	8.0	7.5	8.0	7.5	8.0	7.5	8.0	7.5
Technician Initials	RZS	KR	KR	JR	JR	RZJ	RZJ	RZS	RZJ	RZS	RZS	RZS	RZS	RZJ

pH meter: 3/3

Light meter: Lit-1

Light intensity (Lux): 400-100

Comments:

Reviewed by: MG

Date Reviewed: NOV 09 2021

Chronic *H. azteca* Water-Only Toxicity Test Data Sheet
Water Quality

Client: TECK
Work Order No.: 210964
Sample ID: Various - see below
Start Date: May 20/21
Termination Date: June 17/21
Test Organism: *Hyalella azteca*

Dissolved Oxygen (mg/L)

Sample ID/Conc.	Day													
	21	22		23		24		25		26		27		28
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
EV-MC2	8.6	7.0	8.4	5.3	8.0	4.9	7.9	4.9	8.4	4.7	8.1	4.5	7.9	4.3
EV-HC2	8.6	7.2	8.3	6.1	7.8	4.7	7.8	4.4	8.4	4.7	8.2	4.5	8.0	4.5
LC-DCDS	8.5	7.1	8.4	6.0	8.0	4.2	7.9	4.1	8.4	4.5	8.0	4.6	7.9	4.6
LC-LC3	8.7	7.2	8.5	5.4	8.0	4.7	7.9	4.7	8.4	4.6	8.0	4.6	8.0	4.8
LC-LCS	8.5	7.2	8.4	5.9	8.1	5.7	7.8	5.1	8.4	5.0	8.0	5.1	7.9	5.1
LC-LCDSSLCC	8.5	7.0	8.4	5.4	8.0	4.3	8.0	4.6	8.3	4.6	7.9	4.6	7.8	4.6
RG-MIDAG	8.7	7.3	8.3	5.4	8.1	4.7	8.0	4.8	8.4	4.9	8.0	4.8	7.8	4.3
FR-FR4	8.6	7.3	8.2	5.6	8.0	4.5	7.9	5.0	8.3	5.1	8.0	5.0	7.8	4.8
FR-FRRD	8.5	7.2	8.3	5.6	7.9	4.2	7.9	4.4	8.4	4.9	8.1	4.7	7.8	4.6
FR-FR2	8.5	7.2	8.2	5.9	8.1	5.1	7.9	5.1	8.3	5.1	8.0	4.8	7.9	4.5
Technician Initials	RZS	KR	KR	JR	JR	RZS	RZS	RZS	RZS	RZS	RZS	RZS	RZS	RZS

DO meter: 3/3

pH

Sample ID/Conc.	Day													
	21	22		23		24		25		26		27		28
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
EV-MC2	7.8	7.5	7.8	7.5	7.8	7.3	7.8	7.3	7.8	7.3	7.8	7.3	7.8	7.2
EV-HC2	8.0	7.6	7.9	7.7	8.0	7.6	8.0	7.6	8.0	7.6	8.0	7.6	8.1	7.6
LC-DCDS	7.9	7.4	7.8	7.4	7.9	7.2	7.9	7.3	7.9	7.3	7.9	7.3	7.9	7.3
LC-LC3	7.9	7.6	7.8	7.7	8.0	7.6	8.0	7.6	7.9	7.6	7.9	7.6	7.9	7.6
LC-LCS	8.0	7.5	8.0	7.7	8.1	7.5	8.0	7.5	8.0	7.6	8.0	7.5	8.0	7.5
LC-LCDSSLCC	7.9	7.5	7.9	7.6	8.0	7.3	8.0	7.4	8.0	7.5	8.0	7.4	8.0	7.4
RG-MIDAG	7.8	7.5	7.7	7.5	7.9	7.3	7.9	7.4	7.9	7.4	7.9	7.3	7.9	7.2
FR-FR4	7.9	7.5	7.8	7.7	8.0	7.5	8.0	7.6	8.0	7.6	8.0	7.6	8.0	7.5
FR-FRRD	7.9	7.6	7.8	7.9	8.1	7.7	8.1	7.7	8.0	7.8	8.1	7.8	8.1	7.7
FR-FR2	7.9	7.7	7.9	7.7	8.1	7.5	8.0	7.5	8.0	7.5	8.0	7.5	8.0	7.4
Technician Initials	RZS	KR	KR	JR	JR	RZS	RZS	RZS	RZS	RZS	RZS	RZS	RZS	RZS

pH meter: 3/3

Light meter: Lit-1
Light intensity (Lux): 400-900

Comments:

Reviewed by: _____ Date Reviewed: _____

Chronic *H. azteca* Water-Only Toxicity Test Data Sheet
Water Quality

Client: TECK
Work Order No.: 210964
Sample ID: Various - see below

Start Date: May 20/21
Termination Date: June 17/21
Test Organism: *Hyalella azteca*

Dissolved Oxygen (mg/L)

Sample ID/Conc.	Day													
	21	22		23		24		25		26		27		28
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
FR-MULTIPLATE	8.6	7.3	8.2	6.0	8.1	4.9	8.0	5.1	8.3	5.2	8.0	5.3	8.0	5.4
Technician Initials	RZJ	KJV	KJV	JDL	JDL	RZJ	RZJ	RZJ	RZJ	RZJ	RZJ	RZJ	RZJ	RZJ

DO meter: 3/3

pH

Sample ID/Conc.	Day													
	21	22		23		24		25		26		27		28
	new	old	new	old	new	old	new	old	new	old	new	old	new	old
FR-MULTIPLATE	7.9	7.6	7.9	7.6	8.0	7.3	7.9	7.4	7.9	7.4	7.8	7.5	8.0	7.4
Technician Initials	RZJ	KJV	KJV	JDL	JDL	RZJ	RZJ	RZJ	RZJ	RZJ	RZJ	RZJ	RZJ	RZJ

pH meter: 3/3

Light meter: Li-1

Light intensity (Lux): 400-1010

Comments:

Reviewed by: MC

Date Reviewed: NOV 0 9 2021

H. azteca Sediment Toxicity Test Data Sheet

Freshwater Sediment Survival and Weight

Client: TECK
Work Order No: 210964
Sample ID: Various - see below

Start Date: May 20/21
Termination Date: June 17/21
Test Organism: *Hyalella azteca*
Balance: 1

Sample ID	Pan No.	Rep	No. alive	No. dead	No. missing	Initials	Pan weight (mg)	Pan + organism (mg)	No. weighed	Initials
Control	1	A	10	0	0	RZS	1000.29	1001.18	1	RZS
	2	B	8	0	2	↓	1001.65			↓
	3	C	10	0	0	↓	1002.23	1008.20	10	↓
	4	D	10	0	0	↓	1001.29	1008.79	10	↓
	5	E	9	0	1	↓	1006.51	1012.59	~~10~~ 9	↓
FR-UFR1	6	A	9	0	2	RZS	1002.29	1008.11	9	↓
	7	B	12	0	0	↓	1002.68	1012.34	12	↓
	8	C	10	0	0	↓	1001.77	1008.63	10	↓
	9	D	10	0	0	↓	1001.74	1010.14	10	↓
	10	E	9	0	1	↓	1000.30	1005.98	9	↓
GH-ER2	11	A	10	0	0	RZS	1003.37	1009.99	10	↓
	12	B	9	↓	1	↓	995 80	1003.08	9	↓
	13	C	10	↓	0	↓	1000.03	1007.65	10	↓
	14	D	10	↓	0	↓	1003.42	1010.03	10	↓
	15	E	7①	↓	3	↓	1005.53	1010.88	7	↓
CM-MC1	16	A	10	0	0	KJL	1004.94	1012.84	10	↓
	17	B	10	↓	↓	↓	1007.89	1011.55	10	↓
	18	C	10	↓	↓	↓	1008.63	1015.52	10	↓
	19	D	10	↓	↓	↓	1011.10	RZS ~~1019.19~~ 1020.15	EH ~~9~~ 10	↓
	20	E	10	↓	↓	↓	1005.39	RZS ~~1012.50~~ 1015.60	RZS ~~9~~ 10	↓

Comments: ① Checked by KJL
~~② 1 organism lost during transfer RZS~~

Reviewed by: MG

Date Reviewed: NOV 0 9 2021

H. azteca Sediment Toxicity Test Data Sheet

Freshwater Sediment Survival and Weight

Client: TECK

Work Order No: 210964

Sample ID: Various - See below

Start Date: May 20/21

Termination Date: June 17/21

Test Organism: *Hyalella azteca*

Balance: 1

Sample ID	Pan No.	Rep	No. alive	No. dead	No. missing	Initials	Pan weight (mg)	Pan + organism (mg)	No. weighed	Initials
LC-SLC	21	A	10	0	0	RZS	998.45	1006.10	10	RZS
	22	B	↓	↓	↓	↓	1001.09	1008.37	10	↓
	23	C					993.35	1000.91	10	
	24	D					1002.44	1010.57	10	
	25	E	↓	↓	↓	↓	1007.98	1016.09	10	
FR_FRABCH	26	A	~~9~~ 10	0	0	KJL	1011.34	1018.97	10	
	27	B	↓	↓	↓	↓	1013.84	1021.80	10	
	28	C					1005.55	1012.48	10	
	29	D	↓	↓	↓	↓	998.98	1006.22	10	
	30	E	8	↓	FWD 2	↓	999.23	1005.14	8	
FR-FRCP1	31	A	10	0	0	RZS	999.74	1008.00	10	
	32	B	↓	↓	↓	↓	1005.21	1011.48	10	
	33	C	9	↓	1	↓	1012.06	1017.34	9	
	34	D	10	↓	0	↓	1003.31	1011.04	10	
	35	E	↓	↓	↓	↓	1010.19	1017.28	10	
GH-FR1	36	A	9	1	0	KJL	~~1011.~~ 1012.33	1018.91	9	
	37	B	10	0	↓	↓	1004.83	1012.49	10	
	38	C	10	0	↓	↓	1013.87	1020.80	10	
	39	D	10	0	↓	↓	999.71	1006.44	10	
	40	E	9	0	1	↓	999.69	1006.99	9	↓

Comments:

Reviewed by: MG

Date Reviewed: NOV 09 2021

H. azteca Sediment Toxicity Test Data Sheet

Freshwater Sediment Survival and Weight

Client: TECK

Work Order No: ~~210964~~ 210964

Sample ID: Various - see below

Start Date: May 20/21

Termination Date: June 17/21

Test Organism: *Hyalella azteca*

Balance: 1

Sample ID	Pan No.	Rep	No. alive	No. dead	No. missing	Initials	Pan weight (mg)	Pan + organism (mg)	No. weighed	Initials
GH-ERC	41	A	10	0	0	RZS	1015.44	1023.39	10	RZS
	42	B	10	↓	↓	↓	1013.85	1021.54	10	↓
	43	C	9		1		998.09	1003.61	9	
	44	D	8		2		1000.36	1005.11	8	
	45	E	10	↓	0	↓	996.56	1003.88	10	
CM-MC2	46	A	6	0	4	RZS	1015.69	1019.25	6	
	47	B	7		3		1008.96	1011.24	7	
	48	C	6		4		997.69	1000.24	6	
	49	D	7		3		1006.09	1009.79	7	
	50	E	9	↓	1	↓	997.71	1000.46	9	
EV-MC2	51	A	10	0	0	KJC	993.98	1001.05	10	
	52	B	10		0		1006.65	1014.33	10	
	53	C	9		1		1015.99	1024.34	9	
	54	D	9		1		1003.87	1010.81	9	
	55	E	10	↓	0	↓	1012.02	1019.60	10	
EV-MC1	56	A	10	0	0	RZS	1006.85	1014.46	10	
	57	B	↓	↓	↓	↓	1011.12	1017.51	10	
	58	C					1001.76	1009.09	10	
	59	D					997.50	1005.25	10	
	60	E	↓	↓	↓	↓	1003.84	1010.98	10	↓

Comments:

Reviewed by: MG

Date Reviewed: NOV 09 2021

H. azteca Sediment Toxicity Test Data Sheet
Freshwater Sediment Survival and Weight

Client: TECK
Work Order No: 210964
Sample ID: Various - see below

Start Date: May 20/21
Termination Date: June 17/21
Test Organism: *Hyalella azteca*
Balance: 1

Sample ID	Pan No.	Rep	No. alive	No. dead	No. missing	Initials	Pan weight (mg)	Pan + organism (mg)	No. weighed	Initials
LC-DCDS	61	A	10	0	0	KJL	1003.28	1010.09	10	RJS
	62	B	9		1		1011.64	1018.46	9	
	63	C	10		0		1012.61	1019.43	10	
	64	D	8		2		1004.44	1009.14	7	
	65	E	9		1		1007.09	1013.17	9	
LC-LC3	66	A	10	0	0	RJS	998.14			
	67	B					1016.65	1020.26	10	
	68	C	9		1		1011.79	1015.72	9	
	69	D	10		0		1016.75	1021.06	10	
	70	E					1012.02	1013.81	3	
LC-LC5	71	A	10	0	0	RJS	1014.18	1021.58	10	
	72	B					1015.08	1022.70	10	
	73	C	RJS 9 10		0		1008.31	1015.59	10	
	74	D	10		0		1011.38	1018.71	10	
	75	E					1005.63	1013.57	10	
LC-LCDSSLCC	76	A	9	1	0	AT	1014.90	1016.55	9	
	77	B	10	0			1004.33	1005.06	1	
	78	C	10				1002.45	1007.54	10	
	79	D	10				1004.79	1006.70	4	
	80	E	10				1006.98			

Comments:

Reviewed by: MG

Date Reviewed: NOV 0 9 2021

H. azteca Sediment Toxicity Test Data Sheet
Freshwater Sediment Survival and Weight

Client: TECK
Work Order No: 210964
Sample ID: Various - see below

Start Date: May 20/21
Termination Date: June 17/21
Test Organism: *Hyalella azteca*
Balance: 1

Sample ID	Pan No.	Rep	No. alive	No. dead	No. missing	Initials	Pan weight (mg)	Pan + organism (mg)	No. weighed	Initials
RG_MIDAG	81	A	10	0	0	RZS	1009.81	1017.75	10	RZS
	82	B	↓	↓	↓	↓	1012.16	1014.71	3	
	83	C					1003.46	1011.54	10	
	84	D					1001.68	1009.15	10	
	85	E	↓	↓	↓	↓	1004.34	1011.82	10	
FR_FR4	86	A	10	0	0	RZS	1009.86			
	87	B	↓	↓	↓	↓	1003.84	1009.94	10	
	88	C					1010.78	1017.39	10	
	89	D					1016.96			
	90	E	↓	↓	↓	↓	1011.08	1014.48	6	
FR_FR10	91	A	10	0	0	ax	1008.31	1013.64	10	
	92	B	9	0	~~0~~ 1	↓	1013.18			
	93	C	9	0	1		1012.19			
	94	D	10	0	0		1013.31	1015.84	3	
	95	E	10	0	0	↓	1009.61			
FR_FR2	96	A	10	0	0	SAV	1010.99			
	97	B	7	0	3	↓	1008.91			
	98	C	10	0	0		1002.25			
	99	D	6	1	~~3~~ 3	↓	1006.99	1007.20	1	
	100	E	8	0	0	↓	1006.73			

Comments:

Reviewed by: MG

Date Reviewed: NOV 09 2021

H. azteca Sediment Toxicity Test Data Sheet

Freshwater Sediment Survival and Weight

Client: TECK

Work Order No: 210964

Sample ID: Various - see below

Start Date: May 20/21

Termination Date: June 17/21

Test Organism: *Hyalella azteca*

Balance: 1

Sample ID	Pan No.	Rep	No. alive	No. dead	No. missing	Initials	Pan weight (mg)	Pan + organism (mg)	No. weighed	Initials
FR-MULTIPLATE	101	A	10	0	0	RZS	1009.42	~~1012.16~~ RZS	~~10~~ RZS	RZS
	102	B	↓	↓	↓	↓	1005.10	1012.16	10	↓
	103	C	↓	↓	↓	↓	1002.18	1008.53	10	↓
	104	D	9	↓	1	↓	997.74	999.41	2	↓
	105	E	10	↓	0	↓	1006.90	1011.46	10	↓
		A								
		B								
		C								
		D								
		E								
		A								
		B								
		C								
		D								
		E								
		A								
		B								
		C								
		D								
		E								

Comments:

Reviewed by: MC

Date Reviewed: NOV 09 2021

Hyalella 28-d Survival and Growth Sediment Test

Nautilus Environmental

Batch ID:	07-5364-5346	**Test Type:**	Survival-Growth	**Analyst:**	Karen Lee
Start Date:	20 May-21	**Protocol:**	EPA/600/R-99/064 (2000)	**Diluent:**	
Ending Date:	17 Jun-21	**Species:**	Hyalella azteca	**Brine:**	
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	Aquatic Biosystems, CO **Age:** 7-8d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
Lab Control	16-0549-5947	20 May-21	20 May-21 06:00	n/a	Teck Coal	
FR_UFR1	12-4424-2146	18 May-21	19 May-21 11:20	48h (2.3 °C)		
GH_ER2	02-4275-7088	18 May-21 09:55	19 May-21 11:20	38h (0.4 °C)		
CM_MC1	01-4263-6393	18 May-21 11:08	19 May-21 11:20	37h (1.1 °C)		
LC_SLC	12-1662-7355	18 May-21 09:45	19 May-21 11:20	38h (4.1 °C)		
FR_FRABCH	05-6713-4959	18 May-21	19 May-21 11:20	48h (1.9 °C)		
FR_FRCP1	19-8027-7867	18 May-21	19 May-21 11:20	48h (1.2 °C)		
GH_FR1	15-9886-5398	18 May-21 12:30	19 May-21 11:20	35h (0.1 °C)		
GH_ERC	21-0704-4941	18 May-21 11:20	19 May-21 11:20	37h (0.6 °C)		
CM_MC2	17-6814-6287	18 May-21 09:50	19 May-21 11:20	38h (1.1 °C)		
EV_MC2	15-5628-9197	18 May-21 13:00	19 May-21 11:20	35h (3.6 °C)		
EV_HC1	05-8730-9056	18 May-21 11:20	19 May-21 11:20	37h (4.8 °C)		
LC_DCDS	20-0340-1068	18 May-21 11:00	19 May-21 11:20	37h (4.6 °C)		
LC_LC3	18-4816-9590	18 May-21 10:15	19 May-21 11:20	38h (4.7 °C)		
LC_LC5	03-8768-2280	18 May-21 09:50	19 May-21 11:20	38h (5.2 °C)		
LC_LCDSSLCC	02-2977-6783	18 May-21 11:00	19 May-21 11:20	37h (4.3 °C)		
RG_MIDAG	19-6180-4600	18 May-21 09:15	19 May-21 11:20	39h (0.1 °C)		
FR_FR4	17-1641-7069	18 May-21 09:29	19 May-21 11:20	39h (4.6 °C)		
FR_FRRD	06-3190-8505	18 May-21 08:22	19 May-21 11:20	40h (3.4 °C)		
FR_FR2	11-2149-8709	18 May-21 10:28	19 May-21 11:20	38h (4.6 °C)		
FR_MULTIPLATE	16-7235-2081	18 May-21 11:21	19 May-21 11:20	37h (3.4 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
Lab Control	Water Sample	Teck Coal	Lab Control	
FR_UFR1	Water Sample	Teck Coal	FR_UFR1_WEK_2021-05-1	
GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-05-18_	
CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-05-18	
LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-05-18_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_WEK_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_WEK_2021-05	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-05-18_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-05-18	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-05-18	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2020_Q2_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2020_Q2_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-05-18	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-05-18_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-05-18_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	
RG_MIDAG	Water Sample	Teck Coal	RG_MIDAG_WS_2021-05-	
FR_FR4	Water Sample	Teck Coal	FR_FR4_WS_2021-05-18_	
FR_FRRD	Water Sample	Teck Coal	FR_FRRD_WS_2021-05-18	
FR_FR2	Water Sample	Teck Coal	FR_FR2_WS_2021-05-18_	
FR_MULTIPLATE	Water Sample	Teck Coal	FR_MULTIPLATE_WS_202	

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Lab Control passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	RG_MIDAG passed survival rate	1

MG

Hyalella 28-d Survival and Growth Sediment Test — Nautilus Environmental

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Lab Control passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	RG_MIDAG passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	RG_MIDAG passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Lab Control passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed survival rate	1

MG
NOV 09 2021

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	RG_MIDAG passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Lab Control passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Lab Control passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	RG_MIDAG passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed survival rate	1

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Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Lab Control passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	RG_MIDAG passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Lab Control passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	RG_MIDAG passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Lab Control passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	RG_MIDAG passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed survival rate	1

Hyalella 28-d Survival and Growth Sediment Test — Nautilus Environmental

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.0330	LC_LC5 failed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.0330	FR_FR2 failed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.0330	FR_UFR1 failed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.0330	FR_MULTIPLATE failed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.0330	LC_LCDSSLCC failed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.0330	EV_MC2 failed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.0330	CM_MC2 failed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.0330	FR_FR4 failed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.0330	EV_HC1 failed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.0330	CM_MC1 failed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.0330	FR_FRCP1 failed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.0330	LC_LC3 failed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.0330	RG_MIDAG failed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.0330	LC_SLC failed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.0330	LC_DCDS failed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.0330	GH_ERC failed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.0330	GH_FR1 failed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.0330	GH_ER2 failed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.0330	FR_FRABCH failed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.0330	Lab Control failed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	0.0330	FR_FRRD failed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Lab Control passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	RG_MIDAG passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Lab Control passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed survival rate	1

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Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	RG_MIDAG passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	RG_MIDAG passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Lab Control passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	RG_MIDAG passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Lab Control passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed survival rate	1

Hyalella 28-d Survival and Growth Sediment Test — Nautilus Environmental

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Lab Control passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	RG_MIDAG passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	RG_MIDAG passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Lab Control passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed survival rate	1

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Hyalella 28-d Survival and Growth Sediment Test — Nautilus Environmental

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	RG_MIDAG passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Lab Control passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Lab Control passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	RG_MIDAG passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	RG_MIDAG passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Lab Control passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed survival rate	1

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Hyalella 28-d Survival and Growth Sediment Test — Nautilus Environmental

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Lab Control passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	RG_MIDAG passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	Lab Control passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_SLC passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LCDSSLCC passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_UFR1 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_DCDS passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	RG_MIDAG passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_MC2 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC2 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	CM_MC1 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ERC passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR4 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRABCH passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC3 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	LC_LC5 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_FR1 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_MULTIPLATE passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	EV_HC1 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRCP1 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FR2 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	GH_ER2 passed survival rate	1
04-3082-4079	Survival Rate	Fisher Exact/Bonferroni-Holm Test	1.0000	FR_FRRD passed survival rate	1

Test Acceptability

Analysis ID	Endpoint	Attribute	Test Stat	TAC Limits Lower	TAC Limits Upper	Overlap	Decision
04-3082-4079	Survival Rate	Control Resp	0.94	0.8	>>	Yes	Passes Criteria

Hyalella 28-d Survival and Growth Sediment Test — Nautilus Environmental

Survival Rate Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
Lab Control	N	5	0.9400	0.8289	1.0000	0.8000	1.0000	0.0400	0.0894	9.52%	0.00%
FR_UFR1		5	0.9600	0.8920	1.0000	0.9000	1.0000	0.0245	0.0548	5.71%	-2.13%
GH_ER2		5	0.9200	0.7581	1.0000	0.7000	1.0000	0.0583	0.1304	14.17%	2.13%
CM_MC1		5	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	-6.38%
LC_SLC		5	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	-6.38%
FR_FRABCH		5	0.9600	0.8489	1.0000	0.8000	1.0000	0.0400	0.0894	9.32%	-2.13%
FR_FRCP1		5	0.9800	0.9245	1.0000	0.9000	1.0000	0.0200	0.0447	4.56%	-4.26%
GH_FR1		5	0.9600	0.8920	1.0000	0.9000	1.0000	0.0245	0.0548	5.71%	-2.13%
GH_ERC		5	0.9400	0.8289	1.0000	0.8000	1.0000	0.0400	0.0894	9.52%	0.00%
CM_MC2		5	0.7000	0.5479	0.8521	0.6000	0.9000	0.0548	0.1225	17.50%	25.53%
EV_MC2		5	0.9600	0.8920	1.0000	0.9000	1.0000	0.0245	0.0548	5.71%	-2.13%
EV_HC1		5	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	-6.38%
LC_DCDS		5	0.9200	0.8161	1.0000	0.8000	1.0000	0.0374	0.0837	9.09%	2.13%
LC_LC3		5	0.9800	0.9245	1.0000	0.9000	1.0000	0.0200	0.0447	4.56%	-4.26%
LC_LC5		5	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	-6.38%
LC_LCDSSLCC		5	0.9800	0.9245	1.0000	0.9000	1.0000	0.0200	0.0447	4.56%	-4.26%
RG_MIDAG		5	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	-6.38%
FR_FR4		5	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	-6.38%
FR_FRRD		5	0.9600	0.8920	1.0000	0.9000	1.0000	0.0245	0.0548	5.71%	-2.13%
FR_FR2		5	0.8200	0.5979	1.0000	0.6000	1.0000	0.0800	0.1789	21.82%	12.77%
FR_MULTIPLATE		5	0.9800	0.9245	1.0000	0.9000	1.0000	0.0200	0.0447	4.56%	-4.26%

Survival Rate Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
Lab Control	N	1.0000	0.8000	1.0000	1.0000	0.9000
FR_UFR1		0.9000	1.0000	1.0000	1.0000	0.9000
GH_ER2		1.0000	0.9000	1.0000	1.0000	0.7000
CM_MC1		1.0000	1.0000	1.0000	1.0000	1.0000
LC_SLC		1.0000	1.0000	1.0000	1.0000	1.0000
FR_FRABCH		1.0000	1.0000	1.0000	1.0000	0.8000
FR_FRCP1		1.0000	1.0000	0.9000	1.0000	1.0000
GH_FR1		0.9000	1.0000	1.0000	1.0000	0.9000
GH_ERC		1.0000	1.0000	0.9000	0.8000	1.0000
CM_MC2		0.6000	0.7000	0.6000	0.7000	0.9000
EV_MC2		1.0000	1.0000	0.9000	0.9000	1.0000
EV_HC1		1.0000	1.0000	1.0000	1.0000	1.0000
LC_DCDS		1.0000	0.9000	1.0000	0.8000	0.9000
LC_LC3		1.0000	1.0000	0.9000	1.0000	1.0000
LC_LC5		1.0000	1.0000	1.0000	1.0000	1.0000
LC_LCDSSLCC		0.9000	1.0000	1.0000	1.0000	1.0000
RG_MIDAG		1.0000	1.0000	1.0000	1.0000	1.0000
FR_FR4		1.0000	1.0000	1.0000	1.0000	1.0000
FR_FRRD		1.0000	0.9000	0.9000	1.0000	1.0000
FR_FR2		1.0000	0.7000	1.0000	0.6000	0.8000
FR_MULTIPLATE		1.0000	1.0000	1.0000	0.9000	1.0000

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 Analyst: KJC QA: NOV 09 2021

Hyalella 28-d Survival and Growth Sediment Test
Nautilus Environmental

Survival Rate Binomials

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
Lab Control	N	10/10	8/10	10/10	10/10	9/10
FR_UFR1		9/10	12/12	10/10	10/10	9/10
GH_ER2		10/10	9/10	10/10	10/10	7/10
CM_MC1		10/10	10/10	10/10	10/10	10/10
LC_SLC		10/10	10/10	10/10	10/10	10/10
FR_FRABCH		10/10	10/10	10/10	10/10	8/10
FR_FRCP1		10/10	10/10	9/10	10/10	10/10
GH_FR1		9/10	10/10	10/10	10/10	9/10
GH_ERC		10/10	10/10	9/10	8/10	10/10
CM_MC2		6/10	7/10	6/10	7/10	9/10
EV_MC2		10/10	10/10	9/10	9/10	10/10
EV_HC1		10/10	10/10	10/10	10/10	10/10
LC_DCDS		10/10	9/10	10/10	8/10	9/10
LC_LC3		10/10	10/10	9/10	10/10	10/10
LC_LC5		10/10	10/10	10/10	10/10	10/10
LC_LCDSSLCC		9/10	10/10	10/10	10/10	10/10
RG_MIDAG		10/10	10/10	10/10	10/10	10/10
FR_FR4		10/10	10/10	10/10	10/10	10/10
FR_FRRD		10/10	9/10	9/10	10/10	10/10
FR_FR2		10/10	7/10	10/10	6/10	8/10
FR_MULTIPLATE		10/10	10/10	10/10	9/10	10/10

Hyalella 28-d Survival and Growth Sediment Test

Nautilus Environmental

Analysis ID:	04-3082-4079	**Endpoint:**	Survival Rate	**CETIS Version:**	CETISv1.9.4
Analyzed:	29 Oct-21 10:22	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1
Batch ID:	07-5364-5346	**Test Type:**	Survival-Growth	**Analyst:**	Karen Lee
Start Date:	20 May-21	**Protocol:**	EPA/600/R-99/064 (2000)	**Diluent:**	
Ending Date:	17 Jun-21	**Species:**	Hyalella azteca	**Brine:**	
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	Aquatic Biosystems, CO **Age:** 7-8d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
Lab Control	16-0549-5947	20 May-21	20 May-21 06:00	n/a	Teck Coal	
FR_UFR1	12-4424-2146	18 May-21	19 May-21 11:20	48h (2.3 °C)		
GH_ER2	02-4275-7088	18 May-21 09:55	19 May-21 11:20	38h (0.4 °C)		
CM_MC1	01-4263-6393	18 May-21 11:08	19 May-21 11:20	37h (1.1 °C)		
LC_SLC	12-1662-7355	18 May-21 09:45	19 May-21 11:20	38h (4.1 °C)		
FR_FRABCH	05-6713-4959	18 May-21	19 May-21 11:20	48h (1.9 °C)		
FR_FRCP1	19-8027-7867	18 May-21	19 May-21 11:20	48h (1.2 °C)		
GH_FR1	15-9886-5398	18 May-21 12:30	19 May-21 11:20	35h (0.1 °C)		
GH_ERC	21-0704-4941	18 May-21 11:20	19 May-21 11:20	37h (0.6 °C)		
CM_MC2	17-6814-6287	18 May-21 09:50	19 May-21 11:20	38h (1.1 °C)		
EV_MC2	15-5628-9197	18 May-21 13:00	19 May-21 11:20	35h (3.6 °C)		
EV_HC1	05-8730-9056	18 May-21 11:20	19 May-21 11:20	37h (4.8 °C)		
LC_DCDS	20-0340-1068	18 May-21 11:00	19 May-21 11:20	37h (4.6 °C)		
LC_LC3	18-4816-9590	18 May-21 10:15	19 May-21 11:20	38h (4.7 °C)		
LC_LC5	03-8768-2280	18 May-21 09:50	19 May-21 11:20	38h (5.2 °C)		
LC_LCDSSLCC	02-2977-6783	18 May-21 11:00	19 May-21 11:20	37h (4.3 °C)		
RG_MIDAG	19-6180-4600	18 May-21 09:15	19 May-21 11:20	39h (0.1 °C)		
FR_FR4	17-1641-7069	18 May-21 09:29	19 May-21 11:20	39h (4.6 °C)		
FR_FRRD	06-3190-8505	18 May-21 08:22	19 May-21 11:20	40h (3.4 °C)		
FR_FR2	11-2149-8709	18 May-21 10:28	19 May-21 11:20	38h (4.6 °C)		
FR_MULTIPLATE	16-7235-2081	18 May-21 11:21	19 May-21 11:20	37h (3.4 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
Lab Control	Water Sample	Teck Coal	Lab Control	
FR_UFR1	Water Sample	Teck Coal	FR_UFR1_WEK_2021-05-1	
GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-05-18_	
CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-05-18	
LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-05-18_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_WEK_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_WEK_2021-05	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-05-18_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-05-18	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-05-18	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2020_Q2_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2020_Q2_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-05-18	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-05-18_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-05-18_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	
RG_MIDAG	Water Sample	Teck Coal	RG_MIDAG_WS_2021-05-	
FR_FR4	Water Sample	Teck Coal	FR_FR4_WS_2021-05-18_	
FR_FRRD	Water Sample	Teck Coal	FR_FRRD_WS_2021-05-18	
FR_FR2	Water Sample	Teck Coal	FR_FR2_WS_2021-05-18_	
FR_MULTIPLATE	Water Sample	Teck Coal	FR_MULTIPLATE_WS_202	

Fisher Exact/Bonferroni-Holm Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
Negative Control		FR_UFR1	0.8308	Exact	1.0000	Non-Significant Effect
		GH_ER2	0.5000	Exact	1.0000	Non-Significant Effect

MQ

Hyalella 28-d Survival and Growth Sediment Test — Nautilus Environmental

Analysis ID: 04-3082-4079 Endpoint: Survival Rate CETIS Version: CETISv1.9.4
Analyzed: 29 Oct-21 10:22 Analysis: STP 2xK Contingency Tables Status Level: 1

Fisher Exact/Bonferroni-Holm Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
		CM_MC1	1.0000	Exact	1.0000	Non-Significant Effect
		LC_SLC	1.0000	Exact	1.0000	Non-Significant Effect
		FR_FRABCH	0.8189	Exact	1.0000	Non-Significant Effect
		FR_FRCP1	0.9413	Exact	1.0000	Non-Significant Effect
		GH_FR1	0.8189	Exact	1.0000	Non-Significant Effect
		GH_ERC	0.6611	Exact	1.0000	Non-Significant Effect
		CM_MC2*	0.0017	Exact	0.0330	Significant Effect
		EV_MC2	0.8189	Exact	1.0000	Non-Significant Effect
		EV_HC1	1.0000	Exact	1.0000	Non-Significant Effect
		LC_DCDS	0.5000	Exact	1.0000	Non-Significant Effect
		LC_LC3	0.9413	Exact	1.0000	Non-Significant Effect
		LC_LC5	1.0000	Exact	1.0000	Non-Significant Effect
		LC_LCDSSLCC	0.9413	Exact	1.0000	Non-Significant Effect
		RG_MIDAG	1.0000	Exact	1.0000	Non-Significant Effect
		FR_FR4	1.0000	Exact	1.0000	Non-Significant Effect
		FR_FRRD	0.8189	Exact	1.0000	Non-Significant Effect
		FR_FR2	0.0606	Exact	1.0000	Non-Significant Effect
		FR_MULTIPLATE	0.9413	Exact	1.0000	Non-Significant Effect

Test Acceptability Criteria

Attribute	Test Stat	TAC Limits Lower	Upper	Overlap	Decision
Control Resp	0.94	0.8	>>	Yes	Passes Criteria

Data Summary

Sample	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
Lab Control	N	47	3	50	0.94	0.06	6.0%
FR_UFR1		50	2	52	0.9615	0.03846	3.85%
GH_ER2		46	4	50	0.92	0.08	8.0%
CM_MC1		50	0	50	1	0	0.0%
LC_SLC		50	0	50	1	0	0.0%
FR_FRABCH		48	2	50	0.96	0.04	4.0%
FR_FRCP1		49	1	50	0.98	0.02	2.0%
GH_FR1		48	2	50	0.96	0.04	4.0%
GH_ERC		47	3	50	0.94	0.06	6.0%
CM_MC2		35	15	50	0.7	0.3	30.0%
EV_MC2		48	2	50	0.96	0.04	4.0%
EV_HC1		50	0	50	1	0	0.0%
LC_DCDS		46	4	50	0.92	0.08	8.0%
LC_LC3		49	1	50	0.98	0.02	2.0%
LC_LC5		50	0	50	1	0	0.0%
LC_LCDSSLCC		49	1	50	0.98	0.02	2.0%
RG_MIDAG		50	0	50	1	0	0.0%
FR_FR4		50	0	50	1	0	0.0%
FR_FRRD		48	2	50	0.96	0.04	4.0%
FR_FR2		41	9	50	0.82	0.18	18.0%
FR_MULTIPLATE		49	1	50	0.98	0.02	2.0%

Hyalella 28-d Survival and Growth Sediment Test — **Nautilus Environmental**

Analysis ID:	04-3082-4079	**Endpoint:**	Survival Rate	**CETIS Version:**	CETISv1.9.4
Analyzed:	29 Oct-21 10:22	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1

Survival Rate Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
Lab Control	N	1.0000	0.8000	1.0000	1.0000	0.9000
FR_UFR1		0.9000	1.0000	1.0000	1.0000	0.9000
GH_ER2		1.0000	0.9000	1.0000	1.0000	0.7000
CM_MC1		1.0000	1.0000	1.0000	1.0000	1.0000
LC_SLC		1.0000	1.0000	1.0000	1.0000	1.0000
FR_FRABCH		1.0000	1.0000	1.0000	1.0000	0.8000
FR_FRCP1		1.0000	1.0000	0.9000	1.0000	1.0000
GH_FR1		0.9000	1.0000	1.0000	1.0000	0.9000
GH_ERC		1.0000	1.0000	0.9000	0.8000	1.0000
CM_MC2		0.6000	0.7000	0.6000	0.7000	0.9000
EV_MC2		1.0000	1.0000	0.9000	0.9000	1.0000
EV_HC1		1.0000	1.0000	1.0000	1.0000	1.0000
LC_DCDS		1.0000	0.9000	1.0000	0.8000	0.9000
LC_LC3		1.0000	1.0000	0.9000	1.0000	1.0000
LC_LC5		1.0000	1.0000	1.0000	1.0000	1.0000
LC_LCDSSLCC		0.9000	1.0000	1.0000	1.0000	1.0000
RG_MIDAG		1.0000	1.0000	1.0000	1.0000	1.0000
FR_FR4		1.0000	1.0000	1.0000	1.0000	1.0000
FR_FRRD		1.0000	0.9000	0.9000	1.0000	1.0000
FR_FR2		1.0000	0.7000	1.0000	0.6000	0.8000
FR_MULTIPLATE		1.0000	1.0000	1.0000	0.9000	1.0000

Survival Rate Binomials

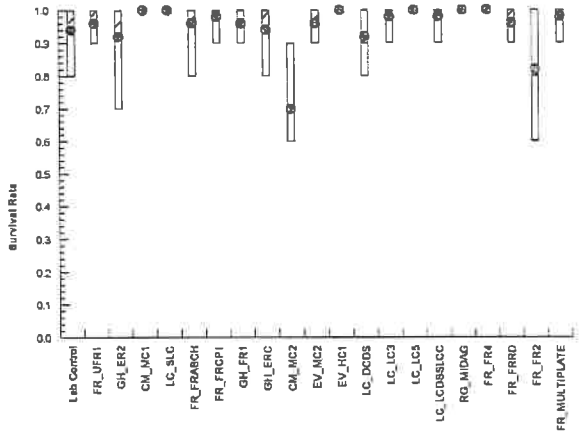
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
Lab Control	N	10/10	8/10	10/10	10/10	9/10
FR_UFR1		9/10	12/12	10/10	10/10	9/10
GH_ER2		10/10	9/10	10/10	10/10	7/10
CM_MC1		10/10	10/10	10/10	10/10	10/10
LC_SLC		10/10	10/10	10/10	10/10	10/10
FR_FRABCH		10/10	10/10	10/10	10/10	8/10
FR_FRCP1		10/10	10/10	9/10	10/10	10/10
GH_FR1		9/10	10/10	10/10	10/10	9/10
GH_ERC		10/10	10/10	9/10	8/10	10/10
CM_MC2		6/10	7/10	6/10	7/10	9/10
EV_MC2		10/10	10/10	9/10	9/10	10/10
EV_HC1		10/10	10/10	10/10	10/10	10/10
LC_DCDS		10/10	9/10	10/10	8/10	9/10
LC_LC3		10/10	10/10	9/10	10/10	10/10
LC_LC5		10/10	10/10	10/10	10/10	10/10
LC_LCDSSLCC		9/10	10/10	10/10	10/10	10/10
RG_MIDAG		10/10	10/10	10/10	10/10	10/10
FR_FR4		10/10	10/10	10/10	10/10	10/10
FR_FRRD		10/10	9/10	9/10	10/10	10/10
FR_FR2		10/10	7/10	10/10	6/10	8/10
FR_MULTIPLATE		10/10	10/10	10/10	9/10	10/10

Analyst: KJL QA: MG NOV 09 2021

Hyalella 28-d Survival and Growth Sediment Test — **Nautilus Environmental**

Analysis ID:	04-3082-4079	**Endpoint:**	Survival Rate	**CETIS Version:**	CETISv1.9.4
Analyzed:	29 Oct-21 10:22	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1

Graphics



Hyalella 28-d Survival and Growth Sediment Test

Nautilus Environmental

Analysis ID:	16-8713-2236	**Endpoint:**	Survival Rate	**CETIS Version:**	CETISv1.9.4
Analyzed:	29 Oct-21 10:22	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1
Batch ID:	07-5364-5346	**Test Type:**	Survival-Growth	**Analyst:**	Karen Lee
Start Date:	20 May-21	**Protocol:**	EPA/600/R-99/064 (2000)	**Diluent:**	
Ending Date:	17 Jun-21	**Species:**	Hyalella azteca	**Brine:**	
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	Aquatic Biosystems, CO **Age:** 7-8d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
FR_UFR1	12-4424-2146	18 May-21	19 May-21 11:20	48h (2.3 °C)	Teck Coal	
GH_ER2	02-4275-7088	18 May-21 09:55	19 May-21 11:20	38h (0.4 °C)		
CM_MC1	01-4263-6393	18 May-21 11:08	19 May-21 11:20	37h (1.1 °C)		
LC_SLC	12-1662-7355	18 May-21 09:45	19 May-21 11:20	38h (4.1 °C)		
FR_FRABCH	05-6713-4959	18 May-21	19 May-21 11:20	48h (1.9 °C)		
FR_FRCP1	19-8027-7867	18 May-21	19 May-21 11:20	48h (1.2 °C)		
GH_FR1	15-9886-5398	18 May-21 12:30	19 May-21 11:20	35h (0.1 °C)		
GH_ERC	21-0704-4941	18 May-21 11:20	19 May-21 11:20	37h (0.6 °C)		
CM_MC2	17-6814-6287	18 May-21 09:50	19 May-21 11:20	38h (1.1 °C)		
EV_MC2	15-5628-9197	18 May-21 13:00	19 May-21 11:20	35h (3.6 °C)		
EV_HC1	05-8730-9056	18 May-21 11:20	19 May-21 11:20	37h (4.8 °C)		
LC_DCDS	20-0340-1068	18 May-21 11:00	19 May-21 11:20	37h (4.6 °C)		
LC_LC3	18-4816-9590	18 May-21 10:15	19 May-21 11:20	38h (4.7 °C)		
LC_LC5	03-8768-2280	18 May-21 09:50	19 May-21 11:20	38h (5.2 °C)		
LC_LCDSSLCC	02-2977-6783	18 May-21 11:00	19 May-21 11:20	37h (4.3 °C)		
RG_MIDAG	19-6180-4600	18 May-21 09:15	19 May-21 11:20	39h (0.1 °C)		
FR_FR4	17-1641-7069	18 May-21 09:29	19 May-21 11:20	39h (4.6 °C)		
FR_FRRD	06-3190-8505	18 May-21 08:22	19 May-21 11:20	40h (3.4 °C)		
FR_FR2	11-2149-8709	18 May-21 10:28	19 May-21 11:20	38h (4.6 °C)		
FR_MULTIPLATE	16-7235-2081	18 May-21 11:21	19 May-21 11:20	37h (3.4 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_UFR1	Water Sample	Teck Coal	FR_UFR1_WEK_2021-05-1	
GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-05-18_	
CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-05-18	
LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-05-18_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_WEK_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_WEK_2021-05	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-05-18_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-05-18	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-05-18	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2020_Q2_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2020_Q2_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-05-18	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-05-18_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-05-18_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	
RG_MIDAG	Water Sample	Teck Coal	RG_MIDAG_WS_2021-05-	
FR_FR4	Water Sample	Teck Coal	FR_FR4_WS_2021-05-18_	
FR_FRRD	Water Sample	Teck Coal	FR_FRRD_WS_2021-05-18	
FR_FR2	Water Sample	Teck Coal	FR_FR2_WS_2021-05-18_	
FR_MULTIPLATE	Water Sample	Teck Coal	FR_MULTIPLATE_WS_202	

Fisher Exact/Bonferroni-Holm Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
Site Control		GH_ER2	0.3204	Exact	1.0000	Non-Significant Effect
(FR-UFR1)		CM_MC1	1.0000	Exact	1.0000	Non-Significant Effect
		LC_SLC	1.0000	Exact	1.0000	Non-Significant Effect
		FR_FRABCH	0.6763	Exact	1.0000	Non-Significant Effect

Hyalella 28-d Survival and Growth Sediment Test — Nautilus Environmental

Analysis ID: 16-8713-2236 Endpoint: Survival Rate CETIS Version: CETISv1.9.4
Analyzed: 29 Oct-21 10:22 Analysis: STP 2xK Contingency Tables Status Level: 1

Fisher Exact/Bonferroni-Holm Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
		FR_FRCP1	0.8713	Exact	1.0000	Non-Significant Effect
		GH_FR1	0.6763	Exact	1.0000	Non-Significant Effect
		GH_ERC	0.4812	Exact	1.0000	Non-Significant Effect
		CM_MC2*	0.0003	Exact	0.0064	Significant Effect
		EV_MC2	0.6763	Exact	1.0000	Non-Significant Effect
		EV_HC1	1.0000	Exact	1.0000	Non-Significant Effect
		LC_DCDS	0.3204	Exact	1.0000	Non-Significant Effect
		LC_LC3	0.8713	Exact	1.0000	Non-Significant Effect
		LC_LC5	1.0000	Exact	1.0000	Non-Significant Effect
		LC_LCDSSLCC	0.8713	Exact	1.0000	Non-Significant Effect
		RG_MIDAG	1.0000	Exact	1.0000	Non-Significant Effect
		FR_FR4	1.0000	Exact	1.0000	Non-Significant Effect
		FR_FRRD	0.6763	Exact	1.0000	Non-Significant Effect
		FR_FR2	0.0219	Exact	0.3934	Non-Significant Effect
		FR_MULTIPLATE	0.8713	Exact	1.0000	Non-Significant Effect

Data Summary

Sample	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
FR_UFR1	XC	50	2	52	0.9615	0.03846	3.85%
GH_ER2		46	4	50	0.92	0.08	8.0%
CM_MC1		50	0	50	1	0	0.0%
LC_SLC		50	0	50	1	0	0.0%
FR_FRABCH		48	2	50	0.96	0.04	4.0%
FR_FRCP1		49	1	50	0.98	0.02	2.0%
GH_FR1		48	2	50	0.96	0.04	4.0%
GH_ERC		47	3	50	0.94	0.06	6.0%
CM_MC2		35	15	50	0.7	0.3	30.0%
EV_MC2		48	2	50	0.96	0.04	4.0%
EV_HC1		50	0	50	1	0	0.0%
LC_DCDS		46	4	50	0.92	0.08	8.0%
LC_LC3		49	1	50	0.98	0.02	2.0%
LC_LC5		50	0	50	1	0	0.0%
LC_LCDSSLCC		49	1	50	0.98	0.02	2.0%
RG_MIDAG		50	0	50	1	0	0.0%
FR_FR4		50	0	50	1	0	0.0%
FR_FRRD		48	2	50	0.96	0.04	4.0%
FR_FR2		41	9	50	0.82	0.18	18.0%
FR_MULTIPLATE		49	1	50	0.98	0.02	2.0%

MG

Analyst: KJV QA NOV 09 2021

Hyalella 28-d Survival and Growth Sediment Test — Nautilus Environmental

Analysis ID: 16-8713-2236 Endpoint: Survival Rate CETIS Version: CETISv1.9.4
Analyzed: 29 Oct-21 10:22 Analysis: STP 2xK Contingency Tables Status Level: 1

Survival Rate Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
FR_UFR1	XC	0.9000	1.0000	1.0000	1.0000	0.9000
GH_ER2		1.0000	0.9000	1.0000	1.0000	0.7000
CM_MC1		1.0000	1.0000	1.0000	1.0000	1.0000
LC_SLC		1.0000	1.0000	1.0000	1.0000	1.0000
FR_FRABCH		1.0000	1.0000	1.0000	1.0000	0.8000
FR_FRCP1		1.0000	1.0000	0.9000	1.0000	1.0000
GH_FR1		0.9000	1.0000	1.0000	1.0000	0.9000
GH_ERC		1.0000	1.0000	0.9000	0.8000	1.0000
CM_MC2		0.6000	0.7000	0.6000	0.7000	0.9000
EV_MC2		1.0000	1.0000	0.9000	0.9000	1.0000
EV_HC1		1.0000	1.0000	1.0000	1.0000	1.0000
LC_DCDS		1.0000	0.9000	1.0000	0.8000	0.9000
LC_LC3		1.0000	1.0000	0.9000	1.0000	1.0000
LC_LC5		1.0000	1.0000	1.0000	1.0000	1.0000
LC_LCDSSLCC		0.9000	1.0000	1.0000	1.0000	1.0000
RG_MIDAG		1.0000	1.0000	1.0000	1.0000	1.0000
FR_FR4		1.0000	1.0000	1.0000	1.0000	1.0000
FR_FRRD		1.0000	0.9000	0.9000	1.0000	1.0000
FR_FR2		1.0000	0.7000	1.0000	0.6000	0.8000
FR_MULTIPLATE		1.0000	1.0000	1.0000	0.9000	1.0000

Survival Rate Binomials

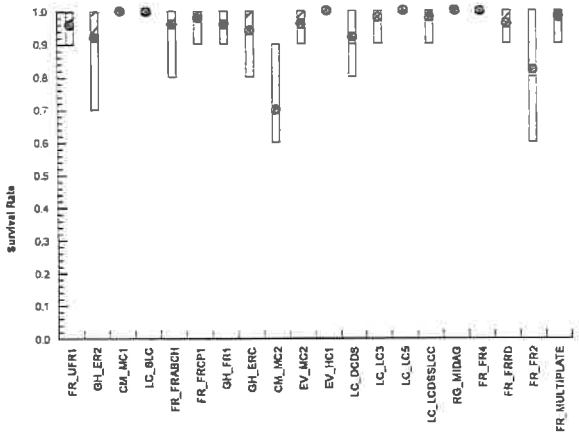
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
FR_UFR1	XC	9/10	12/12	10/10	10/10	9/10
GH_ER2		10/10	9/10	10/10	10/10	7/10
CM_MC1		10/10	10/10	10/10	10/10	10/10
LC_SLC		10/10	10/10	10/10	10/10	10/10
FR_FRABCH		10/10	10/10	10/10	10/10	8/10
FR_FRCP1		10/10	10/10	9/10	10/10	10/10
GH_FR1		9/10	10/10	10/10	10/10	9/10
GH_ERC		10/10	10/10	9/10	8/10	10/10
CM_MC2		6/10	7/10	6/10	7/10	9/10
EV_MC2		10/10	10/10	9/10	9/10	10/10
EV_HC1		10/10	10/10	10/10	10/10	10/10
LC_DCDS		10/10	9/10	10/10	8/10	9/10
LC_LC3		10/10	10/10	9/10	10/10	10/10
LC_LC5		10/10	10/10	10/10	10/10	10/10
LC_LCDSSLCC		9/10	10/10	10/10	10/10	10/10
RG_MIDAG		10/10	10/10	10/10	10/10	10/10
FR_FR4		10/10	10/10	10/10	10/10	10/10
FR_FRRD		10/10	9/10	9/10	10/10	10/10
FR_FR2		10/10	7/10	10/10	6/10	8/10
FR_MULTIPLATE		10/10	10/10	10/10	9/10	10/10

MG

Hyalella 28-d Survival and Growth Sediment Test — **Nautilus Environmental**

Analysis ID:	16-8713-2236	**Endpoint:**	Survival Rate	**CETIS Version:**	CETISv1.9.4
Analyzed:	29 Oct-21 10:22	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1

Graphics



Analyst: KJL QA: NOV 09 2021

MG

Hyalella 28-d Survival and Growth Sediment Test — Nautilus Environmental

Analysis ID:	07-2903-4970	Endpoint:	Survival Rate	CETIS Version:	CETISv1.9.4
Analyzed:	29 Oct-21 10:23	Analysis:	STP 2xK Contingency Tables	Status Level:	1
Batch ID:	07-5364-5346	Test Type:	Survival-Growth	Analyst:	Karen Lee
Start Date:	20 May-21	Protocol:	EPA/600/R-99/064 (2000)	Diluent:	
Ending Date:	17 Jun-21	Species:	Hyalella azteca	Brine:	
Test Length:	28d 0h	Taxon:	Malacostraca	Source:	Aquatic Biosystems, CO Age: 7-8d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
FR_UFR1	12-4424-2146	18 May-21	19 May-21 11:20	48h (2.3 °C)	Teck Coal	
GH_ER2	02-4275-7088	18 May-21 09:55	19 May-21 11:20	38h (0.4 °C)		
CM_MC1	01-4263-6393	18 May-21 11:08	19 May-21 11:20	37h (1.1 °C)		
LC_SLC	12-1662-7355	18 May-21 09:45	19 May-21 11:20	38h (4.1 °C)		
FR_FRABCH	05-6713-4959	18 May-21	19 May-21 11:20	48h (1.9 °C)		
FR_FRCP1	19-8027-7867	18 May-21	19 May-21 11:20	48h (1.2 °C)		
GH_FR1	15-9886-5398	18 May-21 12:30	19 May-21 11:20	35h (0.1 °C)		
GH_ERC	21-0704-4941	18 May-21 11:20	19 May-21 11:20	37h (0.6 °C)		
CM_MC2	17-6814-6287	18 May-21 09:50	19 May-21 11:20	38h (1.1 °C)		
EV_MC2	15-5628-9197	18 May-21 13:00	19 May-21 11:20	35h (3.6 °C)		
EV_HC1	05-8730-9056	18 May-21 11:20	19 May-21 11:20	37h (4.8 °C)		
LC_DCDS	20-0340-1068	18 May-21 11:00	19 May-21 11:20	37h (4.6 °C)		
LC_LC3	18-4816-9590	18 May-21 10:15	19 May-21 11:20	38h (4.7 °C)		
LC_LC5	03-8768-2280	18 May-21 09:50	19 May-21 11:20	38h (5.2 °C)		
LC_LCDSSLCC	02-2977-6783	18 May-21 11:00	19 May-21 11:20	37h (4.3 °C)		
RG_MIDAG	19-6180-4600	18 May-21 09:15	19 May-21 11:20	39h (0.1 °C)		
FR_FR4	17-1641-7069	18 May-21 09:29	19 May-21 11:20	39h (4.6 °C)		
FR_FRRD	06-3190-8505	18 May-21 08:22	19 May-21 11:20	40h (3.4 °C)		
FR_FR2	11-2149-8709	18 May-21 10:28	19 May-21 11:20	38h (4.6 °C)		
FR_MULTIPLATE	16-7235-2081	18 May-21 11:21	19 May-21 11:20	37h (3.4 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_UFR1	Water Sample	Teck Coal	FR_UFR1_WEK_2021-05-1	
GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-05-18_	
CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-05-18	
LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-05-18_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_WEK_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_WEK_2021-05	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-05-18_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-05-18	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-05-18	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2020_Q2_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2020_Q2_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-05-18	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-05-18_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-05-18_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	
RG_MIDAG	Water Sample	Teck Coal	RG_MIDAG_WS_2021-05-	
FR_FR4	Water Sample	Teck Coal	FR_FR4_WS_2021-05-18_	
FR_FRRD	Water Sample	Teck Coal	FR_FRRD_WS_2021-05-18	
FR_FR2	Water Sample	Teck Coal	FR_FR2_WS_2021-05-18_	
FR_MULTIPLATE	Water Sample	Teck Coal	FR_MULTIPLATE_WS_202	

Fisher Exact/Bonferroni-Holm Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
Site Control (GH-ER2)		FR_UFR1	0.9064	Exact	1.0000	Non-Significant Effect
		CM_MC1	1.0000	Exact	1.0000	Non-Significant Effect
		LC_SLC	1.0000	Exact	1.0000	Non-Significant Effect
		FR_FRABCH	0.8978	Exact	1.0000	Non-Significant Effect

MG

Analysis ID: 07-2903-4970 Endpoint: Survival Rate CETIS Version: CETISv1.9.4
Analyzed: 29 Oct-21 10:23 Analysis: STP 2xK Contingency Tables Status Level: 1

Fisher Exact/Bonferroni-Holm Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
		FR_FRCP1	0.9719	Exact	1.0000	Non-Significant Effect
		GH_FR1	0.8978	Exact	1.0000	Non-Significant Effect
		GH_ERC	0.7820	Exact	1.0000	Non-Significant Effect
		CM_MC2	0.0047	Exact	0.0901	Non-Significant Effect
		EV_MC2	0.8978	Exact	1.0000	Non-Significant Effect
		EV_HC1	1.0000	Exact	1.0000	Non-Significant Effect
		LC_DCDS	0.6425	Exact	1.0000	Non-Significant Effect
		LC_LC3	0.9719	Exact	1.0000	Non-Significant Effect
		LC_LC5	1.0000	Exact	1.0000	Non-Significant Effect
		LC_LCDSSLCC	0.9719	Exact	1.0000	Non-Significant Effect
		RG_MIDAG	1.0000	Exact	1.0000	Non-Significant Effect
		FR_FR4	1.0000	Exact	1.0000	Non-Significant Effect
		FR_FRRD	0.8978	Exact	1.0000	Non-Significant Effect
		FR_FR2	0.1168	Exact	1.0000	Non-Significant Effect
		FR_MULTIPLATE	0.9719	Exact	1.0000	Non-Significant Effect

Data Summary

Sample	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
FR_UFR1		50	2	52	0.9615	0.03846	3.85%
GH_ER2	XC	46	4	50	0.92	0.08	8.0%
CM_MC1		50	0	50	1	0	0.0%
LC_SLC		50	0	50	1	0	0.0%
FR_FRABCH		48	2	50	0.96	0.04	4.0%
FR_FRCP1		49	1	50	0.98	0.02	2.0%
GH_FR1		48	2	50	0.96	0.04	4.0%
GH_ERC		47	3	50	0.94	0.06	6.0%
CM_MC2		35	15	50	0.7	0.3	30.0%
EV_MC2		48	2	50	0.96	0.04	4.0%
EV_HC1		50	0	50	1	0	0.0%
LC_DCDS		46	4	50	0.92	0.08	8.0%
LC_LC3		49	1	50	0.98	0.02	2.0%
LC_LC5		50	0	50	1	0	0.0%
LC_LCDSSLCC		49	1	50	0.98	0.02	2.0%
RG_MIDAG		50	0	50	1	0	0.0%
FR_FR4		50	0	50	1	0	0.0%
FR_FRRD		48	2	50	0.96	0.04	4.0%
FR_FR2		41	9	50	0.82	0.18	18.0%
FR_MULTIPLATE		49	1	50	0.98	0.02	2.0%

MG

Hyalella 28-d Survival and Growth Sediment Test — Nautilus Environmental

Analysis ID: 07-2903-4970 Endpoint: Survival Rate CETIS Version: CETISv1.9.4
Analyzed: 29 Oct-21 10:23 Analysis: STP 2xK Contingency Tables Status Level: 1

Survival Rate Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
FR_UFR1		0.9000	1.0000	1.0000	1.0000	0.9000
GH_ER2	XC	1.0000	0.9000	1.0000	1.0000	0.7000
CM_MC1		1.0000	1.0000	1.0000	1.0000	1.0000
LC_SLC		1.0000	1.0000	1.0000	1.0000	1.0000
FR_FRABCH		1.0000	1.0000	1.0000	1.0000	0.8000
FR_FRCP1		1.0000	1.0000	0.9000	1.0000	1.0000
GH_FR1		0.9000	1.0000	1.0000	1.0000	0.9000
GH_ERC		1.0000	1.0000	0.9000	0.8000	1.0000
CM_MC2		0.6000	0.7000	0.6000	0.7000	0.9000
EV_MC2		1.0000	1.0000	0.9000	0.9000	1.0000
EV_HC1		1.0000	1.0000	1.0000	1.0000	1.0000
LC_DCDS		1.0000	0.9000	1.0000	0.8000	0.9000
LC_LC3		1.0000	1.0000	0.9000	1.0000	1.0000
LC_LC5		1.0000	1.0000	1.0000	1.0000	1.0000
LC_LCDSSLCC		0.9000	1.0000	1.0000	1.0000	1.0000
RG_MIDAG		1.0000	1.0000	1.0000	1.0000	1.0000
FR_FR4		1.0000	1.0000	1.0000	1.0000	1.0000
FR_FRRD		1.0000	0.9000	0.9000	1.0000	1.0000
FR_FR2		1.0000	0.7000	1.0000	0.6000	0.8000
FR_MULTIPLATE		1.0000	1.0000	1.0000	0.9000	1.0000

Survival Rate Binomials

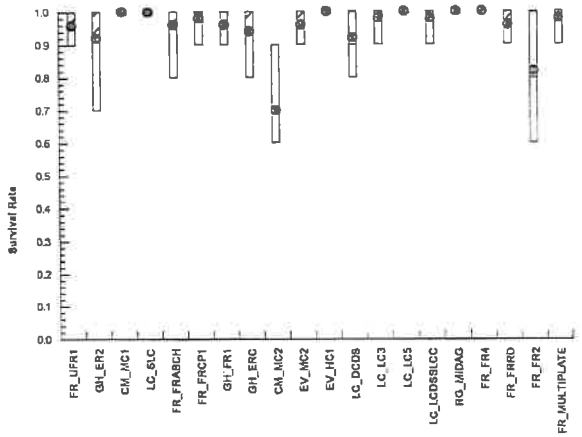
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
FR_UFR1		9/10	12/12	10/10	10/10	9/10
GH_ER2	XC	10/10	9/10	10/10	10/10	7/10
CM_MC1		10/10	10/10	10/10	10/10	10/10
LC_SLC		10/10	10/10	10/10	10/10	10/10
FR_FRABCH		10/10	10/10	10/10	10/10	8/10
FR_FRCP1		10/10	10/10	9/10	10/10	10/10
GH_FR1		9/10	10/10	10/10	10/10	9/10
GH_ERC		10/10	10/10	9/10	8/10	10/10
CM_MC2		6/10	7/10	6/10	7/10	9/10
EV_MC2		10/10	10/10	9/10	9/10	10/10
EV_HC1		10/10	10/10	10/10	10/10	10/10
LC_DCDS		10/10	9/10	10/10	8/10	9/10
LC_LC3		10/10	10/10	9/10	10/10	10/10
LC_LC5		10/10	10/10	10/10	10/10	10/10
LC_LCDSSLCC		9/10	10/10	10/10	10/10	10/10
RG_MIDAG		10/10	10/10	10/10	10/10	10/10
FR_FR4		10/10	10/10	10/10	10/10	10/10
FR_FRRD		10/10	9/10	9/10	10/10	10/10
FR_FR2		10/10	7/10	10/10	6/10	8/10
FR_MULTIPLATE		10/10	10/10	10/10	9/10	10/10

MB

Hyalella 28-d Survival and Growth Sediment Test — Nautilus Environmental

Analysis ID:	07-2903-4970	**Endpoint:**	Survival Rate	**CETIS Version:**	CETISv1.9.4
Analyzed:	29 Oct-21 10:23	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1

Graphics



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Analyst: KJL QA: NOV 09 2021

Hyalella 28-d Survival and Growth Sediment Test

Nautilus Environmental

Analysis ID:	12-4449-5706	**Endpoint:**	Survival Rate	**CETIS Version:**	CETISv1.9.4
Analyzed:	29 Oct-21 10:24	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1
Batch ID:	07-5364-5346	**Test Type:**	Survival-Growth	**Analyst:**	Karen Lee
Start Date:	20 May-21	**Protocol:**	EPA/600/R-99/064 (2000)	**Diluent:**	
Ending Date:	17 Jun-21	**Species:**	Hyalella azteca	**Brine:**	
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	Aquatic Biosystems, CO **Age:** 7-8d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
FR_UFR1	12-4424-2146	18 May-21	19 May-21 11:20	48h (2.3 °C)	Teck Coal	
GH_ER2	02-4275-7088	18 May-21 09:55	19 May-21 11:20	38h (0.4 °C)		
CM_MC1	01-4263-6393	18 May-21 11:08	19 May-21 11:20	37h (1.1 °C)		
LC_SLC	12-1662-7355	18 May-21 09:45	19 May-21 11:20	38h (4.1 °C)		
FR_FRABCH	05-6713-4959	18 May-21	19 May-21 11:20	48h (1.9 °C)		
FR_FRCP1	19-8027-7867	18 May-21	19 May-21 11:20	48h (1.2 °C)		
GH_FR1	15-9886-5398	18 May-21 12:30	19 May-21 11:20	35h (0.1 °C)		
GH_ERC	21-0704-4941	18 May-21 11:20	19 May-21 11:20	37h (0.6 °C)		
CM_MC2	17-6814-6287	18 May-21 09:50	19 May-21 11:20	38h (1.1 °C)		
EV_MC2	15-5628-9197	18 May-21 13:00	19 May-21 11:20	35h (3.6 °C)		
EV_HC1	05-8730-9056	18 May-21 11:20	19 May-21 11:20	37h (4.8 °C)		
LC_DCDS	20-0340-1068	18 May-21 11:00	19 May-21 11:20	37h (4.6 °C)		
LC_LC3	18-4816-9590	18 May-21 10:15	19 May-21 11:20	38h (4.7 °C)		
LC_LC5	03-8768-2280	18 May-21 09:50	19 May-21 11:20	38h (5.2 °C)		
LC_LCDSSLCC	02-2977-6783	18 May-21 11:00	19 May-21 11:20	37h (4.3 °C)		
RG_MIDAG	19-6180-4600	18 May-21 09:15	19 May-21 11:20	39h (0.1 °C)		
FR_FR4	17-1641-7069	18 May-21 09:29	19 May-21 11:20	39h (4.6 °C)		
FR_FRRD	06-3190-8505	18 May-21 08:22	19 May-21 11:20	40h (3.4 °C)		
FR_FR2	11-2149-8709	18 May-21 10:28	19 May-21 11:20	38h (4.6 °C)		
FR_MULTIPLATE	16-7235-2081	18 May-21 11:21	19 May-21 11:20	37h (3.4 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_UFR1	Water Sample	Teck Coal	FR_UFR1_WEK_2021-05-1	
GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-05-18_	
CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-05-18	
LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-05-18_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_WEK_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_WEK_2021-05	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-05-18_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-05-18	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-05-18	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2020_Q2_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2020_Q2_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-05-18	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-05-18_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-05-18_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	
RG_MIDAG	Water Sample	Teck Coal	RG_MIDAG_WS_2021-05-	
FR_FR4	Water Sample	Teck Coal	FR_FR4_WS_2021-05-18_	
FR_FRRD	Water Sample	Teck Coal	FR_FRRD_WS_2021-05-18	
FR_FR2	Water Sample	Teck Coal	FR_FR2_WS_2021-05-18_	
FR_MULTIPLATE	Water Sample	Teck Coal	FR_MULTIPLATE_WS_202	

Fisher Exact/Bonferroni-Holm Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
Site Control		FR_UFR1	0.2574	Exact	1.0000	Non-Significant Effect
(CM_MC1)		GH_ER2	0.0587	Exact	0.9984	Non-Significant Effect
		LC_SLC	1.0000	Exact	1.0000	Non-Significant Effect
		FR_FRABCH	0.2475	Exact	1.0000	Non-Significant Effect

MG

Hyalella 28-d Survival and Growth Sediment Test — Nautilus Environmental

Analysis ID: 12-4449-5706 Endpoint: Survival Rate CETIS Version: CETISv1.9.4
Analyzed: 29 Oct-21 10:24 Analysis: STP 2xK Contingency Tables Status Level: 1

Fisher Exact/Bonferroni-Holm Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
		FR_FRCP1	0.5000	Exact	1.0000	Non-Significant Effect
		GH_FR1	0.2475	Exact	1.0000	Non-Significant Effect
		GH_ERC	0.1212	Exact	1.0000	Non-Significant Effect
		CM_MC2*	0.0000	Exact	1.7E-04	Significant Effect
		EV_MC2	0.2475	Exact	1.0000	Non-Significant Effect
		EV_HC1	1.0000	Exact	1.0000	Non-Significant Effect
		LC_DCDS	0.0587	Exact	0.9984	Non-Significant Effect
		LC_LC3	0.5000	Exact	1.0000	Non-Significant Effect
		LC_LC5	1.0000	Exact	1.0000	Non-Significant Effect
		LC_LCDSSLCC	0.5000	Exact	1.0000	Non-Significant Effect
		RG_MIDAG	1.0000	Exact	1.0000	Non-Significant Effect
		FR_FR4	1.0000	Exact	1.0000	Non-Significant Effect
		FR_FRRD	0.2475	Exact	1.0000	Non-Significant Effect
		FR_FR2*	0.0013	Exact	0.0237	Significant Effect
		FR_MULTIPLATE	0.5000	Exact	1.0000	Non-Significant Effect

Data Summary

Sample	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
FR_UFR1		50	2	52	0.9615	0.03846	3.85%
GH_ER2		46	4	50	0.92	0.08	8.0%
CM_MC1	XC	50	0	50	1	0	0.0%
LC_SLC		50	0	50	1	0	0.0%
FR_FRABCH		48	2	50	0.96	0.04	4.0%
FR_FRCP1		49	1	50	0.98	0.02	2.0%
GH_FR1		48	2	50	0.96	0.04	4.0%
GH_ERC		47	3	50	0.94	0.06	6.0%
CM_MC2		35	15	50	0.7	0.3	30.0%
EV_MC2		48	2	50	0.96	0.04	4.0%
EV_HC1		50	0	50	1	0	0.0%
LC_DCDS		46	4	50	0.92	0.08	8.0%
LC_LC3		49	1	50	0.98	0.02	2.0%
LC_LC5		50	0	50	1	0	0.0%
LC_LCDSSLCC		49	1	50	0.98	0.02	2.0%
RG_MIDAG		50	0	50	1	0	0.0%
FR_FR4		50	0	50	1	0	0.0%
FR_FRRD		48	2	50	0.96	0.04	4.0%
FR_FR2		41	9	50	0.82	0.18	18.0%
FR_MULTIPLATE		49	1	50	0.98	0.02	2.0%

MG

Hyalella 28-d Survival and Growth Sediment Test — Nautilus Environmental

Analysis ID: 12-4449-5706 Endpoint: Survival Rate CETIS Version: CETISv1.9.4
Analyzed: 29 Oct-21 10:24 Analysis: STP 2xK Contingency Tables Status Level: 1

Survival Rate Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
FR_UFR1		0.9000	1.0000	1.0000	1.0000	0.9000
GH_ER2		1.0000	0.9000	1.0000	1.0000	0.7000
CM_MC1	XC	1.0000	1.0000	1.0000	1.0000	1.0000
LC_SLC		1.0000	1.0000	1.0000	1.0000	1.0000
FR_FRABCH		1.0000	1.0000	1.0000	1.0000	0.8000
FR_FRCP1		1.0000	1.0000	0.9000	1.0000	1.0000
GH_FR1		0.9000	1.0000	1.0000	1.0000	0.9000
GH_ERC		1.0000	1.0000	0.9000	0.8000	1.0000
CM_MC2		0.6000	0.7000	0.6000	0.7000	0.9000
EV_MC2		1.0000	1.0000	0.9000	0.9000	1.0000
EV_HC1		1.0000	1.0000	1.0000	1.0000	1.0000
LC_DCDS		1.0000	0.9000	1.0000	0.8000	0.9000
LC_LC3		1.0000	1.0000	0.9000	1.0000	1.0000
LC_LC5		1.0000	1.0000	1.0000	1.0000	1.0000
LC_LCDSSLCC		0.9000	1.0000	1.0000	1.0000	1.0000
RG_MIDAG		1.0000	1.0000	1.0000	1.0000	1.0000
FR_FR4		1.0000	1.0000	1.0000	1.0000	1.0000
FR_FRRD		1.0000	0.9000	0.9000	1.0000	1.0000
FR_FR2		1.0000	0.7000	1.0000	0.6000	0.8000
FR_MULTIPLATE		1.0000	1.0000	1.0000	0.9000	1.0000

Survival Rate Binomials

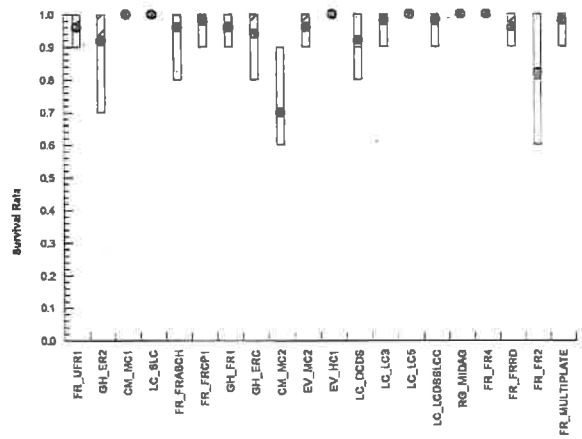
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
FR_UFR1		9/10	12/12	10/10	10/10	9/10
GH_ER2		10/10	9/10	10/10	10/10	7/10
CM_MC1	XC	10/10	10/10	10/10	10/10	10/10
LC_SLC		10/10	10/10	10/10	10/10	10/10
FR_FRABCH		10/10	10/10	10/10	10/10	8/10
FR_FRCP1		10/10	10/10	9/10	10/10	10/10
GH_FR1		9/10	10/10	10/10	10/10	9/10
GH_ERC		10/10	10/10	9/10	8/10	10/10
CM_MC2		6/10	7/10	6/10	7/10	9/10
EV_MC2		10/10	10/10	9/10	9/10	10/10
EV_HC1		10/10	10/10	10/10	10/10	10/10
LC_DCDS		10/10	9/10	10/10	8/10	9/10
LC_LC3		10/10	10/10	9/10	10/10	10/10
LC_LC5		10/10	10/10	10/10	10/10	10/10
LC_LCDSSLCC		9/10	10/10	10/10	10/10	10/10
RG_MIDAG		10/10	10/10	10/10	10/10	10/10
FR_FR4		10/10	10/10	10/10	10/10	10/10
FR_FRRD		10/10	9/10	9/10	10/10	10/10
FR_FR2		10/10	7/10	10/10	6/10	8/10
FR_MULTIPLATE		10/10	10/10	10/10	9/10	10/10

MG

Hyalella 28-d Survival and Growth Sediment Test — **Nautilus Environmental**

Analysis ID:	12-4449-5706	**Endpoint:**	Survival Rate	**CETIS Version:**	CETISv1.9.4
Analyzed:	29 Oct-21 10:24	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1

Graphics



Analyst: KS ✓ QA: NOV 09 2021 MG

CETIS Analytical Report

Hyalella 28-d Survival and Growth Sediment Test

Nautilus Environmental

Analysis ID:	12-9688-8781	**Endpoint:**	Survival Rate	**CETIS Version:**	CETISv1.9.4
Analyzed:	10 Nov-21 11:11	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1
Batch ID:	07-5364-5346	**Test Type:**	Survival-Growth	**Analyst:**	Karen Lee
Start Date:	20 May-21	**Protocol:**	EPA/600/R-99/064 (2000)	**Diluent:**	
Ending Date:	17 Jun-21	**Species:**	Hyalella azteca	**Brine:**	
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	Aquatic Biosystems, CO **Age:** 7-8d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
FR_UFR1	12-4424-2146	18 May-21	19 May-21 11:20	48h (2.3 °C)	Teck Coal	
GH_ER2	02-4275-7088	18 May-21 09:55	19 May-21 11:20	38h (0.4 °C)		
CM_MC1	01-4263-6393	18 May-21 11:08	19 May-21 11:20	37h (1.1 °C)		
LC_SLC	12-1662-7355	18 May-21 09:45	19 May-21 11:20	38h (4.1 °C)		
FR_FRABCH	05-6713-4959	18 May-21	19 May-21 11:20	48h (1.9 °C)		
FR_FRCP1	19-8027-7867	18 May-21	19 May-21 11:20	48h (1.2 °C)		
GH_FR1	15-9886-5398	18 May-21 12:30	19 May-21 11:20	35h (0.1 °C)		
GH_ERC	21-0704-4941	18 May-21 11:20	19 May-21 11:20	37h (0.6 °C)		
CM_MC2	17-6814-6287	18 May-21 09:50	19 May-21 11:20	38h (1.1 °C)		
EV_MC2	15-5628-9197	18 May-21 13:00	19 May-21 11:20	35h (3.6 °C)		
EV_HC1	05-8730-9056	18 May-21 11:20	19 May-21 11:20	37h (4.8 °C)		
LC_DCDS	20-0340-1068	18 May-21 11:00	19 May-21 11:20	37h (4.6 °C)		
LC_LC3	18-4816-9590	18 May-21 10:15	19 May-21 11:20	38h (4.7 °C)		
LC_LC5	03-8768-2280	18 May-21 09:50	19 May-21 11:20	38h (5.2 °C)		
LC_LCDSSLCC	02-2977-6783	18 May-21 11:00	19 May-21 11:20	37h (4.3 °C)		
RG_MIDAG	19-6180-4600	18 May-21 09:15	19 May-21 11:20	39h (0.1 °C)		
FR_FR4	17-1641-7069	18 May-21 09:29	19 May-21 11:20	39h (4.6 °C)		
FR_FRRD	06-3190-8505	18 May-21 08:22	19 May-21 11:20	40h (3.4 °C)		
FR_FR2	11-2149-8709	18 May-21 10:28	19 May-21 11:20	38h (4.6 °C)		
FR_MULTIPLATE	16-7235-2081	18 May-21 11:21	19 May-21 11:20	37h (3.4 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
FR_UFR1	Water Sample	Teck Coal	FR_UFR1_WEK_2021-05-1	
GH_ER2	Water Sample	Teck Coal	GH_ER2_WS_2021-05-18_	
CM_MC1	Water Sample	Teck Coal	CM_MC1_WS_2021-05-18	
LC_SLC	Water Sample	Teck Coal	LC_SLC_WS_2021-05-18_	
FR_FRABCH	Water Sample	Teck Coal	FR_FRABCH_WEK_2021-	
FR_FRCP1	Water Sample	Teck Coal	FR_FRCP1_WEK_2021-05	
GH_FR1	Water Sample	Teck Coal	GH_FR1_WS_2021-05-18_	
GH_ERC	Water Sample	Teck Coal	GH_ERC_WS_2021-05-18	
CM_MC2	Water Sample	Teck Coal	CM_MC2_WS_2021-05-18	
EV_MC2	Water Sample	Teck Coal	EV_MC2_WS_2020_Q2_W	
EV_HC1	Water Sample	Teck Coal	EV_HC1_WS_2020_Q2_W	
LC_DCDS	Water Sample	Teck Coal	LC_DCDS_WS_2021-05-18	
LC_LC3	Water Sample	Teck Coal	LC_LC3_WS_2021-05-18_	
LC_LC5	Water Sample	Teck Coal	LC_LC5_WS_2021-05-18_	
LC_LCDSSLCC	Water Sample	Teck Coal	LC_LCDSSLCC_WS_2021-	
RG_MIDAG	Water Sample	Teck Coal	RG_MIDAG_WS_2021-05-	
FR_FR4	Water Sample	Teck Coal	FR_FR4_WS_2021-05-18_	
FR_FRRD	Water Sample	Teck Coal	FR_FRRD_WS_2021-05-18	
FR_FR2	Water Sample	Teck Coal	FR_FR2_WS_2021-05-18_	
FR_MULTIPLATE	Water Sample	Teck Coal	FR_MULTIPLATE_WS_202	

Fisher Exact/Bonferroni-Holm Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
Site Control (LC-SLC)		FR_UFR1	0.2574	Exact	1.0000	Non-Significant Effect
		GH_ER2	0.0587	Exact	0.9984	Non-Significant Effect
		CM_MC1	1.0000	Exact	1.0000	Non-Significant Effect
		FR_FRABCH	0.2475	Exact	1.0000	Non-Significant Effect

Hyalella 28-d Survival and Growth Sediment Test — **Nautilus Environmental**

Analysis ID:	12-9688-8781	**Endpoint:**	Survival Rate	**CETIS Version:**	CETISv1.9.4
Analyzed:	10 Nov-21 11:11	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1

Fisher Exact/Bonferroni-Holm Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
		FR_FRCP1	0.5000	Exact	1.0000	Non-Significant Effect
		GH_FR1	0.2475	Exact	1.0000	Non-Significant Effect
		GH_ERC	0.1212	Exact	1.0000	Non-Significant Effect
		CM_MC2*	0.0000	Exact	1.7E-04	Significant Effect
		EV_MC2	0.2475	Exact	1.0000	Non-Significant Effect
		EV_HC1	1.0000	Exact	1.0000	Non-Significant Effect
		LC_DCDS	0.0587	Exact	0.9984	Non-Significant Effect
		LC_LC3	0.5000	Exact	1.0000	Non-Significant Effect
		LC_LC5	1.0000	Exact	1.0000	Non-Significant Effect
		LC_LCDSSLCC	0.5000	Exact	1.0000	Non-Significant Effect
		RG_MIDAG	1.0000	Exact	1.0000	Non-Significant Effect
		FR_FR4	1.0000	Exact	1.0000	Non-Significant Effect
		FR_FRRD	0.2475	Exact	1.0000	Non-Significant Effect
		FR_FR2*	0.0013	Exact	0.0237	Significant Effect
		FR_MULTIPLATE	0.5000	Exact	1.0000	Non-Significant Effect

Data Summary

Sample	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
FR_UFR1		50	2	52	0.9615	0.03846	3.85%
GH_ER2		46	4	50	0.92	0.08	8.0%
CM_MC1		50	0	50	1	0	0.0%
LC_SLC	XC	50	0	50	1	0	0.0%
FR_FRABCH		48	2	50	0.96	0.04	4.0%
FR_FRCP1		49	1	50	0.98	0.02	2.0%
GH_FR1		48	2	50	0.96	0.04	4.0%
GH_ERC		47	3	50	0.94	0.06	6.0%
CM_MC2		35	15	50	0.7	0.3	30.0%
EV_MC2		48	2	50	0.96	0.04	4.0%
EV_HC1		50	0	50	1	0	0.0%
LC_DCDS		46	4	50	0.92	0.08	8.0%
LC_LC3		49	1	50	0.98	0.02	2.0%
LC_LC5		50	0	50	1	0	0.0%
LC_LCDSSLCC		49	1	50	0.98	0.02	2.0%
RG_MIDAG		50	0	50	1	0	0.0%
FR_FR4		50	0	50	1	0	0.0%
FR_FRRD		48	2	50	0.96	0.04	4.0%
FR_FR2		41	9	50	0.82	0.18	18.0%
FR_MULTIPLATE		49	1	50	0.98	0.02	2.0%

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Hyalella 28-d Survival and Growth Sediment Test — **Nautilus Environmental**

Analysis ID: 12-9688-8781 **Endpoint:** Survival Rate **CETIS Version:** CETISv1.9.4
Analyzed: 10 Nov-21 11:11 **Analysis:** STP 2xK Contingency Tables **Status Level:** 1

Survival Rate Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
FR_UFR1		0.9000	1.0000	1.0000	1.0000	0.9000
GH_ER2		1.0000	0.9000	1.0000	1.0000	0.7000
CM_MC1		1.0000	1.0000	1.0000	1.0000	1.0000
LC_SLC	XC	1.0000	1.0000	1.0000	1.0000	1.0000
FR_FRABCH		1.0000	1.0000	1.0000	1.0000	0.8000
FR_FRCP1		1.0000	1.0000	0.9000	1.0000	1.0000
GH_FR1		0.9000	1.0000	1.0000	1.0000	0.9000
GH_ERC		1.0000	1.0000	0.9000	0.8000	1.0000
CM_MC2		0.6000	0.7000	0.6000	0.7000	0.9000
EV_MC2		1.0000	1.0000	0.9000	0.9000	1.0000
EV_HC1		1.0000	1.0000	1.0000	1.0000	1.0000
LC_DCDS		1.0000	0.9000	1.0000	0.8000	0.9000
LC_LC3		1.0000	1.0000	0.9000	1.0000	1.0000
LC_LC5		1.0000	1.0000	1.0000	1.0000	1.0000
LC_LCDSSLCC		0.9000	1.0000	1.0000	1.0000	1.0000
RG_MIDAG		1.0000	1.0000	1.0000	1.0000	1.0000
FR_FR4		1.0000	1.0000	1.0000	1.0000	1.0000
FR_FRRD		1.0000	0.9000	0.9000	1.0000	1.0000
FR_FR2		1.0000	0.7000	1.0000	0.6000	0.8000
FR_MULTIPLATE		1.0000	1.0000	1.0000	0.9000	1.0000

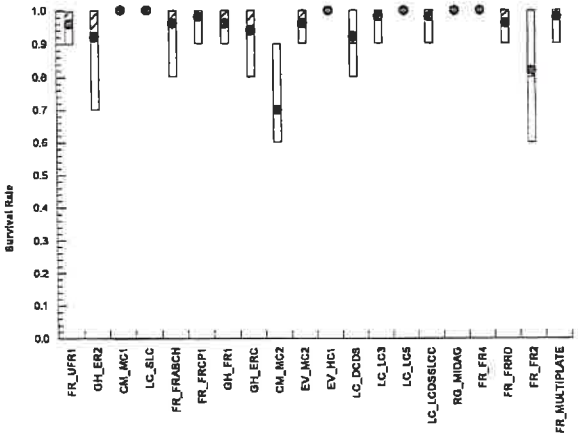
Survival Rate Binomials

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
FR_UFR1		9/10	12/12	10/10	10/10	9/10
GH_ER2		10/10	9/10	10/10	10/10	7/10
CM_MC1		10/10	10/10	10/10	10/10	10/10
LC_SLC	XC	10/10	10/10	10/10	10/10	10/10
FR_FRABCH		10/10	10/10	10/10	10/10	8/10
FR_FRCP1		10/10	10/10	9/10	10/10	10/10
GH_FR1		9/10	10/10	10/10	10/10	9/10
GH_ERC		10/10	10/10	9/10	8/10	10/10
CM_MC2		6/10	7/10	6/10	7/10	9/10
EV_MC2		10/10	10/10	9/10	9/10	10/10
EV_HC1		10/10	10/10	10/10	10/10	10/10
LC_DCDS		10/10	9/10	10/10	8/10	9/10
LC_LC3		10/10	10/10	9/10	10/10	10/10
LC_LC5		10/10	10/10	10/10	10/10	10/10
LC_LCDSSLCC		9/10	10/10	10/10	10/10	10/10
RG_MIDAG		10/10	10/10	10/10	10/10	10/10
FR_FR4		10/10	10/10	10/10	10/10	10/10
FR_FRRD		10/10	9/10	9/10	10/10	10/10
FR_FR2		10/10	7/10	10/10	6/10	8/10
FR_MULTIPLATE		10/10	10/10	10/10	9/10	10/10

Hyalella 28-d Survival and Growth Sediment Test — **Nautilus Environmental**

Analysis ID:	12-9688-8781	**Endpoint:**	Survival Rate	**CETIS Version:**	CETISv1.9.4
Analyzed:	10 Nov-21 11:11	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1

Graphics



APPENDIX B - Chain-of-custody forms

Teck

COC ID: 5/18/2021 | TURNAROUND TIME: | RUSH:

PROJECT/CLIENT INFO				LABORATORY				OTHER INFO			
Facility Name / Job#	Fording River Operation			Lab Name	Nautilus Environmental - BC			Report Format / Distribution		Excel	PDF	EDD
Project Manager	Scott Roughead			Lab Contact				Email 1:	david.burroughs@teck.com	X	X	X
Email	scott.roughead@teck.com			Email	BCinfo@nautilusenvironmental.ca			Email 2:	britt.anderson@teck.com	X	X	X
Address				Address	8664 Commerce Court			Email 3:	scott.roughead@teck.com	X	X	X
								Email 4:	teckcoal@equisonline.com			X
City	Elkford	Province	BC	City	Burnaby	Province	BC	Email 5:	carlie.meyer@teck.com	X	X	X
Postal Code		Country	Canada	Postal Code	V5A 4N7	Country	Canada	Email 6:	cait.good@teck.com	X	X	X
Phone Number	1-250-433-6976			Phone Number	604-420-8773							

SAMPLE DETAILS / ANALYSIS REQUESTED

Filtered - F: Field, L: Lab, FL: Field & Lab, N: None

Sample ID	Sample Location (sys_loc_code)	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	TIR	PRESERV.	ANALYSIS: 7-d C.dubia P/F	7-d C.dubia P/F (EDTA)	72-hr P. subcapitata P/F	30-d embryo EA P/F	28-d Hyalella P/F	28-d Hyalella P/F (EDTA)				
FR_FR4_WS_2021-05-18_N	FR_FR4	WS	NO	5/18/2021	9:29	G	4			X			4	4					4.6-4.8
FR_FRRD_WS_2021-05-18_N	FR_FRRD	WS	NO	5/18/2021	8:22	G	4			X			4	4					3.4-3.8
FR_FR2_WS_2021-05-18_N	FR_FR2	WS	NO	5/18/2021	10:28	G	4			X			4	4					4.6-5.8
FR_MULTIPLATE_WS_2021-05-18_NP	FR_MULTIPLATE	WS	NO	5/18/2021	11:21	G	4			X			4	4					3.4-3.7
													210963	210964					

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
-Only 2 containers for FRRD arrived -2 containers for DC1 arrived			Tyrone Hamilton Nautilus - Burnaby	May 19/21 @ 11:20 Q2-W1

SERVICE REQUEST (rush - subject to availability)					
Regular (default)	X	Sampler's Name	Tyler Forbin	Mobile #	
Priority (2-3 business days) - 50% surcharge		Sampler's Signature		Date/Time	2021.05.18
Emergency (1 Business Day) - 100% surcharge					
For Emergency <1 Day, ASAP or Weekend - Contact ALS					

Teck

COC ID: 5/18/2021 | TURNAROUND TIME: | RUSH:

PROJECT/CLIENT INFO				LABORATORY				OTHER INFO				
Facility Name / Job#	Fording River Operation			Lab Name	Nautilus Environmental - BC			Report Format / Distribution		Excel	PDF	EDD
Project Manager	Scott Roughead			Lab Contact				Email 1:	david.burroughs@teck.com	X	X	X
Email	scott.roughead@teck.com			Email	BCinfo@nautilusenvironmental.ca			Email 2:	britt.anderson@teck.com	X	X	X
Address				Address	8664 Commerce Court			Email 3:	scott.roughead@teck.com	X	X	X
								Email 4:	teckcoal@equisonline.com			X
City	Elkford	Province	BC	City	Burnaby	Province	BC	Email 5:				
Postal Code		Country	Canada	Postal Code	V5A 4N7	Country	Canada	Email 6:	jared.cayenne@teck.com	X	X	X
Phone Number	1-250-433-6976			Phone Number	604-420-8773			VPO00741382				

SAMPLE DETAILS | **ANALYSIS REQUESTED** (Filtered - F: Field, L: Lab, FL: Field & Lab, N: None)

Sample ID	Sample Location (sys_loc_code)	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	Filt.	PRESERV.	ANALYSIS: 7-d C.dubia P/F	7-d C.dubia P/F (EDTA)	72-hr P. subcapitata P/F	30-d embryo EA P/F	28-d Hyalella P/F	28-d Hyalella P/F (EDTA)						
								NO	NO	NO	NO	NO	NO								
FR_FRCP1_WEK_2021-05-17_N	FR_FRCP1	WS	NO	5/18/2021		G	5			X	X	X	X	X	X					1.2-2.4	
FR_FRABCH_WEK_2021-05-17_N	FR_FRABCH	WS	NO	5/18/2021		G	4			X		X	X	X						1.9-2.8	
FR_UFR1_WEK_2021-05-17_N	FR_UFR1	WS	NO	5/18/2021		G	4			X		X	X	X						2.3-3.3	
										210962	210959	210961	210963	210964	210960						

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
7 COOLERS TOTAL	Cruz Canlas	May 18, 2021	Tyrone Hamilton	May 19/21 @1020
			Nautilus - Burnaby	Q2-Q1

SERVICE REQUEST (rush - subject to availability)

Regular (default)	X
Priority (2-3 business days) - 50% surcharge	
Emergency (1 Business Day) - 100% surcharge	
For Emergency <1 Day, ASAP or Weekend - Contact ALS	

Sampler's Name	Cruz Canlas	Mobile #	250-433-6166
Sampler's Signature		Date/Time	May 18, 2021

Teck

COC ID:	18 th of May, Chronic TOX_Naut	TURNAROUND TIME:	regular	RUSH:	

PROJECT/CLIENT INFO				LABORATORY				OTHER INFO				
Facility Name	Greenhills Operations			Lab Name	Nautilus Environmental			EDD delivery:				
Project Manager	Jeremy Enns			Lab Contact	Richard Chea			Email 1:		x	x	x
Email	jeremy.enns@teck.com			Email				Email 2:		x	x	x
Address	PO Box 5000			Address	8664 Commerce Court			Email 3:	teckcoal@equisonline.com			x
								Email 4:		x	x	x
City	Elkford	Province	BC	City	Burnaby	Province	BC	Email 5:		x	x	x
Postal Code	V0B 1H0	Country	Canada	Postal Code	V5A 4N7	Country	Can	Email 6:	DL-Equis-GHO-Field@teck.com	x	x	x
Phone Number	250 865 3274			Phone Number	403.253.7121			PO number		610307		

SAMPLE DETAILS / ANALYSIS REQUESTED

Please indicate below Filtered, Perserved or both (F, P, F/P)

Sample ID	Sample Location	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	ANALYSIS	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
									210962 7-d C.dubia P/F	210961 72-hr P. subcapitata P/F	210963 30-d embryo EA P/F	210964 28-d Hyalella P/F								
GH_ER2_WS_2021-05-18_N	GH_ER2	WS	N	18/05/2021	9:55	G	4		X	X	X	X							0.4 - 0.5	
GH_ERC_WS_2021-05-18_N	GH_ERC	WS	N	18/05/2021	11:20	G	4		X	X	X	X							0.6 - 1.0	
GH_FR1_WS_2021-05-18_N	GH_FR1	WS	N	18/05/2021	12:30	G	4		X	X	X	X							0.1 - 0.3	

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	Date	Time	Accepted By/Affiliation	Date	Time
				Tyrone Hamilton	May 19/21	@11:20
				Nautilus - Burnaby	02-W1	

SERVICE REQUEST (rush - subject to availability)					
Regular (default)	X	Sampler's Name	SS/RG	Mobile #	
Priority (2-3 business days) - 50% surcharge					
Emergency (1 Business Day) - 100% surcharge		Sampler's Signature		Date/Time	18th of May,2021
For Emergency <1 Day, ASAP or Weekend - Contact ALS					

Teck

COC ID:	20210518CRN1B	TURNAROUND TIME:		RUSH:	

PROJECT/CLIENT INFO				LABORATORY				OTHER INFO				
Facility Name / Job#	Elkview Operations			Lab Name	Nautilus Environmental			Report Format / Distribution		Excel	PDF	EDD
Job Description	Q1 Chronic Sampling			Lab Contact	Jeslin Wijaya			Email 1:	kennedy.Allen@teck.com	x	x	x
Project Manager	Jennifer Dane			Email	jeslin@nautilusenvironmental.ca			Email 2:	teckcoal@equisonline.com			x
Email	jennifer.dane@teck.com			Address	8664 Commerce Court			Email 3:	Colby.bracken@teck.com	x	x	x
Address	RR#1 HWY# 3				Imperial Square Lake City			Email 4:	Chris.emslie@teck.com	x	x	x
								Email 5:	Teck.Lab.Results@teck.com	x	x	x
City	Sparwood	Province	BC	City	Burnaby	Province	BC	PO number	VPO00678876			
Postal Code	V1C 4C3	Country	Canada	Postal Code	V5A 4N7	Country	Canada					
Phone Number	1-250-425-8137			Phone Number	604-420-8773							

SAMPLE DETAILS								ANALYSIS REQUESTED										Filtered - F: Field, L: Lab, FL: Field & Lab, N: None
								FILTERED	No	No	No	No						
								PRESERVED	No	No	No	No						
Sample ID	Sample Location	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	ANALYSIS	7-d C.dubia P/F	72-hr P. subcapitata P/F	30-d embryo EA P/F	28-d H. azteca P/F						
EV_HC1_WS_2020_Q2_WK1_N	EV_HC1	WS	N	5/18/2021	11:20	G	4				4						4.8-5.1	
EV_MC2_WS_2020_Q2_WK1_N	EV_MC2	WS	N	2/18/2021	13:00	G	4				4						3.6-3.8	
											210963	210964						
					Total		8											

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
Toxicity 96-Hr/48-HR = 96 Hr Rainbow Trout pass/fail & 48 Hr Daphnia pass/fail (Daphinia testing to occur at 20 degrees)	C. Bracken	18-May-21	Tyrone Hamilton Nautilus - Burnaby	May 19/21 @11:20 Q2 - W1

NB OF BOTTLES RETURNED/DESCRIPTION					
Regular (default)	X	Sampler's Name	C. Bracken	Mobile #	1-250-425-1101
Priority (2-3 business days) - 50% surcharge					
Emergency (1 Business Day) - 100% surcharge		Sampler's Signature	Colby B	Date/Time	May 18, 2021
For Emergency <1 Day, ASAP or Weekend - Contact ALS					

Teck

COC ID:	Q2_CHRONIC_05182021_Burn	TURNAROUND TIME:	Regular	RUSH:	No

PROJECT/CLIENT INFO				LABORATORY				OTHER INFO				
Facility Name / Job#	Coal Mountain Operations			Lab Name	Nautilus Environmental			Report Format / Distribution		Excel	PDF	EDD
Project Manager	Victoria Sharpe			Lab Contact	Armando Tang			Email 1:	Jay.jones@teck.com	X	X	X
Email	Victoria.Sharpe@teck.com			Email	armando@nautilusenvironmental.ca			Email 2:	teckcoal@equisonline.com			X
								Email 3:	Victoria.Sharpe@teck.com	X	X	X
								Email 4	Don.Sacino@teck.com	X	X	X
Address	PO Box 3000			Address	8664 commerce Court			Email 5:	Shelby.Holden@teck.com	X	X	X
City	Sparwood	Province	BC	City	Burnaby	Province	BC	PO number				
Postal Code	V0B 2G0	Country	Canada	Postal Code	V5A 4N7	Country	Canada					
Phone Number	1-250-425-7522			Phone Number	604-420-8773							

SAMPLE DETAILS								ANALYSIS REQUESTED												Filtered - F: Field, L: Lab, FL: Field & Lab, N: None
								Filt.												
								PRESERV.	210962	210959	210961	210963	210964	210960						
Sample ID	Sample Location	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	ANALYSIS	7-d C.dubia P/F	7-d C.dubia P/F (EDTA)	72-hr P. subcapitata P/F	30-d embryo EA P/F	28-d Hyalella P/F	28-d Hyalella P/F (EDTA)						
CM_MC2_WS_2021-05-18_N	CM_MC2	WS	No	5/18/2021	9:50	G	5		x	x	x	x	x	x					1.1-1.8	
CM_MC1_WS_2021-05-18_N	CM_MC1	WS	No	5/18/2021	11:08	G	4		x		x	x	x						1.1-1.2	
RG_MIDAG_WS_2021-05-18_N	RG_MIDAG	WS	No	5/18/2021	9:15	G	2		x	x			x	x					Q1-1.0	

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
			Tyrone Hamilton	May 19/21 @ 11:20
			Nautilus - Burnaby	Q2-W1

NB OF BOTTLES RETURNED/DESCRIPTION	
Regular (default)	X
Priority (2-3 business days) - 50% surcharge	
Emergency (1 Business Day) - 100% surcharge	
For Emergency <1 Day, ASAP or Weekend - Contact ALS	

Sampler's Name	SH/DS	Mobile #	250 425 7522
Sampler's Signature	SHDS	Date/Time	May 18, 2021

Teck

COC ID:	20210518 Chronic Tox Burn	TURNAROUND TIME:		RUSH:	

PROJECT/CLIENT INFO				LABORATORY				OTHER INFO				
Facility Name / Job#	Line Creek Operation			Lab Name	Nautilus Environmental			Report Format / Distribution		Excel	PDF	EDD
Project Manager	Tom Jeffery			Lab Contact	Armando Tang			Email 1:	tom.jeffery@teck.com	x	x	
Email	tom.jeffery@teck.com			Email	armando@nautilusenvironmental.com			Email 2:	teckcoal@equisonline.com			x
Address	Box 2003			Address	8664 Commerce Crt			Email 3:	drake.tymstra@teck.com	x	x	
	15km North Hwy 43							Email 4:	shanise.fossen@teck.com	x	x	
								Email 5:	tanya.dick@teck.com	x	x	
City	Sparwood	Province	BC	City	Burnaby	Province	BC	PO number	VPO00741384			
Postal Code	V0B 2G0	Country	Canada	Postal Code	V5A 4N7	Country	Canada					
Phone Number	250-425-6111			Phone Number	604-420-8773							

SAMPLE DETAILS / ANALYSIS REQUESTED

Filtered - F: Field, L: Lab, FL: Field & Lab, N: None

Sample ID	Sample Location	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	7-d C.dubia P/F (290962)	72-hr P. subcapitata P/F (210961)	30-d embryo EA P/F (210963)	28-d Hyalella P/F (210964)								
Filt.								N	N	N	N								
PRESERV.								N	N	N	N								
LC_DCDS_WS_2021-05-18_N	LC_DCDS	WS	No	18-May-21	11:00	G	1	x	x	x	x							4.6 -	4.9
LC_LC3_WS_2021-05-18_N	LC_LC3	WS	No	18-May-21	10:15	G	1	x	x	x	x							4.7 -	5.8
LC_SLC_WS_2021-05-18_N	LC_SLC	WS	No	18-May-21	9:45	G	1	x	x	x	x							4.1 -	5.0
LC_LC5_WS_2021-05-18_N	LC_LC5	WS	No	18-May-21	9:50	G	1	x	x	x	x							5.2 -	5.6
LC_LCDSSLCC_WS_2021-05-18_N	LC_LCDSSLCC	WS	No	18-May-21	11:00	G	1	x	x	x	x							4.3 -	5.4

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
Please provide prelimnary update as results are available	S.Fossen [signature]	5/18/2021	Tyrone Hamilton	May 19/21 @ 11:20
			Nautilus - Burnaby	Q2 - W1

NB OF BOTTLES RETURNED/DESCRIPTION					
Regular (default)	X	Sampler's Name	S.Fossen	Mobile #	O: 250-425-3196 / C: 780-223-8222
Priority (2-3 business days) - 50% surcharge					
Emergency (1 Business Day) - 100% surcharge		Sampler's Signature	[signature]	Date/Time	May 18, 2021
For Emergency <1 Day, ASAP or Weekend - Contact ALS					

Teck

COC ID: 5/25/2021 | TURNAROUND TIME: | RUSH:

PROJECT/CLIENT INFO				LABORATORY				OTHER INFO			
Facility Name / Job#	Fording River Operation			Lab Name	Nautilus Environmental - BC			Report Format / Distribution		Excel	PDF	EDD
Project Manager	Scott Roughead			Lab Contact				Email 1:	david.burroughs@teck.com	X	X	X
Email	scott.roughead@teck.com			Email	BCinfo@nautilusenvironmental.ca			Email 2:	britt.anderson@teck.com	X	X	X
Address				Address	8664 Commerce Court			Email 3:	scott.roughead@teck.com	X	X	X
								Email 4:	teckcoal@equisonline.com			X
City	Elkford	Province	BC	City	Burnaby	Province	BC	Email 5:	carlie.meyer@teck.com	X	X	X
Postal Code		Country	Canada	Postal Code	V5A 4N7	Country	Canada	Email 6:	cait.good@teck.com	X	X	X
Phone Number	1-250-433-6976			Phone Number	604-420-8773							

SAMPLE DETAILS | **ANALYSIS REQUESTED** (Filtered - F: Field, L: Lab, FL: Field & Lab, N: None)

Sample ID	Sample Location (sys loc code)	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	FILT.	PRESERV.	ANALYSIS: 7-d C.dubia P/F	7-d C.dubia P/F (EDTA)	72-hr P. subcapitata P/F	30-d embryo EA P/F	28-d Hyalella P/F	28-d Hyalella P/F (EDTA)					
FR_FR4_WS_2021-05-25_N	FR_FR4	WS	NO	5/25/2021	8:32	G	3						X	X					3.6-4.0	
FR_FRRD_WS_2021-05-25_N	FR_FRRD	WS	NO	5/25/2021	7:51	G	3						X	X					3.3-3.6	
FR_FR2_WS_2021-05-25_N	FR_FR2	WS	NO	5/25/2021	9:24	G	3						X	X					4.2-4.6	
FR_MULTIPLATE_WS_2021-05-25_NP	FR_MULTIPLATE	WS	NO	5/25/2021	10:19	G	3						X	X					2.6-2.8	
													210963	196412						

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
			Tyrone Hamilton	May 26/21 @ 11:00
			Nautilus - Burnaby	Q2-W2

SERVICE REQUEST (rush - subject to availability)

Regular (default)	X
Priority (2-3 business days) - 50% surcharge	
Emergency (1 Business Day) - 100% surcharge	
For Emergency <1 Day, ASAP or Weekend - Contact ALS	

Sampler's Name	Tyler Fortin	Mobile #	
Sampler's Signature		Date/Time	May 25, 2021

Teck

COC ID: 5/25/2021 | TURNAROUND TIME: | RUSH:

PROJECT/CLIENT INFO				LABORATORY				OTHER INFO			
Facility Name / Job#	Fording River Operation			Lab Name	Nautilus Environmental - BC			Report Format / Distribution		Excel	PDF	EDD
Project Manager	Scott Roughead			Lab Contact				Email 1:	david.burroughs@teck.com	X	X	X
Email	scott.roughead@teck.com			Email	BCinfo@nautiluser.vironmental.ca			Email 2:	britt.anderson@teck.com	X	X	X
Address				Address	8664 Commerce Court			Email 3:	scott.roughead@teck.com	X	X	X
								Email 4:	cruz.canlas@teck.com	X	X	X
City	Elkford	Province	BC	City	Burnaby	Province	BC	Email 5:	jamie.walsh@teck.com	X	X	X
Postal Code		Country	Canada	Postal Code	V5A 4N7	Country	Canada	Email 6:	teckcoal@equisonline.com			X
Phone Number	1-250-433-6976			Phone Number	604-420-8773			VPO00741382				

SAMPLE DETAILS								ANALYSIS REQUESTED														
								Filt	NO	NO	NO	NO	NO	NO								
								PRESTAV	NO	NO	NO	NO	NO	NO								
								ANALYSIS	7-d C.dubia P/F	7-d C.dubia P/F (EDTA)	72-hr P. subcapitata P/F	30-d embryo EA P/F	28-d Hyalella P/F	28-d Hyalella P/F (EDTA)								
Sample ID	Sample Location (sys_loc_code)	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.															
FR_FRCP1_WEK_2021-05-24_N	FR_FRCP1	WS	NO	5/25/2021	9:46	G	5					X	X	X							3.1 - 3.8	
FR_FRABCH_WEK_2021-05-24_N	FR_FRABCH	WS	NO	5/25/2021	9:30	G	4					X	X								2.9 - 3.1	
FR_UFR1_WEK_2021-05-24_N	FR_UFR1	WS	NO	5/25/2021	11:26	G	4					X	X								2.1 - 2.6	
												210963	210964	210960								

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
7 COOLERS TOTAL		May 25, 2021	Tyrone Hamilton	May 26/21 @ 11:00
			Nautilus - Burnaby	Q2-W2

SERVICE REQUEST (rush - subject to availability)					
Regular (default)	X	Sampler's Name	Hanna Whiting	Mobile #	(250)425-5999
Priority (2-3 business days) - 50% surcharge		Sampler's Signature	Hanna Whiting	Date/Time	May 25, 2021
Emergency (1 Business Day) - 100% surcharge					
For Emergency <1 Day, ASAP or Weekend - Contact ALS					

Teck

COC ID:	25th of May, Chronic TOX_Naut	TURNAROUND TIME:	regular	RUSH:	

PROJECT/CLIENT INFO				LABORATORY				OTHER INFO				
Facility Name	Greenhills Operations			Lab Name	Nautilus Environmental			EDD delivery:				
Project Manager	Jeremy Enns			Lab Contact	Richard Chea			Email 1:				
Email	jeremy.enns@teck.com			Email				Email 2:				
Address	PO Box 5000			Address	8664 Commerce Court			Email 3:	teckcoal@equisonline.com	x	x	x
								Email 4:				
City	Elkford	Province	BC	City	Burnaby	Province	BC	Email 5:				
Postal Code	V0B 1H0	Country	Canada	Postal Code	V5A 4N7	Country	Can	Email 6:	DL-Equis-GHO-Field@teck.com	x	x	x
Phone Number	250 865 3274			Phone Number	403.253.7121			PO number	610307			

SAMPLE DETAILS								ANALYSIS REQUESTED													
								Please indicate below Filtered, Perserved or both (F, P, F/P)													
								#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		
Sample ID	Sample Location	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	7-d C.dubia P/F	72-hr P. subcapitata P/F	30-d embryo EA P/F 210963	28-d Hyalella P/F 210964										
GH_ER2_WS_2021-05-25_N	GH_ER2	WS		25-May	11:45	G	3			X	X									1.9 - 2.6	
GH_ERC_WS_2021-05-25_N	GH_ERC	WS		25-May	10:45	G	3			X	X									0.0 - 0.0	
GH_FR1_WS_2021-05-25_N	GH_FR1	WS		25-May	10:05	G	3			X	X									0.0 - 0.7	

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	Date	Time	Accepted By/Affiliation	Date	Time
1 container of ER2 arrived leaking				Tyrone Hamilton	May 26/21	@ 11:09
				Nautilus - Burnaby	Q2+W2	

SERVICE REQUEST (rush - subject to availability)					
Regular (default)	X	Sampler's Name	SS/RG	Mobile #	
Priority (2-3 business days) - 50% surcharge					
Emergency (1 Business Day) - 100% surcharge		Sampler's Signature		Date/Time	25th of May,2021
For Emergency <1 Day, ASAP or Weekend - Contact ALS					

Teck

COC ID:	20210525CRN1B	TURNAROUND TIME:		RUSH:	

PROJECT/CLIENT INFO

Facility Name / Job#	Elkview Operations		
Job Description	Q1 Chronic Sampling		
Project Manager	Jennifer Dane		
Email	jennifer.dane@teck.com		
Address	RR#1 HWY# 3		
City	Sparwood	Province	BC
Postal Code	V1C 4C3	Country	Canada
Phone Number	1-250-425-8137		

LABORATORY

Lab Name	Nautilus Environmental		
Lab Contact	Jeslin Wijaya		
Email	[illegible]		
Address	8664 Commerce Court		
	Imperial Square Lake City		
City	Burnaby	Province	BC
Postal Code	V5A 4N7	Country	Canada
Phone Number	604-420-8773		

OTHER INFO

Report Format / Distribution		Excel	PDF	EDD
Email 1:	kennedy.Allen@teck.com	x	x	x
Email 2:	teckcoal@equisonline.com			x
Email 3:	Colby.bracken@teck.com	x	x	x
Email 4:	Chris.emslie@teck.com	x	x	x
Email 5:	Teck.Lab.Results@teck.com	x	x	x
PO number	VPO00678876			

SAMPLE DETAILS

ANALYSIS REQUESTED

Filtered = F: Field, L: Lab, FL: Field & Lab, N: None

Sample ID	Sample Location	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	ANALYSIS	7-d C.dubia P/F	72-hr P. subcapitata P/F	30-d embryo EA P/F	28-d H. azteca P/F					
FILTERED									No	No	No	No					
PRESERVED									No	No	No	No					
EV_HC1_WS_2021_Q2_WK2_N	EV_HC1	WS	N	5/25/2021	9:30	G	3				3						2.0-2.6
EV_MC2_WS_2021_Q2_WK2_N	EV_MC2	WS	N	5/25/2021	12:00	G	3				3						2.3-2.9
											210965	210964					
					Total		6										

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
Toxicity 96-Hr/48-HR = 96 Hr Rainbow Trout pass/fail & 48 Hr Daphnia pass/fail (Daphinia testing to occur at 20 degrees)	C. Bracken/S. Hansen	25-May-21	Tyrone Hamilton Nautilus - Burnaby	May 26/21 @ 11:00 Q2-W2

NB OF BOTTLES RETURNED/DESCRIPTION

Regular (default)	X
Priority (2-3 business days) - 50% surcharge	
Emergency (1 Business Day) - 100% surcharge	
For Emergency <1 Day, ASAP or Weekend - Contact ALS	

Sampler's Name	C. Bracken/S. Hansen	Mobile #	1-250-425-1101
Sampler's Signature	Colby	Date/Time	May 25, 2021

Teck

COC ID:	Q2_CHRONIC_05252021_Burn	TURNAROUND TIME:	Regular	RUSH:	No

PROJECT/CLIENT INFO				LABORATORY				OTHER INFO				
Facility Name / Job#	Coal Mountain Operations			Lab Name	Nautilus Environmental			Report Format / Distribution		Excel	PDF	EDD
Project Manager	Victoria Sharpe			Lab Contact	Armando Tang			Email 1:	Jay.jones@teck.com	X	X	X
Email	Victoria.Sharpe@teck.com			Email	armando@nautilusenvironmental.ca			Email 2:	teckcoal@equisonline.com			X
								Email 3:	Victoria.Sharpe@teck.com	X	X	X
								Email 4	Don.Sacino@teck.com	X	X	X
Address	PO Box 3000			Address	8664 commerce Court			Email 5:	Shelby.Holden@teck.com	X	X	X
City	Sparwood	Province	BC	City	Burnaby	Province	BC	PO number				
Postal Code	V0B 2G0	Country	Canada	Postal Code	V5A 4N7	Country	Canada					
Phone Number	1-250-425-7522			Phone Number	604-420-8773							

SAMPLE DETAILS								ANALYSIS REQUESTED												Filtered - F: Field, L: Lab, FL: Field & Lab, N: None
							Filt.													
							PRESERV.													
							ANALYSIS	7-d C.dubia P/F	7-d C.dubia P/F (EDTA)	72-hr P. subcapitata P/F	30-d embryo EA P/F 210963	28-d Hyalella P/F 210964	28-d Hyalella P/F (EDTA) 210960						
Sample ID	Sample Location	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.													
CM_MC2_WS_2021-05-25_N	CM_MC2	WS	No	5/25/2021	10:29	G	4				X	X	X						6.5-7.0	
CM_MC1_WS_2021-05-25_N	CM_MC1	WS	No	5/25/2021	8:58	G	3				X	X							5.3-5.5	
RG_MIDAG_WS_2021-05-25_N	RG_MIDAG	WS	No	5/25/2021	9:57	G	2					X	X						5.8-5.5	

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
			Tyrone Hamilton	May 26/21 @ 1150
			Nautilus - Burnaby	Q2-W2

NB OF BOTTLES RETURNED/DESCRIPTION	
Regular (default)	X
Priority (2-3 business days) - 50% surcharge	
Emergency (1 Business Day) - 100% surcharge	
For Emergency <1 Day, ASAP or Weekend - Contact ALS	

Sampler's Name	SH/DS	Mobile #	250 425 7522
Sampler's Signature	SDH	Date/Time	May 25, 2021

Teck

COC ID:	20210525 Chronic Tox Burn	TURNAROUND TIME:		RUSH:	

PROJECT/CLIENT INFO				LABORATORY				OTHER INFO				
Facility Name / Job#	Line Creek Operation			Lab Name	Nautilus Environmental			Report Format / Distribution		Excel	PDF	EDD
Project Manager	Tom Jeffery			Lab Contact	Armando Tang			Email 1:	tom.jeffery@teck.com	x	x	
Email	tom.jeffery@teck.com			Email	armando@nautilusenvironmental.com			Email 2:	teckcoal@equisonline.com			x
Address	Box 2003			Address	8664 Commerce Crt			Email 3:	drake.tymstra@teck.com	x	x	
	15km North Hwy 43							Email 4:	shanise.fossen@teck.com	x	x	
								Email 5:	tanya.dick@teck.com	x	x	
City	Sparwood	Province	BC	City	Burnaby	Province	BC	PO number	VPO00741384			
Postal Code	V0B 2G0	Country	Canada	Postal Code	V5A 4N7	Country	Canada					
Phone Number	250-425-6111			Phone Number	604-420-8773							

SAMPLE DETAILS								ANALYSIS REQUESTED											Filtered - F: Field, L: Lab, FL: Field & Lab, N: None
								FIL.	N	N									
								PRESERV.	N	N									
								ANALYSIS	210963 30-d embryo EA P/F	210964 28-d Hyalella P/F									
Sample ID	Sample Location	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.												
LC_DCDS_WS_2021-05-25_N	LC_DCDS	WS	No	25-May-21	11:45	G	3		x	x								1.6	2.1
LC_LC3_WS_2021-05-25_N	LC_LC3	WS	No	25-May-21	12:00	G	3		x	x								0.6	1.4
LC_SLC_WS_2021-05-25_N	LC_SLC	WS	No	25-May-21	11:10	G	3		x	x								0.6	1.0
LC_LC5_WS_2021-05-25_N	LC_LC5	WS	No	25-May-21	13:00	G	3		x	x								0.9	2.0
LC_LCDSSLCC_WS_2021-05-25_N	LC_LCDSSLCC	WS	No	25-May-21	12:30	G	3		x	x								0.0	0.0

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
Please provide prelimnary update as results are available	S.Fossen	2021-05-25	Tyrone Hamilton	May 26/21 @11:00
			Nautilus - Burnaby	Q2-W2

NB OF BOTTLES RETURNED/DESCRIPTION	
Regular (default)	X
Priority (2-3 business days) - 50% surcharge	
Emergency (1 Business Day) - 100% surcharge	
For Emergency <1 Day, ASAP or Weekend - Contact ALS	

Sampler's Name	S.Fossen	Mobile #	O: 250-425-3196 / C: 780-223-8222
Sampler's Signature	S Fossen	Date/Time	May 25, 2021

Teck

COC ID: 6/1/2021 | TURNAROUND TIME: | RUSH:

PROJECT/CLIENT INFO				LABORATORY				OTHER INFO				
Facility Name / Job#	Fording River Operation			Lab Name	Nautilus Environmental - BC			Report Format / Distribution		Excel	PDF	EDD
Project Manager	Scott Roughead			Lab Contact				Email 1:	david.burroughs@teck.com	X	X	X
Email	scott.roughead@teck.com			Email	BCinfo@nautilusenvironmental.ca			Email 2:	britt.anderson@teck.com	X	X	X
Address				Address	8664 Commerce Court			Email 3:	scott.roughead@teck.com	X	X	X
								Email 4:	cruz.canlas@teck.com	X	X	X
City	Elkford	Province	BC	City	Burnaby	Province	BC	Email 5:	jamie.walsh@teck.com	X	X	X
Postal Code		Country	Canada	Postal Code	V5A 4N7	Country	Canada	Email 6:	teckcoal@equisonline.com			X
Phone Number	1-250-433-6976			Phone Number	604-420-8773			VPO00741382				

SAMPLE DETAILS | **ANALYSIS REQUESTED** (Filtered - F: Field, L: Lab, FL: Field & Lab, N: None)

Sample ID	Sample Location (sys_loc_code)	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	FIL	PRESERV.	ANALYSIS: 7-d C.dubia P/F	7-d C.dubia P/F (EDTA)	72-hr P. subcapitata P/F	30-d embryo EA P/F	28-d Hyalella P/F	28-d Hyalella P/F (EDTA)						
								NO	NO				NO	NO	NO						
FR_FRCP1_WEK_2021-05-31_N	FR_FRCP1	WS	NO	6/1/2021		G	5						X	X	X					6.7	6.8
FR_FRABCH_WEK_2021-05-31_N	FR_FRABCH	WS	NO	6/1/2021		G	4						X	X						5.5	5.6
FR_UFR1_WEK_2021-05-31_N	FR_UFR1	WS	NO	6/1/2021		G	4						X	X						4.1	5.9
													21 00 63	21 00 64	21 00 60						

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
7 COOLERS TOTAL	HANNA WHITING	June 1, 2021	Tyrone Hamilton	June 2/21 @ 11:30
			Nautilus - Burnaby	Q2-W3

SERVICE REQUEST (rush - subject to availability)

Regular (default)	X
Priority (2-3 business days) - 50% surcharge	
Emergency (1 Business Day) - 100% surcharge	
For Emergency <1 Day, ASAP or Weekend - Contact ALS	

Sampler's Name	HANNA WHITING	Mobile #	250 4255999
Sampler's Signature	HannaWhiting	Date/Time	June 1, 2021

Teck

COC ID:	20210112-CPX2 TOX	TURNAROUND TIME:	regular	RUSH:	

PROJECT/CLIENT INFO				LABORATORY				OTHER INFO				
Facility Name	Greenhills Operations			Lab Name	Hydroqual Laboratories Ltd			EDD delivery:				
Project Manager	Leigh Stickney			Lab Contact	Jacklyn Pool			Email 1:	Leigh.Stickney@teck.com	x	x	x
Email	leigh.stickney@teck.com			Email				Email 2:	jeremy.enns@teck.com	x	x	x
Address	PO Box 5000			Address	#4, 6125 - 12th Street S.E.			Email 3:	teckcoal@equisonline.com			x
								Email 4:	jaydon.francis@teck.com	x	x	x
City	Elkford	Province	BC	City	Calgary	Province	AB	Email 5:	Heather.Stevenson@teck.com	x	x	x
Postal Code	V0B 1H0	Country	Canada	Postal Code	T2H 2K1	Country	Can	Email 6:	DL-Equis-GHO-Field@teck.com	x	x	x
Phone Number	250 865 3274			Phone Number	403.253.7121			PO number	740426			

SAMPLE DETAILS								ANALYSIS REQUESTED											
								Please indicate below Filtered, Perserved or both (F, P, F/P)											
Sample ID	Sample Location	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	ANALYSIS	7-d C.dubia P/F	72-hr P. subcapitata P/F	30-d embryo EA P/F	28-d Hyalella P/F							
GH_FR1_WS_2021-06-01_N	GH_FR1	WS		6/1/2201	12:15	G	2		1	1	1	1							6.6-6.8
GH_ERC_WS_2021-06-01_N	GH_ERC	WS		6/1/2201	11:25	G	2		1	1	1	1							7.4-8.1
GH_ER2_WS_2021-06-01_N	Gh_ERC	WS		6/1/2201	10:20	G	2		1	1	1	1							7.3-7.4
									210962	210961	210963	210964							
									210965	210966	210967	210968							

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	Date	Time	Accepted By/Affiliation	Date	Time
				Tyrone Hamilton	June 2/21	@ 11:30
				Newterra - Burnaby		02-03

SERVICE REQUEST (rush - subject to availability)					
Regular (default)	X	Sampler's Name	MWILSON	Mobile #	
Priority (2-3 business days) - 50% surcharge					
Emergency (1 Business Day) - 100% surcharge		Sampler's Signature		Date/Time	12-Jan
For Emergency <1 Day, ASAP or Weekend - Contact ALS					

Teck

COC ID:	Q2_CHRONIC_06012021_Burn	TURNAROUND TIME:	Regular	RUSH:	No

PROJECT/CLIENT INFO				LABORATORY				OTHER INFO				
Facility Name / Job#	Coal Mountain Operations			Lab Name	Nautilus Environmental			Report Format / Distribution		Excel	PDF	EDD
Project Manager	Victoria Sharpe			Lab Contact	Armando Tang			Email 1:	Jay.jones@teck.com	X	X	X
Email	Victoria.Sharpe@teck.com			Email	armando@nautilusenvironmental.ca			Email 2:	teckcoal@equisonline.com			X
								Email 3:	Victoria.Sharpe@teck.com	X	X	X
								Email 4	Don.Sacino@teck.com	X	X	X
Address	PO Box 3000			Address	8664 commerce Court			Email 5:	Shelby.Holden@teck.com	X	X	X
City	Sparwood	Province	BC	City	Burnaby	Province	BC	PO number				
Postal Code	V0B 2G0	Country	Canada	Postal Code	V5A 4N7	Country	Canada					
Phone Number	1-250-425-7522			Phone Number	604-420-8773							

SAMPLE DETAILS / **ANALYSIS REQUESTED** (Filtered - F: Field, L: Lab, FL: Field & Lab, N: None)

Sample ID	Sample Location	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	Filt.	PRESERV.	ANALYSIS: 7-d C.dubia P/F	7-d C.dubia P/F (EDTA)	72-hr P. subcapitata P/F	30-d embryo EA P/F	28-d Hyalella P/F	28-d Hyalella P/F (EDTA)						
													210063	210064	210060						
CM_MC2_WS_2021-06-01_N	CM_MC2	WS	No	6/1/2021	9:55	G	4						x	x	x						6.3-8.8
CM_MC1_WS_2021-06-01_N	CM_MC1	WS	No	6/1/2021	8:50	G	3						x	x							4.8-4.9
RG_MIDAG_WS_2021-06-01_N	RG_MIDAG	WS	No	6/1/2021	9:25	G	2							x	x						6.0-6.1

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
			Tyrone Hamilton	June 2/21 @ 11:30
			Nautilus - Burnaby	Q2-W3

NB OF BOTTLES RETURNED/DESCRIPTION	
Regular (default)	X
Priority (2-3 business days) - 50% surcharge	
Emergency (1 Business Day) - 100% surcharge	
For Emergency <1 Day, ASAP or Weekend - Contact ALS	

Sampler's Name	SH/DS	Mobile #	250 425 7522
Sampler's Signature	SDH	Date/Time	June 1, 2021

Teck

COC ID:	20210601CRN2B	TURNAROUND TIME:		RUSH:	

PROJECT/CLIENT INFO				LABORATORY				OTHER INFO				
Facility Name / Job#	Elkview Operations			Lab Name	Nautilus Environmental			Report Format / Distribution		Excel	PDF	EDD
Job Description	Q2 Chronic Sampling			Lab Contact	Jeslin Wijaya			Email 1:	kennedy.Allen@teck.com	X	X	X
Project Manager	Jennifer Dane			Email	[redacted]			Email 2:	teckcoal@equisonline.com			X
Email	jennifer.dane@teck.com			Address	8664 Commerce Court			Email 3:	Colby.bracken@teck.com	X	X	X
Address	RR#1 HWY# 3				Imperial Square Lake City			Email 4:	Chris.emslie@teck.com	X	X	X
								Email 5:	Teck.Lab.Results@teck.com	X	X	X
City	Sparwood	Province	BC	City	Burnaby	Province	BC	PO number	VPO00678876			
Postal Code	V1C 4C3	Country	Canada	Postal Code	V5A 4N7	Country	Canada					
Phone Number	1-250-425-8137			Phone Number	604-420-8773							

SAMPLE DETAILS								ANALYSIS REQUESTED											Filtered - F: Field, L: Lab, FL: Field & Lab, N: None
								FILTERED	No	No	No	No							
								PRESERVED	No	No	No	No							
Sample ID	Sample Location	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	ANALYSIS	7-d C.dubia P/F	72-hr P. subcapitata P/F	30-d embryo EA P/F	28-d Hyalella P/F							
EV_HC1_WS_2021-05_WEEK23_N	EV_HC1	WS	N	2021-06-01	9:13	G	3				3								11.2 - 11.3
EV_MC2_WS_2021-05_WEEK23_N	EV_MC2	WS	N	2021-06-01	10:22	G	3				3								9.9 - 10.1
											21 0063	21 0064							
					Total		6				21	21							

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
Toxicity 96-Hr/48-HR = 96 Hr Rainbow Trout pass/fail & 48 Hr Daphnia pass/fail (Daphinia testing to occur at 20 degrees)	C. Emslie/S. Hansen	1-Jun-21	Tyrone Hamilton Nautilus - Burnaby	June 2/21 @ 11:30 Q2-W3

NB OF BOTTLES RETURNED/DESCRIPTION					
Regular (default)	X	Sampler's Name	C. Emslie/S. Hansen	Mobile #	1-250-425-1101
Priority (2-3 business days) - 50% surcharge					
Emergency (1 Business Day) - 100% surcharge		Sampler's Signature		Date/Time	June 1, 2021
For Emergency <1 Day, ASAP or Weekend - Contact ALS					

Teck

COC ID:	Q2_CHRONIC_06082021_Burn	TURNAROUND TIME:	Regular	RUSH:	No

PROJECT/CLIENT INFO				LABORATORY				OTHER INFO				
Facility Name / Job#	Coal Mountain Operations			Lab Name	Nautilus Environmental			Report Format / Distribution		Excel	PDF	EDD
Project Manager	Victoria Sharpe			Lab Contact	Armando Tang			Email 1:	Jay.Jones@teck.com	X	X	X
Email	Victoria.Sharpe@teck.com			Email	armando@nautilusenvironmental.ca			Email 2:	teckcoal@equisonline.com			X
								Email 3:	Victoria.Sharpe@teck.com	X	X	X
								Email 4	Don.Sacino@teck.com	X	X	X
Address	PO Box 3000			Address	8664 commerce Court			Email 5:	Shelby.Holden@teck.com	X	X	X
City	Sparwood	Province	BC	City	Burnaby	Province	BC	PO number				
Postal Code	V0B 2G0	Country	Canada	Postal Code	V5A 4N7	Country	Canada					
Phone Number	1-250-425-7522			Phone Number	604-420-8773							

SAMPLE DETAILS								ANALYSIS REQUESTED												Filtered - F: Field, L: Lab, FL: Field & Lab, N: None					
								Filt.																	
								PRESERV.						TH		TH		210960							
								ANALYSIS	7-d C.dubia P/F	7-d C.dubia P/F (EDTA)	72-hr P. subcapitata P/F	30-d embryo EA P/F	210963 210963	28-d Hyalella P/F	210964 210964	28-d Hyalella P/F (EDTA)	210960 210960 TH								
Sample ID	Sample Location	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.																		
CM_MC2_WS_2021-06-08_N	CM_MC2	WS	No	6/8/2021	10:23	G	4					x		x		x								6.0-6.1	
CM_MC1_WS_2021-06-08_N	CM_MC1	WS	No	6/8/2021	9:17	G	3					x		x										4.1-4.1	
RG_MIDAG_WS_2021-06-08_N	RG_MIDAG	WS	No	6/8/2021	9:57	G	2							x		x								5.1-5.4	

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
			Tymne Hamilton	June 9/21 @ 11:30
			Nautilus - Burnaby	Q2-W4

NB OF BOTTLES RETURNED/DESCRIPTION	
Regular (default)	X
Priority (2-3 business days) - 50% surcharge	
Emergency (1 Business Day) - 100% surcharge	
For Emergency <1 Day, ASAP or Weekend - Contact ALS	

Sampler's Name	SH/DS	Mobile #	250 425 7522
Sampler's Signature	S.Holden	Date/Time	June 8, 2021

Teck

COC ID: 20210608CRN2B | TURNAROUND TIME: | RUSH:

PROJECT/CLIENT INFO				LABORATORY				OTHER INFO			
Facility Name / Job#	Elkview Operations			Lab Name	Nautilus Environmental			Report Format / Distribution		Excel	PDF	EDD
Job Description	Q2 Chronic Sampling			Lab Contact	Jeslin Wijaya			Email 1:	kennedy.Allen@teck.com	X	X	X
Project Manager	Jennifer Dane			Email	[illegible]			Email 2:	teckcoal@equisonline.com			X
Email	jennifer.dane@teck.com			Address	8664 Commerce Court			Email 3:	Colby.bracken@teck.com	X	X	X
Address	RR#1 HWY# 3				Imperial Square Lake City			Email 4:	Chris.emslie@teck.com	X	X	X
								Email 5:	Teck.Lab.Results@teck.com	X	X	X
City	Sparwood	Province	BC	City	Burnaby	Province	BC	PO number	VPO00678876			
Postal Code	V1C 4C3	Country	Canada	Postal Code	V5A 4N7	Country	Canada					
Phone Number	1-250-425-8137			Phone Number	604-420-8773							

SAMPLE DETAILS | **ANALYSIS REQUESTED** (Filtered - F: Field, L: Lab, FL: Field & Lab, N: None)

Sample ID	Sample Location	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	ANALYSIS	7-d C.dubia P/F	72-hr P. subcapitata P/F	30-d embryo EA P/F	28-d Hyalella P/F						
FILTERED									No	No	No	No						
PRESERVED									No	No	No	No						
EV_HC1_WS_2021-06_MON_N	EV_HC1	WS	N	6/8/2021	9:28	G	3				210963 TM 3	210964 TM						5.6-5.7
EV_MC2_WS_2021_Q2_WK4_N	EV_MC2	WS	N	6/8/2021	10:30	G	3				210963 3	210964						6.4-6.4
											210963	210964						
					Total		6											

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
Toxicity 96-Hr/48-HR = 96 Hr Rainbow Trout pass/fail & 48 Hr Daphnia pass/fail (Daphinia testing to occur at 20 degrees)	C. Emslie/S. Hansen	8-Jun-21	Tyson Hamilton Nautilus - Burnaby	June 9/21 @ 11:30 Q2-W4

NB OF BOTTLES RETURNED/DESCRIPTION					
Regular (default)	X	Sampler's Name	C. Emslie/S. Hansen	Mobile #	1-250-425-1101
Priority (2-3 business days) - 50% surcharge		Sampler's Signature		Date/Time	June 8, 2021
Emergency (1 Business Day) - 100% surcharge					
For Emergency <1 Day, ASAP or Weekend - Contact ALS					

Teck

COC ID: 6/8/2021 | TURNAROUND TIME: | RUSH:

PROJECT/CLIENT INFO				LABORATORY				OTHER INFO			
Facility Name / Job#	Fording River Operation			Lab Name	Nautilus Environmental - BC			Report Format / Distribution		Excel	PDF	EDD
Project Manager	Scott Roughead			Lab Contact				Email 1:	david.burroughs@teck.com	X	X	X
Email	scott.roughead@teck.com			Email	BCinfo@nautilusenvironmental.ca			Email 2:	britt.anderson@teck.com	X	X	X
Address				Address	8664 Commerce Court			Email 3:	scott.roughead@teck.com	X	X	X
								Email 4:	cruz.canlas@teck.com	X	X	X
City	Elkford	Province	BC	City	Burnaby	Province	BC	Email 5:	jamia.walsh@teck.com	X	X	X
Postal Code		Country	Canada	Postal Code	V5A 4N7	Country	Canada	Email 6:	teckcoal@equisonline.com			X
Phone Number	1-250-433-6976			Phone Number	604-420-8773			VPO00741382				

SAMPLE DETAILS / ANALYSIS REQUESTED (Filtered - F: Field, L: Lab, FL: Field & Lab, N: None)

Sample ID	Sample Location (sys_loc_code)	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	FIL	PRESERV.	ANALYSIS: 7-d C.dubia P/F	7-d C.dubia P/F (EDTA)	72-hr P. subcapitata P/F	30-d embryo EA P/F	28-d Hyalella P/F	28-d Hyalella P/F (EDTA)						
								NO	NO	NO	NO	NO	NO								
FR_FRCP1_MON_2021-06-07_N	FR_FRCP1	WS	NO	6/8/2021		G	5						X	X	X					2.1	2.4
FR_FRABCH_MON_2021-06-07_N	FR_FRABCH	WS	NO	6/8/2021		G	4						X	X						2.8	2.4
FR_UFR1_MON_2021-06-07_N	FR_UFR1	WS	NO	6/8/2021		G	4						X	X						2.3	2.8
													21 0963	21 0964	21 0960						

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
7 COOLERS TOTAL	Cruz Canlas	June 8, 2021	Tyrone Hamilton	June 9/21 @ 11:30
			Nautilus - Burnaby	QZ-W4

SERVICE REQUEST (rush - subject to availability)					
Regular (default)	X	Sampler's Name	Cruz Canlas	Mobile #	250 433 6166
Priority (2-3 business days) - 50% surcharge		Sampler's Signature		Date/Time	June 8, 2021
Emergency (1 Business Day) - 100% surcharge					
For Emergency <1 Day, ASAP or Weekend - Contact ALS					

Teck

Page 1 of 1

COC ID: 8 6/8/2021 | TURNAROUND TIME: | RUSH:

PROJECT/CLIENT INFO				LABORATORY				OTHER INFO				
Facility Name / Job#	Fording River Operation			Lab Name	Nautilus Environmental - BC			Report Format / Distribution		Excel	PDF	EDD
Project Manager	Scott Roughead			Lab Contact				Email 1:	david.burroughs@teck.com	X	X	X
Email	scott.roughead@teck.com			Email	BCinfo@nautilusenvironmental.ca			Email 2:	britt.anderson@teck.com	X	X	X
Address				Address	8664 Commerce Court			Email 3:	scott.roughead@teck.com	X	X	X
								Email 4:	teckcoal@equisonline.com			X
City	Elkford	Province	BC	City	Burnaby	Province	BC	Email 5:	carlie.meyer@teck.com	X	X	X
Postal Code		Country	Canada	Postal Code	V5A 4N7	Country	Canada	Email 6:	cait.good@teck.com	X	X	X
Phone Number	1-250-433-6976			Phone Number	604-420-8773							

SAMPLE DETAILS / ANALYSIS REQUESTED (Filtered - F: Field, L: Lab, FL: Field & Lab, N: None)

Sample ID	Sample Location (sys loc code)	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	FIltr.	PRESERV.	ANALYSIS: 7-d C.dubia P/F	7-d C.dubia P/F (EDTA)	72-hr P. subcapitata P/F	30-d embryo EA P/F	28-d Hyalella P/F	28-d Hyalella P/F (EDTA)					
FR_FR4_WS_2021-06-08_N	FR_FR4	WS	NO	6/8/2021	9:17	G	3						X	X						3.3-3.4
FR_FRRD_WS_2021-06-08_N	FR_FRRD	WS	NO	6/8/2021	8:30	G	3						X	X						4.1-4.8
FR_FR2_WS_2021-06-08_N	FR_FR2	WS	NO	6/8/2021	9:55	G	3						X	X						4.1-4.2
FR_MULTIPLATE_WS_2021-06-08_NP	FR_MULTIPLATE	WS	NO	6/8/2021	10:29	G	3						X	X						2.9-3.3
													21 0963	21 0964						

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
			Tyrone Hamilton	June 9/21 @ 11:30
			Nautilus - Burnaby	Q2-W4

SERVICE REQUEST (rush - subject to availability)

Regular (default)	X
Priority (2-3 business days) - 50% surcharge	
Emergency (1 Business Day) - 100% surcharge	
For Emergency <1 Day, ASAP or Weekend - Contact ALS	

Sampler's Name	Tyler Fortin	Mobile #	250-464-5914
Sampler's Signature		Date/Time	June 8 2021

Teck

COC ID:	2021-06-08 CHRONIC TOX	TURNAROUND TIME:	regular	RUSH:	

PROJECT/CLIENT INFO				LABORATORY				OTHER INFO				
Facility Name	Greenhills Operations			Lab Name	Nautilus Environmental			EDD delivery:				
Project Manager	Jeremy Enns			Lab Contact	Armando			Email 1:				
Email	jeremy.enns@teck.com			Email				Email 2:				
Address	PO Box 5000			Address	8664 Commerce Court			Email 3:	teckcoal@equisonline.com	x	x	x
								Email 4:				
City	Elkford	Province	BC	City	Burnaby	Province	BC	Email 5:				
Postal Code	V0B 1H0	Country	Canada	Postal Code	V5A 4N7	Country	Can	Email 6:	DL-Equis-GHO-Field@teck.com	x	x	x
Phone Number	250 865 3274			Phone Number	403.253.7121			PO number	610307			

SAMPLE DETAILS / **ANALYSIS REQUESTED**

Please indicate below Filtered, Perserved or both (F, P, F/P)

Sample ID	Sample Location	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	7-d C.dubia P/F	72-hr P. subcapitata P/F	30-d embryo EA P/F 210963	28-d Hyalella P/F 210964	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
GH_ER2_WS_2021-06-08_N	GH_ER2	WS		8-Jun	10:10	G	3			X	X									7.2 - 7.8	
GH_ERC_WS_2021-06-08_N	GH_ERC	WS		8-Jun	11:05	G	3			X	X									7.2 - 7.5	
GH_FR1_WS_2021-06-08_N	GH_FR1	WS		8-Jun	12:00	G	3			X	X									6.3 - 7.2	

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	Date	Time	Accepted By/Affiliation	Date	Time
				Tyrone Hamilton	June 9/21	@ 11:30
				Nautilus - Burnaby		Q2-W4

SERVICE REQUEST (rush - subject to availability)

Regular (default)	X
Priority (2-3 business days) - 50% surcharge	
Emergency (1 Business Day) - 100% surcharge	
For Emergency <1 Day, ASAP or Weekend - Contact ALS	

Sampler's Name	HS/RG	Mobile #	
Sampler's Signature		Date/Time	JUNE 8 2021

Teck

COC ID: 20210608 Chronic Tox Burn | TURNAROUND TIME: | RUSH:

PROJECT/CLIENT INFO

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OTHER INFO

Report Format / Distribution		Excel	PDF	EDD
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Email 4:	shanise.fossen@teck.com	x	x	
Email 5:	tanya.dick@teck.com	x	x	
PO number	VPO00741384			

SAMPLE DETAILS / ANALYSIS REQUESTED

Filtered - F: Field, L: Lab, FL: Field & Lab, N: None

Sample ID	Sample Location	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	FIL.	PRESERV.	ANALYSIS: 210963 30-d embryo EA P/F	ANALYSIS: 210964 28-d Hyalella P/F									
								N	N											
								N	N											
LC_DCDS_WS_2021-06-08_N	LC_DCDS	WS	No	8-Jun-21		G	3			x	x									7.4 - 7.9
LC_LC3_WS_2021-06-08_N	LC_LC3	WS	No	8-Jun-21	10:30	G	3			x	x									6.3 - 7.0
LC_SLC_WS_2021-06-08_N	LC_SLC	WS	No	8-Jun-21	10:10	G	3			x	x									7.9 - 7.9
LC_LC5_WS_2021-06-08_N	LC_LC5	WS	No	8-Jun-21	10:00	G	3			x	x									7.3 - 7.6
LC_LCDSSLCC_WS_2021-06-08_N	LC_LCDSSLCC	WS	No	8-Jun-21	11:00	G	3			x	x									8.4 - 10.0

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
Please provide prelimnary update as results are available	S.Fossen	6/8/2021	Tyrone Hamilton	June 9/21 @ 11:30
			Nautilus - Burnaby	Q2-W4

NB OF BOTTLES RETURNED/DESCRIPTION

Regular (default)	X
Priority (2-3 business days) - 50% surcharge	
Emergency (1 Business Day) - 100% surcharge	
For Emergency <1 Day, ASAP or Weekend - Contact ALS	

Sampler's Name	S.Fossen	Mobile #	O: 250-425-3196 / C: 780-223-8222
Sampler's Signature	S Fossen	Date/Time	June 8, 2021

END OF REPORT

March 3, 2022

Memo: Results of the 2021 Toxicity Identification Evaluation testing for FR_FRCP1

To	Cait Good	*From*	Émilie Viczko; Melanie Gallant
Affiliation	Teck Coal Ltd.	*Tel*	(403) 253-7121
e-mail	Cait.Good@teck.com	*e-mail*	emilie@nautilusenvironmental.ca melanie@nautilusenvironmental.ca

Introduction

Nautilus Environmental conducted chronic toxicity tests in 2021 for Teck Coal Ltd. with samples collected from various locations as part of a quarterly toxicity testing program (permit number 107517). Toxicity testing included:

- *Ceriodaphnia dubia* 7-d survival and reproduction,
- *Pseudokirchneriella subcapitata* 72-h growth inhibition,
- *Hyalella azteca* 28-d survival and growth,
- *Pimephales promelas* 32-d survival and growth and
- *Oncorhynchus mykiss* embryo-alevin development.

Samples collected as part of quarterly monitoring from FR_FRCP1 have previously exhibited toxicity in a subset of chronic toxicity tests. Consequently, a Toxicity Identification Evaluation (TIE) approach was incorporated into the testing program using *C. dubia* and *H. azteca*. In particular, an EDTA treatment was employed concurrently with the testing program to evaluate the potential role of divalent metal cations as a cause of toxicity. The results of these test treatments are summarized in this memo.

Methods

TIE treatments involve physico-chemical manipulations of the sample, followed by toxicity tests on the treated and untreated samples to provide information on the cause of toxicity. Treatments are based on general guidance provided by the USEPA. The following TIE treatment was performed on the samples:

- **Ethylenediaminetetraacetic acid (EDTA) chelation**: the sample was treated with 5 mg/L EDTA, which is a chelating agent that binds divalent metal cations, such as copper, cadmium, nickel and zinc, and reduces their bioavailability. Thus, a reduction in toxicity following treatment with EDTA indicates that a metal that can be chelated with EDTA may be responsible for toxicity.

Treated and untreated samples were tested concurrently, so that any effect of the treatment could be discerned. A control treatment in which EDTA was added to laboratory control water was also tested to ensure that the treatment itself did not produce adverse effects.

Results and Discussion

The results for *C. dubia* survival are presented in Table 1. There were no effects on survival of *C. dubia* in FR_UFR1 or FR_FRCP1 tested in any quarter with the survival in all samples meeting the performance criteria for a control (i.e., ≥80% survival).

The results for *C. dubia* reproduction are presented in Table 2. Samples collected from FR_FRCP1 exhibited reduced reproduction relative to the reference location and the laboratory control in the first, third, and fourth quarters. In the first and third quarters, EDTA treatment of FR_FRCP1 samples improved reproduction, although not enough to return reproduction to site control levels. This demonstrates that divalent cationic metals may have contributed to the observed adverse effects, but were not the sole cause of toxicity. In the fourth quarter, EDTA treatment of the FR_FRCP1 samples did not improve reproduction. Samples collected from FR_FRCP1 performed similarly to the reference location and the laboratory control in the second quarter.

Results of *H. azteca* tests are summarized in Tables 3 and 4. Survival of *H. azteca* in the FR_FRCP1 samples was comparable to that observed in the upstream reference water, FR_UFR1, and the laboratory control in all quarters tested. Survival for all treatments, in all quarters, ranged from 92 – 98%. However, growth was reduced in the FR_FRCP1 sample in the third quarter relative to FR_UFR1. Treatment of the sample with EDTA did not improve growth.

EDTA treatments conducted in 2021 produced somewhat reduced survival and growth in the EDTA controls in some instances. This includes EDTA controls for *C. dubia* tested in the first, third, and fourth quarter, and the EDTA control for *H. azteca* in the third quarter, which had lower growth than the control. The FR_FRCP1 samples treated with EDTA also exhibited an adverse effect, relative to the untreated FR_FRCP1 sample, in some instances. This includes the EDTA-treated FR_FRCP1 sample *C. dubia* tested in the fourth quarter, which had somewhat reduced reproduction relative to the untreated sample, and the EDTA-treated FR_FRCP1 sample for *H. azteca* in the third quarter, which had lower growth than the untreated sample. These data demonstrate that EDTA itself can produce adverse responses in these toxicity tests, and that the 5 mg/L EDTA treatment is close to a threshold for adverse effects. However, reducing the treatment concentration may result in the treatment becoming insufficient to bind the divalent metals that are present in the sample.

Additional TIE efforts beyond EDTA treatments, may be appropriate to characterize the cause of toxicity during quarterly sampling events in 2022, if observed adverse responses are not effectively treated with EDTA.

Table 1. ***Ceriodaphnia dubia*** **survival (%) in EDTA treatments of samples from FR_FRCP1 and related locations.**

Test initiation	Treatment	Control	FR_UFR1	FR_FRCP1
First quarter 2021				
15 Apr, 2021	Untreated	100	100	90
	EDTA-treated	100	--	100
Second quarter 2021				
19 May, 2021	Untreated	100	100	100
	EDTA-treated	100	--	100
Third quarter 2021				
11 Aug, 2021	Untreated	100	100	90
	EDTA-treated	80	--	100
Fourth quarter 2021				
13 Oct, 2021	Untreated	100	100	100
	EDTA-treated	90	--	100

Table 2. ***Ceriodaphnia dubia*** **reproduction (mean ± SD) in EDTA treatments of samples from FR_FRCP1 and related locations.**

Test initiation	Treatment	Control	FR_UFR1	FR_FRCP1
First quarter 2021				
15 Apr, 2021	Untreated	19.9 ± 7.8	18.9 ± 2.2	10.4 ± 5.5
	EDTA-treated	15.3 ± 3.1	--	14.2 ± 5.7
Second quarter 2021				
19 May, 2021	Untreated	22.4 ± 4.6	23.4 ± 4.8	23.5 ± 5.0
	EDTA-treated	20.2 ± 5.2	--	24.4 ± 5.1
Third quarter 2021				
11 Aug, 2021	Untreated	22.2 ± 3.8	22.1 ± 3.3	12.7 ± 7.4
	EDTA-treated	17.0 ± 9.6	--	18.7 ± 3.4
Fourth quarter 2021				
13 Oct, 2021	Untreated	23.0 ± 3.3	22.9 ± 4.9	15.8 ± 4.4
	EDTA-treated	17.5 ± 8.6	--	12.0 ± 6.5

Table 3. ***Hyalella azteca*** **survival (mean ± SD) in EDTA treatments of samples from FR_FRCP1 and related locations.**

Test initiation	Treatment	Control	FR_UFR1	FR_FRCP1
Second quarter 2021				
20 May, 2021	Untreated	94.0 ± 8.9	96.0 ± 5.5	98.0 ± 4.5
	EDTA-treated	94.0 ± 5.5	--	96.0 ± 5.5
Third quarter 2021				
12 Aug, 2021	Untreated	96.0 ± 8.9	94.0 ± 8.9	98.0 ± 4.5
	EDTA-treated	94.0 ± 8.9	--	98.0 ± 4.5
Fourth quarter 2021				
14 Oct, 2021	Untreated	92.0 ± 8.3	98.0 ± 4.5	98.0 ± 4.5
	EDTA-treated	96.0 ± 5.5	--	96.0 ± 8.9

Table 4. ***Hyalella azteca*** **growth (mean ± SD) in EDTA treatments of samples from FR_FRCP1 and related locations.**

Test initiation	Treatment	Control	FR_UFR1	FR_FRCP1
Third quarter 2021				
12 Aug, 2021	Untreated	0.86 ± 0.15	0.61 ± 0.12	0.45 ± 0.14
	EDTA-treated	0.48 ± 0.16	--	0.35 ± 0.10
Fourth quarter 2021				
14 Oct, 2021	Untreated	0.43 ± 0.07	0.49 ± 0.06	0.53 ± 0.07
	EDTA-treated	0.67 ± 0.09	--	0.65 ± 0.08

Please contact the undersigned if you have any questions regarding these results.

Yours truly,

Émilie Viczko, MSc

Project Biologist

Melanie Gallant, PhD.

Environmental Toxicologist

March 3, 2022

Memo: Results of the 2021 Toxicity Identification Evaluation testing for CM_MC2

To	Cait Good	*From*	Émilie Viczko; Melanie Gallant
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e-mail	Cait.Good@teck.com	*e-mail*	emilie@nautilusenvironmental.ca; melanie@nautilusenvironmental.ca

Introduction

Nautilus Environmental conducted chronic toxicity tests in 2021 for Teck Coal Ltd. with samples collected from various locations as part of a quarterly toxicity testing program (permit number 107517). Toxicity testing included:

- *Ceriodaphnia dubia* 7-d survival and reproduction,
- *Pseudokirchneriella subcapitata* 72-h growth inhibition,
- *Hyalella azteca* 28-d survival and growth,
- *Pimephales promelas* 32-d survival and growth and
- *Oncorhynchus mykiss* embryo-alevin development.

Samples collected as part of quarterly monitoring for Teck Coal Ltd. from CM_MC2 have previously exhibited toxicity in chronic toxicity tests using *C. dubia* and *H. azteca*. Consequently, Nautilus Environmental conducted a Toxicity Identification Evaluation (TIE) in order to determine the cause of toxicity. The results of this TIE identified nickel as the most likely cause of adverse effects in samples from this location to both species.

A TIE approach was incorporated into the quarterly testing program using *C. dubia* and *H. azteca*, in order to evaluate the potential role of divalent metal cations as a cause of toxicity. An EDTA treatment was applied to CM_MC2 and RG_MIDAG samples collected in 2021. The results of these test treatments are summarized in this memo.

Methods

TIE treatments involve physico-chemical manipulations of the sample, followed by toxicity tests on the treated and untreated samples to provide information on the cause of toxicity. Treatments are based on general guidance provided by the USEPA for TIEs. The following TIE treatment was performed on the samples:

- **Ethylenediaminetetraacetic acid (EDTA) chelation**: the sample was treated with 5 mg/L EDTA, which is a chelating agent that binds divalent metal cations, such as copper, cadmium, nickel and zinc, and reduces their bioavailability. Thus, a reduction in toxicity following treatment with EDTA indicates that a metal that can be chelated with EDTA may be responsible for toxicity.

Treated and untreated samples were tested concurrently, so that any effect of the treatment could be discerned. A control treatment in which EDTA was added to laboratory control water was also tested to ensure that the treatment itself did not produce adverse effects.

Results and Discussion

The results for *C. dubia* survival are presented in Table 1. There was no affect on survival of *C. dubia* in CM_MC2 or RG_MIDAG samples tested in any quarter with survival for all samples meeting the performance criteria for a control (i.e., ≥80% survival).

The results for *C. dubia* reproduction are presented in Table 2. Samples collected from CM_MC2 exhibited somewhat reduced reproduction relative to the reference water, CM_MC1, and the laboratory control in the first and fourth quarters. In the first quarter, EDTA treatment of CM_MC2 effectively improved reproduction, indicating that divalent cationic metals likely caused the observed adverse effects. In the fourth quarter, EDTA treatment of CM_MC2 also improved reproduction, although not enough to entirely eliminate the adverse response. This demonstrates that divalent cationic metals contributed to the observed adverse effects, but may not be the sole cause of toxicity.

Results of *H. azteca* tests are summarized in Tables 3 and 4 for survival and growth, respectively. Survival and growth of *H. azteca* in the untreated RG_MIDAG samples was comparable to that observed in the upstream reference water, CM_MC1, and the laboratory control in all quarters tested. Reduced survival was observed in the second and third quarter for CM_MC2. In the second quarter, EDTA treatment removed adverse effects on survival indicating that divalent metal cations were likely responsible for the observed toxicity. In the third quarter, EDTA treatment also improved survival but not enough to entirely eliminate the effect. Growth of *H. azteca* in the CM_MC2 sample was reduced relative to the reference water, CM_MC1, and the laboratory control in the third quarter. Treatment of CM_MC2 with EDTA did not improve growth.

EDTA treatments conducted in 2021 resulted in somewhat reduced survival and growth in the EDTA controls in some instances. This includes EDTA controls for *C. dubia* tested in the first, third, and fourth quarter, and the EDTA control for *H. azteca* in the third quarter, which had lower growth than the control. The CM_MC2 and RG_MIDAG samples treated with EDTA also exhibited an adverse effect, relative to their untreated counterpart, in some instances. This includes the EDTA-treated CM_MC2 sample *C. dubia* tested in the second quarter, which had somewhat reduced reproduction relative to the untreated sample, and the EDTA-treated CM_MC2 and RG_MIDAG samples for *H. azteca* in the third quarter, which had lower growth than the untreated samples. These data demonstrate that EDTA itself can produce adverse responses, and that the 5 mg/L EDTA treatment is close to a threshold for adverse effects. However, reducing the treatment concentration may result in the treatment becoming insufficient to bind the divalent metals that are present in the sample.

Additional TIE efforts beyond EDTA treatments, may be appropriate to characterize the cause of toxicity during quarterly sampling events in 2022, if observed adverse responses are not effectively counteracted by EDTA.

Table 1. *Ceriodaphnia dubia* survival (%) in EDTA treatments of samples from CM_MC2 and RG_MIDAG and related locations.

Test initiation	Treatment	Control	CM_MC1	CM_MC2	RG_MIDAG
First quarter 2021					
15 Apr, 2021	Untreated	100	90	100	100
	EDTA-treated	100	--	100	100
Second quarter 2021					
19 May, 2021	Untreated	100	90	100	100
	EDTA-treated	100	--	90	100
Third quarter 2021					
11 Aug, 2021	Untreated	100	100	90	100
	EDTA-treated	80	--	100	100
Fourth quarter 2021					
13 Oct, 2021	Untreated	100	90	100	100
	EDTA-treated	90	--	100	100

Table 2. *Ceriodaphnia dubia* reproduction (mean ± SD) in EDTA treatments of samples from CM_MC2 and RG_MIDAG and related locations.

Test initiation	Treatment	Control	CM_MC1	CM_MC2	RG_MIDAG
First quarter 2021					
15 Apr, 2021	Untreated	19.9 ± 7.8	18.5 ± 7.6	11.8 ± 5.7	15.5 ± 4.9
	EDTA-treated	15.3 ± 3.1	--	17.8 ± 3.5	18.1 ± 4.7
Second quarter 2021					
19 May, 2021	Untreated	22.4 ± 4.6	23.8 ± 5.2	21.3 ± 5.3	23.3 ± 5.9
	EDTA-treated	20.2 ± 5.2	--	17.8 ± 6.3	20.9 ± 4.6
Third quarter 2021					
11 Aug, 2021	Untreated	22.2 ± 3.8	23.0 ± 4.0	19.3 ± 4.4	22.2 ± 4.4
	EDTA-treated	17.0 ± 9.6	--	18.2 ± 3.9	20.4 ± 3.4
Fourth quarter 2021					
13 Oct, 2021	Untreated	23.0 ± 3.3	21.8 ± 9.0	14.5 ± 7.6	18.4 ± 5.9
	EDTA-treated	17.5 ± 8.6		17.2 ± 4.0	21.6 ± 3.4

Table 3. ***Hyalella azteca*** **survival (mean ± SD) in EDTA treatments of samples from CM_MC2 and RG_MIDAG and related locations.**

Test initiation	Treatment	Control	CM_MC1	CM_MC2	RG_MIDAG
Second quarter 2021					
20 May, 2021	Untreated	94.0 ± 8.9	100.0 ± 0.0	70.0 ± 12.2	100.0 ± 0.0
	EDTA-treated	94.0 ± 5.5	--	96.0 ± 5.5	96.0 ± 5.5
Third quarter 2021					
12 Aug, 2021	Untreated	96.0 ± 8.9	98.0 ± 4.5	38.0 ± 31.9	94.0 ± 13.4
	EDTA-treated	94.0 ± 8.9	--	88.0 ± 13.0	88.0 ± 8.4
Fourth quarter 2021					
14 Oct, 2021	Untreated	92.0 ± 8.3	90.0 ± 17.3	98.0 ± 4.5	100.0 ± 0.0
	EDTA-treated	96.0 ± 5.5	--	98.0 ± 4.5	94.0 ± 5.5

Table 4. ***Hyalella azteca*** **growth (mean ± SD) in EDTA treatments of samples from CM_MC2 and RG_MIDAG and related locations.**

Test initiation	Treatment	Control	CM_MC1	CM_MC2	RG_MIDAG
Third quarter 2021					
12 Aug, 2021	Untreated	0.86 ± 0.15	0.77 ± 0.07	0.32 ± 0.10	0.79 ± 0.07
	EDTA-treated	0.48 ± 0.16	--	0.24 ± 0.11	0.31 ± 0.18
Fourth quarter 2021					
14 Oct, 2021	Untreated	0.43 ± 0.07	0.55 ± 0.06	0.57 ± 0.09	0.50 ± 0.09
	EDTA-treated	0.67 ± 0.09	--	0.66 ± 0.12	0.46 ± 0.06

Please contact the undersigned if you have any questions regarding these results.

Yours truly,

Émilie Viczko, MSc
Project Biologist

Melanie Gallant, PhD.
Environmental Toxicologist

5.5 Acute Toxicity Testing Results

The results summarized in this section are for water sampling sites listed in Appendix 2 (Tables 10 to 25) and in Appendix 5 (Tables 5B4, 5C2, and 5C3) in Permit 107517. Results are tabulated in Appendix M and final lab reports are provided in Appendix N.

Acute toxicity results for the locations listed in Appendix 4 for the water treatment facilities (WLC AWTF, EVO SRF, FRO-S, and FRO-N) are summarized and provided in the Annual Water Treatment Performance Report as per Section 4A8 (xi and xii) in Permit 107517.

All quarterly acute toxicity testing requirements were met in 2021 with the exception of CM_PC2 in Q3. This resulted in a noncompliance (missed data) as noted in Section 3.3 of this report.

5.5.1 *Daphnia magna* Test Results

As per Section 6.2 of Permit 107517, effluent is not acutely toxic if it does not cause greater than 50% mortality in a 48-hour *Daphnia magna* single concentration (100%) test. In 2021, 553 *Daphnia magna* single concentration (100%) acute toxicity tests were conducted on samples collected from permitted water sampling sites—none exhibited greater than 50% mortality.

Of the 553 *Daphnia magna* single concentration (100%) acute toxicity test results, there were twenty-nine that exhibited greater than 0% mortality: one test result exhibited 27% mortality (FR_CC1); two test results exhibited 17% mortality (CM_CCPD and CM_CCOFF); two test results exhibited 13% mortality (EV_GC2 and GH_WADE), and twenty-four test results (at eleven different locations) exhibited between 3% and 10% mortality (these were within the negative control performance standard of ≤ 10% for this test procedure). These results are not discussed further in this report.

Teck also conducted 42 *Daphnia magna* LC50 tests in 2021 on samples collected from permitted water sampling sites. Two tests exhibited 10% mortality in the undiluted sample and the rest exhibited 0% mortality. These results are not discussed further in this report.

5.5.2 Rainbow Trout Test Results

As per Section 6.2 of Permit 107517, effluent is not acutely toxic if it does not cause greater than 50% mortality in a 96-hour Rainbow Trout single concentration (100%) test. In 2021, 555 Rainbow Trout single concentration (100%) acute toxicity tests were conducted on samples collected from permitted water sampling sites— one test result exhibited greater than 50% mortality (i.e., a failed test result). The failed test result exhibited 100% mortality and was for a sample collected at the Liverpool Sediment Pond Decant (FR_LP1; E304835) on November 17. This result is discussed in detail in the subsections that follow.

Of the 555 Rainbow Trout single concentration (100%) acute toxicity test results, there were thirty that exhibited greater than 0% mortality but less than 50%: one test result exhibited 20% mortality (EV_GC2) and twenty-nine test results (at twelve different locations) exhibited 10% mortality (these were within the negative control performance standard of ≤ 10% for this test procedure). These results are not discussed further in this report.

Teck also conducted 45 Rainbow Trout LC50 tests in 2021 on samples collected from permitted water sampling sites. Eight tests were conducted on samples collected at FR_LP1 as part of the investigation for the failed toxicity test result noted above—one test result exhibited greater than 50% mortality in the undiluted sample (i.e., a failed test result). This failed test result exhibited 60% mortality in the undiluted sample and was for a sample collected at the Liverpool Sediment Pond Decant (FR_LP1; E304835) on November 24. Two other test results exhibited elevated mortality in the undiluted sample but were not failed test results (November 22: 30% mortality and November 25: 50% mortality). The LC50 test results for FR_LP1 are discussed in detail in the subsections that follow. The rest of the Rainbow Trout LC50 tests conducted in 2021 exhibited 0% mortality in the undiluted sample.

5.5.3 Noncompliant Acute Toxicity Test Result

In response to the noncompliant (i.e., failed) acute toxicity test results for samples collected at FR_LP1 on November 17 and November 24, 2021, Teck followed the requirements of Section 9.2.3 in Permit 107517 and the adaptive management plan response framework with respect to notification, confirmatory testing, corrective actions where possible, and the provision of follow-up test information to regulators and Ktunaxa Nation Council as it became available.

5.5.3.1 Description of Event

An acute toxicity sample collected on November 17, 2021, from the Liverpool Sediment Pond discharge location (FR_LP1; E304835) showed 100% mortality in the 96-hour Rainbow Trout single concentration (100%) test. A sample collected the same day in the Fording River immediately downstream of FR_LP1 (FR_FRDSLP1) showed 40% mortality. As per Section 9.2.3 of Permit 107517, a sample was collected at FR_LP1 on November 22 for a confirmatory LC50 test.

Teck immediately initiated additional (daily) monitoring (water chemistry and acute toxicity) at FR_LP1 and FR_FRDSLP1, followed by investigative sampling of inputs to Liverpool Pond to identify the source of the toxicity. An LC50 Rainbow Trout acute toxicity test conducted on a sample collected November 24 showed 60% mortality in the undiluted sample—a second failed test result. Toxicity results for samples collected from an operational dewatering sump within Swift Pit (FR_IP3) suggested that this was the source of toxicity. Toxicity results associated with this investigation and a map of the sampling locations are provided in Appendix O.

Teck had Nautilus Environmental conduct toxicity identification evaluation (TIE) testing for samples collected on November 22, 24, and 25 at FR_LP1; for a sample collected on November 25 at FR_FRDSLP1; and for samples collected on November 26, 30, and December 1 at FR_IP3. Teck also contracted a qualified professional (Golder, member of WSP) to evaluate all data and laboratory evaluations associated with this investigation.

Operational inputs to Liverpool Pond were stopped on November 26, and the Liverpool discharge gate was closed on November 29. The discharge gate remains closed.

5.5.3.2 Interpretation of Cause

Nautilus Environmental (2022) conducted a toxicity identification evaluation (TIE) to evaluate potential causes of the failed Rainbow Trout tests at FR_LP1. A TIE involves physico-chemical manipulations of

water samples, followed by toxicity tests on the treated and untreated samples, to provide information regarding the cause of toxicity. A TIE could not be conducted on the original November 17 sample due to insufficient volume; therefore, TIEs were conducted on subsequent samples collected from FR_LP1 (November 22, 24, and 25), FR_FRDSLP1 (November 25), and FR_IP3 (November 26, 30, and December 1) (Table 24). The strength of toxicity was reduced in the sampling events subsequent to November 17, but still provided sufficient toxicity signal between November 22 and 25 to warrant a TIE. In addition, nitrite spiking tests were conducted with non-toxic composited samples collected from FR_LP1 on November 27 and 29 (first test) and December 2, 3,4, and 6 (second test).

Acute toxicity tests performed as part of the TIE used 96-h Rainbow Trout single concentration screening tests according to procedures from Environment Canada. TIE treatments included the following:

- chloride addition: a reduction in toxicity following chloride addition would indicate toxicity was due to a compound that is chloride-dependent, such as nitrite.
- pH stabilization: a reduction in toxicity following pH-stabilization would indicate toxicity was due to a compound with pH-dependent characteristics, such as ammonia.
- EDTA addition: ethylenediaminetetraacetic acid (EDTA) is a chelating agent that binds to divalent metal cations. A reduction in toxicity following EDTA treatment would indicate toxicity was due to a metal.
- nitrite additions (spiking series): untreated FR_LP1 samples that were non-toxic were used in a nitrite spiking series to determine the sensitivity of Rainbow Trout to nitrite in site water.

TIE results are presented in Table 24 and Figure 34 and Figure 35. Chloride addition of 25 mg/L and chloride addition in combination with pH-stabilization were generally found to substantially reduce or remove toxicity observed in the untreated samples. The pH-stabilized treatment alone was insufficient to remove toxicity (three tests showed no reduction in toxicity and two tests showed a marginal [20%] reduction in toxicity), whereas the combination of chloride treatment and pH control removed the adverse response. Collectively, the TIE results demonstrated that adding chloride into the samples consistently reduced toxicity of the samples.[29] EDTA treatment increased toxicity in both the FR_LP1 sample and the EDTA-treated negative laboratory control (Nautilus 2022), indicating that the EDTA treatment itself contributed to adverse effects. Based on these findings, and a comparison to effect concentrations published in the literature (see below), Nautilus (2022) concluded that nitrite was primarily responsible for toxicity, but that the presence of unionized ammonia may also have contributed to the adverse effects. The evidence for potential contribution of ammonia and nitrite is discussed below.

The toxicity of ammonia depends on the chemical speciation of ammonia (i.e., the unionized form NH_3 versus the ammonium ion NH_4^+), which varies with temperature and pH (USEPA 1999)[30]; the fraction of unionized ammonia increases as pH and temperature increase. Figure 34 shows the relationship between unionized ammonia and Rainbow Trout percent survival in literature LC50 tests (grey X), TIE

[29] One exception was the FR_LP1 sample collected on November 22 with 15 mg/L chloride; there was no sample remaining with which to confirm this result, and all subsequent treatments that were effective at removing toxicity were performed with 25 mg/L of chloride.

[30] Ammonia speciation also depends on ionic strength, but in fresh water this effect is much smaller than the effects of pH and temperature (USEPA 1999).

tests (open symbols), and the FR_LP1 November 17 and 24 failed toxicity test (filled symbols). Key findings from this figure are as follows:

- Rainbow Trout 96-h LC50 values for unionized ammonia range from 0.09 to 1.9 mg/L as N, with an average of 0.5 mg/L as N (USEPA 2013). Approximately half of the TIE tests had unionized ammonia concentrations below the minimum LC50 value, indicating that ammonia would not be expected to result in acute lethality to Rainbow Trout. In other TIE tests, although unionized ammonia concentrations were above the minimum LC50 in literature tests, there was a lack of correspondence between unionized ammonia and percent survival in TIE tests.
- For the November 17 and 24 samples from FR_LP1, the concentration of unionized ammonia under laboratory conditions (0.1 mg/L as N) was approximately equal to the minimum LC50 reported in USEPA (2013; 0.09 mg/L as N), but the lack of correspondence between unionized ammonia and percent survival makes the contribution from ammonia uncertain. Furthermore, it should be noted that under laboratory testing conditions, the temperature is higher (15°C, per EC 2000 protocol); as the temperature increases, the form of ammonia present in the sample shifted from the ionized form to the more toxic un-ionized form (i.e., from NH_4^+ to NH_3), thereby increasing the concentration of unionized ammonia under lab conditions. Under field conditions, the temperature was lower (2.5°C to 6.1°C); concentrations of unionized ammonia under field conditions (0.05 to 0.06 mg/L as N) were below the minimum Rainbow Trout LC50 value reported in USEPA (2013; 0.09 mg/L as N) and approximately 10 times lower than the average Rainbow Trout LC50 value (0.5 mg/L as N).

In aggregate, the results indicate that ammonia may have contributed to the FR_LP1 test failures, and that the potential contribution from unionized ammonia is an artefact of testing conditions (higher temperature), which causes the fraction of unionized ammonia to increase to an extent that the test results do not represent the actual field conditions. Given that the pH-stabilized treatment alone was insufficient to remove toxicity and that there is no correspondence between survival and ammonia concentrations, ammonia is not expected to be the primary cause of toxicity in these samples.

The toxicity of nitrite is primarily influenced by chloride (BC ENV 2021), although other factors such as fish size and pH have also been shown to influence toxicity (e.g., Russo et al. 1981). Figure 35 (top) shows the relationship between nitrite and percent survival in literature LC50 tests (grey X) and FR_LP1 LC50 tests (blue X). The following equation was used in this section to describe the ameliorating effect of chloride on 96-hour nitrite LC50s published in the literature for Rainbow Trout:

$$Estimated\ 96h\ Rainbow\ Trout\ Nitrite\ LC50\ (mg/L\ as\ N) = (0.57 \times chloride)^{0.82}$$

In FR_LP1 tests, the LC50 at chloride of 5.47 mg/L (2.2 mg/L as N) was approximately equal to the expected LC50 based on literature testing (grey dashed line); this demonstrates reasonable agreement across sources.[31] In the other FR_LP1 test, the LC50 (0.53 mg/L at chloride of 3.94 mg/L) was more than two times below the expected LC50 based on literature testing (grey dashed line). The reason for differences in the FR_LP1 LC50s is not known, but the test at 5.47 mg/L chloride is expected to be a

[31] A factor of two is often used in toxicity literature to represent reasonable agreement between measured and predicted values (e.g., CCME 2018).

more reliable estimate of nitrite toxicity in FR_LP1 water because more fish per test concentration were used[32] and survival in the site control met the acceptability criterion[33].

Figure 35 (bottom) shows the correspondence between nitrite concentrations (as indicated by magnitude[34]) and percent mortality in acute toxicity tests with Rainbow Trout conducted as part of the TIE (open symbols), literature LC50 tests (grey X), FR_LP1 LC50 tests (blue X), and the FR_LP1 November 17 and 24 failed toxicity tests (filled symbols). On this figure, the magnitude of estimated nitrite LC50 is used as the exposure variable so that the modifying effect of chloride is comparable across tests. A magnitude of 1 indicates that the nitrite concentration in the test was equal to the estimated LC50. Key findings from this figure are as follows:

- There is good correspondence between Rainbow Trout survival and nitrite concentrations (as indicated by the magnitude). As the concentration of nitrite increases, percent survival decreases. In TIE tests (open symbols), one exception was identified for the FR_LP1 TIE test with 15 mg/L chloride (blue circle); as discussed earlier, there was no sample remaining with which to confirm this result, and all subsequent samples with FR_LP1 conformed to the overarching pattern.
- In the November 17 and 24 samples from FR_LP1, nitrite concentration were within the range of LC50s reported in literature and FR_LP1 tests. The extent of toxicity in the November 17 sample was somewhat greater than would be expected based on measured concentrations of nitrite, which could indicate another contributor to the adverse response (e.g., ammonia, as discussed above) or simply reflect test variability which is common at concentrations near the LC50 (magnitude of 1).

In aggregate, the TIE results indicate that nitrite was the primary cause of the failed toxicity test.

[32] The 5.47 mg/L chloride test had 10 fish per concentration (in alignment with the EC 2000 protocol) compared to only five fish per concentration in the 3.94 mg/L chloride test. Reduction of the number of fish per test solution results in a loss of the precision of the LC50 (EC 2000); this is demonstrated by the wider confidence intervals for the 3.94 mg/L chloride test (±1.8 times the LC50) compared to the 5.47 mg/L chloride test (±1.2 times the LC50).

[33] The 5.47 mg/L chloride test had 100% survival in the site control. The 3.94 mg/L chloride test had 80% survival in the site control, which is below the EC (2000) test validity criterion of 90%; this makes the 3.94 mg/L chloride test invalid.

[34] Magnitude of LC50 calculated as the nitrite concentration in the test divided by the estimated chloride-dependent LC50.

Table 24. Summary of 96-hour Rainbow Trout TIE results.

Station	Water Sample Collection Date(s)	TIE Initiation Date	Treatment(s)	Survival (%)	Nitrite (mg/L N)[1]	Total Ammonia (mg/L N)[1]	Chloride (mg/L)[2]	Unionized Ammonia (mg/L N)	pH[3]
FR_LP1	2021-11-22	2021-11-26	Untreated	60	0.47	3.25	1.29	0.12	8.2
			15 mg/L chloride	50			16.29	0.12	8.2
		2021-11-29	Untreated	75	0.46	4.66	1.29	0.14	8.1
			EDTA	25			1.29	0.14	8.1
	2021-11-24	2021-12-08	Untreated	100	0.23	2.76	1.28	0.12	8.3
			25 mg/L chloride	100			26.28	0.12	8.3
	2021-11-25	2021-12-03	Untreated	80	0.43	3.19	1.68	0.11	8.2
			25 mg/L chloride	100			26.68	0.04	7.8
			pH stabilized	100			1.68	0.05	7.9
			pH stabilized (with 25 mg/L chloride)	100			26.68	0.13	8.3
	2021-11-27 and 29 (composited)	2021-12-21	Nitrite spiking series		see Figure 34 and 35				
	2021-12-2,3,4 and 6 (composited)	2021-12-14	Nitrite spiking series		see Figure 34 and 35				
FR_FRDSLP1	2021-11-25	2021-12-03	Untreated	100	0.27	1.58	1.5	0.05	7.7
			25 mg/L chloride	100			26.5	0.02	7.9
			pH stabilized	100			1.5	0.03	8.2
			pH stabilized (with 25 mg/L chloride)	100			26.5	0.05	8.2
FR_IP3	2021-11-26	2021-11-30	Untreated	20	1.1	5.32	0.93	0.14	8.1
			pH stabilized	20			0.93	0.06	7.7
			pH stabilized (with 25 mg/L chloride)	100			25.93	0.06	7.7
		2021-12-03	Untreated	20	1.8	6.37	0.93	0.22	8.2
			25 mg/L chloride	80			25.93	0.27	8.3
	2021-11-30	2021-12-06	Untreated	0	3.3	6.09	0.45	0.17	8.1
			25 mg/L chloride	100			25.45	0.17	8.1
			pH stabilized	0			0.45	0.07	7.7
			pH stabilized (with 25 mg/L chloride)	100			25.45	0.07	7.7
	2021-12-01	2021-12-06	Untreated	0	2.2	4.83	1.16	0.13	8.1
			25 mg/L chloride	100			26.16	0.13	8.1
			pH stabilized	20			1.16	0.03	7.5
			pH stabilized (with 25 mg/L chloride)	100			26.16	0.03	7.5

Notes: (1) Measured in-house by toxicity testing lab. (2) Measured in site water. (3) Average pH recorded for the duration of the test; used in Nautilus' calculation of unionized ammonia.

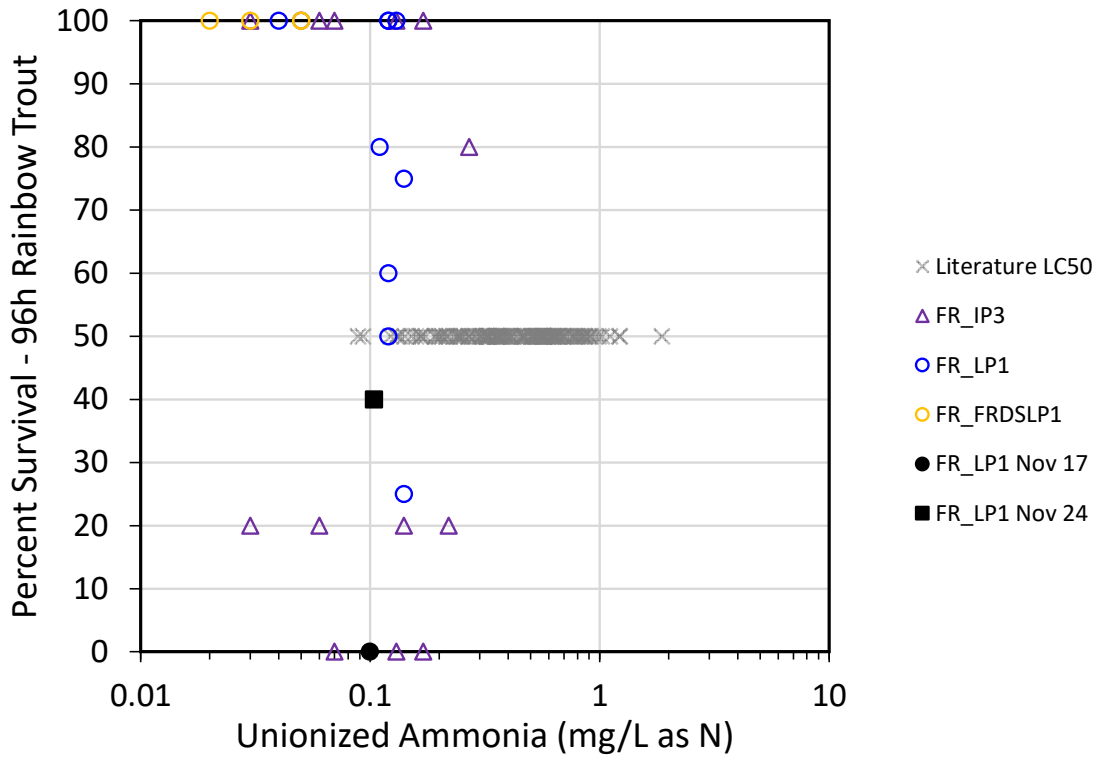

Figure 34. Relationship between unionized ammonia and percent survival in acute toxicity tests conducted with Rainbow Trout.

Notes: Concentrations are in milligrams per litre as nitrogen (mg/L as N). LC50 = concentration associated with 50% lethality in 96-hour tests conducted with Rainbow Trout. TIE = toxicity identification evaluation. Literature LC50s were obtained from US EPA (2013; n = 154). Open symbols (triangles, circles, squares) represent TIE test results from Table 24. Filled symbols indicate the November 17 and 24 samples from FR_LP1 (i.e., the failed toxicity tests).

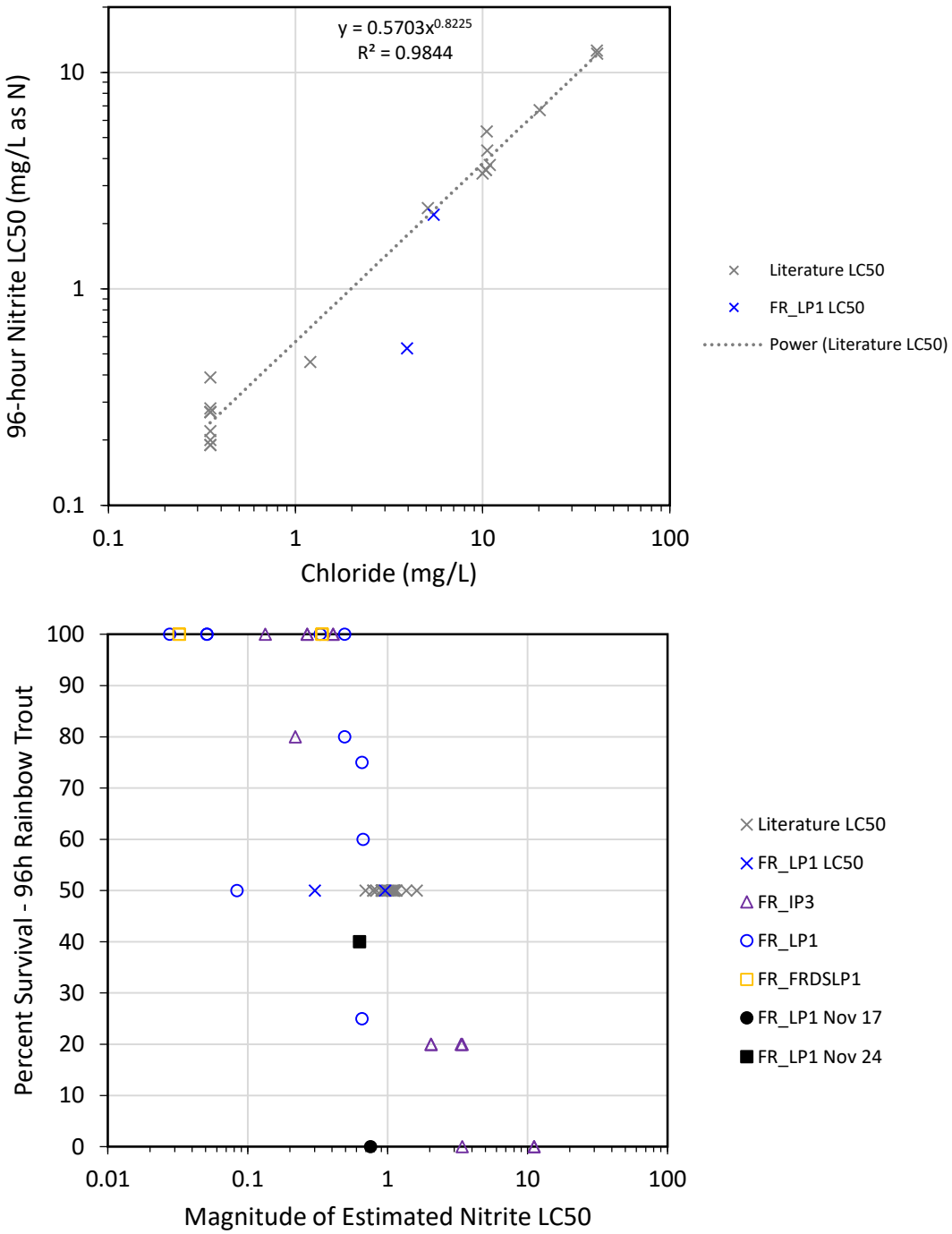

Figure 35. Relationship between chloride and nitrite LC50s for Rainbow Trout (top) or magnitude of estimated nitrite LC50 and percent survival (bottom).

Notes: Concentrations are in milligrams per litre (mg/L) or milligrams per litre as nitrogen (mg/L as N). LC50 = concentration associated with 50% lethality in 96-hour tests conducted with Rainbow Trout. X symbols indicate LC50s obtained from literature (grey) or nitrite spiking tests with FR_LP1 (blue). Literature LC50s were obtained from Russo et al. 1974; Russo and Thurston 1977; Russo et al. 1981; Kroupova et al. 2008 (n = 20). Open symbols (triangles, circles, squares) represent TIE test results from Table 24. Filled symbols indicate the November 17 and 24 samples from FR_LP1 (i.e., the failed toxicity tests). Magnitude of 1 indicates that nitrite concentration is equal to the estimated LC50.

5.5.3.3 Water Quality Screening

The following summarizes the screening results of water quality to British Columbia Water Quality Guidelines (BCWQGs) for the November 17 and 24 FR_LP1 samples that yielded acute toxicity to Rainbow Trout. Constituent concentrations were below BWQGs, with the exception of nitrite, lithium, and selenium.

- Nitrite concentrations in these samples (0.44 to 0.58 mg/L as N) were greater than the short-term BCWQG (0.06 mg/L as N; chloride-dependent). As discussed in the previous section, nitrite concentrations were within the range of Rainbow Trout LC50s reported in the literature and measured as part of the TIE. This screening aligns with the TIE results presented above.
- Lithium concentration in these samples (196 to 228 µg/L) were greater than the long-term probable no-effect concentration derived by ECCC (2018) of 122 µg/L. Currently, there is no approved short-term BCWQG for lithium; however, the lowest 96-hour LC50 for Rainbow Trout reported in Merck (2010, 2018) and Sigma (2021a, b) safety data sheets is 30,300 µg/L, indicating that lithium would not be expected to contribute to acute effects. This screening aligns with the TIE results in that EDTA treatment did not remove toxicity; both lines of evidence indicate that metals did not contribute to the adverse response.
- Selenium concentrations in these samples (7.5 to 8 µg/L) were greater than the long-term chronic BCWQG of 2 µg/L. The long-term chronic BCWQG of for selenium is intended to prevent chronic bioaccumulation of selenium in tissue and not direct acute effects (BC ENV 2014); therefore, selenium concentrations greater than the long-term chronic BCWQG would not be interpreted to cause acute effects. Currently, there is no approved short-term BCWQG for selenium; however, the lowest 96-hour LC_{50} for Rainbow Trout compiled by the US EPA (2004) is 4,200 µg/L selenite and 4,500 µg/L for selenate, indicating that selenium would not be expected to contribute to acute effects. Additionally, selenium concentrations in the November tests that exhibited an acute toxicity test failure were within the range of concentrations in FR_LP1 tests that had no adverse effects.

5.5.3.4 Summary

Investigations of the original test observations and the follow-up TIE testing, combined with water quality evaluations, indicate that nitrite was the probable cause of the November 17 and 24 toxicity test failures. The main lines of evidence in support of this conclusion were:

- Results above the nitrite short-term water quality guideline and toxicological benchmarks for Rainbow Trout survival
- Lack of other constituents with strong potential to elicit the magnitude of responses observed
- Empirical results of TIE treatments in which chloride additions (which reduce nitrite toxicity) demonstrably reduced mortality to Rainbow Trout
- Limited to no efficacy of other TIE treatments in reducing toxicity to Rainbow Trout
- Correspondence between Rainbow Trout survival and nitrite concentrations (as mediated by chloride amendment across a spiking series)

There are indications of possible influence of unionized ammonia in some samples under laboratory test conditions. However, such responses are secondary to the nitrite influences, and may not be relevant to field conditions given the effect of water temperature on ammonia speciation.

5.5.3.5 Description of Actions Taken

Below is a summary of actions taken by Teck in 2021 in response to this event. Teck's response continues in 2022, as do regular and frequent updates to regulators and KNC.

- November 22: Teck reported the failed acute toxicity test to EMBC (DGIR# 213390) upon receiving preliminary results from the lab.
- November 22: Teck collected confirmatory samples (for LC50 and TIE tests) and initiated additional (daily) sampling at FR_LP1 and FR_FRDSLP1. Teck began evaluating mitigation options.
- November 24: Teck notified ENV, EMLI, KNC, and ECCC of the acute toxicity failure.
- November 26: Operational inputs to Liverpool Pond were stopped.
- November 26: Began collecting samples from operational inputs to Liverpool pond to identify the source of the toxicity.
- November 29: Liverpool discharge gate was closed.
- November 30: Preliminary acute toxicity test results suggest mitigation measures were successful in eliminating toxicity in Liverpool Pond.
- December 3: Teck contracted QPs to support the investigation and evaluation of water quality results.
- December 24: Teck submitted the *Swift Water Management Interim EFN Contingency Plan* to regulators and KNC.

During Teck's response to this event, regular and frequent updates were provided to regulators and KNC. These included preliminary and final water quality and acute toxicity results as they became available; updates on how operational water from Swift Pit was being managed; and updates on how EFNs in the Fording River were being managed.

Teck is revising its internal procedure for pit water management plans and is updating its data management tools to help to better identify and pro-actively manage water quality risks associated with our authorized activities.

APPENDIX C

Water Quality Screening

Parameter	Unit	Guidelines for the protection of: Aquatic Life 30-day mean	Aquatic Life Maximum	EVWQP Benchmarks	Q1 FR_UFR1 P. subcapitata 23-Feb-21	2-Mar-21	9-Mar-21	16-Mar-21	23-Mar-21	30-Mar-21	Mar 2, 9, 16, 23, 30 P. promelas Mean	P. promelas CV	C. dubia 13-Apr-21
Field Measured													
pH	-	6.5 - 9.0	6.5 - 9.0	-	8.2	8.3	8.2	7.9	8.0	8.3	8.1	0.022	8.1
Conductivity	µS/cm	-	-	-	-	-	302	240	-	265	269	0.12	-
Specific conductivity	µS/cm at 25 C	-	-	-	363	353	-	-	223	-	288	0.32	279
Temperature	°C	-	-	-	0	0	0	0	0.1	0	0.02	2.2	<0.10
Dissolved oxygen	mg/L	11	9.0	-	12	12	12	12	12	12	12	0.011	12
Turbidity	NTU	-	-	-	-	-	1.3	-	3.6	-	2.5	0.64	0.36
Dissolved oxygen	%	-	-	-	79	80	80	80	81	82	81	0.011	83
Oxidation-reduction potential field	mv	-	-	-	175	129	151	137	145	119	136	0.093	159
Conventional Parameters													
pH	-	6.5 - 9.0	6.5 - 9.0	-	8.2	8.3	8.1	8.2	8.2	8.2	8.2	0.0086	8.4
Hardness, as $CaCO_3$	mg/L	-	-	-	197	191	165	115	111	143	145	0.23	145
Total alkalinity, as $CaCO_3$	mg/L	20[a]	-	-	140	140	127	104	97	115	117	0.15	125
Total dissolved solids	mg/L	-	-	-	194	221	158	151	144	160	167	0.19	179
Total suspended solids	mg/L	-	-	-	<1.0	<1.0	1.3	2.8	<1.0	3.3	1.9	0.58	<1.0
Total organic carbon	mg/L	-	-	-	<0.50	<0.50	2.4	3.6	4.9	2.9	2.9	0.57	3.1
Dissolved organic carbon	mg/L	-	-	-	<0.50	<0.50	2.2	3.6	4.5	3.2	2.8	0.55	2.7
Colour	TCU	-	-	-	<5.0	-	-	-	-	-	-	-	-
Turbidity	NTU	-	-	-	0.14	0.11	3.5	6.8	3.7	2.5	3.3	0.73	0.8
Total acidity	mg/L	-	-	-	<2.0	<2.0	<2.0	<2.0	2.2	<2.0	2.0	0.044	<2.0
Cation - anion balance	%	-	-	-	2.3	0.26	5.7	7.0	3.6	1.9	3.7	0.74	2.7
Ion balance	%	-	-	-	105	100	89	87	93	96	93	0.057	95
Conductivity	µS/cm	-	-	-	311	340	286	240	211	257	267	0.18	283
Oxidation-reduction potential	mv	-	-	-	385	342	474	329	394	405	389	0.15	273
Major Ions													
Bicarbonate	mg/L	-	-	-	-	-	-	-	-	-	-	-	-
Bromide	mg/L	-	-	-	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.05	0	<0.050
Calcium	mg/L	-	-	-	53	53	47	31	31	40	40	0.24	40
Carbonate, as $CaCO_3$	mg/L	-	-	-	-	-	-	-	-	-	-	-	-
Chloride	mg/L	150	600	-	0.13	0.18	0.61	0.14	0.1	0.16	0.24	0.88	<0.10
Fluoride	mg/L	0.12[b]	1.4 - 1.6[c]	-	**0.13**[Mn]	**0.14**[Mn]	0.11	0.1	0.086	**0.15**[Mn]	0.12	0.22	0.091
Hydroxide	mg/L	-	-	-	-	-	-	-	-	-	-	-	-
Magnesium	mg/L	-	-	-	15	14	12	8.9	8.3	11	11	0.22	11
Potassium	mg/L	-	-	-	0.39	0.4	0.39	0.37	0.36	0.37	0.38	0.042	0.36
Sodium	mg/L	-	-	-	0.73	0.77	0.63	0.55	0.54	0.63	0.62	0.15	0.67
Sulphate	mg/L	309 - 429[c,d]	-	481	47	49	53	28	22	33	37	0.36	28
Major anion sum	meq/l	-	-	-	3.8	3.9	3.7	2.7	2.4	3.0	3.1	0.2	3.1
Major cation sum	meq/l	-	-	-	4.0	3.9	3.3	2.3	2.3	2.9	2.9	0.23	2.9
Bicarbonate Alkalinity, as $CaCO_3$	mg/l	-	-	-	140	136	127	104	119	141	125	0.12	123
Carbonate Alkalinity, as $CaCO_3$	mg/l	-	-	-	<1.0	3.4	<1.0	<1.0	<1.0	<1.0	1.5	0.73	2.2
Hydroxide Alkalinity, as $CaCO_3$	mg/l	-	-	-	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1	0	<1.0
Nutrients and Biological Indicators													
Nitrate	mg-N/L	3.0	33	3.4 - 6.0[c]	0.17	0.17	1.0	0.13	0.072	0.075	0.29	1.4	0.013
Nitrite	mg-N/L	0.020[e]	0.060[e]	-	<0.0010	0.001	0.0057	0.0015	<0.0010	0.0026	0.0024	0.84	<0.0010
Total ammonia	mg-N/L	2.1	14	-	0.06	<0.0050	0.0051	<0.0050	0.014	0.034	0.013	0.99	0.0056
Total Kjeldahl nitrogen	mg-N/L	-	-	-	<0.050	<0.050	<0.050	0.072	0.13	<0.050	0.07	0.47	0.092
Total phosphorus	mg-P/L	-	-	-	0.019	0.003	0.016	0.026	0.013	0.01	0.014	0.63	0.005
Orthophosphate	mg-P/L	-	-	-	0.0056	0.0028	0.012	0.014	0.011	0.0094	0.0098	0.44	0.0045
Biochemical oxygen demand	mg/L	-	-	-	<2.0	-	-	-	-	-	-	-	-
Total Metals													
Aluminum	mg/L	-	-	-	0.0046	0.004	0.28	0.5	0.26	0.2	0.25	0.72	0.067
Antimony	mg/L	0.0090	-	-	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.00010
Arsenic	mg/L	0.0050	0.0050	-	<0.00010	0.0001	0.00019	0.00024	0.00021	0.00023	0.00019	0.29	0.00013
Barium	mg/L	1.0	-	-	0.072	0.075	0.071	0.052	0.05	0.055	0.061	0.19	0.056
Beryllium	mg/L	0.00013	-	-	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.00002	0	<0.000020
Bismuth	mg/L	0.0005[f]	-	-	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0	<0.000050
Boron	mg/L	1.2	29[b]	-	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.01	0	<0.010
Cadmium	mg/L	-	-	-	0.000011	0.0000099	0.000029	0.00005	0.000024	0.000019	0.000026	0.57	0.000011
Calcium	mg/L	-	-	-	54	59	42	37	33	38	42	0.24	40
Chromium	mg/L	0.0010[g]	-	-	0.00012	0.00015	0.00062	**0.0010**[Mn]	0.00055	0.00048	0.00056	0.54	0.00025
Cobalt	mg/L	0.0040	0.11	-	<0.00010	<0.00010	<0.00010	0.00011	<0.00010	<0.00010	0.0001	0.044	<0.00010
Copper	mg/L	-	-	-	<0.00050	<0.00050	0.00056	0.0008	0.00065	<0.00050	0.0006	0.21	<0.00050
Iron	mg/L	0.55 - 2.91[f,h]	1.0	-	<0.010	<0.010	0.12	0.23	0.14	0.083	0.12	0.68	0.033
Lead	mg/L	0.0069 - 0.011[c]	0.093 - 0.20[c]	-	<0.000050	<0.000050	0.00011	0.0002	0.0001	0.000061	0.0001	0.56	<0.000050
Lithium	mg/L	0.1216[f]	-	-	0.0016	0.0017	0.0021	0.0014	0.0013	0.0016	0.0016	0.19	0.0014
Magnesium	mg/L	-	-	-	15	15	12	9.0	8.9	10	11	0.22	11
Manganese	mg/L	1.1 - 1.5[c]	1.8 - 2.7[c]	-	0.00031	0.0003	0.0019	0.0032	0.0016	0.0013	0.0017	0.63	0.00066
Mercury	mg/L	0.000010	-	-	<0.00000050	<0.00000050	0.0000017	0.0000048	0.0000036	0.0000023	0.0000026	0.65	0.0000015
Molybdenum	mg/L	1.0	2.0	-	0.00059	0.00057	0.00056	0.00052	0.00048	0.00059	0.00054	0.083	0.00058
Nickel	mg/L	0.0053[i]	-	-	<0.00050	<0.00050	0.00062	0.001	0.00074	<0.00050	0.00067	0.31	<0.00050
Potassium	mg/L	-	-	-	0.39	0.39	0.47	0.46	0.43	0.42	0.44	0.077	0.36
Selenium	mg/L	0.0020	-	0.019	0.00099	0.00089	0.00091	0.00074	0.00078	0.00081	0.00083	0.089	0.00095
Silicon	mg/L	-	-	-	1.9	1.9	2.5	2.6	2.5	2.3	2.4	0.12	2.1
Silver	mg/L	0.0015[c]	0.0030[c]	-	<0.000010	<0.000010	0.000017	0.000042	0.000027	0.000011	0.000021	0.62	<0.000010
Sodium	mg/L	-	-	-	0.75	0.71	0.67	0.55	0.55	0.6	0.62	0.12	0.66
Strontium	mg/L	-	-	-	0.1	0.095	0.083	0.063	0.057	0.073	0.074	0.2	0.073
Sulphur	mg/L	-	-	-	18	19	14	9.6	8.0	9.8	12	0.37	10.0
Thallium	mg/L	0.00080	-	-	<0.000010	<0.000010	<0.000010	0.000019	0.000013	<0.000010	0.000012	0.32	<0.000010
Tin	mg/L	0.30[f]	-	-	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.00010
Titanium	mg/L	0.85[f]	-	-	<0.00030	<0.00030	0.0073	0.014	0.0065	0.0054	0.0066	0.72	0.0015
Uranium	mg/L	0.0085	0.033[b]	-	0.00054	0.0005	0.00045	0.00038	0.0003	0.00038	0.0004	0.19	0.00041
Vanadium	mg/L	0.12[f]	-	-	<0.00050	<0.00050	0.0014	0.0022	0.0014	0.0014	0.0014	0.43	<0.00050
Zinc	mg/L	0.023 - 0.090	0.049 - 0.12	-	<0.0030	<0.0030	<0.0030	0.0033	<0.0030	<0.0030	0.0031	0.044	<0.0030
Dissolved Metals													
Aluminum	mg/L	0.050[h]	0.10[h]	-	0.0041	<0.0010	0.0072	0.022	0.019	0.008	0.011	0.77	0.0044
Antimony	mg/L	-	-	-	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.00010
Arsenic	mg/L	-	-	-	<0.00010	<0.00010	0.00013	0.00017	0.00015	0.00014	0.00014	0.19	0.0001
Barium	mg/L	-	-	-	0.073	0.074	0.064	0.047	0.046	0.054	0.057	0.21	0.057
Beryllium	mg/L	-	-	-	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.00002	0	<0.000020
Bismuth	mg/L	-	-	-	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0	<0.000050
Boron	mg/L	-	-	-	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.01	0	<0.010
Cadmium	mg/L	0.00023 - 0.00035[c]	0.00065 - 0.0012[c]	0.00015 - 0.00024[c]	0.0000077	0.0000091	0.000014	0.000017	0.000012	0.0000083	0.000012	0.29	0.000011
Chromium	mg/L	-	-	-	0.00014	0.00013	0.00016	0.00011	0.00014	0.00017	0.00014	0.17	0.00011
Cobalt	mg/L	-	-	-	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.00010
Copper	mg/L	0.0003 - 0.0031[j]	0.0018 - 0.0184[j]	-	<0.00020	<0.00020	0.00027	0.00045	0.00048	0.00056	0.00039	0.38	0.00026
Iron	mg/L	-	0.35	-	<0.010	<0.010	0.012	0.035	0.026	<0.010	0.019	0.61	<0.010
Lead	mg/L	-	-	-	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0	<0.000050
Lithium	mg/L	-	-	-	0.0017	0.0017	0.0015	<0.0010	0.0012	0.0013	0.0013	0.2	0.0014
Manganese	mg/L	-	-	-	0.00018	0.00019	0.00082	0.0013	0.00059	0.00044	0.00067	0.63	0.00014
Mercury	mg/L	-	-	-	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.000005	0	<0.0000050
Molybdenum	mg/L	-	-	-	0.00061	0.00062	0.00052	0.00044	0.00044	0.0005	0.0005	0.15	0.00055
Nickel	mg/L	-	-	-	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	0	<0.00050
Selenium	mg/L	-	-	-	0.00092	0.00092	0.001	0.00076	0.00074	0.0011	0.0009	0.17	0.00088
Silicon	mg/L	-	-	-	1.9	1.8	1.9	2.0	2.1	2.0	1.9	0.07	2.0
Silver	mg/L	-	-	-	<0.000010	<0.000010	<0.000010	0.000012	<0.000010	<0.000010	0.00001	0.086	<0.000010
Strontium	mg/L	2.5[f]	-	-	0.1	0.1	0.077	0.061	0.056	0.067	0.072	0.25	0.076
Sulphur	mg/L	-	-	-	17	17	13	10	8.0	9.4	11	0.31	10
Thallium	mg/L	-	-	-	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	0	<0.000010
Tin	mg/L	-	-	-	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.00010
Titanium	mg/L	-	-	-	<0.00030	<0.00030	0.0003	0.0011	0.00079	<0.00030	0.00055	0.65	<0.00030
Uranium	mg/L	-	-	-	0.00051	0.00051	0.0004	0.00032	0.0003	0.00036	0.00038	0.22	0.00043
Vanadium	mg/L	-	-	-	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	0	<0.00050
Zinc	mg/L	-	-	-	0.0022	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.001	0	<0.0010

Parameter	Q2 FR_UFR1 C. dubia and P. subcapitata 18-May-21	25-May-21	1-Jun-21	8-Jun-21	15-Jun-21	May 18, 25, June 1, 8 H. azteca Mean	H. azteca CV	May 18, 25, June 1, 8, 15 O. mykiss Mean	O. mykiss CV	29-Jun-21	6-Jul-21	13-Jul-21	20-Jul-21	June 29, July 7, 13, 20 H. azteca (retest) Mean	H. azteca (retest) CV
Field Measured															
pH	8.1	8.5	8.0	8.2	8.1	8.2	0.023	8.2	0.024	8.5	8.4	8.4	8.7	8.5	0.017
Conductivity	-	-	-	-	231	-	-	231	-	-	270	387	328	328	0.52
Specific conductivity	211	230	215	224	233	220	0.035	223	0.043	251	-	-	-	251	-
Temperature	2.6	2.9	3.1	2.7	5.3	2.8	0.071	3.3	0.34	8.4	9.7	8.8	11	9.6	0.13
Dissolved oxygen	11	11	11	**10**[Mn]	**11**[Mn]	**11**[Mn]	0.058	**11**[Mn]	0.046	**10**[Mn]	**9.7**[Mn]	**10**[Mn]	**9.0**[Mn]	**9.7**[Mn]	0.049
Turbidity	10.0	0.55	6.6	1.1	1.1	4.5	0.93	3.8	1.1	-	-	-	-	-	-
Dissolved oxygen (%)	81	84	82	77	83	81	0.036	82	0.031	-	-	-	-	-	-
Oxidation-reduction potential field	170	145	233	158	137	176	0.2	168	0.23	218	171	175	128	173	0.21
Conventional Parameters															
pH	7.9	7.9	8.2	8.2	8.3	8.1	0.02	8.1	0.023	8.4	8.3	8.3	8.4	8.4	0.0069
Hardness, as $CaCO_3$	114	122	115	111	120	116	0.039	116	0.039	145	138	155	164	151	0.076
Total alkalinity, as $CaCO_3$	117	123	106	114	115	115	0.053	115	0.053	125	131	132	132	130	0.026
Total dissolved solids	127	134	121	128	143	128	0.036	131	0.064	122	164	138	183	152	0.18
Total suspended solids	18	2.2	10	3.2	4.9	8.4	0.81	7.7	0.85	<1.0	2.2	<1.0	1.4	0.4	1.4
Total organic carbon	3.0	2.3	2.7	2.5	2.1	2.6	0.099	2.5	0.13	1.5	1.1	2.1	0.78	1.4	0.43
Dissolved organic carbon	3.4	2.2	2.9	4.2	1.8	3.2	0.27	2.9	0.32	1.6	0.88	2.3	0.66	1.4	0.56
Colour	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Turbidity	7.3	1.6	3.5	1.2	1.0	3.4	0.76	2.9	0.9	0.24	0.82	0.21	0.31	0.4	0.73
Total acidity	<2.0	<2.0	<2.0	<2.0	<2.0	<2	0	<2	0	<2.0	<2.0	<2.0	<2.0	<2	0
Cation - anion balance	4.5	4.8	0.43	4.6	2.6	3.6	0.53	3.4	0.56	1.2	4.9	0.32	1.5	2.0	1.0
Ion balance	91	91	101	91	95	94	0.047	94	0.046	102	91	99	103	99	0.057
Conductivity	210	228	212	221	225	218	0.034	219	0.036	265	270	282	302	280	0.059
Oxidation-reduction potential	304	406	436	467	396	403	0.17	402	0.15	482	452	437	464	459	0.041
Major Ions															
Bicarbonate	-	-	-	-	136	-	-	136	0.45	146	-	159	156	154	-
Bromide	<0.050	<0.050	<0.050	<0.050	<0.050	<0.05	0	<0.05	0	<0.050	<0.050	<0.050	<0.050	<0.05	0
Calcium	32	33	32	30	34	32	0.04	32	0.044	40	39	43	45	42	0.069
Carbonate, as $CaCO_3$	-	-	-	-	1.9	-	-	1.9	0.45	3.0	-	1.4	2.2	2.2	-
Chloride	<0.10	<0.10	0.15	<0.10	<0.10	0.11	0.2	0.11	0.2	<0.10	0.13	<0.10	<0.10	0.043	0.35
Fluoride	0.11	**0.13**[Mn]	0.1	0.057	**0.14**[Mn]	0.10	0.33	0.11	0.3	**0.12**[Mn]	**0.13**[Mn]	**0.12**[Mn]	0.034	0.1	0.44
Hydroxide	-	-	-	-	<1.0	-	-	1.0	0.45	<1.0	-	<1.0	<1.0	1.0	-
Magnesium	8.5	9.6	8.8	8.8	8.8	8.9	0.047	8.9	0.047	11	10	12	13	11	0.084
Potassium	0.33	0.35	0.31	0.41	0.35	0.35	0.14	0.35	0.11	0.4	0.37	0.43	0.47	0.42	0.097
Sodium	0.5	0.63	0.56	0.64	0.56	0.59	0.11	0.58	0.099	0.58	0.54	0.62	0.66	0.6	0.086
Sulphate	8.8	13	9.2	9.3	13	10	0.16	11	0.18	17	22	25	27	23	0.19
Major anion sum	2.5	2.7	2.3	2.5	2.6	2.5	0.059	2.5	0.059	2.9	3.1	3.2	3.2	3.1	0.05
Major cation sum	2.3	2.5	2.3	2.3	2.4	2.3	0.039	2.4	0.039	2.9	2.8	3.1	3.3	3.0	0.074
Bicarbonate Alkalinity, as $CaCO_3$	117	123	106	114	112	115	0.053	114	0.055	120	128	130	128	127	0.035
Carbonate Alkalinity, as $CaCO_3$	<1.0	<1.0	<1.0	<1.0	3.2	<1	0	1.4	0.68	5.0	3.0	2.4	3.6	3.5	0.32
Hydroxide Alkalinity, as $CaCO_3$	<1.0	<1.0	<1.0	<1.0	<1.0	<1	0	<1	0	<1.0	<1.0	<1.0	<1.0	<1	0
Nutrients and Biological Indicators															
Nitrate	0.086	0.011	0.044	0.032	0.036	0.043	0.65	0.042	0.66	0.013	0.012	0.016	<0.0050	0.0089	0.53
Nitrite	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.001	0	<0.001	0	<0.0010	<0.0010	<0.0010	0.0021	0.00023	2.4
Total ammonia	0.012	0.0053	<0.0050	0.005	0.006	0.0067	0.43	0.0066	0.43	<0.0050	0.044	0.034	0.044	0.029	0.63
Total Kjeldahl nitrogen	0.16	<0.050	0.058	<0.050	0.11	0.078	0.59	0.085	0.55	0.073	0.29	0.12	0.054	0.13	0.81
Total phosphorus	0.028	<0.0020	0.0098	0.0065	0.009	0.012	0.88	0.011	0.9	0.0032	0.0074	0.0033	0.0032	0.0043	0.49
Orthophosphate	0.0037	0.0027	0.0018	0.0046	<0.0010	0.0032	0.38	0.0028	0.52	0.0024	0.0022	0.0034	0.0017	0.0024	0.29
Biochemical oxygen demand	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Metals															
Aluminum	0.18	0.066	0.19	0.032	0.051	0.12	0.67	0.1	0.72	0.0061	0.14	0.0045	0.035	0.047	1.4
Antimony	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.0001	0	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0
Arsenic	0.0002	0.00016	0.00018	0.00011	0.00015	0.00016	0.25	0.00016	0.21	0.00013	0.00014	0.00011	0.00015	0.00013	0.13
Barium	0.038	0.04	0.034	0.036	0.035	0.037	0.056	0.037	0.06	0.046	0.055	0.061	0.066	0.057	0.15
Beryllium	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.00002	0	<0.00002	0	<0.000020	<0.000020	<0.000020	<0.000020	<0.00002	0
Bismuth	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0	<0.00005	0	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0
Boron	<0.010	<0.010	<0.010	<0.010	<0.010	<0.01	0	<0.01	0	<0.010	<0.010	<0.010	<0.010	<0.01	0
Cadmium	0.000032	0.000011	0.000018	0.000011	0.000016	0.000018	0.5	0.000018	0.48	0.0000093	0.000019	0.000011	0.00002	0.000015	0.37
Calcium	31	33	30	33	32	32	0.045	32	0.041	37	37	43	45	40	0.094
Chromium	0.00038	0.00017	0.0004	0.00018	0.00021	0.00028	0.41	0.00027	0.42	0.00011	0.00024	0.00012	0.00017	0.00016	0.37
Cobalt	0.00012	<0.00010	<0.00010	<0.00010	<0.00010	0.00011	0.085	0.0001	0.086	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0
Copper	0.00052	<0.00050	<0.00050	<0.00050	0.00058	0.00051	0.018	0.00052	0.067	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	0
Iron	0.16	0.045	0.17	0.03	0.058	0.1	0.7	0.092	0.72	<0.010	0.082	<0.010	0.046	0.027	1.3
Lead	0.00017	<0.000050	0.00011	<0.000050	0.000067	0.000096	0.58	0.00009	0.59	<0.000050	0.000073	<0.000050	0.00007	0.000011	1.2
Lithium	0.0012	0.0015	0.0016	0.0012	0.0012	0.0014	0.14	0.0013	0.15	0.0013	0.0015	0.0016	0.0018	0.0016	0.13
Magnesium	8.6	9.6	7.7	9.7	9.4	8.9	0.1	9.0	0.094	10	11	12	12	11	0.09
Manganese	0.013	0.0022	0.0061	0.003	0.0036	0.0061	0.73	0.0056	0.78	0.00081	0.0035	0.0006	0.0029	0.002	0.75
Mercury	0.000003	0.0000013	0.0000018	0.0000011	0.00000095	0.0000018	0.45	0.0000016	0.51	0.00000051	0.00000057	<0.00000050	0.00000055	0.00000028	0.12
Molybdenum	0.00049	0.0006	0.00052	0.00061	0.00061	0.00056	0.1	0.00057	0.099	0.00066	0.00066	0.00072	0.00068	0.00068	0.042
Nickel	0.00062	<0.00050	<0.00050	<0.00050	<0.00050	0.00053	0.1	0.00052	0.1	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	0
Potassium	0.4	0.36	0.38	0.35	0.37	0.37	0.049	0.37	0.045	0.39	0.45	0.41	0.48	0.43	0.095
Selenium	0.00042	0.00054	0.00045	0.00055	0.00047	0.00049	0.12	0.00049	0.11	0.00045	0.00054	0.00055	0.0006	0.00054	0.12
Silicon	2.1	2.0	2.0	2.0	1.9	2.0	0.025	2.0	0.047	1.9	2.1	2.2	2.2	2.1	0.072
Silver	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	0	<0.00001	0	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	0
Sodium	0.52	0.61	0.53	0.6	0.56	0.56	0.075	0.56	0.069	0.55	0.59	0.61	0.67	0.6	0.082
Strontium	0.062	0.07	0.063	0.069	0.067	0.066	0.061	0.066	0.056	0.077	0.082	0.09	0.092	0.085	0.085
Sulphur	3.3	4.7	3.2	4.0	4.4	3.8	0.15	3.9	0.16	6.4	7.6	9.0	9.9	8.2	0.19
Thallium	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	0	<0.00001	0	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	0
Tin	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.0001	0	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0
Titanium	0.0033	<0.0015	0.0045	<0.00060	0.0008	0.0025	0.7	0.0021	0.79	<0.00030	0.0022	<0.00030	<0.00060	0.00025	3.6
Uranium	0.0003	0.00034	0.00032	0.00032	0.00033	0.00032	0.034	0.00032	0.036	0.00035	0.00035	0.0004	0.00042	0.00038	0.096
Vanadium	0.0009	0.00052	0.0008	<0.00050	<0.00050	0.00068	0.28	0.00064	0.3	<0.00050	0.00056	<0.00050	<0.00050	0.00024	0.13
Zinc	<0.0030	<0.0030	<0.0030	0.0038	<0.0030	0.0032	0.14	0.0032	0.11	<0.0030	<0.0030	<0.0030	<0.0030	<0.003	0
Dissolved Metals															
Aluminum	0.0047	0.004	0.0026	0.003	0.0021	0.0036	0.24	0.0033	0.32	0.0022	<0.0010	0.0018	0.0012	0.0011	0.52
Antimony	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.0001	0	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0
Arsenic	0.00014	0.00011	0.0001	0.00011	0.00012	0.00012	0.13	0.00012	0.13	0.00011	<0.00010	<0.00010	<0.00010	0.000048	0.11
Barium	0.036	0.04	0.034	0.036	0.036	0.036	0.056	0.036	0.056	0.047	0.046	0.065	0.067	0.056	0.2
Beryllium	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.00002	0	<0.00002	0	<0.000020	<0.000020	<0.000020	<0.000020	<0.00002	0
Bismuth	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0	<0.00005	0	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0
Boron	<0.010	<0.010	<0.010	<0.010	<0.010	<0.01	0	<0.01	0	<0.010	<0.010	<0.010	<0.010	<0.01	0
Cadmium	0.0000085	0.0000086	<0.0000050	0.0000067	0.0000063	0.0000072	0.21	0.000007	0.22	0.0000081	0.0000093	0.000011	0.0000084	0.0000091	0.13
Chromium	0.00015	0.0001	0.00012	<0.00010	0.0002	0.00012	0.19	0.00013	0.31	0.00029	0.00011	0.0001	0.00021	0.00018	0.51
Cobalt	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.0001	0	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0
Copper	0.00026	0.00027	<0.00020	0.00032	<0.00020	0.00026	0.19	0.00025	0.2	<0.00020	<0.00020	<0.00020	<0.00020	<0.0002	0
Iron	<0.010	<0.010	<0.010	<0.010	<0.010	<0.01	0	<0.01	0	<0.010	<0.010	<0.010	<0.010	<0.01	0
Lead	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0	<0.00005	0	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0
Lithium	<0.0010	0.0012	0.001	0.0012	0.0012	0.0011	0.10	0.0011	0.098	0.0014	0.0012	0.0016	0.0017	0.0015	0.15
Manganese	0.00032	0.00028	0.00018	0.00028	0.00025	0.00027	0.2	0.00026	0.2	0.00031	0.00025	0.00032	0.00031	0.0003	0.11
Mercury	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.000005	0	<0.000005	0	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.000005	0
Molybdenum	0.00053	0.00056	0.00056	0.00059	0.00059	0.00056	0.046	0.00056	0.044	0.00063	0.00065	0.00074	0.0007	0.00068	0.074
Nickel	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	0	<0.0005	0	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	0
Selenium	0.00052	0.0006	0.00045	0.00046	0.00042	0.00051	0.12	0.00049	0.15	0.00055	0.00047	0.00059	0.0007	0.00058	0.16
Silicon	1.7	1.9	1.7	1.9	1.9	1.8	0.069	1.8	0.066	1.9	1.9	2.1	2.2	2.0	0.067
Silver	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	0	<0.00001	0	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	0
Strontium	0.063	0.068	0.067	0.067	0.067	0.066	0.028	0.067	0.028	0.077	0.082	0.093	0.093	0.086	0.095
Sulphur	3.0	4.4	3.4	3.7	4.3	3.6	0.15	3.7	0.16	5.9	7.1	8.6	10	7.9	0.23
Thallium	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	0	<0.00001	0	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	0
Tin	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.0001	0	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0
Titanium	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.0003	0	<0.0003	0	<0.00030	<0.00030	<0.00030	<0.00030	<0.0003	0
Uranium	0.00029	0.00033	0.00032	0.0003	0.00032	0.00031	0.053	0.00031	0.051	0.00033	0.00034	0.00041	0.00043	0.00038	0.13
Vanadium	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	0	<0.0005	0	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	0
Zinc	<0.0010	<0.0010	<0.0010	0.0036	<0.0010	0.0017	0.86	0.0015	0.76	0.0013	<0.0010	0.0021	0.0011	0.00088	0.57

Parameter	Q3 FR_UFR1 C. dubia and P. subcapitata 10-Aug-21	17-Aug-21	24-Aug-21	31-Aug-21	7-Sep-21
Field Measured					
pH	8.3	8.3	8.3	8.0	8.2
Conductivity	-	323	324	1088	350
Specific conductivity	354	-	-	-	-
Temperature	9.7	8.2	7.4	7.2	6.2
Dissolved oxygen	**9.0**[Mn]	9.6	**10**[Mn]	**9.5**[Mn]	**10**[Mn]
Turbidity	0.76	-	-	-	-
Dissolved oxygen (%)	79	81	84	79	81
Oxidation-reduction potential field	151	203	204	159	277
Conventional Parameters					
pH	8.3	8.3	8.3	8.4	8.3
Hardness, as $CaCO_3$	177	166	168	175	179
Total alkalinity, as $CaCO_3$	151	146	145	148	151
Total dissolved solids	211	169	204	211	206
Total suspended solids	<1.0	25	<1.0	<1.0	<1.0
Total organic carbon	2.2	4.5	1.6	1.7	1.6
Dissolved organic carbon	2.4	4.5	1.8	2.3	1.4
Colour	-	-	-	-	-
Turbidity	0.28	9.4	0.41	0.13	0.17
Total acidity	<2.0	<2.0	<2.0	<2.0	<2.0
Cation - anion balance	2.2	4.0	4.6	3.0	3.7
Ion balance	96	92	91	94	93
Conductivity	328	302	307	337	295
Oxidation-reduction potential	406	372	371	476	344
Major Ions					
Bicarbonate	180	178	177	173	216
Bromide	<0.050	<0.050	<0.050	<0.050	<0.050
Calcium	50	46	46	48	50
Carbonate, as $CaCO_3$	2.3	<1.0	<1.0	4.2	1.9
Chloride	0.12	0.18	0.16	0.12	0.22
Fluoride	**0.15**[Mn]	**0.15**[Mn]	**0.19**[Mn]	**0.13**[Mn]	**0.16**[Mn]
Hydroxide	<1.0	<1.0	<1.0	<1.0	<1.0
Magnesium	13	13	13	13	13
Potassium	0.47	0.51	0.41	0.41	0.43
Sodium	0.66	0.68	0.6	0.65	0.63
Sulphate	35	34	39	38	42
Major anion sum	3.8	3.7	3.7	3.8	3.9
Major cation sum	3.6	3.4	3.4	3.5	3.6
Bicarbonate Alkalinity, as $CaCO_3$	147	146	145	142	177
Carbonate Alkalinity, as $CaCO_3$	3.8	<1.0	<1.0	7.0	3.2
Hydroxide Alkalinity, as $CaCO_3$	<1.0	<1.0	<1.0	<1.0	<1.0
Nutrients and Biological Indicators					
Nitrate	0.017	0.066	0.023	<0.0050	0.014
Nitrite	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Total ammonia	0.027	<0.0050	0.0056	<0.0050	0.011
Total Kjeldahl nitrogen	0.083	0.32	0.1	<0.050	<0.050
Total phosphorus	0.0044	0.056	0.0047	0.0028	<0.0020
Orthophosphate	0.0032	0.0047	0.0018	0.0017	0.0016
Biochemical oxygen demand	-	-	-	-	-
Total Metals					
Aluminum	0.0035	0.12	0.0042	<0.0030	0.0076
Antimony	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Arsenic	0.00014	0.00017	0.00012	<0.00010	0.00012
Barium	0.076	0.065	0.061	0.068	0.065
Beryllium	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
Bismuth	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Boron	<0.010	<0.010	<0.010	<0.010	<0.010
Cadmium	0.000011	0.000057	0.000011	0.0000079	0.0000091
Calcium	50	47	46	49	50
Chromium	0.00014	0.00027	0.00014	<0.00010	0.00014
Cobalt	<0.00010	0.00013	<0.00010	<0.00010	<0.00010
Copper	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Iron	<0.010	0.15	<0.010	<0.010	<0.010
Lead	<0.000050	0.00021	<0.000050	<0.000050	<0.000050
Lithium	0.0019	0.0017	0.002	0.0018	0.0016
Magnesium	13	12	12	14	12
Manganese	0.00054	0.018	0.00064	0.00039	0.0007
Mercury	<0.00000050	0.0000021	0.00000057	<0.00000050	<0.00000050
Molybdenum	0.00067	0.0007	0.0007	0.00068	0.00069
Nickel	<0.00050	0.00067	<0.00050	<0.00050	<0.00050
Potassium	0.48	0.54	0.42	0.4	0.37
Selenium	0.0006	0.00055	0.00072	0.00069	0.00074
Silicon	2.2	2.4	2.1	2.1	1.7
Silver	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Sodium	0.68	0.66	0.64	0.64	0.59
Strontium	0.1	0.092	0.098	0.1	0.11
Sulphur	13	12	13	14	13
Thallium	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Tin	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Titanium	<0.00030	0.0016	<0.00030	<0.00030	<0.00030
Uranium	0.00046	0.0004	0.00048	0.00046	0.00045
Vanadium	<0.00050	0.00066	<0.00050	<0.00050	<0.00050
Zinc	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030
Dissolved Metals					
Aluminum	0.0014	0.0018	0.0011	<0.0010	0.0028
Antimony	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Arsenic	0.0001	0.00011	<0.00010	<0.00010	<0.00010
Barium	0.074	0.061	0.063	0.068	0.071
Beryllium	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
Bismuth	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Boron	<0.010	<0.010	<0.010	<0.010	<0.010
Cadmium	0.000011	0.000011	0.0000063	0.0000066	0.0000097
Chromium	0.00011	0.00012	<0.00010	0.0001	0.00012
Cobalt	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Copper	0.00038	<0.00020	<0.00020	<0.00020	<0.00020
Iron	<0.010	<0.010	<0.010	<0.010	<0.010
Lead	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Lithium	0.0019	0.0016	0.0017	0.0017	0.0017
Manganese	0.0003	0.0014	0.00024	0.0002	0.00048
Mercury	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Molybdenum	0.00068	0.00067	0.00064	0.00066	0.00063
Nickel	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Selenium	0.00057	0.00064	0.00069	0.00079	0.00072
Silicon	2.2	2.1	1.9	2.0	1.8
Silver	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Strontium	0.1	0.099	0.092	0.099	0.098
Sulphur	12	11	12	13	13
Thallium	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Tin	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Titanium	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
Uranium	0.00043	0.00042	0.00043	0.00046	0.00045
Vanadium	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Zinc	<0.0010	0.0018	0.0014	<0.0010	<0.0010

[a] = guideline is a minimum value, unless the background concentration or value is lower.
[b] = guideline is adopted from CCME Canadian Environmental Quality Guidelines (CCME, 1999).
[c] = guideline is hardness dependent. The guideline range shown is based on the hardness range observed in the dataset (111 to 200 mg/L). The guideline is calculated based on the individual hardness value for each sample.

[d] = for some samples, water hardness was greater than 250 mg/L. At this hardness, no BC ENV water quality guideline has been established for sulphate; however, the observed data were screened against the guideline for very hard water (i.e., 429 mg/L) for comparative purposes.
[e] = guideline is chloride dependent. The guideline range shown is based on the chloride concentration range observed in the dataset (0.050 to 0.610 mg/L). The guideline is calculated based on the individual chloride concentration in each sample.
[f] = guideline is adopted from the ECCC PNECs (ECCC, 2018) or draft FEQGs (ECCC, 2017).
[g] = guideline is for chromium VI.
[h] = guideline is pH dependent. The guideline range shown is based on the pH range observed in the dataset (7.9 to 8.7). The guideline is calculated based on the individual pH for each sample.
[i] = guideline is a level 1 interim screening value.
[j] = dissolved copper guideline was calculated using the simplified Biotic Ligand Midel (BC ENV, 2019). Where values were missing, the temporally nearest value from the same location was taken.
[Mn] = concentration is higher than the 30-day mean BC ENV guideline or outside the recommended pH, DO or total alkalinity range.
[Mx] = concentration is higher than the maximum BC ENV guideline or outside the recommended pH, DO or total alkalinity range.
[E] = concentration is higher than the EVWQP benchmarks guideline.
Bolded concentrations are higher than water quality guidelines
Shaded concentrations are higher than the EVWQP benchmark (e.g., for nitrate, total selenium, dissolved cadmium or sulphate).

Parameter	Unit	Guidelines for the protection of:			Aug 10, 17, 24, 31 *H. azteca*		Aug 10, 17, 24, 31 Sept 7 *P. promelas*		*C. dubia* and *P. subcapitata*	Q4 FR_UFR1				Oct 12, 19, 26, Nov 2 *H. azteca*		Oct 12, 19, 26, Nov 2, 9 *O. mykiss*	
		Aquatic Life		EVWQP Benchmarks						19-Oct-21	26-Oct-21	2-Nov-21	9-Nov-21				
		30-day mean	Maximum		Mean	CV	Mean	CV	12-Oct-21					Mean	CV	Mean	CV
Field Measured																	
pH	-	6.5 - 9.0	6.5 - 9.0	-	8.2	0.02	8.2	0.016	-	-	8.0	-	-	8.0	-	8.0	-
Conductivity	µS/cm	-	-	-	579	0.76	521	0.72	-	-	-	-	-	-	-	-	-
Specific conductivity	µS/cm at 25 C	-	-	-	354	-	354	-	-	-	359	-	-	359	-	359	-
Temperature	°C	-	-	-	8.1	0.13	7.7	0.17	-	-	2.9	-	-	2.9	-	2.9	-
Dissolved oxygen	mg/L	11	9.0	-	9.5	0.037	9.6	0.043	-	-	**11**[(Mn)]	-	-	[1](Mn)	-	[1](Mn)	-
Turbidity	NTU	-	-	-	0.76	-	0.76	-	-	-	0.19	-	-	0.19	-	0.19	-
Dissolved oxygen	%	-	-	-	81	0.025	81	0.023	-	-	79	-	-	79	-	79	-
Oxidation-reduction potential field	mv	-	-	-	179	0.15	199	0.25	-	-	166	-	-	166	-	166	-
Conventional Parameters																	
pH	-	6.5 - 9.0	6.5 - 9.0	-	8.3	0.0066	8.3	0.0054	8.1	8.4	8.3	8.3	8.3	8.3	0.013	8.3	0.013
Hardness, as $CaCO_3$	mg/L	-	-	-	172	0.028	173	0.033	181	200	180	182	185	186	0.045	186	0.045
Total alkalinity, as $CaCO_3$	mg/L	20[(ac)]	-	-	148	0.016	148	0.019	168	149	155	144	151	154	0.065	153	0.059
Total dissolved solids	mg/L	-	-	-	199	0.092	200	0.088	202	212	210	210	203	209	0.019	207	0.022
Total suspended solids	mg/L	-	-	-	5.4	2.0	4.1	2.6	<1.0	<1.0	<1.0	1.2	<1.0	0.45	0.24	0.56	0.16
Total organic carbon	mg/L	-	-	-	2.5	0.49	2.3	0.54	<0.50	1.1	1.2	1.1	<0.50	0.75	0.39	0.5	0.73
Dissolved organic carbon	mg/L	-	-	-	2.7	0.38	2.5	0.48	<0.50	0.57	0.99	1.4	<0.50	0.6	0.68	0.38	0.99
Colour	TCU	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Turbidity	NTU	-	-	-	2.6	1.6	2.1	2.0	<0.10	0.13	<0.10	0.34	0.16	0.068	1.9	0.086	1.2
Total acidity	mg/L	-	-	-	<2	0	<2	0	<2.0	<2.0	<2.0	<2.0	<2.0	<2	0	<2	0
Cation - anion balance	%	-	-	-	3.5	0.28	3.5	0.27	8.3	0.62	6.1	2.7	3.7	4.4	0.7	4.3	0.7
Ion balance	%	-	-	-	93	0.019	93	0.019	85	101	89	95	93	92	0.068	92	0.067
Conductivity	µS/cm	-	-	-	319	0.052	314	0.057	343	343	352	340	328	345	0.014	341	0.025
Oxidation-reduction potential	mv	-	-	-	406	0.13	394	0.13	472	444	445	486	443	462	0.045	458	0.043
Major Ions																	
Bicarbonate	mg/L	-	-	-	177	0.018	185	0.095	205	174	181	175	151	184	0.072	177	0.11
Bromide	mg/L	-	-	-	<0.05	0	<0.05	0	<0.050	<0.050	<0.050	<0.050	<0.050	<0.05	0	<0.05	0
Calcium	mg/L	-	-	-	48	0.033	48	0.038	50	57	50	51	50	52	0.057	51	0.061
Carbonate, as $CaCO_3$	mg/L	-	-	-	1.1	1.4	1.3	1.0	<1.0	3.7	3.8	<1.0	<1.0	1.4	1.1	0.9	1.7
Chloride	mg/L	150	600	-	0.15	0.2	0.16	0.27	0.12	0.12	0.19	0.14	0.2	0.14	0.2	0.15	0.25
Fluoride	mg/L	0.12[(f)]	1.4 - 1.6[(c)]	-	0.16	0.16	0.16	0.14	0.11	**0.12**[(Mn)]	**0.16**[(Mn)]	**0.12**[(Mn)]	**0.16**[(Mn)]	**0.13**[(Mn)]	0.16	**0.13**[(Mn)]	0.18
Hydroxide	mg/L	-	-	-	<1	0	<1	0	<1.0	<1.0	<1.0	<1.0	<1.0	<1	0	<1	0
Magnesium	mg/L	-	-	-	13	0.029	13	0.029	14	14	14	13	15	14	0.024	14	0.042
Potassium	mg/L	-	-	-	0.45	0.10	0.45	0.095	0.41	0.41	0.39	0.33	0.39	0.39	0.11	0.39	0.085
Sodium	mg/L	-	-	-	0.65	0.046	0.64	0.048	0.69	0.66	0.68	0.61	0.68	0.66	0.057	0.66	0.047
Sulphate	mg/L	309 - 429[(Cd)]	-	481	36	0.06	38	0.084	46	48	48	47	47	47	0.02	47	0.02
Major anion sum	meq/l	-	-	-	3.7	0.013	3.8	0.024	4.3	4.0	4.1	3.9	4.0	4.1	0.046	4.1	0.041
Major cation sum	meq/l	-	-	-	3.5	0.029	3.5	0.033	3.7	4.0	3.6	3.7	3.7	3.8	0.045	3.7	0.044
Bicarbonate Alkalinity, as $CaCO_3$	mg/l	-	-	-	145	0.016	151	0.095	168	143	148	144	124	151	0.07	145	0.11
Carbonate Alkalinity, as $CaCO_3$	mg/l	-	-	-	2.2	1.4	2.4	1.0	<1.0	6.2	6.4	<1.0	<1.0	2.7	1.1	1.9	1.5
Hydroxide Alkalinity, as $CaCO_3$	mg/l	-	-	-	<1	0	<1	0	<1.0	<1.0	<1.0	<1.0	<1.0	<1	0	<1	0
Nutrients and Biological Indicators																	
Nitrate	mg-N/L	3.0	33	3.4 - 6.0[(c)]	0.025	0.99	0.023	1.0	0.06	0.012	0.012	0.027	0.017	0.028	0.7	0.026	0.78
Nitrite	mg-N/L	0.020[(e)]	0.060[(e)]	-	<0.001	0	<0.001	0	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.001	0	<0.001	0
Total ammonia	mg-N/L	2.1	14	-	0.0057	1.7	0.0068	1.4	<0.0050	0.024	<0.0050	<0.0050	<0.0050	0.0023	3.7	0.00086	10
Total Kjeldahl nitrogen	mg-N/L	-	-	-	0.11	1.0	0.081	1.4	<0.050	<0.050	<0.050	0.057	<0.050	0.023	0.16	0.029	0.11
Total phosphorus	mg-P/L	-	-	-	0.017	1.4	0.013	1.8	0.0037	<0.0020	0.0023	0.0033	0.0054	0.0018	0.4	0.0025	0.53
Orthophosphate	mg-P/L	-	-	-	0.0029	0.47	0.0026	0.52	0.0023	0.0024	0.0019	0.0025	0.0019	0.0023	0.11	0.0022	0.13
Biochemical oxygen demand	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Metals																	
Aluminum	mg/L	-	-	-	0.031	1.7	0.026	1.9	0.0073	<0.0030	<0.0030	0.0074	0.011	0.0022	1.1	0.0039	0.86
Antimony	mg/L	0.0090	-	-	<0.0001	0	<0.0001	0	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.0001	0
Arsenic	mg/L	0.0050	0.0050	-	0.000083	0.36	0.00009	0.29	0.00011	0.00012	<0.00010	<0.00010	0.00013	0.0000075	1.2	0.000032	0.41
Barium	mg/L	1.0	-	-	0.067	0.08	0.067	0.083	0.076	0.073	0.075	0.067	0.066	0.073	0.061	0.071	0.066
Beryllium	mg/L	0.00013	-	-	<0.00002	0	<0.00002	0	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.00002	0	<0.00002	0
Bismuth	mg/L	0.0005[(f)]	-	-	<0.00005	0	<0.00005	0	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0	<0.00005	0
Boron	mg/L	1.2	29[(h)]	-	<0.01	0	<0.01	0	<0.010	<0.010	<0.010	<0.010	<0.010	<0.01	0	<0.01	0
Cadmium	mg/L	-	-	-	0.000022	0.98	0.000019	1.1	0.0000092	0.0000069	0.0000096	0.000011	0.0000093	0.0000092	0.18	0.0000092	0.16
Calcium	mg/L	-	-	-	48	0.034	49	0.036	54	54	53	51	50	53	0.028	52	0.034
Chromium	mg/L	0.0010[(g)]	-	-	0.00011	0.62	0.00012	0.55	<0.00010	0.00013	0.00012	0.00014	0.00013	0.000073	0.23	0.000084	0.18
Cobalt	mg/L	0.0040	0.11	-	0.000043	0.32	0.000054	0.25	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.0001	0
Copper	mg/L	-	-	-	<0.0005	0	<0.0005	0	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	0	<0.0005	0
Iron	mg/L	0.55 - 2.91[(f,h)]	1.0	-	0.03	2.1	0.022	2.9	<0.010	<0.010	<0.010	<0.010	<0.010	<0.01	0	<0.01	0
Lead	mg/L	0.0069 - 0.011[(g)]	0.093 - 0.20[(g)]	-	0.000016	4.6	0.0000028	26	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0	<0.00005	0
Lithium	mg/L	0.1216[(f)]	-	-	0.019	0.062	0.0018	0.088	0.0018	0.0017	0.0017	0.0015	0.0016	0.0017	0.08	0.0017	0.069
Magnesium	mg/L	-	-	-	13	0.061	13	0.059	15	14	15	14	14	15	0.036	14	0.047
Manganese	mg/L	1.1 - 1.5[(d)]	1.8 - 2.7[(d)]	-	0.005	1.6	0.0041	1.9	0.00046	0.00027	0.00032	0.00067	0.00057	0.00043	0.44	0.00046	0.37
Mercury	mg/L	0.000010	-	-	0.00000041	1.7	0.00000023	3.0	<0.00000050	<0.00000050	<0.00000050	<0.00000050	<0.00000050	<0.00000005	0	<0.00000005	0
Molybdenum	mg/L	1.0	2.0	-	0.00069	0.018	0.00069	0.017	0.00068	0.00065	0.00064	0.00061	0.00055	0.00065	0.048	0.00063	0.078
Nickel	mg/L	0.0053[(g)]	-	-	0.00021	0.37	0.00027	0.29	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	0	<0.0005	0
Potassium	mg/L	-	-	-	0.46	0.13	0.44	0.15	0.42	0.39	0.39	0.34	0.38	0.38	0.091	0.38	0.075
Selenium	mg/L	0.0020	-	0.019	0.00064	0.11	0.00066	0.12	0.00075	0.00077	0.00084	0.00073	0.00071	0.00077	0.056	0.00076	0.064
Silicon	mg/L	-	-	-	2.2	0.071	2.1	0.12	1.8	1.8	1.7	1.7	1.6	1.8	0.039	1.7	0.068
Silver	mg/L	0.0015[(e)]	0.0030[(e)]	-	<0.00001	0	<0.00001	0	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	0	<0.00001	0
Sodium	mg/L	-	-	-	0.66	0.023	0.64	0.054	0.69	0.68	0.69	0.66	0.63	0.68	0.02	0.67	0.035
Strontium	mg/L	-	-	-	0.099	0.047	0.1	0.075	0.1	0.11	0.11	0.1	0.1	0.1	0.0052	0.1	0.016
Sulphur	mg/L	-	-	-	13	0.069	13	0.058	17	18	17	17	16	17	0.036	17	0.051
Thallium	mg/L	0.00080	-	-	<0.00001	0	<0.00001	0	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	0	<0.00001	0
Tin	mg/L	0.30[(f)]	-	-	<0.0001	0	<0.0001	0	<0.00010	0.00022	<0.00010	<0.00010	<0.00010	0.00002	2.7	0.000036	1.5
Titanium	mg/L	0.85[(f)]	-	-	0.00019	3.2	0.000088	6.8	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.0003	0	<0.0003	0
Uranium	mg/L	0.0085	0.033[(b)]	-	0.00045	0.065	0.00045	0.064	0.00053	0.00053	0.00054	0.00051	0.0005	0.00052	0.027	0.00052	0.029
Vanadium	mg/L	0.12[(f)]	-	-	0.00021	0.34	0.00027	0.27	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	0	<0.0005	0
Zinc	mg/L	0.023 - 0.090	0.049 - 0.12	-	<0.003	0	<0.003	0	<0.0030	0.0046	<0.0030	<0.0030	<0.0030	0.0011	0.65	0.0015	0.48
Dissolved Metals																	
Aluminum	mg/L	0.050[(b)]	0.10[(b)]	-	0.00083	0.42	0.0012	0.6	0.0015	<0.0010	<0.0010	<0.0010	0.0016	0.00038	0.6	0.00002	15
Antimony	mg/L	-	-	-	<0.0001	0	<0.0001	0	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.0001	0
Arsenic	mg/L	-	-	-	0.0000025	1.8	0.000018	0.25	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.0001	0
Barium	mg/L	-	-	-	0.066	0.077	0.067	0.083	0.072	0.07	0.071	0.067	0.07	0.036	0	0.07	0.032
Beryllium	mg/L	-	-	-	<0.00002	0	<0.00002	0	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.00002	0	<0.00002	0
Bismuth	mg/L	-	-	-	<0.00005	0	<0.00005	0	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0	<0.00005	0
Boron	mg/L	-	-	-	<0.01	0	<0.01	0	<0.010	<0.010	<0.010	<0.010	<0.010	<0.01	0	<0.01	0
Cadmium	mg/L	0.00023 - 0.00035[(d)]	0.00065 - 0.0012[(d)]	0.00015 - 0.00024[(d)]	0.0000089	0.3	0.000009	0.27	0.0000054	0.0000077	0.0000079	<0.0000050	0.0000075	0.000004	0.37	0.0000047	0.29
Chromium	mg/L	-	-	-	0.000058	0.16	0.00007	0.14	<0.00010	0.00011	0.00011	<0.00010	0.00012	0.000005	1.1	0.000028	0.3
Cobalt	mg/L	-	-	-	<0.0001	0	<0.0001	0	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.0001	0
Copper	mg/L	0.0003 - 0.0031[(i)]	0.0018 - 0.0184[(i)]	-	0.000055	1.5	0.000084	0.96	<0.00020	<0.00020	<0.00020	0.00037	<0.00020	0.000058	1.6	0.000086	0.88
Iron	mg/L	-	0.35	-	<0.01	0	<0.01	0	<0.010	<0.010	<0.010	<0.010	<0.010	<0.01	0	<0.01	0
Lead	mg/L	-	-	-	<0.00005	0	<0.00005	0	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0	<0.00005	0
Lithium	mg/L	-	-	-	0.0017	0.064	0.0017	0.064	0.0017	0.0019	0.0016	0.0018	0.0014	0.0018	0.065	0.0017	0.11
Manganese	mg/L	-	-	-	0.00053	0.97	0.00052	0.95	0.0003	0.00016	0.0002	0.00018	0.00017	0.00021	0.26	0.0002	0.28
Mercury	mg/L	-	-	-	<0.00005	0	<0.00005	0	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.000005	0	<0.000005	0
Molybdenum	mg/L	-	-	-	0.00066	0.025	0.00065	0.033	0.0007	0.00055	0.0006	0.00058	0.00063	0.00061	0.095	0.00061	0.094
Nickel	mg/L	-	-	-	<0.0005	0	<0.0005	0	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	0	<0.0005	0
Selenium	mg/L	-	-	-	0.00067	0.14	0.00068	0.12	0.00095	0.00077	0.00083	0.00073	0.00082	0.00082	0.11	0.00082	0.1
Silicon	mg/L	-	-	-	2.0	0.051	2.0	0.081	1.8	1.7	1.7	1.5	1.5	1.7	0.074	1.6	0.08
Silver	mg/L	-	-	-	<0.00001	0	<0.00001	0	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	0	<0.00001	0
Strontium	mg/L	2.5[(f)]	-	-	0.099	0.043	0.098	0.043	0.1	0.099	0.094	0.094	0.1	0.097	0.035	0.098	0.045
Sulphur	mg/L	-	-	-	12	0.072	12	0.062	17	14	17	14	17	16	0.097	16	0.092
Thallium	mg/L	-	-	-	<0.00001	0	<0.00001	0	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	0	<0.00001	0
Tin	mg/L	-	-	-	<0.0001	0	<0.0001	0	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.0001	0
Titanium	mg/L	-	-	-	<0.0003	0	<0.0003	0	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.0003	0	<0.0003	0
Uranium	mg/L	-	-	-	0.00043	0.04	0.00044	0.035	0.0005	0.00044	0.00054	0.00046	0.00051	0.00049	0.085	0.00049	0.083
Vanadium	mg/L	-	-	-	<0.0005	0	<0.0005	0	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	0	<0.0005	0
Zinc	mg/L	-	-	-	0.0003	1.2	0.000039	8.9	0.0012	<0.0010	0.0013	<0.0010	<0.0010	0.00013	1.1	0.0001	1.4

[a] = guideline is a minimum value, unless the background concentration or value is lower.
[b] = guideline is adopted from CCME Canadian Environmental Quality Guidelines (CCME, 1999).
[c] = guideline is hardness dependent. The guideline range shown is based on the hardness range observed in the dataset (111 to 200 mg/L). The guideline is calculated based on the individual hardness value for each sample.

[d] = for some samples, water hardness was greater than 250 mg/L. At this hardness, no BC ENV water quality guideline has been established for sulphate; however, the observed data were screened against the guideline for very hard water (i.e., 429 mg/L) for comparative purposes.
[e] = guideline is chloride dependent. The guideline range shown is based on the chloride concentration range observed in the dataset (0.050 to 0.610 mg/L). The guideline is calculated based on the individual chloride concentration in each sample.
[f] = guideline is adopted from the ECCC PNECs (ECCC, 2018) or draft FEQGs (ECCC, 2017).
[g] = guideline is for chromium VI.
[h] = guideline is pH dependent. The guideline range shown is based on the pH range observed in the dataset (7.9 to 8.7). The guideline is calculated based on the individual pH for each sample.
[i] = guideline is a level 1 interim screening value.
[j] = dissolved copper guideline was calculated using the simplified Biotic Ligand Model (BC ENV, 2019). Where values were missing, the temporally nearest value from the same location was taken.
[Mn] = concentration is higher than the 30-day mean BC ENV guideline or outside the recommended pH, DO or total alkalinity range.
[Mx] = concentration is higher than the maximum BC ENV guideline or outside the recommended pH, DO or total alkalinity range.
[B] = concentration is higher than the EVWQP benchmarks guideline.
Bolded concentrations are higher than water quality guidelines
Shaded concentrations are higher than the EVWQP benchmark (e.g., for nitrate, total selenium, dissolved cadmium or sulphate).

Parameter	Unit	Guidelines for the protection of: Aquatic Life 30-day mean	Aquatic Life Maximum	EVWQP Benchmarks	Q1 FR_FRCP1 P. subcapitata 23-Feb-21	2-Mar-21	9-Mar-21	16-Mar-21	23-Mar-21	30-Mar-21	Mar 2, 9, 16, 23, 30 P. promelas Mean	CV	C. dubia 13-Apr-21	Q2 FR_FRCP1 C. dubia and P. subcapitata 18-May-21	25-May-21	1-Jun-21	8-Jun-21	15-Jun-21	May 18, 25, June 1, 8 H. azteca Mean	CV	May 18, 25, June 1, 8, 15 O. mykiss Mean	CV
Field Measured																						
pH	-	6.5 - 9.0	6.5 - 9.0	-	8.2	8.1	8.2	8.3	8.3	8.2	8.2	0.01	8.3	8.0	8.2	8.0	7.7	8.0	8.0	0.027	8.0	0.022
Conductivity	µS/cm	-	-	-	-	-	1540	-	-	-	1540	-	-	-	-	553	-	553	553	-	553	0
Specific conductivity	µS/cm at 25 C	-	-	-	2113	1513	-	1206	1167	1320	1302	0.12	13	501	726	-	694	-	640	0.19	640	0.19
Temperature	°C	-	-	-	0.3	0.1	0	0.4	<0.10	0	0.08	2.1	0.8	4.6	4.3	5.9	4.3	6.3	4.8	0.15	5.1	0.19
Dissolved oxygen	mg/L	11	9.0	-	11	12	12	12	12	12	12	0.022	13	**11**(Mn)	**11**(Mn)	**11**(Mn)	**9.4**(Mn)	**10**(Mn)	**11**(Mn)	0.083	**10**(Mn)	0.071
Turbidity	NTU	-	-	-	-	-	1.5	11	3.7	5.7	5.4	0.73	1.0	19	1.6	8.3	2.1	4.0	7.8	0.96	7.0	1.0
Dissolved oxygen	%	-	-	-	80	81	83	81	83	84	83	0.018	89	84	84	86	72	83	81	0.083	82	0.066
Oxidation-reduction potential field	mv	-	-	-	162	167	153	102	145	146	142	0.17	132	174	181	174	176	140	176	0.017	169	0.098
Conventional Parameters																						
pH	-	6.5 - 9.0	6.5 - 9.0	-	8.1	8.2	8.0	8.5	8.4	8.2	8.3	0.024	8.5	8.1	8.1	8.3	8.2	8.4	8.2	0.01	8.2	0.016
Hardness, as $CaCO_3$	mg/L	-	-	-	1300	942	928	631	617	796	783	0.2	716	262	381	304	343	274	323	0.14	313	0.16
Total alkalinity, as $CaCO_3$	mg/L	20(a)	-	-	334	264	281	230	214	233	244	0.11	232	144	185	152	185	158	167	0.12	165	0.12
Total dissolved solids	mg/L	-	-	-	1590	1220	1140	766	866	1050	1008	0.19	940	322	455	387	460	359	406	0.15	397	0.15
Total suspended solids	mg/L	-	-	-	33	6.8	1.7	14	5.0	1.2	5.6	0.88	2.7	59	7.6	10	6.0	9.3	21	1.1	18	1.2
Total organic carbon	mg/L	-	-	-	2.7	1.2	1.2	1.1	2.7	1.3	1.5	0.47	2.0	2.8	1.5	2.7	2.0	1.7	2.2	0.24	2.1	0.27
Dissolved organic carbon	mg/L	-	-	-	1.9	0.6	1.2	0.91	2.0	1.7	1.3	0.44	2.0	2.3	1.1	2.0	2.0	1.6	1.9	0.23	1.8	0.25
Colour	TCU	-	-	-	-	<5.0	-	<5.0	<5.0	<5.0	5.0	0.45	<5.0	6.8	<5.0	<5.0	<5.0	<5.0	5.5	0.15	5.4	0.15
Turbidity	NTU	-	-	-	24	2.5	1.6	9.0	4.1	1.3	3.7	0.86	1.0	15	2.6	6.2	2.1	2.5	6.5	0.86	5.7	0.97
Total acidity	mg/L	-	-	-	2.6	<2.0	<2.0	<2.0	<2.0	<2.0	<2	0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2	0	<2	0
Cation - anion balance	%	-	-	-	0.38	0.26	5.0	5.2	4.6	5.9	4.2	0.54	1.7	1.7	3.1	1.2	3.5	3.5	2.4	0.47	2.6	0.43
Ion balance	%	-	-	-	101	100	110	90	91	89	96	0.092	97	97	94	102	93	93	96	0.039	96	0.039
Conductivity	µS/cm	-	-	-	1930	1480	1430	1150	1080	1290	1286	0.13	1260	483	708	535	666	524	598	0.16	583	0.17
Oxidation-reduction potential	mv	-	-	-	446	346	449	386	390	388	392	0.094	260	411	423	502	416	444	438	0.088	439	0.085
Major Ions																						
Bicarbonate	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	182	-	-	182	0.45
Bromide	mg/L	-	-	-	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	0	<0.25	<0.050	<0.050	<0.050	<0.050	<0.050	<0.05	0	<0.05	0
Calcium	mg/L	-	-	-	257	204	208	134	136	180	172	0.21	155	62	87	72	78	64	75	0.12	73	0.14
Carbonate, as $CaCO_3$	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4.9	-	-	4.9	0.45
Chloride	mg/L	150	600	-	4.6	4.7	4.9	2.9	2.2	3.3	3.6	0.32	1.6	0.4	0.63	0.39	0.54	0.42	0.49	0.21	0.48	0.22
Fluoride	mg/L	0.12(b)	1.7 - 2.4(c)	-	**0.14**(Mn)	**0.21**(Mn)	**0.18**(Mn)	<0.10	<0.10	**0.17**(Mn)	**0.15**(Mn)	0.33	<0.10	**0.15**(Mn)	**0.18**(Mn)	**0.15**(Mn)	**0.17**(Mn)	**0.19**(Mn)	**0.16**(Mn)	0.083	**0.17**(Mn)	0.11
Hydroxide	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<1.0	-	-	1.0	0.45
Magnesium	mg/L	-	-	-	161	105	99	72	67	84	86	0.19	80	26	40	30	36	28	33	0.17	32	0.18
Potassium	mg/L	-	-	-	4.5	3.2	2.9	2.5	2.7	2.9	2.8	0.095	2.9	1.1	1.6	1.2	1.8	1.3	1.4	0.23	1.4	0.21
Sodium	mg/L	-	-	-	4.9	3.7	3.5	3.0	2.7	3.5	3.3	0.13	3.0	0.94	1.7	1.3	1.9	1.4	1.4	0.28	1.4	0.25
Sulphate	mg/L	429(c,d)	-	481	**811**(Mn, E)	**571**(Mn, E)	**462**(Mn)	389	376	**528**(Mn, E)	**465**(Mn)	0.18	406	100	166	112	134	106	128	0.2	124	0.22
Major anion sum	meq/l	-	-	-	26	19	17	14	14	18	16	0.15	15	5.5	8.2	6.0	7.5	6.0	6.8	0.17	6.6	0.17
Major cation sum	meq/l	-	-	-	26	19	19	13	13	16	16	0.2	15	5.3	7.7	6.2	7.0	5.6	6.5	0.14	6.3	0.16
Bicarbonate Alkalinity, as $CaCO_3$	mg/l	-	-	-	334	264	281	212	252	233	248	0.11	217	144	185	152	185	150	167	0.12	163	0.12
Carbonate Alkalinity, as $CaCO_3$	mg/l	-	-	-	<1.0	<1.0	<1.0	17	4.0	<1.0	4.8	1.5	15	<1.0	<1.0	<1.0	<1.0	8.2	<1	0	2.4	1.3
Hydroxide Alkalinity, as $CaCO_3$	mg/l	-	-	-	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1	0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1	0	<1	0
Nutrients and Biological Indicators																						
Nitrate	mg-N/L	3.0	33	7.9 - 15(c)	**35**(Mn, Mx, E)	**26**(Mn, E)	**22**(Mn, E)	**20**(Mn, E)	**22**(Mn, E)	**33**(Mn, Mx, E)	**25**(Mn, E)	0.21	**26**(Mn, E)	**7.2**(Mn)	**14**(Mn, E)	**8.8**(Mn)	**14**(Mn, E)	**8.0**(Mn)	**11**(Mn, E)	0.3	**10**(Mn, E)	0.32
Nitrite	mg-N/L	0.020 - 0.060(e)	0.060 - 0.18(e)	-	0.04	0.038	0.041	0.027	0.03	0.037	0.034	0.18	**0.024**(Mn)	0.0059	0.0066	0.0034	0.0012	0.0035	0.0043	0.59	0.0041	0.53
Total ammonia	mg-N/L	2.1	14	-	0.014	0.025	0.037	0.033	0.046	0.048	0.038	0.25	<0.0050	0.027	0.0097	0.018	<0.0050	0.012	0.015	0.63	0.014	0.6
Total Kjeldahl nitrogen	mg-N/L	-	-	-	0.12	<0.050	<0.050	<0.050	<0.050	0.5	0.14	1.4	<0.050	0.54	<0.050	0.57	<0.050	0.13	0.3	0.91	0.27	0.99
Total phosphorus	mg-P/L	-	-	-	0.0068	<0.0020	0.0033	0.012	0.0049	<0.0020	0.0048	0.85	0.0021	0.031	0.0051	0.016	0.0094	0.0074	0.015	0.66	0.014	0.76
Orthophosphate	mg-P/L	-	-	-	0.0056	<0.0010	0.0016	<0.0010	<0.0010	0.0019	0.0013	0.33	<0.0010	<0.0010	0.0017	<0.0010	0.0034	<0.0010	0.0018	0.69	0.0016	0.64
Biochemical oxygen demand	mg/L	-	-	-	-	<2.0	-	<2.0	<2.0	<2.0	2.0	0.45	<2.0	2.3	<2.0	<2.0	<2.0	<2.0	2.1	0.065	2.1	0.065
Total Metals																						
Aluminum	mg/L	-	-	-	0.14	0.025	0.023	0.098	0.12	0.03	0.059	0.78	0.029	0.35	0.054	0.21	0.038	0.059	0.16	0.85	0.14	0.95
Antimony	mg/L	0.0090	-	-	0.00054	0.0004	0.00042	0.00038	0.00041	0.00046	0.00041	0.072	0.00044	0.00018	0.00022	0.00018	0.00025	0.0002	0.00021	0.17	0.00021	0.14
Arsenic	mg/L	0.0050	0.0050	-	0.0003	0.00018	0.00016	0.00024	0.00017	0.00025	0.0002	0.21	0.00015	0.0003	0.00014	0.00025	0.00014	0.00014	0.00021	0.37	0.00019	0.39
Barium	mg/L	1.0	-	-	0.11	0.097	0.098	0.081	0.091	0.09	0.091	0.077	0.084	0.052	0.054	0.044	0.044	0.046	0.048	0.1	0.048	0.095
Beryllium	mg/L	0.00013	-	-	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.00002	0	<0.000020	0.000031	<0.000020	<0.000020	<0.000020	<0.000020	0.000023	0.22	0.000022	0.22
Bismuth	mg/L	0.0005(f)	-	-	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0	<0.00005	0
Boron	mg/L	1.2	29(b)	-	0.018	0.015	0.015	0.013	0.013	0.013	0.014	0.079	0.013	<0.010	<0.010	<0.010	0.011	<0.010	0.01	0.053	0.01	0.044
Cadmium	mg/L	-	-	-	0.00017	0.000096	0.0001	0.00012	0.00013	0.00016	0.00012	0.21	0.00016	0.0002	0.000064	0.000083	0.00011	0.000047	0.00011	0.45	0.0001	0.6
Calcium	mg/L	-	-	-	271	213	190	152	147	164	173	0.16	154	67	84	64	85	63	75	0.14	73	0.15
Chromium	mg/L	0.0010(g)	-	-	0.00038	0.00018	0.00012	0.00025	0.00029	0.00014	0.0002	0.37	0.00012	0.00066	0.00019	0.00046	0.00014	0.00024	0.00036	0.64	0.00034	0.64
Cobalt	mg/L	0.0040	0.11	-	0.00073	0.00035	0.00038	0.00055	0.00067	0.00027	0.00044	0.37	0.0003	0.00068	0.00011	0.00026	0.00017	0.00014	0.00031	0.76	0.00027	0.86
Copper	mg/L	-	-	-	0.0011	0.0011	<0.00050	0.00069	0.00077	<0.00050	0.00071	0.34	<0.00050	0.001	<0.00050	0.00056	<0.00050	<0.00050	0.00064	0.34	0.00061	0.36
Iron	mg/L	0.69 - 2.18(f,h)	1.0	-	0.27	0.058	0.042	0.18	0.12	0.04	0.087	0.69	0.036	0.43	0.04	0.3	0.062	0.09	0.21	0.84	0.18	0.93
Lead	mg/L	0.014 - 0.020(c)	0.28 - 0.42(c)	-	0.00028	0.00011	<0.000050	0.00019	0.000097	<0.000050	0.000098	0.57	<0.000050	0.00048	<0.000050	0.00021	<0.000050	0.000075	0.0002	0.95	0.00017	1.1
Lithium	mg/L	0.1216(f)	-	-	0.1	0.08	0.08	0.059	0.06	0.078	0.071	0.15	0.065	0.016	0.032	0.023	0.043	0.025	0.029	0.42	0.028	0.36
Magnesium	mg/L	-	-	-	172	118	107	76	75	84	92	0.21	75	27	39	25	42	30	33	0.25	33	0.23
Manganese	mg/L	1.8 - 2.6(c)	3.4(c)	-	0.05	0.019	0.022	0.027	0.023	0.012	0.021	0.27	0.012	0.059	0.0049	0.019	0.0067	0.008	0.022	1.0	0.02	1.2
Mercury	mg/L	0.000010	-	-	<0.0000020	0.00000051	<0.00000050	0.000002	0.0000011	0.00000068	0.00000095	0.66	0.00000068	0.0000036	0.0000014	0.0000018	0.000001	0.0000011	0.000002	0.56	0.0000018	0.61
Molybdenum	mg/L	1.0	2.0	-	0.006	0.0039	0.0046	0.003	0.003	0.0036	0.0036	0.19	0.0032	0.00092	0.0014	0.0011	0.0017	0.0013	0.0013	0.29	0.0013	0.24
Nickel	mg/L	0.0053(i)	-	-	**0.018**(Mn)	**0.014**(Mn)	**0.013**(Mn)	**0.011**(Mn)	**0.013**(Mn)	**0.014**(Mn)	**0.013**(Mn)	0.094	**0.013**(Mn)	**0.0057**(Mn)	0.0036	0.0031	0.0047	0.0026	0.0043	0.24	0.0039	0.32
Potassium	mg/L	-	-	-	4.5	3.5	3.3	2.5	2.7	2.8	2.9	0.14	2.6	1.2	1.6	1.2	1.8	1.3	1.4	0.21	1.4	0.19
Selenium	mg/L	0.0020	-	0.019	**0.21**(Mn, E)	**0.15**(Mn, E)	**0.14**(Mn, E)	**0.085**(Mn, E)	**0.095**(Mn, E)	**0.11**(Mn, E)	**0.116**(Mn, E)	0.24	**0.11**(Mn, E)	**0.026**(Mn, E)	**0.055**(Mn, E)	**0.034**(Mn, E)	**0.052**(Mn, E)	**0.031**(Mn, E)	**0.042**(Mn, E)	0.31	**0.040**(Mn, E)	0.33
Silicon	mg/L	-	-	-	3.1	2.4	2.4	2.2	2.4	2.0	2.3	0.074	2.0	2.3	1.8	2.0	1.8	1.7	2.0	0.1	1.9	0.12
Silver	mg/L	0.0015(c)	0.0030(c)	-	<0.000010	<0.000010	<0.000010	0.00001	<0.000010	<0.000010	0.00001	0	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	0	<0.00001	0
Sodium	mg/L	-	-	-	5.3	4.0	4.0	3.0	2.8	3.4	3.4	0.15	2.7	0.99	1.6	1.2	2.1	1.3	1.5	0.34	1.4	0.29
Strontium	mg/L	-	-	-	0.32	0.24	0.25	0.19	0.19	0.22	0.22	0.13	0.21	0.096	0.12	0.096	0.11	0.094	0.1	0.081	0.1	0.093
Sulphur	mg/L	-	-	-	313	226	206	144	140	152	174	0.23	152	38	61	39	55	39	48	0.22	46	0.24
Thallium	mg/L	0.00080	-	-	0.000027	0.000016	0.000018	0.00002	0.00002	0.000018	0.000018	0.091	0.000018	0.000015	<0.000010	0.00001	<0.000010	<0.000010	0.000011	0.2	0.000011	0.2
Tin	mg/L	0.30(f)	-	-	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.0001	0
Titanium	mg/L	0.85(f)	-	-	0.0023	0.00036	0.00056	0.0015	<0.0030	0.00073	0.0012	0.88	0.00084	<0.0090	<0.0015	0.0036	<0.00060	0.00065	0.0037	0.96	0.0031	1.2
Uranium	mg/L	0.0085	0.033(b)	-	**0.0092**(Mn)	0.0068	0.0068	0.005	0.0043	0.0054	0.0057	0.2	0.0052	0.0014	0.0026	0.0019	0.0026	0.0018	0.0021	0.26	0.0021	0.26
Vanadium	mg/L	0.12(f)	-	-	0.001	<0.00050	<0.00050	0.00082	0.00085	0.00079	0.00069	0.26	<0.00050	0.0016	0.00052	0.0011	<0.00050	0.00053	0.00094	0.54	0.00085	0.58
Zinc	mg/L	0.14 - 0.19	0.16 - 0.34	-	0.012	0.0086	0.0058	0.0067	0.01	0.0085	0.0079	0.21	0.0079	0.018	0.0041	0.0049	0.0046	<0.0030	0.0079	0.76	0.0069	0.9
Dissolved Metals																						
Aluminum	mg/L	0.050(h)	0.10(h)	-	0.0012	<0.0010	0.0023	0.0027	0.0044	0.0029	0.0027	0.46	0.0021	0.0034	0.0019	0.0027	0.0014	0.0022	0.0024	0.37	0.0023	0.33
Antimony	mg/L	-	-	-	0.0005	0.00038	0.00042	0.00034	0.00039	0.00044	0.00039	0.098	0.00044	0.00015	0.00022	0.00017	0.00026	0.00018	0.0002	0.25	0.0002	0.22
Arsenic	mg/L	-	-	-	0.00018	0.0001	0.00011	0.00015	0.00014	0.00016	0.00013	0.2	0.00012	0.00014	0.00012	0.0001	<0.00010	<0.00010	0.00012	0.16	0.00011	0.16
Barium	mg/L	-	-	-	0.1	0.085	0.091	0.079	0.082	0.088	0.085	0.057	0.096	0.04	0.052	0.039	0.045	0.04	0.044	0.12	0.043	0.12
Beryllium	mg/L	-	-	-	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.00002	0	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.00002	0	<0.00002	0
Bismuth	mg/L	-	-	-	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0	<0.00005	0
Boron	mg/L	-	-	-	0.017	0.014	0.014	0.011	0.012	0.012	0.013	0.11	0.014	<0.010	<0.010	<0.010	0.012	<0.010	0.011	0.1	0.01	0.086
Cadmium	mg/L	0.00043 - 0.00046(c)	0.0016 - 0.0028(c)	0.00030 - 0.00032(c)	0.000063	0.000073	0.000082	0.000086	0.00014	0.00012	0.0001	0.28	0.00014	0.000035	0.000053	0.000036	0.000098	0.000031	0.000055	0.58	0.000051	0.55
Chromium	mg/L	-	-	-	0.00012	0.0002	<0.00010	<0.00010	0.00013	0.00011	0.00013	0.33	<0.00010	0.0001	<0.00010	0.0001	<0.00010	<0.00010	0.0001	0	0.0001	0
Cobalt	mg/L	-	-	-	0.00038	0.00028	0.00032	0.00039	0.00056	0.00023	0.00036	0.36	0.00032	<0.00010	<0.00010	<0.00010	0.00012	<0.00010	0.00011	0.1	0.0001	0.086
Copper	mg/L	0.0005 - 0.0025(j)	0.0029 - 0.0139(j)	-	0.00048	0.00027	0.00022	0.0003	0.00043	0.00031	0.00031	0.25	0.00032	0.00025	0.00025	0.00021	0.00022	<0.00020	0.00023	0.08	0.00023	0.1
Iron	mg/L	-	0.35	-	<0.010	<0.010	<0.010	<0.010	0.01	<0.010	0.01	0	0.01	<0.010	<0.010	<0.010	<0.010	<0.010	<0.01	0	<0.01	0
Lead	mg/L	-	-	-	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0	<0.00005	0
Lithium	mg/L	-	-	-	0.11	0.086	0.085	0.06	0.059	0.074	0.073	0.18	0.063	0.015	0.031	0.026	0.039	0.024	0.028	0.37	0.027	0.33
Manganese	mg/L	-	-	-	0.02	0.017	0.019	0.016	0.017	0.011	0.016	0.2	0.011	0.0021	0.002	0.0023	0.0032	0.0023	0.0024	0.25	0.0024	0.2
Mercury	mg/L	-	-	-	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.000005	0	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.000005	0	<0.000005	0
Molybdenum	mg/L	-	-	-	0.0061	0.0042	0.0042	0.0027	0.0027	0.0033	0.0034	0.21	0.0032	0.0012	0.0013	0.0011	0.0018	0.0013	0.0013	0.26	0.0013	0.21
Nickel	mg/L	-	-	-	0.016	0.012	0.012	0.01	0.013	0.013	0.012	0.095	0.014	0.0025	0.0035	0.0023	0.0045	0.0021	0.0032	0.33	0.003	0.34
Selenium	mg/L	-	-	-	0.23	0.17	0.15	0.11	0.099	0.13	0.13	0.22	0.12	0.027	0.058	0.034	0.051	0.032	0.042	0.3	0.04	0.33
Silicon	mg/L	-	-	-	3.0	2.2	2.1	2.0	2.1	2.0	2.1	0.027	1.8	1.6	1.7	1.5	1.7	1.6	1.6	0.059	1.6	0.059
Silver	mg/L	-	-	-	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	0	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	0	<0.00001	0
Strontium	mg/L	2.5(f)	-	-	0.3	0.26	0.23	0.19	0.18	0.22	0.21	0.15	0.21	0.097	0.12	0.1	0.11	0.09	0.1	0.074	0.1	0.099
Sulphur	mg/L	-	-	-	298	207	191	138	136	158	166	0.19	157	35	56	39	47	35	44	0.18	42	0.21
Thallium	mg/L	-	-	-	0.00002	0.000017	0.000018	0.000013	0.000014	0.000016	0.000016	0.13	0.000017	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	0	<0.00001	0
Tin	mg/L	-	-	-	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.0001	0
Titanium	mg/L	-	-	-	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.0003	0	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.0003	0	<0.0003	0
Uranium	mg/L	-	-	-	0.0084	0.0067	0.0064	0.0044	0.0043	0.0052	0.0054	0.21	0.0051	0.0015	0.0026	0.002	0.0025	0.0018	0.0021	0.23	0.0021	0.23
Vanadium	mg/L	-	-	-	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	0	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	0	<0.0005	0
Zinc	mg/L	-	-	-	0.0041	0.0042	0.005	0.0044	0.0069	0.0082	0.0057	0.3	0.0076	0.0026	0.0031	0.0019	0.0036	0.0017	0.0028	0.26	0.0026	0.31

Parameter	Unit	Q3 FR_FRCP1 C. dubia and P. subcapitata 10-Aug-21	17-Aug-21	24-Aug-21	31-Aug-21	7-Sep-21	Aug 10, 17, 24, 31 H. azteca Mean	CV	Aug 10, 17, 24, 31 Sept 7 P. promelas Mean	CV	Q4 FR_FRCP1 C. dubia and P. subcapitata 12-Oct-21	19-Oct-21	26-Oct-21	2-Nov-21	9-Nov-21	Oct 12, 19, H. az[…] Mean
Field Measured																
pH	-	8.2	8.2	8.3	8.2	8.3	8.2	0.0054	8.2	0.0066	8.1	-	8.4	-	-	8.3
Conductivity	µS/cm	1080	1066	833	1007	-	997	0.099	997	0.46	-	-	-	-	-	-
Specific conductivity	µS/cm at 25 C	-	-	-	-	1105	-	-	1105	-	1295	-	1294	-	-	1295
Temperature	°C	11	9.3	9.0	10	9.7	9.8	0.076	9.8	0.076	2.6	-	4.3	-	-	3.5
Dissolved oxygen	mg/L	**8.9**(Mn, Mx)	**9.3**(Mn)	**9.7**(Mn)	**9.4**(Mn)	**9.5**(Mn)	**9.3**(Mn)	0.031	**9.4**(Mn)	0.032	12	-	**11**(Mn)	-	-	11
Turbidity	NTU	-	-	-	-	<0.18	-	-	0.18	-	0.84	-	<0.23	-	-	0.31
Dissolved oxygen	%	81	81	84	83	84	82	0.015	83	0.017	85	-	84	-	-	85
Oxidation-reduction potential field	mv	151	177	185	147	171	165	0.11	166	0.1	194	-	153	-	-	174
Conventional Parameters																
pH	-	8.4	8.3	8.3	8.4	8.3	8.4	0.0066	8.3	0.0066	8.4	8.4	8.4	8.3	8.3	8.4
Hardness, as $CaCO_3$	mg/L	596	583	448	558	592	546	0.11	555	0.11	701	760	706	752	823	730
Total alkalinity, as $CaCO_3$	mg/L	219	222	201	232	238	219	0.058	222	0.064	244	258	256	269	266	257
Total dissolved solids	mg/L	756	731	606	712	813	701	0.082	724	0.1	903	957	977	1010	1040	962
Total suspended solids	mg/L	<1.0	19	<1.0	<1.0	6.0	5.4	1.5	5.5	1.4	<1.0	<1.0	<1.0	<1.0	2.1	<1
Total organic carbon	mg/L	2.0	12	2.2	1.7	1.7	4.5	1.0	4.0	1.2	0.89	1.8	1.7	1.5	0.52	1.5
Dissolved organic carbon	mg/L	2.4	2.9	1.5	2.0	1.7	2.2	0.23	2.1	0.26	0.83	1.8	1.7	1.7	0.52	1.5
Colour	TCU	<5.0	<5.0	<5.0	<5.0	<5.0	<5	0	<5	0	<5.0	-	-	<5.0	-	5.0
Turbidity	NTU	0.37	30	0.42	0.38	1.7	7.7	1.7	6.5	2.0	0.35	0.3	0.24	0.32	0.48	0.3
Total acidity	mg/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2	0	<2	0	<2.0	<2.0	<2.0	<2.0	<2.0	<2
Cation - anion balance	%	1.2	3.3	4.9	3.0	4.8	3.1	0.42	3.4	0.44	5.3	1.3	4.4	3.8	0.3	3.7
Ion balance	%	98	94	91	94	91	94	0.026	93	0.03	90	98	92	93	101	93
Conductivity	µS/cm	1000	990	787	982	1050	940	0.096	962	0.11	1180	1230	1250	1300	1260	1240
Oxidation-reduction potential	mv	407	405	418	470	356	425	0.078	411	0.099	457	428	453	435	438	443
Major Ions																
Bicarbonate	mg/L	250	271	234	273	276	257	0.068	261	0.07	278	294	299	328	266	300
Bromide	mg/L	<0.25	<0.25	<0.050	<0.25	<0.25	<0.2	0.45	<0.21	0.43	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25
Calcium	mg/L	130	121	98	120	124	117	0.099	119	0.1	147	162	147	159	163	154
Carbonate, as $CaCO_3$	mg/L	8.6	<1.0	5.5	5.0	7.1	5.0	0.54	5.4	0.53	9.6	10	6.5	<1.0	<1.0	6.8
Chloride	mg/L	4.5	1.9	1.1	1.1	1.6	2.1	0.7	2.0	0.7	2.2	1.7	2.3	1.8	2.5	2.0
Fluoride	mg/L	**0.21**(Mn)	**0.17**(Mn)	**0.25**(Mn)	**0.17**(Mn)	**0.20**(Mn)	**0.20**(Mn)	0.18	**0.20**(Mn)	0.17	**0.19**(Mn)	**0.16**(Mn)	**0.24**(Mn)	**0.16**(Mn)	**0.20**(Mn)	**0.19**(Mn)
Hydroxide	mg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1	0	<1	0	<1.0	<1.0	<1.0	<1.0	<1.0	<1
Magnesium	mg/L	66	68	49	63	69	62	0.12	63	0.13	81	86	82	86	101	84
Potassium	mg/L	2.3	2.5	1.8	2.4	2.5	2.3	0.11	2.3	0.12	2.5	3.0	2.8	3.2	3.1	2.9
Sodium	mg/L	2.0	2.0	1.6	2.1	2.2	1.9	0.11	2.0	0.12	2.5	2.6	2.7	2.8	3.1	2.6
Sulphate	mg/L	328	344	250	306	350	307	0.12	316	0.13	**445**(Mn)	**444**(Mn)	**434**(Mn)	**451**(Mn)	**458**(Mn)	**444**(Mn)
Major anion sum	meq/l	12	13	10	12	13	12	0.087	12	0.1	16	16	16	16	17	16
Major cation sum	meq/l	12	12	9.1	11	12	11	0.11	11	0.11	14	15	14	15	17	15
Bicarbonate Alkalinity, as $CaCO_3$	mg/l	205	222	192	224	226	211	0.068	214	0.069	228	241	245	269	218	246
Carbonate Alkalinity, as $CaCO_3$	mg/l	14	<1.0	9.2	8.4	12	8.3	0.58	9.0	0.56	16	17	11	<1.0	<1.0	11
Hydroxide Alkalinity, as $CaCO_3$	mg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1	0	<1	0	<1.0	<1.0	<1.0	<1.0	<1.0	<1
Nutrients and Biological Indicators																
Nitrate	mg-N/L	**14**(Mn)	**14**(Mn)	**11**(Mn)	**14**(Mn)	**15**(Mn)	**13**(Mn)	0.1	**14**(Mn)	0.11	**23**(Mn, E)	**19**(Mn, E)	**20**(Mn, E)	**22**(Mn, E)	**24**(Mn, E)	**21**(Mn, E)
Nitrite	mg-N/L	0.0086	0.013	<0.0010	0.017	0.013	0.0099	0.68	0.01	0.58	0.023	**0.034**(Mn)	0.03	**0.050**(Mn)	0.036	**0.034**(Mn)
Total ammonia	mg-N/L	0.0075	0.035	0.015	0.0084	0.023	0.016	0.7	0.018	0.64	<0.0050	0.1	0.049	0.17	0.11	0.083
Total Kjeldahl nitrogen	mg-N/L	0.44	0.53	0.22	0.35	<0.050	0.39	0.3	0.32	0.59	0.35	0.52	0.43	0.24	0.39	0.38
Total phosphorus	mg-P/L	0.0029	0.052	0.0071	0.003	<0.0020	0.016	1.3	0.013	1.6	0.0028	<0.0020	0.0022	<0.0020	<0.0020	0.0023
Orthophosphate	mg-P/L	0.0014	0.0012	<0.0010	<0.0010	<0.0010	0.0012	0.16	0.0011	0.16	0.0014	<0.0010	0.0013	0.0014	<0.0010	0.0013
Biochemical oxygen demand	mg/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2	0	<2	0	<2.0	-	-	<2.0	-	2.0
Total Metals																
Aluminum	mg/L	0.0057	0.3	0.0076	0.0034	0.0084	0.079	1.7	0.065	2.0	0.0046	0.0039	0.0031	0.0047	0.011	0.0041
Antimony	mg/L	0.0003	0.00032	0.00028	0.00034	0.0003	0.00031	0.084	0.00031	0.074	0.00038	0.00048	0.00042	0.00071	0.0005	0.0005
Arsenic	mg/L	0.00015	0.00034	0.00014	0.00013	0.00014	0.00019	0.48	0.00018	0.5	0.00013	0.00016	0.00012	0.00014	0.00018	0.00014
Barium	mg/L	0.079	0.077	0.063	0.071	0.074	0.072	0.087	0.073	0.086	0.09	0.091	0.091	0.091	0.082	0.091
Beryllium	mg/L	<0.000020	0.000036	<0.000020	<0.000020	<0.000020	0.000024	0.3	0.000023	0.31	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.00002
Bismuth	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0	<0.00005	0	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005
Boron	mg/L	0.014	0.014	0.013	0.016	0.014	0.014	0.094	0.014	0.077	0.012	0.016	0.014	0.016	0.013	0.015
Cadmium	mg/L	0.00013	0.00022	0.000083	0.0001	0.00012	0.00014	0.4	0.00013	0.4	0.00017	0.00014	0.00014	0.00015	0.00013	0.00015
Calcium	mg/L	125	128	99	120	124	118	0.097	119	0.098	156	160	158	167	161	160
Chromium	mg/L	0.00012	0.00064	0.00013	<0.00010	<0.00010	0.00025	0.95	0.00022	1.1	<0.00010	0.00035	0.00011	<0.00010	0.00011	0.00017
Cobalt	mg/L	0.00011	0.00065	0.00028	0.00029	0.00031	0.00033	0.59	0.00033	0.6	0.00012	0.0002	0.00019	0.00039	0.00028	0.00023
Copper	mg/L	<0.00050	0.0011	<0.00050	<0.00050	<0.00050	0.00064	0.39	0.00061	0.4	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005
Iron	mg/L	0.022	0.51	0.028	0.026	0.037	0.15	1.5	0.12	1.7	0.029	0.028	0.029	0.031	0.048	0.029
Lead	mg/L	<0.000050	0.00047	<0.000050	<0.000050	<0.000050	0.00015	1.2	0.00013	1.4	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005
Lithium	mg/L	0.046	0.046	0.039	0.054	0.048	0.046	0.14	0.047	0.12	0.056	0.068	0.07	0.074	0.07	0.067
Magnesium	mg/L	66	69	50	64	72	62	0.12	64	0.13	95	88	87	93	87	91
Manganese	mg/L	0.0062	0.028	0.011	0.011	0.012	0.014	0.6	0.014	0.61	0.0087	0.0094	0.0096	0.013	0.013	0.01
Mercury	mg/L	<0.00000050	0.0000033	0.00000067	<0.00000050	<0.00000050	0.0000012	0.99	0.0000011	1.1	<0.00000050	<0.00000050	<0.00000050	<0.00000050	<0.00000050	<0.0000005
Molybdenum	mg/L	0.0026	0.0028	0.0022	0.0026	0.0025	0.0025	0.097	0.0025	0.098	0.0032	0.0037	0.0032	0.0047	0.0037	0.0037
Nickel	mg/L	**0.0070**(Mn)	**0.011**(Mn)	**0.0063**(Mn)	**0.0073**(Mn)	**0.0086**(Mn)	**0.0079**(Mn)	0.23	**0.0080**(Mn)	0.23	**0.012**(Mn)	**0.012**(Mn)	**0.011**(Mn)	**0.014**(Mn)	**0.012**(Mn)	**0.012**(Mn)
Potassium	mg/L	2.2	2.5	2.0	2.3	2.4	2.3	0.093	2.3	0.096	2.6	3.1	2.9	3.3	2.8	2.9
Selenium	mg/L	**0.080**(Mn, E)	**0.084**(Mn, E)	**0.054**(Mn, E)	**0.071**(Mn, E)	**0.082**(Mn, E)	**0.072**(Mn, E)	0.16	**0.074**(Mn, E)	0.17	**0.12**(Mn, E)	**0.11**(Mn, E)	**0.11**(Mn, E)	**0.11**(Mn, E)	**0.11**(Mn, E)	**0.11**(Mn, E)
Silicon	mg/L	2.1	2.6	2.2	2.2	2.1	2.3	0.081	2.2	0.088	2.0	2.1	2.0	2.2	1.9	2.0
Silver	mg/L	<0.000010	0.000012	<0.000010	<0.000010	<0.000010	0.000011	0.085	0.00001	0.086	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001
Sodium	mg/L	2.0	2.0	1.7	2.0	2.3	1.9	0.082	2.0	0.11	2.5	2.8	2.8	2.9	2.7	2.7
Strontium	mg/L	0.16	0.15	0.15	0.18	0.18	0.16	0.078	0.17	0.081	0.2	0.23	0.2	0.26	0.23	0.22
Sulphur	mg/L	119	125	86	116	129	112	0.13	115	0.15	165	168	165	161	156	165
Thallium	mg/L	0.000011	0.000024	<0.000010	0.000011	0.00001	0.000014	0.42	0.000013	0.46	0.000012	0.000018	0.000015	0.000025	0.000016	0.000018
Tin	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.0001	0	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001
Titanium	mg/L	<0.00030	0.004	<0.00030	<0.00030	<0.00030	0.0012	1.4	0.001	1.6	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.0003
Uranium	mg/L	0.0039	0.0038	0.0033	0.004	0.0043	0.0037	0.08	0.0038	0.094	0.0053	0.0057	0.0055	0.0055	0.0057	0.0055
Vanadium	mg/L	<0.00050	0.0017	<0.00050	<0.00050	<0.00050	0.00081	0.68	0.00075	0.74	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005
Zinc	mg/L	0.0059	0.014	0.0047	0.0054	0.0064	0.0076	0.53	0.0073	0.54	0.01	0.017	0.0081	0.0081	0.008	0.011
Dissolved Metals																
Aluminum	mg/L	<0.0010	0.0028	0.002	<0.0010	<0.0010	0.0017	0.48	0.0016	0.52	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.001
Antimony	mg/L	0.00028	0.0003	0.00023	0.00034	0.00029	0.00029	0.16	0.00029	0.14	0.00034	0.00048	0.00041	0.0007	0.00052	0.00048
Arsenic	mg/L	0.00011	0.00011	<0.00010	0.00012	0.00012	0.00011	0.076	0.00011	0.075	0.00011	0.00011	0.0001	0.00015	0.00013	0.00012
Barium	mg/L	0.076	0.066	0.059	0.072	0.076	0.068	0.1	0.07	0.11	0.083	0.089	0.087	0.091	0.096	0.087
Beryllium	mg/L	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.00002	0	<0.00002	0	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.00002
Bismuth	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0	<0.00005	0	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005
Boron	mg/L	0.014	0.013	0.012	0.015	0.015	0.014	0.097	0.014	0.094	0.011	0.015	0.013	0.016	0.012	0.014
Cadmium	mg/L	0.00013	0.00013	0.000072	0.000098	0.000091	0.00011	0.22	0.0001	0.23	0.00017	0.00014	0.00014	0.00014	0.00014	0.00015
Chromium	mg/L	<0.00010	<0.00010	0.0001	<0.00010	<0.00010	0.0001	0	0.0001	0	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001
Cobalt	mg/L	0.00011	0.00026	0.00024	0.0003	0.0003	0.00023	0.34	0.00024	0.32	0.00011	0.0002	0.00018	0.00036	0.00026	0.00021
Copper	mg/L	<0.00020	0.00025	<0.00020	<0.00020	<0.00020	0.00021	0.11	0.00021	0.11	<0.00020	<0.00020	<0.00020	<0.00020	0.00022	<0.0002
Iron	mg/L	<0.010	<0.010	<0.010	0.015	<0.010	0.011	0.24	0.011	0.2	0.019	0.017	0.017	0.015	0.016	0.017
Lead	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0	<0.00005	0	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005
Lithium	mg/L	0.05	0.046	0.036	0.051	0.052	0.046	0.14	0.047	0.14	0.056	0.059	0.066	0.073	0.068	0.063
Manganese	mg/L	0.0048	0.011	0.0088	0.011	0.01	0.0088	0.29	0.0091	0.28	0.0078	0.0086	0.0086	0.012	0.012	0.0092
Mercury	mg/L	<0.0000050	<0.0000050	0.0000077	<0.0000050	<0.0000050	0.0000057	0.21	0.0000055	0.22	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.000005
Molybdenum	mg/L	0.0027	0.0029	0.0019	0.0026	0.0024	0.0025	0.15	0.0025	0.15	0.003	0.0032	0.0031	0.0048	0.0037	0.0035
Nickel	mg/L	0.0068	0.0087	0.0056	0.0072	0.0086	0.0071	0.16	0.0074	0.18	0.011	0.011	0.011	0.013	0.013	0.011
Selenium	mg/L	0.085	0.088	0.055	0.076	0.082	0.076	0.17	0.077	0.17	0.13	0.11	0.11	0.11	0.12	0.11
Silicon	mg/L	2.1	2.0	2.0	2.2	2.0	2.1	0.063	2.0	0.057	1.8	1.9	1.8	1.9	1.9	1.9
Silver	mg/L	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	0	<0.00001	0	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001
Strontium	mg/L	0.17	0.16	0.14	0.17	0.17	0.16	0.082	0.16	0.08	0.19	0.22	0.19	0.25	0.24	0.21
Sulphur	mg/L	113	113	79	109	109	103	0.14	105	0.14	158	144	158	141	160	150
Thallium	mg/L	<0.000010	0.000012	<0.000010	0.00001	0.000012	0.000011	0.085	0.000011	0.1	0.000011	0.000018	0.000016	0.000021	0.000018	0.000017
Tin	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.0001	0	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001
Titanium	mg/L	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.0003	0	<0.0003	0	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.0003
Uranium	mg/L	0.0038	0.0039	0.0028	0.0037	0.0039	0.0036	0.13	0.0036	0.13	0.0051	0.0048	0.0054	0.0053	0.0055	0.0051
Vanadium	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	0	<0.0005	0	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005
Zinc	mg/L	0.0064	0.0076	0.0041	0.0053	0.0057	0.0059	0.23	0.0058	0.22	0.0086	0.0076	0.0079	0.0075	0.0074	0.0079

(a) = guideline is a minimum value, unless the background concentration or value is lower.
(b) = guideline is adopted from CCME Canadian Environmental Quality Guidelines (CCME, 1999).
(c) = guideline is hardness dependent. The guideline range shown is based on the hardness range observed in the dataset (262 to 1,300 mg/L). The guideline is calculated based on the individual hardness value for each sample.
(d) = for some samples, water hardness was greater than 250 mg/L. At this hardness, no BC ENV water quality guideline has been established for sulphate; however, the observed data were screened against the guideline for very hard water (i.e., 429 mg/L) for comparative purposes.
(e) = guideline is chloride dependent. The guideline range shown is based on the chloride concentration range observed in the dataset (0.390 to 4.930 mg/L). The guideline is calculated based on the individual chloride concentration in each sample.
(f) = guideline is adopted from the ECCC PNECs (ECCC, 2018) or draft FEQGs (ECCC, 2017).
(g) = guideline is for chromium VI.
(h) = guideline is pH dependent. The guideline range shown is based on the pH range observed in the dataset (7.7 to 8.4). The guideline is calculated based on the individual pH for each sample.
(i) = guideline is a level 1 interim screening value.
(j) = dissolved copper guideline was calculated using the simplified Biotic Ligand Midel (BC ENV, 2019). Where values were missing, the temporally nearest value from the same location was taken.
(Mn) = concentration is higher than the 30-day mean BC ENV guideline or outside the recommended pH, DO or total alkalinity range.
(Mx) = concentration is higher than the maximum BC ENV guideline or outside the recommended pH, DO or total alkalinity range.
(E) = concentration is higher than the EVWQP benchmarks guideline.
Bolded concentrations are higher than water quality guidelines.
Shaded concentrations are higher than the EVWQP benchmark (e.g., for nitrate, total selenium, dissolved cadmium or sulphate).
Water quality data and guidelines shown in this table were rounded to reflect laboratory or field instrument precision after comparisons to guidelines. Therefore, values slightly above guidelines may be displayed as being equal to the guidelines and identified as exceedances. Concentrations equal to the guideline values were not identified as exceedances.
Concentrations were screened against available Working and Approved British Columbia Ministry of Environment and Climate Change Strategy (BC ENV) Water Quality Guidelines for the Protection of Aquatic Life; Accessed January 2020 from: https://www2.gov.bc.ca/gov/content/environment/air-land-water/water/water-quality/water-quality-guidelines.
\- = no guideline or no data
BC ENV = British Columbia Ministry of Environment & Climate Change Strategy; EVWQP = Elk Valley Water Quality Plan guidelines; *C. dubia* = *Ceriodaphnia dubia*; *P. subcapitata* = *Pseudokirchneriella subcapitata*; *H. azteca* = *Hyallela azteca*; *P. promelas* = *Pimephales promelas*; *O. mykiss* = *Oncorhynchus mykiss*; CV = coefficient of variation; ∑ = sum of; WQGs = Water Quality Guidelines; CaCO3 = calcium carbonate; mg/L = milligrams per litre; µS/cm = microsiemens per centimeter; NTU = nephelometric turbidity units; meq/L = milliequivalents per litre; mg-N/L = milligrams of Nitrogen per litre; mg=P/L = milligrams of Phosphorus per litre.
BC ENV (B.C. Ministry of Climate Chande Strategy). 2019. Copper Water Quality guideline for the Protection of Aquatic Life-Technical Report. Water Quality Guideline Series, WQG-03-1. Prov. B.C., Victoria B.C.

Parameter	Unit	Guidelines for the protection of:			26, Nov 2	Oct 12, 19, 26, Nov 2, 9
		Aquatic Life		EVWQP Benchmarks	lrca	O. mykiss
		30-day mean	Maximum		CV	Mean	CV
Field Measured							
pH	-	6.5 - 9.0	6.5 - 9.0	-	0.026	8.3	0.026
Conductivity	µS/cm	-	-	-	-	-	-
Specific conductivity	µS/cm at 25 C	-	-	-	0.00055	1295	0.00055
Temperature	°C	-	-	-	0.35	3.5	0.35
Dissolved oxygen	mg/L	11	9.0	-	0.036	11	0.036
Turbidity	NTU	-	-	-	1.4	0.31	1.4
Dissolved oxygen	%	-	-	-	0.013	85	0.013
Oxidation-reduction potential field	mv	-	-	-	0.17	174	0.17
Conventional Parameters							
pH	-	6.5 - 9.0	6.5 - 9.0	-	0.0065	8.4	0.0066
Hardness, as $CaCO_3$	mg/L	-	-	-	0.039	748	0.066
Total alkalinity, as $CaCO_3$	mg/L	20[c]	-	-	0.041	259	0.038
Total dissolved solids	mg/L	-	-	-	0.046	977	0.053
Total suspended solids	mg/L	-	-	-	0	1.2	0.4
Total organic carbon	mg/L	-	-	-	0.25	1.3	0.44
Dissolved organic carbon	mg/L	-	-	-	0.26	1.3	0.44
Colour	TCU	-	-	-	0.55	5.0	0.55
Turbidity	NTU	-	-	-	0.14	0.34	0.26
Total acidity	mg/L	-	-	-	0	<2	0
Cation - anion balance	%	-	-	-	0.41	3.0	0.71
Ion balance	%	-	-	-	0.03	95	0.048
Conductivity	µS/cm	-	-	-	0.041	1244	0.035
Oxidation-reduction potential	mv	-	-	-	0.029	442	0.028
Major Ions							
Bicarbonate	mg/L	-	-	-	0.074	293	0.08
Bromide	mg/L	-	-	-	0	<0.25	0
Calcium	mg/L	-	-	-	0.047	156	0.051
Carbonate, as $CaCO_3$	mg/L	-	-	-	0.66	5.6	0.79
Chloride	mg/L	150	600	-	0.14	2.1	0.17
Fluoride	mg/L	0.12[b]	1.7 - 2.4[c,i]	-	0.19	**0.19**[Mn]	0.17
hydroxide	mg/L	-	-	-	0	<1	0
Magnesium	mg/L	-	-	-	0.029	87	0.091
Potassium	mg/L	-	-	-	0.1	2.9	0.095
Sodium	mg/L	-	-	-	0.049	2.7	0.082
Sulphate	mg/L	429[c,d]	-	481	0.016	**446**[Mn]	0.02
Major anion sum	meq/l	-	-	-	0.024	16	0.027
Major cation sum	meq/l	-	-	-	0.038	15	0.067
Bicarbonate Alkalinity, as $CaCO_3$	mg/l	-	-	-	0.074	240	0.08
Carbonate Alkalinity, as $CaCO_3$	mg/l	-	-	-	0.7	9.1	0.85
Hydroxide Alkalinity, as $CaCO_3$	mg/l	-	-	-	0	<1	0
Nutrients and Biological Indicators							
Nitrate	mg-N/L	3.0	33	7.9 - 15[c]	0.078	**22**[Mn, E]	0.096
Nitrite	mg-N/L	0.020 - 0.060[c]	0.060 - 0.18[c]	-	0.35	0.035	0.29
Total ammonia	mg-N/L	2.1	14	-	0.9	0.087	0.73
Total Kjeldahl nitrogen	mg-N/L	-	-	-	0.32	0.39	0.27
Total phosphorus	mg-P/L	-	-	-	0.15	0.0022	0.16
Orthophosphate	mg-P/L	-	-	-	0.14	0.0012	0.17
Biochemical oxygen demand	mg/L	-	-	-	0.55	2.0	0.55
Total Metals							
Aluminum	mg/L	-	-	-	0.17	0.0054	0.56
Antimony	mg/L	0.0090	-	-	0.32	0.0005	0.26
Arsenic	mg/L	0.0050	0.0050	-	0.11	0.00015	0.16
Barium	mg/L	1.0	-	-	0.005	0.089	0.043
Beryllium	mg/L	0.00013	-	-	0	<0.00002	0
Bismuth	mg/L	0.0005[f]	-	-	0	<0.00005	0
Boron	mg/L	1.2	29[c]	-	0.12	0.014	0.13
Cadmium	mg/L	-	-	-	0.084	0.00014	0.11
Calcium	mg/L	-	-	-	0.032	160	0.026
Chromium	mg/L	0.0010[g]	-	-	0.67	0.00015	0.71
Cobalt	mg/L	0.0040	0.11	-	0.55	0.00024	0.44
Copper	mg/L	-	-	-	0	<0.0005	0
Iron	mg/L	0.69 - 2.18[c,j]	1.0	-	0.046	0.033	0.26
Lead	mg/L	0.014 - 0.020[c,j]	0.28 - 0.42[c,j]	-	0	<0.00005	0
Lithium	mg/L	0.1216[f]	-	-	0.11	0.067	0.1
Magnesium	mg/L	-	-	-	0.039	90	0.043
Manganese	mg/L	1.8 - 2.6[c,i]	3.4[c,i]	-	0.21	0.011	0.2
Mercury	mg/L	0.000010	-	-	0	<0.0000005	0
Molybdenum	mg/L	1.0	2.0	-	0.2	0.0037	0.16
Nickel	mg/L	0.0053[f]	-	-	0.11	**0.012**[Mn]	0.09
Potassium	mg/L	-	-	-	0.10	2.9	0.09
Selenium	mg/L	0.0020	-	0.019	0.04	**0.11**[Mn, E]	0.04
Silicon	mg/L	-	-	-	0.048	2.0	0.056
Silver	mg/L	0.0015[c]	0.0030[c]	-	0	<0.00001	0
Sodium	mg/L	-	-	-	0.063	2.7	0.057
Strontium	mg/L	-	-	-	0.14	0.22	0.12
Sulphur	mg/L	-	-	-	0.018	163	0.028
Thallium	mg/L	0.00080	-	-	0.34	0.000017	0.28
Tin	mg/L	0.30[h]	-	-	0	<0.0001	0
Titanium	mg/L	0.85[h]	-	-	0	<0.0003	0
Uranium	mg/L	0.0085	0.033[c]	-	0.023	0.0055	0.027
Vanadium	mg/L	0.12[h]	-	-	0	<0.0005	0
Zinc	mg/L	0.14 - 0.19	0.16 - 0.34	-	0.36	0.01	0.38
Dissolved Metals							
Aluminum	mg/L	0.050[c]	0.10[c]	-	0	<0.001	0
Antimony	mg/L	-	-	-	0.34	0.00049	0.28
Arsenic	mg/L	-	-	-	0.2	0.00012	0.17
Barium	mg/L	-	-	-	0.036	0.089	0.052
Beryllium	mg/L	-	-	-	0	<0.00002	0
Bismuth	mg/L	-	-	-	0	<0.00005	0
Boron	mg/L	-	-	-	0.16	0.013	0.15
Cadmium	mg/L	0.00043 - 0.00046[c,i]	0.0016 - 0.0028[c,i]	0.00030 - 0.00032[c,i]	0.088	0.00014	0.085
Chromium	mg/L	-	-	-	0	<0.0001	0
Cobalt	mg/L	-	-	-	0.53	0.00022	0.42
Copper	mg/L	0.0005 - 0.0025[j]	0.0029 - 0.0139[j]	-	0	0.0002	0.044
Iron	mg/L	-	0.35	-	0.098	0.017	0.088
Lead	mg/L	-	-	-	0	<0.00005	0
Lithium	mg/L	-	-	-	0.13	0.064	0.11
Manganese	mg/L	-	-	-	0.2	0.0096	0.19
Mercury	mg/L	-	-	-	0	<0.0000005	0
Molybdenum	mg/L	-	-	-	0.26	0.0035	0.2
Nickel	mg/L	-	-	-	0.098	0.012	0.10
Selenium	mg/L	-	-	-	0.058	0.12	0.059
Silicon	mg/L	-	-	-	0.024	1.9	0.022
Silver	mg/L	-	-	-	0	<0.00001	0
Strontium	mg/L	2.5[d]	-	-	0.13	0.22	0.12
Sulphur	mg/L	-	-	-	0.059	152	0.059
Thallium	mg/L	-	-	-	0.25	0.000017	0.22
Tin	mg/L	-	-	-	0	<0.0001	0
Titanium	mg/L	-	-	-	0	<0.0003	0
Uranium	mg/L	-	-	-	0.047	0.0052	0.054
Vanadium	mg/L	-	-	-	0	<0.0005	0
Zinc	mg/L	-	-	-	0.059	0.0078	0.062

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- = no guideline or no data
BC ENV = British Columbia Ministry of Environment & Climate Change Strategy; EVWQP = Elk Valley Water Quality Plan guidelines; *C. dubia = Ceriodaphnia dubia* ; *P. subcapitata = Pseudokirchneriella subcapitata* ; *H. azteca = Hyallela azteca* ; *P. promelas = Pimephales promelas* ; *O. mykiss = Oncorhynchus mykiss* ; CV = coefficient of variation; $\sum$ = sum of; WQGs = Water Quality Guidelines; $CaCO3$ = calcium carbonate; mg/L = milligrams per litre; µS/cm = microsiemens per centimeter; NTU = nephelometric turbidity units; meq/L = milliequivalents per litre; mg-N/L = milligrams of Nitrogen per litre; mg-P/L = milligrams of Phosphorus per litre.
BC ENV (B.C. Ministry of Climate Chande Strategy). 2019. Copper Water Quality guideline for the Protection of Aquatic Life-Technical Report. Water Quality Guideline Series, WQG-03-1. Prov. B.C., Victoria B.C.

Parameter	Unit	Guidelines for the protection of:			Q1 FR_FRABCH									Q2 FR_FRABCH									Q3 FR_FRABCH									Q4 FR_FRABCH				
		Aquatic Life		EVWQP Benchmarks	*P. subcapitata*	2-Mar-21	9-Mar-21	16-Mar-21	23-Mar-21	30-Mar-21	Mar 2, 9, 16, 23, 30 *P. promelas*		*C. dubia*	*C. dubia* and *P. subcapitata*	25-May-21	1-Jun-21	8-Jun-21	15-Jun-21	May 18, 25, June 1, 8 *H. azteca*		May 18, 25, June 1, 8, 15 *O. mykiss*		*C. dubia* and *P. subcapitata*	17-Aug-21	24-Aug-21	31-Aug-21	7-Sep-21	Aug 10, 17, 24, 31 *H. azteca*		Aug 10, 17, 24, 31 Sept 7 *P. promelas*		*C. dubia* and *P. subcapitata*	19-Oct-21	26-Oct-21	2-Nov-21	9-Nov-21
		30-day mean	Maximum		23-Feb-21						Mean	CV	13-Apr-21	18-May-21					Mean	CV	Mean	CV	10-Aug-21					Mean	CV	Mean	CV	12-Oct-21				
Field Measured																																				
pH	-	6.5 - 9.0	6.5 - 9.0	-	7.9	8.0	8.0	8.1	8.1	8.0	8.0	0.0068	8.0	8.0	7.9	7.9	7.9	7.9	7.9	0.0056	7.9	0.0056	8.0	7.9	8.0	8.0	8.1	8.0	0.0056	8.0	0.0088	-	-	8.1	-	-
Conductivity	µS/cm	-	-	-	-	-	1344	-	-	-	1344	-	-	-	-	-	-	637	-	-	637	-	1152	1095	1005	1088	-	1085	0.048	1085	0.06	-	-	-	-	-
Specific conductivity	µS/cm at 25 C	-	-	-	1281	1282	-	1350	1260	1275	1292	0.031	13	595	825	632	779	-	708	0.14	708	0.16	-	-	-	-	1168	-	-	1168	-	-	-	1228	-	-
Temperature	°C	-	-	-	1.4	2.4	0.7	3.0	1.5	0.9	1.7	0.58	2.2	4.6	4.3	4.8	4.0	5.9	4.4	0.081	4.7	0.15	8.6	8.0	9.3	7.2	5.5	8.3	0.11	7.7	0.19	-	-	4.7	-	-
Dissolved oxygen	mg/L	11	9.0	-	**11**[Mn]	**11**[Mn]	11	**11**[Mn]	**11**[Mn]	11	11	0.012	11	**9.8**[Mn]	**10**[Mn]	**10**[Mn]	**9.1**[Mn]	**10**[Mn]	**9.7**[Mn]	0.048	**9.8**[Mn]	0.04	**9.1**[Mn]	**9.2**[Mn]	**9.6**[Mn]	**9.5**[Mn]	**10**[Mn]	**9.4**[Mn]	0.023	**9.5**[Mn]	0.038	-	-	**9.6**[Mn]	-	-
Turbidity	NTU	-	-	-	-	-	<0.26	0.08	0.54	0.44	0.2	1.0	0.7	29	5.4	17	5.0	9.1	14	0.75	13	0.77	-	-	-	-	<1.3	-	-	1.3	-	-	-	<0.34	-	-
Dissolved oxygen	%	-	-	-	77	79	79	79	79	79	79	0.0021	82	76	80	81	70	80	77	0.07	77	0.061	78	78	84	79	83	80	0.033	80	0.037	-	-	75	-	-
Oxidation-reduction potential field	mv	-	-	-	170	163	161	111	139	156	146	0.15	143	135	222	235	179	156	193	0.21	186	0.23	129	185	206	159	127	170	0.17	161	0.21	-	-	163	-	-
Conventional Parameters																																				
pH	-	6.5 - 9.0	6.5 - 9.0	-	8.1	8.0	8.2	8.3	8.3	8.1	8.2	0.016	8.3	8.2	8.1	8.3	8.3	8.4	8.2	0.011	8.3	0.014	8.3	8.2	8.3	8.3	8.2	8.3	0.0054	8.3	0.0066	8.2	8.2	8.2	8.1	8.1
Hardness, as $CaCO_3$	mg/L	-	-	-	756	763	805	721	676	757	744	0.065	689	307	441	347	386	313	370	0.13	359	0.16	610	584	535	600	596	582	0.051	585	0.05	659	684	659	662	677
Total alkalinity, as $CaCO_3$	mg/L	20[a]	-	-	251	222	267	251	246	258	249	0.068	237	159	200	163	192	167	179	0.11	176	0.11	237	240	239	248	244	241	0.022	242	0.018	252	262	273	261	285
Total dissolved solids	mg/L	-	-	-	898	972	883	1020	948	993	963	0.054	981	370	552	415	524	421	465	0.17	456	0.17	820	731	750	770	887	768	0.043	792	0.079	858	887	873	854	915
Total suspended solids	mg/L	-	-	-	<1.0	1.1	<1.0	3.1	<1.0	1.1	1.5	0.63	<1.0	138	7.6	21	12	43	45	1.3	44	1.2	<1.0	1.9	16	<1.0	<1.0	5.1	1.3	4.2	1.6	2.2	<1.0	2.3	1.6	1.2
Total organic carbon	mg/L	-	-	-	<0.50	1.3	0.56	0.54	1.2	0.67	0.85	0.43	1.4	2.8	2.1	3.0	2.3	1.7	2.5	0.15	2.4	0.22	2.1	4.2	1.7	1.8	1.9	2.5	0.44	2.3	0.46	0.92	1.8	1.2	1.2	<0.50
Dissolved organic carbon	mg/L	-	-	-	<0.50	0.52	0.62	0.64	1.1	1.1	0.79	0.35	1.6	2.3	1.4	2.2	2.0	1.7	2.0	0.16	1.9	0.18	2.4	3.8	1.6	2.0	1.4	2.5	0.35	2.2	0.44	0.74	2.1	0.86	1.3	<0.50
Colour	TCU	-	-	-	<5.0	<5.0	-	<5.0	<5.0	<5.0	5.0	0.45	<5.0	5.0	<5.0	<5.0	<5.0	<5.0	5.0	0	5.0	0	<5.0	<5.0	5.0	<5.0	<5.0	5.0	0	5.0	0	-	-	-	<5.0	-
Turbidity	NTU	-	-	-	0.22	0.36	0.12	0.44	0.9	0.51	0.47	0.61	0.64	27	3.4	9.4	4.6	6.7	11	0.9	10	0.95	0.38	2.4	5.2	0.29	0.36	2.1	1.0	1.7	1.2	0.38	0.18	0.13	0.18	0.11
Total acidity	mg/L	-	-	-	3.6	2.3	<2.0	6.2	<2.0	2.9	3.1	0.58	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2	0	<2	0	<2.0	<2.0	<2.0	<2.0	3.5	<2	0	2.3	0.29	2.4	3.6	<2.0	<2.0	<2.0
Cation - anion balance	%	-	-	-	2.7	3.4	1.3	4.0	4.2	5.6	3.7	0.43	2.8	3.1	2.9	0.5	3.6	3.9	2.5	0.51	2.8	0.48	0.8	2.1	6.9	3.2	4.7	3.2	0.7	3.5	0.67	<0.010	1.4	5.0	0.37	5.5
Ion balance	%	-	-	-	106	107	102	92	92	90	97	0.078	95	94	94	101	93	93	96	0.035	95	0.036	98	96	87	94	91	94	0.045	93	0.047	100	97	91	101	90
Conductivity	µS/cm	-	-	-	1180	1190	1230	1270	1170	1240	1220	0.033	1230	579	808	607	746	597	685	0.14	667	0.15	1050	1000	945	1070	1080	1016	0.053	1029	0.055	1100	1140	1190	1180	1200
Oxidation-reduction potential	mv	-	-	-	419	405	442	353	442	391	407	0.092	251	312	441	398	475	414	407	0.17	408	0.15	411	438	390	468	356	427	0.081	413	0.1	461	433	433	455	445
Major Ions																																				
Bicarbonate	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	193	-	-	193	0.45	289	293	292	298	298	293	0.013	294	0.013	307	320	333	318	285
Bromide	mg/L	-	-	-	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	0	<0.25	<0.050	<0.050	<0.050	<0.050	<0.050	<0.05	0	<0.05	0	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	0	<0.25	0	<0.25	<0.25	<0.25	<0.25	<0.25
Calcium	mg/L	-	-	-	176	178	194	159	152	174	171	0.096	151	72	101	81	86	73	85	0.13	83	0.14	139	131	119	133	132	131	0.056	131	0.056	148	162	146	153	151
Carbonate, as $CaCO_3$	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5.3	-	-	5.3	0.45	<1.0	<1.0	<1.0	2.2	<1.0	1.3	0.51	1.2	0.43	<1.0	<1.0	<1.0	<1.0	<1.0
Chloride	mg/L	150	600	-	1.8	2.6	4.6	3.4	3.2	3.7	3.5	0.21	2.3	0.63	1.1	0.63	0.8	0.63	0.79	0.23	0.75	0.26	2.0	1.7	2.4	1.3	1.8	1.9	0.25	1.8	0.22	1.6	1.7	2.9	1.5	5.4
Fluoride	mg/L	0.12[b]	1.8 - 2.2[c]	-	0.1	**0.15**[Mn]	**0.15**[Mn]	<0.10	<0.10	**0.13**[Mn]	0.13	0.2	<0.10	**0.14**[Mn]	**0.16**[Mn]	**0.14**[Mn]	**0.15**[Mn]	**0.18**[Mn]	**0.15**[Mn]	0.057	**0.15**[Mn]	0.11	**0.17**[Mn]	**0.14**[Mn]	**0.42**[Mn]	**0.13**[Mn]	**0.15**[Mn]	**0.22**[Mn]	0.58	**0.20**[Mn]	0.61	0.11	**0.12**[Mn]	**0.19**[Mn]	<0.10	**0.13**[Mn]
Hydroxide	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<1.0	-	-	1.0	0.45	<1.0	<1.0	<1.0	<1.0	<1.0	<1	0	<1	0	<1.0	<1.0	<1.0	<1.0	<1.0
Magnesium	mg/L	-	-	-	77	77	78	79	72	78	77	0.036	76	31	46	35	41	32	38	0.15	37	0.17	64	62	58	65	65	62	0.049	63	0.048	70	68	72	68	73
Potassium	mg/L	-	-	-	1.8	1.9	1.8	2.0	2.2	2.1	2.0	0.081	2.1	1.2	1.6	1.3	1.8	1.3	1.5	0.21	1.4	0.19	2.1	2.2	2.0	2.2	2.2	2.1	0.043	2.1	0.044	2.2	2.0	2.0	2.1	2.1
Sodium	mg/L	-	-	-	2.5	3.0	2.7	3.2	3.1	3.3	3.1	0.078	3.0	1.2	2.0	1.5	2.2	1.5	1.7	0.26	1.7	0.24	2.7	2.7	2.4	2.7	2.7	2.6	0.057	2.6	0.058	3.2	3.0	2.8	3.0	3.0
Sulphate	mg/L	429[c,d]	-	481	360	384	396	416	388	**460**[Mn]	409	0.076	387	131	203	139	164	132	159	0.18	154	0.2	297	285	293	315	325	298	0.045	303	0.054	321	347	354	312	369
Major anion sum	meq/l	-	-	-	14	14	16	16	15	17	16	0.066	15	6.6	9.5	7.0	8.4	6.9	7.9	0.15	7.7	0.16	13	12	12	13	13	13	0.026	13	0.033	13	14	15	13	15
Major cation sum	meq/l	-	-	-	15	15	16	15	14	15	15	0.062	14	6.2	8.9	7.0	7.8	6.4	7.5	0.14	7.3	0.16	12	12	11	12	12	12	0.054	12	0.053	13	14	13	13	14
Bicarbonate Alkalinity, as $CaCO_3$	mg/l	-	-	-	251	222	267	243	300	258	258	0.11	237	159	200	163	191	158	178	0.1	174	0.11	237	240	239	244	244	240	0.013	241	0.013	252	262	273	261	233
Carbonate Alkalinity, as $CaCO_3$	mg/l	-	-	-	<1.0	<1.0	<1.0	8.0	<1.0	<1.0	2.4	1.3	<1.0	<1.0	<1.0	<1.0	1.4	8.8	1.1	0.2	2.6	1.3	<1.0	<1.0	<1.0	3.6	<1.0	1.7	0.86	1.5	0.76	<1.0	<1.0	<1.0	<1.0	<1.0
Hydroxide Alkalinity, as $CaCO_3$	mg/l	-	-	-	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1	0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1	0	<1	0	<1.0	<1.0	<1.0	<1.0	<1.0	<1	0	<1	0	<1.0	<1.0	<1.0	<1.0	<1.0
Nutrients and Biological Indicators																																				
Nitrate	mg-N/L	3.0	33	9.3 - 15[c]	**26**[Mn, E]	**27**[Mn, E]	**29**[Mn, E]	**29**[Mn, E]	**26**[Mn, E]	**32**[Mn, E]	**29**[Mn, E]	0.08	**27**[Mn, E]	**9.7**[Mn, E]	**17**[Mn, E]	**11**[Mn, E]	**16**[Mn, E]	**11**[Mn, E]	**13**[Mn, E]	0.25	**13**[Mn, E]	0.26	**23**[Mn, E]	**22**[Mn, E]	**20**[Mn, E]	**21**[Mn, E]	**23**[Mn, E]	**22**[Mn, E)]	0.053	**22**[Mn, E]	0.06	**23**[Mn, E]	**24**[Mn, E]	**24**[Mn, E]	**22**[Mn, E]	**24**[Mn, E]
Nitrite	mg-N/L	0.020 - 0.060[e]	0.060 - 0.18[e]	-	<0.0050	0.012	0.011	0.007	0.011	0.013	0.011	0.22	0.01	<0.0010	0.0048	0.0029	<0.0010	0.0022	0.0024	0.7	0.0024	0.66	0.0092	0.011	<0.0050	0.0053	0.006	0.0075	0.35	0.0072	0.35	<0.0050	<0.0050	0.011	0.0072	0.013
Total ammonia	mg-N/L	2.1	14	-	<0.0050	0.0069	<0.0050	0.011	0.0092	<0.0050	0.0073	0.34	0.0053	0.018	<0.0050	<0.0050	0.006	0.0064	0.0086	0.67	0.0082	0.71	0.052	0.045	0.0093	<0.0050	0.025	0.028	0.84	0.027	0.77	0.0073	<0.0050	<0.0050	0.011	0.026
Total Kjeldahl nitrogen	mg-N/L	-	-	-	<0.050	<0.050	<0.050	<0.050	<0.050	0.34	0.11	1.2	<0.050	0.89	<0.050	0.47	<0.050	<0.050	0.36	1.0	0.3	1.2	0.47	0.51	<0.050	0.31	0.29	0.33	0.54	0.33	0.56	<0.050	0.11	0.082	0.44	<0.050
Total phosphorus	mg-P/L	-	-	-	<0.0020	<0.0020	0.0031	0.0024	<0.0020	<0.0020	0.0023	0.21	0.0024	0.13	0.0083	0.017	0.023	0.011	0.044	1.1	0.037	1.3	<0.0020	0.016	0.033	0.0021	0.0026	0.013	1.0	0.011	1.2	0.0055	0.007	0.0047	<0.0020	<0.0020
Orthophosphate	mg-P/L	-	-	-	0.0016	<0.0010	0.0017	0.0011	<0.0010	0.0022	0.0014	0.38	<0.0010	<0.0010	0.0013	<0.0010	0.0033	<0.0010	0.0017	0.73	0.0015	0.66	<0.0010	<0.0010	<0.0010	0.0015	<0.0010	0.0011	0.24	0.0011	0.2	0.0017	0.0011	0.0016	0.0016	0.0015
Biochemical oxygen demand	mg/L	-	-	-	<2.0	<2.0	-	<2.0	<2.0	<2.0	2.0	0.45	<2.0	2.4	<2.0	<2.0	<2.0	<2.0	2.1	0.085	2.1	0.086	<2.0	<2.0	<2.0	<2.0	<2.0	<2	0	<2	0	-	-	-	<2.0	-
Total Metals											-	-																								
Aluminum	mg/L	-	-	-	0.0048	0.0066	<0.0030	0.012	0.019	0.017	0.011	0.58	0.063	0.6	0.059	0.26	0.12	0.084	0.26	0.85	0.22	1.0	0.004	0.057	0.075	0.0039	0.0042	0.035	0.99	0.029	1.2	0.01	0.029	0.015	<0.0030	0.0099
Antimony	mg/L	0.0090	-	-	<0.00010	<0.00010	<0.00010	0.0001	0.00016	0.00016	0.00012	0.27	0.00017	0.00016	0.00019	0.00016	0.00021	0.00018	0.00018	0.14	0.00018	0.12	0.00014	0.00012	0.00017	0.00018	0.00016	0.00015	0.18	0.00015	0.16	0.00016	0.00016	0.00015	0.00016	0.00017
Arsenic	mg/L	0.0050	0.0050	-	<0.00010	<0.00010	<0.00010	0.00011	0.00011	0.00017	0.00012	0.25	0.00013	0.00037	0.00018	0.00023	0.0002	0.00014	0.00025	0.31	0.00022	0.39	0.00012	0.00015	0.0002	0.0001	0.00019	0.00014	0.3	0.00015	0.28	<0.00010	0.00014	<0.00010	<0.00010	0.00013
Barium	mg/L	1.0	-	-	0.11	0.11	0.12	0.11	0.11	0.1	0.11	0.076	0.095	0.06	0.063	0.052	0.056	0.044	0.058	0.072	0.055	0.13	0.092	0.09	0.082	0.083	0.087	0.087	0.054	0.087	0.05	0.11	0.11	0.1	0.096	0.11
Beryllium	mg/L	0.00013	-	-	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.00002	0	<0.000020	0.000035	<0.000020	<0.000020	<0.000020	<0.000020	0.000024	0.28	0.000023	0.29	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.00002	0	<0.00002	0	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
Bismuth	mg/L	0.0005[f]	-	-	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0	<0.00005	0	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0	<0.00005	0	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Boron	mg/L	1.2	29[b]	-	0.012	0.012	0.011	0.014	0.012	0.013	0.012	0.092	0.011	<0.010	<0.010	<0.010	0.011	<0.010	0.01	0.053	0.01	0.044	0.014	0.013	0.014	0.015	0.016	0.014	0.06	0.014	0.079	0.013	0.013	0.013	0.012	0.013
Cadmium	mg/L	-	-	-	0.000039	0.000037	0.000046	0.000041	0.000049	0.000058	0.000046	0.17	0.000071	0.00016	0.000066	0.000078	0.000085	0.000053	0.000097	0.39	0.000088	0.48	0.000041	0.000065	0.000075	0.000044	0.000039	0.000056	0.27	0.000053	0.31	0.000049	0.000052	0.000045	0.000044	0.00004
Calcium	mg/L	-	-	-	169	180	167	179	163	169	172	0.044	156	74	97	75	98	75	86	0.15	84	0.15	140	135	123	132	144	133	0.047	135	0.06	154	154	158	155	154
Chromium	mg/L	0.0010[g]	-	-	0.0001	0.00015	0.00013	0.00016	0.00012	0.00012	0.00014	0.13	0.0002	**0.0011**[Mn]	0.00019	0.0005	0.00024	0.00024	0.00051	0.75	0.00045	0.84	0.00013	0.0002	0.00027	<0.00010	0.00014	0.00018	0.42	0.00017	0.4	0.00013	0.00019	0.00019	0.0001	0.00016
Cobalt	mg/L	0.0040	0.11	-	<0.00010	0.0001	0.0001	0.00013	0.00017	0.00012	0.00012	0.23	0.00016	0.00051	0.00012	0.00022	0.00018	0.00012	0.00026	0.6	0.00023	0.71	<0.00010	0.00012	0.00016	<0.00010	<0.00010	0.00012	0.22	0.00012	0.22	<0.00010	0.0001	<0.00010	<0.00010	<0.00010
Copper	mg/L	-	-	-	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	0	<0.00050	0.0011	<0.00050	0.00057	<0.00050	<0.00050	0.00066	0.37	0.00062	0.38	0.0017	<0.00050	<0.00050	<0.00050	<0.00050	0.00079	0.66	0.00073	0.71	<0.00050	0.00069	<0.00050	<0.00050	<0.00050
Iron	mg/L	0.65 - 2.54[f,h]	1.0	-	0.018	0.021	0.015	0.038	0.036	0.033	0.029	0.35	0.11	0.62	0.07	0.34	0.22	0.11	0.31	0.66	0.27	0.81	0.012	0.13	0.17	0.014	0.012	0.081	0.94	0.067	1.1	0.03	0.06	0.036	0.013	0.026
Lead	mg/L	0.017 - 0.020[c]	0.34 - 0.42[c]	-	<0.000050	0.000077	<0.000050	0.000062	<0.000050	<0.000050	0.000058	0.21	0.000063	0.00052	0.000072	0.00024	0.00015	0.0001	0.00025	0.71	0.00022	0.84	<0.000050	0.00011	0.00014	<0.000050	<0.000050	0.000088	0.48	0.00008	0.53	<0.000050	0.0001	<0.000050	<0.000050	<0.000050
Lithium	mg/L	0.1216[f]	-	-	0.036	0.038	0.04	0.038	0.047	0.048	0.042	0.12	0.045	0.018	0.033	0.023	0.042	0.026	0.029	0.36	0.028	0.32	0.043	0.043	0.043	0.049	0.046	0.045	0.074	0.045	0.06	0.045	0.049	0.05	0.047	0.051
Magnesium	mg/L	-	-	-	77	80	79	82	78	76	79	0.027	74	32	46	30	47	33	39	0.21	38	0.21	65	62	57	68	65	63	0.074	63	0.066	81	79	74	74	75
Manganese	mg/L	2.0 - 2.6[c]	3.4[c]	-	0.0061	0.0062	0.0052	0.0066	0.0081	0.0072	0.0067	0.16	0.01	0.044	0.0072	0.017	0.012	0.0082	0.02	0.72	0.018	0.85	0.005	0.015	0.012	0.0042	0.0039	0.0089	0.55	0.0079	0.62	0.0051	0.0077	0.006	0.0047	0.0056
Mercury	mg/L	0.000010	-	-	<0.00000050	<0.00000050	<0.00000050	<0.00000050	<0.00000050	<0.00000050	<0.0000005	0	<0.00000050	0.0000058	0.0000012	0.0000021	0.00000081	0.00000089	0.0000025	0.85	0.0000022	0.97	<0.00000050	0.0000016	0.0000015	<0.00000050	<0.00000050	0.000001	0.56	0.00000091	0.62	0.00000055	<0.00000050	<0.00000050	<0.00000050	<0.00000050
Molybdenum	mg/L	1.0	2.0	-	0.00071	0.00069	0.00067	0.00078	0.0012	0.0013	0.00093	0.33	0.0013	0.00097	0.0012	0.001	0.0015	0.0011	0.0012	0.23	0.0012	0.19	0.0012	0.00097	0.0013	0.0014	0.0014	0.0012	0.15	0.0013	0.14	0.0011	0.00097	0.0011	0.0012	0.0013
Nickel	mg/L	0.0053[i]	-	-	0.00075	0.00067	0.00055	0.0008	0.003	0.0023	0.0015	0.77	0.0034	0.0041	0.0025	0.0024	0.0035	0.002	0.0031	0.22	0.0029	0.29	0.0015	0.0018	0.0029	0.0022	0.0022	0.0021	0.25	0.0021	0.25	0.0017	0.0016	0.0017	0.0017	0.0023
Potassium	mg/L	-	-	-	1.7	1.9	1.9	2.0	2.2	2.1	2.0	0.076	2.1	1.4	1.6	1.3	1.8	1.3	1.5	0.15	1.5	0.15	2.0	2.1	2.1	2.2	2.1	2.1	0.028	2.1	0.023	2.2	2.2	2.2	2.1	2.2
Selenium	mg/L	0.0020	-	0.019	**0.11**[Mn, E]	**0.12**[Mn, E]	**0.12**[Mn, E]	**0.11**[Mn, E]	**0.11**[Mn, E]	**0.11**[Mn, E]	**0.11**[Mn, E]	0.048	**0.11**[Mn, E]	**0.036**[Mn, E]	**0.063**[Mn, E]	**0.043**[Mn, E]	**0.061**[Mn, E]	**0.038**[Mn, E]	**0.051**[Mn, E]	0.24	**0.048**[Mn, E]	0.27	**0.092**[Mn, E]	**0.085**[Mn, E]	**0.081**[Mn, E]	**0.084**[Mn, E]	**0.091**[Mn, E]	**0.086**[Mn, E]	0.048	**0.087**[Mn, E]	0.055	**0.10**[Mn, E]	**0.10**[Mn, E]	**0.10**[Mn, E]	**0.096**[Mn, E]	**0.094**[Mn, E]
Silicon	mg/L	-	-	-	2.4	2.5	2.4	2.3	2.5	2.3	2.4	0.039	2.3	3.0	1.9	2.1	2.1	1.7	2.3	0.18	2.2	0.23	2.2	2.4	2.4	2.4	2.1	2.3	0.042	2.3	0.058	2.5	2.6	2.4	2.5	2.3
Silver	mg/L	0.0015[c]	0.0030[c]	-	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	0	<0.000010	0.000013	<0.000010	<0.000010	<0.000010	<0.000010	0.000011	0.12	0.000011	0.13	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	0	<0.00001	0	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Sodium	mg/L	-	-	-	2.7	2.7	3.1	3.3	3.3	3.3	3.1	0.081	3.0	1.3	1.9	1.4	2.2	1.5	1.7	0.26	1.6	0.23	2.7	2.6	2.4	2.8	2.7	2.6	0.052	2.7	0.05	3.4	3.4	3.2	3.3	3.0
Strontium	mg/L	-	-	-	0.21	0.21	0.22	0.21	0.2	0.21	0.21	0.037	0.2	0.1	0.13	0.1	0.12	0.1	0.11	0.1	0.11	0.12	0.17	0.16	0.16	0.18	0.19	0.17	0.047	0.17	0.078	0.19	0.2	0.2	0.2	0.21
Sulphur	mg/L	-	-	-	140	149	146	152	144	134	145	0.047	138	49	74	47	67	47	60	0.2	57	0.23	112	104	104	115	112	109	0.052	109	0.046	132	132	135	125	126
Thallium	mg/L	0.00080	-	-	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	0	<0.000010	0.000021	<0.000010	0.000012	<0.000010	<0.000010	0.000013	0.36	0.000013	0.38	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	0	<0.00001	0	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Tin	mg/L	0.3[f]	-	-	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.0001	0	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.0001	0	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Titanium	mg/L	0.85[f]	-	-	<0.00030	<0.00030	<0.00030	<0.00030	0.00051	<0.00030	0.00034	0.27	0.0017	0.014	<0.0012	<0.0045	0.0011	0.0016	0.0051	1.1	0.0044	1.2	<0.00030	0.00079	<0.0015	<0.00030	<0.00030	0.00072	0.73	0.00064	0.83	<0.00030	0.00036	<0.00030	<0.00030	<0.00030
Uranium	mg/L	0.0085	0.033[b]	-	0.0039	0.0039	0.004	0.0047	0.004	0.0044	0.0042	0.081	0.0042	0.0017	0.0029	0.002	0.0027	0.002	0.0023	0.21	0.0023	0.22	0.0036	0.0033	0.0036	0.0039	0.0041	0.0036	0.073	0.0037	0.085	0.0042	0.0042	0.0041	0.004	0.0043
Vanadium	mg/L	0.12[f]	-	-	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00069	0.00054	0.16	<0.00050	0.0024	0.00054	0.0012	0.00063	0.00055	0.0012	0.66	0.0011	0.76	<0.00050	<0.00050	0.00063	<0.00050	<0.00050	0.00053	0.11	0.00053	0.11	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Zinc	mg/L	0.17 - 0.19	0.20 - 0.34	-	<0.0030	0.0041	<0.0030	<0.0030	<0.0030	<0.0030	0.0032	0.15	<0.0030	0.0095	0.0039	0.0049	0.0045	<0.0030	0.0057	0.4	0.0052	0.49	<0.0030	0.004	0.0035	<0.0030	<0.0030	0.0034	0.13	0.0033	0.14	0.0083	0.004	<0.0030	<0.0030	<0.0030
Dissolved Metals																																				
Aluminum	mg/L	0.050[h]	0.10[h]	-	0.0014	<0.0010	<0.0010	<0.0010	0.0014	0.0014	0.0012	0.19	0.0012	0.0036	0.0012	0.0024	0.004	0.0019	0.0028	0.44	0.0026	0.45	<0.0010	0.001	<0.0010	<0.0010	<0.0010	0.001	0	0.001	0	0.0011	<0.0010	0.004	<0.0010	<0.0010
Antimony	mg/L	-	-	-	<0.00010	<0.00010	<0.00010	<0.00010	0.00015	0.00015	0.00012	0.23	0.00016	0.00014	0.00018	0.00015	0.00021	0.00014	0.00017	0.19	0.00016	0.19	0.00012	0.00011	0.00015	0.00018	0.00015	0.00014	0.23	0.00014	0.2	0.00012	0.00012	0.00014	0.00015	0.00017
Arsenic	mg/L	-	-	-	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.00011	0.0001	0.044	<0.00010	0.00013	0.00012	0.00011	<0.00010	0.00011	0.00012	0.11	0.00011	0.1	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.0001	0	<0.00010	<0.00010	<0.00010	<0.00010	0.0001
Barium	mg/L	-	-	-	0.11	0.11	0.11	0.098	0.1	0.098	0.1	0.066	0.099	0.05	0.064	0.048	0.054	0.047	0.054	0.11	0.052	0.13	0.095	0.085	0.08	0.087	0.089	0.087	0.062	0.087	0.064	0.1	0.096	0.1	0.096	0.091
Beryllium	mg/L	-	-	-	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.00002	0	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.00002	0	<0.00002	0	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.00002	0	<0.00002	0	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
Bismuth	mg/L	-	-	-	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0	<0.00005	0	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0	<0.00005	0	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Boron	mg/L	-	-	-	0.01	0.011	0.012	0.011	0.012	0.012	0.012	0.047	0.012	<0.010	<0.010	<0.010	0.011	<0.010	0.01	0.053	0.01	0.044	0.014	0.013	0.012	0.014	0.014	0.013	0.068	0.013	0.067	0.013	0.012	0.011	0.013	0.012
Cadmium	mg/L	0.00046[c]	0.0019 - 0.0028[c]	0.00032[c]	0.000038	0.000039	0.000037	0.000038	0.00005	0.000052	0.000043	0.17	0.000056	0.000037	0.000052	0.00003	0.000062	0.000032	0.000045	0.33	0.000042	0.33	0.000044	0.000048	0.000043	0.000041	0.00004	0.000044	0.066	0.000043	0.076	0.000041	0.000033	0.000045	0.000045	0.000034
Chromium	mg/L	-	-	-	0.00012	0.00012	<0.00010	0.00011	0.00012	<0.00010	0.00011	0.091	0.00019	0.00011	<0.00010	<0.00010	<0.00010	<0.00010	0.0001	0.044	0.0001	0.044	<0.00010	0.00011	<0.00010	<0.00010	0.00011	0.0001	0.044	0.0001	0.053	0.00012	0.00011	0.00016	0.0001	0.00012
Cobalt	mg/L	-	-	-	<0.00010	<0.00010	<0.00010	0.00011	0.00015	0.00011	0.00011	0.18	0.00011	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.0001	0	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.0001	0	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Copper	mg/L	0.0004 - 0.0026[j]	0.002 - 0.0149[j]	-	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.0002	0	<0.00020	0.00032	0.00022	0.00021	0.00042	0.00026	0.00029	0.35	0.00029	0.3	0.0018	<0.00020	<0.00020	<0.00020	<0.00020	0.00059	1.2	0.00051	1.4	<0.00020	<0.00020	<0.00020	<0.00020	0.00022
Iron	mg/L	-	0.35	-	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.01	0	0.012	<0.010	<0.010	<0.010	<0.010	<0.010	<0.01	0	<0.01	0	<0.010	<0.010	<0.010	<0.010	<0.010	<0.01	0	<0.01	0	<0.010	<0.010	0.062	<0.010	<0.010
Lead	mg/L	-	-	-	0.000068	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0	<0.00005	0	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0	<0.00005	0	<0.000050	<0.000050	0.00005	<0.000050	<0.000050
Lithium	mg/L	-	-	-	0.036	0.041	0.042	0.043	0.043	0.047	0.043	0.055	0.046	0.017	0.032	0.024	0.037	0.025	0.028	0.32	0.027	0.29	0.044	0.04	0.04	0.047	0.046	0.043	0.081	0.043	0.073	0.047	0.044	0.044	0.048	0.048
Manganese	mg/L	-	-	-	0.006	0.0056	0.0045	0.0061	0.0074	0.0068	0.0061	0.18	0.0075	0.0054	0.0026	0.0038	0.0026	0.0019	0.0036	0.34	0.0033	0.42	0.0045	0.0083	0.0046	0.0044	0.0035	0.0055	0.31	0.0051	0.36	0.0046	0.0049	0.0058	0.0049	0.0049
Mercury	mg/L	-	-	-	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.000005	0	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.000005	0	<0.000005	0	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.000005	0	<0.000005	0	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Molybdenum	mg/L	-	-	-	0.00066	0.00072	0.00065	0.00073	0.0012	0.0011	0.00088	0.29	0.0013	0.0011	0.0012	0.001	0.0015	0.0011	0.0012	0.22	0.0012	0.18	0.0012	0.0010	0.0012	0.0014	0.0012	0.0012	0.14	0.0012	0.12	0.0010	0.00089	0.0011	0.0012	0.0013
Nickel	mg/L	-	-	-	0.00068	0.00053	0.00064	0.00079	0.0026	0.0026	0.0014	0.75	0.0033	0.0018	0.0024	0.0017	0.003	0.0015	0.0022	0.29	0.0021	0.3	0.0014	0.0014	0.0022	0.0021	0.0021	0.0018	0.22	0.0018	0.21	0.0015	0.0013	0.0016	0.0016	0.0022
Selenium	mg/L	-	-	-	0.11	0.14	0.13	0.15	0.11	0.13	0.13	0.099	0.12	0.036	0.069	0.042	0.061	0.039	0.052	0.27	0.049	0.29	0.092	0.094	0.083	0.093	0.095	0.09	0.046	0.091	0.049	0.11	0.1	0.1	0.098	0.098
Silicon	mg/L	-	-	-	2.4	2.3	2.3	2.3	2.4	2.3	2.3	0.0088	2.0	1.7	1.9	1.6	1.9	1.6	1.8	0.073	1.7	0.083	2.1	2.2	2.1	2.3	2.1	2.2	0.05	2.2	0.045	2.4	2.4	2.2	2.2	2.3
Silver	mg/L	-	-	-	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	0	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	0	<0.00001	0	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	0	<0.00001	0	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Strontium	mg/L	2.5[f]	-	-	0.2	0.22	0.21	0.2	0.19	0.2	0.21	0.057	0.19	0.1	0.13	0.11	0.11	0.095	0.11	0.077	0.11	0.11	0.17	0.16	0.15	0.17	0.17	0.17	0.054	0.17	0.052	0.19	0.18	0.18	0.19	0.2
Sulphur	mg/L	-	-	-	130	141	140	145	140	146	142	0.02	135	45	68	48	58	42	55	0.16	52	0.2	102	98	92	111	103	101	0.085	101	0.071	128	119	118	111	127
Thallium	mg/L	-	-	-	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	0	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	0	<0.00001	0	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	0	<0.00001	0	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Tin	mg/L	-	-	-	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.0001	0	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.0001	0	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Titanium	mg/L	-	-	-	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.0003	0	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.0003	0	<0.0003	0	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.0003	0	<0.0003	0	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
Uranium	mg/L	-	-	-	0.0037	0.0038	0.004	0.004	0.0041	0.004	0.004	0.028	0.0038	0.0017	0.0028	0.0022	0.0027	0.002	0.0023	0.2	0.0023	0.21	0.0037	0.0035	0.0033	0.0037	0.0037	0.0035	0.06	0.0036	0.056	0.0039	0.0036	0.0036	0.0038	0.004
Vanadium	mg/L	-	-	-	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	0	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	0	<0.0005	0	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	0	<0.0005	0	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Zinc	mg/L	-	-	-	<0.0010	0.0014	<0.0010	<0.0010	0.0019	<0.0010	0.0013	0.32	0.0022	0.0031	0.0031	0.0024	0.0065	0.0016	0.0038	0.53	0.0033	0.56	0.0024	0.0016	0.0019	0.0015	0.0015	0.0019	0.21	0.0018	0.22	0.0026	0.0019	0.0015	0.0012	0.0018

(a) = guideline is a minimum value, unless the background concentration or value is lower.
(b) = guideline is adopted from CCME Canadian Environmental Quality Guidelines (CCME, 1999).
(c) = guideline is hardness dependent. The guideline range shown is based on the hardness range observed in the dataset (307 to 805 mg/L). The guideline is calculated based on the individual hardness value for each sample.
(d) = for some samples, water hardness was greater than 250 mg/L. At this hardness, no BC ENV water quality guideline has been established for sulphate; however, the observed data were screened against the guideline for very hard water (i.e., 429 mg/L) for comparative purposes.
(e) = guideline is chloride dependent. The guideline range shown is based on the chloride concentration range observed in the dataset (0.6300 to 5.3700 mg/L). The guideline is calculated based on the individual chloride concentration in each sample.
(f) = guideline is adopted from the ECCC PNECs (ECCC, 2018) or draft FEQGs (ECCC, 2017).
(g) = guideline is for chromium VI.
(h) = guideline is pH dependent. The guideline range shown is based on the pH range observed in the dataset (7.9 to 8.4). The guideline is calculated based on the individual pH for each sample.
(i) = guideline is a level 1 interim screening value.
(j) = dissolved copper guideline was calculated using the simplified Biotic Ligand Midel (BC ENV, 2019). Where values were missing, the temporally nearest value from the same location was taken.
(Mn) = concentration is higher than the 30-day mean BC ENV guideline or outside the recommended pH, DO or total alkalinity range.
(Mx) = concentration is higher than the maximum BC ENV guideline or outside the recommended pH, DO or total alkalinity range.
(E) = concentration is higher than the EVWQP benchmarks guideline.
Bolded concentrations are higher than water quality guidelines.
Shaded concentrations are higher than the EVWQP benchmark (e.g., for nitrate, total selenium, dissolved cadmium or sulphate).
Water quality data and guidelines shown in this table were rounded to reflect laboratory or field instrument precision after comparisons to guidelines. Therefore, values slightly above guidelines may be displayed as being equal to the guidelines and identified as exceedances. Concentrations equal to the guideline values were not identified as exceedances.
Concentrations were screened against available Working and Approved British Columbia Ministry of Environment and Climate Change Strategy (BC ENV) Water Quality Guidelines for the Protection of Aquatic Life; Accessed January 2020 from: https://www2.gov.bc.ca/gov/content/environment/air-land-water/water/water-quality/water-quality-guidelines.
\- = no guideline or no data
BC ENV = British Columbia Ministry of Environment & Climate Change Strategy; EVWQP = Elk Valley Water Quality Plan guidelines; *C. dubia = Ceriodaphnia dubia* ; *P. subcapitata = Pseudokirchneriella subcapitata* ; *H. azteca = Hyallela azteca* ; *P. promelas = Pimephales promelas* ; *O. mykiss = Oncorhynchus mykiss* ; CV = coefficient of variation; ∑ = sum of; WQGs = Water Quality Guidelines; CaCO3 = calcium carbonate; mg/L = milligrams per litre; µS/cm = microsiemens per centimeter; NTU = nephelometric turbidity units; meq/L = milliequivalents per litre; mg-N/L = milligrams of Nitrogen per litre; mg=P/L = milligrams of Phosphorus per litre.
BC ENV (B.C. Ministry of Climate Chande Strategy). 2019. Copper Water Quality guideline for the Protection of Aquatic Life-Technical Report. Water Quality Guideline Series, WQG-03-1. Prov. B.C., Victoria B.C.

Parameter	Unit	Guidelines for the protection of:			Oct 12, 19, 26, Nov 2 *H. azteca*		Oct 12, 19, 26, Nov 2, 9 *O. mykiss*	
		Aquatic Life		EVWQP Benchmarks				
		30-day mean	Maximum		Mean	CV	Mean	CV
Field Measured								
pH	-	6.5 - 9.0	6.5 - 9.0	-	8.1	-	8.1	-
Conductivity	µS/cm	-	-	-	-	-	-	-
Specific conductivity	µS/cm at 25 C	-	-	-	1228	-	1228	-
Temperature	°C	-	-	-	4.7	-	4.7	-
Dissolved oxygen	mg/L	11	9.0	-	**9.6**[(Mn)]	-	**9.6**[(Mn)]	-
Turbidity	NTU	-	-	-	0.34	-	0.34	-
Dissolved oxygen	%	-	-	-	75	-	75	-
Oxidation-reduction potential field	mv	-	-	-	163	-	163	-
Conventional Parameters								
pH	-	6.5 - 9.0	6.5 - 9.0	-	8.2	0.0067	8.2	0.0067
Hardness, as $CaCO_3$	mg/L	-	-	-	666	0.016	668	0.017
Total alkalinity, as $CaCO_3$	mg/L	20[(d)]	-	-	262	0.028	267	0.048
Total dissolved solids	mg/L	-	-	-	868	0.017	877	0.028
Total suspended solids	mg/L	-	-	-	1.3	0.41	1.3	0.46
Total organic carbon	mg/L	-	-	-	1.3	0.26	0.91	0.51
Dissolved organic carbon	mg/L	-	-	-	1.2	0.42	0.88	0.69
Colour	TCU	-	-	-	5.0	-	5.0	-
Turbidity	NTU	-	-	-	0.22	0.45	0.2	0.55
Total acidity	mg/L	-	-	-	0.5	1.4	0	-
Cation - anion balance	%	-	-	-	1.7	1.2	2.5	1.1
Ion balance	%	-	-	-	97	0.046	96	0.056
Conductivity	µS/cm	-	-	-	1153	0.033	1162	0.036
Oxidation-reduction potential	mv	-	-	-	446	0.03	445	0.028
Major Ions								
Bicarbonate	mg/L	-	-	-	320	0.029	313	0.058
Bromide	mg/L	-	-	-	<0.25	0	<0.25	0
Calcium	mg/L	-	-	-	152	0.041	152	0.041
Carbonate, as $CaCO_3$	mg/L	-	-	-	<1	0	<1	0
Chloride	mg/L	150	600	-	1.9	0.3	2.6	0.62
Fluoride	mg/L	0.12[(h)]	1.8 - 2.2[(h)]	-	0.08	0.48	0.09	0.4
hydroxide	mg/L	-	-	-	<1	0	<1	0
Magnesium	mg/L	-	-	-	69	0.024	70	0.031
Potassium	mg/L	-	-	-	2.1	0.046	2.1	0.048
Sodium	mg/L	-	-	-	3.0	0.04	3.0	0.04
Sulphate	mg/L	429[(d,d)]	-	481	334	0.06	341	0.069
Major anion sum	meq/l	-	-	-	14	0.046	14	0.06
Major cation sum	meq/l	-	-	-	13	0.014	14	0.016
Bicarbonate Alkalinity, as $CaCO_3$	mg/l	-	-	-	262	0.028	256	0.058
Carbonate Alkalinity, as $CaCO_3$	mg/l	-	-	-	<1	0	<1	0
Hydroxide Alkalinity, as $CaCO_3$	mg/l	-	-	-	<1	0	<1	0
Nutrients and Biological Indicators								
Nitrate	mg-N/L	3.0	33	9.3 - 15[(h,i)]	**23**[(Mn, E)]	0.043	**23**[(Mn, E)]	0.038
Nitrite	mg-N/L	0.020 - 0.060[(k)]	0.060 - 0.18[(k)]	-	0.0021	1.2	0.0043	0.86
Total ammonia	mg-N/L	2.1	14	-	0.0021	1.5	0.0069	1.3
Total Kjeldahl nitrogen	mg-N/L	-	-	-	0.15	1.4	0.11	1.6
Total phosphorus	mg-P/L	-	-	-	0.0038	0.58	0.0026	0.84
Orthophosphate	mg-P/L	-	-	-	0.0015	0.16	0.0015	0.16
Biochemical oxygen demand	mg/L	-	-	-	2.0	-	2.0	-
Total Metals								
Aluminum	mg/L	-	-	-	0.013	0.83	0.012	0.79
Antimony	mg/L	0.0090	-	-	0.00016	0.028	0.00016	0.044
Arsenic	mg/L	0.0050	0.0050	-	0.00004	0.45	0.000406	3.2
Barium	mg/L	1.0	-	-	0.1	0.06	0.1	0.052
Beryllium	mg/L	0.00013	-	-	<0.00002	0	<0.00002	0
Bismuth	mg/L	0.0005[(f)]	-	-	<0.00005	0	<0.00005	0
Boron	mg/L	1.2	29[(k)]	-	0.013	0.043	0.013	0.035
Cadmium	mg/L	-	-	-	0.000047	0.073	0.000046	0.098
Calcium	mg/L	-	-	-	155	0.011	155	0.011
Chromium	mg/L	0.0010[(g)]	-	-	0.00015	0.3	0.00015	0.25
Cobalt	mg/L	0.0040	0.11	-	0.00005	0	0.00006	0
Copper	mg/L	-	-	-	0.0002	0.42	0.00026	0.32
Iron	mg/L	0.65 - 2.54[(h)]	1.0	-	0.035	0.56	0.033	0.52
Lead	mg/L	0.017 - 0.020[(h)]	0.34 - 0.42[(h)]	-	0.000012	2.1	0.000019	1.3
Lithium	mg/L	0.1216[(f)]	-	-	0.048	0.034	0.048	0.043
Magnesium	mg/L	-	-	-	77	0.04	76	0.04
Manganese	mg/L	2.0 - 2.6[(h)]	3.4[(h)]	-	0.0059	0.22	0.0058	0.2
Mercury	mg/L	0.000010	-	-	0.00000024	0.094	0.00000029	0.077
Molybdenum	mg/L	1.0	2.0	-	0.0011	0.098	0.0011	0.12
Nickel	mg/L	0.0053[(f)]	-	-	0.0017	0.035	0.0018	0.17
Potassium	mg/L	-	-	-	2.2	0.026	2.2	0.022
Selenium	mg/L	0.0020	-	0.019	**0.098**[(Mn, E)]	0.022	**0.098**[(Mn, E)]	0.029
Silicon	mg/L	-	-	-	2.5	0.028	2.5	0.042
Silver	mg/L	0.0015[(c)]	0.0030[(c)]	-	<0.00001	0	<0.00001	0
Sodium	mg/L	-	-	-	3.3	0.024	3.3	0.046
Strontium	mg/L	-	-	-	0.2	0.028	0.2	0.031
Sulphur	mg/L	-	-	-	131	0.035	130	0.033
Thallium	mg/L	0.00080	-	-	<0.00001	0	<0.00001	0
Tin	mg/L	0.3[(f)]	-	-	<0.0001	0	<0.0001	0
Titanium	mg/L	0.85[(f)]	-	-	0.00014	0.2	0.00017	0.16
Uranium	mg/L	0.0085	0.033[(k)]	-	0.0041	0.023	0.0042	0.031
Vanadium	mg/L	0.12[(f)]	-	-	<0.0005	0	<0.0005	0
Zinc	mg/L	0.17 - 0.19	0.20 - 0.34	-	0.0016	1.5	0.00066	3.5
Dissolved Metals								
Aluminum	mg/L	0.050[(k)]	0.10[(k)]	-	0.00078	1.7	0.00042	3.2
Antimony	mg/L	-	-	-	0.00013	0.11	0.00014	0.15
Arsenic	mg/L	-	-	-	<0.0001	0	0.00006	0
Barium	mg/L	-	-	-	0.099	0.039	0.098	0.053
Beryllium	mg/L	-	-	-	<0.00002	0	<0.00002	0
Bismuth	mg/L	-	-	-	<0.00005	0	<0.00005	0
Boron	mg/L	-	-	-	0.012	0.073	0.012	0.069
Cadmium	mg/L	0.00046[(c)]	0.0019 - 0.0028[(c)]	0.00032[(c)]	0.000041	0.13	0.000039	0.15
Chromium	mg/L	-	-	-	0.00012	0.2	0.00012	0.19
Cobalt	mg/L	-	-	-	<0.0001	0	<0.0001	0
Copper	mg/L	0.0004 - 0.0026[(c)]	0.002 - 0.0149[(c)]	-	<0.0002	0	0.00012	0.077
Iron	mg/L	-	0.35	-	0.008	2.9	0.0044	5.3
Lead	mg/L	-	-	-	0.000025	0	0.00003	0
Lithium	mg/L	-	-	-	0.046	0.044	0.046	0.043
Manganese	mg/L	-	-	-	0.005	0.086	0.005	0.087
Mercury	mg/L	-	-	-	<0.000005	0	<0.000005	0
Molybdenum	mg/L	-	-	-	0.0011	0.14	0.0011	0.14
Nickel	mg/L	-	-	-	0.0015	0.1	0.0016	0.21
Selenium	mg/L	-	-	-	0.1	0.042	0.1	0.042
Silicon	mg/L	-	-	-	2.3	0.042	2.3	0.039
Silver	mg/L	-	-	-	<0.00001	0	<0.00001	0
Strontium	mg/L	2.5[(f)]	-	-	0.18	0.0077	0.19	0.046
Sulphur	mg/L	-	-	-	119	0.059	121	0.058
Thallium	mg/L	-	-	-	<0.00001	0	<0.00001	0
Tin	mg/L	-	-	-	<0.0001	0	<0.0001	0
Titanium	mg/L	-	-	-	<0.0003	0	<0.0003	0
Uranium	mg/L	-	-	-	0.0037	0.041	0.0038	0.049
Vanadium	mg/L	-	-	-	<0.0005	0	<0.0005	0
Zinc	mg/L	-	-	-	0.0018	0.33	0.0018	0.29

(a) = guideline is a minimum value, unless the background concentration or value is lower.
(b) = guideline is adopted from CCME Canadian Environmental Quality Guidelines (CCME, 1999).
(c) = guideline is hardness dependent. The guideline range shown is based on the hardness range observed in the dataset (307 to 805 mg/L). The guideline is calculated based on the individual hardness value for each sample.
(d) = for some samples, water hardness was greater than 250 mg/L. At this hardness, no BC ENV water quality guideline has been established for sulphate; however, the observed data were screened against the guideline for very hard water (i.e., 429 mg/L) for comparative purposes.
(e) = guideline is chloride dependent. The guideline range shown is based on the chloride concentration range observed in the dataset (0.6300 to 5.3700 mg/L). The guideline is calculated based on the individual chloride concentration in each sample.
(f) = guideline is adopted from the ECCC PNECs (ECCC, 2018) or draft FEQGs (ECCC, 2017).
(g) = guideline is for chromium VI.
(h) = guideline is pH dependent. The guideline range shown is based on the pH range observed in the dataset (7.9 to 8.4). The guideline is calculated based on the individual pH for each sample.
(i) = guideline is a level 1 interim screening value.
(j) = dissolved copper guideline was calculated using the simplified Biotic Ligand Midel (BC ENV, 2019). Where values were missing, the temporally nearest value from the same location was taken.
(Mn) = concentration is higher than the 30-day mean BC ENV guideline or outside the recommended pH, DO or total alkalinity range.
(Mx) = concentration is higher than the maximum BC ENV guideline or outside the recommended pH, DO or total alkalinity range.
(E) = concentration is higher than the EVWQP benchmarks guideline.
Bolded concentrations are higher than water quality guidelines.
Shaded concentrations are higher than the EVWQP benchmark (e.g., for nitrate, total selenium, dissolved cadmium or sulphate).
Water quality data and guidelines shown in this table were rounded to reflect laboratory or field instrument precision after comparisons to guidelines. Therefore, values slightly above guidelines may be displayed as being equal to the guidelines and identified as exceedances. Concentrations equal to the guideline values were not identified as exceedances.
Concentrations were screened against available Working and Approved British Columbia Ministry of Environment and Climate Change Strategy (BC ENV) Water Quality Guidelines for the Protection of Aquatic Life: Accessed January 2020 from: https://www2.gov.bc.ca/gov/content/environment/air-land-water/water/water-quality/water-quality-guidelines.
- = no guideline or no data
BC ENV = British Columbia Ministry of Environment & Climate Change Strategy; EVWQP = Elk Valley Water Quality Plan guidelines; *C. dubia* = *Ceriodaphnia dubia* ; *P. subcapitata* = *Pseudokirchneriella subcapitata* ; *H. azteca* = *Hyallela azteca* ; *P. promelas* = *Pimephales promelas* ; *O. mykiss* = *Oncorhynchus mykiss* ; CV = coefficient of variation; ∑ = sum of; WQGs = Water Quality Guidelines; CaCO3 = calcium carbonate; mg/L = milligrams per litre; µS/cm = microsiemens per centimeter; NTU = nephelometric turbidity units; meq/L = milliequivalents per litre; mg-N/L = milligrams of Nitrogen per litre; mg=P/L = milligrams of Phosphorus per litre.
BC ENV (B.C. Ministry of Climate Chande Strategy). 2019. Copper Water Quality guideline for the Protection of Aquatic Life-Technical Report. Water Quality Guideline Series, WQG-03-1. Prov. B.C., Victoria B.C.

Parameter	Unit	Guidelines for the protection of: Aquatic Life		EVWQP Benchmarks	Q1 GH_FR1								
		30-day mean	Maximum		*P. subcapitata*	2-Mar-21	9-Mar-21	16-Mar-21	23-Mar-21	30-Mar-21	Mar 2, 9, 16, 23, 30 *P. promelas*		*C. dubia*
					23-Feb-21						Mean	CV	13-Apr-21
Field Measured													
pH	-	6.5 - 9.0	6.5 - 9.0	-	8.7	8.2	8.6	8.6	8.3	8.1	8.4	0.028	8.3
Specific conductivity	µS/cm at 25 C	-	-	-	843	836	934	1011	1005	962	950	0.075	938
Temperature	°C	-	-	-	0.2	0.1	0	0.6	0.5	1.8	0.6	1.2	1.8
Dissolved oxygen	mg/L	11	9.0	-	12	11	12	11	12	12	12	0.036	13
Turbidity	NTU	-	-	-	0.6	0.13	1.8	1.2	0.32	2.3	1.2	0.82	0.4
Dissolved oxygen	%	-	-	-	81	77	82	79	83	87	81	0.049	95
Oxidation-reduction potential field	mv	-	-	-	96	247	106	82	75	95	121	0.59	36
Conventional Parameters													
pH	-	6.5 - 9.0	6.5 - 9.0	-	7.9	8.0	8.1	8.2	8.3	8.2	8.2	0.014	8.3
Hardness, as $CaCO_3$	mg/L	-	-	-	524	480	595	628	534	542	556	0.1	550
Total alkalinity, as $CaCO_3$	mg/L	20[a]	-	-	214	204	215	227	217	223	217	0.04	221
Total dissolved solids	mg/L	-	-	-	552	575	660	668	740	820	693	0.13	716
Total suspended solids	mg/L	-	-	-	20	3.8	2.6	7.3	1.9	1.9	3.5	0.65	<1.0
Total organic carbon	mg/L	-	-	-	0.66	<0.50	1.2	2.2	1.6	1.0	1.3	0.5	1.1
Dissolved organic carbon	mg/L	-	-	-	<0.50	<0.50	0.68	1.2	1.2	1.1	0.93	0.35	0.92
Colour	TCU	-	-	-	-	-	-	-	-	-	-	-	-
Turbidity	NTU	-	-	-	3.7	1.0	0.92	2.3	0.71	0.91	1.2	0.55	0.48
Total acidity	mg/L	-	-	-	2.6	3.0	2.8	<2.0	<2.0	<2.0	2.4	0.21	<2.0
Cation - anion balance	%	-	-	-	0.95	4.8	4.4	0.78	1.8	3.5	3.0	0.56	3.0
Ion balance	%	-	-	-	102	91	109	98	96	93	98	0.072	94
Conductivity	µS/cm	-	-	-	828	822	928	985	946	955	927	0.067	967
Oxidation-reduction potential	mv	-	-	-	311	324	368	364	330	382	354	0.071	433
Major Ions													
Bicarbonate	mg/L	-	-	-	-	-	-	-	-	-	-	-	-
Bromide	mg/L	-	-	-	<0.050	<0.25	<0.050	<0.25	<0.050	<0.25	0.17	0.64	<0.25
Calcium	mg/L	-	-	-	119	113	142	142	121	124	128	0.1	127
Carbonate, as $CaCO_3$	mg/L	-	-	-	-	-	-	-	-	-	-	-	-
Chloride	mg/L	150	600	-	2.0	3.0	2.8	3.3	3.0	3.3	3.1	0.067	3.0
Fluoride	mg/L	0.12[b]	1.7 - 2.1[c]	-	**0.12**[Mn]	**0.18**[Mn]	**0.14**[Mn]	**0.18**[Mn]	0.095	**0.16**[Mn]	**0.15**[Mn]	0.23	0.12
Hydroxide	mg/L	-	-	-	-	-	-	-	-	-	-	-	-
Magnesium	mg/L	-	-	-	55	48	58	66	56	56	57	0.11	57
Potassium	mg/L	-	-	-	1.3	1.2	1.4	1.9	1.6	1.5	1.5	0.18	1.5
Sodium	mg/L	-	-	-	2.6	2.6	2.4	3.5	2.8	2.8	2.8	0.14	3.0
Sulphate	mg/L	429[c,d]	-	481	245	257	268	340	272	289	285	0.11	298
Major anion sum	meq/l	-	-	-	10	11	11	13	11	12	12	0.076	12
Major cation sum	meq/l	-	-	-	11	9.7	12	13	11	11	11	0.1	11
Bicarbonate Alkalinity, as $CaCO_3$	mg/l	-	-	-	214	204	215	227	214	223	217	0.041	221
Carbonate Alkalinity, as $CaCO_3$	mg/l	-	-	-	<1.0	<1.0	<1.0	<1.0	3.4	<1.0	1.5	0.73	<1.0
Hydroxide Alkalinity, as $CaCO_3$	mg/l	-	-	-	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	0	<1.0
Nutrients and Biological Indicators													
Nitrate	mg-N/L	3.0	33	7.7 - 15[c]	**14**[Mn]	**17**[Mn, E]	**15**[Mn]	**17**[Mn, E]	**16**[Mn, E]	**17**[Mn, E]	**16**[Mn, E]	0.055	**16**[Mn, E]
Nitrite	mg-N/L	0.020 - 0.040[e]	0.060 - 0.12[e]	-	0.0025	0.0077	0.007	0.0077	0.0083	0.0095	0.008	0.12	0.0067
Total ammonia	mg-N/L	2.1	14	-	0.025	0.0088	0.012	0.023	0.15	0.011	0.04	1.5	<0.0050
Total Kjeldahl nitrogen	mg-N/L	-	-	-	1.5	<0.050	<0.050	0.36	0.35	<0.050	0.17	0.97	<0.050
Total phosphorus	mg-P/L	-	-	-	0.11	<0.0020	0.0045	<0.0020	<0.0020	<0.0020	0.0025	0.45	0.003
Orthophosphate	mg-P/L	-	-	-	0.0016	<0.0010	0.0026	<0.0010	0.0019	0.0013	0.0016	0.44	0.0017
Biochemical oxygen demand	mg/L	-	-	-	-	-	-	-	-	-	-	-	-
Total Metals													
Aluminum	mg/L	-	-	-	0.88	0.0069	0.028	0.027	0.018	0.019	0.02	0.43	0.0084
Antimony	mg/L	0.0090	-	-	0.0002	0.0001	0.00016	0.00012	0.00015	0.00012	0.00013	0.19	0.00013
Arsenic	mg/L	0.0050	0.0050	-	0.00084	<0.00010	0.00012	0.00011	0.00011	0.00013	0.00011	0.1	0.0001
Barium	mg/L	1.0	-	-	0.17	0.12	0.13	0.11	0.13	0.13	0.12	0.052	0.12
Beryllium	mg/L	0.00013	-	-	0.000095	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	0.00002	0	<0.000020
Bismuth	mg/L	0.0005[f]	-	-	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	0.00005	0	<0.000050
Boron	mg/L	1.2	29[b]	-	0.011	<0.010	<0.010	<0.010	<0.010	<0.010	0.01	0	<0.010
Cadmium	mg/L	-	-	-	0.00037	0.000024	0.000027	0.00003	0.000026	0.000027	0.000027	0.084	0.000028
Calcium	mg/L	-	-	-	144	126	134	141	136	118	131	0.069	128
Chromium	mg/L	0.0010[g]	-	-	**0.0019**[Mn]	0.00022	0.00044	0.00019	0.00014	0.00017	0.00023	0.52	<0.00010
Cobalt	mg/L	0.0040	0.11	-	0.00096	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.0001	0	<0.00010
Copper	mg/L	-	-	-	0.0027	<0.00050	0.00052	<0.00050	<0.00050	<0.00050	0.0005	0.018	<0.00050
Iron	mg/L	0.67 - 3.86[f,h]	1.0	-	**1.9**[Mn, Mx]	0.018	0.049	0.028	0.019	0.03	0.029	0.43	0.016
Lead	mg/L	0.014 - 0.020[c]	0.27 - 0.42[c]	-	0.0014	<0.000050	0.000062	<0.000050	<0.000050	<0.000050	0.000052	0.1	<0.000050
Lithium	mg/L	0.1216[f]	-	-	0.022	0.023	0.022	0.024	0.029	0.027	0.025	0.12	0.027
Magnesium	mg/L	-	-	-	57	53	61	72	61	58	61	0.11	59
Manganese	mg/L	1.7 - 2.6[c]	3.4 - 3.4[c]	-	0.12	0.0015	0.0033	0.003	0.0025	0.0028	0.0026	0.27	0.002
Mercury	mg/L	0.000010	-	-	<0.0000010	<0.00000050	<0.00000050	<0.00000050	<0.00000050	0.00000056	0.00000051	0.052	<0.00000050
Molybdenum	mg/L	1.0	2.0	-	0.00089	0.00078	0.0009	0.0013	0.0014	0.00091	0.001	0.24	0.0011
Nickel	mg/L	0.0053[i]	-	-	**0.0059**[Mn]	<0.00050	0.001	0.0019	0.0017	0.0012	0.0013	0.44	0.0018
Potassium	mg/L	-	-	-	1.5	1.2	1.4	1.6	1.6	1.5	1.5	0.12	1.5
Selenium	mg/L	0.0020	-	0.019	**0.065**[Mn, E]	**0.064**[Mn, E]	**0.075**[Mn, E]	**0.082**[Mn, E]	**0.075**[Mn, E]	**0.069**[Mn, E]	**0.073**[Mn, E]	0.093	**0.071**[Mn, E]
Silicon	mg/L	-	-	-	3.7	2.4	2.6	2.6	2.6	2.2	2.5	0.07	2.0
Silver	mg/L	0.0015[c]	0.0030[c]	-	0.000045	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	0.00001	0	<0.000010
Sodium	mg/L	-	-	-	2.4	2.4	2.8	2.9	3.0	2.8	2.8	0.075	2.9
Strontium	mg/L	-	-	-	0.19	0.18	0.19	0.18	0.17	0.17	0.18	0.049	0.17
Sulphur	mg/L	-	-	-	99	82	109	125	112	92	104	0.16	94
Thallium	mg/L	0.00080	-	-	0.000045	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	0.00001	0	<0.000010
Tin	mg/L	0.3[f]	-	-	<0.00010	<0.00010	0.00012	<0.00010	<0.00010	<0.00010	0.0001	0.086	<0.00010
Titanium	mg/L	0.85[f]	-	-	0.0073	<0.00030	0.00066	0.00062	0.00048	0.00032	0.00048	0.35	<0.00030
Uranium	mg/L	0.0085	0.033[b]	-	0.0026	0.0022	0.0028	0.0035	0.003	0.0029	0.0029	0.16	0.003
Vanadium	mg/L	0.12[f]	-	-	0.004	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.0005	0	<0.00050
Zinc	mg/L	0.13 - 0.19	0.16 - 0.34	-	0.022	0.0078	0.0074	<0.0030	<0.0030	0.0035	0.0049	0.49	<0.0030
Dissolved Metals													
Aluminum	mg/L	0.050[h]	0.10[h]	-	<0.0010	<0.0010	0.0092	0.0022	0.0015	<0.0010	0.003	1.2	<0.0010
Antimony	mg/L	-	-	-	<0.00010	<0.00010	0.00011	0.00014	0.00015	0.00012	0.00012	0.17	0.00013
Arsenic	mg/L	-	-	-	<0.00010	<0.00010	<0.00010	0.00012	<0.00010	<0.00010	0.0001	0.086	<0.00010
Barium	mg/L	-	-	-	0.13	0.13	0.13	0.12	0.11	0.12	0.12	0.059	0.13
Beryllium	mg/L	-	-	-	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	0.00002	0	<0.000020
Bismuth	mg/L	-	-	-	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	0.00005	0	<0.000050
Boron	mg/L	-	-	-	<0.010	<0.010	<0.010	<0.010	0.01	<0.010	0.01	0	<0.010
Cadmium	mg/L	0.00042 - 0.00046[c]	0.0015 - 0.0028[c]	0.00029 - 0.00032[c]	0.00002	0.000016	0.000023	0.000032	0.000025	0.00002	0.000023	0.25	0.000026
Chromium	mg/L	-	-	-	0.00012	<0.00010	0.00017	0.00018	0.0001	0.00011	0.00013	0.3	<0.00010
Cobalt	mg/L	-	-	-	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.0001	0	<0.00010
Copper	mg/L	0.0004 - 0.0051[j]	0.0022 - 0.029[j]	-	<0.00020	<0.00020	<0.00020	0.00078	<0.00020	<0.00020	0.00032	0.82	<0.00020
Iron	mg/L	-	0.35	-	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.01	0	<0.010
Lead	mg/L	-	-	-	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	0.00005	0	<0.000050
Lithium	mg/L	-	-	-	0.021	0.02	0.021	0.023	0.025	0.027	0.023	0.12	0.029
Manganese	mg/L	-	-	-	0.001	0.00085	0.0016	0.0027	0.0019	0.0018	0.0018	0.38	0.0036
Mercury	mg/L	-	-	-	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	0.000005	0	<0.0000050
Molybdenum	mg/L	-	-	-	0.00077	0.00066	0.00085	0.0011	0.0013	0.00094	0.00098	0.26	0.0011
Nickel	mg/L	-	-	-	0.00069	<0.00050	0.00094	0.0016	0.0016	0.0012	0.0012	0.4	0.0017
Selenium	mg/L	-	-	-	0.07	0.065	0.081	0.09	0.081	0.08	0.079	0.11	0.078
Silicon	mg/L	-	-	-	2.4	2.2	2.5	2.5	2.4	2.2	2.4	0.065	2.1
Silver	mg/L	-	-	-	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	0.00001	0	<0.000010
Strontium	mg/L	2.5[f]	-	-	0.17	0.17	0.19	0.18	0.17	0.18	0.18	0.045	0.18
Sulphur	mg/L	-	-	-	95	88	106	124	102	97	103	0.13	98
Thallium	mg/L	-	-	-	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	0.00001	0	<0.000010
Tin	mg/L	-	-	-	<0.00010	<0.00010	<0.00010	0.0001	<0.00010	<0.00010	0.0001	0	<0.00010
Titanium	mg/L	-	-	-	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	0.0003	0	<0.00030
Uranium	mg/L	-	-	-	0.0024	0.0024	0.0027	0.0033	0.0029	0.003	0.0028	0.12	0.003
Vanadium	mg/L	-	-	-	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.0005	0	<0.00050
Zinc	mg/L	-	-	-	0.0022	0.0011	0.0022	0.018	<0.0010	0.0017	0.0049	1.5	<0.0010

Parameter	Q2 GH_FR1								
	C. dubia and *P. subcapitata*	25-May-21	1-Jun-21	8-Jun-21	15-Jun-21	May 18, 25, June 1, 8 *H. azteca*		May 18, 25, June 1, 8, 15 *O. mykiss*	
	18-May-21					Mean	CV	Mean	CV
Field Measured									
pH	8.1	8.3	8.0	8.2	8.2	8.2	0.014	8.2	0.014
Specific conductivity	504	659	511	556	499	558	0.11	546	0.12
Temperature	4.8	4.2	6.0	5.1	9.0	5.0	0.13	5.8	0.33
Dissolved oxygen	**11**[Mn]	**11**[Mn]	**11**[Mn]	**11**[Mn]	**10**[Mn]	11	0	**11**[Mn]	0.041
Turbidity	26	21	11	39	12	24	0.5	22	0.53
Dissolved oxygen	83	84	87	85	88	85	0.02	85	0.028
Oxidation-reduction potential field	1030	112	140	129	188	353	1.1	320	1.2
Conventional Parameters									
pH	8.2	8.3	8.1	8.3	8.3	8.2	0.011	8.2	0.011
Hardness, as $CaCO_3$	256	346	270	311	285	296	0.12	294	0.12
Total alkalinity, as $CaCO_3$	153	174	151	177	161	164	0.081	163	0.073
Total dissolved solids	330	390	324	406	436	363	0.11	377	0.13
Total suspended solids	48	14	22	17	8.0	25	0.54	22	0.7
Total organic carbon	5.0	2.2	3.0	1.5	1.9	3.0	0.49	2.8	0.5
Dissolved organic carbon	3.2	2.3	1.7	1.4	1.7	2.1	0.37	2.0	0.36
Colour	-	-	-	-	-	-	-	-	-
Turbidity	22	5.0	7.4	5.3	3.0	10.0	0.75	8.6	0.91
Total acidity	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	0	2.0	0
Cation - anion balance	4.8	1.8	1.7	3.0	2.0	2.8	0.44	2.7	0.49
Ion balance	91	97	97	94	96	95	0.025	95	0.026
Conductivity	497	643	518	590	519	562	0.11	553	0.11
Oxidation-reduction potential	242	441	397	445	404	381	0.23	386	0.22
Major Ions									
Bicarbonate	-	-	-	-	191	-	-	191	0.45
Bromide	<0.050	<0.050	<0.050	<0.050	<0.050	0.05	0	0.05	0
Calcium	62	78	66	72	67	70	0.092	69	0.093
Carbonate, as $CaCO_3$	-	-	-	-	2.9	-	-	2.9	0.45
Chloride	0.68	1.2	0.82	0.9	0.8	0.9	0.22	0.88	0.23
Fluoride	**0.13**[Mn]	**0.17**[Mn]	**0.14**[Mn]	**0.19**[Mn]	**0.19**[Mn]	**0.16**[Mn]	0.18	**0.16**[Mn]	0.17
Hydroxide	-	-	-	-	<1.0	-	-	1.0	0.45
Magnesium	25	37	25	32	29	30	0.17	29	0.17
Potassium	1.1	1.2	0.91	1.1	1.0	1.1	0.095	1.1	0.094
Sodium	1.4	1.9	1.3	1.6	1.4	1.5	0.14	1.5	0.15
Sulphate	106	148	102	117	108	118	0.15	116	0.16
Major anion sum	5.7	7.3	5.7	6.7	6.0	6.3	0.11	6.3	0.11
Major cation sum	5.2	7.0	5.5	6.3	5.8	6.0	0.12	6.0	0.12
Bicarbonate Alkalinity, as $CaCO_3$	153	174	151	177	156	164	0.081	162	0.076
Carbonate Alkalinity, as $CaCO_3$	<1.0	<1.0	<1.0	<1.0	4.8	1.0	0	1.8	0.97
Hydroxide Alkalinity, as $CaCO_3$	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	0	1.0	0
Nutrients and Biological Indicators									
Nitrate	**5.9**[Mn]	**9.5**[Mn]	**6.9**[Mn]	**9.7**[Mn, E]	**7.4**[Mn]	**8.0**[Mn]	0.23	**7.9**[Mn]	0.21
Nitrite	0.0033	<0.0010	0.0022	<0.0010	0.0036	0.0019	0.55	0.0022	0.55
Total ammonia	0.018	0.016	<0.0050	0.0099	0.022	0.012	0.43	0.014	0.47
Total Kjeldahl nitrogen	0.85	0.17	<0.050	<0.050	<0.050	0.28	1.2	0.23	1.5
Total phosphorus	0.027	0.0072	<0.0020	0.013	0.01	0.012	0.76	0.012	0.79
Orthophosphate	<0.0010	0.0011	<0.0010	0.0026	<0.0010	0.0014	0.6	0.0013	0.53
Biochemical oxygen demand	-	-	-	-	-	-	-	-	-
Total Metals									
Aluminum	0.27	0.091	0.21	0.13	0.1	0.18	0.41	0.16	0.48
Antimony	0.00014	0.00015	0.00014	0.00017	0.00014	0.00015	0.1	0.00015	0.088
Arsenic	0.00029	0.00018	0.00025	0.00016	0.00016	0.00022	0.27	0.00021	0.28
Barium	0.067	0.069	0.064	0.066	0.061	0.066	0.031	0.065	0.05
Beryllium	0.000024	<0.000020	<0.000020	<0.000020	<0.000020	0.000021	0.085	0.000021	0.086
Bismuth	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	0.00005	0	0.00005	0
Boron	<0.010	<0.010	<0.010	<0.010	<0.010	0.01	0	0.01	0
Cadmium	0.00011	0.000049	0.000081	0.000044	0.000046	0.000072	0.43	0.000067	0.46
Calcium	63	79	67	69	64	69	0.084	68	0.092
Chromium	0.00046	0.00026	0.00044	0.00034	0.00026	0.00038	0.22	0.00035	0.27
Cobalt	0.00031	0.00011	0.00018	0.00012	<0.00010	0.00018	0.47	0.00016	0.53
Copper	0.00094	<0.00050	0.00063	<0.00050	<0.00050	0.00064	0.3	0.00061	0.31
Iron	0.3	0.13	0.33	0.16	0.14	0.23	0.4	0.21	0.45
Lead	0.00039	0.000098	0.00025	0.00011	0.00011	0.00021	0.6	0.00019	0.66
Lithium	0.013	0.018	0.014	0.021	0.016	0.016	0.25	0.016	0.21
Magnesium	25	38	26	30	28	30	0.17	30	0.17
Manganese	0.031	0.0064	0.016	0.0079	0.0089	0.015	0.68	0.014	0.73
Mercury	0.0000038	0.0000011	0.000001	0.0000013	0.0000012	0.0000018	0.65	0.0000017	0.71
Molybdenum	0.00082	0.001	0.001	0.0013	0.0011	0.001	0.22	0.001	0.18
Nickel	0.0026	0.0022	0.0019	0.0021	0.0014	0.0022	0.13	0.002	0.21
Potassium	1.1	1.2	1.0	1.3	1.1	1.2	0.1	1.1	0.095
Selenium	**0.025**[Mn, E]	**0.041**[Mn, E]	**0.027**[Mn, E]	**0.036**[Mn, E]	**0.029**[Mn, E]	**0.032**[Mn, E]	0.21	**0.032**[Mn, E]	0.21
Silicon	2.4	2.1	2.4	2.2	1.9	2.3	0.062	2.2	0.094
Silver	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	0.00001	0	0.00001	0
Sodium	1.4	1.7	1.3	1.7	1.4	1.5	0.14	1.5	0.13
Strontium	0.1	0.12	0.1	0.11	0.11	0.11	0.054	0.11	0.055
Sulphur	37	57	36	42	38	43	0.2	42	0.21
Thallium	0.000012	<0.000010	<0.000010	<0.000010	<0.000010	0.000011	0.085	0.00001	0.086
Tin	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.0001	0	0.0001	0
Titanium	0.0066	0.0012	0.0024	<0.0027	<0.0015	0.0032	0.63	0.0029	0.76
Uranium	0.0014	0.0021	0.0015	0.0019	0.0016	0.0017	0.19	0.0017	0.18
Vanadium	0.0012	0.00056	0.0011	0.00073	0.0006	0.00088	0.29	0.00082	0.33
Zinc	0.0076	<0.0030	0.005	<0.0030	<0.0030	0.0047	0.44	0.0043	0.47
Dissolved Metals									
Aluminum	0.0015	0.0014	0.0012	0.0011	0.017	0.0013	0.14	0.0044	1.6
Antimony	0.00012	0.00016	0.00012	0.00016	0.00013	0.00014	0.16	0.00014	0.15
Arsenic	0.00012	0.00011	0.00011	0.00011	<0.00010	0.00011	0.04	0.00011	0.064
Barium	0.058	0.069	0.057	0.065	0.056	0.062	0.085	0.061	0.094
Beryllium	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	0.00002	0	0.00002	0
Bismuth	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	0.00005	0	0.00005	0
Boron	<0.010	<0.010	<0.010	<0.010	<0.010	0.01	0	0.01	0
Cadmium	0.000025	0.000032	0.000018	0.000024	0.000022	0.000024	0.2	0.000024	0.21
Chromium	<0.00010	<0.00010	<0.00010	0.00012	0.00012	0.00011	0.1	0.00011	0.1
Cobalt	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.0001	0	0.0001	0
Copper	0.00032	0.0002	<0.00020	<0.00020	0.0002	0.00023	0.23	0.00022	0.24
Iron	<0.010	<0.010	<0.010	<0.010	<0.010	0.01	0	0.01	0
Lead	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	0.00005	0	0.00005	0
Lithium	0.012	0.019	0.014	0.022	0.018	0.017	0.26	0.017	0.22
Manganese	0.0035	0.0015	0.0016	0.0015	0.0014	0.002	0.43	0.0019	0.46
Mercury	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	0.000005	0	0.000005	0
Molybdenum	0.00098	0.0013	0.0011	0.0013	0.001	0.0011	0.11	0.0011	0.12
Nickel	0.0012	0.0018	0.00095	0.0016	0.00094	0.0014	0.25	0.0013	0.29
Selenium	0.026	0.043	0.029	0.041	0.03	0.035	0.22	0.034	0.22
Silicon	1.8	1.9	1.9	1.9	1.7	1.9	0.014	1.8	0.043
Silver	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	0.00001	0	0.00001	0
Strontium	0.1	0.12	0.099	0.1	0.1	0.11	0.085	0.1	0.087
Sulphur	36	53	33	41	38	41	0.19	40	0.19
Thallium	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	0.00001	0	0.00001	0
Tin	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.0001	0	0.0001	0
Titanium	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	0.0003	0	0.0003	0
Uranium	0.0014	0.0018	0.0014	0.002	0.0016	0.0017	0.18	0.0017	0.16
Vanadium	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.0005	0	0.0005	0
Zinc	0.0021	0.0015	<0.0010	0.0011	<0.0010	0.0014	0.32	0.0013	0.35

Parameter	Q3 GH_FR1									Q4 GH			
	C. dubia and *P. subcapitata*	17-Aug-21	24-Aug-21	31-Aug-21	7-Sep-21	Aug 10, 17, 24, 31 *H. azteca*		Aug 10, 17, 24, 31 Sept 7 *P. promelas*		*C. dubia* and *P. subcapitata*	19-Oct-21	26-Oct-21	2-Nov-21
	10-Aug-21					Mean	CV	Mean	CV	12-Oct-21			
Field Measured													
pH	8.2	8.3	8.3	8.1	8.2	8.2	0.012	8.2	0.01	8.1	8.4	8.2	8.4
Specific conductivity	764	762	692	740	755	740	0.045	743	0.04	794	799	847	859
Temperature	8.6	8.5	6.6	6.8	8.3	7.6	0.14	7.8	0.13	0.9	3.3	3.8	0.3
Dissolved oxygen	**9.1**[Mn]	**9.3**[Mn]	**8.7**[Mn, Mx]	**10**[Mn]	**11**[Mn]	**9.3**[Mn]	0.059	**9.6**[Mn]	0.094	11	11	11	12
Turbidity	3.9	34	12	35	10	21	0.74	19	0.75	11	2.8	23	6.8
Dissolved oxygen	78	80	71	82	90	78	0.06	80	0.083	80	86	85	82
Oxidation-reduction potential field	327	213	146	234	263	230	0.32	237	0.28	230	173	286	239
Conventional Parameters													
pH	8.4	8.4	8.3	8.3	8.3	8.4	0.0069	8.3	0.0066	8.3	8.4	8.3	8.3
Hardness, as $CaCO_3$	448	443	387	449	434	432	0.069	432	0.06	483	518	493	536
Total alkalinity, as $CaCO_3$	204	202	197	177	210	195	0.063	198	0.064	239	224	208	237
Total dissolved solids	565	604	542	542	577	563	0.052	566	0.046	590	682	676	650
Total suspended solids	<1.0	8.2	6.7	<1.0	<1.0	4.2	0.89	3.6	1.0	<1.0	1.7	3.1	1.5
Total organic carbon	2.0	2.8	2.7	7.5	0.94	3.8	0.68	3.2	0.8	<0.50	0.86	0.6	1.1
Dissolved organic carbon	2.3	1.4	2.7	6.8	0.98	3.3	0.72	2.9	0.81	0.52	0.76	0.77	1.2
Colour	-	-	-	-	-	-	-	-	-	<5.0	-	-	-
Turbidity	0.3	3.5	2.5	0.37	0.24	1.7	0.96	1.4	1.1	0.19	0.17	0.58	0.26
Total acidity	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	0	2.0	0	<2.0	<2.0	<2.0	<2.0
Cation - anion balance	0.055	6.3	4.7	3.2	3.1	3.6	0.74	3.5	0.67	2.5	3.7	2.0	1.4
Ion balance	100	88	91	107	94	97	0.089	96	0.079	95	93	96	97
Conductivity	793	812	707	763	790	769	0.06	773	0.053	857	918	901	867
Oxidation-reduction potential	412	376	363	481	326	408	0.13	392	0.15	452	451	460	464
Major Ions													
Bicarbonate	236	229	225	207	249	224	0.055	229	0.067	285	258	248	237
Bromide	<0.050	<0.050	<0.050	<0.050	<0.050	0.05	0	0.05	0	<0.050	<0.050	<0.050	<0.25
Calcium	105	95	87	103	97	97	0.087	97	0.075	109	110	110	124
Carbonate, as $CaCO_3$	6.7	8.6	7.7	4.2	3.5	6.8	0.28	6.1	0.36	3.2	7.6	2.8	<1.0
Chloride	1.8	1.6	1.5	1.5	1.7	1.6	0.082	1.6	0.075	1.6	1.8	2.2	1.6
Fluoride	**0.17**[Mn]	**0.12**[Mn]	**0.18**[Mn]	**0.15**[Mn]	**0.17**[Mn]	**0.16**[Mn]	0.17	**0.16**[Mn]	0.15	0.12	0.1	**0.16**[Mn]	0.12
Hydroxide	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	0	1.0	0	<1.0	<1.0	<1.0	<1.0
Magnesium	45	50	42	47	46	46	0.078	46	0.068	51	59	53	55
Potassium	1.5	1.6	1.4	1.5	1.5	1.5	0.056	1.5	0.049	1.4	1.5	1.4	1.5
Sodium	2.4	2.3	2.2	2.4	2.4	2.3	0.043	2.3	0.039	2.6	2.6	2.5	2.6
Sulphate	195	255	187	199	203	209	0.15	208	0.13	216	277	250	259
Major anion sum	9.1	10	8.6	8.5	9.4	9.1	0.083	9.2	0.073	10	11	10	11
Major cation sum	9.1	9.0	7.9	9.1	8.8	8.8	0.069	8.8	0.06	9.8	11	10.0	11
Bicarbonate Alkalinity, as $CaCO_3$	193	188	184	170	204	184	0.054	188	0.066	234	212	203	194
Carbonate Alkalinity, as $CaCO_3$	11	14	13	7.0	5.8	11	0.28	10	0.36	5.4	13	4.6	<1.0
Hydroxide Alkalinity, as $CaCO_3$	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	0	1.0	0	<1.0	<1.0	<1.0	<1.0
Nutrients and Biological Indicators													
Nitrate	**13**[Mn]	**11**[Mn]	**11**[Mn]	**11**[Mn]	**12**[Mn]	**12**[Mn]	0.087	**12**[Mn]	0.077	**13**[Mn]	**14**[Mn]	**14**[Mn]	**15**[Mn]
Nitrite	0.006	0.0062	0.0048	0.0061	0.002	0.0058	0.11	0.005	0.35	0.0033	0.004	0.0046	0.0091
Total ammonia	0.05	0.018	0.027	0.0077	0.0076	0.026	0.7	0.022	0.8	<0.0050	<0.0050	0.011	<0.0050
Total Kjeldahl nitrogen	0.1	<0.050	0.43	0.15	0.35	0.18	0.92	0.21	0.76	0.26	0.42	0.47	0.39
Total phosphorus	0.0028	0.0091	0.017	0.0037	0.0029	0.0082	0.8	0.0071	0.86	0.015	<0.0020	0.0027	<0.0020
Orthophosphate	<0.0010	<0.0010	0.0015	<0.0010	<0.0010	0.0011	0.22	0.0011	0.2	<0.0010	0.0016	0.002	<0.0010
Biochemical oxygen demand	-	-	-	<2.0	-	2.0	0.5	2.0	0.45	<2.0	-	-	-
Total Metals													
Aluminum	0.0095	0.027	0.041	0.3	0.0064	0.093	1.5	0.076	1.6	0.0033	0.017	0.019	0.0036
Antimony	0.00012	0.00014	0.00013	0.00016	0.00014	0.00014	0.12	0.00014	0.11	0.00011	0.00013	0.00013	0.00013
Arsenic	0.00013	0.00013	0.00016	0.0004	0.00012	0.00021	0.64	0.00019	0.64	0.00012	0.00012	0.00011	0.0001
Barium	0.11	0.097	0.09	0.11	0.11	0.1	0.1	0.1	0.091	0.13	0.12	0.12	0.11
Beryllium	<0.000020	<0.000020	<0.000020	0.00003	<0.000020	0.000023	0.22	0.000022	0.2	<0.000020	<0.000020	<0.000020	<0.000020
Bismuth	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	0.00005	0	0.00005	0	<0.000050	<0.000050	<0.000050	<0.000050
Boron	<0.010	0.01	<0.010	0.012	0.01	0.011	0.095	0.01	0.086	<0.010	<0.010	<0.010	0.01
Cadmium	0.000022	0.000031	0.000035	0.000096	0.000027	0.000046	0.73	0.000042	0.72	0.000022	0.000023	0.000032	0.000014
Calcium	92	98	88	104	101	96	0.072	97	0.066	115	114	114	115
Chromium	0.00015	0.00017	0.00024	0.00069	0.00013	0.00031	0.81	0.00028	0.85	0.00022	0.00017	0.00015	0.00015
Cobalt	<0.00010	<0.00010	<0.00010	0.00034	<0.00010	0.00016	0.75	0.00015	0.73	<0.00010	<0.00010	<0.00010	<0.00010
Copper	0.002	<0.00050	<0.00050	0.00091	<0.00050	0.00098	0.72	0.00088	0.74	<0.00050	<0.00050	<0.00050	<0.00050
Iron	0.015	0.061	0.07	0.62	0.012	0.19	1.5	0.16	1.7	0.011	0.048	0.041	<0.010
Lead	<0.000050	0.000084	0.000063	0.00056	<0.000050	0.00019	1.3	0.00016	1.4	<0.000050	<0.000050	<0.000050	<0.000050
Lithium	0.024	0.022	0.021	0.027	0.025	0.023	0.1	0.024	0.093	0.027	0.025	0.028	0.029
Magnesium	45	50	40	45	49	45	0.086	46	0.085	54	59	56	53
Manganese	0.002	0.0072	0.0045	0.031	0.0019	0.011	1.2	0.0093	1.3	0.0016	0.0028	0.0053	0.0015
Mercury	<0.00000050	0.0000015	0.00000063	<0.00000050	<0.00000050	0.00000079	0.62	0.00000073	0.61	<0.00000050	<0.00000050	0.0000005	<0.00000050
Molybdenum	0.001	0.0011	0.0011	0.0011	0.0011	0.0011	0.046	0.0011	0.04	0.0011	0.0011	0.0011	0.0011
Nickel	0.0011	0.0018	0.0015	0.0025	0.0011	0.0017	0.35	0.0016	0.36	0.0009	0.0013	0.0011	0.0009
Potassium	1.4	1.5	1.3	1.5	1.5	1.4	0.063	1.5	0.061	1.6	1.5	1.6	1.5
Selenium	**0.054**[Mn, E]	**0.054**[Mn, E]	**0.047**[Mn, E]	**0.049**[Mn, E]	**0.056**[Mn, E]	**0.051**[Mn, E]	0.07	**0.052**[Mn, E]	0.073	**0.062**[Mn, E]	0.0019	**0.067**[Mn, E]	**0.065**[Mn, E]
Silicon	2.3	2.4	2.3	2.7	2.3	2.4	0.081	2.4	0.078	2.5	2.5	2.4	2.5
Silver	<0.000010	<0.000010	<0.000010	0.000015	<0.000010	0.000011	0.22	0.000011	0.2	<0.000010	<0.000010	<0.000010	<0.000010
Sodium	2.4	2.3	2.1	2.2	2.6	2.2	0.073	2.3	0.09	2.8	2.5	2.9	2.7
Strontium	0.15	0.14	0.13	0.16	0.16	0.14	0.066	0.15	0.071	0.17	0.17	0.17	0.17
Sulphur	71	83	67	70	82	73	0.096	74	0.097	89	101	98	90
Thallium	<0.000010	<0.000010	<0.000010	0.000012	<0.000010	0.000011	0.095	0.00001	0.086	<0.000010	<0.000010	<0.000010	<0.000010
Tin	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.0001	0	0.0001	0	<0.00010	<0.00010	<0.00010	<0.00010
Titanium	<0.00030	0.00037	0.00049	0.0044	<0.00030	0.0014	1.4	0.0012	1.5	<0.00030	<0.00030	<0.00030	<0.00030
Uranium	0.0024	0.0028	0.0022	0.0025	0.0025	0.0025	0.092	0.0025	0.08	0.0027	0.003	0.0031	0.0029
Vanadium	<0.00050	<0.00050	<0.00050	0.0018	<0.00050	0.00083	0.8	0.00077	0.78	<0.00050	<0.00050	<0.00050	<0.00050
Zinc	<0.0030	<0.0030	<0.0030	0.0066	<0.0030	0.0039	0.46	0.0037	0.43	<0.0030	<0.0030	<0.0030	<0.0030
Dissolved Metals													
Aluminum	<0.0010	0.0015	0.0025	0.0046	<0.0010	0.0024	0.66	0.0021	0.71	<0.0010	<0.0010	0.0011	<0.0010
Antimony	0.00012	0.00015	0.00012	0.00014	0.00012	0.00013	0.11	0.00013	0.11	0.00011	0.00013	0.00011	0.00011
Arsenic	<0.00010	0.00012	0.0001	<0.00010	0.0001	0.00011	0.095	0.0001	0.086	<0.00010	<0.00010	<0.00010	<0.00010
Barium	0.11	0.094	0.088	0.099	0.1	0.097	0.078	0.098	0.071	0.12	0.12	0.11	0.12
Beryllium	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	0.00002	0	0.00002	0	<0.000020	<0.000020	<0.000020	<0.000020
Bismuth	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	0.00005	0	0.00005	0	<0.000050	<0.000050	<0.000050	<0.000050
Boron	0.011	<0.010	<0.010	0.01	0.01	0.01	0.049	0.01	0.044	<0.010	<0.010	<0.010	<0.010
Cadmium	0.000025	0.000014	0.000024	0.000025	0.000021	0.000022	0.24	0.000022	0.21	0.000017	0.00002	0.000017	0.000021
Chromium	0.00013	<0.00010	0.00019	0.00014	<0.00010	0.00014	0.27	0.00013	0.28	0.00016	0.00011	0.00015	<0.00010
Cobalt	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.0001	0	0.0001	0	<0.00010	<0.00010	<0.00010	<0.00010
Copper	0.0015	<0.00020	<0.00020	0.00038	<0.00020	0.00056	1.1	0.00049	1.1	<0.00020	<0.00020	<0.00020	<0.00020
Iron	<0.010	<0.010	<0.010	0.014	<0.010	0.011	0.18	0.011	0.17	<0.010	<0.010	<0.010	<0.010
Lead	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	0.00005	0	0.00005	0	<0.000050	<0.000050	<0.000050	<0.000050
Lithium	0.026	0.022	0.023	0.027	0.027	0.024	0.11	0.025	0.099	0.027	0.026	0.026	0.029
Manganese	0.0014	0.0034	0.0017	0.002	0.002	0.0022	0.41	0.0021	0.36	0.0014	0.0017	0.0012	0.0013
Mercury	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	0.000005	0	0.000005	0	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Molybdenum	0.0012	0.0012	0.0012	0.0012	0.0011	0.0012	0.024	0.0012	0.046	0.00099	0.001	0.0011	0.001
Nickel	0.001	0.0015	0.00084	0.0011	0.001	0.0011	0.25	0.0011	0.23	0.00085	0.0012	0.00083	0.0009
Selenium	0.057	0.061	0.048	0.055	0.053	0.055	0.094	0.055	0.085	0.061	0.0019	0.073	0.064
Silicon	2.2	2.3	2.2	2.3	2.1	2.2	0.018	2.2	0.028	2.2	2.4	2.3	2.3
Silver	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	0.00001	0	0.00001	0	<0.000010	<0.000010	<0.000010	<0.000010
Strontium	0.16	0.14	0.14	0.15	0.14	0.15	0.067	0.15	0.062	0.16	0.17	0.16	0.18
Sulphur	69	82	63	77	74	73	0.12	73	0.1	83	98	85	90
Thallium	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	0.00001	0	0.00001	0	<0.000010	<0.000010	<0.000010	<0.000010
Tin	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.0001	0	0.0001	0	<0.00010	<0.00010	<0.00010	<0.00010
Titanium	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	0.0003	0	0.0003	0	<0.00030	<0.00030	<0.00030	<0.00030
Uranium	0.0024	0.0027	0.0024	0.0025	0.0025	0.0025	0.062	0.0025	0.054	0.0027	0.003	0.0028	0.0027
Vanadium	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.0005	0	0.0005	0	<0.00050	<0.00050	<0.00050	<0.00050
Zinc	0.0011	<0.0010	0.0015	<0.0010	<0.0010	0.0012	0.21	0.0011	0.19	<0.0010	<0.0010	0.0012	<0.0010

(a) = guideline is a minimum value, unless the background concentration or value is lower.
(b) = guideline is adopted from CCME Canadian Environmental Quality Guidelines (CCME, 1999).
(c) = guideline is hardness dependent. The guideline range shown is based on the hardness range observed in the dataset (256 to 628 mg/L). The guideline is calculated based on the individual hardness value for each sample.

(d) = for some samples, water hardness was greater than 250 mg/L. At this hardness, no BC ENV water quality guideline has been established for sulphate; however, the observed data were screened against the guideline for very hard water (i.e., 429 mg/L) for comparative purposes.
(e) = guideline is chloride dependent. The guideline range shown is based on the chloride concentration range observed in the dataset (0.680 to 3.310 mg/L). The guideline is calculated based on the individual chloride concentration in each sample.
(f) = guideline is adopted from the ECCC PNECs (ECCC, 2018) or draft FEQGs (ECCC, 2017).
(g) = guideline is for chromium VI.
(h) = guideline is pH dependent. The guideline range shown is based on the pH range observed in the dataset (8.0 to 8.7). The guideline is calculated based on the individual pH for each sample.
(i) = guideline is a level 1 interim screening value.
(j) = dissolved copper guideline was calculated using the simplified Biotic Ligand Midel (BC ENV, 2019). Where values were missing, the temporally nearest value from the same location was taken.
(Mn) = concentration is higher than the 30-day mean BC ENV guideline or outside the recommended pH, DO or total alkalinity range.
(Mx) = concentration is higher than the maximum BC ENV guideline or outside the recommended pH, DO or total alkalinity range.
(E) = concentration is higher than the EVWQP benchmarks guideline.
Bolded concentrations are higher than water quality guidelines.
Shaded concentrations are higher than the EVWQP benchmark (e.g., for nitrate, total selenium, dissolved cadmium or sulphate).
Water quality data and guidelines shown in this table were rounded to reflect laboratory or field instrument precision after comparisons to guidelines. Therefore, values slightly above guidelines may be displayed as being equal to the guidelines and identified as exceedances. Concentrations equal to the guideline values were not identified as exceedances.
Concentrations were screened against available Working and Approved British Columbia Ministry of Environment and Climate Change Strategy (BC ENV) Water Quality Guidelines for the Protection of Aquatic Life; Accessed January 2020 from: https://www2.gov.bc.ca/gov/content/environment/air-land-water/water/water-quality/water-quality-guidelines.
\- = no guideline or no data
BC ENV = British Columbia Ministry of Environment & Climate Change Strategy; EVWQP = Elk Valley Water Quality Plan guidelines; *C. dubia = Ceriodaphnia dubia* ; *P. subcapitata = Pseudokirchneriella subcapitata* ; *H. azteca = Hyallela azteca* ; *P. promelas = Pimephales promelas* ; *O. mykiss = Oncorhynchus mykiss* ; CV = coefficient of variation; ∑ = sum of; WQGs = Water Quality Guidelines; CaCO3 = calcium carbonate; mg/L = milligrams per litre; µS/cm = microsiemens per centimeter; NTU = nephelometric turbidity units; meq/L = milliequivalents per litre; mg-N/L = milligrams of Nitrogen per litre; mg=P/L = milligrams of Phosphorus per litre.
BC ENV (B.C. Ministry of Climate Chande Strategy). 2019. Copper Water Quality guideline for the Protection of Aquatic Life-Technical Report. Water Quality Guideline Series, WQG-03-1. Prov. B.C., Victoria B.C.

Parameter	Unit	Guidelines for the protection of:			9_FR1				
		Aquatic Life		EVWQP Benchmarks	9-Nov-21	Oct 12, 19, 26, Nov 2 *H. azteca*		Oct 12, 19, 26, Nov 2, 9 *O. mykiss*	
		30-day mean	Maximum			Mean	CV	Mean	CV
Field Measured									
pH	-	6.5 - 9.0	6.5 - 9.0	-	8.1	8.3	0.018	8.2	0.018
Specific conductivity	µS/cm at 25 C	-	-	-	969	825	0.04	854	0.083
Temperature	°C	-	-	-	0.6	2.1	0.84	1.8	0.92
Dissolved oxygen	mg/L	11	9.0	-	12	11	0.028	12	0.043
Turbidity	NTU	-	-	-	15	11	0.81	12	0.67
Dissolved oxygen	%	-	-	-	87	83	0.034	84	0.035
Oxidation-reduction potential field	mv	-	-	-	222	232	0.2	230	0.18
Conventional Parameters									
pH	-	6.5 - 9.0	6.5 - 9.0	-	8.2	8.3	0.006	8.3	0.0085
Hardness, as $CaCO_3$	mg/L	-	-	-	543	508	0.047	515	0.051
Total alkalinity, as $CaCO_3$	mg/L	20[Mn]	-	-	239	227	0.063	229	0.059
Total dissolved solids	mg/L	-	-	-	666	650	0.065	653	0.057
Total suspended solids	mg/L	-	-	-	<1.0	1.8	0.49	1.7	0.52
Total organic carbon	mg/L	-	-	-	0.66	0.76	0.34	0.74	0.31
Dissolved organic carbon	mg/L	-	-	-	<0.50	0.81	0.33	0.74	0.36
Colour	TCU	-	-	-	-	5.0	0.5	5.0	0.45
Turbidity	NTU	-	-	-	0.41	0.3	0.64	0.32	0.53
Total acidity	mg/L	-	-	-	<2.0	2.0	0	2.0	0
Cation - anion balance	%	-	-	-	0.45	2.4	0.41	2.0	0.6
Ion balance	%	-	-	-	99	95	0.019	96	0.024
Conductivity	µS/cm	-	-	-	911	886	0.032	891	0.031
Oxidation-reduction potential	mv	-	-	-	437	457	0.014	453	0.023
Major Ions									
Bicarbonate	mg/L	-	-	-	239	257	0.08	253	0.077
Bromide	mg/L	-	-	-	<0.050	0.1	1.0	0.09	0.99
Calcium	mg/L	-	-	-	120	113	0.063	115	0.06
Carbonate, as $CaCO_3$	mg/L	-	-	-	<1.0	3.7	0.77	3.1	0.87
Chloride	mg/L	150	600	-	2.6	1.8	0.15	1.9	0.21
Fluoride	mg/L	0.12[(h)]	1.7 - 2.1[(h)]	-	**0.19**[(Mn)]	**0.12**[(Mn)]	0.2	**0.14**[(Mn)]	0.26
Hydroxide	mg/L	-	-	-	<1.0	1.0	0	1.0	0
Magnesium	mg/L	-	-	-	59	55	0.061	55	0.064
Potassium	mg/L	-	-	-	1.6	1.5	0.023	1.5	0.054
Sodium	mg/L	-	-	-	2.9	2.6	0.017	2.6	0.055
Sulphate	mg/L	429[(d,d)]	-	481	247	251	0.1	250	0.089
Major anion sum	meq/l	-	-	-	11	11	0.048	11	0.043
Major cation sum	meq/l	-	-	-	11	10	0.048	10	0.051
Bicarbonate Alkalinity, as $CaCO_3$	mg/l	-	-	-	196	211	0.081	208	0.078
Carbonate Alkalinity, as $CaCO_3$	mg/l	-	-	-	<1.0	5.9	0.82	4.9	0.96
Hydroxide Alkalinity, as $CaCO_3$	mg/l	-	-	-	<1.0	1.0	0	1.0	0
Nutrients and Biological Indicators									
Nitrate	mg-N/L	3.0	33	7.7 - 15[(h)]	**15**[(Mn)]	**14**[(Mn)]	0.058	**14**[(Mn)]	0.059
Nitrite	mg-N/L	0.020 - 0.040[(h)]	0.060 - 0.12[(h)]	-	0.0054	0.0053	0.5	0.0053	0.43
Total ammonia	mg-N/L	2.1	14	-	0.0085	0.0064	0.43	0.0068	0.38
Total Kjeldahl nitrogen	mg-N/L	-	-	-	<0.050	0.39	0.24	0.32	0.54
Total phosphorus	mg-P/L	-	-	-	<0.0020	0.0054	1.2	0.0047	1.2
Orthophosphate	mg-P/L	-	-	-	0.001	0.0014	0.35	0.0013	0.35
Biochemical oxygen demand	mg/L	-	-	-	-	2.0	0.5	2.0	0.45
Total Metals									
Aluminum	mg/L	-	-	-	<0.0030	0.011	0.79	0.0092	0.89
Antimony	mg/L	0.0090	-	-	0.00013	0.00013	0.08	0.00013	0.071
Arsenic	mg/L	0.0050	0.0050	-	0.00014	0.00011	0.085	0.00012	0.13
Barium	mg/L	1.0	-	-	0.12	0.12	0.069	0.12	0.06
Beryllium	mg/L	0.00013	-	-	<0.000020	0.00002	0	0.00002	0
Bismuth	mg/L	0.0005[(f)]	-	-	<0.000050	0.00005	0	0.00005	0
Boron	mg/L	1.2	29[(h)]	-	<0.010	0.01	0	0.01	0
Cadmium	mg/L	-	-	-	0.000018	0.000023	0.32	0.000022	0.31
Calcium	mg/L	-	-	-	114	115	0.005	114	0.0048
Chromium	mg/L	0.0010[(g)]	-	-	0.00014	0.00017	0.19	0.00017	0.19
Cobalt	mg/L	0.0040	0.11	-	<0.00010	0.0001	0	0.0001	0
Copper	mg/L	-	-	-	<0.00050	0.0005	0	0.0005	0
Iron	mg/L	0.67 - 3.86[(Fe)]	1.0	-	<0.010	0.028	0.72	0.024	0.79
Lead	mg/L	0.014 - 0.020[(c)]	0.27 - 0.42[(c)]	-	<0.000050	0.00005	0	0.00005	0
Lithium	mg/L	0.1216[(i)]	-	-	0.027	0.027	0.071	0.027	0.061
Magnesium	mg/L	-	-	-	55	55	0.043	55	0.038
Manganese	mg/L	1.7 - 2.6[(c)]	3.4 - 3.4[(c)]	-	0.0014	0.0028	0.65	0.0025	0.68
Mercury	mg/L	0.000010	-	-	<0.00000050	0.0000005	0	0.0000005	0
Molybdenum	mg/L	1.0	2.0	-	0.0011	0.0011	0.027	0.0011	0.031
Nickel	mg/L	0.0053[(c)]	-	-	0.001	0.0011	0.17	0.001	0.15
Potassium	mg/L	-	-	-	1.5	1.5	0.053	1.5	0.048
Selenium	mg/L	0.0020	-	0.019	**0.060**[(Mn, E)]	**0.049**[(Mn, E)]	0.64	**0.051**[(Mn, E)]	0.54
Silicon	mg/L	-	-	-	2.3	2.5	0.025	2.4	0.045
Silver	mg/L	0.0015[(c)]	0.0030[(c)]	-	<0.000010	0.00001	0	0.00001	0
Sodium	mg/L	-	-	-	2.7	2.7	0.061	2.7	0.053
Strontium	mg/L	-	-	-	0.18	0.17	0.015	0.17	0.022
Sulphur	mg/L	-	-	-	90	94	0.063	93	0.059
Thallium	mg/L	0.00080	-	-	<0.000010	0.00001	0	0.00001	0
Tin	mg/L	0.3[(f)]	-	-	<0.00010	0.0001	0	0.0001	0
Titanium	mg/L	0.85[(f)]	-	-	<0.00030	0.0003	0	0.0003	0
Uranium	mg/L	0.0085	0.033[(e)]	-	0.0028	0.0029	0.066	0.0029	0.061
Vanadium	mg/L	0.12[(f)]	-	-	<0.00050	0.0005	0	0.0005	0
Zinc	mg/L	0.13 - 0.19	0.16 - 0.34	-	0.0052	0.003	0	0.0034	0.29
Dissolved Metals									
Aluminum	mg/L	0.050[(h)]	0.10[(h)]	-	<0.0010	0.001	0.049	0.001	0.044
Antimony	mg/L	-	-	-	0.00012	0.00012	0.087	0.00012	0.077
Arsenic	mg/L	-	-	-	<0.00010	0.0001	0	0.0001	0
Barium	mg/L	-	-	-	0.13	0.12	0.036	0.12	0.062
Beryllium	mg/L	-	-	-	<0.000020	0.00002	0	0.00002	0
Bismuth	mg/L	-	-	-	<0.000050	0.00005	0	0.00005	0
Boron	mg/L	-	-	-	0.01	0.01	0	0.01	0
Cadmium	mg/L	0.00042 - 0.00046[(c)]	0.0015 - 0.0028[(c)]	0.00029 - 0.00032[(c)]	0.000019	0.000019	0.099	0.000019	0.085
Chromium	mg/L	-	-	-	0.00013	0.00013	0.23	0.00013	0.2
Cobalt	mg/L	-	-	-	<0.00010	0.0001	0	0.0001	0
Copper	mg/L	0.0004 - 0.0051[(j)]	0.0022 - 0.029[(j)]	-	<0.00020	0.0002	0	0.0002	0
Iron	mg/L	-	0.35	-	<0.010	0.01	0	0.01	0
Lead	mg/L	-	-	-	<0.000050	0.00005	0	0.00005	0
Lithium	mg/L	-	-	-	0.027	0.027	0.052	0.027	0.045
Manganese	mg/L	-	-	-	0.0013	0.0014	0.14	0.0014	0.13
Mercury	mg/L	-	-	-	<0.0000050	0.000005	0	0.000005	0
Molybdenum	mg/L	-	-	-	0.0012	0.001	0.057	0.0011	0.069
Nickel	mg/L	-	-	-	0.0011	0.00094	0.17	0.00096	0.15
Selenium	mg/L	-	-	-	0.067	0.05	0.65	0.053	0.55
Silicon	mg/L	-	-	-	2.3	2.3	0.043	2.3	0.037
Silver	mg/L	-	-	-	<0.000010	0.00001	0	0.00001	0
Strontium	mg/L	2.5[(f)]	-	-	0.19	0.17	0.044	0.17	0.061
Sulphur	mg/L	-	-	-	90	89	0.073	89	0.063
Thallium	mg/L	-	-	-	<0.000010	0.00001	0	0.00001	0
Tin	mg/L	-	-	-	<0.00010	0.0001	0	0.0001	0
Titanium	mg/L	-	-	-	<0.00030	0.0003	0	0.0003	0
Uranium	mg/L	-	-	-	0.0028	0.0028	0.062	0.0028	0.054
Vanadium	mg/L	-	-	-	<0.00050	0.0005	0	0.0005	0
Zinc	mg/L	-	-	-	0.0016	0.0011	0.095	0.0012	0.22

(a) = guideline is a minimum value, unless the background concentration or value is lower.
(b) = guideline is adopted from CCME Canadian Environmental Quality Guidelines (CCME, 1999).
(c) = guideline is hardness dependent. The guideline range shown is based on the hardness range observed in the dataset (256 to 628 mg/L). The guideline is calculated based on the individual hardness value for each sample.

(d) = for some samples, water hardness was greater than 250 mg/L. At this hardness, no BC ENV water quality guideline has been established for sulphate; however, the observed data were screened against the guideline for very hard water (i.e., 429 mg/L) for comparative purposes.
(e) = guideline is chloride dependent. The guideline range shown is based on the chloride concentration range observed in the dataset (0.680 to 3.310 mg/L). The guideline is calculated based on the individual chloride concentration in each sample.
(f) = guideline is adopted from the ECCC PNECs (ECCC, 2018) or draft FEQGs (ECCC, 2017).
(g) = guideline is for chromium VI.
(h) = guideline is pH dependent. The guideline range shown is based on the pH range observed in the dataset (8.0 to 8.7). The guideline is calculated based on the individual pH for each sample.
(i) = guideline is a level 1 interim screening value.
(j) = dissolved copper guideline was calculated using the simplified Biotic Ligand Midel (BC ENV, 2019). Where values were missing, the temporally nearest value from the same location was taken.
(Mn) = concentration is higher than the 30-day mean BC ENV guideline or outside the recommended pH, DO or total alkalinity range.
(Mx) = concentration is higher than the maximum BC ENV guideline or outside the recommended pH, DO or total alkalinity range.
(E) = concentration is higher than the EVWQP benchmarks guideline.
Bolded concentrations are higher than water quality guidelines.
Shaded concentrations are higher than the EVWQP benchmark (e.g., for nitrate, total selenium, dissolved cadmium or sulphate).
Water quality data and guidelines shown in this table were rounded to reflect laboratory or field instrument precision after comparisons to guidelines. Therefore, values slightly above guidelines may be displayed as being equal to the guidelines and identified as exceedances. Concentrations equal to the guideline values were not identified as exceedances.
Concentrations were screened against available Working and Approved British Columbia Ministry of Environment and Climate Change Strategy (BC ENV) Water Quality Guidelines for the Protection of Aquatic Life; Accessed January 2020 from: https://www2.gov.bc.ca/gov/content/environment/air-land-water/water/water-quality/water-quality-guidelines.
- = no guideline or no data
BC ENV = British Columbia Ministry of Environment & Climate Change Strategy; EVWQP = Elk Valley Water Quality Plan guidelines; *C. dubia = Ceriodaphnia dubia* ; *P. subcapitata = Pseudokirchneriella subcapitata* ; *H. azteca = Hyalella azteca* ; *P. promelas = Pimephales promelas* ; *O. mykiss = Oncorhynchus mykiss* ; CV = coefficient of variation; ∑ = sum of; WQGs = Water Quality Guidelines; CaCO3 = calcium carbonate; mg/L = milligrams per litre; µS/cm = microsiemens per centimeter; NTU = nephelometric turbidity units; meq/L = milliequivalents per litre; mg-N/L = milligrams of Nitrogen per litre; mg=P/L = milligrams of Phosphorus per litre.
BC ENV (B.C. Ministry of Climate Chande Strategy). 2019. Copper Water Quality guideline for the Protection of Aquatic Life-Technical Report. Water Quality Guideline Series. WQG-03-1. Prov. B.C., Victoria B.C.

Parameter	Unit	Guidelines for the protection of: Aquatic Life 30-day mean	Aquatic Life Maximum	EVWQP Benchmarks	Q1 LC_LC5 P. subcapitata 23-Feb-21	2-Mar-21	9-Mar-21	16-Mar-21	23-Mar-21	30-Mar-21	Mar 2, 9, 16, 23, 30 P. promelas Mean	P. promelas CV	C. dubia 13-Apr-21
Field Measured													
pH	-	6.5 - 9.0	6.5 - 9.0	-	8.2	8.2	8.4	8.2	8.4	8.4	8.3	0.013	8.4
Specific conductivity	µS/cm at 25 C	-	-	-	806	860	880	908	1118	1128	979	0.14	930
Temperature	°C	-	-	-	0.5	1.0	0.7	0.9	0.7	0.3	0.72	0.37	3.1
Dissolved oxygen	mg/L	11	9.0	-	13	12	11	13	12	12	12	0.05	11
Turbidity	NTU	-	-	-	0.29	1.4	1.0	0.98	0.1	4.1	1.5	1.0	0.19
Dissolved oxygen	%	-	-	-	106	88	78	88	81	80	83	0.055	85
Oxidation-reduction potential field	mv	-	-	-	75	288	141	308	137	114	197	0.47	153
Conventional Parameters													
pH	-	6.5 - 9.0	6.5 - 9.0	-	8.3	8.1	8.3	8.2	8.3	8.3	8.2	0.011	8.4
Hardness, as $CaCO_3$	mg/L	-	-	-	499	508	492	536	533	442	502	0.076	491
Total alkalinity, as $CaCO_3$	mg/L	20[a]	-	-	190	182	199	207	205	206	200	0.052	204
Total dissolved solids	mg/L	-	-	-	627	579	603	636	619	627	613	0.037	642
Total suspended solids	mg/L	-	-	-	<1.0	1.3	1.1	1.9	1.1	4.7	2.0	0.76	<1.0
Total organic carbon	mg/L	-	-	-	<0.50	<0.50	<0.50	<0.50	1.1	<0.50	0.62	0.43	1.4
Dissolved organic carbon	mg/L	-	-	-	<0.50	<0.50	<0.50	<0.50	0.9	<0.50	0.58	0.31	1.3
Turbidity	NTU	-	-	-	0.12	1.2	0.75	0.47	0.32	2.2	0.99	0.76	0.27
Total acidity	mg/L	-	-	-	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.2	0.37	<2.0
Cation - anion balance	%	-	-	-	3.7	6.2	1.7	2.9	2.6	8.5	4.4	0.65	2.0
Ion balance	%	-	-	-	108	113	103	106	105	84	102	0.1	96
Conductivity	µS/cm	-	-	-	804	802	831	843	871	907	851	0.047	910
Oxidation-reduction potential	mv	-	-	-	457	320	342	428	390	394	375	0.12	258
Major Ions													
Bicarbonate	mg/L	-	-	-	-	-	-	-	-	-	-	-	-
Bromide	mg/L	-	-	-	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.05	0	<0.050
Calcium	mg/L	-	-	-	116	120	115	125	127	102	118	0.085	114
Carbonate, as $CaCO_3$	mg/L	-	-	-	-	-	-	-	-	-	-	-	-
Chloride	mg/L	150	600	-	5.6	5.1	4.9	5.9	6.3	6.1	5.7	0.11	5.6
Fluoride	mg/L	0.12[b]	1.7 - 2.0[c]	-	**0.18**[Mn]	**0.15**[Mn]	0.11	**0.21**[Mn]	**0.16**[Mn]	**0.19**[Mn]	**0.16**[Mn]	0.24	**0.15**[Mn]
Hydroxide	mg/L	-	-	-	-	-	-	-	-	-	-	-	-
Magnesium	mg/L	-	-	-	51	51	50	54	53	46	51	0.066	50
Potassium	mg/L	-	-	-	1.2	1.2	1.2	1.2	1.4	1.2	1.2	0.08	1.4
Sodium	mg/L	-	-	-	4.0	4.0	4.2	3.8	4.4	3.8	4.0	0.068	4.3
Sulphate	mg/L	429[c,d]	-	481	226	220	229	244	244	260	239	0.064	246
Major anion sum	meq/l	-	-	-	9.5	9.2	9.7	10	10	11	10	0.06	10
Major cation sum	meq/l	-	-	-	10	10	10	11	11	9.0	10	0.075	10
Bicarbonate Alkalinity, as $CaCO_3$	mg/l	-	-	-	190	182	199	207	203	206	199	0.051	196
Carbonate Alkalinity, as $CaCO_3$	mg/l	-	-	-	<1.0	<1.0	<1.0	<1.0	2.8	<1.0	1.4	0.59	7.6
Hydroxide Alkalinity, as $CaCO_3$	mg/l	-	-	-	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1	0	<1.0
Nutrients and Biological Indicators													
Nitrate	mg-N/L	3.0	33	7.4 - 15[c]	**11**[Mn]	**11**[Mn]	**12**[Mn]	**13**[Mn]	**13**[Mn]	**14**[Mn, E]	**13**[Mn]	0.09	**14**[Mn]
Nitrite	mg-N/L	0.020 - 0.080[e]	0.060 - 0.24[e]	-	0.0024	0.0018	0.0035	0.0042	0.0044	0.0033	0.0034	0.3	0.0077
Total ammonia	mg-N/L	2.1	14	-	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.005	0	<0.0050
Total Kjeldahl nitrogen	mg-N/L	-	-	-	<0.050	0.43	<0.050	0.26	<0.25	0.39	0.28	0.54	<0.050
Total phosphorus	mg-P/L	-	-	-	<0.0020	<0.0020	<0.0020	<0.0020	0.0024	<0.0020	0.0021	0.086	0.0024
Orthophosphate	mg-P/L	-	-	-	0.0011	0.0014	<0.0010	0.0014	<0.0010	0.0015	0.0013	0.19	<0.0010
Biochemical oxygen demand	mg/L	-	-	-	-	<2.0	-	-	-	-	2.0	0.45	-
Total Metals													
Aluminum	mg/L	-	-	-	0.0046	0.018	0.017	0.011	0.011	0.044	0.02	0.66	0.01
Antimony	mg/L	0.0090	-	-	0.00011	<0.00010	<0.00010	<0.00010	0.00012	0.00012	0.00011	0.1	0.00013
Arsenic	mg/L	0.0050	0.0050	-	0.00013	0.00014	0.00012	0.0001	0.00011	0.0002	0.00013	0.3	0.00011
Barium	mg/L	1.0	-	-	0.11	0.11	0.11	0.1	0.11	0.11	0.11	0.027	0.11
Beryllium	mg/L	0.00013	-	-	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.00002	0	<0.000020
Bismuth	mg/L	0.0005[f]	-	-	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0	<0.000050
Boron	mg/L	1.2	29[b]	-	<0.010	<0.010	<0.010	<0.010	0.01	0.01	0.01	0	<0.010
Cadmium	mg/L	-	-	-	0.000017	0.000019	0.00002	0.000024	0.000027	0.000037	0.000025	0.28	0.000024
Calcium	mg/L	-	-	-	116	125	123	112	124	124	122	0.045	109
Chromium	mg/L	0.0010[g]	-	-	0.00015	0.00021	0.00016	<0.00010	0.00016	0.00018	0.00016	0.25	0.00011
Cobalt	mg/L	0.0040	0.11	-	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.00010
Copper	mg/L	-	-	-	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	0	<0.00050
Iron	mg/L	0.67 - 2.46[f,h]	1.0	-	<0.010	0.014	0.02	0.017	0.017	0.054	0.024	0.68	0.017
Lead	mg/L	0.013 - 0.020[c]	0.26 - 0.42[c]	-	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	0.000056	0.000051	0.052	<0.000050
Lithium	mg/L	0.1216[f]	-	-	0.021	0.021	0.024	0.023	0.029	0.031	0.025	0.16	0.027
Magnesium	mg/L	-	-	-	51	52	52	53	54	53	53	0.014	50
Manganese	mg/L	1.7 - 2.6[c]	3.2 - 3.4[c]	-	0.0008	0.0012	0.0013	0.0014	0.002	0.004	0.002	0.59	0.0013
Mercury	mg/L	0.000010	-	-	<0.00000050	<0.00000050	<0.00000050	<0.00000050	<0.00000050	0.00000066	0.00000053	0.13	<0.00000050
Molybdenum	mg/L	1.0	2.0	-	0.0011	0.0012	0.0013	0.0012	0.0014	0.0013	0.0013	0.067	0.0014
Nickel	mg/L	0.0053[i]	-	-	0.0006	0.00074	0.00081	0.00081	0.0013	0.0012	0.00098	0.27	0.0012
Potassium	mg/L	-	-	-	1.2	1.2	1.2	1.2	1.3	1.4	1.3	0.072	1.3
Selenium	mg/L	0.0020	-	0.019	**0.051**[Mn, E]	**0.054**[Mn, E]	**0.056**[Mn, E]	**0.058**[Mn, E]	**0.061**[Mn, E]	**0.058**[Mn, E]	**0.057**[Mn, E]	0.045	**0.055**[Mn, E]
Silicon	mg/L	-	-	-	2.4	2.5	2.5	2.4	2.5	2.4	2.4	0.019	2.1
Silver	mg/L	0.0015[c]	0.0030[c]	-	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	0	<0.000010
Sodium	mg/L	-	-	-	4.1	4.1	4.3	4.0	4.4	4.1	4.1	0.038	4.0
Strontium	mg/L	-	-	-	0.2	0.23	0.2	0.19	0.21	0.2	0.21	0.062	0.2
Sulphur	mg/L	-	-	-	86	87	100	94	95	95	94	0.048	88
Thallium	mg/L	0.00080	-	-	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	0	<0.000010
Tin	mg/L	0.3[f]	-	-	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.00010
Titanium	mg/L	0.85[f]	-	-	<0.010	<0.010	<0.010	<0.010	<0.010	0.00075	0.0082	0.51	<0.00030
Uranium	mg/L	0.0085	0.033[b]	-	0.0027	0.0027	0.0025	0.0028	0.0027	0.0029	0.0027	0.052	0.0027
Vanadium	mg/L	0.12[f]	-	-	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	0	<0.00050
Zinc	mg/L	0.12 - 0.19	0.15 - 0.34	-	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.003	0	<0.0030
Dissolved Metals													
Aluminum	mg/L	0.050[h]	0.10[h]	-	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0010	<0.0026	0.34	<0.0010
Antimony	mg/L	-	-	-	<0.00010	0.0001	<0.00010	<0.00010	0.00012	<0.00010	0.0001	0.086	0.00012
Arsenic	mg/L	-	-	-	<0.00010	<0.00010	<0.00010	0.00011	<0.00010	<0.00010	0.0001	0.044	<0.00010
Barium	mg/L	-	-	-	0.11	0.11	0.097	0.1	0.11	0.09	0.1	0.078	0.11
Beryllium	mg/L	-	-	-	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.00002	0	<0.000020
Bismuth	mg/L	-	-	-	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0	<0.000050
Boron	mg/L	-	-	-	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.01	0	<0.010
Cadmium	mg/L	0.00041 - 0.00046[c]	0.0015 - 0.0028[c]	0.00028 - 0.00032[c]	0.000012	0.000013	0.000016	0.000017	0.000018	0.000016	0.000016	0.11	0.000024
Chromium	mg/L	-	-	-	0.00012	0.00011	0.00011	0.00013	0.00014	<0.00010	0.00012	0.14	0.00011
Cobalt	mg/L	-	-	-	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.00010
Copper	mg/L	0.0004 - 0.0032[j]	0.0024 - 0.0178[j]	-	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.0002	0	<0.00020
Iron	mg/L	-	0.35	-	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.01	0	<0.010
Lead	mg/L	-	-	-	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0	<0.000050
Lithium	mg/L	-	-	-	0.023	0.024	0.022	0.022	0.026	0.025	0.024	0.069	0.028
Manganese	mg/L	-	-	-	0.00017	0.00021	0.00021	0.00031	0.00066	0.00059	0.0004	0.54	0.00047
Mercury	mg/L	-	-	-	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.000005	0	<0.0000050
Molybdenum	mg/L	-	-	-	0.0011	0.0012	0.0012	0.0012	0.0013	0.001	0.0012	0.096	0.0013
Nickel	mg/L	-	-	-	0.0006	0.0006	0.00069	0.00091	0.0011	0.00093	0.00084	0.23	0.0012
Selenium	mg/L	-	-	-	0.052	0.061	0.058	0.06	0.06	0.05	0.058	0.076	0.06
Silicon	mg/L	-	-	-	2.4	2.4	2.4	2.2	2.3	1.9	2.2	0.087	2.2
Silver	mg/L	-	-	-	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	0	<0.000010
Strontium	mg/L	2.5[f]	-	-	0.2	0.2	0.21	0.19	0.21	0.16	0.2	0.1	0.2
Sulphur	mg/L	-	-	-	80	85	89	90	86	76	85	0.066	93
Thallium	mg/L	-	-	-	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	0	<0.000010
Tin	mg/L	-	-	-	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.00010
Titanium	mg/L	-	-	-	<0.010	<0.010	<0.010	<0.010	<0.010	<0.00030	<0.00806	0.54	<0.00030
Uranium	mg/L	-	-	-	0.0025	0.0027	0.0025	0.0026	0.0027	0.0024	0.0026	0.062	0.0028
Vanadium	mg/L	-	-	-	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	0	<0.00050
Zinc	mg/L	-	-	-	<0.0010	0.0012	<0.0010	0.0013	<0.0010	<0.0010	0.0011	0.13	0.0016

Parameter	Q2 LC_LC5 C. dubia and P. subcapitata 18-May-21	25-May-21	1-Jun-21	8-Jun-21	15-Jun-21	May 18, 25, June 1, 8 H. azteca Mean	H. azteca CV	May 18, 25, June 1, 8, 15 O. mykiss Mean	O. mykiss CV
Field Measured									
pH	8.2	8.4	8.3	-	8.2	8.3	0.012	8.3	0.012
Specific conductivity	512	587	499	-	546	533	0.09	536	0.074
Temperature	5.7	5.3	6.1	-	8.0	5.7	0.07	6.3	0.19
Dissolved oxygen	**10**[Mn]	**11**[Mn]	**10**[Mn]	-	**9.7**[Mn]	**10**[Mn]	0.056	**10**[Mn]	0.056
Turbidity	28	4.2	8.0	-	4.3	14	0.96	11	1.0
Dissolved oxygen	81	84	82	-	82	82	0.021	82	0.017
Oxidation-reduction potential field	73	181	69	-	64	108	0.59	97	0.58
Conventional Parameters									
pH	8.2	8.3	8.3	8.4	8.4	8.3	0.01	8.3	0.01
Hardness, as $CaCO_3$	245	297	257	291	281	273	0.086	274	0.081
Total alkalinity, as $CaCO_3$	160	158	147	162	158	157	0.04	157	0.037
Total dissolved solids	336	375	319	364	351	349	0.067	349	0.064
Total suspended solids	76	6.6	31	11	11	31	0.94	27	1.1
Total organic carbon	2.6	2.2	1.8	1.2	1.8	2.0	0.31	1.9	0.26
Dissolved organic carbon	2.0	2.2	2.0	1.0	1.3	1.8	0.32	1.7	0.3
Turbidity	11	2.5	7.0	3.5	1.4	6.0	0.58	5.1	0.76
Total acidity	<2.0	<2.0	<2.0	<2.0	<2.0	<2	0	<2	0
Cation - anion balance	7.2	3.0	2.1	0.17	2.3	3.1	0.93	3.0	0.88
Ion balance	87	94	96	100	96	94	0.058	94	0.051
Conductivity	505	567	491	529	526	523	0.055	524	0.055
Oxidation-reduction potential	469	437	438	417	453	440	0.048	443	0.044
Major Ions									
Bicarbonate	-	-	-	-	184	-	-	184	0.45
Bromide	<0.050	0.14	<0.050	<0.050	<0.050	0.072	0.55	0.068	0.59
Calcium	58	69	60	69	67	64	0.087	65	0.081
Carbonate, as $CaCO_3$	-	-	-	-	4.3	-	-	4.3	0.45
Chloride	1.4	2.3	1.3	1.3	1.5	1.6	0.25	1.6	0.25
Fluoride	**0.18**[Mn]	**0.18**[Mn]	**0.15**[Mn]	**0.19**[Mn]	**0.17**[Mn]	**0.18**[Mn]	0.094	**0.17**[Mn]	0.087
Hydroxide	-	-	-	-	<1.0	-	-	1.0	0.45
Magnesium	24	30	26	29	28	27	0.088	27	0.085
Potassium	0.91	1.0	0.89	1.1	1.1	0.98	0.12	1.0	0.1
Sodium	1.7	2.2	1.8	2.0	2.0	1.9	0.093	1.9	0.094
Sulphate	102	127	98	102	110	107	0.11	108	0.11
Major anion sum	5.8	6.4	5.5	5.9	6.0	5.9	0.061	5.9	0.061
Major cation sum	5.0	6.1	5.2	5.9	5.7	5.6	0.086	5.6	0.081
Bicarbonate Alkalinity, as $CaCO_3$	160	156	147	157	151	155	0.032	154	0.034
Carbonate Alkalinity, as $CaCO_3$	<1.0	1.4	<1.0	5.8	7.2	2.3	1.1	3.3	0.91
Hydroxide Alkalinity, as $CaCO_3$	<1.0	<1.0	<1.0	<1.0	<1.0	<1	0	<1	0
Nutrients and Biological Indicators									
Nitrate	**5.7**[Mn]	**8.0**[Mn]	**6.1**[Mn]	**7.5**[Mn]	**7.1**[Mn]	**6.8**[Mn]	0.15	**6.9**[Mn]	0.14
Nitrite	0.0026	0.012	0.0023	<0.0010	0.0033	0.0046	1.1	0.0043	1.1
Total ammonia	0.0098	0.019	<0.0050	<0.0050	0.0056	0.0096	0.62	0.0088	0.66
Total Kjeldahl nitrogen	0.65	<0.050	0.79	0.36	0.52	0.46	0.62	0.47	0.6
Total phosphorus	0.12	0.0093	0.018	0.012	0.014	0.041	1.2	0.035	1.4
Orthophosphate	<0.0010	<0.0010	<0.0010	0.0019	<0.0010	0.0012	0.4	0.0012	0.34
Biochemical oxygen demand	-	-	-	-	-	-	-	-	-
Total Metals									
Aluminum	0.54	0.11	0.19	0.097	0.11	0.23	0.81	0.21	0.89
Antimony	0.00016	0.00014	0.00014	0.00016	0.00015	0.00015	0.073	0.00015	0.067
Arsenic	0.00051	0.00018	0.00027	0.00015	0.00021	0.00028	0.55	0.00026	0.55
Barium	0.079	0.069	0.065	0.062	0.066	0.069	0.1	0.068	0.098
Beryllium	0.000056	<0.000020	<0.000020	<0.000020	<0.000020	0.000029	0.56	0.000027	0.59
Bismuth	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0	<0.00005	0
Boron	<0.010	<0.010	<0.010	<0.010	<0.010	<0.01	0	<0.01	0
Cadmium	0.0002	0.000057	0.000099	0.000064	0.000058	0.0001	0.56	0.000095	0.63
Calcium	67	69	63	70	71	67	0.044	68	0.046
Chromium	**0.0010**[Mn]	0.00032	0.00046	0.00024	0.00032	0.00051	0.63	0.00047	0.66
Cobalt	0.00059	0.00011	0.00021	<0.00010	0.00012	0.00025	0.84	0.00023	0.92
Copper	0.0014	<0.00050	0.00064	<0.00050	<0.00050	0.00077	0.53	0.00072	0.57
Iron	0.9	0.16	0.34	0.11	0.17	0.38	0.9	0.34	0.97
Lead	0.00074	0.0001	0.00025	0.000093	0.00013	0.0003	0.94	0.00026	1.0
Lithium	0.015	0.018	0.015	0.021	0.02	0.017	0.17	0.018	0.16
Magnesium	26	29	26	29	28	27	0.059	27	0.056
Manganese	0.07	0.0088	0.021	0.0092	0.012	0.027	0.97	0.024	1.1
Mercury	0.0000053	0.000001	0.0000015	-	0.0000011	0.0000026	0.84	0.0000022	0.92
Molybdenum	0.00096	0.0012	0.0011	0.0012	0.0012	0.0011	0.096	0.0011	0.096
Nickel	0.0038	0.0018	0.0023	0.002	0.0018	0.0025	0.33	0.0023	0.37
Potassium	1.1	1.1	0.99	1.1	1.1	1.1	0.051	1.1	0.058
Selenium	**0.025**[Mn, E]	**0.031**[Mn, E]	**0.026**[Mn, E]	**0.031**[Mn, E]	**0.029**[Mn, E]	**0.028**[Mn, E]	0.11	**0.028**[Mn, E]	0.098
Silicon	2.8	2.0	2.1	2.1	2.1	2.3	0.15	2.2	0.15
Silver	0.000016	<0.000010	<0.000010	<0.000010	<0.000010	0.000012	0.23	0.000011	0.24
Sodium	1.7	2.3	1.8	2.1	2.1	2.0	0.11	2.0	0.11
Strontium	0.12	0.12	0.11	0.11	0.12	0.12	0.043	0.12	0.05
Sulphur	38	42	37	39	39	39	0.05	39	0.05
Thallium	0.000028	<0.000010	0.000011	<0.000010	<0.000010	0.000015	0.54	0.000014	0.58
Tin	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.0001	0
Titanium	0.008	0.0014	0.0028	0.0012	0.0015	0.0033	0.87	0.003	0.97
Uranium	0.0015	0.0019	0.0016	0.0018	0.0018	0.0017	0.079	0.0017	0.082
Vanadium	0.0021	0.00062	0.00088	<0.00050	0.00069	0.001	0.67	0.00097	0.69
Zinc	0.012	<0.0030	0.0064	0.0034	0.0042	0.0061	0.6	0.0057	0.62
Dissolved Metals									
Aluminum	0.0013	0.0011	<0.0030	0.0016	0.0015	0.0018	0.43	0.0017	0.44
Antimony	0.00012	0.00013	0.00014	0.00014	0.00012	0.00013	0.068	0.00013	0.077
Arsenic	0.00012	0.0001	0.00011	0.00012	<0.00010	0.00011	0.08	0.00011	0.091
Barium	0.055	0.063	0.054	0.059	0.06	0.058	0.061	0.058	0.061
Beryllium	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.00002	0	<0.00002	0
Bismuth	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0	<0.00005	0
Boron	<0.010	<0.010	<0.010	<0.010	<0.010	<0.01	0	<0.01	0
Cadmium	0.000024	0.000029	0.000028	0.000038	0.000029	0.00003	0.22	0.00003	0.18
Chromium	<0.00010	<0.00010	0.00013	0.00012	0.00014	0.00011	0.12	0.00012	0.15
Cobalt	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.0001	0
Copper	0.00021	0.0002	0.00022	0.00024	0.0002	0.00022	0.082	0.00021	0.078
Iron	<0.010	<0.010	<0.010	<0.010	<0.010	<0.01	0	<0.01	0
Lead	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0	<0.00005	0
Lithium	0.014	0.019	0.015	0.021	0.019	0.017	0.19	0.017	0.17
Manganese	0.0014	0.00086	0.00078	0.00071	0.00068	0.00094	0.31	0.00089	0.34
Mercury	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.000005	0	<0.000005	0
Molybdenum	0.00098	0.0011	0.001	0.0012	0.0011	0.0011	0.08	0.0011	0.067
Nickel	0.0011	0.0014	0.0012	0.0018	0.0013	0.0014	0.22	0.0014	0.18
Selenium	0.025	0.031	0.024	0.029	0.027	0.027	0.1	0.027	0.098
Silicon	1.8	1.8	1.7	1.9	1.7	1.8	0.045	1.8	0.049
Silver	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	0	<0.00001	0
Strontium	0.11	0.12	0.11	0.11	0.12	0.11	0.058	0.11	0.062
Sulphur	37	42	35	36	37	37	0.079	37	0.078
Thallium	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	0	<0.00001	0
Tin	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.0001	0
Titanium	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.0003	0	<0.0003	0
Uranium	0.0014	0.0016	0.0015	0.0017	0.0018	0.0016	0.083	0.0016	0.10
Vanadium	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	0	<0.0005	0
Zinc	0.0025	0.0028	0.0025	0.0024	0.0022	0.0026	0.064	0.0025	0.087

Parameter	Q3 LC_LC5 C. dubia and P. subcapitata 10-Aug-21	17-Aug-21	24-Aug-21	31-Aug-21	7-Sep-21	Aug 10, 17, 24, 31 H. azteca Mean	H. azteca CV	Aug 10, 17, 24, 31 Sept 7 P. promelas Mean	P. promelas CV	Q4 C. dubia and P. subcapitata 12-Oct-21	19-Oct-21	26-Oct-21	2-Nov-21
Field Measured													
pH	8.3	8.2	8.2	8.3	8.4	8.3	0.0066	8.3	0.01	8.7	8.2	8.2	8.3
Specific conductivity	747	659	700	741	730	712	0.053	715	0.051	799	771	807	832
Temperature	11	9.9	7.7	9.0	9.8	9.5	0.14	9.5	0.14	2.9	5.0	4.6	1.7
Dissolved oxygen	**9.3**[Mn]	**9.7**[Mn]	**10**[Mn]	**9.9**[Mn]	**10**[Mn]	**9.7**[Mn]	0.029	**9.8**[Mn]	0.03	12	12	11	12
Turbidity	0	9.7	0.9	0.8	0.01	2.9	1.4	2.3	1.8	0.5	0.42	0.67	1.8
Dissolved oxygen	85	86	84	86	90	85	0.008	86	0.024	87	91	86	89
Oxidation-reduction potential field	101	245	97	253	216	174	0.48	182	0.42	297	231	122	227
Conventional Parameters													
pH	8.4	8.4	8.2	8.3	8.4	8.3	0.01	8.3	0.011	8.4	8.6	8.4	8.3
Hardness, as $CaCO_3$	395	343	372	380	370	373	0.052	372	0.051	432	430	444	443
Total alkalinity, as $CaCO_3$	192	176	189	164	198	180	0.074	184	0.074	213	199	195	200
Total dissolved solids	489	431	496	485	540	475	0.055	488	0.08	576	572	576	567
Total suspended solids	<1.0	9.9	1.3	<1.0	<1.0	3.3	1.2	2.8	1.4	2.0	1.2	<1.0	1.3
Total organic carbon	2.6	1.7	0.9	4.3	1.6	2.4	0.64	2.2	0.59	-	2.0	0.86	1.1
Dissolved organic carbon	3.5	0.98	1.1	1.2	1.3	1.7	0.63	1.6	0.66	0.94	2.6	1.0	0.97
Turbidity	0.2	9.6	0.51	0.18	0.29	2.6	1.6	2.2	1.9	0.19	0.12	<0.10	0.38
Total acidity	<2.0	<2.0	<2.0	<2.0	<2.0	<2	0	<2	0	<2.0	<2.0	<2.0	<2.0
Cation - anion balance	1.2	2.3	0.72	0.58	5.4	1.2	0.61	2.0	0.99	1.1	3.5	1.5	3.5
Ion balance	98	96	99	101	90	98	0.024	97	0.044	98	93	97	93
Conductivity	726	628	654	696	744	676	0.057	690	0.07	779	810	834	830
Oxidation-reduction potential	486	378	508	260	476	408	0.29	422	0.24	453	434	406	483
Major Ions													
Bicarbonate	220	200	230	196	222	212	0.074	214	0.069	245	221	224	245
Bromide	<0.050	<0.050	<0.050	<0.050	<0.050	<0.05	0	<0.05	0	<0.050	<0.050	<0.050	<0.050
Calcium	93	81	91	88	84	88	0.053	87	0.058	99	94	104	105
Carbonate, as $CaCO_3$	7.2	7.6	<1.0	2.2	9.2	4.5	0.69	5.4	0.66	7.7	10	7.0	<1.0
Chloride	3.8	3.4	3.1	3.2	3.5	3.4	0.087	3.4	0.083	3.9	5.1	5.0	5.8
Fluoride	**0.21**[Mn]	0.12	**0.22**[Mn]	**0.17**[Mn]	**0.15**[Mn]	**0.18**[Mn]	0.23	**0.17**[Mn]	0.25	**0.15**[Mn]	**0.22**[Mn]	**0.20**[Mn]	**0.23**[Mn]
Hydroxide	<1.0	<1.0	<1.0	<1.0	<1.0	<1	0	<1	0	<1.0	<1.0	<1.0	<1.0
Magnesium	40	35	35	39	39	37	0.063	37	0.062	45	47	45	44
Potassium	1.3	1.3	1.2	1.3	1.3	1.3	0.046	1.3	0.047	1.3	1.3	1.3	1.2
Sodium	3.4	3.1	3.1	3.3	3.4	3.2	0.039	3.3	0.043	4.0	4.2	4.1	3.8
Sulphate	173	151	155	175	176	164	0.072	166	0.072	190	216	216	225
Major anion sum	8.3	7.4	7.7	7.7	8.4	7.8	0.042	7.9	0.057	9.0	9.4	9.4	9.7
Major cation sum	8.1	7.0	7.6	7.8	7.6	7.6	0.051	7.6	0.05	8.9	8.8	9.1	9.1
Bicarbonate Alkalinity, as $CaCO_3$	180	164	189	161	182	174	0.074	175	0.069	200	181	184	200
Carbonate Alkalinity, as $CaCO_3$	12	13	<1.0	3.6	15	7.3	0.73	8.9	0.7	13	17	12	<1.0
Hydroxide Alkalinity, as $CaCO_3$	<1.0	<1.0	<1.0	<1.0	<1.0	<1	0	<1	0	<1.0	<1.0	<1.0	<1.0
Nutrients and Biological Indicators													
Nitrate	**10**[Mn]	**8.4**[Mn]	**8.6**[Mn]	**9.3**[Mn]	**10**[Mn]	**9.1**[Mn]	0.07	**9.3**[Mn]	0.081	**10**[Mn]	**11**[Mn]	**11**[Mn]	**12**[Mn]
Nitrite	0.0044	0.0036	<0.0010	0.0051	0.0017	0.0035	0.48	0.0032	0.55	0.0032	0.0033	0.0017	0.0041
Total ammonia	0.0057	0.024	<0.0050	0.011	0.014	0.011	0.67	0.012	0.64	<0.0050	0.0076	0.0051	0.0052
Total Kjeldahl nitrogen	0.37	0.55	<0.050	0.32	0.086	0.32	0.55	0.28	0.75	0.3	<0.050	0.37	0.34
Total phosphorus	0.0091	0.013	0.0026	0.0023	<0.0020	0.0069	0.74	0.0059	0.87	0.0063	<0.0020	<0.0020	0.016
Orthophosphate	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.001	0	<0.001	0	<0.0010	0.0013	0.0012	0.0015
Biochemical oxygen demand	-	<2.0	<2.0	<2.0	-	2.0	0.45	2.0	0.55	-	<2.0	-	-
Total Metals													
Aluminum	<0.0030	0.078	0.023	0.0084	0.0055	0.028	1.1	0.023	1.3	0.046	<0.0030	<0.0030	0.014
Antimony	0.00014	0.00012	0.00013	0.00015	0.00013	0.00014	0.097	0.00013	0.085	0.00014	0.00011	0.00012	0.00014
Arsenic	0.00012	0.00018	0.00015	0.00012	0.00012	0.00014	0.19	0.00014	0.19	<0.00010	0.0001	0.00013	0.00012
Barium	0.096	0.081	0.084	0.086	0.097	0.087	0.063	0.089	0.08	0.1	0.10	0.1	0.1
Beryllium	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.00002	0	<0.00002	0	<0.000020	<0.000020	<0.000020	<0.000020
Bismuth	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0	<0.00005	0	<0.000050	<0.000050	<0.000050	<0.000050
Boron	0.011	0.01	0.011	0.012	0.011	0.011	0.076	0.011	0.064	0.011	<0.010	<0.010	0.01
Cadmium	0.000038	0.000074	0.000041	0.000041	0.000028	0.000048	0.31	0.000044	0.39	0.000063	0.000027	0.000022	0.000062
Calcium	94	82	83	92	93	87	0.066	89	0.068	109	95	101	106
Chromium	0.00013	0.00027	0.00015	0.00011	0.00011	0.00017	0.41	0.00015	0.43	0.0002	0.00013	0.00012	0.00015
Cobalt	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.0001	0	<0.00010	<0.00010	<0.00010	<0.00010
Copper	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	0	<0.0005	0	<0.00050	<0.00050	<0.00050	<0.00050
Iron	<0.010	0.1	0.028	0.018	<0.010	0.039	0.95	0.033	1.1	0.079	<0.010	<0.010	0.044
Lead	<0.000050	0.00012	<0.000050	<0.000050	<0.000050	0.000066	0.44	0.000063	0.46	0.000064	<0.000050	<0.000050	<0.000050
Lithium	0.026	0.022	0.023	0.028	0.025	0.025	0.1	0.025	0.091	0.03	0.027	0.025	0.031
Magnesium	39	35	36	41	42	38	0.078	39	0.083	42	44	46	45
Manganese	0.00071	0.0063	0.002	0.0021	0.00066	0.0028	0.77	0.0024	0.99	0.0057	0.00051	0.00037	0.0051
Mercury	<0.00000050	0.0000015	<0.00000050	<0.00000050	<0.00000050	0.00000076	0.61	0.00000071	0.66	<0.00000050	<0.00000050	<0.00000050	<0.00000050
Molybdenum	0.0014	0.0013	0.0012	0.0013	0.0014	0.0013	0.05	0.0013	0.051	0.0014	0.0013	0.0013	0.0014
Nickel	0.0012	0.0016	0.0015	0.0012	0.0013	0.0014	0.15	0.0014	0.15	0.0014	0.001	0.0011	0.0014
Potassium	1.3	1.3	1.2	1.3	1.3	1.3	0.017	1.3	0.016	1.4	1.2	1.3	1.3
Selenium	**0.040**[Mn, E]	**0.033**[Mn, E]	**0.037**[Mn, E]	**0.040**[Mn, E]	**0.044**[Mn, E]	**0.038**[Mn, E]	0.082	**0.039**[Mn, E]	0.11	**0.044**[Mn, E]	**0.047**[Mn, E]	**0.046**[Mn, E]	**0.049**[Mn, E]
Silicon	2.3	2.4	2.5	2.4	2.2	2.4	0.023	2.4	0.04	2.5	2.2	2.3	2.4
Silver	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	0	<0.00001	0	<0.000010	<0.000010	<0.000010	<0.000010
Sodium	3.3	3.0	3.0	3.6	3.5	3.2	0.083	3.3	0.077	4.1	3.9	4.0	4.3
Strontium	0.17	0.15	0.15	0.17	0.17	0.16	0.064	0.16	0.06	0.19	0.18	0.19	0.19
Sulphur	65	57	57	69	71	62	0.096	64	0.1	78	79	78	76
Thallium	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	0	<0.00001	0	<0.000010	<0.000010	<0.000010	<0.000010
Tin	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.0001	0	<0.00010	<0.00010	<0.00010	<0.00010
Titanium	<0.00030	<0.0012	0.00058	<0.00030	<0.00030	0.0006	0.66	0.00054	0.73	<0.00090	<0.00030	<0.00030	<0.00030
Uranium	0.0022	0.0018	0.0021	0.0024	0.0024	0.0021	0.11	0.0022	0.11	0.0026	0.0023	0.0027	0.0027
Vanadium	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	0	<0.0005	0	<0.00050	<0.00050	<0.00050	<0.00050
Zinc	<0.0030	0.0039	<0.0030	<0.0030	<0.0030	0.0032	0.12	0.0032	0.13	0.0036	<0.0030	<0.0030	<0.0030
Dissolved Metals													
Aluminum	0.0011	0.0017	0.0018	<0.0010	<0.0010	0.0014	0.28	0.0013	0.3	0.001	0.0019	<0.0010	<0.0010
Antimony	0.00012	0.00013	0.00014	0.00013	0.00012	0.00013	0.054	0.00013	0.065	0.00011	0.00011	0.00012	0.00011
Arsenic	0.0001	<0.00010	<0.00010	<0.00010	<0.00010	0.0001	0	0.0001	0	<0.00010	<0.00010	<0.00010	<0.00010
Barium	0.099	0.083	0.082	0.086	0.088	0.088	0.077	0.088	0.076	0.097	0.099	0.097	0.096
Beryllium	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.00002	0	<0.00002	0	<0.000020	<0.000020	<0.000020	<0.000020
Bismuth	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0	<0.00005	0	<0.000050	<0.000050	<0.000050	<0.000050
Boron	0.012	0.01	0.01	0.011	0.01	0.011	0.078	0.011	0.084	0.01	<0.010	0.01	<0.010
Cadmium	0.000031	0.000018	0.000029	0.000027	0.000025	0.000026	0.19	0.000026	0.19	0.000018	0.000024	0.000017	0.000021
Chromium	0.00012	0.00013	<0.00010	0.00012	<0.00010	0.00012	0.093	0.00011	0.12	0.00019	0.00011	<0.00040	0.00017
Cobalt	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.0001	0	<0.00010	<0.00010	<0.00010	<0.00010
Copper	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.0002	0	<0.0002	0	0.00035	<0.00020	<0.00020	<0.00020
Iron	<0.010	<0.010	<0.010	<0.010	<0.010	<0.01	0	<0.01	0	<0.010	<0.010	<0.010	<0.010
Lead	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0	<0.00005	0	<0.000050	<0.000050	<0.000050	<0.000050
Lithium	0.027	0.022	0.024	0.027	0.025	0.025	0.09	0.025	0.08	0.028	0.027	0.024	0.028
Manganese	0.00029	0.0014	0.00036	0.00036	0.00029	0.00061	0.79	0.00054	0.9	0.00037	0.00031	0.00027	0.00044
Mercury	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.000005	0	<0.000005	0	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Molybdenum	0.0014	0.0012	0.0013	0.0014	0.0012	0.0013	0.066	0.0013	0.065	0.0014	0.0014	0.0013	0.0014
Nickel	0.0012	0.0012	0.0012	0.0011	0.0011	0.0012	0.043	0.0012	0.046	0.0012	0.00075	0.0011	0.001
Selenium	0.042	0.033	0.035	0.039	0.043	0.037	0.099	0.038	0.11	0.043	0.042	0.048	0.046
Silicon	2.3	2.1	2.1	2.3	2.1	2.2	0.044	2.2	0.044	2.3	2.0	2.1	2.1
Silver	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	0	<0.00001	0	<0.000010	<0.000010	<0.000010	<0.000010
Strontium	0.17	0.15	0.16	0.17	0.15	0.16	0.046	0.16	0.052	0.18	0.18	0.18	0.18
Sulphur	63	50	53	66	66	58	0.13	60	0.13	73	74	80	71
Thallium	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	0	<0.00001	0	<0.000010	<0.000010	<0.000010	<0.000010
Tin	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.0001	0	<0.00010	<0.00010	<0.00010	<0.00010
Titanium	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.0003	0	<0.0003	0	<0.00030	<0.00030	<0.00030	<0.00030
Uranium	0.0022	0.002	0.0022	0.0023	0.0023	0.0022	0.066	0.0022	0.064	0.0026	0.0027	0.0027	0.0025
Vanadium	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	0	<0.0005	0	<0.00050	<0.00050	<0.00050	<0.00050
Zinc	0.0014	0.002	0.0031	0.0011	0.0014	0.0019	0.44	0.0018	0.44	0.0025	0.0015	0.001	0.001

(a) = guideline is a minimum value, unless the background concentration or value is lower.
(b) = guideline is adopted from CCME Canadian Environmental Quality Guidelines (CCME, 1999).
(c) = guideline is hardness dependent. The guideline range shown is based on the hardness range observed in the dataset (245 to 536 mg/L). The guideline is calculated based on the individual hardness value for each sample.

(d) = for some samples, water hardness was greater than 250 mg/L. At this hardness, no BC ENV water quality guideline has been established for sulphate; however, the observed data were screened against the guideline for very hard water (i.e., 429 mg/L) for comparative purposes.
(e) = guideline is chloride dependent. The guideline range shown is based on the chloride concentration range observed in the dataset (1.330 to 6.270 mg/L). The guideline is calculated based on the individual chloride concentration in each sample.
(f) = guideline is adopted from the ECCC PNECs (ECCC, 2018) or draft FEQGs (ECCC, 2017).
(g) = guideline is for chromium VI.
(h) = guideline is pH dependent. The guideline range shown is based on the pH range observed in the dataset (8.2 to 8.7). The guideline is calculated based on the individual pH for each sample.
(i) = guideline is a level 1 interim screening value.
(j) = dissolved copper guideline was calculated using the simplified Biotic Ligand Midel (BC ENV, 2019). Where values were missing, the temporally nearest value from the same location was taken.
(Mn) = concentration is higher than the 30-day mean BC ENV guideline or outside the recommended pH, DO or total alkalinity range.
(Mx) = concentration is higher than the maximum BC ENV guideline or outside the recommended pH, DO or total alkalinity range.
(E) = concentration is higher than the EVWQP benchmarks guideline.
Bolded concentrations are higher than water quality guidelines.
Shaded concentrations are higher than the EVWQP benchmark (e.g., for nitrate, total selenium, dissolved cadmium or sulphate).
Water quality data and guidelines shown in this table were rounded to reflect laboratory or field instrument precision after comparisons to guidelines. Therefore, values slightly above guidelines may be displayed as being equal to the guidelines and identified as exceedances. Concentrations equal to the guideline values were not identified as exceedances.
Concentrations were screened against available Working and Approved British Columbia Ministry of Environment and Climate Change Strategy (BC ENV) Water Quality Guidelines for the Protection of Aquatic Life; Accessed January 2020 from: https://www2.gov.bc.ca/gov/content/environment/air-land-water/water/water-quality/water-quality-guidelines.
- = no guideline or no data
BC ENV = British Columbia Ministry of Environment & Climate Change Strategy; EVWQP = Elk Valley Water Quality Plan guidelines; *C. dubia* = *Ceriodaphnia dubia* ; *P. subcapitata* = *Pseudokirchneriella subcapitata* ; *H. azteca* = *Hyallela azteca* ; *P. promelas* = *Pimephales promelas* ; *O. mykiss* = *Oncorhynchus mykiss* ; CV = coefficient of variation; ∑ = sum of; WQGs = Water Quality Guidelines; CaCO3 = calcium carbonate; mg/L = milligrams per litre; µS/cm = microsiemens per centimeter; NTU = nephelometric turbidity units; meq/L = milliequivalents per litre; mg-N/L = milligrams of Nitrogen per litre; mg=P/L = milligrams of Phosphorus per litre.
BC ENV (B.C. Ministry of Climate Chande Strategy). 2019. Copper Water Quality guideline for the Protection of Aquatic Life-Technical Report. Water Quality Guideline Series, WQG-03-1. Prov. B.C., Victoria B.C.

Parameter	Unit	Guidelines for the protection of:			LC_LC5				
		Aquatic Life		EVWQP Benchmarks	9-Nov-21	Oct 12, 19, 26, Nov 2 *H. azteca*		Oct 12, 19, 26, Nov 2, 9 *O. mykiss*	
		30-day mean	Maximum			Mean	CV	Mean	CV
Field Measured									
pH	-	6.5 - 9.0	6.5 - 9.0	-	8.3	8.4	0.025	8.3	0.025
Specific conductivity	µS/cm at 25 C	-	-	-	861	802	0.032	814	0.042
Temperature	°C	-	-	-	1.2	3.6	0.44	3.1	0.55
Dissolved oxygen	mg/L	11	9.0	-	12	12	0.049	12	0.048
Turbidity	NTU	-	-	-	0.67	0.86	0.84	0.82	0.7
Dissolved oxygen	%	-	-	-	880	88	0.02	247	1.4
Oxidation-reduction potential field	mv	-	-	-	158	219	0.28	207	0.33
Conventional Parameters									
pH	-	6.5 - 9.0	6.5 - 9.0	-	8.3	8.4	0.015	8.4	0.015
Hardness, as $CaCO_3$	mg/L	-	-	-	450	437	0.016	440	0.019
Total alkalinity, as $CaCO_3$	mg/L	20[a]	-	-	221	202	0.034	206	0.053
Total dissolved solids	mg/L	-	-	-	576	573	0.0079	573	0.0069
Total suspended solids	mg/L	-	-	-	<1.0	1.4	0.28	1.3	0.32
Total organic carbon	mg/L	-	-	-	0.99	1.3	0.54	1.2	0.58
Dissolved organic carbon	mg/L	-	-	-	1.1	1.4	0.52	1.3	0.54
Turbidity	NTU	-	-	-	0.12	0.2	0.7	0.18	0.64
Total acidity	mg/L	-	-	-	<2.0	<2	0	<2	0
Cation - anion balance	%	-	-	-	5.1	2.4	0.52	2.9	0.56
Ion balance	%	-	-	-	90	95	0.024	94	0.033
Conductivity	µS/cm	-	-	-	855	813	0.028	822	0.035
Oxidation-reduction potential	mv	-	-	-	450	444	0.074	445	0.063
Major Ions									
Bicarbonate	mg/L	-	-	-	215	234	0.053	230	0.061
Bromide	mg/L	-	-	-	<0.050	<0.05	0	<0.05	0
Calcium	mg/L	-	-	-	101	101	0.048	101	0.043
Carbonate, as $CaCO_3$	mg/L	-	-	-	6.0	6.5	0.65	6.4	0.53
Chloride	mg/L	150	600	-	5.5	4.9	0.16	5.0	0.14
Fluoride	mg/L	0.12[b]	1.7 - 2.0[c]	-	**0.20**[Mn]	**0.20**[Mn]	0.17	**0.20**[Mn]	0.15
Hydroxide	mg/L	-	-	-	<1.0	<1	0	<1	0
Magnesium	mg/L	-	-	-	48	45	0.031	46	0.039
Potassium	mg/L	-	-	-	1.3	1.3	0.032	1.3	0.031
Sodium	mg/L	-	-	-	4.5	4.0	0.044	4.1	0.059
Sulphate	mg/L	429[c,d]	-	481	228	212	0.068	215	0.07
Major anion sum	meq/l	-	-	-	10	9.4	0.029	9.5	0.046
Major cation sum	meq/l	-	-	-	9.2	8.9	0.015	9.0	0.019
Bicarbonate Alkalinity, as $CaCO_3$	mg/l	-	-	-	176	191	0.05	188	0.059
Carbonate Alkalinity, as $CaCO_3$	mg/l	-	-	-	10	11	0.69	11	0.57
Hydroxide Alkalinity, as $CaCO_3$	mg/l	-	-	-	<1.0	<1	0	<1	0
Nutrients and Biological Indicators									
Nitrate	mg-N/L	3.0	33	7.4 - 15[c,i]	**12**[Mn]	**11**[Mn]	0.076	**11**[Mn]	0.075
Nitrite	mg-N/L	0.020 - 0.080[c,e]	0.060 - 0.24[e]	-	0.0027	0.0031	0.32	0.003	0.29
Total ammonia	mg-N/L	2.1	14	-	<0.0050	0.0057	0.19	0.0056	0.2
Total Kjeldahl nitrogen	mg-N/L	-	-	-	<0.050	0.26	0.49	0.22	0.71
Total phosphorus	mg-P/L	-	-	-	<0.0020	0.0067	1.1	0.0057	1.1
Orthophosphate	mg-P/L	-	-	-	0.0012	0.0013	0.17	0.0012	0.15
Biochemical oxygen demand	mg/L	-	-	-	-	2.0	0.45	2.0	0.45
Total Metals									
Aluminum	mg/L	-	-	-	<0.0030	0.017	1.1	0.014	1.4
Antimony	mg/L	0.0090	-	-	0.00013	0.00013	0.11	0.00013	0.1
Arsenic	mg/L	0.0050	0.0050	-	0.00011	0.00011	0.12	0.00011	0.12
Barium	mg/L	1.0	-	-	0.11	0.1	0.012	0.1	0.021
Beryllium	mg/L	0.00013	-	-	<0.000020	<0.00002	0	<0.00002	0
Bismuth	mg/L	0.0005[f]	-	-	<0.000050	<0.00005	0	<0.00005	0
Boron	mg/L	1.2	29[b]	-	<0.010	0.01	0.044	0.01	0.044
Cadmium	mg/L	-	-	-	0.000012	0.000043	0.48	0.000037	0.64
Calcium	mg/L	-	-	-	106	103	0.052	103	0.052
Chromium	mg/L	0.0010[g]	-	-	0.00014	0.00015	0.21	0.00015	0.21
Cobalt	mg/L	0.0040	0.11	-	<0.00010	<0.0001	0	<0.0001	0
Copper	mg/L	-	-	-	<0.00050	<0.0005	0	<0.0005	0
Iron	mg/L	0.67 - 2.46[f,h]	1.0	-	<0.010	0.036	0.81	0.031	1.0
Lead	mg/L	0.013 - 0.020[c]	0.26 - 0.42[c]	-	<0.000050	0.000054	0.12	0.000053	0.12
Lithium	mg/L	0.1216[f]	-	-	0.029	0.028	0.092	0.028	0.08
Magnesium	mg/L	-	-	-	47	44	0.033	45	0.046
Manganese	mg/L	1.7 - 2.6[c]	3.2 - 3.4[c]	-	0.00024	0.0029	0.92	0.0024	1.2
Mercury	mg/L	0.000010	-	-	<0.00000050	<0.0000005	0	<0.0000005	0
Molybdenum	mg/L	1.0	2.0	-	0.0015	0.0014	0.017	0.0014	0.045
Nickel	mg/L	0.0053[g]	-	-	0.0011	0.0012	0.15	0.0012	0.15
Potassium	mg/L	-	-	-	1.4	1.3	0.042	1.3	0.044
Selenium	mg/L	0.0020	-	0.019	**0.047**[Mn, E]	**0.047**[Mn, E]	0.046	**0.047**[Mn, E]	0.039
Silicon	mg/L	-	-	-	2.2	2.3	0.047	2.3	0.053
Silver	mg/L	0.0015[c]	0.0030[c]	-	<0.000010	<0.00001	0	<0.00001	0
Sodium	mg/L	-	-	-	4.1	4.1	0.045	4.1	0.038
Strontium	mg/L	-	-	-	0.2	0.19	0.038	0.19	0.047
Sulphur	mg/L	-	-	-	79	78	0.022	78	0.019
Thallium	mg/L	0.00080	-	-	<0.000010	<0.00001	0	<0.00001	0
Tin	mg/L	0.73[f]	-	-	<0.00010	<0.0001	0	<0.0001	0
Titanium	mg/L	0.85[f]	-	-	<0.00030	<0.00045	0.6	<0.00042	0.64
Uranium	mg/L	0.0085	0.033[b]	-	0.0027	0.0026	0.058	0.0026	0.062
Vanadium	mg/L	0.12[f]		-	<0.00050	<0.0005	0	<0.0005	0
Zinc	mg/L	0.12 - 0.19	0.15 - 0.34	-	<0.0030	0.0032	0.085	0.0031	0.086
Dissolved Metals									
Aluminum	mg/L	0.050[b,j]	0.10[b,j]	-	<0.0010	0.0012	0.33	0.0012	0.34
Antimony	mg/L	-	-	-	0.00012	0.00011	0.04	0.00011	0.048
Arsenic	mg/L	-	-	-	0.00011	<0.0001	0	0.0001	0.044
Barium	mg/L	-	-	-	0.1	0.097	0.011	0.099	0.032
Beryllium	mg/L	-	-	-	<0.000020	<0.00002	0	<0.00002	0
Bismuth	mg/L	-	-	-	<0.000050	<0.00005	0	<0.00005	0
Boron	mg/L	-	-	-	<0.010	0.01	0	0.01	0
Cadmium	mg/L	0.00041 - 0.00046[b,j]	0.0015 - 0.0028[b,j]	0.00028 - 0.00032[b,j]	0.000016	0.00002	0.13	0.000019	0.16
Chromium	mg/L	-	-	-	0.00012	0.00022	0.51	0.0002	0.59
Cobalt	mg/L	-	-	-	<0.00010	<0.0001	0	<0.0001	0
Copper	mg/L	0.0004 - 0.0032[j]	0.0024 - 0.0178[j]	-	<0.00020	0.00024	0.28	0.00023	0.29
Iron	mg/L	-	0.35	-	<0.010	<0.01	0	<0.01	0
Lead	mg/L	-	-	-	<0.000050	<0.00005	0	<0.00005	0
Lithium	mg/L	-	-	-	0.027	0.027	0.056	0.027	0.055
Manganese	mg/L	-	-	-	0.00027	0.00035	0.22	0.00033	0.22
Mercury	mg/L	-	-	-	<0.0000050	<0.0000005	0	<0.0000005	0
Molybdenum	mg/L	-	-	-	0.0015	0.0014	0.011	0.0014	0.032
Nickel	mg/L	-	-	-	0.0011	0.001	0.18	0.001	0.17
Selenium	mg/L	-	-	-	0.054	0.045	0.058	0.047	0.1
Silicon	mg/L	-	-	-	2.2	2.1	0.042	2.1	0.042
Silver	mg/L	-	-	-	<0.000010	<0.00001	0	<0.00001	0
Strontium	mg/L	2.5[f]	-	-	0.19	0.18	0.018	0.18	0.023
Sulphur	mg/L	-	-	-	82	75	0.05	76	0.061
Thallium	mg/L	-	-	-	<0.000010	<0.00001	0	<0.00001	0
Tin	mg/L	-	-	-	<0.00010	<0.0001	0	<0.0001	0
Titanium	mg/L	-	-	-	<0.00030	<0.0003	0	<0.0003	0
Uranium	mg/L	-	-	-	0.0026	0.0026	0.036	0.0026	0.032
Vanadium	mg/L	-	-	-	<0.00050	<0.0005	0	<0.0005	0
Zinc	mg/L	-	-	-	<0.0010	0.0015	0.43	0.0014	0.47

(a) = guideline is a minimum value, unless the background concentration or value is lower.
(b) = guideline is adopted from CCME Canadian Environmental Quality Guidelines (CCME, 1999).
(c) = guideline is hardness dependent. The guideline range shown is based on the hardness range observed in the dataset (245 to 536 mg/L). The guideline is calculated based on the individual hardness value for each sample.

(d) = for some samples, water hardness was greater than 250 mg/L. At this hardness, no BC ENV water quality guideline has been established for sulphate; however, the observed data were screened against the guideline for very hard water (i.e., 429 mg/L) for comparative purposes.
(e) = guideline is chloride dependent. The guideline range shown is based on the chloride concentration range observed in the dataset (1.330 to 6,270 mg/L). The guideline is calculated based on the individual chloride concentration in each sample.
(f) = guideline is adopted from the ECCC PNECs (ECCC, 2018) or draft FEQGs (ECCC, 2017).
(g) = guideline is for chromium VI.
(h) = guideline is pH dependent. The guideline range shown is based on the pH range observed in the dataset (8.2 to 8.7). The guideline is calculated based on the individual pH for each sample.
(i) = guideline is a level 1 interim screening value.
(j) = dissolved copper guideline was calculated using the simplified Biotic Ligand Midel (BC ENV, 2019). Where values were missing, the temporally nearest value from the same location was taken.
(Mn) = concentration is higher than the 30-day mean BC ENV guideline or outside the recommended pH, DO or total alkalinity range.
(Mx) = concentration is higher than the maximum BC ENV guideline or outside the recommended pH, DO or total alkalinity range.
(E) = concentration is higher than the EVWQP benchmarks guideline.
Bolded concentrations are higher than water quality guidelines.
Shaded concentrations are higher than the EVWQP benchmark (e.g., for nitrate, total selenium, dissolved cadmium or sulphate).
Water quality data and guidelines shown in this table were rounded to reflect laboratory or field instrument precision after comparisons to guidelines. Therefore, values slighlty above guidelines may be displayed as being equal to the guidelines and identified as exceedances. Concentrations equal to the guideline values were not identified as exceedances.
Concentrations were screened against available Working and Approved British Columbia Ministry of Environment and Climate Change Strategy (BC ENV) Water Quality Guidelines for the Protection of Aquatic Life; Accessed January 2020 from: https://www2.gov.bc.ca/gov/content/environment/air-land-water/water/water-quality/water-quality-guidelines.
- = no guideline or no data
BC ENV = British Columbia Ministry of Environment & Climate Change Strategy; EVWQP = Elk Valley Water Quality Plan guidelines; *C. dubia* = *Ceriodaphnia dubia* ; *P. subcapitata* = *Pseudokirchneriella subcapitata* ; *H. azteca* = *Hyalella azteca* ; *P. promelas* = *Pimephales promelas* ; *O. mykiss* = *Oncorhynchus mykiss* ; CV = coefficient of variation; ∑ = sum of; WQGs = Water Quality Guidelines; CaCO3 = calcium carbonate; mg/L = milligrams per litre; µS/cm = microsiemens per centimeter; NTU = nephelometric turbidity units; meq/L = milliequivalents per litre; mg-N/L = milligrams of Nitrogen per litre; mg-P/L = milligrams of Phosphorus per litre.
BC ENV (B.C. Ministry of Climate Chande Strategy). 2019. Copper Water Quality guideline for the Protection of Aquatic Life-Technical Report. Water Quality Guideline Series, WQG-03-1. Prov. B.C., Victoria B.C.

Table C-2. Water Quality Screening for FR_FRCP1

Parameter	Unit	Guidelines for the protection of: Aquatic Life 30-day mean	Aquatic Life Maximum	EVWQP Benchmarks	Q1 LC_DCDS P. subcapitata 23-Feb-21	2-Mar-21	9-Mar-21	16-Mar-21	23-Mar-21	30-Mar-21	Mar 2, 9, 16, 23, 30 P. promelas Mean	CV	C. dubia 13-Apr-21
Field Measured													
pH	-	6.5 - 9.0	6.5 - 9.0	-	7.9	8.0	8.2	8.2	8.1	8.0	8.1	0.012	7.9
Specific conductivity	µS/cm at 25 C	-	-	-	981	1043	919	647	563	651	765	0.27	591
Temperature	°C	-	-	-	0.3	0.5	0.3	0.4	0.8	0.4	0.48	0.4	0.9
Dissolved oxygen	mg/L	11	9.0	-	12	12	12	**11**[Mn]	12	12	12	0.04	12
Turbidity	NTU	-	-	-	0.38	0.24	11	14	11	5.6	8.4	0.65	5.5
Dissolved oxygen	%	-	-	-	84	83	84	76	85	84	82	0.044	85
Oxidation-reduction potential field	mv	-	-	-	290	276	230	154	295	143	219	0.31	274
Conventional Parameters													
pH	-	6.5 - 9.0	6.5 - 9.0	-	8.0	8.0	8.0	8.1	8.2	8.2	8.1	0.012	8.2
Hardness, as $CaCO_3$	mg/L	-	-	-	530	509	471	348	279	288	379	0.28	311
Total alkalinity, as $CaCO_3$	mg/L	20[a]	-	-	146	153	154	145	140	146	148	0.04	138
Total dissolved solids	mg/L	-	-	-	627	662	1140	370	333	402	581	0.58	369
Total suspended solids	mg/L	-	-	-	<1.0	<1.0	10	16	11	9.1	9.4	0.57	8.7
Total organic carbon	mg/L	-	-	-	2.4	2.1	1.2	2.3	2.1	2.1	2.0	0.22	2.5
Dissolved organic carbon	mg/L	-	-	-	2.2	1.8	1.3	1.8	1.9	2.2	1.8	0.17	2.3
Turbidity	NTU	-	-	-	0.4	0.23	12	14	11	7.7	9.0	0.61	6.6
Total acidity	mg/L	-	-	-	3.7	1.6	1.1	1.1	<1.0	<2.0	1.4	0.31	<2.0
Cation - anion balance	%	-	-	-	2.7	<7.3	1.1	2.8	1.8	9.2	1.5	2.4	0.23
Ion balance	%	-	-	-	106	87	102	106	104	83	96	0.11	100
Conductivity	µS/cm	-	-	-	914	972	863	616	500	626	715	0.27	572
Oxidation-reduction potential	mv	-	-	-	340	314	317	326	310	383	330	0.092	299
Major Ions													
Bicarbonate	mg/L	-	-	-	-	-	-	-	-	-	-	-	-
Bromide	mg/L	-	-	-	<0.25	<0.25	<0.050	<0.050	<0.050	<0.25	<0.13	0.84	<0.050
Calcium	mg/L	-	-	-	130	134	118	88	68	72	96	0.3	79
Carbonate, as $CaCO_3$	mg/L	-	-	-	-	-	-	-	-	-	-	-	-
Chloride	mg/L	150	600	-	18	22	14	8.8	6.1	9.3	12	0.52	8.1
Fluoride	mg/L	0.12[b]	1.6 - 2.1[c]	-	0.11	<0.10	0.058	0.1	0.11	0.1	0.095	0.22	0.075
Hydroxide	mg/L	-	-	-	-	-	-	-	-	-	-	-	-
Magnesium	mg/L	-	-	-	50	43	43	31	26	26	34	0.25	28
Potassium	mg/L	-	-	-	3.3	2.7	2.9	2.1	2.1	1.9	2.3	0.19	2.0
Sodium	mg/L	-	-	-	4.7	4.0	4.6	2.8	2.7	2.4	3.3	0.29	2.7
Sulphate	mg/L	429[c]	-	481	185	201	162	100	73	112	130	0.4	101
Sulphide	mg/L	0.010 - 0.029[d]	-	-	-	-	-	-	-	<0.0015	0.0015	0.45	<0.0015
T-sulphide (as s)	mg/l	-	-	-	0.0021	<0.0015	<0.0015	<0.0015	<0.0015	-	0.0015	0.45	-
Major anion sum	meq/l	-	-	-	10	12	9.5	6.7	5.5	7.1	8.2	0.32	6.4
Major cation sum	meq/l	-	-	-	11	10	9.7	7.1	5.8	5.9	7.8	0.28	6.4
Bicarbonate Alkalinity, as $CaCO_3$	mg/l	-	-	-	146	153	154	145	140	146	148	0.04	138
Carbonate Alkalinity, as $CaCO_3$	mg/l	-	-	-	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1	0	<1.0
Hydroxide Alkalinity, as $CaCO_3$	mg/l	-	-	-	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1	0	<1.0
Nutrients and Biological Indicators													
Nitrate	mg-N/L	3.0	33	3.1 - 7.6[c]	**42**[Mn, Mx, E]	**59**[Mn, Mx, E]	**37**[Mn, Mx, E]	**21**[Mn, E]	**15**[Mn, E]	**22**[Mn, E]	**31**[Mn, E]	0.58	**18**[Mn, E]
Nitrite	mg-N/L	0.040 - 0.20[e]	0.12 - 0.60[e]	-	0.039	0.17	0.068	0.042	0.053	0.067	0.081	0.65	0.051
Total ammonia	mg-N/L	2.1	14	-	<0.0050	0.032	0.0074	0.0087	0.012	0.019	0.016	0.64	0.018
Total Kjeldahl nitrogen	mg-N/L	-	-	-	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.05	0	<0.050
Total phosphorus	mg-P/L	-	-	-	0.013	0.015	0.012	0.037	0.029	0.025	0.024	0.43	0.03
Orthophosphate	mg-P/L	-	-	-	0.0035	0.013	0.014	0.016	0.014	0.017	0.015	0.12	0.013
Biochemical oxygen demand	mg/L	-	-	-	-	-	-	-	-	-	-	-	-
Total Metals													
Aluminum	mg/L	-	-	-	0.0034	0.0041	0.2	0.26	0.17	0.18	0.16	0.58	0.17
Antimony	mg/L	0.0090	-	-	0.00093	0.0009	0.0008	0.00061	0.00061	0.00069	0.00072	0.18	0.00064
Arsenic	mg/L	0.0050	0.0050	-	0.00036	0.00042	0.00046	0.00042	0.00041	0.00041	0.00042	0.049	0.00034
Barium	mg/L	1.0	-	-	0.28	0.3	0.33	0.25	0.24	0.22	0.27	0.16	0.22
Beryllium	mg/L	0.00013	-	-	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.00002	0	<0.000020
Bismuth	mg/L	0.0005[f]	-	-	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0	<0.000050
Boron	mg/L	1.2	29[b]	-	0.012	0.01	0.012	0.012	0.011	0.011	0.011	0.075	0.01
Cadmium	mg/L	-	-	-	0.00028	0.00034	0.00017	0.00015	0.00012	0.00012	0.00018	0.52	0.00012
Calcium	mg/L	-	-	-	135	153	122	80	73	82	102	0.34	80
Chromium	mg/L	0.0010[g]	-	-	<0.00010	0.00011	0.00031	0.00041	0.00025	0.00026	0.00027	0.41	0.00023
Cobalt	mg/L	0.0040	0.11	-	0.00053	0.00065	0.00042	0.00047	0.00043	0.0004	0.00047	0.21	0.00031
Copper	mg/L	-	-	-	<0.00050	<0.00050	0.00073	0.00086	0.00073	0.00052	0.00067	0.23	0.0005
Iron	mg/L	1.29 - 2.33[d,f]	1.0	-	<0.010	<0.010	0.23	0.3	0.2	0.15	0.18	0.62	0.15
Lead	mg/L	0.011 - 0.020[c]	0.21 - 0.42[c]	-	<0.000050	<0.000050	0.00024	0.00028	0.00021	0.00014	0.00018	0.49	0.00014
Lithium	mg/L	0.1216[f]	-	-	0.021	0.02	0.023	0.018	0.017	0.016	0.019	0.16	0.014
Magnesium	mg/L	-	-	-	48	50	45	31	27	30	37	0.28	28
Manganese	mg/L	1.5 - 2.6[c]	2.8 - 3.4[c]	-	0.017	0.021	0.042	0.065	0.066	0.044	0.048	0.39	0.036
Mercury	mg/L	0.000010	-	-	0.000001	0.00000094	0.0000033	0.0000025	0.0000029	0.0000021	0.0000023	0.39	0.0000028
Molybdenum	mg/L	1.0	2.0	-	0.0047	0.004	0.0045	0.0031	0.0029	0.0033	0.0036	0.19	0.0056
Nickel	mg/L	0.0053[h]	-	-	**0.010**[Mn]	**0.012**[Mn]	**0.0056**[Mn]	0.0035	0.0028	0.0034	**0.005458**[Mn]	0.7	0.0033
Potassium	mg/L	-	-	-	3.2	3.2	2.9	2.2	1.9	2.2	2.5	0.21	2.0
Selenium	mg/L	0.0020	-	0.019	**0.070**[Mn, E]	**0.073**[Mn, E]	**0.060**[Mn, E]	**0.034**[Mn, E]	**0.027**[Mn, E]	**0.036**[Mn, E]	**0.046**[Mn, E]	0.43	**0.033**[Mn, E]
Silicon	mg/L	-	-	-	3.1	2.9	3.0	3.1	2.9	3.0	3.0	0.019	2.8
Silver	mg/L	0.0015[c]	0.0030[c]	-	<0.000010	<0.000010	0.000013	0.000015	0.000011	0.00001	0.000012	0.18	<0.000010
Sodium	mg/L	-	-	-	4.5	5.1	4.4	3.1	2.6	2.8	3.6	0.29	2.6
Strontium	mg/L	-	-	-	0.17	0.2	0.16	0.1	0.099	0.11	0.14	0.33	0.11
Sulphur	mg/L	-	-	-	72	76	69	38	30	39	50	0.41	33
Thallium	mg/L	0.00080	-	-	0.000022	0.000022	0.000021	0.000022	0.000018	0.000018	0.00002	0.1	0.000018
Tin	mg/L	0.3[f]	-	-	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.00010
Titanium	mg/L	0.85[f]	-	-	<0.010	<0.010	<0.010	<0.010	<0.010	0.0053	0.0091	0.23	0.0049
Uranium	mg/L	0.0085	0.033[b]	-	0.0026	0.0022	0.0026	0.0018	0.0015	0.0019	0.002	0.21	0.0016
Vanadium	mg/L	0.12[f]	-	-	0.0012	0.0012	0.0023	0.0025	0.0021	0.0024	0.0021	0.24	0.0019
Zinc	mg/L	0.095 - 0.19	0.12 - 0.34	-	0.0082	0.0097	0.011	0.0058	<0.0030	0.0045	0.0068	0.5	0.0047
Dissolved Metals													
Aluminum	mg/L	0.050[d]	0.10[d]	-	<0.0030	<0.0030	0.012	0.023	0.013	0.008	0.012	0.63	0.012
Antimony	mg/L	-	-	-	0.00088	0.00099	0.00074	0.00059	0.00063	0.00055	0.0007	0.25	0.00059
Arsenic	mg/L	-	-	-	0.00033	0.00034	0.0003	0.00024	0.00029	0.00026	0.00029	0.13	0.00026
Barium	mg/L	-	-	-	0.32	0.24	0.3	0.22	0.23	0.19	0.23	0.17	0.21
Beryllium	mg/L	-	-	-	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.00002	0	<0.000020
Bismuth	mg/L	-	-	-	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0	<0.000050
Boron	mg/L	-	-	-	0.012	0.01	0.01	<0.010	0.01	<0.010	0.01	0	<0.010
Cadmium	mg/L	0.00036 - 0.00046[c]	0.0012 - 0.0028[c]	0.00025 - 0.00032[c]	0.00028	0.00029	0.000056	0.000029	0.000027	0.000042	0.000089	1.3	0.000041
Chromium	mg/L	-	-	-	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.00010
Cobalt	mg/L	-	-	-	0.00054	0.00056	0.00033	0.00028	0.00033	0.00028	0.00036	0.33	0.00026
Copper	mg/L	0.001 - 0.0024[i]	0.0059 - 0.0133[i]	-	0.00023	<0.00020	<0.00020	0.0005	0.00022	<0.00020	0.00026	0.5	0.00021
Iron	mg/L	-	0.35	-	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.01	0	<0.010
Lead	mg/L	-	-	-	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0	<0.000050
Lithium	mg/L	-	-	-	0.024	0.021	0.022	0.017	0.015	0.013	0.018	0.21	0.014
Manganese	mg/L	-	-	-	0.017	0.019	0.04	0.056	0.065	0.04	0.044	0.41	0.034
Mercury	mg/L	-	-	-	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.000005	0	<0.0000050
Molybdenum	mg/L	-	-	-	0.0048	0.0043	0.0041	0.0031	0.0031	0.0027	0.0035	0.2	0.0054
Nickel	mg/L	-	-	-	0.01	0.01	0.0043	0.0022	0.0019	0.0023	0.0042	0.83	0.0024
Selenium	mg/L	-	-	-	0.067	0.075	0.06	0.031	0.027	0.029	0.045	0.49	0.031
Silicon	mg/L	-	-	-	2.9	2.7	2.8	2.4	2.8	2.2	2.6	0.11	2.6
Silver	mg/L	-	-	-	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	0	<0.000010
Strontium	mg/L	2.5[f]	-	-	0.16	0.19	0.17	0.11	0.099	0.091	0.13	0.34	0.1
Sulphur	mg/L	-	-	-	64	67	59	32	31	33	44	0.39	33
Thallium	mg/L	-	-	-	0.000021	0.000023	0.000012	<0.000010	<0.000010	<0.000010	0.000013	0.44	0.000012
Tin	mg/L	-	-	-	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.00010
Titanium	mg/L	-	-	-	<0.010	<0.010	<0.010	<0.010	<0.010	<0.00030	<0.00806	0.54	<0.00030
Uranium	mg/L	-	-	-	0.0025	0.0021	0.0025	0.0018	0.0015	0.0015	0.0019	0.22	0.0016
Vanadium	mg/L	-	-	-	0.0012	0.00095	0.0014	0.0014	0.0015	0.0012	0.0013	0.16	0.0013
Zinc	mg/L	-	-	-	0.0081	0.0086	0.0029	0.0019	<0.0010	0.0024	0.0034	0.9	0.0026

Parameter	Q2 LC_DCDS C. dubia and P. subcapitata 18-May-21	25-May-21	1-Jun-21	8-Jun-21	15-Jun-21	May 18, 25, June 1, 8 H. azteca Mean	CV	May 18, 25, June 1, 8, 15 O. mykiss Mean	CV
Field Measured									
pH	8.2	8.2	8.1	8.3	8.2	8.2	0.010	8.2	0.0086
Specific conductivity	464	506	445	474	566	472	0.054	491	0.096
Temperature	2.7	3.0	5.2	4.0	7.4	3.7	0.3	4.5	0.43
Dissolved oxygen	**10**[Mn]	**11**[Mn]	**10**[Mn]	**10**[Mn]	**9.7**[Mn]	**10**[Mn]	0.049	**10**[Mn]	0.049
Turbidity	24	3.9	5.3	5.4	1.1	9.7	0.99	8.0	1.1
Dissolved oxygen	77	79	80	80	81	79	0.018	79	0.018
Oxidation-reduction potential field	131	125	86	142	103	121	0.2	117	0.19
Conventional Parameters									
pH	8.1	8.0	8.1	7.6	8.2	8.0	0.03	8.0	0.029
Hardness, as $CaCO_3$	225	240	207	236	210	227	0.065	224	0.067
Total alkalinity, as $CaCO_3$	111	125	115	126	129	119	0.062	121	0.064
Total dissolved solids	292	316	294	317	376	305	0.045	319	0.11
Total suspended solids	40	8.5	3.5	<1.0	<1.0	13	1.4	11	1.5
Total organic carbon	7.7	2.5	3.1	3.0	2.2	4.1	0.6	3.7	0.61
Dissolved organic carbon	3.2	2.5	3.0	2.7	2.0	2.8	0.11	2.7	0.18
Turbidity	25	5.8	4.0	1.4	1.0	9.0	1.2	7.4	1.3
Total acidity	<2.0	<2.0	<2.0	<2.0	<2.0	<2	0	<2	0
Cation - anion balance	1.6	4.9	4.1	1.9	17	3.1	0.52	5.8	1.1
Ion balance	97	91	92	96	72	94	0.032	90	0.12
Conductivity	455	501	440	458	518	464	0.057	474	0.07
Oxidation-reduction potential	378	499	435	425	458	434	0.11	439	0.1
Major Ions									
Bicarbonate	-	-	-	-	158	-	-	158	0.45
Bromide	<0.050	<0.050	<0.050	<0.050	<0.050	<0.05	0	<0.05	0
Calcium	56	60	50	58	53	56	0.072	56	0.068
Carbonate, as $CaCO_3$	-	-	-	-	<1.0	-	-	1.0	0.45
Chloride	3.9	5.1	3.9	4.4	6.3	4.3	0.13	4.7	0.22
Fluoride	0.078	0.073	0.075	0.045	0.073	0.068	0.23	0.069	0.2
Hydroxide	-	-	-	-	<1.0	-	-	1.0	0.45
Magnesium	21	22	20	22	19	21	0.058	21	0.072
Potassium	2.0	1.8	1.6	1.8	1.6	1.8	0.09	1.7	0.099
Sodium	2.1	3.0	2.0	2.7	2.9	2.4	0.19	2.5	0.18
Sulphate	79	88	70	72	101	77	0.1	82	0.16
Sulphide	0.0016	<0.0015	<0.0015	<0.0015	<0.0015	0.0015	0.033	0.0015	0.029
T-sulphide (as s)	-	-	-	-	-	-	-	-	-
Major anion sum	4.8	5.5	4.6	5.1	6.1	5.0	0.076	5.2	0.11
Major cation sum	4.7	5.0	4.3	4.9	4.4	4.7	0.069	4.6	0.068
Bicarbonate Alkalinity, as $CaCO_3$	111	125	115	126	129	119	0.062	121	0.064
Carbonate Alkalinity, as $CaCO_3$	<1.0	<1.0	<1.0	<1.0	<1.0	<1	0	<1	0
Hydroxide Alkalinity, as $CaCO_3$	<1.0	<1.0	<1.0	<1.0	<1.0	<1	0	<1	0
Nutrients and Biological Indicators									
Nitrate	**12**[Mn, E]	**14**[Mn, E]	**11**[Mn, E]	**13**[Mn, E]	**17**[Mn, E]	**13**[Mn, E]	0.1	**13**[Mn, E]	0.17
Nitrite	**0.044**[Mn]	0.057	0.038	0.047	0.06	0.046	0.17	0.049	0.19
Total ammonia	0.047	0.094	0.016	0.011	<0.0050	0.042	0.91	0.035	1.1
Total Kjeldahl nitrogen	<0.050	0.059	<0.050	<0.050	<0.050	0.052	0.086	0.052	0.078
Total phosphorus	0.054	0.024	0.021	0.026	0.019	0.031	0.5	0.029	0.51
Orthophosphate	0.013	0.017	0.021	0.023	0.016	0.019	0.22	0.018	0.21
Biochemical oxygen demand	-	-	-	-	-	-	-	-	-
Total Metals									
Aluminum	0.47	0.13	0.055	0.035	0.031	0.17	1.2	0.14	1.3
Antimony	0.00081	0.00061	0.00062	0.00061	0.00062	0.00066	0.15	0.00065	0.13
Arsenic	0.0005	0.0004	0.00036	0.00035	0.00031	0.0004	0.17	0.00038	0.19
Barium	0.17	0.19	0.15	0.16	0.18	0.17	0.083	0.17	0.074
Beryllium	0.00003	<0.000020	<0.000020	<0.000020	<0.000020	0.000023	0.22	0.000022	0.2
Bismuth	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0	<0.00005	0
Boron	0.011	<0.010	<0.010	0.01	0.01	0.01	0.049	0.01	0.044
Cadmium	0.00027	0.00012	0.00012	0.00011	0.00012	0.00015	0.5	0.00015	0.46
Calcium	57	61	52	61	69	58	0.076	60	0.1
Chromium	0.00091	0.00022	0.00016	0.00012	0.00028	0.00035	1.1	0.00034	0.96
Cobalt	0.00078	0.00027	0.00022	0.00016	0.00016	0.00036	0.8	0.00032	0.82
Copper	0.0013	0.00054	<0.00050	<0.00050	<0.00050	0.00071	0.55	0.00067	0.53
Iron	0.4	0.09	0.05	0.032	0.026	0.14	1.2	0.12	1.3
Lead	0.00046	0.000086	0.000056	<0.000050	0.00006	0.00016	1.2	0.00014	1.2
Lithium	0.013	0.015	0.012	0.015	0.019	0.014	0.13	0.015	0.19
Magnesium	22	21	21	22	26	21	0.023	22	0.091
Manganese	0.078	0.025	0.014	0.008	0.0065	0.031	1.0	0.026	1.1
Mercury	0.0000057	0.0000024	0.0000021	0.0000015	0.0000013	0.0000029	0.65	0.0000026	0.69
Molybdenum	0.003	0.0048	0.0027	0.005	0.0052	0.0039	0.3	0.0041	0.29
Nickel	**0.0056**[Mn]	0.0034	0.004	0.0047	**0.0058**[Mn]	0.0044	0.21	0.0047	0.22
Potassium	2.1	1.8	1.7	1.7	1.9	1.8	0.098	1.8	0.09
Selenium	**0.028**[Mn, E]	**0.030**[Mn, E]	**0.025**[Mn, E]	**0.027**[Mn, E]	**0.036**[Mn, E]	**0.028**[Mn, E]	0.076	**0.029**[Mn, E]	0.14
Silicon	3.3	2.7	2.6	2.7	2.6	2.8	0.12	2.8	0.11
Silver	0.000016	<0.000010	<0.000010	<0.000010	<0.000010	0.000012	0.26	0.000011	0.24
Sodium	2.1	2.8	2.0	2.8	3.4	2.4	0.17	2.6	0.22
Strontium	0.086	0.092	0.081	0.089	0.12	0.087	0.056	0.092	0.14
Sulphur	28	31	25	28	34	28	0.087	29	0.12
Thallium	0.000036	0.000016	0.000016	0.000014	0.000013	0.000021	0.51	0.000019	0.5
Tin	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.0001	0
Titanium	0.015	0.0041	<0.0018	0.00093	0.00073	0.0055	1.2	0.0046	1.3
Uranium	0.0011	0.001	0.00088	0.00094	0.0012	0.00099	0.1	0.001	0.12
Vanadium	0.0034	0.0019	0.0018	0.0017	0.0017	0.0022	0.37	0.0021	0.36
Zinc	0.012	0.0046	0.0049	0.0049	0.0048	0.0065	0.52	0.0061	0.49
Dissolved Metals									
Aluminum	0.013	0.0098	0.0073	0.0056	0.004	0.009	0.37	0.008	0.46
Antimony	0.00076	0.00059	0.00062	0.00061	0.00044	0.00065	0.12	0.0006	0.19
Arsenic	0.0003	0.00032	0.0003	0.00032	0.00023	0.00031	0.037	0.00029	0.13
Barium	0.15	0.18	0.14	0.16	0.19	0.16	0.12	0.16	0.14
Beryllium	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.00002	0	<0.00002	0
Bismuth	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0	<0.00005	0
Boron	<0.010	<0.010	<0.010	<0.010	<0.010	<0.01	0	<0.01	0
Cadmium	0.000044	0.000075	0.00009	0.00009	0.000086	0.000075	0.29	0.000077	0.25
Chromium	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.0001	0
Cobalt	0.00039	0.00024	0.00018	0.00016	<0.00010	0.00024	0.43	0.00021	0.52
Copper	0.00036	0.00029	0.00035	0.0003	0.00025	0.00033	0.11	0.00031	0.15
Iron	0.012	<0.010	<0.010	<0.010	<0.010	0.011	0.095	0.01	0.086
Lead	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0	<0.00005	0
Lithium	0.012	0.015	0.011	0.015	0.017	0.013	0.14	0.014	0.16
Manganese	0.063	0.022	0.012	0.0071	0.0034	0.026	0.98	0.022	1.1
Mercury	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.000005	0	<0.000005	0
Molybdenum	0.0034	0.0048	0.0027	0.0046	0.0034	0.0039	0.26	0.0038	0.23
Nickel	0.0028	0.0031	0.0036	0.0046	0.0037	0.0035	0.22	0.0035	0.19
Selenium	0.026	0.029	0.024	0.026	0.023	0.026	0.08	0.026	0.098
Silicon	2.5	2.5	2.5	2.5	2.6	2.5	0.012	2.5	0.015
Silver	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	0	<0.00001	0
Strontium	0.082	0.092	0.08	0.091	0.083	0.086	0.07	0.086	0.064
Sulphur	27	28	24	26	23	26	0.068	26	0.08
Thallium	0.000016	0.000012	0.000014	0.000013	<0.000010	0.000014	0.12	0.000013	0.17
Tin	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.0001	0
Titanium	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.0003	0	<0.0003	0
Uranium	0.0011	0.001	0.00084	0.00092	0.00079	0.00097	0.11	0.00093	0.13
Vanadium	0.0014	0.0014	0.0015	0.0016	0.001	0.0015	0.049	0.0014	0.15
Zinc	0.024	0.0027	0.0042	0.0042	0.003	0.0088	1.2	0.0076	1.2

Parameter	Q3 LC_DCDS C. dubia and P. subcapitata 10-Aug-21	17-Aug-21	24-Aug-21	31-Aug-21	7-Sep-21	Aug 10, 17, 24, 31 H. azteca Mean	CV	Aug 10, 17, 24, 31 Sept 7 P. promelas Mean	CV
Field Measured									
pH	8.3	8.1	8.2	8.1	8.4	8.2	0.012	8.2	0.016
Specific conductivity	88	923	944	979	1010	733	0.59	789	0.5
Temperature	11	5.2	5.0	6.3	5.9	7.0	0.43	6.8	0.39
Dissolved oxygen	**9.2**[Mn]	**11**[Mn]	**10**[Mn]	**10**[Mn]	**11**[Mn]	**10**[Mn]	0.073	**10**[Mn]	0.075
Turbidity	0.34	0.26	0.89	1.0	0.41	0.62	0.6	0.58	0.59
Dissolved oxygen	84	83	82	84	85	83	0.011	83	0.012
Oxidation-reduction potential field	213	109	85	257	206	166	0.5	174	0.42
Conventional Parameters									
pH	8.3	8.2	8.2	8.2	8.2	8.2	0.0061	8.2	0.0054
Hardness, as $CaCO_3$	438	472	494	486	493	473	0.052	477	0.049
Total alkalinity, as $CaCO_3$	124	143	153	151	151	143	0.093	144	0.083
Total dissolved solids	618	730	699	763	747	703	0.088	711	0.081
Total suspended solids	3.2	2.0	8.3	<1.0	<1.0	3.6	0.89	3.1	0.98
Total organic carbon	2.8	2.9	2.5	2.2	2.1	2.6	0.11	2.5	0.14
Dissolved organic carbon	2.6	2.7	2.7	2.6	2.0	2.6	0.021	2.5	0.12
Turbidity	1.4	1.3	3.0	0.37	0.56	1.5	0.7	1.3	0.77
Total acidity	<2.0	<2.0	<2.0	<2.0	4.4	<2	0	2.5	0.43
Cation - anion balance	0.77	3.0	1.9	3.9	7.3	2.4	0.56	3.4	0.73
Ion balance	99	94	96	93	86	95	0.027	94	0.049
Conductivity	853	938	922	943	1010	914	0.046	933	0.06
Oxidation-reduction potential	499	405	445	408	262	439	0.10	404	0.22
Major Ions									
Bicarbonate	148	174	187	184	184	173	0.1	175	0.092
Bromide	<0.050	<0.25	<0.25	<0.25	<0.25	<0.2	0.5	<0.21	0.43
Calcium	106	116	126	119	121	117	0.071	118	0.063
Carbonate, as $CaCO_3$	2.0	<1.0	<1.0	<1.0	<1.0	1.3	0.4	1.2	0.37
Chloride	14	14	14	15	18	14	0.05	15	0.12
Fluoride	0.08	<0.10	<0.10	<0.10	<0.10	0.095	0.11	0.096	0.093
Hydroxide	<1.0	<1.0	<1.0	<1.0	<1.0	<1	0	<1	0
Magnesium	42	44	44	46	46	44	0.036	44	0.039
Potassium	2.6	2.8	2.7	2.7	2.9	2.7	0.019	2.8	0.039
Sodium	5.9	6.6	6.4	6.4	6.9	6.3	0.05	6.4	0.061
Sulphate	181	206	205	215	241	202	0.072	210	0.1
Sulphide	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	0	<0.0015	0
T-sulphide (as s)	-	-	-	-	-	-	-	-	-
Major anion sum	9.2	10	11	11	12	10	0.07	11	0.088
Major cation sum	9.1	9.8	10	10	10	9.8	0.05	9.9	0.048
Bicarbonate Alkalinity, as $CaCO_3$	121	143	153	151	151	142	0.1	144	0.093
Carbonate Alkalinity, as $CaCO_3$	3.4	<1.0	<1.0	<1.0	<1.0	1.6	0.75	1.5	0.73
Hydroxide Alkalinity, as $CaCO_3$	<1.0	<1.0	<1.0	<1.0	<1.0	<1	0	<1	0
Nutrients and Biological Indicators									
Nitrate	**36**[Mn, Mx, E]	**41**[Mn, Mx, E]	**40**[Mn, Mx, E]	**41**[Mn, Mx, E]	**45**[Mn, Mx, E]	**40**[Mn, Mx, E]	0.06	**41**[Mn, Mx, E]	0.079
Nitrite	0.095	0.027	0.025	0.028	0.023	0.044	0.77	0.04	0.78
Total ammonia	0.0099	0.019	0.01	0.011	0.01	0.012	0.34	0.012	0.31
Total Kjeldahl nitrogen	<0.050	2.1	0.55	<0.050	0.37	0.68	1.4	0.62	1.4
Total phosphorus	0.021	0.026	0.029	0.023	0.019	0.025	0.14	0.024	0.16
Orthophosphate	<0.0010	0.017	0.029	0.02	0.02	0.017	0.69	0.017	0.58
Biochemical oxygen demand	-	-	-	-	-	-	-	-	-
Total Metals									
Aluminum	0.014	0.017	0.0093	0.0079	0.011	0.012	0.34	0.012	0.31
Antimony	0.00078	0.00072	0.00082	0.00076	0.00071	0.00077	0.054	0.00076	0.059
Arsenic	0.00036	0.00034	0.00036	0.00032	0.0003	0.00035	0.056	0.00034	0.078
Barium	0.2	0.22	0.23	0.22	0.23	0.22	0.05	0.22	0.05
Beryllium	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.00002	0	<0.00002	0
Bismuth	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0	<0.00005	0
Boron	0.012	0.012	0.012	0.011	0.012	0.012	0.043	0.012	0.038
Cadmium	0.00012	0.00026	0.00024	0.00026	0.00026	0.00022	0.31	0.00023	0.27
Calcium	108	124	131	121	133	121	0.08	123	0.08
Chromium	<0.00010	0.00011	<0.00010	<0.00010	<0.00010	0.0001	0.049	0.0001	0.044
Cobalt	0.00014	0.00012	0.00011	0.00011	0.00011	0.00012	0.12	0.00012	0.11
Copper	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	0	<0.0005	0
Iron	0.011	0.022	<0.010	<0.010	0.01	0.013	0.44	0.013	0.42
Lead	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0	<0.00005	0
Lithium	0.032	0.033	0.033	0.033	0.036	0.033	0.015	0.033	0.041
Magnesium	43	45	48	52	51	47	0.086	48	0.08
Manganese	0.0037	0.0055	0.0031	0.0025	0.003	0.0037	0.34	0.0036	0.32
Mercury	0.00000089	0.0000014	0.00000093	0.00000084	0.00000081	0.000001	0.26	0.00000098	0.26
Molybdenum	0.0069	0.0073	0.0082	0.0078	0.008	0.0075	0.074	0.0076	0.07
Nickel	**0.0091**[Mn]	**0.011**[Mn]	**0.012**[Mn]	**0.012**[Mn]	**0.012**[Mn]	**0.011**[Mn]	0.12	**0.011**[Mn]	0.11
Potassium	3.0	2.9	2.8	3.0	2.9	2.9	0.028	2.9	0.025
Selenium	**0.069**[Mn, E]	**0.085**[Mn, E]	**0.079**[Mn, E]	**0.085**[Mn, E]	**0.083**[Mn, E]	**0.080**[Mn, E]	0.095	**0.080**[Mn, E]	0.084
Silicon	1.2	2.6	2.6	2.7	2.5	2.3	0.31	2.3	0.26
Silver	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	0	<0.00001	0
Sodium	6.4	7.0	7.1	6.9	7.2	6.9	0.046	6.9	0.044
Strontium	0.18	0.2	0.21	0.2	0.21	0.2	0.059	0.2	0.058
Sulphur	67	76	74	82	82	75	0.087	76	0.086
Thallium	0.000023	0.00002	0.000022	0.000017	0.00002	0.000021	0.13	0.00002	0.11
Tin	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.0001	0
Titanium	0.00038	0.0005	<0.00030	<0.00030	<0.00030	0.00037	0.26	0.00036	0.25
Uranium	0.0021	0.0023	0.0027	0.0026	0.0027	0.0024	0.12	0.0025	0.11
Vanadium	0.0015	0.0015	0.0015	0.0014	0.0014	0.0015	0.035	0.0014	0.046
Zinc	0.0053	0.0092	0.0098	0.0086	0.009	0.0082	0.24	0.0084	0.21
Dissolved Metals									
Aluminum	0.0058	0.0032	0.0037	0.003	0.003	0.0039	0.33	0.0037	0.32
Antimony	0.00073	0.00066	0.00075	0.00063	0.00067	0.00069	0.082	0.00069	0.073
Arsenic	0.00029	0.00032	0.00031	0.00028	0.00029	0.0003	0.061	0.0003	0.055
Barium	0.2	0.21	0.21	0.21	0.22	0.21	0.034	0.21	0.041
Beryllium	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.00002	0	<0.00002	0
Bismuth	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0	<0.00005	0
Boron	0.011	0.01	0.011	0.01	0.011	0.011	0.055	0.011	0.052
Cadmium	0.000087	0.00024	0.00023	0.00022	0.00025	0.00019	0.37	0.0002	0.32
Chromium	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.0001	0
Cobalt	0.00011	0.0001	<0.00010	<0.00010	0.0001	0.0001	0.049	0.0001	0.044
Copper	0.00033	0.00025	0.00024	0.00023	0.00025	0.00026	0.17	0.00026	0.15
Iron	<0.010	<0.010	<0.010	<0.010	<0.010	<0.01	0	<0.01	0
Lead	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0	<0.00005	0
Lithium	0.03	0.032	0.032	0.033	0.034	0.032	0.041	0.032	0.051
Manganese	0.0022	0.0039	0.0026	0.0021	0.0025	0.0027	0.3	0.0027	0.26
Mercury	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.000005	0	<0.000005	0
Molybdenum	0.0067	0.0067	0.0074	0.007	0.0072	0.0069	0.049	0.007	0.045
Nickel	0.0078	0.01	0.011	0.011	0.012	0.010	0.16	0.01	0.15
Selenium	0.07	0.079	0.076	0.075	0.08	0.075	0.047	0.076	0.052
Silicon	1.2	2.4	2.4	2.4	2.5	2.1	0.29	2.2	0.26
Silver	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	0	<0.00001	0
Strontium	0.17	0.18	0.19	0.18	0.19	0.18	0.048	0.18	0.046
Sulphur	63	69	66	68	79	66	0.04	69	0.089
Thallium	0.000022	0.00002	0.000021	0.000017	0.000019	0.00002	0.11	0.00002	0.097
Tin	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.0001	0
Titanium	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.0003	0	<0.0003	0
Uranium	0.0019	0.0022	0.0027	0.0024	0.0027	0.0023	0.14	0.0024	0.14
Vanadium	0.0012	0.0013	0.0013	0.0011	0.0013	0.0012	0.08	0.0012	0.07
Zinc	0.0077	0.0083	0.0086	0.0081	0.0083	0.0082	0.046	0.0082	0.04

Parameter	Q4 LC_DCDS C. dubia and P. subcapitata 12-Oct-21	19-Oct-21	26-Oct-21	2-Nov-21	9-Nov-21	Oct 12, 19, 26, Nov 2 H. azteca Mean	CV
Field Measured							
pH	8.1	8.1	8.2	8.3	8.4	8.2	0.012
Specific conductivity	1157	1074	1116	1124	1106	1118	0.031
Temperature	1.0	2.0	2.4	0.6	0.5	1.5	0.56
Dissolved oxygen	12	12	11	12	12	12	0.025
Turbidity	0.95	0.53	0.5	0.71	0.4	0.67	0.31
Dissolved oxygen	83	85	82	83	81	83	0.015
Oxidation-reduction potential field	230	210	245	210	231	224	0.076
Conventional Parameters							
pH	8.3	8.3	8.2	8.3	8.3	8.3	0.006
Hardness, as $CaCO_3$	590	600	573	555	538	580	0.034
Total alkalinity, as $CaCO_3$	160	166	173	166	159	166	0.032
Total dissolved solids	838	753	645	731	692	742	0.11
Total suspended solids	<1.0	1.2	<1.0	2.2	2.5	1.4	0.43
Total organic carbon	2.2	2.0	2.6	2.4	2.1	2.3	0.12
Dissolved organic carbon	2.2	2.0	2.6	2.3	2.1	2.3	0.12
Turbidity	0.26	0.34	0.22	0.31	0.22	0.28	0.19
Total acidity	2.0	<2.0	<2.0	<2.0	<2.0	2.0	0
Cation - anion balance	1.2	1.6	4.4	3.8	2.2	2.8	0.57
Ion balance	102	97	92	93	96	96	0.05
Conductivity	1140	1120	1100	1090	1080	1113	0.02
Oxidation-reduction potential	430	451	446	379	456	427	0.077
Major Ions							
Bicarbonate	189	202	211	203	159	201	0.045
Bromide	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	0
Calcium	143	150	141	140	131	144	0.031
Carbonate, as $CaCO_3$	3.0	<1.0	<1.0	<1.0	<1.0	1.5	0.67
Chloride	18	21	22	21	20	20	0.099
Fluoride	<0.10	<0.10	0.11	<0.10	<0.10	0.1	0.058
Hydroxide	<1.0	<1.0	<1.0	<1.0	<1.0	<1	0
Magnesium	57	55	54	50	51	54	0.052
Potassium	3.1	3.1	2.9	2.9	2.8	3.0	0.046
Sodium	8.3	8.1	7.9	7.5	7.3	8.0	0.047
Sulphate	235	254	257	244	226	248	0.04
Sulphide	<0.0015	-	-	-	-	0.0015	0.5
T-sulphide (as s)	-	<0.0015	<0.0015	<0.0015	<0.0015	0.0015	0.5
Major anion sum	12	13	13	12	12	13	0.039
Major cation sum	12	12	12	12	11	12	0.033
Bicarbonate Alkalinity, as $CaCO_3$	155	166	173	166	130	165	0.045
Carbonate Alkalinity, as $CaCO_3$	5.0	<1.0	<1.0	<1.0	<1.0	2.0	1.0
Hydroxide Alkalinity, as $CaCO_3$	<1.0	<1.0	<1.0	<1.0	<1.0	<1	0
Nutrients and Biological Indicators							
Nitrate	**47**[Mn, Mx, E]	**51**[Mn, Mx, E]	**50**[Mn, Mx, E]	**48**[Mn, Mx, E]	**44**[Mn, Mx, E]	**49**[Mn, Mx, E]	0.037
Nitrite	0.011	0.011	0.012	0.013	0.0093	0.012	0.088
Total ammonia	0.0076	0.0058	0.0056	0.0057	0.013	0.0062	0.15
Total Kjeldahl nitrogen	0.51	0.1	0.28	<0.050	<0.050	0.23	0.88
Total phosphorus	0.017	0.022	0.019	0.022	0.019	0.02	0.13
Orthophosphate	0.016	0.021	0.019	0.023	0.022	0.019	0.16
Biochemical oxygen demand	-	-	-	-	<2.0	-	-
Total Metals							
Aluminum	0.0076	0.0099	0.0066	0.0091	0.006	0.0083	0.18
Antimony	0.00066	0.00063	0.0007	0.00061	0.00062	0.00065	0.06
Arsenic	0.00031	0.00031	0.00032	0.00029	0.00029	0.00031	0.041
Barium	0.24	0.23	0.24	0.22	0.23	0.23	0.033
Beryllium	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.00002	0
Bismuth	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0
Boron	0.011	0.01	0.01	0.011	<0.010	0.011	0.055
Cadmium	0.0003	0.00031	0.00028	0.00026	0.00026	0.00029	0.065
Calcium	146	142	145	142	135	144	0.014
Chromium	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0
Cobalt	0.0001	0.00011	0.0001	0.0001	<0.00010	0.0001	0.049
Copper	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	0
Iron	<0.010	0.013	<0.010	0.013	<0.010	0.012	0.15
Lead	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0
Lithium	0.041	0.039	0.04	0.039	0.038	0.04	0.02
Magnesium	56	57	56	51	52	55	0.054
Manganese	0.0024	0.0031	0.0023	0.0038	0.0018	0.0029	0.23
Mercury	0.00000065	0.00000082	0.0000016	0.00000061	0.000002	0.00000093	0.51
Molybdenum	0.0079	0.0075	0.0076	0.0078	0.0044	0.0077	0.023
Nickel	**0.013**[Mn]	**0.013**[Mn]	**0.013**[Mn]	**0.013**[Mn]	**0.013**[Mn]	**0.013**[Mn]	0
Potassium	3.1	3.0	3.2	2.8	2.9	3.0	0.053
Selenium	**0.094**[Mn, E]	**0.092**[Mn, E]	**0.086**[Mn, E]	**0.081**[Mn, E]	**0.082**[Mn, E]	**0.088**[Mn, E]	0.067
Silicon	2.5	2.5	2.4	2.6	2.6	2.5	0.027
Silver	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	0
Sodium	8.1	8.2	8.7	7.6	7.4	8.2	0.054
Strontium	0.22	0.22	0.24	0.2	0.21	0.22	0.066
Sulphur	91	89	87	85	81	88	0.03
Thallium	0.00002	0.000019	0.000018	0.000019	0.00002	0.000019	0.043
Tin	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0
Titanium	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.0003	0
Uranium	0.0033	0.0033	0.0035	0.0032	0.0031	0.0033	0.045
Vanadium	0.0013	0.0014	0.0013	0.0013	0.0013	0.0013	0.041
Zinc	0.01	0.011	0.0098	0.0095	0.0092	0.01	0.06
Dissolved Metals							
Aluminum	0.0023	0.0024	0.0025	0.0022	0.0024	0.0024	0.055
Antimony	0.00066	0.00066	0.00061	0.00061	0.00061	0.00064	0.045
Arsenic	0.0003	0.00028	0.0003	0.00027	0.00028	0.00029	0.052
Barium	0.24	0.24	0.23	0.23	0.21	0.23	0.023
Beryllium	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.00002	0
Bismuth	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0
Boron	0.01	<0.010	<0.010	<0.010	<0.010	0.01	0
Cadmium	0.00028	0.00028	0.00024	0.00023	0.00025	0.00025	0.11
Chromium	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0
Cobalt	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0
Copper	0.00024	0.00021	0.00024	0.00028	0.0002	0.00024	0.12
Iron	<0.010	<0.010	<0.010	<0.010	<0.010	<0.01	0
Lead	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0
Lithium	0.04	0.038	0.041	0.037	0.037	0.039	0.051
Manganese	0.0019	0.0019	0.0018	0.0021	0.0014	0.0019	0.067
Mercury	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.000005	0
Molybdenum	0.0075	0.0071	0.0074	0.0076	0.0043	0.0074	0.029
Nickel	0.013	0.013	0.013	0.012	0.012	0.013	0.038
Selenium	0.092	0.098	0.094	0.08	0.086	0.091	0.082
Silicon	2.5	2.5	2.4	2.5	2.5	2.5	0.025
Silver	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	0
Strontium	0.22	0.21	0.21	0.2	0.21	0.21	0.03
Sulphur	87	86	88	81	80	85	0.037
Thallium	0.000021	0.00002	0.000018	0.000017	0.000018	0.000019	0.096
Tin	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0
Titanium	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.0003	0
Uranium	0.0032	0.003	0.0031	0.0031	0.003	0.0031	0.029
Vanadium	0.0012	0.0012	0.0011	0.0011	0.0012	0.0012	0.035
Zinc	0.01	0.0098	0.0087	0.0098	0.0094	0.0097	0.07

(a) = guideline is a minimum value, unless the background concentration or value is lower.
(b) = guideline is adopted from CCME Canadian Environmental Quality Guidelines (CCME, 1999).
(b) = guideline is hardness dependent. The guideline range shown is based on the hardness range observed in the dataset (207 to 600 mg/L). The guideline is calculated based on the individual hardness value for each sample.
(c) = for some samples, water hardness was greater than 250 mg/L. At this hardness, no BC ENV water quality guideline has been established for sulphate; however, the observed data were screened against the guideline for very hard water (i.e., 429 mg/L) for comparative purposes.
(d) = guideline is pH dependent. The guideline range shown is based on the pH range observed in the dataset (7.9 to 8.4). The guideline is calculated based on the individual pH for each sample.
(e) = guideline is chloride dependent. The guideline range shown is based on the chloride concentration range observed in the dataset (3.8600 to 22.0000 mg/L). The guideline is calculated based on the individual chloride concentration in each sample.
(f) = guideline is adopted from the ECCC PNECs (ECCC, 2018) or draft FEQGs (ECCC, 2017).
(g) = guideline is for chromium VI.
(h) = guideline is a level 1 interim screening value.
(i) = dissolved copper guideline was calculated using the simplified Biotic Ligand Midel (BC ENV, 2019). Where values were missing, the temporally nearest value from the same location was taken.
(Mn) = concentration is higher than the 30-day mean BC ENV guideline or outside the recommended pH, DO or total alkalinity range.
(Mx) = concentration is higher than the maximum BC ENV guideline or outside the recommended pH, DO or total alkalinity range.
(E) = concentration is higher than the EVWQP benchmarks guideline.
Bolded concentrations are higher than water quality guidelines.
Shaded concentrations are higher than the EVWQP benchmark (e.g., for nitrate, total selenium, dissolved cadmium or sulphate).
Water quality data and guidelines shown in this table were rounded to reflect laboratory or field instrument precision after comparisons to guidelines. Therefore, values slightly above guidelines may be displayed as being equal to the guidelines and identified as exceedances. Concentrations equal to the guideline values were not identified as exceedances.
Concentrations were screened against available Working and Approved British Columbia Ministry of Environment and Climate Change Strategy (BC ENV) Water Quality Guidelines for the Protection of Aquatic Life; Accessed January 2020 from: https://www2.gov.bc.ca/gov/content/environment/air-land-water/water/water-quality/water-quality-guidelines.
\- = no guideline or no data
BC ENV = British Columbia Ministry of Environment & Climate Change Strategy; EVWQP = Elk Valley Water Quality Plan guidelines; *C. dubia* = *Ceriodaphnia dubia* ; *P. subcapitata* = *Pseudokirchneriella subcapitata* ; *H. azteca* = *Hyallela azteca* ; *P. promelas* = *Pimephales promelas* ; *O. mykiss* = *Oncorhynchus mykiss* ; CV = coefficient of variation; ∑ = sum of; WQGs = Water Quality Guidelines; CaCO3 = calcium carbonate; mg/L = milligrams per litre; µS/cm = microsiemens per centimeter; NTU = nephelometric turbidity units; meq/L = milliequivalents per litre; mg-N/L = milligrams of Nitrogen per litre; mg=P/L = milligrams of Phosphorus per litre.
BC ENV (B.C. Ministry of Climate Chande Strategy). 2019. Copper Water Quality guideline for the Protection of Aquatic Life-Technical Report. Water Quality Guideline Series, WQG-03-1. Prov. B.C., Victoria B.C.

Parameter	Unit	Guidelines for the protection of:		EVWQP Benchmarks	Oct 12, 19, 26, Nov 2, 9 *O. mykiss*	
		Aquatic Life				
		30-day mean	Maximum		Mean	CV
Field Measured						
pH	-	6.5 - 9.0	6.5 - 9.0	-	8.2	0.016
Specific conductivity	µS/cm at 25 C	-	-	-	1115	0.027
Temperature	°C	-	-	-	1.3	0.66
Dissolved oxygen	mg/L	11	9.0	-	12	0.021
Turbidity	NTU	-	-	-	0.62	0.35
Dissolved oxygen	%	-	-	-	83	0.018
Oxidation-reduction potential field	mv	-	-	-	225	0.067
Conventional Parameters						
pH	-	6.5 - 9.0	6.5 - 9.0	-	8.3	0.0054
Hardness, as $CaCO_3$	mg/L	-	-	-	571	0.044
Total alkalinity, as $CaCO_3$	mg/L	20[(c)]	-	-	165	0.034
Total dissolved solids	mg/L	-	-	-	732	0.099
Total suspended solids	mg/L	-	-	-	1.6	0.45
Total organic carbon	mg/L	-	-	-	2.3	0.11
Dissolved organic carbon	mg/L	-	-	-	2.2	0.12
Turbidity	NTU	-	-	-	0.27	0.2
Total acidity	mg/L	-	-	-	2.0	0
Cation - anion balance	%	-	-	-	2.6	0.52
Ion balance	%	-	-	-	96	0.043
Conductivity	µS/cm	-	-	-	1106	0.022
Oxidation-reduction potential	mv	-	-	-	432	0.073
Major Ions						
Bicarbonate	mg/L	-	-	-	193	0.11
Bromide	mg/L	-	-	-	<0.25	0
Calcium	mg/L	-	-	-	141	0.048
Carbonate, as $CaCO_3$	mg/L	-	-	-	1.4	0.64
Chloride	mg/L	150	600	-	20	0.089
Fluoride	mg/L	0.12[(h)]	1.6 - 2.1[(d)]	-	0.1	0.052
Hydroxide	mg/L	-	-	-	<1	0
Magnesium	mg/L	-	-	-	53	0.051
Potassium	mg/L	-	-	-	3.0	0.046
Sodium	mg/L	-	-	-	7.8	0.056
Sulphate	mg/L	429[(c)]	-	481	243	0.053
Sulphide	mg/L	0.010 - 0.029[(d)]	-	-	0.0015	0.45
T-sulphide (as s)	mg/l	-	-	-	0.0015	0.45
Major anion sum	meq/l	-	-	-	12	0.048
Major cation sum	meq/l	-	-	-	12	0.045
Bicarbonate Alkalinity, as $CaCO_3$	mg/l	-	-	-	158	0.11
Carbonate Alkalinity, as $CaCO_3$	mg/l	-	-	-	1.8	0.99
Hydroxide Alkalinity, as $CaCO_3$	mg/l	-	-	-	<1	0
Nutrients and Biological Indicators						
Nitrate	mg-N/L	3.0	33	3.1 - 7.6[(c)]	**48**[(Mn, Mx, E)]	0.057
Nitrite	mg-N/L	0.040 - 0.20[(d)]	0.12 - 0.60[(d)]	-	0.011	0.12
Total ammonia	mg-N/L	2.1	14	-	0.0076	0.44
Total Kjeldahl nitrogen	mg-N/L	-	-	-	0.2	1.0
Total phosphorus	mg-P/L	-	-	-	0.02	0.12
Orthophosphate	mg-P/L	-	-	-	0.02	0.14
Biochemical oxygen demand	mg/L	-	-	-	2.0	0.45
Total Metals						
Aluminum	mg/L	-	-	-	0.0078	0.21
Antimony	mg/L	0.0090	-	-	0.00064	0.057
Arsenic	mg/L	0.0050	0.0050	-	0.0003	0.044
Barium	mg/L	1.0	-	-	0.23	0.031
Beryllium	mg/L	0.00013	-	-	<0.00002	0
Bismuth	mg/L	0.0005[(f)]	-	-	<0.00005	0
Boron	mg/L	1.2	29[(h)]	-	0.01	0.053
Cadmium	mg/L	-	-	-	0.00028	0.075
Calcium	mg/L	-	-	-	142	0.03
Chromium	mg/L	0.0010[(g)]	-	-	<0.0001	0
Cobalt	mg/L	0.0040	0.11	-	0.0001	0.044
Copper	mg/L	-	-	-	<0.0005	0
Iron	mg/L	1.29 - 2.33[(d,f)]	1.0	-	0.011	0.15
Lead	mg/L	0.011 - 0.020[(d)]	0.21 - 0.42[(d)]	-	<0.00005	0
Lithium	mg/L	0.1216[(f)]	-	-	0.039	0.024
Magnesium	mg/L	-	-	-	55	0.054
Manganese	mg/L	1.5 - 2.6[(d)]	2.8 - 3.4[(d)]	-	0.0027	0.29
Mercury	mg/L	0.000010	-	-	0.0000011	0.56
Molybdenum	mg/L	1.0	2.0	-	0.0071	0.21
Nickel	mg/L	0.0053[(h)]	-	-	**0.013**[(Mx)]	0
Potassium	mg/L	-	-	-	3.0	0.051
Selenium	mg/L	0.0020	-	0.019	**0.087**[(Mn, E)]	0.067
Silicon	mg/L	-	-	-	2.5	0.025
Silver	mg/L	0.0015[(h)]	0.0030[(h)]	-	<0.00001	0
Sodium	mg/L	-	-	-	8.0	0.064
Strontium	mg/L	-	-	-	0.22	0.059
Sulphur	mg/L	-	-	-	87	0.044
Thallium	mg/L	0.00080	-	-	0.000019	0.044
Tin	mg/L	0.3[(f)]	-	-	<0.0001	0
Titanium	mg/L	0.85[(f)]	-	-	<0.0003	0
Uranium	mg/L	0.0085	0.033[(h)]	-	0.0033	0.047
Vanadium	mg/L	0.12[(f)]	-	-	0.0013	0.037
Zinc	mg/L	0.095 - 0.19	0.12 - 0.34	-	0.0099	0.066
Dissolved Metals						
Aluminum	mg/L	0.050[(d)]	0.10[(d)]	-	0.0024	0.048
Antimony	mg/L	-	-	-	0.00063	0.043
Arsenic	mg/L	-	-	-	0.00029	0.047
Barium	mg/L	-	-	-	0.23	0.042
Beryllium	mg/L	-	-	-	<0.00002	0
Bismuth	mg/L	-	-	-	<0.00005	0
Boron	mg/L	-	-	-	0.01	0
Cadmium	mg/L	0.00036 - 0.00046[(e)]	0.0012 - 0.0028[(e)]	0.00025 - 0.00032[(e)]	0.00025	0.091
Chromium	mg/L	-	-	-	<0.0001	0
Cobalt	mg/L	-	-	-	<0.0001	0
Copper	mg/L	0.001 - 0.0024[(i)]	0.0059 - 0.0133[(i)]	-	0.00023	0.13
Iron	mg/L	-	0.35	-	<0.01	0
Lead	mg/L	-	-	-	<0.00005	0
Lithium	mg/L	-	-	-	0.038	0.051
Manganese	mg/L	-	-	-	0.0018	0.14
Mercury	mg/L	-	-	-	<0.000005	0
Molybdenum	mg/L	-	-	-	0.0068	0.21
Nickel	mg/L	-	-	-	0.013	0.037
Selenium	mg/L	-	-	-	0.09	0.077
Silicon	mg/L	-	-	-	2.5	0.022
Silver	mg/L	-	-	-	<0.00001	0
Strontium	mg/L	2.5[(d)]	-	-	0.21	0.03
Sulphur	mg/L	-	-	-	84	0.042
Thallium	mg/L	-	-	-	0.000019	0.087
Tin	mg/L	-	-	-	<0.0001	0
Titanium	mg/L	-	-	-	<0.0003	0
Uranium	mg/L	-	-	-	0.0031	0.026
Vanadium	mg/L	-	-	-	0.0012	0.03
Zinc	mg/L	-	-	-	0.0096	0.062

(a) = guideline is a minimum value, unless the background concentration or value is lower.
(b) = guideline is adopted from CCME Canadian Environmental Quality Guidelines (CCME, 1999).
(b) = guideline is hardness dependent. The guideline range shown is based on the hardness range observed in the dataset (207 to 600 mg/L). The guideline is calculated based on the individual hardness value for each sample.
(c) = for some samples, water hardness was greater than 250 mg/L. At this hardness, no BC ENV water quality guideline has been established for sulphate; however, the observed data were screened against the guideline for very hard water (i.e., 429 mg/L) for comparative purposes.
(d) = guideline is pH dependent. The guideline range shown is based on the pH range observed in the dataset (7.9 to 8.4). The guideline is calculated based on the individual pH for each sample.
(e) = guideline is chloride dependent. The guideline range shown is based on the chloride concentration range observed in the dataset (3.8600 to 22.0000 mg/L). The guideline is calculated based on the individual chloride concentration in each sample.
(f) = guideline is adopted from the ECCC PNECs (ECCC, 2018) or draft FEQGs (ECCC, 2017).
(g) = guideline is for chromium VI.
(h) = guideline is a level 1 interim screening value.
(i) = dissolved copper guideline was calculated using the simplified Biotic Ligand Midel (BC ENV, 2019). Where values were missing, the temporally nearest value from the same location was taken.
(Mn) = concentration is higher than the 30-day mean BC ENV guideline or outside the recommended pH, DO or total alkalinity range.
(Mx) = concentration is higher than the maximum BC ENV guideline or outside the recommended pH, DO or total alkalinity range.
(E) = concentration is higher than the EVWQP benchmarks guideline.
Bolded concentrations are higher than water quality guidelines.
Shaded concentrations are higher than the EVWQP benchmark (e.g., for nitrate, total selenium, dissolved cadmium or sulphate).
Water quality data and guidelines shown in this table were rounded to reflect laboratory or field instrument precision after comparisons to guidelines. Therefore, values slighlty above guidelines may be displayed as being equal to the guidelines and identified as exceedances.
Concentrations equal to the guideline values were not identified as exceedances.
Concentrations were screened against available Working and Approved British Columbia Ministry of Environment and Climate Change Strategy (BC ENV) Water Quality Guidelines for the Protection of Aquatic Life; Accessed January 2020 from: https://www2.gov.bc.ca/gov/content/environment/air-land-water/water/water-quality/water-quality-guidelines.
- = no guideline or no data
BC ENV = British Columbia Ministry of Environment & Climate Change Strategy; EVWQP = Elk Valley Water Quality Plan guidelines; *C. dubia* = *Ceriodaphnia dubia* ; *P. subcapitata* = *Pseudokirchneriella subcapitata* ; *H. azteca* = *Hyalella azteca* ; *P. promelas* = *Pimephales promelas* ; *O. mykiss* = *Oncorhynchus mykiss* ; CV = coefficient of variation; ∑ = sum of. WQGs = Water Quality Guidelines; CaCO3 = calcium carbonate; mg/L = milligrams per litre; µS/cm = microsiemens per centimeter; NTU = nephelometric turbidity units; meq/L = milliequivalents per litre; mg-N/L = milligrams of Nitrogen per litre; mg-P/L = milligrams of Phosphorus per litre.
BC ENV (B.C. Ministry of Climate Chande Strategy). 2019. Copper Water Quality guideline for the Protection of Aquatic Life-Technical Report. Water Quality Guideline Series, WQG-03-1. Prov. B.C., Victoria B.C.

Parameter	Unit	Guidelines for the protection of:			Q1 GH_ER2									Q2 GH_ER2									Q3 GH_ER2									Q4 GH_ER2						
		Aquatic Life		EVWQP Benchmarks	*P. subcapitata*	2-Mar-21	9-Mar-21	16-Mar-21	23-Mar-21	30-Mar-21	Mar 2, 9, 16, 23, 30 *P. promelas*		*C. dubia*	*C. dubia* and *P. subcapitata*	25-May-21	1-Jun-21	8-Jun-21	15-Jun-21	May 18, 25, June 1, 8 *H. azteca*		May 18, 25, June 1, 8, 15 *O. mykiss*		*C. dubia* and *P. subcapitata*	17-Aug-21	24-Aug-21	31-Aug-21	7-Sep-21	Aug 10, 17, 24, 31 *H. azteca*		Aug 10, 17, 24, 31 Sept 7 *P. promelas*		*C. dubia* and *P. subcapitata*	19-Oct-21	26-Oct-21	2-Nov-21	9-Nov-21	Oct 12, 19, 26, Nov 2 *H. azteca*	
		30-day mean	Maximum		23-Feb-21						Mean	CV	13-Apr-21	18-May-21					Mean	CV	Mean	CV	10-Aug-21					Mean	CV	Mean	CV	12-Oct-21					Mean	CV
Field Measured																																						
pH	-	6.5 - 9.0	6.5 - 9.0	-	8.4	8.4	8.5	8.2	8.2	7.9	8.2	0.028	7.7	8.2	8.2	8.1	8.4	8.4	8.2	0.016	8.3	0.016	8.3	8.0	8.4	8.1	8.4	8.2	0.02	8.2	0.022	8.1	8.2	8.2	8.2	7.7	8.2	0.0055
Specific conductivity	µS/cm at 25 C	-	-	-	300	296	302	303	311	304	303	0.017	299	275	277	266	236	227	263	0.078	256	0.091	252	261	253	262	267	257	0.018	259	0.023	240	282	282	286	318	272	0.071
Temperature	°C	-	-	-	3.1	3.3	2.0	2.6	1.8	3.0	2.5	0.25	2.6	4.8	4.7	5.6	4.8	6.5	5.0	0.075	5.3	0.15	9.7	8.3	8.0	8.1	8.0	8.5	0.084	8.4	0.086	3.0	4.5	4.8	3.0	2.4	3.8	0.24
Dissolved oxygen	mg/L	11	9.0	-	**10**(Mn)	**10**(Mn)	**11**(Mn)	**10**(Mn)	12	**10**(Mn)	**11**(Mn)	0.091	12	**10**(Mn)	11	**11**(Mn)	**11**(Mn)	**10**(Mn)	**11**(Mn)	0.042	**11**(Mn)	0.052	**9.1**(Mn)	**7.7**(Mn, Mx)	**10**(Mn)	**9.8**(Mn)	**9.7**(Mn)	**9.2**(Mn)	0.1	**9.7**(Mn)	0.1	**11**(Mn)	**10**(Mn)	**10**(Mn)	11	11	**11**(Mn)	0.053
Turbidity	NTU	-	-	-	0.8	0.01	0	2.0	0.26	0.71	0.6	1.4	0	67	10	22	21	41	30	0.74	32	0.7	0.39	9.5	0.05	0.02	0.2	2.5	1.7	2.0	2.1	1.2	1.5	2.0	1.1	0.97	1.4	0.26
Dissolved oxygen	%	-	-	-	78	75	78	75	88	78	79	0.067	85	81	86	85	82	84	83	0.025	83	0.024	80	65	84	83	82	78	0.1	79	0.099	81	80	80	82	83	81	0.012
Oxidation-reduction potential field	mv	-	-	-	80	197	103	89	87	48	105	0.53	99	86	130	116	121	194	113	0.15	129	0.31	306	199	189	284	133	245	0.22	222	0.32	240	227	285	229	247	245	0.1
Conventional Parameters																																						
pH	-	6.5 - 9.0	6.5 - 9.0	-	7.9	8.3	8.0	8.4	8.3	8.0	8.2	0.023	8.2	8.1	8.2	8.1	8.2	8.3	8.2	0.0067	8.2	0.01	8.3	8.3	8.3	8.2	8.2	8.3	0.0066	8.3	0.0066	8.1	8.3	8.2	8.2	8.2	8.2	0.0086
Hardness, as $CaCO_3$	mg/L	-	-	-	170	175	189	173	179	170	177	0.042	174	142	146	141	137	137	142	0.027	141	0.027	143	145	141	149	144	145	0.025	144	0.021	155	163	158	172	166	162	0.048
Total alkalinity, as $CaCO_3$	mg/L	20(a)	-	-	156	152	154	173	154	158	158	0.054	157	149	141	137	138	129	141	0.035	139	0.052	132	139	135	119	139	131	0.071	133	0.062	158	152	148	160	164	155	0.035
Total dissolved solids	mg/L	-	-	-	145	190	152	183	190	170	177	0.091	190	168	164	162	150	140	161	0.052	157	0.074	148	151	165	160	154	156	0.045	156	0.044	169	183	180	186	180	180	0.039
Total suspended solids	mg/L	-	-	-	1.1	<1.0	<1.0	1.4	<1.0	3.7	1.6	0.73	9.2	159	32	59	44	100	73	0.71	79	0.66	6.9	4.7	1.5	<1.0	3.9	3.5	0.76	3.6	0.67	6.4	1.2	7.7	1.9	1.2	4.3	0.7
Total organic carbon	mg/L	-	-	-	<0.50	0.68	<0.50	<0.50	3.4	0.68	1.1	1.1	<0.50	4.0	2.3	1.7	2.1	3.1	2.5	0.35	2.6	0.34	1.4	1.0	2.2	7.1	0.68	2.9	1.1	2.5	1.1	<0.50	1.2	0.61	0.98	<0.50	0.83	0.36
Dissolved organic carbon	mg/L	-	-	-	<0.50	0.63	<0.50	<0.50	<0.50	<0.50	0.53	0.11	<0.50	2.7	2.4	1.2	2.2	1.8	2.1	0.26	2.0	0.28	1.8	0.62	2.0	6.4	0.78	2.7	1.0	2.3	1.0	<0.50	1.4	<0.50	1.4	<0.50	0.93	0.51
Colour	TCU	-	-	-	-	<5.0	-	<5.0	<5.0	<5.0	5.0	0.45	<5.0	6.2	6.0	7.3	<5.0	<5.0	6.1	0.16	5.9	0.16	<5.0	-	-	-	-	5.0	0.45	5.0	0.45	<5.0	-	<5.0	<5.0	-	5.0	0.45
Turbidity	NTU	-	-	-	0.11	0.11	0.11	0.19	0.25	0.84	0.3	1.0	0.42	79	13	21	26	30	35	0.76	34	0.77	0.8	6.9	0.98	0.52	1.2	2.3	1.2	2.1	1.3	0.43	0.18	0.97	0.38	0.22	0.49	0.61
Total acidity	mg/L	-	-	-	2.0	<2.0	<2.0	2.4	<2.0	2.6	2.2	0.13	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2	0	<2	0	<2.0	<2.0	<2.0	<2.0	<2.0	<2	0	<2	0	<2.0	<2.0	<2.0	<2.0	<2.0	<2	0
Cation - anion balance	%	-	-	-	2.4	0.14	2.1	6.0	0.7	3.1	2.4	0.97	1.3	7.0	3.0	3.1	4.3	1.8	4.3	0.37	3.8	0.52	1.0	2.8	3.5	4.7	3.6	3.0	0.51	3.1	0.43	6.3	2.9	4.2	2.1	5.6	3.9	0.45
Ion balance	%	-	-	-	95	100	96	89	101	94	96	0.051	98	87	94	94	92	97	92	0.032	93	0.039	98	95	93	110	93	99	0.084	98	0.073	88	94	92	96	89	93	0.035
Conductivity	µS/cm	-	-	-	284	314	310	319	295	302	308	0.031	319	274	276	272	252	250	269	0.045	265	0.048	261	258	256	266	275	260	0.018	263	0.029	289	299	301	291	304	295	0.018
Oxidation-reduction potential	mv	-	-	-	457	414	406	423	411	471	425	0.062	386	278	394	397	426	432	374	0.16	385	0.16	451	386	362	214	329	353	0.3	348	0.25	454	458	452	457	455	455	0.0055
Major Ions																																						
Bicarbonate	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	158	-	-	158	0.45	159	163	164	145	170	158	0.06	160	0.058	192	180	180	160	164	178	0.079
Bromide	mg/L	-	-	-	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.05	0	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.05	0	<0.05	0	<0.050	<0.050	<0.050	<0.050	<0.050	<0.05	0	<0.05	0	<0.050	<0.050	<0.050	<0.050	<0.050	<0.05	0
Calcium	mg/L	-	-	-	48	50	55	49	50	49	51	0.045	50	41	42	41	39	40	41	0.023	40	0.02	42	42	40	43	41	42	0.025	41	0.023	44	47	45	49	47	46	0.047
Carbonate, as $CaCO_3$	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<1.0	-	-	1.0	0.45	<1.0	3.0	<1.0	<1.0	<1.0	1.5	0.6	1.4	0.64	<1.0	2.5	<1.0	<1.0	<1.0	1.4	0.49
Chloride	mg/L	150	600	-	0.35	0.36	0.51	0.35	0.24	0.27	0.35	0.3	0.22	0.45	0.57	0.43	0.37	0.25	0.46	0.18	0.41	0.28	0.29	0.2	0.28	0.22	0.32	0.25	0.16	0.26	0.19	0.26	0.26	0.4	0.25	0.37	0.29	0.22
Fluoride	mg/L	0.12(b)	1.5 - 1.6(c)	-	**0.14**(Mn)	**0.16**(Mn)	**0.14**(Mn)	**0.16**(Mn)	**0.12**(Mn)	**0.18**(Mn)	**0.15**(Mn)	0.15	0.11	0.12	**0.16**(Mn)	0.12	**0.14**(Mn)	**0.15**(Mn)	**0.13**(Mn)	0.14	**0.14**(Mn)	0.14	**0.16**(Mn)	**0.13**(Mn)	**0.14**(Mn)	**0.13**(Mn)	**0.16**(Mn)	**0.14**(Mn)	0.093	**0.14**(Mn)	0.11	**0.13**(Mn)	0.11	**0.17**(Mn)	0.12	**0.17**(Mn)	**0.13**(Mn)	0.18
Hydroxide	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<1.0	-	-	1.0	0.45	<1.0	<1.0	<1.0	<1.0	<1.0	<1	0	<1	0	<1.0	<1.0	<1.0	<1.0	<1.0	<1	0
Magnesium	mg/L	-	-	-	12	12	13	12	13	12	12	0.053	12	9.8	10	9.6	9.3	9.1	9.7	0.043	9.6	0.049	9.4	9.8	9.9	10	10	9.9	0.038	9.9	0.038	11	11	11	12	12	11	0.051
Potassium	mg/L	-	-	-	0.33	0.37	0.35	0.34	0.39	0.34	0.36	0.057	0.35	0.37	0.39	0.33	0.32	0.33	0.35	0.086	0.35	0.085	0.35	0.43	0.36	0.34	0.36	0.37	0.094	0.37	0.09	0.35	0.34	0.34	0.35	0.37	0.35	0.013
Sodium	mg/L	-	-	-	0.71	0.68	0.69	0.74	0.81	0.69	0.72	0.075	0.73	0.72	0.73	0.66	0.58	0.51	0.67	0.11	0.64	0.15	0.59	0.6	0.62	0.63	0.64	0.61	0.03	0.61	0.034	0.7	0.67	0.68	0.68	0.71	0.68	0.018
Sulphate	mg/L	309 - 429(c,d)	-	481	23	23	39	23	23	23	26	0.28	21	15	14	13	11	13	13	0.12	13	0.099	14	15	17	17	17	16	0.087	16	0.085	19	22	23	20	22	21	0.083
Major anion sum	meq/l	-	-	-	3.6	3.5	4.0	4.0	3.6	3.7	3.7	0.056	3.6	3.3	3.1	3.0	3.0	2.9	3.1	0.041	3.1	0.053	3.0	3.1	3.1	2.7	3.1	3.0	0.059	3.0	0.054	3.6	3.5	3.5	3.6	3.8	3.5	0.022
Major cation sum	meq/l	-	-	-	3.4	3.5	3.8	3.5	3.6	3.4	3.6	0.04	3.5	2.9	3.0	2.9	2.8	2.8	2.9	0.03	2.8	0.029	2.9	2.9	2.9	3.0	2.9	2.9	0.023	2.9	0.019	3.1	3.3	3.2	3.5	3.4	3.3	0.049
Bicarbonate Alkalinity, as $CaCO_3$	mg/l	-	-	-	156	145	154	163	185	158	161	0.093	157	149	141	137	138	129	141	0.035	139	0.052	130	134	135	119	139	130	0.061	131	0.058	158	148	148	131	134	146	0.081
Carbonate Alkalinity, as $CaCO_3$	mg/l	-	-	-	<1.0	7.0	<1.0	9.8	1.3	<1.0	4.0	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1	0	<1	0	1.6	5.0	<1.0	<1.0	<1.0	2.2	0.81	1.9	0.91	<1.0	4.2	<1.0	<1.0	<1.0	1.8	0.8
Hydroxide Alkalinity, as $CaCO_3$	mg/l	-	-	-	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1	0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1	0	<1	0	<1.0	<1.0	<1.0	<1.0	<1.0	<1	0	<1	0	<1.0	<1.0	<1.0	<1.0	<1.0	<1	0
Nutrients and Biological Indicators																																						
Nitrate	mg-N/L	3.0	33	3.0(c)	0.10	0.098	0.66	0.092	0.13	0.09	0.21	1.2	0.09	0.13	0.11	0.096	0.078	0.079	0.1	0.22	0.099	0.22	0.03	0.056	0.042	0.035	0.025	0.041	0.25	0.038	0.32	0.063	0.066	0.077	0.064	0.07	0.067	0.082
Nitrite	mg-N/L	0.020(e)	0.060(e)	-	<0.0010	0.0019	0.0017	<0.0010	<0.0010	<0.0010	0.0013	0.34	0.0013	<0.0010	<0.0010	<0.0010	0.0017	<0.0010	0.0012	0.33	0.0011	0.27	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.001	0	<0.001	0	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.001	0
Total ammonia	mg-N/L	2.1	14	-	<0.0050	0.052	0.019	<0.0050	0.0064	<0.0050	0.017	1.2	<0.0050	0.011	<0.0050	0.024	<0.0050	0.0071	0.011	0.73	0.01	0.76	<0.0050	0.012	<0.0050	<0.0050	<0.0050	0.0067	0.45	0.0064	0.48	0.013	<0.0050	0.0062	<0.0050	<0.0050	0.0073	0.48
Total Kjeldahl nitrogen	mg-N/L	-	-	-	0.094	0.054	0.15	<0.050	<0.050	0.094	0.08	0.56	0.077	0.44	0.23	<0.050	0.16	0.27	0.22	0.66	0.23	0.63	<0.050	0.13	<0.050	<0.050	<0.050	0.069	0.49	0.065	0.52	<0.050	<0.050	<0.050	<0.050	<0.050	<0.05	0
Total phosphorus	mg-P/L	-	-	-	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0067	0.0029	0.71	0.0037	0.19	0.014	0.065	0.048	0.13	0.079	0.85	0.088	0.78	0.0098	0.058	0.0074	0.0029	0.0058	0.019	1.2	0.017	1.4	0.19	0.0033	<0.0020	0.031	<0.0020	0.057	1.4
Orthophosphate	mg-P/L	-	-	-	0.0015	<0.0010	0.002	0.0016	<0.0010	0.0018	0.0015	0.31	0.0017	0.0016	<0.0010	<0.0010	0.0025	0.0012	0.0015	0.49	0.0015	0.43	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.001	0	<0.001	0	<0.0010	0.0014	0.0016	<0.0010	0.0018	0.0013	0.23
Biochemical oxygen demand	mg/L	-	-	-	-	-	-	<2.0	<2.0	<2.0	2.0	0.55	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2	0	<2	0	<2.0	-	-	<2.0	<2.0	2.0	0.55	2.0	0.55	<2.0	-	<2.0	<2.0	<2.0	2.0	0.45
Total Metals																																						
Aluminum	mg/L	-	-	-	0.0042	0.0058	0.015	0.0065	0.0091	0.2	0.047	1.8	0.0087	0.95	0.37	0.51	0.51	0.83	0.58	0.38	0.63	0.39	0.069	0.1	0.04	0.0089	0.044	0.055	0.74	0.053	0.67	0.0092	<0.0030	0.24	0.019	0.0098	0.067	1.5
Antimony	mg/L	0.0090	-	-	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.00010	0.00013	<0.00010	<0.00010	<0.00010	0.00012	0.00011	0.12	0.00011	0.13	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.0001	0	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0
Arsenic	mg/L	0.0050	0.0050	-	0.00011	0.00011	0.0001	<0.00010	<0.00010	0.00021	0.00012	0.39	<0.00010	0.00078	0.00034	0.00047	0.00052	0.0008	0.00053	0.3	0.00058	0.35	0.00017	0.00019	0.00012	0.00017	0.00016	0.00016	0.16	0.00016	0.16	0.00011	0.0001	0.00035	0.00011	0.00013	0.00017	0.65
Barium	mg/L	1.0	-	-	0.051	0.051	0.051	0.05	0.047	0.056	0.051	0.062	0.047	0.065	0.045	0.046	0.044	0.051	0.05	0.18	0.05	0.17	0.043	0.051	0.039	0.044	0.046	0.044	0.096	0.045	0.097	0.048	0.047	0.058	0.047	0.046	0.05	0.095
Beryllium	mg/L	0.00013	-	-	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.00002	0	<0.000020	0.000094	0.000025	0.000032	0.000034	0.00006	0.000046	0.61	0.000049	0.58	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.00002	0	<0.00002	0	<0.000020	<0.000020	0.000033	<0.000020	<0.000020	0.000023	0.25
Bismuth	mg/L	0.0005(f)	-	-	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0	<0.00005	0	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0	<0.00005	0	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0
Boron	mg/L	1.2	29(b)	-	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.01	0	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.01	0	<0.01	0	<0.010	<0.010	<0.010	<0.010	<0.010	<0.01	0	<0.01	0	<0.010	<0.010	<0.010	<0.010	<0.010	<0.01	0
Cadmium	mg/L	-	-	-	0.000006	0.0000069	0.000007	<0.0000050	0.0000051	0.000023	0.0000094	0.81	0.0000062	0.00021	0.000048	0.0001	0.000077	0.00012	0.00011	0.58	0.00011	0.56	0.000022	0.000027	0.000012	<0.0000050	0.000013	0.000016	0.6	0.000015	0.55	0.0000068	0.0000058	0.000067	0.0000071	<0.0000050	0.000022	1.2
Calcium	mg/L	-	-	-	54	51	51	49	49	52	50	0.027	47	55	45	49	48	44	48	0.09	47	0.093	41	44	40	44	41	42	0.053	42	0.048	47	44	54	47	46	48	0.075
Chromium	mg/L	0.0010(g)	-	-	0.00031	0.00028	0.00038	0.00029	0.00026	0.00072	0.00039	0.5	0.00026	**0.0023**(Mn)	0.00092	**0.0012**(Mn)	**0.0012**(Mn)	**0.0020**(Mn)	**0.0014**(Mn)	0.38	**0.0015**(Mn)	0.39	0.00037	0.00041	0.00022	0.0002	0.00033	0.0003	0.34	0.00031	0.3	0.00036	0.00024	0.00078	0.00034	0.00029	0.00043	0.49
Cobalt	mg/L	0.0040	0.11	-	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.00010	0.00078	0.0002	0.00031	0.00028	0.00051	0.00039	0.59	0.00042	0.56	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.0001	0	<0.00010	<0.00010	0.0003	<0.00010	<0.00010	0.00015	0.6
Copper	mg/L	-	-	-	<0.00050	<0.00050	0.0044	<0.00050	<0.00050	<0.00050	0.0013	1.4	<0.00050	0.0023	0.001	0.00093	0.00091	0.0015	0.0013	0.49	0.0013	0.46	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	0	<0.0005	0	<0.00050	<0.00050	0.00069	<0.00050	<0.00050	0.00055	0.16
Iron	mg/L	0.62 - 3.72(f,h)	1.0	-	<0.010	0.012	0.019	<0.010	<0.010	0.25	0.059	1.8	0.013	**1.5**(Mx)	0.46	0.72	0.72	**1.3**(Mx)	0.85	0.47	0.94	0.47	0.11	0.16	0.034	0.014	0.094	0.081	0.82	0.083	0.72	0.018	<0.010	0.44	0.027	0.019	0.12	1.5
Lead	mg/L	0.0081 - 0.010(c)	0.12 - 0.18(c)	-	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	0.00014	0.000068	0.58	<0.000050	0.0013	0.00033	0.00049	0.00044	0.00077	0.00063	0.6	0.00066	0.57	0.00012	0.00012	<0.000050	<0.000050	0.00022	0.000085	0.45	0.00011	0.63	<0.000050	<0.000050	0.00043	<0.000050	<0.000050	0.00015	1.2
Lithium	mg/L	0.1216(f)	-	-	0.0018	0.0016	0.0018	0.0016	0.0019	0.002	0.0018	0.1	0.0016	0.0029	0.0018	0.0021	0.0019	0.0022	0.0022	0.21	0.0022	0.2	0.0018	0.0018	0.0016	0.0019	0.0017	0.0018	0.069	0.0018	0.065	0.0018	0.0019	0.0022	0.0018	0.0018	0.0019	0.09
Magnesium	mg/L	-	-	-	13	12	12	13	13	13	12	0.027	12	13	11	10	10	11	11	0.09	11	0.085	9.3	9.4	9.4	10	11	9.6	0.042	9.8	0.07	11	11	13	11	12	12	0.054
Manganese	mg/L	1.2 - 1.4(c)	2.0 - 2.6(c)	-	0.0017	0.0021	0.0021	0.0015	0.00067	0.0097	0.0032	1.1	0.0015	0.09	0.021	0.043	0.036	0.071	0.048	0.55	0.052	0.53	0.0087	0.014	0.003	0.0022	0.004	0.0069	0.74	0.0063	0.76	0.0021	0.0011	0.037	0.0024	0.0018	0.011	1.5
Mercury	mg/L	0.000010	-	-	<0.00000050	<0.00000050	<0.00000050	<0.00000050	<0.00000050	<0.00000050	<0.0000005	0	<0.00000050	0.0000096	0.0000015	0.00000091	0.0000026	0.0000041	0.0000037	0.97	0.0000037	0.94	0.0000016	0.0000013	<0.00000050	<0.00000050	<0.00000050	0.00000096	0.53	0.00000087	0.59	<0.00000050	<0.00000050	<0.00000050	<0.00000050	<0.00000050	<0.0000005	0
Molybdenum	mg/L	1.0	2.0	-	0.001	0.0009	0.0011	0.00093	0.0011	0.0011	0.001	0.081	0.00099	0.00091	0.00091	0.00091	0.00097	0.0010	0.00093	0.037	0.00094	0.045	0.00095	0.001	0.00095	0.001	0.0011	0.00098	0.04	0.001	0.055	0.0011	0.00098	0.00089	0.00099	0.001	0.00099	0.07
Nickel	mg/L	0.0053(i)	-	-	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	0	<0.00050	0.0035	0.0011	0.0013	0.0014	0.0023	0.0018	0.56	0.0019	0.54	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	0	<0.0005	0	<0.00050	<0.00050	0.00099	<0.00050	<0.00050	0.00062	0.35
Potassium	mg/L	-	-	-	0.33	0.33	0.34	0.32	0.35	0.43	0.36	0.13	0.33	0.8	0.54	0.54	0.55	0.7	0.61	0.19	0.63	0.19	0.36	0.45	0.35	0.35	0.39	0.38	0.11	0.38	0.11	0.36	0.34	0.47	0.36	0.35	0.38	0.13
Selenium	mg/L	0.0020	-	0.019	0.001	0.00089	0.001	0.00089	0.0011	0.0011	0.001	0.12	0.00098	0.00092	0.00071	0.00083	0.00059	0.00073	0.00076	0.19	0.00075	0.17	0.00073	0.00053	0.00082	0.00071	0.00077	0.0007	0.15	0.00071	0.16	0.00087	0.00077	0.00097	0.00081	0.00092	0.00086	0.091
Silicon	mg/L	-	-	-	1.9	1.8	1.9	1.8	1.9	2.2	1.9	0.093	1.8	3.3	2.5	2.7	2.6	2.9	2.8	0.12	2.8	0.12	1.8	2.1	1.8	1.8	1.9	1.9	0.082	1.9	0.08	2.0	1.8	2.2	2.0	1.8	2.0	0.075
Silver	mg/L	0.0015(c)	0.0030(c)	-	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	0	<0.000010	0.000032	<0.000010	0.000015	0.000013	0.000023	0.000018	0.5	0.000019	0.48	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	0	<0.00001	0	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	0
Sodium	mg/L	-	-	-	0.74	0.69	0.76	0.71	0.75	0.71	0.72	0.043	0.68	0.79	0.72	0.67	0.61	0.52	0.7	0.11	0.66	0.15	0.6	0.57	0.57	0.6	0.67	0.59	0.031	0.6	0.071	0.7	0.66	0.76	0.7	0.69	0.7	0.049
Strontium	mg/L	-	-	-	0.23	0.21	0.23	0.21	0.21	0.22	0.22	0.046	0.21	0.22	0.2	0.21	0.2	0.21	0.21	0.057	0.21	0.054	0.2	0.19	0.2	0.22	0.22	0.2	0.057	0.2	0.06	0.22	0.21	0.23	0.21	0.22	0.22	0.039
Sulphur	mg/L	-	-	-	8.7	8.0	8.2	8.3	8.5	8.0	8.2	0.025	6.8	5.5	5.9	4.7	4.5	4.5	5.2	0.13	5.0	0.13	5.2	5.1	5.8	6.4	6.7	5.6	0.11	5.8	0.12	7.6	7.3	8.3	7.4	7.4	7.7	0.049
Thallium	mg/L	0.00080	-	-	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	0	<0.000010	0.000048	0.000015	0.000023	0.000025	0.000035	0.000028	0.44	0.000029	0.43	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	0	<0.00001	0	<0.000010	<0.000010	0.00001	<0.000010	<0.000010	0.00001	0
Tin	mg/L	0.30(f)	-	-	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.0001	0	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.0001	0	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0
Titanium	mg/L	0.85(f)	-	-	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.0039	<0.00102	1.6	<0.00030	0.0091	<0.0051	0.0048	0.0043	0.0061	0.0058	0.35	0.0059	0.32	<0.0012	0.0011	0.00072	<0.00030	0.00055	0.00083	0.51	0.00077	0.48	<0.00030	<0.00030	0.0015	<0.00030	<0.00030	0.00061	0.91
Uranium	mg/L	0.0085	0.033(b)	-	0.00082	0.00075	0.00082	0.0008	0.00075	0.00089	0.0008	0.071	0.00078	0.00092	0.00077	0.00075	0.00075	0.00075	0.0008	0.092	0.00079	0.094	0.00063	0.00058	0.00062	0.00068	0.00069	0.00063	0.068	0.00064	0.07	0.00073	0.00074	0.00094	0.00075	0.00076	0.00079	0.11
Vanadium	mg/L	0.12(f)	-	-	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.0011	0.00062	0.44	<0.00050	0.0044	0.0016	0.0024	0.0024	0.0038	0.0027	0.39	0.0029	0.39	0.00064	0.0006	<0.00050	0.00051	<0.00050	0.00056	0.11	0.00055	0.12	<0.00050	<0.00050	0.0014	<0.00050	<0.00050	0.00072	0.54
Zinc	mg/L	0.043 - 0.082	0.068 - 0.11	-	<0.0030	<0.0030	0.0074	<0.0030	<0.0030	<0.0030	0.0039	0.51	<0.0030	0.016	0.0061	0.0059	0.006	0.0092	0.0084	0.51	0.0086	0.49	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.003	0	<0.003	0	<0.0030	<0.0030	0.015	<0.0030	<0.0030	0.006	0.89
Dissolved Metals																																						
Aluminum	mg/L	0.050(h)	0.10(h)	-	0.0018	<0.0010	0.0013	0.0013	0.0015	0.0033	0.0017	0.55	<0.0010	0.0029	0.0028	0.0019	0.0027	0.0022	0.0026	0.16	0.0025	0.17	<0.0010	0.0015	<0.0010	<0.0010	<0.0010	0.0011	0.2	0.0011	0.2	0.0017	0.0039	0.0016	0.0028	0.0012	0.0025	0.38
Antimony	mg/L	-	-	-	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.0001	0	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.0001	0	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0
Arsenic	mg/L	-	-	-	<0.00010	<0.00010	0.00012	<0.00010	<0.00010	<0.00010	0.0001	0.086	<0.00010	0.00013	0.00012	0.00011	0.00014	0.00013	0.00013	0.1	0.00013	0.09	<0.00010	<0.00010	<0.00010	0.00011	0.0001	0.0001	0.053	0.0001	0.044	<0.00010	0.00011	<0.00010	0.00011	0.0001	0.00011	0.052
Barium	mg/L	-	-	-	0.05	0.055	0.055	0.051	0.049	0.05	0.052	0.058	0.051	0.039	0.038	0.034	0.036	0.033	0.037	0.051	0.036	0.069	0.04	0.05	0.04	0.042	0.043	0.043	0.094	0.043	0.094	0.047	0.049	0.047	0.05	0.049	0.048	0.034
Beryllium	mg/L	-	-	-	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.00002	0	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.00002	0	<0.00002	0	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.00002	0	<0.00002	0	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.00002	0
Bismuth	mg/L	-	-	-	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0	<0.00005	0	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0	<0.00005	0	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0
Boron	mg/L	-	-	-	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.01	0	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.01	0	<0.01	0	<0.010	<0.010	<0.010	<0.010	<0.010	<0.01	0	<0.01	0	<0.010	<0.010	<0.010	<0.010	<0.010	<0.01	0
Cadmium	mg/L	0.00027 - 0.00034(c)	0.00081 - 0.0011(c)	0.00018 - 0.00023(c)	0.0000062	<0.0000050	0.0000057	0.0000053	0.000005	0.0000053	0.0000053	0.055	<0.0000050	0.0000088	0.0000096	0.0000058	0.0000059	0.0000052	0.0000075	0.25	0.0000071	0.28	0.0000054	<0.0000050	0.0000067	0.0000064	0.0000069	0.0000059	0.13	0.0000061	0.14	0.0000076	0.0000086	0.000007	<0.0000050	<0.0000050	0.0000071	0.23
Chromium	mg/L	-	-	-	0.00027	0.00028	0.00029	0.0003	0.00032	0.00027	0.00029	0.066	0.00022	0.00014	0.00019	0.0002	0.00022	0.0002	0.00019	0.18	0.00019	0.16	0.0002	0.00022	0.00021	0.00018	0.0002	0.0002	0.088	0.0002	0.073	0.0003	0.00025	0.00026	0.00022	0.00026	0.00026	0.13
Cobalt	mg/L	-	-	-	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.0001	0	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.0001	0	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0
Copper	mg/L	0.0002 - 0.004(j)	0.0014 - 0.0235(j)	-	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.0002	0	<0.00020	<0.00020	0.0003	<0.00020	<0.00020	<0.00020	0.00023	0.2	0.00022	0.2	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.0002	0	<0.0002	0	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.0002	0
Iron	mg/L	-	0.35	-	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.01	0	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.01	0	<0.01	0	<0.010	<0.010	<0.010	<0.010	<0.010	<0.01	0	<0.01	0	<0.010	<0.010	<0.010	<0.010	<0.010	<0.01	0
Lead	mg/L	-	-	-	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0	<0.00005	0	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0	<0.00005	0	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0
Lithium	mg/L	-	-	-	0.0016	0.0015	0.0016	0.0016	0.0017	0.0017	0.0016	0.052	0.0018	0.0015	0.0015	0.0013	0.0013	0.0013	0.0014	0.078	0.0014	0.079	0.0016	0.0017	0.0015	0.0017	0.0016	0.0016	0.055	0.0016	0.052	0.0018	0.0022	0.0017	0.0018	0.0017	0.0019	0.1
Manganese	mg/L	-	-	-	0.0014	0.0015	0.0015	0.0014	0.00038	0.0018	0.0013	0.41	0.0011	0.0016	0.00085	0.0009	0.001	0.0009	0.0011	0.27	0.001	0.28	0.0013	0.0046	0.0011	0.0013	0.0012	0.0021	0.72	0.0019	0.8	0.0012	0.0022	0.0011	0.0014	0.0011	0.0015	0.29
Mercury	mg/L	-	-	-	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.000005	0	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.000005	0	<0.000005	0	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.000005	0	<0.000005	0	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.000005	0
Molybdenum	mg/L	-	-	-	0.00094	0.00096	0.00097	0.00096	0.00097	0.00098	0.00097	0.0087	0.001	0.00087	0.0017	0.00087	0.0009	0.00087	0.0011	0.34	0.001	0.36	0.001	0.001	0.001	0.001	0.00098	0.001	0.0044	0.001	0.019	0.0011	0.00098	0.001	0.00097	0.0011	0.001	0.048
Nickel	mg/L	-	-	-	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	0	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	0	<0.0005	0	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	0	<0.0005	0	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	0
Selenium	mg/L	-	-	-	0.001	0.0012	0.0012	0.0011	0.0011	0.0012	0.0012	0.05	0.0011	0.00085	0.00088	0.00079	0.00061	0.00068	0.00078	0.17	0.00076	0.15	0.00064	0.00059	0.00071	0.00074	0.00068	0.00067	0.098	0.00067	0.086	0.00088	0.0008	0.0011	0.0009	0.0009	0.00091	0.1
Silicon	mg/L	-	-	-	1.9	1.8	2.0	1.8	1.8	1.8	1.8	0.047	1.9	1.8	1.8	1.9	1.7	1.6	1.8	0.046	1.7	0.067	1.7	1.8	1.7	1.8	1.8	1.7	0.039	1.7	0.039	1.8	1.8	1.9	1.8	1.8	1.8	0.024
Silver	mg/L	-	-	-	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	0	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	0	<0.00001	0	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	0	<0.00001	0	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	0
Strontium	mg/L	2.5(f)	-	-	0.21	0.22	0.21	0.21	0.23	0.22	0.22	0.025	0.22	0.2	0.2	0.19	0.19	0.19	0.19	0.022	0.19	0.019	0.21	0.2	0.21	0.22	0.2	0.21	0.054	0.21	0.049	0.22	0.21	0.21	0.23	0.22	0.22	0.039
Sulphur	mg/L	-	-	-	8.5	7.4	8.5	8.5	7.8	7.5	7.9	0.067	7.7	5.2	5.2	4.5	4.1	4.6	4.8	0.11	4.7	0.097	5.2	4.7	5.4	6.2	6.3	5.4	0.12	5.6	0.12	7.1	7.0	7.1	7.3	7.9	7.1	0.019
Thallium	mg/L	-	-	-	<0.000010	<0.000010	<0.000020	<0.000010	<0.000010	<0.000010	<0.000012	0.37	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	0	<0.00001	0	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	0	<0.00001	0	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	0
Tin	mg/L	-	-	-	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.0001	0	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.0001	0	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0
Titanium	mg/L	-	-	-	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.0003	0	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.0003	0	<0.0003	0	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.0003	0	<0.0003	0	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.0003	0
Uranium	mg/L	-	-	-	0.00076	0.00076	0.00075	0.00081	0.00074	0.00079	0.00077	0.039	0.00081	0.00071	0.00064	0.00062	0.00068	0.00068	0.00066	0.058	0.00067	0.058	0.0006	0.0006	0.00066	0.00066	0.00067	0.00063	0.054	0.00064	0.056	0.00074	0.00073	0.00072	0.00072	0.00073	0.00072	0.012
Vanadium	mg/L	-	-	-	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	0	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	0	<0.0005	0	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	0	<0.0005	0	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	0
Zinc	mg/L	-	-	-	0.0014	<0.0010	<0.0010	0.0011	<0.0010	0.0033	0.0015	0.69	<0.0010	<0.0010	0.0023	<0.0010	<0.0010	<0.0010	0.0013	0.44	0.0013	0.46	<0.0010	0.0017	0.0023	<0.0010	<0.0010	0.0015	0.39	0.0014	0.42	<0.0010	<0.0010	<0.0010	<0.0010	0.0018	<0.001	0

(a) = guideline is a minimum value, unless the background concentration or value is lower.
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(c) = guideline is hardness dependent. The guideline range shown is based on the hardness range observed in the dataset (137 to 189 mg/L). The guideline is calculated based on the individual hardness value for each sample.
(d) = for some samples, water hardness was greater than 250 mg/L. At this hardness, no BC ENV water quality guideline has been established for sulphate; however, the observed data were screened against the guideline for very hard water (i.e., 429 mg/L) for comparative purposes.
(e) = guideline is chloride dependent. The guideline range shown is based on the chloride concentration range observed in the dataset (0.200 to 0.570 mg/L). The guideline is calculated based on the individual chloride concentration in each sample.
(f) = guideline is adopted from the ECCC PNECs (ECCC, 2018) or draft FEQGs (ECCC, 2017).
(g) = guideline is for chromium VI.
(h) = guideline is pH dependent. The guideline range shown is based on the pH range observed in the dataset (7.7 to 8.5). The guideline is calculated based on the individual pH for each sample.
(i) = guideline is a level 1 interim screening value.
(j) = dissolved copper guideline was calculated using the simplified Biotic Ligand Midel (BC ENV, 2019). Where values were missing, the temporally nearest value from the same location was taken.
(Mn) = concentration is higher than the 30-day mean BC ENV guideline or outside the recommended pH, DO or total alkalinity range.
(Mx) = concentration is higher than the maximum BC ENV guideline or outside the recommended pH, DO or total alkalinity range.
(E) = concentration is higher than the EVWQP benchmarks guideline.
Bolded concentrations are higher than water quality guidelines.
Shaded concentrations are higher than the EVWQP benchmark (e.g., for nitrate, total selenium, dissolved cadmium or sulphate).
Water quality data and guidelines shown in this table were rounded to reflect laboratory or field instrument precision after comparisons to guidelines. Therefore, values slightly above guidelines may be displayed as being equal to the guidelines and identified as exceedances. Concentrations equal to the guideline values were not identified as exceedances.
Concentrations were screened against available Working and Approved British Columbia Ministry of Environment and Climate Change Strategy (BC ENV) Water Quality Guidelines for the Protection of Aquatic Life; Accessed January 2020 from: https://www2.gov.bc.ca/gov/content/environment/air-land-water/water/water-quality/water-quality-guidelines.
\- = no guideline or no data
BC ENV = British Columbia Ministry of Environment & Climate Change Strategy; EVWQP = Elk Valley Water Quality Plan guidelines; *C. dubia* = *Ceriodaphnia dubia* ; *P. subcapitata* = *Pseudokirchneriella subcapitata* ; *H. azteca* = *Hyallela azteca* ; *P. promelas* = *Pimephales promelas* ; *O. mykiss* = *Oncorhynchus mykiss* ; CV = coefficient of variation; ∑ = sum of; WQGs = Water Quality Guidelines; CaCO3 = calcium carbonate; mg/L = milligrams per litre; µS/cm = microsiemens per centimeter; NTU = nephelometric turbidity units; meq/L = milliequivalents per litre; mg-N/L = milligrams of Nitrogen per litre; mg=P/L = milligrams of Phosphorus per litre.
BC ENV (B.C. Ministry of Climate Chande Strategy). 2019. Copper Water Quality guideline for the Protection of Aquatic Life-Technical Report. Water Quality Guideline Series, WQG-03-1. Prov. B.C., Victoria B.C.

Parameter	Unit	Guidelines for the protection of:			Oct 12, 19, 26, Nov 2, 9 *O. mykiss*	
		Aquatic Life		EVWQP Benchmarks		
		30-day mean	Maximum		Mean	CV
Field Measured						
pH	-	6.5 - 9.0	6.5 - 9.0	-	8.1	0.027
Specific conductivity	µS/cm at 25 C	-	-	-	281	0.097
Temperature	°C	-	-	-	3.5	0.3
Dissolved oxygen	mg/L	11	9.0	-	**11**(Min)	0.057
Turbidity	NTU	-	-	-	1.3	0.3
Dissolved oxygen	%	-	-	-	81	0.014
Oxidation-reduction potential field	mv	-	-	-	245	0.096
Conventional Parameters						
pH	-	6.5 - 9.0	6.5 - 9.0	-	8.2	0.0086
Hardness, as $CaCO_3$	mg/L	-	-	-	163	0.041
Total alkalinity, as $CaCO_3$	mg/L	20[a]	-	-	156	0.041
Total dissolved solids	mg/L	-	-	-	180	0.036
Total suspended solids	mg/L	-	-	-	3.7	0.85
Total organic carbon	mg/L	-	-	-	0.76	0.42
Dissolved organic carbon	mg/L	-	-	-	0.84	0.56
Colour	TCU	-	-	-	5.0	0.55
Turbidity	NTU	-	-	-	0.44	0.73
Total acidity	mg/L	-	-	-	<2	0
Cation - anion balance	%	-	-	-	4.2	0.41
Ion balance	%	-	-	-	92	0.035
Conductivity	µS/cm	-	-	-	297	0.022
Oxidation-reduction potential	mv	-	-	-	455	0.0052
Major Ions						
Bicarbonate	mg/L	-	-	-	175	0.075
Bromide	mg/L	-	-	-	<0.05	0
Calcium	mg/L	-	-	-	46	0.04
Carbonate, as $CaCO_3$	mg/L	-	-	-	1.3	0.52
Chloride	mg/L	150	600	-	0.31	0.23
Fluoride	mg/L	0.12[b]	1.5 - 1.6[b]	-	**0.14**(Min)	0.2
Hydroxide	mg/L	-	-	-	<1	0
Magnesium	mg/L	-	-	-	11	0.047
Potassium	mg/L	-	-	-	0.35	0.03
Sodium	mg/L	-	-	-	0.69	0.028
Sulphate	mg/L	309 - 429[c,d]	-	481	21	0.083
Major anion sum	meq/l	-	-	-	3.6	0.033
Major cation sum	meq/l	-	-	-	3.3	0.042
Bicarbonate Alkalinity, as $CaCO_3$	mg/l	-	-	-	144	0.078
Carbonate Alkalinity, as $CaCO_3$	mg/l	-	-	-	1.6	0.87
Hydroxide Alkalinity, as $CaCO_3$	mg/l	-	-	-	<1	0
Nutrients and Biological Indicators						
Nitrate	mg-N/L	3.0	33	3.0[e,i]	0.068	0.08
Nitrite	mg-N/L	0.020[e,i]	0.060[e,i]	-	<0.001	0
Total ammonia	mg-N/L	2.1	14	-	0.0069	0.51
Total Kjeldahl nitrogen	mg-N/L	-	-	-	<0.05	0
Total phosphorus	mg-P/L	-	-	-	0.046	1.8
Orthophosphate	mg-P/L	-	-	-	0.0014	0.26
Biochemical oxygen demand	mg/L	-	-	-	2.0	0.45
Total Metals						
Aluminum	mg/L	-	-	-	0.055	1.8
Antimony	mg/L	0.0090	-	-	<0.0001	0
Arsenic	mg/L	0.0050	0.0050	-	0.00016	0.67
Barium	mg/L	1.0	-	-	0.049	0.1
Beryllium	mg/L	0.00013	-	-	0.000023	0.26
Bismuth	mg/L	0.0005[f]	-	-	<0.00005	0
Boron	mg/L	1.2	29[Mn]	-	<0.01	0
Cadmium	mg/L	-	-	-	0.000018	1.5
Calcium	mg/L	-	-	-	47	0.077
Chromium	mg/L	0.0010[g]	-	-	0.0004	0.54
Cobalt	mg/L	0.0040	0.11	-	0.00014	0.64
Copper	mg/L	-	-	-	0.00054	0.16
Iron	mg/L	0.62 - 3.72[f,h]	1.0	-	0.1	1.8
Lead	mg/L	0.0081 - 0.010[h]	0.12 - 0.18[h]	-	0.00013	1.4
Lithium	mg/L	0.1216[f]	-	-	0.0019	0.091
Magnesium	mg/L	-	-	-	12	0.053
Manganese	mg/L	1.2 - 1.4[h]	2.0 - 2.6[h]	-	0.0088	1.8
Mercury	mg/L	0.000010	-	-	<0.0000005	0
Molybdenum	mg/L	1.0	2.0	-	0.0010	0.073
Nickel	mg/L	0.0053[f]	-	-	0.0006	0.37
Potassium	mg/L	-	-	-	0.38	0.14
Selenium	mg/L	0.0020	-	0.019	0.00087	0.092
Silicon	mg/L	-	-	-	2.0	0.092
Silver	mg/L	0.0015[h]	0.0030[h]	-	<0.000001	0
Sodium	mg/L	-	-	-	0.7	0.051
Strontium	mg/L	-	-	-	0.22	0.037
Sulphur	mg/L	-	-	-	7.6	0.049
Thallium	mg/L	0.00080	-	-	0.00001	0
Tin	mg/L	0.30[f]	-	-	<0.0001	0
Titanium	mg/L	0.85[f]	-	-	0.00055	1.0
Uranium	mg/L	0.0085	0.033[Mn]	-	0.00078	0.11
Vanadium	mg/L	0.12[f]	-	-	0.00067	0.57
Zinc	mg/L	0.043 - 0.082	0.068 - 0.11	-	0.0054	0.99
Dissolved Metals						
Aluminum	mg/L	0.050[b]	0.10[b]	-	0.0022	0.49
Antimony	mg/L	-	-	-	<0.0001	0
Arsenic	mg/L	-	-	-	0.0001	0.053
Barium	mg/L	-	-	-	0.048	0.029
Beryllium	mg/L	-	-	-	<0.00002	0
Bismuth	mg/L	-	-	-	<0.00005	0
Boron	mg/L	-	-	-	<0.01	0
Cadmium	mg/L	0.00027 - 0.00034[h]	0.00081 - 0.0011[h]	0.00018 - 0.00023[h]	0.0000066	0.24
Chromium	mg/L	-	-	-	0.00026	0.11
Cobalt	mg/L	-	-	-	<0.0001	0
Copper	mg/L	0.0002 - 0.004[f]	0.0014 - 0.0235[f]	-	<0.0002	0
Iron	mg/L	-	0.35	-	<0.01	0
Lead	mg/L	-	-	-	<0.00005	0
Lithium	mg/L	-	-	-	0.0018	0.11
Manganese	mg/L	-	-	-	0.0014	0.33
Mercury	mg/L	-	-	-	<0.000005	0
Molybdenum	mg/L	-	-	-	0.001	0.047
Nickel	mg/L	-	-	-	<0.0005	0
Selenium	mg/L	-	-	-	0.00091	0.1
Silicon	mg/L	-	-	-	1.8	0.024
Silver	mg/L	-	-	-	<0.00001	0
Strontium	mg/L	2.5[f]	-	-	0.22	0.034
Sulphur	mg/L	-	-	-	7.3	0.048
Thallium	mg/L	-	-	-	<0.00001	0
Tin	mg/L	-	-	-	<0.0001	0
Titanium	mg/L	-	-	-	<0.0003	0
Uranium	mg/L	-	-	-	0.00073	0.0099
Vanadium	mg/L	-	-	-	<0.0005	0
Zinc	mg/L	-	-	-	0.0012	0.31

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- = no guideline or no data
BC ENV = British Columbia Ministry of Environment & Climate Change Strategy; EVWQP = Elk Valley Water Quality Plan guidelines; *C. dubia* = *Ceriodaphnia dubia* ; *P. subcapitata* = *Pseudokirchneriella subcapitata* ; *H. azteca* = *Hyalella azteca* ; *P. promelas* = *Pimephales promelas* ; *O. mykiss* = *Oncorhynchus mykiss* ; CV = coefficient of variation; ∑ = sum of. WQGs = Water Quality Guidelines; CaCO3 = calcium carbonate; mg/L = milligrams per litre; µS/cm = microsiemens per centimeter; NTU = nephelometric turbidity units; meq/L = milliequivalents per litre; mg-N/L = milligrams of Nitrogen per litre; mg-P/L = milligrams of Phosphorus per litre.
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Parameter	Unit	Guidelines for the protection of: Aquatic Life 30-day mean	Aquatic Life Maximum	EVWQP Benchmarks	Q1 GH_ERC P. subcapitata 23-Feb-21	2-Mar-21	9-Mar-21	16-Mar-21	23-Mar-21	30-Mar-21	Mar 2, 9, 16, 23, 30 P. promelas Mean	CV	C. dubia 13-Apr-21
Field Measured													
pH	-	6.5 - 9.0	6.5 - 9.0	-	8.3	8.4	8.4	8.1	7.8	7.7	8.1	0.038	7.8
Specific conductivity	µS/cm at 25 C	-	-	-	338	336	340	342	368	360	347	0.038	350
Temperature	°C	-	-	-	3.7	3.9	3.4	3.7	4.1	3.4	3.7	0.075	2.8
Dissolved oxygen	mg/L	11	9.0	-	11	**11**[Mn]	**11**[Mn]	11	**10**[Mn]	11	**11**[Mn]	0.044	12
Turbidity	NTU	-	-	-	0.88	0.12	0	1.1	0.69	0.12	0.49	0.96	0
Dissolved oxygen	%	-	-	-	84	80	82	85	78	85	82	0.035	90
Oxidation-reduction potential field	mv	-	-	-	91	191	94	81	91	73	103	0.42	107
Conventional Parameters													
pH	-	6.5 - 9.0	6.5 - 9.0	-	7.9	8.3	7.9	8.4	8.2	8.0	8.1	0.026	8.2
Hardness, as $CaCO_3$	mg/L	-	-	-	194	198	201	197	199	193	197	0.015	196
Total alkalinity, as $CaCO_3$	mg/L	20[a]	-	-	159	155	162	152	156	159	157	0.023	158
Total dissolved solids	mg/L	-	-	-	190	230	181	209	228	187	204	0.1	207
Total suspended solids	mg/L	-	-	-	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1	0	<1.0
Total organic carbon	mg/L	-	-	-	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.5	0	<0.50
Dissolved organic carbon	mg/L	-	-	-	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.5	0	<0.50
Colour	TCU	-	-	-	-	<5.0	-	<5.0	<5.0	<5.0	<5.0	0.45	<5.0
Turbidity	NTU	-	-	-	<0.10	<0.10	<0.10	0.12	<0.10	<0.10	0.1	0.079	0.1
Total acidity	mg/L	-	-	-	2.1	<2.0	<2.0	2.6	<2.0	2.6	2.2	0.14	2.7
Cation - anion balance	%	-	-	-	1.4	0.37	4.6	1.0	0.37	4.2	2.0	0.96	1.7
Ion balance	%	-	-	-	97	101	110	102	99	92	100	0.059	97
Conductivity	µS/cm	-	-	-	326	353	348	356	349	356	348	0.032	371
Oxidation-reduction potential	mv	-	-	-	334	315	421	383	325	421	367	0.13	396
Major Ions													
Bicarbonate	mg/L	-	-	-	-	-	-	-	-	-	-	-	-
Bromide	mg/L	-	-	-	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.05	0	<0.050
Calcium	mg/L	-	-	-	53	55	57	54	54	53	54	0.028	54
Carbonate, as $CaCO_3$	mg/L	-	-	-	-	-	-	-	-	-	-	-	-
Chloride	mg/L	150	600	-	0.4	0.44	0.33	0.64	0.41	0.58	0.47	0.25	0.48
Fluoride	mg/L	0.12[b]	1.5 - 1.6[c]	-	**0.14**[Mn]	**0.15**[Mn]	**0.15**[Mn]	**0.15**[Mn]	0.12	**0.16**[Mn]	**0.14**[Mn]	0.1	**0.12**[Mn]
Hydroxide	mg/L	-	-	-	-	-	-	-	-	-	-	-	-
Magnesium	mg/L	-	-	-	15	15	14	15	16	15	15	0.028	15
Potassium	mg/L	-	-	-	0.4	0.44	0.4	0.39	0.43	0.4	0.41	0.049	0.4
Sodium	mg/L	-	-	-	1.1	1.1	1.1	1.2	1.2	1.2	1.1	0.05	1.2
Sulphate	mg/L	309 - 429[c,d]	-	481	39	40	22	39	43	48	38	0.22	42
Major anion sum	meq/l	-	-	-	4.1	4.0	3.7	3.9	4.1	4.3	4.0	0.044	4.1
Major cation sum	meq/l	-	-	-	3.9	4.0	4.1	4.0	4.1	3.9	4.0	0.016	4.0
Bicarbonate Alkalinity, as $CaCO_3$	mg/l	-	-	-	159	148	162	143	190	159	160	0.1	158
Carbonate Alkalinity, as $CaCO_3$	mg/l	-	-	-	<1.0	6.2	<1.0	9.8	<1.0	<1.0	3.3	1.1	<1.0
Hydroxide Alkalinity, as $CaCO_3$	mg/l	-	-	-	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1	0	<1.0
Nutrients and Biological Indicators													
Nitrate	mg-N/L	3.0	33	3.0 - 3.0[c]	0.64	0.66	0.099	0.64	0.77	0.76	0.59	0.42	0.66
Nitrite	mg-N/L	0.020[e]	0.060[e]	-	<0.0010	0.0012	0.0019	<0.0010	<0.0010	<0.0010	0.0012	0.3	<0.0010
Total ammonia	mg-N/L	2.1	14	-	0.24	0.13	0.017	<0.0050	0.006	0.016	0.07	1.4	<0.0050
Total Kjeldahl nitrogen	mg-N/L	-	-	-	0.49	0.3	0.29	<0.050	0.086	0.19	0.23	0.69	0.077
Total phosphorus	mg-P/L	-	-	-	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.002	0	0.0054
Orthophosphate	mg-P/L	-	-	-	0.0013	<0.0010	0.002	0.0015	<0.0010	0.0019	0.0015	0.3	0.0013
Biochemical oxygen demand	mg/L	-	-	-	-	<2.0	-	<2.0	<2.0	<2.0	2.0	0.52	<2.0
Total Metals													
Aluminum	mg/L	-	-	-	<0.0030	0.0032	0.017	0.0058	<0.0030	0.0039	0.006	0.91	0.0094
Antimony	mg/L	0.0090	-	-	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.00010
Arsenic	mg/L	0.0050	0.0050	-	0.00011	<0.00010	0.0001	<0.00010	0.00011	0.0001	0.0001	0.05	<0.00010
Barium	mg/L	1.0	-	-	0.061	0.068	0.062	0.061	0.063	0.063	0.063	0.037	0.058
Beryllium	mg/L	0.00013	-	-	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.00002	0	<0.000020
Bismuth	mg/L	0.0005[f]	-	-	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0	<0.000050
Boron	mg/L	1.2	29[b]	-	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.01	0	<0.010
Cadmium	mg/L	-	-	-	0.000011	0.0000055	0.000014	0.0000064	0.0000058	0.0000059	0.000008	0.43	0.0000054
Calcium	mg/L	-	-	-	58	54	53	54	55	54	55	0.033	59
Chromium	mg/L	0.0010[g]	-	-	0.00026	0.00033	0.0005	0.00026	0.00026	0.00025	0.00031	0.31	0.00024
Cobalt	mg/L	0.0040	0.11	-	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.00010
Copper	mg/L	-	-	-	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	0	<0.00050
Iron	mg/L	0.62 - 3.22[f,h]	1.0	-	<0.010	<0.010	0.024	<0.010	<0.010	<0.010	0.012	0.46	0.011
Lead	mg/L	0.0081 - 0.011[c]	0.12 - 0.20[c]	-	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0	<0.000050
Lithium	mg/L	0.1216[f]	-	-	0.0038	0.0033	0.0038	0.0037	0.0039	0.0039	0.0037	0.06	0.0037
Magnesium	mg/L	-	-	-	16	15	16	15	16	16	15	0.025	15
Manganese	mg/L	1.2 - 1.5[c]	2.1 - 2.8[c]	-	0.00028	0.00029	0.0018	0.00061	0.00027	0.00032	0.00059	1.0	0.0011
Mercury	mg/L	0.000010	-	-	<0.00000050	<0.00000050	<0.00000050	<0.00000050	<0.00000050	<0.00000050	<0.0000005	0	<0.00000050
Molybdenum	mg/L	1.0	2.0	-	0.001	0.00099	0.0012	0.00098	0.0011	0.0010	0.001	0.062	0.0011
Nickel	mg/L	0.0053[i]	-	-	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	0	<0.00050
Potassium	mg/L	-	-	-	0.39	0.41	0.42	0.41	0.42	0.41	0.41	0.027	0.37
Selenium	mg/L	0.0020	-	0.019	**0.0029**[Mn]	**0.0030**[Mn]	**0.0029**[Mn]	**0.0030**[Mn]	**0.0036**[Mn]	**0.0041**[Mn]	**0.0033**[Mn]	0.15	**0.0037**[Mn]
Silicon	mg/L	-	-	-	1.8	1.9	1.8	1.9	2.0	1.8	1.8	0.033	1.7
Silver	mg/L	0.0015[c]	0.0030[c]	-	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	0	<0.000010
Sodium	mg/L	-	-	-	1.0	1.1	1.2	1.2	1.2	1.2	1.2	0.056	1.1
Strontium	mg/L	-	-	-	0.22	0.21	0.23	0.22	0.22	0.22	0.22	0.025	0.23
Sulphur	mg/L	-	-	-	15	15	15	15	16	15	15	0.038	15
Thallium	mg/L	0.00080	-	-	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	0	<0.000010
Tin	mg/L	0.3[f]	-	-	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.00010
Titanium	mg/L	0.85[f]	-	-	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.0003	0	<0.00030
Uranium	mg/L	0.0085	0.033[b]	-	0.00092	0.00091	0.00096	0.0009	0.0009	0.00098	0.00093	0.033	0.00097
Vanadium	mg/L	0.12[f]	-	-	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	0	<0.00050
Zinc	mg/L	0.044 - 0.091	0.069 - 0.12	-	<0.0030	<0.0030	0.0051	<0.0030	<0.0030	<0.0030	0.0034	0.26	<0.0030
Dissolved Metals													
Aluminum	mg/L	0.050[h]	0.10[h]	-	0.0011	<0.0010	<0.0010	<0.0010	0.0012	<0.0010	0.0011	0.08	<0.0010
Antimony	mg/L	-	-	-	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.00010
Arsenic	mg/L	-	-	-	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.00010
Barium	mg/L	-	-	-	0.061	0.066	0.062	0.061	0.065	0.062	0.063	0.033	0.061
Beryllium	mg/L	-	-	-	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.00002	0	<0.000020
Bismuth	mg/L	-	-	-	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0	<0.000050
Boron	mg/L	-	-	-	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.01	0	<0.010
Cadmium	mg/L	0.00027 - 0.00035[c]	0.00082 - 0.0012[c]	0.00018 - 0.00024[c]	0.0000064	<0.0000050	0.0000067	<0.0000050	0.000008	0.0000064	0.0000063	0.18	0.0000074
Chromium	mg/L	-	-	-	0.00024	0.00023	0.00028	0.00025	0.00023	0.00026	0.00025	0.078	0.00023
Cobalt	mg/L	-	-	-	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.00010
Copper	mg/L	0.0002 - 0.0031[j]	0.0014 - 0.0185[j]	-	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.0002	0	<0.00020
Iron	mg/L	-	0.35	-	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.01	0	<0.010
Lead	mg/L	-	-	-	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0	<0.000050
Lithium	mg/L	-	-	-	0.0036	0.0034	0.0035	0.0036	0.0036	0.0037	0.0036	0.029	0.0035
Manganese	mg/L	-	-	-	0.00019	0.00021	0.00023	0.00024	0.00018	0.00028	0.00022	0.16	0.00034
Mercury	mg/L	-	-	-	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.000005	0	<0.0000050
Molybdenum	mg/L	-	-	-	0.001	0.001	0.001	0.001	0.00096	0.001	0.001	0.028	0.001
Nickel	mg/L	-	-	-	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	0	<0.00050
Selenium	mg/L	-	-	-	0.0033	0.0031	0.0033	0.0033	0.0033	0.0045	0.0035	0.15	0.0041
Silicon	mg/L	-	-	-	1.8	1.7	1.9	1.8	1.9	1.8	1.8	0.028	1.9
Silver	mg/L	-	-	-	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	0	<0.000010
Strontium	mg/L	2.5[f]	-	-	0.22	0.23	0.22	0.21	0.22	0.22	0.22	0.03	0.22
Sulphur	mg/L	-	-	-	14	13	14	15	14	16	15	0.07	15
Thallium	mg/L	-	-	-	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	0	<0.000010
Tin	mg/L	-	-	-	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.00010
Titanium	mg/L	-	-	-	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.0003	0	<0.00030
Uranium	mg/L	-	-	-	0.00087	0.00092	0.00089	0.00092	0.00086	0.00089	0.00089	0.029	0.00095
Vanadium	mg/L	-	-	-	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	0	<0.00050
Zinc	mg/L	-	-	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.001	0	<0.0010

Parameter	Unit	Q2 GH_ERC C. dubia and P. subcapitata 18-May-21	25-May-21	1-Jun-21	8-Jun-21	15-Jun-21	May 18, 25, June 1, 8 H. azteca Mean	CV	May 18, 25, June 1, 8, 15 O. mykiss Mean	CV
Field Measured										
pH	-	8.2	8.2	8.0	8.2	8.2	8.2	0.011	8.2	0.011
Specific conductivity	µS/cm at 25 C	286	296	283	252	242	279	0.073	272	0.086
Temperature	°C	5.4	4.7	6.3	5.0	8.1	5.4	0.12	5.9	0.23
Dissolved oxygen	mg/L	**10**[Mn]	**11**[Mn]	**11**[Mn]	**10**[Mn]	**9.6**[Mn]	**10**[Mn]	0.052	**10**[Mn]	0.062
Turbidity	NTU	71	18	26	37	46	38	0.53	40	0.52
Dissolved oxygen	%	82	85	86	81	81	83	0.03	83	0.03
Oxidation-reduction potential field	mv	90	119	130	125	177	116	0.14	128	0.24
Conventional Parameters										
pH	-	8.2	8.1	8.1	8.2	8.3	8.2	0.0067	8.2	0.01
Hardness, as $CaCO_3$	mg/L	156	157	151	142	149	152	0.048	151	0.04
Total alkalinity, as $CaCO_3$	mg/L	144	143	137	138	133	141	0.023	139	0.033
Total dissolved solids	mg/L	184	181	170	160	152	174	0.065	169	0.08
Total suspended solids	mg/L	165	29	69	87	118	87	0.57	93	0.55
Total organic carbon	mg/L	3.9	2.1	1.5	1.7	3.1	2.3	0.43	2.5	0.42
Dissolved organic carbon	mg/L	2.1	2.1	0.95	1.8	1.9	1.7	0.27	1.8	0.27
Colour	TCU	5.9	6.2	7.5	7.1	<5.0	6.7	0.1	6.3	0.16
Turbidity	NTU	75	24	26	40	37	41	0.5	40	0.51
Total acidity	mg/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2	0	<2	0
Cation - anion balance	%	2.8	2.5	1.5	3.7	0.33	2.6	0.36	2.1	0.6
Ion balance	%	95	95	97	93	99	95	0.019	96	0.026
Conductivity	µS/cm	290	297	290	270	263	287	0.044	282	0.052
Oxidation-reduction potential	mv	263	426	376	440	400	376	0.2	381	0.18
Major Ions										
Bicarbonate	mg/L	-	-	-	-	163	-	-	163	0.45
Bromide	mg/L	<0.050	<0.050	<0.050	<0.050	<0.050	<0.05	0	<0.05	0
Calcium	mg/L	44	44	43	40	43	43	0.043	43	0.034
Carbonate, as $CaCO_3$	mg/L	-	-	-	-	<1.0	-	-	1.0	0.45
Chloride	mg/L	0.47	0.58	0.47	0.39	0.3	0.48	0.16	0.44	0.24
Fluoride	mg/L	0.12	**0.16**[Mn]	0.12	**0.15**[Mn]	**0.15**[Mn]	**0.14**[Mn]	0.14	**0.14**[Mn]	0.14
Hydroxide	mg/L	-	-	-	-	<1.0	-	-	1.0	0.45
Magnesium	mg/L	11	12	11	10	10	11	0.063	11	0.06
Potassium	mg/L	0.42	0.37	0.35	0.35	0.36	0.37	0.081	0.37	0.078
Sodium	mg/L	0.86	0.87	0.78	0.69	0.62	0.8	0.11	0.76	0.14
Sulphate	mg/L	21	20	18	15	17	19	0.15	18	0.14
Major anion sum	meq/l	3.4	3.4	3.2	3.1	3.0	3.2	0.041	3.2	0.047
Major cation sum	meq/l	3.2	3.2	3.1	2.9	3.0	3.1	0.05	3.1	0.042
Bicarbonate Alkalinity, as $CaCO_3$	mg/l	144	143	137	138	133	141	0.023	139	0.033
Carbonate Alkalinity, as $CaCO_3$	mg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1	0	<1	0
Hydroxide Alkalinity, as $CaCO_3$	mg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1	0	<1	0
Nutrients and Biological Indicators										
Nitrate	mg-N/L	0.27	0.74	0.22	0.17	0.16	0.35	0.69	0.31	0.77
Nitrite	mg-N/L	<0.0010	<0.0010	<0.0010	0.0014	<0.0010	0.0011	0.2	0.0011	0.17
Total ammonia	mg-N/L	0.011	<0.0050	<0.0050	<0.0050	0.0074	0.0066	0.43	0.0068	0.41
Total Kjeldahl nitrogen	mg-N/L	0.53	<0.050	<0.050	0.25	0.24	0.22	0.9	0.22	0.87
Total phosphorus	mg-P/L	0.23	0.028	0.073	0.11	0.16	0.11	0.67	0.12	0.64
Orthophosphate	mg-P/L	<0.0010	0.0014	<0.0010	0.0026	<0.0010	0.0015	0.55	0.0014	0.49
Biochemical oxygen demand	mg/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2	0	<2	0
Total Metals										
Aluminum	mg/L	1.3	0.59	0.66	0.81	1.0	0.84	0.33	0.88	0.33
Antimony	mg/L	0.00014	<0.00010	<0.00010	0.00012	0.00012	0.00012	0.15	0.00012	0.14
Arsenic	mg/L	0.0011	0.00042	0.00056	0.00072	0.00091	0.00071	0.37	0.00075	0.37
Barium	mg/L	0.073	0.05	0.053	0.051	0.055	0.057	0.17	0.056	0.17
Beryllium	mg/L	0.00012	0.000032	0.000036	0.000056	0.000077	0.000062	0.59	0.000065	0.57
Bismuth	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0	<0.00005	0
Boron	mg/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.01	0	<0.01	0
Cadmium	mg/L	0.00023	0.000068	0.00011	0.0001	0.00015	0.00013	0.48	0.00013	0.46
Calcium	mg/L	58	49	52	47	52	51	0.092	51	0.083
Chromium	mg/L	**0.0030**[Mn]	**0.0013**[Mn]	**0.0015**[Mn]	**0.0020**[Mn]	**0.0024**[Mn]	**0.0020**[Mn]	0.34	**0.0020**[Mn]	0.34
Cobalt	mg/L	0.00097	0.00024	0.0004	0.00051	0.00063	0.00053	0.51	0.00055	0.5
Copper	mg/L	0.003	0.00085	0.0012	0.0015	0.0018	0.0016	0.5	0.0017	0.5
Iron	mg/L	**2.2**[Mn, Mx]	0.67	0.97	**1.3**[Mx]	**1.5**[Mx]	**1.3**[Mx]	0.45	**1.3**[Mx]	0.44
Lead	mg/L	0.0017	0.00037	0.00069	0.00079	0.00091	0.00088	0.56	0.00089	0.55
Lithium	mg/L	0.0042	0.0025	0.0027	0.0028	0.0029	0.0031	0.22	0.003	0.22
Magnesium	mg/L	14	12	12	11	12	12	0.085	12	0.082
Manganese	mg/L	0.12	0.024	0.05	0.061	0.085	0.063	0.54	0.067	0.53
Mercury	mg/L	0.0000088	0.0000022	0.0000019	0.0000056	0.0000059	0.0000046	0.62	0.0000049	0.59
Molybdenum	mg/L	0.00097	0.00094	0.00098	0.0010	0.001	0.00097	0.025	0.00098	0.032
Nickel	mg/L	0.0043	0.0013	0.0017	0.0024	0.0027	0.0024	0.48	0.0025	0.47
Potassium	mg/L	0.93	0.62	0.62	0.75	0.8	0.73	0.17	0.75	0.17
Selenium	mg/L	0.0018	0.0017	0.0013	0.0013	0.0011	0.0015	0.17	0.0014	0.21
Silicon	mg/L	4.0	3.0	3.0	3.2	3.3	3.3	0.12	3.3	0.12
Silver	mg/L	0.00005	0.000013	0.000016	0.000023	0.000025	0.000026	0.57	0.000025	0.57
Sodium	mg/L	0.9	0.84	0.78	0.76	0.61	0.82	0.076	0.78	0.14
Strontium	mg/L	0.22	0.19	0.21	0.2	0.21	0.2	0.057	0.2	0.054
Sulphur	mg/L	7.9	7.8	6.3	5.8	5.6	6.9	0.15	6.7	0.17
Thallium	mg/L	0.000073	0.000022	0.000028	0.000033	0.000043	0.000039	0.52	0.00004	0.5
Tin	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.0001	0
Titanium	mg/L	0.01	0.0097	0.0059	0.0061	0.0083	0.008	0.27	0.008	0.25
Uranium	mg/L	0.001	0.00084	0.00081	0.00083	0.0008	0.00087	0.089	0.00086	0.095
Vanadium	mg/L	0.0057	0.0025	0.003	0.0037	0.0045	0.0037	0.33	0.0039	0.33
Zinc	mg/L	0.02	0.0058	0.007	0.0089	0.011	0.01	0.54	0.01	0.53
Dissolved Metals										
Aluminum	mg/L	0.011	0.0029	0.0023	0.0018	0.002	0.0046	0.9	0.0041	1.0
Antimony	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.0001	0
Arsenic	mg/L	0.00013	0.00011	0.00012	0.00013	<0.00010	0.00012	0.073	0.00012	0.11
Barium	mg/L	0.043	0.044	0.039	0.04	0.038	0.042	0.051	0.041	0.064
Beryllium	mg/L	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.00002	0	<0.00002	0
Bismuth	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0	<0.00005	0
Boron	mg/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.01	0	<0.01	0
Cadmium	mg/L	0.0000087	0.0000098	0.0000085	0.0000077	0.0000089	0.0000087	0.10	0.0000087	0.087
Chromium	mg/L	0.00016	0.00018	0.00023	0.00021	0.00022	0.0002	0.14	0.0002	0.15
Cobalt	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.0001	0
Copper	mg/L	0.00023	0.00025	<0.00020	<0.00020	<0.00020	0.00022	0.1	0.00022	0.11
Iron	mg/L	0.013	<0.010	<0.010	<0.010	<0.010	0.011	0.12	0.011	0.13
Lead	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0	<0.00005	0
Lithium	mg/L	0.002	0.002	0.0017	0.0018	0.0017	0.0019	0.072	0.0018	0.082
Manganese	mg/L	0.0025	0.00068	0.00092	0.001	0.0012	0.0013	0.57	0.0013	0.57
Mercury	mg/L	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.000005	0	<0.000005	0
Molybdenum	mg/L	0.00093	0.00099	0.0009	0.00094	0.00091	0.00094	0.032	0.00093	0.036
Nickel	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	0	<0.0005	0
Selenium	mg/L	0.0017	0.0017	0.0014	0.0011	0.0011	0.0014	0.21	0.0014	0.22
Silicon	mg/L	1.9	1.9	1.8	1.7	1.7	1.8	0.041	1.8	0.049
Silver	mg/L	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	0	<0.00001	0
Strontium	mg/L	0.21	0.21	0.19	0.18	0.2	0.2	0.066	0.2	0.055
Sulphur	mg/L	7.2	7.5	6.3	5.2	5.4	6.5	0.16	6.3	0.16
Thallium	mg/L	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	0	<0.00001	0
Tin	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.0001	0
Titanium	mg/L	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.0003	0	<0.0003	0
Uranium	mg/L	0.00078	0.0007	0.00068	0.00073	0.00071	0.00072	0.054	0.00072	0.055
Vanadium	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	0	<0.0005	0
Zinc	mg/L	0.001	0.0028	<0.0010	<0.0010	<0.0010	0.0015	0.56	0.0014	0.59

Parameter	Unit	Q3 GH_ERC C. dubia and P. subcapitata 10-Aug-21	17-Aug-21	24-Aug-21	31-Aug-21	7-Sep-21	Aug 10, 17, 24, 31 H. azteca Mean	CV	Aug 10, 17, 24, 31 Sept 7 P. promelas Mean	CV	C. dubia and P. subcapitata 12-Oct-21	19-Oct-21	26-Oct-21	2-Nov-21
Field Measured														
pH	-	8.1	8.1	8.0	7.9	8.0	8.0	0.012	8.0	0.01	8.0	8.0	8.0	7.9
Specific conductivity	µS/cm at 25 C	275	262	276	283	290	274	0.032	277	0.038	301	302	303	305
Temperature	°C	9.9	8.9	8.5	8.8	8.7	9.0	0.067	9.0	0.061	5.4	7.0	6.6	5.0
Dissolved oxygen	mg/L	**8.6**[Mn, Mx]	**8.8**[Mn, Mx]	**9.5**[Mn]	**9.2**[Mn]	**9.2**[Mn]	**9.0**[Mn]	0.045	**9.1**[Mn]	0.039	**9.9**[Mn]	**9.6**[Mn]	**9.6**[Mn]	**10**[Mn]
Turbidity	NTU	3.9	6.1	0.29	4.4	0.27	3.7	0.67	3.0	0.87	0.58	3.7	1.9	3.2
Dissolved oxygen	%	76	76	81	79	79	78	0.03	78	0.027	78	79	79	80
Oxidation-reduction potential field	mv	333	189	214	179	174	229	0.31	218	0.3	250	200	281	247
Conventional Parameters														
pH	-	8.3	8.3	8.3	8.2	8.2	8.3	0.006	8.3	0.0066	8.3	8.4	8.2	8.1
Hardness, as $CaCO_3$	mg/L	155	146	154	170	157	156	0.064	156	0.055	171	175	170	189
Total alkalinity, as $CaCO_3$	mg/L	143	139	144	126	144	138	0.06	139	0.055	151	153	155	177
Total dissolved solids	mg/L	163	163	188	173	180	172	0.069	173	0.063	175	196	192	197
Total suspended solids	mg/L	2.1	25	1.2	<1.0	<1.0	7.2	1.6	6.0	1.7	1.4	<1.0	14	<1.0
Total organic carbon	mg/L	1.3	1.1	2.3	6.2	0.71	2.7	0.86	2.3	0.96	<0.50	<0.50	<0.50	0.82
Dissolved organic carbon	mg/L	1.8	0.77	2.5	5.5	0.66	2.6	0.77	2.2	0.88	<0.50	0.55	0.84	0.8
Colour	TCU	<5.0	-	-	-	-	5.0	0.5	5.0	0.45	<5.0	-	<5.0	<5.0
Turbidity	NTU	0.74	12	0.72	0.45	0.39	3.5	1.6	2.9	1.8	0.19	0.13	2.6	0.13
Total acidity	mg/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2	0	<2	0	<2.0	<2.0	<2.0	<2.0
Cation - anion balance	%	2.3	4.5	3.9	6.8	2.7	4.4	0.43	4.1	0.44	1.1	1.8	4.2	3.7
Ion balance	%	95	91	93	115	95	99	0.11	98	0.10	98	96	92	93
Conductivity	µS/cm	285	268	281	288	295	281	0.031	283	0.035	301	319	325	309
Oxidation-reduction potential	mv	479	457	404	438	317	445	0.071	419	0.15	450	458	460	463
Major Ions														
Bicarbonate	mg/L	172	162	176	154	176	166	0.06	168	0.058	185	179	189	177
Bromide	mg/L	<0.050	<0.050	<0.050	<0.050	<0.050	<0.05	0	<0.05	0	<0.050	<0.050	<0.050	<0.050
Calcium	mg/L	45	42	44	48	44	44	0.063	44	0.055	48	49	47	53
Carbonate, as $CaCO_3$	mg/L	1.3	3.8	<1.0	<1.0	<1.0	1.8	0.76	1.6	0.76	<1.0	4.0	<1.0	<1.0
Chloride	mg/L	0.3	0.24	0.29	0.27	0.34	0.28	0.096	0.29	0.13	0.28	0.29	0.42	0.29
Fluoride	mg/L	**0.16**[Mn]	0.12	**0.14**[Mn]	**0.13**[Mn]	**0.16**[Mn]	**0.14**[Mn]	0.13	**0.14**[Mn]	0.13	**0.13**[Mn]	0.11	**0.17**[Mn]	0.12
Hydroxide	mg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1	0	<1	0	<1.0	<1.0	<1.0	<1.0
Magnesium	mg/L	11	10	11	12	12	11	0.071	11	0.07	13	13	13	14
Potassium	mg/L	0.39	0.41	0.4	0.42	0.42	0.4	0.033	0.41	0.034	0.42	0.42	0.42	0.42
Sodium	mg/L	0.75	0.72	0.75	0.84	0.82	0.76	0.071	0.77	0.068	0.91	0.88	0.87	0.92
Sulphate	mg/L	19	20	22	22	22	21	0.067	21	0.061	24	28	29	26
Major anion sum	meq/l	3.3	3.2	3.4	3.0	3.4	3.2	0.049	3.3	0.047	3.6	3.7	3.7	4.1
Major cation sum	meq/l	3.1	3.0	3.1	3.4	3.2	3.2	0.064	3.2	0.056	3.5	3.5	3.4	3.8
Bicarbonate Alkalinity, as $CaCO_3$	mg/l	141	132	144	126	144	136	0.061	137	0.059	152	147	155	145
Carbonate Alkalinity, as $CaCO_3$	mg/l	2.2	6.4	<1.0	<1.0	<1.0	2.7	0.97	2.3	1.0	<1.0	6.6	<1.0	<1.0
Hydroxide Alkalinity, as $CaCO_3$	mg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1	0	<1	0	<1.0	<1.0	<1.0	<1.0
Nutrients and Biological Indicators														
Nitrate	mg-N/L	0.19	0.21	0.2	0.21	0.24	0.2	0.048	0.21	0.079	0.28	0.3	0.3	0.31
Nitrite	mg-N/L	<0.0010	0.001	<0.0010	<0.0010	<0.0010	0.001	0	0.001	0	<0.0010	<0.0010	<0.0010	<0.0010
Total ammonia	mg-N/L	0.012	0.0083	0.013	<0.0050	<0.0050	0.0097	0.39	0.0087	0.44	0.0065	<0.0050	<0.0050	<0.0050
Total Kjeldahl nitrogen	mg-N/L	<0.050	0.1	0.061	<0.050	0.056	0.066	0.39	0.064	0.35	0.089	<0.050	<0.050	0.059
Total phosphorus	mg-P/L	0.0038	0.029	0.005	0.0021	<0.0020	0.01	1.3	0.0084	1.4	0.0033	<0.0020	0.0027	<0.0020
Orthophosphate	mg-P/L	0.0011	<0.0010	<0.0010	<0.0010	<0.0010	0.001	0.049	0.001	0.044	<0.0010	0.0016	<0.0010	<0.0010
Biochemical oxygen demand	mg/L	<2.0	-	-	<2.0	<2.0	2.0	0.58	2.0	0.55	<2.0	-	<2.0	<2.0
Total Metals														
Aluminum	mg/L	0.02	0.11	0.022	0.0094	0.015	0.039	1.1	0.035	1.2	0.0042	0.0036	0.028	0.0045
Antimony	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.0001	0	<0.00010	<0.00010	<0.00010	<0.00010
Arsenic	mg/L	0.00014	0.00021	0.00014	0.00016	0.00012	0.00016	0.2	0.00015	0.22	0.00012	<0.00010	0.00012	0.0001
Barium	mg/L	0.049	0.049	0.047	0.051	0.053	0.049	0.031	0.05	0.04	0.062	0.056	0.06	0.056
Beryllium	mg/L	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.00002	0	<0.00002	0	<0.000020	<0.000020	<0.000020	<0.000020
Bismuth	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0	<0.00005	0	<0.000050	<0.000050	<0.000050	<0.000050
Boron	mg/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.01	0	<0.01	0	<0.010	<0.010	<0.010	<0.010
Cadmium	mg/L	0.0000058	0.000049	0.0000098	0.0000072	0.0000077	0.000018	1.2	0.000016	1.2	0.0000052	0.0000087	0.000013	0.000007
Calcium	mg/L	42	44	42	46	46	43	0.045	44	0.045	52	51	48	48
Chromium	mg/L	0.00022	0.00043	0.00024	0.00021	0.00025	0.00028	0.38	0.00027	0.34	0.00036	0.00028	0.00034	0.00024
Cobalt	mg/L	<0.00010	0.00012	<0.00010	<0.00010	<0.00010	0.00011	0.095	0.0001	0.086	<0.00010	<0.00010	<0.00010	<0.00010
Copper	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	0	<0.0005	0	<0.00050	<0.00050	<0.00050	<0.00050
Iron	mg/L	0.028	0.15	0.026	0.012	0.019	0.053	1.2	0.046	1.2	<0.010	<0.010	0.04	<0.010
Lead	mg/L	<0.000050	0.00026	<0.000050	<0.000050	<0.000050	0.0001	1.0	0.000091	1.0	<0.000050	<0.000050	<0.000050	<0.000050
Lithium	mg/L	0.0024	0.0023	0.0022	0.0027	0.0025	0.0024	0.09	0.0024	0.079	0.003	0.0031	0.003	0.003
Magnesium	mg/L	11	11	11	11	12	11	0.031	11	0.058	13	13	13	12
Manganese	mg/L	0.0029	0.031	0.0021	0.0018	0.0021	0.0093	1.5	0.0079	1.6	0.00078	0.00067	0.0031	0.00062
Mercury	mg/L	<0.00000050	0.0000019	<0.00000050	<0.00000050	<0.00000050	0.00000084	0.81	0.00000077	0.78	<0.00000050	<0.00000050	0.0000007	<0.00000050
Molybdenum	mg/L	0.0011	0.00082	0.001	0.0011	0.0011	0.00098	0.11	0.001	0.11	0.0012	0.0011	0.0012	0.0011
Nickel	mg/L	<0.00050	0.00059	<0.00050	<0.00050	<0.00050	0.00052	0.086	0.00052	0.078	<0.00050	<0.00050	<0.00050	<0.00050
Potassium	mg/L	0.39	0.42	0.39	0.4	0.41	0.4	0.035	0.4	0.034	0.45	0.41	0.47	0.42
Selenium	mg/L	0.0014	0.0014	0.0018	0.0014	0.0018	0.0015	0.12	0.0016	0.13	**0.0021**[Mn]	**0.0021**[Mn]	**0.0021**[Mn]	**0.0021**[Mn]
Silicon	mg/L	1.9	2.0	1.9	1.9	2.0	1.9	0.025	1.9	0.025	2.2	2.0	2.1	2.1
Silver	mg/L	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	0	<0.00001	0	<0.000010	<0.000010	<0.000010	<0.000010
Sodium	mg/L	0.76	0.71	0.7	0.77	0.85	0.74	0.049	0.76	0.079	0.96	0.89	1.0	0.92
Strontium	mg/L	0.2	0.19	0.19	0.21	0.21	0.2	0.047	0.2	0.045	0.23	0.21	0.21	0.2
Sulphur	mg/L	6.7	7.0	7.8	7.8	9.0	7.3	0.074	7.7	0.12	9.9	9.6	10	9.9
Thallium	mg/L	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	0	<0.00001	0	<0.000010	<0.000010	<0.000010	<0.000010
Tin	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.0001	0	<0.00010	<0.00010	<0.00010	<0.00010
Titanium	mg/L	<0.00030	<0.0015	<0.00030	<0.00030	<0.00030	<0.0006	1.0	<0.00054	0.99	<0.00030	<0.00030	<0.00030	<0.00030
Uranium	mg/L	0.00069	0.0007	0.0007	0.00073	0.00077	0.00071	0.025	0.00072	0.047	0.00087	0.00083	0.00093	0.00081
Vanadium	mg/L	<0.00050	0.00061	<0.00050	0.00055	<0.00050	0.00054	0.097	0.00053	0.092	<0.00050	<0.00050	<0.00050	<0.00050
Zinc	mg/L	<0.0030	0.005	<0.0030	<0.0030	<0.0030	0.0035	0.29	0.0034	0.26	<0.0030	<0.0030	<0.0030	<0.0030
Dissolved Metals														
Aluminum	mg/L	0.0059	0.0013	0.001	0.0022	0.001	0.0026	0.87	0.0023	0.91	<0.0010	0.0013	0.0015	0.0014
Antimony	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.0001	0	<0.00010	<0.00010	<0.00010	<0.00010
Arsenic	mg/L	0.00011	<0.00010	<0.00010	0.00011	<0.00010	0.00011	0.055	0.0001	0.053	<0.00010	<0.00010	<0.00010	<0.00010
Barium	mg/L	0.048	0.045	0.047	0.052	0.052	0.048	0.064	0.049	0.064	0.056	0.056	0.054	0.059
Beryllium	mg/L	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.00002	0	<0.00002	0	<0.000020	<0.000020	<0.000020	<0.000020
Bismuth	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0	<0.00005	0	<0.000050	<0.000050	<0.000050	<0.000050
Boron	mg/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.01	0	<0.01	0	<0.010	<0.010	<0.010	<0.010
Cadmium	mg/L	0.0000056	0.0000093	0.0000072	0.0000075	0.000005	0.0000074	0.2	0.0000069	0.25	0.0000061	0.0000084	0.0000055	0.0000081
Chromium	mg/L	0.00022	0.00018	0.0002	0.0002	0.00019	0.0002	0.082	0.0002	0.075	0.00033	0.00029	0.00022	0.00027
Cobalt	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.0001	0	<0.00010	<0.00010	<0.00010	<0.00010
Copper	mg/L	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.0002	0	<0.0002	0	<0.00020	<0.00020	<0.00020	<0.00020
Iron	mg/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.01	0	<0.01	0	<0.010	<0.010	<0.010	<0.010
Lead	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0	<0.00005	0	<0.000050	<0.000050	<0.000050	<0.000050
Lithium	mg/L	0.0024	0.0022	0.0022	0.0025	0.0024	0.0023	0.065	0.0023	0.057	0.0028	0.0029	0.0028	0.003
Manganese	mg/L	0.0011	0.0023	0.0007	0.00094	0.00072	0.0013	0.58	0.0012	0.59	0.00053	0.00049	0.00039	0.00041
Mercury	mg/L	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.000005	0	<0.000005	0	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Molybdenum	mg/L	0.0011	0.00099	0.00099	0.001	0.001	0.001	0.056	0.001	0.049	0.0011	0.0011	0.0011	0.001
Nickel	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	0	<0.0005	0	<0.00050	<0.00050	<0.00050	<0.00050
Selenium	mg/L	0.0015	0.0014	0.0016	0.0018	0.0017	0.0016	0.1	0.0016	0.091	0.0019	0.002	0.002	0.0021
Silicon	mg/L	1.8	1.7	1.9	1.9	1.9	1.8	0.057	1.8	0.055	1.9	1.9	2.0	2.0
Silver	mg/L	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	0	<0.00001	0	<0.000010	<0.000010	<0.000010	<0.000010
Strontium	mg/L	0.21	0.18	0.2	0.22	0.19	0.2	0.07	0.2	0.064	0.21	0.21	0.2	0.21
Sulphur	mg/L	7.0	6.8	7.2	8.2	8.3	7.3	0.082	7.5	0.093	9.6	9.1	9.2	9.6
Thallium	mg/L	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	0	<0.00001	0	<0.000010	<0.000010	<0.000010	<0.000010
Tin	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.0001	0	<0.00010	<0.00010	<0.00010	<0.00010
Titanium	mg/L	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.0003	0	<0.0003	0	<0.00030	<0.00030	<0.00030	<0.00030
Uranium	mg/L	0.00067	0.00065	0.0007	0.00069	0.00075	0.00068	0.031	0.00069	0.054	0.00076	0.00083	0.00082	0.0008
Vanadium	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	0	<0.0005	0	<0.00050	<0.00050	<0.00050	<0.00050
Zinc	mg/L	0.0015	0.0019	0.0013	0.0018	<0.0010	0.0016	0.17	0.0015	0.24	<0.0010	<0.0010	<0.0010	<0.0010

(a) = guideline is a minimum value, unless the background concentration or value is lower.
(b) = guideline is adopted from CCME Canadian Environmental Quality Guidelines (CCME, 1999).
(c) = guideline is hardness dependent. The guideline range shown is based on the hardness range observed in the dataset (138 to 201 mg/L). The guideline is calculated based on the individual hardness value for each sample.

(d) = for some samples, water hardness was greater than 250 mg/L. At this hardness, no BC ENV water quality guideline has been established for sulphate; however, the observed data were screened against the guideline for very hard water (i.e., 429 mg/L) for comparative purposes.
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(f) = guideline is adopted from the ECCC PNECs (ECCC, 2018) or draft FEQGs (ECCC, 2017).
(g) = guideline is for chromium VI.
(h) = guideline is pH dependent. The guideline range shown is based on the pH range observed in the dataset (7.7 to 8.4). The guideline is calculated based on the individual pH for each sample.
(i) = guideline is a level 1 interim screening value.
(j) = dissolved copper guideline was calculated using the simplified Biotic Ligand Midel (BC ENV, 2019). Where values were missing, the temporally nearest value from the same location was taken.
(Mn) = concentration is higher than the 30-day mean BC ENV guideline or outside the recommended pH, DO or total alkalinity range.
(Mx) = concentration is higher than the maximum BC ENV guideline or outside the recommended pH, DO or total alkalinity range.
(E) = concentration is higher than the EVWQP benchmarks guideline.
Bolded concentrations are higher than water quality guidelines.
Shaded concentrations are higher than the EVWQP benchmark (e.g., for nitrate, total selenium, dissolved cadmium or sulphate).
Water quality data and guidelines shown in this table were rounded to reflect laboratory or field instrument precision after comparisons to guidelines. Therefore, values slightly above guidelines may be displayed as being equal to the guidelines and identified as exceedances. Concentrations equal to the guideline values were not identified as exceedances.
Concentrations were screened against available Working and Approved British Columbia Ministry of Environment and Climate Change Strategy (BC ENV) Water Quality Guidelines for the Protection of Aquatic Life; Accessed January 2020 from: https://www2.gov.bc.ca/gov/content/environment/air-land-water/water/water-quality/water-quality-guidelines.
\- = no guideline or no data
BC ENV = British Columbia Ministry of Environment & Climate Change Strategy; EVWQP = Elk Valley Water Quality Plan guidelines; *C. dubia* = *Ceriodaphnia dubia* ; *P. subcapitata* = *Pseudokirchneriella subcapitata* ; *H. azteca* = *Hyallela azteca* ; *P. promelas* = *Pimephales promelas* ; *O. mykiss* = *Oncorhynchus mykiss* ; CV = coefficient of variation; ∑ = sum of; WQGs = Water Quality Guidelines; CaCO3 = calcium carbonate; mg/L = milligrams per litre; µS/cm = microsiemens per centimeter; NTU = nephelometric turbidity units; meq/L = milliequivalents per litre; mg-N/L = milligrams of Nitrogen per litre; mg=P/L = milligrams of Phosphorus per litre.
BC ENV (B.C. Ministry of Climate Chande Strategy). 2019. Copper Water Quality guideline for the Protection of Aquatic Life-Technical Report. Water Quality Guideline Series, WQG-03-1. Prov. B.C., Victoria B.C.

Parameter	Unit	Guidelines for the protection of:			4 GH_ERC				
		Aquatic Life		EVWQP Benchmarks	9-Nov-21	Oct 12, 19, 26, Nov 2 *H. azteca*		Oct 12, 19, 26, Nov 2, 9 *O. mykiss*	
		30-day mean	Maximum			Mean	CV	Mean	CV
Field Measured									
pH	-	6.5 - 9.0	6.5 - 9.0	-	7.7	8.0	0.0063	7.9	0.016
Specific conductivity	µS/cm at 25 C	-	-	-	340	303	0.0061	310	0.055
Temperature	°C	-	-	-	4.5	6.0	0.16	5.7	0.19
Dissolved oxygen	mg/L	11	9.0	-	**10**[Mn]	**9.8**[Mn]	0.021	**9.8**[Mn]	0.021
Turbidity	NTU	-	-	-	0.08	2.4	0.6	1.9	0.84
Dissolved oxygen	%	-	-	-	81	79	0.0092	79	0.012
Oxidation-reduction potential field	mv	-	-	-	252	244	0.14	246	0.12
Conventional Parameters									
pH	-	6.5 - 9.0	6.5 - 9.0	-	8.1	8.3	0.016	8.2	0.016
Hardness, as $CaCO_3$	mg/L	-	-	-	171	176	0.05	175	0.045
Total alkalinity, as $CaCO_3$	mg/L	20[Mn]	-	-	167	159	0.076	161	0.069
Total dissolved solids	mg/L	-	-	-	191	190	0.054	190	0.047
Total suspended solids	mg/L	-	-	-	<1.0	4.4	1.5	3.7	1.6
Total organic carbon	mg/L	-	-	-	<0.50	0.58	0.28	0.56	0.25
Dissolved organic carbon	mg/L	-	-	-	<0.50	0.67	0.26	0.64	0.26
Colour	TCU	-	-	-	-	5.0	0.5	5.0	0.55
Turbidity	NTU	-	-	-	<0.10	0.77	1.6	0.63	1.8
Total acidity	mg/L	-	-	-	<2.0	<2	0	<2	0
Cation - anion balance	%	-	-	-	6.6	2.7	0.54	3.5	0.62
Ion balance	%	-	-	-	88	95	0.029	93	0.043
Conductivity	µS/cm	-	-	-	322	314	0.034	315	0.032
Oxidation-reduction potential	mv	-	-	-	455	458	0.012	457	0.011
Major Ions									
Bicarbonate	mg/L	-	-	-	167	183	0.03	179	0.047
Bromide	mg/L	-	-	-	<0.050	<0.05	0	<0.05	0
Calcium	mg/L	-	-	-	49	49	0.056	49	0.049
Carbonate, as $CaCO_3$	mg/L	-	-	-	<1.0	1.8	0.86	1.6	0.84
Chloride	mg/L	150	600	-	0.4	0.32	0.21	0.34	0.2
Fluoride	mg/L	0.12[Mn]	1.5 - 1.6[Mn]	-	**0.18**[Mn]	**0.13**[Mn]	0.2	**0.14**[Mn]	0.22
Hydroxide	mg/L	-	-	-	<1.0	<1	0	<1	0
Magnesium	mg/L	-	-	-	12	13	0.037	13	0.041
Potassium	mg/L	-	-	-	0.41	0.42	0.0057	0.42	0.01
Sodium	mg/L	-	-	-	0.91	0.9	0.025	0.9	0.022
Sulphate	mg/L	309 - 429[d,e]	-	481	28	27	0.076	27	0.071
Major anion sum	meq/l	-	-	-	4.0	3.8	0.064	3.8	0.06
Major cation sum	meq/l	-	-	-	3.5	3.6	0.049	3.6	0.044
Bicarbonate Alkalinity, as $CaCO_3$	mg/l	-	-	-	137	150	0.031	147	0.047
Carbonate Alkalinity, as $CaCO_3$	mg/l	-	-	-	<1.0	2.4	1.2	2.1	1.2
Hydroxide Alkalinity, as $CaCO_3$	mg/l	-	-	-	<1.0	<1	0	<1	0
Nutrients and Biological Indicators									
Nitrate	mg-N/L	3.0	33	3.0 - 3.0[Ei]	0.32	0.3	0.041	0.3	0.049
Nitrite	mg-N/L	0.020[Mn]	0.060[Mn]	-	<0.0010	<0.001	0	<0.001	0
Total ammonia	mg-N/L	2.1	14	-	<0.0050	0.0054	0.14	0.0053	0.13
Total Kjeldahl nitrogen	mg-N/L	-	-	-	<0.050	0.062	0.3	0.06	0.28
Total phosphorus	mg-P/L	-	-	-	<0.0020	0.0025	0.25	0.0024	0.24
Orthophosphate	mg-P/L	-	-	-	0.0013	0.0012	0.26	0.0012	0.23
Biochemical oxygen demand	mg/L	-	-	-	<2.0	2.0	0.5	2.0	0.45
Total Metals									
Aluminum	mg/L	-	-	-	0.0035	0.01	1.2	0.0088	1.2
Antimony	mg/L	0.0090	-	-	<0.00010	<0.0001	0	<0.0001	0
Arsenic	mg/L	0.0050	0.0050	-	0.00011	0.00011	0.1	0.00011	0.091
Barium	mg/L	1.0	-	-	0.055	0.059	0.055	0.058	0.056
Beryllium	mg/L	0.00013	-	-	<0.0000020	<0.00002	0	<0.00002	0
Bismuth	mg/L	0.0005[f]	-	-	<0.000050	<0.00005	0	<0.00005	0
Boron	mg/L	1.2	29[Ei]	-	<0.010	<0.01	0	<0.01	0
Cadmium	mg/L	-	-	-	<0.0000050	0.0000084	0.38	0.0000077	0.41
Calcium	mg/L	-	-	-	49	50	0.035	50	0.031
Chromium	mg/L	0.0010[g]	-	-	0.0003	0.00031	0.18	0.0003	0.16
Cobalt	mg/L	0.0040	0.11	-	<0.00010	<0.0001	0	<0.0001	0
Copper	mg/L	-	-	-	<0.00050	<0.0005	0	<0.0005	0
Iron	mg/L	0.62 - 3.22[f,h]	1.0	-	<0.010	0.018	0.86	0.016	0.84
Lead	mg/L	0.0081 - 0.011[c]	0.12 - 0.20[c]	-	<0.0000050	<0.00005	0	<0.00005	0
Lithium	mg/L	0.1216[f]	-	-	0.0028	0.003	0.017	0.003	0.037
Magnesium	mg/L	-	-	-	13	13	0.039	13	0.033
Manganese	mg/L	1.2 - 1.5[c]	2.1 - 2.8[c]	-	0.00057	0.0013	0.94	0.0012	0.96
Mercury	mg/L	0.000010	-	-	<0.00000050	0.00000055	0.18	0.00000054	0.17
Molybdenum	mg/L	1.0	2.0	-	0.0011	0.0011	0.066	0.0011	0.057
Nickel	mg/L	0.0053[f]	-	-	<0.00050	<0.0005	0	<0.0005	0
Potassium	mg/L	-	-	-	0.43	0.44	0.067	0.43	0.06
Selenium	mg/L	0.0020	-	0.019	**0.0021**[Mn]	**0.0021**[Mn]	0	**0.0021**[Mn]	0
Silicon	mg/L	-	-	-	1.9	2.1	0.04	2.0	0.048
Silver	mg/L	0.0015[c]	0.0030[c]	-	<0.000010	<0.00001	0	<0.00001	0
Sodium	mg/L	-	-	-	0.91	0.94	0.051	0.94	0.046
Strontium	mg/L	-	-	-	0.21	0.21	0.061	0.21	0.053
Sulphur	mg/L	-	-	-	9.8	9.9	0.019	9.9	0.017
Thallium	mg/L	0.00080	-	-	<0.000010	<0.00001	0	<0.00001	0
Tin	mg/L	0.3[f]	-	-	<0.00010	<0.0001	0	<0.0001	0
Titanium	mg/L	0.85[f]	-	-	<0.00030	<0.0003	0	<0.0003	0
Uranium	mg/L	0.0085	0.033[Mn]	-	0.00083	0.00086	0.062	0.00085	0.057
Vanadium	mg/L	0.12[f]	-	-	<0.00050	<0.0005	0	<0.0005	0
Zinc	mg/L	0.044 - 0.091	0.069 - 0.12	-	<0.0030	<0.003	0	<0.003	0
Dissolved Metals									
Aluminum	mg/L	0.050[Mn]	0.10[Mn]	-	<0.0010	0.0013	0.17	0.0012	0.19
Antimony	mg/L	-	-	-	<0.00010	<0.0001	0	<0.0001	0
Arsenic	mg/L	-	-	-	0.0001	<0.0001	0	0.0001	0
Barium	mg/L	-	-	-	0.057	0.056	0.035	0.057	0.031
Beryllium	mg/L	-	-	-	<0.0000020	<0.00002	0	<0.00002	0
Bismuth	mg/L	-	-	-	<0.000050	<0.00005	0	<0.00005	0
Boron	mg/L	-	-	-	<0.010	<0.01	0	<0.01	0
Cadmium	mg/L	0.00027 - 0.00035[c]	0.00082 - 0.0012[c]	0.00018 - 0.00024[c]	0.0000073	0.000007	0.21	0.0000071	0.18
Chromium	mg/L	-	-	-	0.00023	0.00028	0.16	0.00027	0.17
Cobalt	mg/L	-	-	-	<0.00010	<0.00001	0	<0.0001	0
Copper	mg/L	0.0002 - 0.0031[j]	0.0014 - 0.0185[j]	-	<0.00020	<0.0002	0	<0.0002	0
Iron	mg/L	-	0.35	-	<0.010	<0.01	0	<0.01	0
Lead	mg/L	-	-	-	<0.0000050	<0.00005	0	<0.00005	0
Lithium	mg/L	-	-	-	0.0033	0.0029	0.033	0.003	0.07
Manganese	mg/L	-	-	-	0.00024	0.00046	0.15	0.00041	0.27
Mercury	mg/L	-	-	-	-	<0.000005	0	0.000005	0.45
Molybdenum	mg/L	-	-	-	0.0011	0.0011	0.036	0.0011	0.032
Nickel	mg/L	-	-	-	<0.00050	<0.0005	0	<0.0005	0
Selenium	mg/L	-	-	-	0.0025	0.002	0.048	0.0021	0.12
Silicon	mg/L	-	-	-	1.9	2.0	0.026	2.0	0.023
Silver	mg/L	-	-	-	<0.000010	<0.00001	0	<0.00001	0
Strontium	mg/L	2.5[f]	-	-	0.21	0.21	0.039	0.21	0.035
Sulphur	mg/L	-	-	-	10	9.4	0.025	9.5	0.04
Thallium	mg/L	-	-	-	<0.000010	<0.00001	0	<0.00001	0
Tin	mg/L	-	-	-	<0.00010	<0.0001	0	<0.0001	0
Titanium	mg/L	-	-	-	<0.00030	<0.0003	0	<0.0003	0
Uranium	mg/L	-	-	-	0.00083	0.0008	0.036	0.00081	0.035
Vanadium	mg/L	-	-	-	<0.00050	<0.0005	0	<0.0005	0
Zinc	mg/L	-	-	-	<0.0010	<0.001	0	<0.001	0

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- = no guideline or no data
BC ENV = British Columbia Ministry of Environment & Climate Change Strategy; EVWQP = Elk Valley Water Quality Plan guidelines; *C. dubia = Ceriodaphnia dubia* ; *P. subcapitata = Pseudokirchneriella subcapitata* ; *H. azteca = Hyalella azteca* ; *P. promelas = Pimephales promelas* ; *O. mykiss = Oncorhynchus mykiss* ; CV = coefficient of variation; ∑ = sum of; WQGs = Water Quality Guidelines; CaCO3 = calcium carbonate; mg/L = milligrams per litre; µS/cm = microsiemens per centimeter; NTU = nephelometric turbidity units; meq/L = milliequivalents per litre; mg-N/L = milligrams of Nitrogen per litre; mg-P/L = milligrams of Phosphorus per litre.
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Parameter	Unit	Guidelines for the protection of:			Q1 CM_MC1									Q2 CM_MC1									Q3 CM_MC1									Q4 CM_MC1				
		Aquatic Life		EVWQP Benchmarks	*P. subcapitata*	2-Mar-21	9-Mar-21	16-Mar-21	23-Mar-21	30-Mar-21	Mar 2, 9, 16, 23, 30 *P. promelas*		*C. dubia*	*C. dubia* and *P. subcapitata*	25-May-21	1-Jun-21	8-Jun-21	15-Jun-21	May 18, 25, June 1, 8 *H. azteca*		May 18, 25, June 1, 8, 15 *O. mykiss*		*C. dubia* and *P. subcapitata*	17-Aug-21	24-Aug-21	31-Aug-21	7-Sep-21	Aug 10, 17, 24, 31 *H. azteca*		Aug 10, 17, 24, 31 Sept 7 *P. promelas*		*C. dubia* and *P. subcapitata*	19-Oct-21	26-Oct-21	2-Nov-21	9-Nov-21
		30-day mean	Maximum		23-Feb-21						Mean	CV	13-Apr-21	18-May-21					Mean	CV	Mean	CV	10-Aug-21					Mean	CV	Mean	CV	12-Oct-21				
Field Measured																																				
pH	-	6.5 - 9.0	6.5 - 9.0	-	8.0	7.7	7.7	8.1	8.0	8.0	7.9	0.024	7.8	8.2	7.6	6.9	6.8	7.7	7.4	0.089	7.4	0.079	8.0	7.7	8.2	8.4	7.8	8.1	0.037	8.0	0.036	8.2	8.3	8.6	7.7	7.2
Specific conductivity	µS/cm at 25 C	-	-	-	302	304	223	311	310	312	292	0.13	320	181	197	175	178	185	183	0.054	183	0.047	281	267	174	292	287	253	0.21	260	0.19	301	290	276	255	257
Temperature	°C	-	-	-	1.1	1.1	1.5	0.9	0.9	0.6	1.0	0.33	0.6	1.3	1.4	2.0	2.3	4.9	1.8	0.27	2.4	0.62	9.2	8.9	5.7	7.0	6.1	7.7	0.21	7.4	0.22	3.6	2.8	2.8	0.4	0.4
Dissolved oxygen	mg/L	11	9.0	-	13	13	15	14	15	16	15	0.072	16	16	15	15	15	14	15	0.021	15	0.042	**11**[Mn]	11	14	12	11	12	0.1	12	0.094	12	13	14	14	14
Turbidity	NTU	-	-	-	0.34	5.1	0.26	2.1	0.03	0.12	1.5	1.4	2.6	23	5.9	19	5.0	4.8	13	0.69	11	0.76	0.82	13	3.3	4.6	2.4	5.4	0.96	4.8	0.98	1.1	2.1	1.7	0.98	0.86
Oxidation-reduction potential field	mv	-	-	-	199	209	203	199	204	201	203	0.018	236	156	222	163	187	165	182	0.17	179	0.15	85	258	225	108	243	169	0.51	183	0.44	131	85	52	76	90
Conventional Parameters																																				
pH	-	6.5 - 9.0	6.5 - 9.0	-	8.1	7.9	8.0	8.3	8.2	8.1	8.1	0.02	8.3	8.1	7.7	8.0	7.5	8.1	7.8	0.035	7.9	0.034	8.3	8.2	8.2	8.1	8.2	8.2	0.010	8.2	0.0086	8.3	8.3	8.2	8.2	8.2
Hardness, as $CaCO_3$	mg/L	-	-	-	156	162	162	159	150	164	159	0.035	165	96	99	89	97	92	95	0.048	95	0.045	148	129	157	149	150	146	0.081	147	0.071	159	172	148	130	129
Total alkalinity, as $CaCO_3$	mg/L	20[a]	-	-	153	154	154	154	155	157	155	0.0084	155	88	106	89	99	100	95	0.089	96	0.079	147	138	150	156	151	148	0.051	148	0.045	159	177	145	135	140
Total dissolved solids	mg/L	-	-	-	151	168	178	150	184	143	165	0.11	172	136	126	95	122	132	120	0.15	122	0.13	164	166	175	176	170	170	0.036	170	0.031	166	150	169	149	135
Total suspended solids	mg/L	-	-	-	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1	0	<1.0	24	3.7	7.5	5.9	1.6	10	0.9	8.5	1.0	<1.0	3.0	<1.0	<15	<1.0	5.0	1.3	4.2	1.5	<1.0	<1.0	<1.0	<1.0	<1.0
Total organic carbon	mg/L	-	-	-	0.74	0.8	1.1	1.3	1.2	1.3	1.1	0.19	<0.50	5.7	4.8	4.3	3.0	9.1	4.5	0.25	5.4	0.42	1.3	1.8	1.4	2.1	1.4	1.6	0.21	1.6	0.2	1.1	<0.50	1.2	3.1	2.5
Dissolved organic carbon	mg/L	-	-	-	1.2	0.82	1.2	1.3	1.3	1.5	1.2	0.2	<0.50	6.0	3.9	3.8	2.7	1.7	4.1	0.34	3.6	0.45	1.4	1.6	1.3	2.3	0.94	1.6	0.28	1.5	0.34	1.2	<0.50	1.3	3.0	2.5
Turbidity	NTU	-	-	-	0.11	<0.10	<0.10	<0.10	<0.10	<0.10	<0.1	0	<0.10	12	3.6	6.7	2.6	1.6	6.2	0.67	5.3	0.79	0.5	1.7	0.32	0.21	0.32	0.67	0.99	0.6	1.0	<0.10	0.12	<0.10	0.6	0.31
Total acidity	mg/L	-	-	-	<2.0	2.6	<2.0	<2.0	2.1	<2.0	2.1	0.12	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2	0	<2	0	<2.0	<2.0	<2.0	<2.0	<2.0	<2	0	<2	0	<2.0	<2.0	<2.0	<2.0	<2.0
Cation - anion balance	%	-	-	-	1.8	0.44	0.58	1.6	5.1	1.7	1.9	0.99	0.43	3.1	4.6	1.9	2.4	5.7	3.0	0.39	3.6	0.45	2.1	5.2	0.15	4.4	2.9	3.0	0.78	3.0	0.68	2.1	3.7	1.7	4.1	6.1
Conductivity	µS/cm	-	-	-	287	284	289	290	295	301	292	0.022	312	145	194	170	177	177	172	0.12	173	0.1	273	264	271	275	281	271	0.018	273	0.023	295	291	244	248	260
Ion balance	%	-	-	-	97	99	99	97	90	97	96	0.036	99	106	91	96	95	89	97	0.065	96	0.068	96	90	100	92	94	94	0.046	94	0.04	96	93	97	92	89
Oxidation-reduction potential	mv	-	-	-	476	412	377	317	354	403	373	0.1	456	214	352	293	448	315	327	0.3	324	0.26	462	408	377	448	437	424	0.091	426	0.08	472	450	432	426	442
Major Ions																																				
Bicarbonate	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	122	-	-	122	0.45	175	168	183	190	184	179	0.053	180	0.048	193	215	177	165	140
Bromide	mg/L	-	-	-	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.05	0	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.05	0	<0.05	0	<0.050	<0.050	<0.050	<0.050	<0.050	<0.05	0	<0.05	0	<0.050	<0.050	<0.050	<0.050	<0.050
Calcium	mg/L	-	-	-	43	45	45	44	42	46	44	0.038	45	27	27	24	26	25	26	0.055	26	0.055	41	35	45	42	42	41	0.1	41	0.088	45	48	40	36	35
Carbonate, as $CaCO_3$	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<1.0	-	-	1.0	0.45	2.2	<1.0	<1.0	<1.0	<1.0	1.3	0.46	1.2	0.43	<1.0	<1.0	<1.0	<1.0	<1.0
Chloride	mg/L	150	600	-	0.5	0.54	0.68	0.62	0.75	0.73	0.66	0.13	0.67	0.12	0.18	0.2	0.12	0.11	0.16	0.27	0.15	0.28	0.46	0.34	0.27	0.36	0.33	0.36	0.22	0.35	0.2	0.35	0.43	0.58	0.36	0.43
Fluoride	mg/L	0.12[b]	1.3 - 1.6[c]	-	0.046	0.054	0.058	0.062	0.076	0.079	0.066	0.17	0.066	0.041	0.06	0.049	0.052	0.051	0.051	0.16	0.051	0.13	0.077	0.068	0.058	0.067	0.059	0.068	0.12	0.066	0.12	0.046	0.055	0.084	0.05	0.074
Hydroxide	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<1.0	-	-	1.0	0.45	<1.0	<1.0	<1.0	<1.0	<1.0	<1	0	<1	0	<1.0	<1.0	<1.0	<1.0	<1.0
Magnesium	mg/L	-	-	-	12	13	12	12	11	12	12	0.039	13	7.1	7.6	7.0	7.8	7.5	7.4	0.053	7.4	0.046	11	10	11	11	11	11	0.042	11	0.037	11	13	11	9.4	10
Potassium	mg/L	-	-	-	0.46	0.48	0.5	0.46	0.47	0.49	0.48	0.032	0.5	0.39	0.36	0.32	0.35	0.32	0.35	0.079	0.35	0.082	0.56	0.53	0.48	0.54	0.5	0.53	0.066	0.52	0.064	0.49	0.52	0.45	0.37	0.39
Sodium	mg/L	-	-	-	3.8	3.7	4.0	3.7	3.9	3.9	3.9	0.038	4.4	1.3	1.5	1.1	1.2	1.2	1.3	0.13	1.2	0.12	3.0	2.9	3.1	3.1	3.1	3.0	0.028	3.0	0.026	3.4	3.7	3.4	2.3	2.5
Sulphate	mg/L	309[c]	-	481	17	17	18	18	19	20	18	0.065	20	4.9	6.4	5.2	5.8	6.0	5.6	0.11	5.7	0.1	13	12	13	14	15	13	0.045	14	0.078	13	16	15	11	12
Bicarbonate Alkalinity, as $CaCO_3$	mg/l	-	-	-	153	154	154	147	155	157	153	0.025	155	88	106	89	99	100	95	0.089	96	0.079	143	138	150	156	151	147	0.054	148	0.048	159	177	145	135	114
Carbonate Alkalinity, as $CaCO_3$	mg/l	-	-	-	<1.0	<1.0	<1.0	6.6	<1.0	<1.0	2.1	1.2	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1	0	<1	0	3.6	<1.0	<1.0	<1.0	<1.0	1.7	0.79	1.5	0.76	<1.0	<1.0	1.4	<1.0	<1.0
Hydroxide Alkalinity, as $CaCO_3$	mg/l	-	-	-	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1	0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1	0	<1	0	<1.0	<1.0	<1.0	<1.0	<1.0	<1	0	<1	0	<1.0	<1.0	<1.0	<1.0	<1.0
Major anion sum	meq/l	-	-	-	3.4	3.5	3.5	3.5	3.5	3.6	3.5	0.014	3.5	1.9	2.3	1.9	2.1	2.1	2.0	0.09	2.1	0.08	3.2	3.0	3.3	3.4	3.4	3.2	0.05	3.3	0.046	3.5	3.9	3.2	2.9	3.1
Major cation sum	meq/l	-	-	-	3.3	3.4	3.4	3.4	3.2	3.5	3.4	0.031	3.5	2.0	2.1	1.8	2.0	1.9	2.0	0.05	2.0	0.046	3.1	2.7	3.3	3.1	3.2	3.1	0.076	3.1	0.067	3.3	3.6	3.1	2.7	2.7
Nutrients																																				
Nitrate	mg-N/L	3.0	33	3.0 - 5.2[c]	0.052	0.087	0.055	0.042	0.035	0.032	0.05	0.45	0.022	0.024	0.011	0.01	0.01	0.0056	0.014	0.5	0.012	0.58	0.015	0.022	0.015	0.02	0.018	0.018	0.2	0.018	0.17	0.018	0.02	<0.0050	0.02	0.017
Nitrite	mg-N/L	0.020[d]	0.060[d]	-	<0.0010	<0.0010	0.0012	<0.0010	<0.0010	<0.0010	0.001	0.086	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.001	0	<0.001	0	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.001	0	<0.001	0	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Total ammonia	mg-N/L	2.1	14	-	0.0068	0.0072	<0.0050	<0.0050	0.015	<0.0050	0.0074	0.56	<0.0050	<0.0050	<0.0050	0.0053	0.013	<0.0050	0.007	0.54	0.0066	0.52	<0.0050	<0.0050	<0.0050	<0.0050	0.013	<0.005	0	0.0065	0.52	0.0051	<0.0050	<0.0050	0.01	<0.0050
Total Kjeldahl nitrogen	mg-N/L	-	-	-	<0.050	<0.050	<0.050	<0.050	0.083	<0.050	0.057	0.26	<0.050	0.062	0.34	<0.050	0.35	<0.050	0.2	0.84	0.17	0.94	0.078	<0.050	0.054	<0.050	<0.050	0.058	0.23	0.056	0.22	<0.050	<0.050	0.058	0.087	0.073
Total phosphorus	mg-P/L	-	-	-	0.0022	0.0035	0.0033	<0.0020	<0.0020	<0.0020	0.0026	0.3	0.0025	0.083	0.0064	0.012	0.0068	0.0055	0.027	1.4	0.023	1.5	0.007	0.0096	0.0044	0.0047	0.0039	0.0064	0.38	0.0059	0.4	0.0057	0.0044	0.0049	0.0069	0.0038
Orthophosphate	mg-P/L	-	-	-	0.0043	0.0034	0.0037	0.0027	0.0027	0.0033	0.0032	0.14	<0.0010	0.0039	0.003	0.0027	0.0042	<0.0010	0.0035	0.21	0.003	0.43	0.0048	0.0051	0.0041	0.0044	0.0039	0.0046	0.096	0.0045	0.11	0.003	0.0037	0.0045	0.005	0.0042
Total Metals																			-		-															
Aluminum	mg/L	-	-	-	0.0034	0.012	<0.0030	0.014	0.0036	0.0059	0.0077	0.65	0.11	0.43	0.27	0.47	0.085	0.12	0.32	0.56	0.28	0.64	0.0088	0.03	0.007	0.0066	0.01	0.013	0.87	0.013	0.79	0.0033	0.0035	0.0042	0.036	0.028
Antimony	mg/L	0.0090	-	-	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.0001	0	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.0001	0	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Arsenic	mg/L	0.0050	0.0050	-	0.00018	0.00017	0.00015	0.00017	0.00017	0.00016	0.00016	0.055	0.00018	0.00047	0.00031	0.0004	0.00028	0.00029	0.00037	0.24	0.00035	0.23	0.00024	0.00023	0.00022	0.00018	0.00018	0.00022	0.12	0.00021	0.13	0.0002	0.00017	0.00016	0.00021	0.00019
Barium	mg/L	1.0	-	-	0.054	0.055	0.058	0.055	0.057	0.055	0.056	0.021	0.054	0.043	0.031	0.029	0.028	0.027	0.033	0.22	0.032	0.21	0.052	0.05	0.051	0.053	0.055	0.051	0.025	0.052	0.037	0.054	0.053	0.048	0.04	0.04
Beryllium	mg/L	0.00013	-	-	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.00002	0	<0.000020	0.000054	<0.000020	<0.000020	<0.000020	<0.000020	0.000029	0.6	0.000027	0.57	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.00002	0	<0.00002	0	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
Bismuth	mg/L	0.0005[e]	-	-	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0	<0.00005	0	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0	<0.00005	0	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Boron	mg/L	1.2	29[b]	-	0.014	0.014	0.013	0.015	0.017	0.015	0.015	0.1	0.015	<0.010	0.012	<0.010	<0.010	<0.010	0.011	0.095	0.01	0.086	0.018	0.017	0.016	0.016	0.018	0.017	0.057	0.017	0.059	0.014	0.015	0.014	0.015	0.012
Cadmium	mg/L	-	-	-	0.000011	0.000015	0.000012	0.0000079	0.0000094	0.000024	0.000014	0.48	0.0000074	0.00011	0.000021	0.000028	0.000017	0.000018	0.000045	1.0	0.00004	1.0	<0.0000050	0.000021	0.0000099	0.000007	0.0000097	0.000011	0.66	0.00001	0.58	0.0000092	0.000014	0.000011	0.000011	0.0000092
Calcium	mg/L	-	-	-	45	45	51	43	45	43	46	0.074	44	26	28	25	25	26	26	0.049	26	0.042	41	38	39	40	43	39	0.038	40	0.055	40	44	40	37	35
Chromium	mg/L	0.0010[f]	-	-	0.00018	0.0002	0.00018	0.0002	0.00019	0.0002	0.00019	0.046	0.0003	0.00064	0.00049	0.00078	0.0005	0.00042	0.0006	0.23	0.00057	0.25	0.00019	0.00021	0.0002	0.0002	0.0002	0.0002	0.041	0.0002	0.035	0.00017	0.0002	0.00017	0.00043	0.00031
Cobalt	mg/L	0.0040	0.11	-	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.00010	0.00043	<0.00010	0.00016	<0.00010	<0.00010	0.0002	0.8	0.00018	0.8	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.0001	0	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Copper	mg/L	-	-	-	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	0	<0.00050	0.0013	0.00059	0.00079	<0.00050	<0.00050	0.00079	0.45	0.00073	0.45	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	0	<0.0005	0	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Iron	mg/L	0.64 - 3.55[e,g]	1.0	-	<0.010	0.013	<0.010	0.011	<0.010	<0.010	0.011	0.12	<0.010	0.38	0.18	0.4	0.17	0.11	0.28	0.43	0.25	0.52	<0.010	0.027	<0.010	<0.010	<0.010	0.014	0.6	0.013	0.57	<0.010	<0.010	<0.010	0.031	0.02
Lead	mg/L	0.0060 - 0.0097[c]	0.070 - 0.16[c]	-	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0	<0.000050	0.0015	0.00011	0.00024	0.000065	0.000085	0.00048	1.4	0.0004	1.6	<0.000050	0.000068	<0.000050	<0.000050	<0.000050	0.000055	0.17	0.000054	0.15	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Lithium	mg/L	0.1216[e]	-	-	0.0048	0.0049	0.0048	0.0046	0.005	0.0049	0.0048	0.031	0.0052	0.0025	0.0027	0.0025	0.0021	0.0022	0.0025	0.1	0.0024	0.1	0.0055	0.0049	0.0048	0.0052	0.0053	0.0051	0.062	0.0051	0.056	0.0048	0.0053	0.0043	0.0039	0.0041
Magnesium	mg/L	-	-	-	12	12	13	12	12	12	12	0.041	12	6.8	7.5	7.2	7.7	7.4	7.3	0.056	7.3	0.049	12	10	11	11	12	11	0.054	11	0.051	11	12	11	9.9	10.0
Manganese	mg/L	1.00 - 1.4[c]	1.5 - 2.4[c]	-	<0.00010	0.00095	<0.00010	0.00047	<0.00010	0.00014	0.00035	1.0	0.00026	0.045	0.0041	0.01	0.0033	0.0028	0.016	1.3	0.013	1.4	0.00052	0.0034	0.00034	0.00033	0.00049	0.0012	1.3	0.001	1.3	0.00018	0.00016	0.00019	0.00069	0.00057
Mercury	mg/L	0.000010	-	-	<0.00000050	<0.00000050	<0.00000050	<0.00000050	<0.00000050	<0.00000050	<0.0000005	0	<0.00000050	0.0000051	0.0000025	0.0000022	0.0000017	0.0000017	0.0000029	0.54	0.0000026	0.55	0.00000062	0.0000015	<0.00000050	<0.00000050	<0.00000050	0.00000078	0.62	0.00000073	0.61	<0.00000050	<0.00000050	<0.00000050	0.00000094	0.00000096
Molybdenum	mg/L	1.0	2.0	-	0.00095	0.00084	0.00089	0.00092	0.0009	0.00088	0.00089	0.034	0.00092	0.00045	0.00063	0.0006	0.00051	0.00054	0.00055	0.15	0.00055	0.13	0.00097	0.00091	0.00092	0.00092	0.00093	0.00093	0.028	0.00093	0.024	0.00088	0.00095	0.00084	0.00075	0.00076
Nickel	mg/L	0.0053[h]	-	-	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	0	<0.00050	0.0013	<0.00050	0.00066	<0.00050	<0.00050	0.00075	0.53	0.0007	0.52	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	0	<0.0005	0	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Potassium	mg/L	-	-	-	0.45	0.47	0.46	0.47	0.49	0.46	0.47	0.027	0.46	0.49	0.45	0.5	0.34	0.37	0.44	0.17	0.43	0.17	0.57	0.54	0.49	0.53	0.5	0.53	0.065	0.52	0.065	0.47	0.46	0.42	0.4	0.39
Selenium	mg/L	0.0020	-	0.019	0.00029	0.00032	0.00033	0.00032	0.00033	0.00039	0.00034	0.08	0.00033	0.00023	0.00022	0.00021	0.00023	0.0002	0.00022	0.048	0.00022	0.058	0.00017	0.00017	0.00022	0.00025	0.00018	0.0002	0.19	0.0002	0.17	0.00018	0.00021	0.0002	0.0002	0.00025
Silicon	mg/L	-	-	-	2.2	2.3	2.2	2.2	2.2	2.0	2.2	0.045	2.1	2.8	2.8	2.8	2.2	2.3	2.6	0.11	2.6	0.11	2.5	2.3	2.2	2.5	2.3	2.4	0.051	2.3	0.046	2.2	2.2	2.1	2.2	2.1
Silver	mg/L	0.000050 - 0.0015[c]	0.00010 - 0.0030[c]	-	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	0	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	0	<0.00001	0	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	0	<0.00001	0	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Sodium	mg/L	-	-	-	3.5	3.8	3.3	3.8	4.2	3.8	3.8	0.083	4.1	1.2	1.5	1.2	1.2	1.1	1.3	0.12	1.2	0.12	3.1	2.8	2.9	3.1	3.2	3.0	0.047	3.0	0.052	3.1	3.2	3.4	2.5	2.4
Strontium	mg/L	-	-	-	0.18	0.16	0.18	0.17	0.16	0.17	0.17	0.047	0.18	0.084	0.09	0.076	0.07	0.075	0.08	0.11	0.079	0.1	0.16	0.14	0.14	0.15	0.16	0.15	0.058	0.15	0.063	0.16	0.18	0.15	0.12	0.12
Sulphur	mg/L	-	-	-	6.7	7.1	6.5	6.8	7.0	6.7	6.8	0.036	7.1	2.1	2.7	2.0	2.0	2.1	2.2	0.16	2.2	0.14	4.5	4.3	4.9	4.7	5.2	4.6	0.056	4.7	0.071	5.7	5.8	5.1	3.9	3.6
Thallium	mg/L	0.00080	-	-	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	0	<0.000010	0.000028	0.000016	0.000024	<0.000010	0.000011	0.00002	0.41	0.000018	0.45	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	0	<0.00001	0	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Tin	mg/L	0.3[e]	-	-	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	0.00016	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.0001	0	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.0001	0	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Titanium	mg/L	0.85[e]	-	-	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.0003	0	<0.00030	0.0098	0.0073	0.0081	0.0016	0.0019	0.0067	0.53	0.0057	0.66	<0.00030	<0.00060	<0.00030	<0.00030	<0.00030	<0.000375	0.4	<0.00036	0.37	<0.00030	<0.00030	<0.00030	0.00069	0.00051
Uranium	mg/L	0.0085	0.033[b]	-	0.00026	0.00026	0.00025	0.00025	0.00026	0.00027	0.00026	0.037	0.00025	0.00018	0.00015	0.00014	0.00013	0.00014	0.00015	0.13	0.00015	0.12	0.00022	0.00022	0.00022	0.00024	0.00023	0.00022	0.038	0.00022	0.034	0.00023	0.00027	0.00022	0.0002	0.00019
Vanadium	mg/L	0.12[e]	-	-	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	0	<0.00050	0.0012	0.001	0.0011	<0.00050	<0.00050	0.00095	0.32	0.00086	0.39	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	0	<0.0005	0	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Zinc	mg/L	0.0075 - 0.069	0.033 - 0.095	-	<0.0030	<0.0030	<0.0030	0.0032	0.0038	<0.0030	0.0032	0.11	0.0053	0.0064	0.0068	0.003	<0.0030	<0.0030	0.0048	0.43	0.0044	0.45	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.003	0	<0.003	0	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030
Dissolved Metals																			-		-															
Aluminum	mg/L	0.050[g]	0.10[g]	-	0.0013	<0.0010	0.001	0.0012	0.001	<0.0010	0.001	0.086	0.002	0.016	0.012	0.013	0.009	0.006	0.012	0.24	0.011	0.35	0.0023	0.0028	0.0016	0.0016	0.0019	0.0021	0.28	0.002	0.25	<0.0010	0.0016	0.0012	0.0078	0.003
Antimony	mg/L	-	-	-	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.0001	0	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.0001	0	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Arsenic	mg/L	-	-	-	0.00017	0.00014	0.00016	0.00016	0.00016	0.00014	0.00015	0.072	0.00018	0.00021	0.00019	0.00021	0.00022	0.00021	0.00021	0.061	0.00021	0.053	0.00022	0.0002	0.00017	0.00019	0.00019	0.0002	0.11	0.00019	0.094	0.00015	0.00015	0.00016	0.00018	0.0002
Barium	mg/L	-	-	-	0.056	0.058	0.057	0.057	0.054	0.056	0.056	0.027	0.059	0.028	0.03	0.027	0.027	0.026	0.028	0.058	0.027	0.06	0.053	0.048	0.048	0.054	0.053	0.051	0.059	0.051	0.054	0.054	0.056	0.049	0.039	0.041
Beryllium	mg/L	-	-	-	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.00002	0	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.00002	0	<0.00002	0	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.00002	0	<0.00002	0	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
Bismuth	mg/L	-	-	-	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0	<0.00005	0	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0	<0.00005	0	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Boron	mg/L	-	-	-	0.013	0.015	0.014	0.013	0.016	0.015	0.015	0.078	0.016	0.01	<0.010	<0.010	<0.010	<0.010	0.01	0	0.01	0	0.017	0.017	0.016	0.017	0.017	0.017	0.03	0.017	0.027	0.015	0.015	0.014	0.013	0.011
Cadmium	mg/L	0.00019 - 0.00032[c]	0.00052 - 0.0010[c]	0.00012 - 0.00021[c]	0.0000077	0.0000071	0.0000063	0.0000083	0.0000057	0.0000071	0.0000069	0.14	0.000012	0.000011	0.000013	0.00001	0.00001	0.0000099	0.000011	0.13	0.000011	0.12	0.0000078	0.000012	0.000012	0.00001	0.0000097	0.000011	0.19	0.00001	0.17	0.0000078	0.0000089	0.0000096	0.0000085	0.0000086
Chromium	mg/L	-	-	-	0.00017	0.00018	0.00018	0.00018	0.00019	0.00015	0.00018	0.086	0.00018	0.00022	0.00019	0.00026	0.00029	0.00026	0.00024	0.18	0.00024	0.16	0.00014	0.00016	0.00017	0.00018	0.00018	0.00016	0.11	0.00017	0.1	0.00019	0.0002	0.00017	0.00039	0.00023
Cobalt	mg/L	-	-	-	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.0001	0	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.0001	0	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Copper	mg/L	0.0003 - 0.0032[i]	0.0015 - 0.0196[i]	-	<0.00020	0.00022	<0.00020	<0.00020	<0.00020	<0.00020	0.0002	0.044	**0.0006** [Mn]	0.00048	0.00036	0.00031	0.00026	0.00026	0.00035	0.27	0.00033	0.27	0.00021	0.00024	0.00021	<0.00020	<0.00020	0.00022	0.081	0.00021	0.078	<0.00020	<0.00020	0.00026	0.0003	0.00029
Iron	mg/L	-	0.35	-	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.01	0	<0.010	0.019	0.013	0.014	<0.010	<0.010	0.014	0.27	0.013	0.28	<0.010	<0.010	<0.010	<0.010	<0.010	<0.01	0	<0.01	0	<0.010	<0.010	<0.010	<0.010	<0.010
Lead	mg/L	-	-	-	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0	<0.00005	0	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0	<0.00005	0	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Lithium	mg/L	-	-	-	0.0048	0.0049	0.0047	0.0043	0.0047	0.005	0.0047	0.057	0.0053	0.0027	0.0025	0.0022	0.0021	0.0021	0.0024	0.12	0.0023	0.12	0.0053	0.0048	0.005	0.0054	0.0049	0.0051	0.054	0.0051	0.051	0.0052	0.0054	0.0044	0.0038	0.0039
Manganese	mg/L	-	-	-	<0.00010	0.00018	<0.00010	0.00028	<0.00010	<0.00010	0.00015	0.52	<0.00010	0.00096	0.00031	0.00033	0.00021	0.00016	0.00045	0.76	0.00039	0.82	0.00017	0.00056	0.00012	0.00014	0.00011	0.00025	0.85	0.00022	0.87	0.00012	<0.00010	0.00026	0.00019	0.00014
Mercury	mg/L	-	-	-	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.000005	0	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.000005	0	<0.000005	0	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.000005	0	<0.000005	0	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Molybdenum	mg/L	-	-	-	0.00087	0.00094	0.00085	0.00082	0.00081	0.00087	0.00086	0.06	0.00089	0.00049	0.00058	0.00051	0.00056	0.0005	0.00053	0.078	0.00052	0.075	0.00093	0.00095	0.00095	0.0009	0.00092	0.00093	0.024	0.00093	0.022	0.00089	0.00085	0.00084	0.0007	0.00076
Nickel	mg/L	-	-	-	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	0	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	0	<0.0005	0	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	0	<0.0005	0	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Selenium	mg/L	-	-	-	0.00032	0.00038	0.00031	0.00034	0.00034	0.00035	0.00034	0.072	0.0004	0.0002	0.00024	0.0002	0.00021	0.00015	0.00021	0.09	0.0002	0.15	0.0002	0.00021	0.0002	0.00021	0.00023	0.0002	0.029	0.00021	0.056	0.00022	0.00027	0.00019	0.00022	0.00026
Silicon	mg/L	-	-	-	2.1	2.1	2.2	2.1	2.1	2.0	2.1	0.024	2.3	2.0	2.1	2.1	2.0	2.0	2.1	0.029	2.0	0.031	2.4	2.3	2.2	2.2	2.3	2.3	0.044	2.3	0.038	2.2	2.3	2.1	2.0	2.0
Silver	mg/L	-	-	-	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	0	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	0	<0.00001	0	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	0	<0.00001	0	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Strontium	mg/L	2.5[e]	-	-	0.17	0.17	0.17	0.16	0.17	0.17	0.17	0.027	0.18	0.081	0.096	0.072	0.078	0.072	0.082	0.12	0.08	0.12	0.16	0.14	0.16	0.16	0.17	0.15	0.045	0.16	0.066	0.17	0.17	0.14	0.11	0.12
Sulphur	mg/L	-	-	-	6.4	6.5	6.7	6.6	6.7	6.6	6.6	0.011	8.1	2.4	2.7	1.5	2.3	2.1	2.2	0.22	2.2	0.2	4.4	4.6	4.3	4.9	5.4	4.5	0.051	4.7	0.088	5.2	6.0	5.3	3.8	3.7
Thallium	mg/L	-	-	-	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	0	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	0	<0.00001	0	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	0	<0.00001	0	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Tin	mg/L	-	-	-	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.0001	0	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.0001	0	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Titanium	mg/L	-	-	-	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.0003	0	<0.00030	0.00035	<0.00030	<0.00030	<0.00030	<0.00030	0.00031	0.08	0.00031	0.072	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.0003	0	<0.0003	0	<0.00030	<0.00030	<0.00030	0.00043	<0.00030
Uranium	mg/L	-	-	-	0.00026	0.00024	0.00027	0.00024	0.00025	0.00027	0.00025	0.055	0.00026	0.00013	0.00013	0.00012	0.00014	0.00013	0.00013	0.051	0.00013	0.045	0.00022	0.00021	0.00024	0.00025	0.00024	0.00023	0.083	0.00023	0.072	0.00026	0.00024	0.00024	0.00019	0.00019
Vanadium	mg/L	-	-	-	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	0	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	0	<0.0005	0	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	0	<0.0005	0	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Zinc	mg/L	-	-	-	<0.0010	<0.0010	0.0032	0.0014	0.015	0.0026	0.0047	1.3	0.0021	0.0022	0.013	<0.0010	<0.0010	<0.0010	0.0042	1.3	0.0036	1.4	<0.0010	0.0013	<0.0010	<0.0010	<0.0010	0.0011	0.14	0.0011	0.13	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010

(a) = guideline is a minimum value, unless the background concentration or value is lower.

(b) = guideline is adopted from CCME Canadian Environmental Quality Guidelines (CCME, 1999).

(c) = guideline is hardness dependent. The guideline range shown is based on the hardness range observed in the dataset (89 to 172 mg/L). The guideline is calculated based on the individual hardness value for each sample.

(d) = guideline is chloride dependent. The guideline range shown is based on the chloride concentration range observed in the dataset (0.11 to 0.75 mg/L). The guideline is calculated based on the individual chloride concentration in each sample.

(e) = guideline is adopted from the ECCC PNECs (ECCC, 2018) or draft FEQGs (ECCC, 2017).

(f) = guideline is for chromium VI.

(g) = guideline is pH dependent. The guideline range shown is based on the pH range observed in the dataset (6.8 to 8.6). The guideline is calculated based on the individual pH for each sample.

(h) = guideline is a level 1 interim screening value.

(i) = dissolved copper guideline was calculated using the simplified Biotic Ligand Midel (BC ENV, 2019). Where values were missing, the temporally nearest value from the same location was taken.

(Mn) = concentration is higher than the 30-day mean water quality guideline or outside the recommended pH, DO or total alkalinity range.

(Mx) = concentration is higher than the maximum water quality guideline or outside the recommended pH, DO or total alkalinity range.

(E) = concentration is higher than the EVWQP benchmarks guideline.

Bolded concentrations are higher than water quality guidelines.

Shaded concentrations are higher than the EVWQP benchmark (e.g., for nitrate, total selenium, dissolved cadmium or sulphate).

Water quality data and guidelines shown in this table were rounded to reflect laboratory or field instrument precision after comparisons to guidelines. Therefore, values slightly above guidelines may be displayed as being equal to the guidelines and identified as exceedances. Concentrations equal to the guideline values were not identified as exceedances.

Concentrations were screened against available Working and Approved British Columbia Ministry of Environment and Climate Change Strategy (BC ENV) Water Quality Guidelines for the Protection of Aquatic Life; Accessed January 2020 from: https://www2.gov.bc.ca/gov/content/environment/air-land-water/water/water-quality/water-quality-guidelines.

- = no guideline or no data

BC ENV = British Columbia Ministry of Environment & Climate Change Strategy; EVWQP = Elk Valley Water Quality Plan guidelines; *C. dubia* = *Ceriodaphnia dubia* ; *P. subcapitata* = *Pseudokirchneriella subcapitata* ; *H. azteca* = *Hyallela azteca* ; *P. promelas* = *Pimephales promelas* ; *O. mykiss* = *Oncorhynchus mykiss* ; CV = coefficient of variation; ∑ = sum of; WQGs = Water Quality Guidelines; CaCO3 = calcium carbonate; mg/L = milligrams per litre; µS/cm = microsiemens per centimeter; NTU = nephelometric turbidity units; meq/L = milliequivalents per litre; mg-N/L = milligrams of Nitrogen per litre; mg=P/L = milligrams of Phosphorus per litre.

BC ENV (B.C. Ministry of Climate Chande Strategy). 2019. Copper Water Quality guideline for the Protection of Aquatic Life-Technical Report. Water Quality Guideline Series, WQG-03-1. Prov. B.C., Victoria B.C.

Parameter	Unit	Guidelines for the protection of: Aquatic Life		Oct 12, 19, 26, Nov 2 *H. azteca*		Oct 12, 19, 26, Nov 2, 9 *O. mykiss*	
		30-day mean	Maximum	Mean	CV	Mean	CV
Field Measured							
pH	-	6.5 - 9.0	6.5 - 9.0	8.2	0.046	8.0	0.069
Specific conductivity	µS/cm at 25 C	-	-	280	0.071	276	0.073
Temperature	°C	-	-	2.4	0.58	2.0	0.75
Dissolved oxygen	mg/L	11	9.0	13	0.087	14	0.078
Turbidity	NTU	-	-	1.5	0.37	1.4	0.4
Oxidation-reduction potential field	mv	-	-	86	0.39	87	0.33
Conventional Parameters							
pH	-	6.5 - 9.0	6.5 - 9.0	8.3	0.007	8.2	0.0066
Hardness, as $CaCO_3$	mg/L	-	-	152	0.12	148	0.13
Total alkalinity, as $CaCO_3$	mg/L	20[w]	-	154	0.12	151	0.11
Total dissolved solids	mg/L	-	-	159	0.066	154	0.09
Total suspended solids	mg/L	-	-	<1	0	1.0	0
Total organic carbon	mg/L	-	-	1.5	0.77	1.7	0.64
Dissolved organic carbon	mg/L	-	-	1.5	0.72	1.7	0.61
Turbidity	NTU	-	-	0.23	1.1	0.25	0.88
Total acidity	mg/L	-	-	<2	0	2.0	0
Cation - anion balance	%	-	-	2.9	0.4	3.5	0.49
Conductivity	µS/cm	-	-	270	0.1	268	0.09
Ion balance	%	-	-	94	0.024	93	0.035
Oxidation-reduction potential	mv	-	-	445	0.046	444	0.04
Major Ions							
Bicarbonate	mg/L	-	-	188	0.12	178	0.16
Bromide	mg/L	-	-	<0.05	0	0.05	0
Calcium	mg/L	-	-	42	0.12	41	0.14
Carbonate, as $CaCO_3$	mg/L	-	-	<1	0	1.0	0
Chloride	mg/L	150	600	0.43	0.25	0.43	0.21
Fluoride	mg/L	0.12[w]	1.3 - 1.6[c]	0.059	0.29	0.062	0.27
Hydroxide	mg/L	-	-	<1	0	1.0	0
Magnesium	mg/L	-	-	11	0.11	11	0.11
Potassium	mg/L	-	-	0.46	0.14	0.44	0.14
Sodium	mg/L	-	-	3.2	0.19	3.0	0.2
Sulphate	mg/L	309[d1]	-	14	0.15	13	0.15
Bicarbonate Alkalinity, as $CaCO_3$	mg/l	-	-	154	0.12	146	0.16
Carbonate Alkalinity, as $CaCO_3$	mg/l	-	-	1.1	0.18	1.1	0.17
Hydroxide Alkalinity, as $CaCO_3$	mg/l	-	-	<1	0	1.0	0
Major anion sum	meq/l	-	-	3.4	0.12	3.3	0.11
Major cation sum	meq/l	-	-	3.2	0.12	3.1	0.13
Nutrients				-		-	
Nitrate	mg-N/L	3.0	33	0.016	0.46	0.016	0.39
Nitrite	mg-N/L	0.020[d2]	0.060[d2]	<0.001	0	0.001	0
Total ammonia	mg-N/L	2.1	14	0.0064	0.41	0.0061	0.39
Total Kjeldahl nitrogen	mg-N/L	-	-	0.061	0.29	0.064	0.25
Total phosphorus	mg-P/L	-	-	0.0055	0.2	0.0051	0.23
Orthophosphate	mg-P/L	-	-	0.0041	0.22	0.0041	0.19
Total Metals							
Aluminum	mg/L	-	-	0.012	1.4	0.015	1.0
Antimony	mg/L	0.0090	-	<0.0001	0	0.0001	0
Arsenic	mg/L	0.0050	0.0050	0.00019	0.13	0.00019	0.11
Barium	mg/L	1.0	-	0.049	0.14	0.047	0.15
Beryllium	mg/L	0.00013	-	<0.00002	0	0.00002	0
Bismuth	mg/L	0.0005[w]	-	<0.00005	0	0.00005	0
Boron	mg/L	1.2	29[h1]	0.015	0.04	0.014	0.087
Cadmium	mg/L	-	-	0.000011	0.17	0.000011	0.17
Calcium	mg/L	-	-	40	0.066	39	0.088
Chromium	mg/L	0.0010[f]	-	0.00024	0.52	0.00026	0.44
Cobalt	mg/L	0.0040	0.11	<0.0001	0	0.0001	0
Copper	mg/L	-	-	<0.0005	0	0.0005	0
Iron	mg/L	0.84 - 3.55[e,g]	1.0	0.015	0.69	0.016	0.58
Lead	mg/L	0.0060 - 0.0097[c1]	0.070 - 0.16[c1]	<0.00005	0	0.00005	0
Lithium	mg/L	0.1216[w]	-	0.0046	0.13	0.0045	0.13
Magnesium	mg/L	-	-	11	0.085	11	0.086
Manganese	mg/L	1.00 - 1.4[c]	1.5 - 2.4[c]	0.00031	0.84	0.00036	0.7
Mercury	mg/L	0.000010	-	0.00000061	0.36	0.00000068	0.36
Molybdenum	mg/L	1.0	2.0	0.00086	0.098	0.00084	0.1
Nickel	mg/L	0.0053[h]	-	<0.0005	0	0.0005	0
Potassium	mg/L	-	-	0.44	0.08	0.43	0.084
Selenium	mg/L	0.0020	-	0.0002	0.063	0.00021	0.12
Silicon	mg/L	-	-	2.2	0.021	2.2	0.034
Silver	mg/L	0.000050 - 0.0015[c1]	0.00010 - 0.0030[c1]	<0.00001	0	0.00001	0
Sodium	mg/L	-	-	3.0	0.13	2.9	0.15
Strontium	mg/L	-	-	0.15	0.18	0.15	0.19
Sulphur	mg/L	-	-	5.1	0.17	4.8	0.21
Thallium	mg/L	0.00080	-	<0.00001	0	0.00001	0
Tin	mg/L	0.3[w]	-	<0.0001	0	0.0001	0
Titanium	mg/L	0.85[w]	-	0.0004	0.49	0.00042	0.42
Uranium	mg/L	0.0085	0.033[h]	0.00023	0.12	0.00022	0.13
Vanadium	mg/L	0.12[w]	-	<0.0005	0	0.0005	0
Zinc	mg/L	0.0075 - 0.069	0.033 - 0.095	<0.003	0	0.003	0
Dissolved Metals							
Aluminum	mg/L	0.050[g]	0.10[g]	0.0029	1.1	0.0029	0.97
Antimony	mg/L	-	-	<0.0001	0	0.0001	0
Arsenic	mg/L	-	-	0.00016	0.088	0.00017	0.13
Barium	mg/L	-	-	0.049	0.16	0.048	0.16
Beryllium	mg/L	-	-	<0.00002	0	0.00002	0
Bismuth	mg/L	-	-	<0.00005	0	0.00005	0
Boron	mg/L	-	-	0.014	0.067	0.014	0.12
Cadmium	mg/L	0.00019 - 0.00032[c]	0.00052 - 0.0010[c]	0.0000087	0.087	0.0000087	0.075
Chromium	mg/L	-	-	0.00024	0.43	0.00024	0.38
Cobalt	mg/L	-	-	<0.0001	0	0.0001	0
Copper	mg/L	0.0003 - 0.0032[c]	0.0015 - 0.0196[c]	0.00024	0.2	0.00025	0.19
Iron	mg/L	-	0.35	<0.01	0	0.01	0
Lead	mg/L	-	-	<0.00005	0	0.00005	0
Lithium	mg/L	-	-	0.0047	0.16	0.0045	0.16
Manganese	mg/L	-	-	0.00017	0.43	0.00016	0.4
Mercury	mg/L	-	-	<0.000005	0	0.000005	0
Molybdenum	mg/L	-	-	0.00082	0.1	0.00081	0.097
Nickel	mg/L	-	-	<0.0005	0	0.0005	0
Selenium	mg/L	-	-	0.00022	0.16	0.00023	0.15
Silicon	mg/L	-	-	2.2	0.061	2.1	0.065
Silver	mg/L	-	-	<0.00001	0	0.00001	0
Strontium	mg/L	2.5[w]	-	0.15	0.19	0.14	0.19
Sulphur	mg/L	-	-	5.0	0.18	4.8	0.21
Thallium	mg/L	-	-	<0.00001	0	0.00001	0
Tin	mg/L	-	-	<0.0001	0	0.0001	0
Titanium	mg/L	-	-	0.00033	0.2	0.00033	0.18
Uranium	mg/L	-	-	0.00023	0.13	0.00022	0.15
Vanadium	mg/L	-	-	<0.0005	0	0.0005	0
Zinc	mg/L	-	-	<0.001	0	0.001	0

(a) = guideline is a minimum value, unless the background concentration or value is lower.

(b) = guideline is adopted from CCME Canadian Environmental Quality Guidelines (CCME, 1999).

(c) = guideline is hardness dependent. The guideline range shown is based on the hardness range observed in the datase guideline is calculated based on the individual hardness value for each sample.

(d) = guideline is chloride dependent. The guideline range shown is based on the chloride concentration range observed ir 0.75 mg/L). The guideline is calculated based on the individual chloride concentration in each sample.

(e) = guideline is adopted from the ECCC PNECs (ECCC, 2018) or draft FEQGs (ECCC, 2017).

(f) = guideline is for chromium VI.

(g) = guideline is pH-dependent. The guideline range shown is based on the pH range observed in the dataset (6.8 to 8.6). calculated based on the individual pH for each sample.

(h) = guideline is a level 1 interim screening value.

(i) = dissolved copper guideline was calculated using the simplified Biotic Ligand Midel (BC ENV, 2019). Where values wer temporally nearest value from the same location was taken.

(Mn) = concentration is higher than the 30-day mean water quality guideline or outside the recommended pH, DO or total a

(Mx) = concentration is higher than the maximum water quality guideline or outside the recommended pH, DO or total alka

(E) = concentration is higher than the EVWQP benchmarks guideline.

Bolded concentrations are higher than water quality guidelines.

Shaded concentrations are higher than the EVWQP benchmark (e.g., for nitrate, total selenium, dissolved cadmium or sulp

Water quality data and guidelines shown in this table were rounded to reflect laboratory or field instrument precision after c guidelines. Therefore, values slightly above guidelines may be displayed as being equal to the guidelines and identified as Concentrations equal to the guideline values were not identified as exceedances.

Concentrations were screened against available Working and Approved British Columbia Ministry of Environment and Clim (BC ENV) Water Quality Guidelines for the Protection of Aquatic Life. Accessed January 2020 from: https://www2.gov.bc.ca/gov/content/environment/air-land-water/water/water-quality/water-quality-guidelines.

- = no guideline or no data

BC ENV = British Columbia Ministry of Environment & Climate Change Strategy; EVWQP = Elk Valley Water Quality Plan

Ceriodaphnia dubia ; *P. subcapitata* = *Pseudokirchneriella subcapitata* ; *H. azteca* = *Hyalella azteca* ; *P. promelas* = *Pime mykiss* = *Oncorhynchus mykiss* ; CV = coefficient of variation; ∑ = sum of; WQGs = Water Quality Guidelines; CaCO3 = c

= milligrams per litre; µS/cm = microsiemens per centimeter; NTU = nephelometric turbidity units; meq/L = milliequivalents milligrams of Nitrogen per litre; mgmP/L = milligrams of Phosphorus per litre.

BC ENV (B.C. Ministry of Climate Chande Strategy). 2019. Copper Water Quality guideline for the Protection of Aquatic Lif Water Quality Guideline Series, WQG-03-1. Prov. B.C., Victoria B.C.

Parameter	Unit	Guidelines for the protection of:			Q1 CM_MC2									Q2 CM_MC2									Q3 CM_MC2									Q4 CM_MC2								
		Aquatic Life		EVWQP Benchmarks	*P. subcapitata*	2-Mar-21	9-Mar-21	16-Mar-21	23-Mar-21	30-Mar-21	Mar 2, 9, 16, 23, 30 *P. promelas*		*C. dubia*	*C. dubia* and *P. subcapitata*	25-May-21	1-Jun-21	8-Jun-21	15-Jun-21	May 18, 25, June 1, 8 *H. azteca*		May 18, 25, June 1, 8, 15 *O. mykiss*		*C. dubia* and *P. subcapitata*	17-Aug-21	24-Aug-21	31-Aug-21	7-Sep-21	Aug 10, 17, 24, 31 *H. azteca*		Aug 10, 17, 24, 31 Sept 7 *P. promelas*		*C. dubia* and *P. subcapitata*	19-Oct-21	26-Oct-21	2-Nov-21	9-Nov-21	Oct 12, 19, 26, Nov 2 *H. azteca*		Oct 12, 19, 26, Nov 2, 9 *O. mykiss*	
		30-day mean	Maximum		23-Feb-21						Mean	CV	13-Apr-21	18-May-21					Mean	CV	Mean	CV	10-Aug-21					Mean	CV	Mean	CV	12-Oct-21					Mean	CV	Mean	CV
Field Measured																																								
pH	-	6.5 - 9.0	6.5 - 9.0	-	7.7	7.5	7.6	7.4	7.8	7.7	7.6	0.021	8.0	7.8	8.0	7.6	7.6	7.9	7.8	0.025	7.8	0.023	8.2	7.9	8.2	8.6	8.2	8.2	0.035	8.2	0.03	8.1	8.5	8.6	8.1	7.5	8.3	0.032	8.2	0.053
Specific conductivity	µS/cm at 25 C	-	-	-	1094	1062	1373	1209	1189	1231	1213	0.092	1111	520	630	478	548	461	544	0.12	528	0.13	954	1019	1070	1183	710	1057	0.092	987	0.18	1198	1107	924	923	870	1038	0.13	1004	0.14
Temperature	°C	-	-	-	0	0.3	0.1	<0.10	0.4	0.2	0.18	0.72	1.0	3.3	3.4	4.5	4.1	6.4	3.8	0.15	4.3	0.29	12	11	7.8	8.9	8.6	9.8	0.19	9.6	0.18	3.4	3.8	4.2	1.0	0.8	3.1	0.46	2.6	0.61
Dissolved oxygen	mg/L	11	9.0	-	15	15	16	15	16	16	16	0.041	15	15	15	14	14	14	15	0.023	14	0.037	11	11	14	12	12	12	0.12	12	0.10	14	14	14	15	15	14	0.036	14	0.032
Turbidity	NTU	-	-	-	0.29	1.2	1.4	0.64	0.67	1.2	1.0	0.33	2.0	48	13	27	12	16	25	0.68	23	0.66	0.94	8.0	2.6	3.3	1.7	3.7	0.82	3.3	0.84	2.6	1.9	2.1	9.1	2.1	3.9	0.88	3.6	0.87
Oxidation-reduction potential field	mv	-	-	-	207	224	215	218	225	224	221	0.019	208	198	162	135	146	139	160	0.17	156	0.16	84	226	138	129	143	144	0.41	144	0.36	151	95	77	78	112	100	0.35	103	0.3
Conventional Parameters																																								
pH	-	6.5 - 9.0	6.5 - 9.0	-	8.2	8.0	8.1	8.3	7.9	8.2	8.1	0.02	8.3	8.2	8.3	8.1	7.9	8.1	8.1	0.021	8.1	0.018	8.3	8.3	8.3	8.2	8.2	8.3	0.006	8.3	0.0066	8.3	8.3	8.3	8.3	8.3	8.3	0	8.3	0
Hardness, as $CaCO_3$	mg/L	-	-	-	594	589	833	671	596	671	672	0.15	614	249	307	233	268	218	264	0.12	255	0.14	503	515	604	610	604	558	0.1	567	0.094	707	672	528	462	443	592	0.2	562	0.21
Total alkalinity, as $CaCO_3$	mg/L	20[(a)]	-	-	230	222	252	249	242	254	244	0.053	243	135	161	129	148	132	143	0.099	141	0.094	196	211	234	263	233	226	0.13	227	0.11	262	259	222	224	212	242	0.09	236	0.098
Total dissolved solids	mg/L	-	-	-	817	696	948	850	814	910	844	0.12	785	346	-	294	360	306	333	0.51	327	0.45	682	754	790	890	798	779	0.11	783	0.096	921	864	674	615	567	769	0.19	728	0.21
Total suspended solids	mg/L	-	-	-	<1.0	<1.0	1.8	<1.0	2.0	<1.0	1.4	0.37	<1.0	56	-	27	11	11	31	0.78	26	0.83	1.3	16	<1.0	62	1.1	20	1.4	16	1.6	6.4	1.4	1.1	2.0	2.4	2.7	0.91	2.7	0.81
Total organic carbon	mg/L	-	-	-	<0.50	0.75	1.3	1.1	0.85	1.3	1.1	0.23	<0.50	3.8	2.3	2.7	1.8	1.2	2.7	0.32	2.4	0.42	1.1	1.5	1.1	1.1	0.77	1.2	0.18	1.1	0.24	1.6	0.53	1.3	1.4	1.6	1.2	0.39	1.3	0.34
Dissolved organic carbon	mg/L	-	-	-	<0.50	0.71	1.3	0.76	0.75	1.7	1.0	0.42	<0.50	2.9	2.1	2.3	1.4	0.72	2.2	0.29	1.9	0.45	1.1	1.5	1.2	1.0	0.82	1.2	0.17	1.1	0.22	2.5	0.61	1.3	1.6	1.6	1.5	0.51	1.5	0.44
Turbidity	NTU	-	-	-	0.26	0.13	0.15	0.41	0.35	0.55	0.32	0.56	0.44	29	-	14	5.2	7.4	16	0.79	14	0.81	0.62	5.2	0.49	0.5	0.45	1.7	1.4	1.5	1.4	0.51	0.29	0.33	1.6	1.2	0.69	0.91	0.79	0.75
Total acidity	mg/L	-	-	-	2.9	2.8	<2.0	<2.0	3.0	<2.0	2.4	0.21	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2	0	<2	0	<2.0	<2.0	<2.0	<2.0	<2.0	<2	0	<2	0	<2.0	<2.0	<2.0	<2.0	<2.0	<2	0	<2	0
Ion balance	%	-	-	-	98	100	106	99	90	99	99	0.06	99	98	97	96	92	91	96	0.027	95	0.034	104	93	96	92	90	96	0.057	95	0.057	103	95	92	89	92	95	0.063	94	0.056
Cation - anion balance	%	-	-	-	1.2	<0.010	2.9	0.69	5.5	0.68	2.0	1.2	0.37	1.3	1.4	1.9	4.2	4.9	2.2	0.62	2.7	0.62	1.9	3.5	2.2	4.3	5.0	3.0	0.38	3.4	0.4	1.4	2.7	4.3	5.6	4.1	3.5	0.53	3.6	0.45
Conductivity	µS/cm	-	-	-	1030	975	1260	1120	1090	1180	1125	0.094	1090	442	608	467	529	448	512	0.14	499	0.14	918	988	1000	1110	1060	1004	0.079	1015	0.072	1200	1110	951	901	853	1041	0.13	1003	0.15
Oxidation-reduction potential	mv	-	-	-	464	346	362	311	298	401	344	0.12	414	178	-	480	429	271	362	0.62	340	0.57	493	394	333	294	438	379	0.23	390	0.2	467	442	442	457	454	452	0.027	452	0.024
Major Ions																																								
Bicarbonate	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	161	-	-	161	0.45	239	251	285	321	284	274	0.13	276	0.12	309	307	270	268	212	289	0.078	273	0.14
Bromide	mg/L	-	-	-	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	0	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.05	0	<0.05	0	<0.050	<0.25	<0.25	<0.25	<0.25	<0.2	0.5	<0.21	0.43	<0.25	<0.25	<0.25	<0.25	<0.050	<0.25	0	<0.21	0.43
Calcium	mg/L	-	-	-	131	131	184	150	135	151	150	0.14	140	60	72	53	62	51	62	0.12	60	0.13	111	112	141	137	135	125	0.13	127	0.11	155	148	119	107	100	132	0.17	126	0.2
Carbonate, as $CaCO_3$	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<1.0	-	-	1.0	0.45	<1.0	2.9	<1.0	<1.0	<1.0	1.5	0.64	1.4	0.62	5.2	4.3	<1.0	2.4	<1.0	3.2	0.59	2.8	0.69
Chloride	mg/L	150	600	-	2.3	2.7	3.6	4.3	4.4	6.0	4.2	0.3	4.8	0.54	0.88	0.62	0.59	0.49	0.66	0.23	0.62	0.24	1.4	3.8	2.1	2.4	7.4	2.4	0.41	3.4	0.69	1.6	2.3	2.2	1.9	2.1	2.0	0.15	2.0	0.13
Fluoride	mg/L	0.12[(b)]	1.6 - 2.2[(c)]	-	<0.10	<0.10	**0.12[(Mn)]**	<0.10	0.12	**0.18[(Mn)]**	**0.12[(Mn)]**	0.27	0.11	0.072	0.11	0.088	0.1	0.086	0.092	0.17	0.091	0.15	**0.13[(Mn)]**	**0.13[(Mn)]**	<0.10	**0.19[(Mn)]**	<0.10	**0.14[(Mn)]**	0.27	**0.13[(Mn)]**	0.28	<0.10	<0.10	**0.15[(Mn)]**	<0.10	**0.13[(Mn)]**	0.11	0.22	0.12	0.2
Hydroxide	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<1.0	-	-	1.0	0.45	<1.0	<1.0	<1.0	<1.0	<1.0	<1	0	<1	0	<1.0	<1.0	<1.0	<1.0	<1.0	<1	0	<1	0
Magnesium	mg/L	-	-	-	65	64	91	72	63	71	72	0.16	64	24	31	24	27	22	27	0.13	26	0.14	55	57	61	65	65	60	0.077	61	0.076	78	74	56	47	47	64	0.23	60	0.24
Potassium	mg/L	-	-	-	1.7	1.6	2.3	2.0	1.9	2.2	2.0	0.13	1.9	1.0	1.2	0.86	1.1	0.85	1.0	0.13	0.99	0.14	2.0	2.1	2.0	2.4	2.2	2.1	0.084	2.1	0.074	2.2	2.0	1.7	1.5	1.3	1.8	0.18	1.7	0.21
Sodium	mg/L	-	-	-	18	16	21	22	24	27	22	0.18	24	12	11	6.6	5.9	6.1	8.8	0.34	8.3	0.35	20	20	22	28	25	22	0.17	23	0.15	19	17	13	15	12	16	0.16	15	0.19
Sulphate	mg/L	429[(c,d)]	-	481	392	375	**540[(Mn, E)]**	**446[(Mn)]**	**449[(Mn)]**	**448[(Mn)]**	**452[(Mn)]**	0.13	394	137	168	120	148	116	143	0.14	138	0.15	314	362	424	**442[(Mn)]**	**460[(Mn)]**	386	0.15	400	0.15	**437[(Mn)]**	**461[(Mn)]**	356	311	277	391	0.18	368	0.21
Major cation sum	meq/l	-	-	-	13	13	18	14	13	15	14	0.14	13	5.5	6.6	5.0	5.6	4.6	5.7	0.12	5.5	0.14	11	11	13	14	13	12	0.11	12	0.097	15	14	11	9.9	9.4	13	0.19	12	0.21
Major anion sum	meq/l	-	-	-	13	13	17	15	15	15	15	0.10	13	5.7	6.8	5.2	6.1	5.1	5.9	0.12	5.8	0.12	11	12	14	15	15	13	0.14	13	0.14	15	15	12	11	10	13	0.14	13	0.17
Bicarbonate Alkalinity, as $CaCO_3$	mg/l	-	-	-	230	222	252	243	242	254	243	0.052	240	135	161	129	148	132	143	0.099	141	0.094	196	206	234	263	233	225	0.13	226	0.12	253	252	222	220	174	237	0.077	224	0.14
Carbonate Alkalinity, as $CaCO_3$	mg/l	-	-	-	<1.0	<1.0	<1.0	5.8	<1.0	<1.0	2.0	1.1	3.6	<1.0	<1.0	<1.0	<1.0	<1.0	<1	0	<1	0	<1.0	4.8	<1.0	<1.0	<1.0	2.0	0.97	1.8	0.97	8.6	7.2	<1.0	4.0	<1.0	5.2	0.65	4.4	0.8
Hydroxide Alkalinity, as $CaCO_3$	mg/l	-	-	-	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1	0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1	0	<1	0	<1.0	<1.0	<1.0	<1.0	<1.0	<1	0	<1	0	<1.0	<1.0	<1.0	<1.0	<1.0	<1	0	<1	0
Nutrients																																								
Nitrate	mg-N/L	3.0	33	6.6 - 15[(c)]	2.7	2.6	**3.8[(Mn)]**	**3.1[(Mn)]**	2.8	2.8	**3.0[(Mn)]**	0.15	2.2	1.1	1.1	0.76	0.87	0.61	0.96	0.18	0.89	0.25	1.5	1.9	2.1	2.4	2.4	2.0	0.19	2.1	0.19	2.4	2.5	2.2	1.8	1.6	2.2	0.14	2.1	0.19
Nitrite	mg-N/L	0.020 - 0.080[(e)]	0.060 - 0.24[(e)]	-	<0.0050	<0.0050	0.0054	<0.0050	0.014	<0.0050	0.0068	0.55	0.0043	0.0061	0.0031	0.0038	0.0028	0.0033	0.004	0.38	0.0038	0.35	0.0071	0.016	0.016	0.015	0.0099	0.013	0.31	0.013	0.31	<0.0050	0.0062	0.0082	0.0087	0.004	0.007	0.25	0.0064	0.31
Total ammonia	mg-N/L	2.1	14	-	0.0052	0.0073	0.0089	<0.0050	0.035	<0.0050	0.012	1.0	0.028	0.035	0.021	0.0086	0.021	0.012	0.021	0.51	0.02	0.52	<0.0050	0.0054	0.0086	0.077	0.0051	0.024	1.5	0.02	1.6	0.0063	<0.0050	<0.0050	0.029	0.0051	0.011	1.0	0.010	1.0
Total Kjeldahl nitrogen	mg-N/L	-	-	-	0.39	0.27	0.4	<0.050	0.46	0.24	0.28	0.56	0.5	0.31	0.26	<0.050	0.71	0.21	0.33	0.82	0.31	0.79	<0.050	0.35	<0.050	0.3	0.25	0.19	0.85	0.2	0.7	0.25	0.37	0.27	0.23	0.33	0.28	0.22	0.29	0.2
Total phosphorus	mg-P/L	-	-	-	0.0022	0.0032	0.0055	<0.0020	<0.0020	<0.0020	0.0029	0.52	0.0022	0.072	0.012	0.029	0.016	0.018	0.032	0.85	0.029	0.83	0.0091	0.0075	<0.0020	<0.0020	<0.0020	0.0052	0.72	0.0045	0.77	0.0045	<0.0020	0.0023	0.0039	0.0034	0.0032	0.38	0.0032	0.33
Orthophosphate	mg-P/L	-	-	-	0.0026	0.0028	0.0038	0.0021	0.0018	0.0027	0.0026	0.29	<0.0010	<0.0010	<0.0010	<0.0010	0.0035	<0.0010	0.0016	0.77	0.0015	0.75	<0.0010	<0.0010	<0.0010	0.001	<0.0010	0.001	0	0.001	0	<0.0010	0.001	0.0016	0.0043	0.0019	0.002	0.8	0.002	0.7
Total Metals																																								
Aluminum	mg/L	-	-	-	0.007	0.0087	0.021	0.013	0.012	0.017	0.014	0.34	0.015	0.58	0.35	0.88	0.13	0.35	0.49	0.66	0.46	0.62	0.016	0.066	0.0092	0.026	0.017	0.029	0.87	0.027	0.84	0.045	0.0072	0.014	0.059	0.03	0.031	0.78	0.031	0.68
Antimony	mg/L	0.0090	-	-	0.00015	0.00013	0.00017	0.00019	0.00017	0.00016	0.00016	0.13	0.00016	0.00013	0.00015	0.00013	0.00014	0.00012	0.00014	0.07	0.00013	0.085	0.00022	0.00023	0.00022	0.00025	0.00024	0.00023	0.061	0.00023	0.056	0.00019	0.0002	0.00014	0.00014	0.00012	0.00017	0.19	0.00016	0.22
Arsenic	mg/L	0.0050	0.0050	-	0.00016	0.00015	0.0002	0.00018	0.00018	0.00018	0.00018	0.1	0.00016	0.00057	0.00032	0.00049	0.00021	0.00031	0.0004	0.41	0.00038	0.38	0.00021	0.00024	0.0002	0.0002	0.00018	0.00021	0.089	0.00021	0.11	0.00024	0.00019	0.00016	0.0002	0.00018	0.0002	0.17	0.00019	0.15
Barium	mg/L	1.0	-	-	0.073	0.077	0.079	0.076	0.075	0.072	0.076	0.033	0.072	0.049	0.044	0.043	0.036	0.036	0.043	0.12	0.042	0.14	0.066	0.067	0.068	0.067	0.073	0.067	0.014	0.068	0.039	0.086	0.078	0.07	0.068	0.06	0.075	0.11	0.072	0.13
Beryllium	mg/L	0.00013	-	-	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.00002	0	<0.000020	0.000056	<0.000020	0.000046	<0.000020	<0.000020	0.000036	0.52	0.000032	0.54	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.00002	0	<0.00002	0	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.00002	0	<0.00002	0
Bismuth	mg/L	0.0005[(f)]	-	-	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0	<0.00005	0	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0	<0.00005	0	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0	<0.00005	0
Boron	mg/L	1.2	29[(b)]	-	0.034	0.032	0.035	0.042	0.058	0.049	0.043	0.24	0.046	0.024	0.026	0.02	0.02	0.018	0.023	0.13	0.022	0.15	0.047	0.047	0.053	0.067	0.06	0.054	0.18	0.055	0.16	0.038	0.036	0.03	0.035	0.026	0.035	0.098	0.033	0.15
Cadmium	mg/L	-	-	-	0.000023	0.000025	0.000026	0.000024	0.000023	0.000025	0.000024	0.046	0.000027	0.00013	0.0001	0.0001	0.00012	0.000057	0.00011	0.12	0.0001	0.27	0.000021	0.000034	0.000017	0.000018	0.000019	0.000022	0.34	0.000022	0.31	0.000024	0.000018	0.000019	0.000017	0.000025	0.00002	0.17	0.000021	0.18
Calcium	mg/L	-	-	-	143	147	200	146	150	136	156	0.16	141	59	70	57	63	49	62	0.098	60	0.13	110	116	123	139	142	122	0.1	126	0.11	145	148	119	109	99	130	0.15	124	0.18
Chromium	mg/L	0.0010[(g)]	-	-	0.00016	0.00021	0.00018	0.00018	0.00019	0.00019	0.00019	0.064	0.00022	0.00085	0.00056	**0.0023[(Mn)]**	0.00034	0.00063	**0.0010[(Mn)]**	0.87	0.00094	0.84	0.00026	0.00027	0.00015	0.00014	0.00015	0.00021	0.34	0.00019	0.34	0.00015	0.00012	0.00018	0.00024	0.00021	0.00017	0.3	0.00018	0.26
Cobalt	mg/L	0.0040	0.11	-	0.00059	0.00056	0.001	0.00099	0.0012	0.0011	0.00097	0.25	0.0014	0.003	0.0027	0.002	0.0019	0.0018	0.0024	0.21	0.0023	0.23	0.00098	0.0015	0.00085	0.00085	0.00069	0.001	0.28	0.00097	0.31	0.00048	0.00018	0.00026	0.00069	0.00057	0.0004	0.57	0.00044	0.49
Copper	mg/L	-	-	-	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	0	<0.00050	0.0012	0.00055	0.0011	<0.00050	0.00053	0.00085	0.45	0.00079	0.46	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	0	<0.0005	0	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	0	<0.0005	0
Iron	mg/L	0.62 - 2.08[(f,h)]	1.0	-	<0.010	<0.010	0.03	0.015	0.017	0.017	0.018	0.42	0.023	0.85	0.4	1.0	0.14	0.4	0.6	0.67	0.56	0.64	0.019	0.065	0.016	0.039	0.029	0.035	0.65	0.034	0.59	0.046	0.01	0.025	0.059	0.038	0.035	0.62	0.036	0.53
Lead	mg/L	0.012 - 0.020[(c)]	0.22 - 0.42[(c)]	-	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0	<0.000050	0.00075	0.00021	0.00056	0.00015	0.00022	0.00042	0.68	0.00038	0.69	<0.000050	0.000077	<0.000050	<0.000050	<0.000050	0.000057	0.24	0.000055	0.22	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0	<0.00005	0
Lithium	mg/L	0.1216[(f)]	-	-	0.02	0.02	0.024	0.025	0.031	0.025	0.025	0.15	0.027	0.014	0.014	0.01	0.0097	0.009	0.012	0.2	0.011	0.21	0.024	0.024	0.026	0.037	0.031	0.028	0.22	0.028	0.19	0.022	0.022	0.017	0.018	0.015	0.02	0.13	0.019	0.16
Magnesium	mg/L	-	-	-	65	63	91	69	73	66	72	0.15	65	24	30	26	28	22	27	0.098	26	0.12	55	55	62	71	64	61	0.13	62	0.11	77	76	57	49	50	65	0.21	62	0.22
Manganese	mg/L	1.6 - 2.6[(c)]	2.9 - 3.4[(c)]	-	0.0045	0.0049	0.0085	0.0076	0.0085	0.0085	0.0076	0.2	0.01	0.057	0.024	0.037	0.019	0.019	0.034	0.5	0.031	0.52	0.0046	0.013	0.0046	0.0053	0.0047	0.0068	0.58	0.0064	0.55	0.0052	0.002	0.0032	0.0068	0.006	0.0043	0.5	0.0046	0.43
Mercury	mg/L	0.000010	-	-	<0.00000050	<0.00000050	<0.00000050	<0.00000050	<0.00000050	<0.00000050	<0.0000005	0	<0.00000050	0.0000035	0.0000016	0.0000013	0.0000011	0.00000096	0.0000019	0.6	0.0000017	0.62	<0.00000050	0.0000016	<0.00000050	<0.00000050	<0.00000050	0.00000077	0.7	0.00000072	0.67	<0.00000050	<0.00000050	<0.00000050	<0.00000050	<0.00000050	<0.0000005	0	<0.0000005	0
Molybdenum	mg/L	1.0	2.0	-	0.00093	0.00088	0.0011	0.001	0.001	0.00093	0.00098	0.072	0.00097	0.00065	0.00087	0.00087	0.00076	0.00075	0.00079	0.13	0.00078	0.12	0.0012	0.001	0.0011	0.0011	0.0012	0.0011	0.049	0.0011	0.052	0.00099	0.00097	0.00085	0.00094	0.00086	0.00094	0.065	0.00092	0.071
Nickel	mg/L	0.0053[(i)]	-	-	**0.012[(Mn)]**	**0.011[(Mn)]**	**0.015[(Mn)]**	**0.014[(Mn)]**	**0.015[(Mn)]**	**0.014[(Mn)]**	**0.014[(Mn)]**	0.12	**0.015[(Mn)]**	**0.013[(Mn)]**	**0.017[(Mn)]**	**0.013[(Mn)]**	**0.014[(Mn)]**	**0.012[(Mn)]**	**0.014[(Mn)]**	0.13	**0.014[(Mn)]**	0.14	**0.021[(Mn)]**	**0.020[(Mn)]**	**0.021[(Mn)]**	**0.024[(Mn)]**	**0.020[(Mn)]**	**0.022[(Mn)]**	0.081	**0.021[(Mn)]**	0.078	**0.013[(Mn)]**	**0.010[(Mn)]**	**0.0087[(Mn)]**	**0.0089[(Mn)]**	**0.0085[(Mn)]**	**0.010[(Mn)]**	0.2	**0.0098[(Mn)]**	0.19
Potassium	mg/L	-	-	-	1.6	1.7	2.0	2.0	2.1	1.9	1.9	0.079	1.9	1.2	1.3	1.2	1.1	0.96	1.2	0.053	1.1	0.1	2.0	2.1	2.1	2.5	2.1	2.2	0.1	2.2	0.089	2.2	1.9	1.6	1.6	1.4	1.8	0.16	1.7	0.18
Selenium	mg/L	0.0020	-	0.019	**0.0096[(Mn)]**	**0.0092[(Mn)]**	**0.014[(Mn)]**	**0.010[(Mn)]**	**0.0099[(Mn)]**	**0.0083[(Mn)]**	**0.010[(Mn)]**	0.21	**0.0091[(Mn)]**	**0.0046[(Mn)]**	**0.0069[(Mn)]**	**0.0044[(Mn)]**	**0.0059[(Mn)]**	**0.0035[(Mn)]**	**0.0055[(Mn)]**	0.22	**0.0051[(Mn)]**	0.26	**0.0067[(Mn)]**	**0.0076[(Mn)]**	**0.0087[(Mn)]**	**0.011[(Mn)]**	**0.0090[(Mn)]**	**0.0085[(Mn)]**	0.22	**0.0086[(Mn)]**	0.19	**0.012[(Mn)]**	**0.011[(Mn)]**	**0.0079[(Mn)]**	**0.0080[(Mn)]**	**0.0073[(Mn)]**	**0.0097[(Mn)]**	0.21	**0.0092[(Mn)]**	0.23
Silicon	mg/L	-	-	-	2.4	2.5	2.5	2.5	2.4	2.2	2.4	0.042	2.6	2.8	2.5	3.2	2.0	2.3	2.6	0.2	2.6	0.18	2.1	2.1	2.1	2.2	2.0	2.1	0.022	2.1	0.029	2.3	2.2	2.3	2.3	2.0	2.3	0.034	2.2	0.056
Silver	mg/L	0.0015[(c)]	0.0030[(c)]	-	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	0	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	0	<0.00001	0	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	0	<0.00001	0	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	0	<0.00001	0
Sodium	mg/L	-	-	-	16	18	20	23	26	24	22	0.15	23	12	10	7.1	6.0	6.4	8.7	0.3	8.3	0.3	20	19	22	31	25	23	0.23	23	0.2	17	17	12	16	12	16	0.14	15	0.17
Strontium	mg/L	-	-	-	0.48	0.44	0.58	0.54	0.58	0.54	0.54	0.11	0.54	0.24	0.27	0.21	0.21	0.19	0.23	0.11	0.22	0.13	0.49	0.49	0.53	0.59	0.58	0.52	0.088	0.53	0.09	0.49	0.52	0.35	0.39	0.33	0.44	0.18	0.42	0.2
Sulphur	mg/L	-	-	-	161	153	218	166	164	144	169	0.17	160	45	61	44	52	40	50	0.15	48	0.17	116	128	142	165	151	138	0.15	140	0.14	178	154	126	111	94	142	0.21	133	0.25
Thallium	mg/L	0.00080	-	-	0.000011	<0.000010	0.000011	0.000012	0.000017	0.00001	0.000012	0.24	0.000013	0.000036	0.000023	0.000032	0.000013	0.000012	0.000026	0.39	0.000023	0.47	0.000019	0.000019	0.000019	0.000017	0.000019	0.000019	0.054	0.000019	0.048	0.000012	<0.000010	<0.000010	<0.000010	<0.000010	0.000011	0.095	0.00001	0.086
Tin	mg/L	0.3[(f)]	-	-	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.0001	0	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.0001	0	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.0001	0
Titanium	mg/L	0.85[(f)]	-	-	<0.00030	<0.00030	0.00038	<0.00060	<0.00030	0.00039	0.00039	0.31	<0.00030	0.0044	0.01	0.013	0.0027	0.006	0.0075	0.64	0.0072	0.59	0.0005	0.0016	<0.00030	<0.00060	0.00032	0.00075	0.78	0.00067	0.81	<0.0012	<0.00030	<0.00030	<0.0042	0.00052	<0.0015	1.2	0.0013	1.3
Uranium	mg/L	0.0085	0.033[(b)]	-	0.003	0.003	0.0043	0.0033	0.0033	0.0034	0.0035	0.14	0.0032	0.0012	0.0017	0.0013	0.0015	0.0012	0.0014	0.16	0.0014	0.17	0.003	0.003	0.0033	0.0037	0.0035	0.0032	0.11	0.0033	0.096	0.0036	0.0037	0.0027	0.0025	0.0023	0.0031	0.2	0.003	0.22
Vanadium	mg/L	0.12[(f)]	-	-	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	0	<0.00050	0.0015	0.0011	0.0019	<0.00050	0.0009	0.0012	0.48	0.0012	0.45	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	0	<0.0005	0	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	0	<0.0005	0
Zinc	mg/L	0.10 - 0.19	0.13 - 0.34	-	<0.0030	0.0033	0.0046	0.0045	0.0052	0.0066	0.0048	0.25	<0.0030	0.012	0.0096	0.011	0.01	0.0054	0.011	0.1	0.0096	0.26	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.003	0	<0.003	0	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.003	0	<0.003	0
Dissolved Metals																																								
Aluminum	mg/L	0.050[(h)]	0.10[(h)]	-	<0.0010	0.001	<0.0010	<0.0010	0.001	<0.0010	0.001	0	0.0016	0.0086	0.0055	0.0054	0.0039	<0.0050	0.0059	0.34	0.0057	0.31	0.0014	0.0021	<0.0010	<0.0010	0.0014	0.0014	0.38	0.0014	0.33	0.0012	<0.0010	<0.0010	0.006	0.0015	0.0023	1.1	0.0021	1.0
Antimony	mg/L	-	-	-	0.00014	0.00013	0.00016	0.00016	0.00015	0.00016	0.00015	0.086	0.00016	0.0001	0.00014	0.00011	0.00012	0.0001	0.00012	0.15	0.00011	0.15	0.00022	0.00022	0.00023	0.00024	0.00023	0.00023	0.042	0.00023	0.037	0.00019	0.00018	0.00013	0.00013	0.00012	0.00016	0.2	0.00015	0.22
Arsenic	mg/L	-	-	-	0.00016	0.00013	0.00018	0.00018	0.00014	0.00019	0.00016	0.16	0.00014	0.00014	0.00015	0.00014	0.00016	0.00015	0.00015	0.065	0.00015	0.057	0.00018	0.00018	0.00017	0.00016	0.00021	0.00017	0.056	0.00018	0.1	0.00016	0.00018	0.00015	0.00018	0.00013	0.00017	0.09	0.00016	0.13
Barium	mg/L	-	-	-	0.079	0.077	0.078	0.077	0.068	0.079	0.076	0.061	0.071	0.041	0.04	0.036	0.035	0.033	0.038	0.081	0.037	0.09	0.065	0.067	0.065	0.069	0.073	0.066	0.026	0.068	0.048	0.083	0.08	0.074	0.063	0.058	0.075	0.12	0.072	0.15
Beryllium	mg/L	-	-	-	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.00002	0	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.00002	0	<0.00002	0	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.00002	0	<0.00002	0	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.00002	0	<0.00002	0
Bismuth	mg/L	-	-	-	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0	<0.00005	0	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0	<0.00005	0	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0	<0.00005	0
Boron	mg/L	-	-	-	0.03	0.032	0.036	0.037	0.051	0.048	0.041	0.2	0.045	0.023	0.022	0.018	0.016	0.019	0.02	0.17	0.02	0.15	0.045	0.048	0.052	0.066	0.056	0.053	0.18	0.053	0.15	0.038	0.036	0.027	0.031	0.025	0.033	0.15	0.031	0.18
Cadmium	mg/L	0.00038 - 0.00046[(c)]	0.0013 - 0.0028[(c)]	0.00026 - 0.00032[(c)]	0.000021	0.000017	0.000024	0.000022	0.000019	0.000024	0.000021	0.15	0.000021	0.000039	0.000081	0.000057	0.000079	0.000039	0.000064	0.31	0.000059	0.35	0.000015	0.000019	0.000021	0.000017	0.000012	0.000018	0.14	0.000017	0.2	0.00002	0.000012	0.000013	0.000023	0.000019	0.000017	0.31	0.000017	0.27
Chromium	mg/L	-	-	-	0.00014	0.00015	0.00019	0.00014	0.00013	0.00014	0.00015	0.16	0.00013	0.00017	0.00016	0.00018	0.00017	0.00022	0.00017	0.048	0.00018	0.13	0.00015	0.00011	0.00013	0.00012	0.00013	0.00013	0.13	0.00013	0.12	0.00017	0.00011	0.00014	0.00021	0.00019	0.00016	0.27	0.00016	0.24
Cobalt	mg/L	-	-	-	0.00052	0.00045	0.00071	0.00089	0.001	0.0011	0.00084	0.32	0.0013	0.0015	0.0024	0.0013	0.0017	0.0014	0.0017	0.27	0.0017	0.26	0.00089	0.00082	0.00074	0.00057	0.00042	0.00076	0.18	0.00069	0.28	0.00022	0.00012	0.00013	0.00059	0.00049	0.00027	0.84	0.00031	0.7
Copper	mg/L	0.0003 - 0.0019[(j)]	0.0017 - 0.0107[(j)]	-	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.0002	0	<0.00020	0.00029	0.00023	0.00021	<0.00020	<0.00020	0.00023	0.17	0.00023	0.17	<0.00020	0.00027	<0.00020	<0.00020	<0.00020	0.00022	0.16	0.00021	0.15	<0.00020	<0.00020	<0.00020	0.00022	<0.00020	0.00021	0.049	0.0002	0.044
Iron	mg/L	-	0.35	-	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.01	0	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.01	0	<0.01	0	<0.010	<0.010	<0.010	<0.010	<0.010	<0.01	0	<0.01	0	<0.010	<0.010	<0.010	<0.010	<0.010	<0.01	0	<0.01	0
Lead	mg/L	-	-	-	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0	<0.00005	0	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0	<0.00005	0	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0	<0.00005	0
Lithium	mg/L	-	-	-	0.02	0.021	0.024	0.025	0.026	0.027	0.025	0.11	0.026	0.015	0.014	0.0094	0.0098	0.009	0.012	0.22	0.011	0.23	0.024	0.026	0.027	0.034	0.029	0.028	0.17	0.028	0.14	0.023	0.022	0.016	0.018	0.014	0.02	0.15	0.019	0.19
Manganese	mg/L	-	-	-	0.0038	0.0037	0.0051	0.0063	0.007	0.0081	0.0061	0.31	0.0093	0.0091	0.013	0.0071	0.0098	0.0078	0.0098	0.26	0.0094	0.25	0.0033	0.0049	0.0031	0.0023	0.0018	0.0034	0.32	0.0031	0.38	0.0023	0.0013	0.0013	0.0054	0.0041	0.0026	0.75	0.0029	0.63
Mercury	mg/L	-	-	-	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.000005	0	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.000005	0	<0.000005	0	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.000005	0	<0.000005	0	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.000005	0	<0.000005	0
Molybdenum	mg/L	-	-	-	0.00092	0.00089	0.001	0.00094	0.00093	0.00091	0.00094	0.048	0.00097	0.00071	0.00085	0.0007	0.00078	0.00069	0.00076	0.092	0.00074	0.092	0.0011	0.0011	0.0012	0.0011	0.0012	0.0011	0.054	0.0011	0.051	0.0010	0.00097	0.00084	0.00083	0.00081	0.00091	0.097	0.00089	0.1
Nickel	mg/L	-	-	-	0.011	0.01	0.015	0.014	0.013	0.015	0.013	0.14	0.014	0.01	0.016	0.0097	0.013	0.011	0.012	0.23	0.012	0.21	0.02	0.019	0.02	0.022	0.02	0.02	0.05	0.02	0.048	0.012	0.0096	0.0084	0.0082	0.0079	0.0096	0.19	0.0092	0.19
Selenium	mg/L	-	-	-	0.0099	0.0092	0.016	0.01	0.01	0.0094	0.011	0.24	0.011	0.0049	0.007	0.0048	0.006	0.0038	0.0057	0.18	0.0053	0.23	0.0076	0.0078	0.0092	0.012	0.0097	0.0091	0.2	0.0092	0.18	0.013	0.012	0.008	0.0077	0.0078	0.01	0.27	0.0097	0.27
Silicon	mg/L	-	-	-	2.2	2.2	2.4	2.3	2.2	2.2	2.3	0.034	2.3	2.0	1.9	1.9	1.8	1.8	1.9	0.039	1.9	0.046	2.0	2.0	2.0	1.9	1.9	2.0	0.022	2.0	0.027	2.2	2.2	2.0	2.0	1.9	2.1	0.043	2.1	0.054
Silver	mg/L	-	-	-	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	0	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	0	<0.00001	0	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	0	<0.00001	0	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	0	<0.00001	0
Strontium	mg/L	2.5[(f)]	-	-	0.47	0.46	0.56	0.51	0.56	0.55	0.52	0.086	0.55	0.24	0.29	0.19	0.21	0.19	0.23	0.18	0.22	0.19	0.47	0.49	0.57	0.61	0.59	0.54	0.12	0.55	0.11	0.53	0.51	0.36	0.36	0.33	0.44	0.2	0.42	0.22
Sulphur	mg/L	-	-	-	142	138	198	160	153	157	161	0.14	155	42	63	42	49	39	49	0.21	47	0.21	117	129	127	151	144	131	0.11	134	0.1	170	149	114	98	92	133	0.25	124	0.27
Thallium	mg/L	-	-	-	0.000011	<0.000010	0.000013	<0.000010	0.000013	0.000013	0.000012	0.13	0.000014	0.000012	0.000012	<0.000010	<0.000010	<0.000010	0.000011	0.1	0.000011	0.1	0.000016	0.000018	0.00002	0.000023	0.00002	0.000019	0.16	0.000019	0.13	0.000012	<0.000010	<0.000010	<0.000010	<0.000010	0.000011	0.095	0.00001	0.086
Tin	mg/L	-	-	-	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.0001	0	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.0001	0	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.0001	0
Titanium	mg/L	-	-	-	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.0003	0	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.0003	0	<0.0003	0	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.0003	0	<0.0003	0	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.0003	0	<0.0003	0
Uranium	mg/L	-	-	-	0.0031	0.0027	0.0046	0.0034	0.0033	0.0034	0.0035	0.18	0.003	0.0012	0.0017	0.0012	0.0015	0.0012	0.0014	0.17	0.0013	0.16	0.0028	0.003	0.0035	0.0038	0.0035	0.0033	0.14	0.0033	0.12	0.004	0.0033	0.0026	0.0024	0.0023	0.0031	0.24	0.0029	0.25
Vanadium	mg/L	-	-	-	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	0	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	0	<0.0005	0	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	0	<0.0005	0	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	0	<0.0005	0
Zinc	mg/L	-	-	-	0.0017	0.0016	0.0018	0.0037	0.0018	0.0031	0.0024	0.39	0.0023	0.0064	0.0096	0.0037	0.0082	0.0031	0.007	0.37	0.0062	0.45	<0.0010	0.0019	<0.0010	<0.0010	0.0011	0.0012	0.37	0.0012	0.33	<0.0010	0.0014	<0.0010	0.0018	0.0017	0.0013	0.29	0.0014	0.27
Selenium Speciation																																								
Selenite	ug/l	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.06	-	-	0.06	-	0.06	-	-	-	-	-	0.078	-	-	0.078	-	-	0.07	-	0.081	-	0.076	-	0.076	-
Selenate	ug/l	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4.2	-	-	4.2	-	4.2	-	-	-	-	-	4.7	-	-	4.7	-	-	7.3	-	7.5	-	7.4	-	7.4	-
Selenomethionine	ug/l	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.010	-	-	<0.010	-	<0.010	-	-	-	-	-	<0.010	-	-	<0.010	-	-	<0.010	-	<0.010	-	<0.010	-	<0.010	-
Methylseleninic acid	ug/l	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.010	-	-	<0.010	-	<0.010	-	-	-	-	-	<0.010	-	-	<0.010	-	-	<0.010	-	<0.010	-	<0.010	-	<0.010	-
Selenocyanate	ug/l	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.010	-	-	<0.010	-	<0.010	-	-	-	-	-	<0.010	-	-	<0.010	-	-	<0.010	-	<0.010	-	<0.010	-	<0.010	-
Dimethylseleneoxide	ug/l	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.010	-	-	<0.010	-	<0.010	-	-	-	-	-	<0.010	-	-	<0.010	-	-	<0.010	-	<0.010	-	<0.010	-	<0.010	-
Methaneselenonic acid	ug/l	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.010	-	-	<0.010	-	<0.010	-	-	-	-	-	<0.010	-	-	<0.010	-	-	<0.010	-	<0.010	-	<0.010	-	<0.010	-
Unknown se species	ug/l	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.010	-	-	<0.010	-	<0.010	-	-	-	-	-	<0.010	-	-	<0.010	-	-	<0.010	-	<0.010	-	<0.010	-	<0.010	-
Selenosulfate	ug/l	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.010	-	-	<0.010	-	<0.010	-	-	-	-	-	<0.010	-	-	<0.010	-	-	<0.010	-	<0.010	-	<0.010	-	<0.010	-

(a) = guideline is a minimum value, unless the background concentration or value is lower.
(b) = guideline is adopted from CCME Canadian Environmental Quality Guidelines (CCME, 1999).
(c) = guideline is hardness dependent. The guideline range shown is based on the hardness range observed in the dataset (218 to 833 mg/L). The guideline is calculated based on the individual hardness value for each sample.
(d) = for some samples, water hardness was greater than 250 mg/L. At this hardness, no BC ENV water quality guideline has been established for sulphate; however, the observed data were screened against the guideline for very hard water (i.e., 429 mg/L) for comparative purposes.
(e) = guideline is chloride dependent. The guideline range shown is based on the chloride concentration range observed in the dataset (0.4900 to 7.3900 mg/L). The guideline is calculated based on the individual chloride concentration in each sample.
(f) = guideline is adopted from the ECCC PNECs (ECCC, 2018) or draft FEQGs (ECCC, 2017).
(g) = guideline is for chromium VI.
(h) = guideline is pH dependent. The guideline range shown is based on the pH range observed in the dataset (7.4 to 8.6). The guideline is calculated based on the individual pH for each sample.
(i) = guideline is a level 1 interim screening value.
(j) = dissolved copper guideline was calculated using the simplified Biotic Ligand Midel (BC ENV, 2019). Where values were missing, the temporally nearest value from the same location was taken.
(Mn) = concentration is higher than the 30-day mean BC ENV guideline or outside the recommended pH, DO or total alkalinity range.
(Mx) = concentration is higher than the maximum BC ENV guideline or outside the recommended pH, DO or total alkalinity range.
(E) = concentration is higher than the EVWQP benchmarks guideline.
Bolded concentrations are higher than water quality guidelines.
Shaded concentrations are higher than the EVWQP benchmark (e.g., for nitrate, total selenium, dissolved cadmium or sulphate).
Water quality data and guidelines shown in this table were rounded to reflect laboratory or field instrument precision after comparisons to guidelines. Therefore, values slightly above guidelines may be displayed as being equal to the guidelines and identified as exceedances. Concentrations equal to the guideline values were not identified as exceedances.
Concentrations were screened against available Working and Approved British Columbia Ministry of Environment and Climate Change Strategy (BC ENV) Water Quality Guidelines for the Protection of Aquatic Life; Accessed January 2020 from: https://www2.gov.bc.ca/gov/content/environment/air-land-water/water/water-quality/water-quality-guidelines.
\- = no guideline or no data
BC ENV = British Columbia Ministry of Environment & Climate Change Strategy; EVWQP = Elk Valley Water Quality Plan guidelines; *C. dubia* = *Ceriodaphnia dubia* ; *P. subcapitata* = *Pseudokirchneriella subcapitata* ; *H. azteca* = *Hyallela azteca* ; *P. promelas* = *Pimephales promelas* ; *O. mykiss* = *Oncorhynchus mykiss* ; CV = coefficient of variation; ∑ = sum of; WQGs = Water Quality Guidelines; CaCO3 = calcium carbonate; mg/L = milligrams per litre; µS/cm = microsiemens per centimeter; NTU = nephelometric turbidity units; meq/L = milliequivalents per litre; mg-N/L = milligrams of Nitrogen per litre; mg=P/L = milligrams of Phosphorus per litre.
BC ENV (B.C. Ministry of Climate Chande Strategy). 2019. Copper Water Quality guideline for the Protection of Aquatic Life-Technical Report. Water Quality Guideline Series, WQG-03-1. Prov. B.C., Victoria B.C.

Parameter	Unit	Guidelines for the protection of: Aquatic Life 30-day mean	Aquatic Life Maximum	EVWQP Benchmarks	Q1 RG_MIDAG 23-Feb-21	2-Mar-21	9-Mar-21	16-Mar-21	23-Mar-21	30-Mar-21	Mar 2, 9, 16, 23, 30 *P. promelas* Mean	CV	*C. dubia* 13-Apr-21
Field Measured													
pH	-	6.5 - 9.0	6.5 - 9.0	-	7.8	7.2	7.5	7.8	7.6	7.5	7.5	0.029	7.8
Specific conductivity	µS/cm at 25 C	-	-	-	772	690	769	798	795	766	763	0.057	729
Temperature	°C	-	-	-	0.1	0.1	0.1	0	0.2	<0.10	0.1	0.71	1.2
Dissolved oxygen	mg/L	11	9.0	-	15	15	16	16	16	16	16	0.03	15
Turbidity	NTU	-	-	-	0.54	0.54	0.59	1.8	0.74	1.1	0.96	0.55	1.2
Oxidation-reduction potential field	mv	-	-	-	235	246	249	243	244	242	245	0.011	212
Conventional Parameters													
pH	-	6.5 - 9.0	6.5 - 9.0	-	8.0	8.3	7.9	8.2	8.2	8.3	8.2	0.02	8.4
Hardness, as $CaCO_3$	mg/L	-	-	-	433	395	415	411	375	405	400	0.04	401
Total alkalinity, as $CaCO_3$	mg/L	20(a)	-	-	186	187	202	200	197	189	195	0.034	203
Total dissolved solids	mg/L	-	-	-	518	499	483	555	549	527	523	0.06	490
Total suspended solids	mg/L	-	-	-	<1.0	<1.0	<1.0	<1.0	<1.0	3.3	1.5	0.7	<1.0
Total organic carbon	mg/L	-	-	-	1.2	<0.50	1.5	1.1	0.94	1.1	1.0	0.35	1.6
Dissolved organic carbon	mg/L	-	-	-	0.97	<0.50	1.5	1.1	<0.50	0.97	0.91	0.47	1.4
Turbidity	NTU	-	-	-	0.1	0.16	0.33	0.13	0.19	0.27	0.22	0.38	0.24
Total acidity	mg/L	-	-	-	4.6	<1.0	<2.0	4.3	<2.0	14	4.6	1.1	<2.0
Cation - anion balance	%	-	-	-	3.7	0	2.4	0.057	4.6	1.6	1.7	1.1	2.3
Ion balance	%	-	-	-	108	100	105	100	91	103	100	0.053	105
Conductivity	µS/cm	-	-	-	732	718	626	750	750	731	715	0.072	711
Oxidation-reduction potential	mv	-	-	-	456	471	395	291	308	484	390	0.23	479
Major Ions													
Bicarbonate	mg/L	-	-	-	-	-	-	-	-	-	-	-	-
Bromide	mg/L	-	-	-	0.053	<0.050	<0.050	<0.050	<0.050	<0.25	<0.09	0.99	<0.050
Calcium	mg/L	-	-	-	107	97	102	100	91	100	98	0.046	102
Carbonate, as $CaCO_3$	mg/L	-	-	-	-	-	-	-	-	-	-	-	-
Chloride	mg/L	150	600	-	2.1	2.3	3.0	5.4	4.6	6.0	4.3	0.37	6.4
Fluoride	mg/L	0.12(b)	1.5 - 1.9(c)	-	**0.13**(Mn)	**0.14**(Mn)	**0.16**(Mn)	0.085	**0.13**(Mn)	**0.18**(Mn)	**0.14**(Mn)	0.26	**0.15**(Mn)
Hydroxide	mg/L	-	-	-	-	-	-	-	-	-	-	-	-
Magnesium	mg/L	-	-	-	40	37	39	39	36	38	38	0.034	36
Potassium	mg/L	-	-	-	1.0	0.98	1.0	1.0	1.1	1.1	1.0	0.052	1.1
Sodium	mg/L	-	-	-	11	11	12	13	13	14	13	0.098	13
Sulphate	mg/L	309 - 429(c,d)	-	481	222	215	202	218	225	212	214	0.039	187
Major anion sum	meq/l	-	-	-	8.5	8.4	8.4	8.8	8.9	8.5	8.6	0.026	8.2
Major cation sum	meq/l	-	-	-	9.2	8.4	8.8	8.8	8.1	8.7	8.6	0.038	8.6
Bicarbonate Alkalinity, as $CaCO_3$	mg/l	-	-	-	186	179	202	200	197	185	193	0.052	195
Carbonate Alkalinity, as $CaCO_3$	mg/l	-	-	-	<1.0	8.2	<1.0	<1.0	<1.0	3.8	3.0	1.0	8.2
Hydroxide Alkalinity, as $CaCO_3$	mg/l	-	-	-	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1	0	<1.0
Nutrients													
Nitrate	mg-N/L	3.0	33	5.1 - 13(c)	1.4	1.4	1.2	1.4	1.4	1.2	1.3	0.076	1.1
Nitrite	mg-N/L	0.020 - 0.080(e)	0.060 - 0.24(e)	-	<0.0010	<0.0010	0.0014	<0.0010	0.003	<0.0050	0.0023	0.76	0.0017
Total ammonia	mg-N/L	2.1	14	-	<0.0050	0.005	0.0074	<0.0050	0.0066	<0.0050	0.0058	0.2	0.0053
Total Kjeldahl nitrogen	mg-N/L	-	-	-	0.2	0.9	0.29	0.32	0.35	0.2	0.41	0.68	<0.050
Total phosphorus	mg-P/L	-	-	-	0.0064	<0.0020	0.0043	0.0043	0.0023	0.0032	0.0032	0.34	0.0045
Orthophosphate	mg-P/L	-	-	-	0.0038	0.0037	0.0052	0.005	0.003	0.0035	0.0041	0.24	0.0026
Total Metals													
Aluminum	mg/L	-	-	-	0.0041	0.0044	0.0096	0.014	0.0093	0.0092	0.0093	0.37	0.094
Antimony	mg/L	0.0090	-	-	0.00011	0.0001	<0.00010	0.00011	0.00011	0.0001	0.0001	0.053	0.0001
Arsenic	mg/L	0.0050	0.0050	-	0.00019	0.00021	0.0002	0.00022	0.00022	0.0002	0.00021	0.048	0.00025
Barium	mg/L	1.0	-	-	0.086	0.075	0.082	0.078	0.081	0.078	0.079	0.036	0.075
Beryllium	mg/L	0.00013	-	-	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.00002	0	<0.000020
Bismuth	mg/L	0.0005(f)	-	-	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0	<0.000050
Boron	mg/L	1.2	29(b)	-	0.021	0.021	0.02	0.021	0.026	0.021	0.022	0.11	0.022
Cadmium	mg/L	-	-	-	0.000017	0.000018	0.000025	0.000027	0.000022	0.000021	0.000023	0.15	0.000028
Calcium	mg/L	-	-	-	107	99	111	109	103	93	103	0.072	93
Chromium	mg/L	0.0010(g)	-	-	0.00018	0.00025	0.00017	0.00021	0.00019	0.0002	0.0002	0.15	0.00034
Cobalt	mg/L	0.0040	0.11	-	<0.00010	<0.00010	0.0001	0.00011	0.00014	<0.00010	0.00011	0.16	0.00029
Copper	mg/L	-	-	-	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	0	<0.00050
Iron	mg/L	0.57 - 1.75(f,h)	1.0	-	<0.010	<0.010	0.012	0.017	<0.010	0.011	0.012	0.24	0.12
Lead	mg/L	0.0096 - 0.020(c)	0.16 - 0.42(c)	-	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0	0.000096
Lithium	mg/L	0.1216(f)	-	-	0.013	0.012	0.012	0.012	0.014	0.011	0.012	0.093	0.011
Magnesium	mg/L	-	-	-	39	37	40	38	41	34	38	0.072	34
Manganese	mg/L	1.4 - 2.5(c)	2.4 - 3.4(c)	-	0.00064	0.00087	0.0013	0.0015	0.0015	0.0014	0.0013	0.19	0.0051
Mercury	mg/L	0.000010	-	-	<0.00000050	<0.00000050	<0.00000050	<0.00000050	<0.00000050	<0.00000050	<0.0000005	0	<0.00000050
Molybdenum	mg/L	1.0	2.0	-	0.0008	0.00084	0.00083	0.00081	0.00086	0.00083	0.00083	0.025	0.00079
Nickel	mg/L	0.0053(i)	-	-	0.0025	0.0027	0.0022	0.0026	0.0035	0.0021	0.0026	0.21	0.0029
Potassium	mg/L	-	-	-	0.99	1.1	0.95	1.0	1.1	0.97	1.0	0.071	1.1
Selenium	mg/L	0.0020	-	0.019	**0.0060**(Mn)	**0.0059**(Mn)	**0.0057**(Mn)	**0.0053**(Mn)	**0.0061**(Mn)	**0.0056**(Mn)	**0.0057**(Mn)	0.053	**0.0046**(Mn)
Silicon	mg/L	-	-	-	2.0	2.0	2.0	2.0	2.1	2.0	2.0	0.027	2.3
Silver	mg/L	0.0015(c)	0.0030(c)	-	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	0	<0.000010
Sodium	mg/L	-	-	-	12	12	12	13	14	12	13	0.074	13
Strontium	mg/L	-	-	-	0.34	0.33	0.35	0.34	0.36	0.32	0.34	0.043	0.31
Sulphur	mg/L	-	-	-	87	84	86	85	88	73	83	0.07	65
Thallium	mg/L	0.00080	-	-	<0.000010	<0.000010	<0.000010	<0.000010	0.000011	<0.000010	0.00001	0.044	0.000013
Tin	mg/L	0.3(f)	-	-	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.00010
Titanium	mg/L	0.85(f)	-	-	<0.00030	<0.010	<0.00030	<0.00030	<0.00030	<0.00030	<0.00224	1.9	<0.0018
Uranium	mg/L	0.0085	0.033(b)	-	0.0021	0.0021	0.002	0.0021	0.0021	0.002	0.002	0.034	0.0018
Vanadium	mg/L	0.12(f)	-	-	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	0	<0.00050
Zinc	mg/L	0.068 - 0.19	0.093 - 0.29	-	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.003	0	<0.0030
Dissolved Metals													
Aluminum	mg/L	0.050(h)	0.10(h)	-	0.0012	<0.0030	<0.0010	<0.0010	0.0017	<0.0010	0.0015	0.57	<0.0010
Antimony	mg/L	-	-	-	0.0001	<0.00010	<0.00010	<0.00010	<0.00010	0.0001	0.0001	0	0.00011
Arsenic	mg/L	-	-	-	0.00018	0.00018	0.00018	0.00016	0.00018	0.00019	0.00018	0.062	0.00018
Barium	mg/L	-	-	-	0.085	0.079	0.082	0.082	0.078	0.091	0.082	0.06	0.077
Beryllium	mg/L	-	-	-	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.00002	0	<0.000020
Bismuth	mg/L	-	-	-	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0	<0.000050
Boron	mg/L	-	-	-	0.019	0.02	0.019	0.018	0.022	0.018	0.019	0.086	0.024
Cadmium	mg/L	0.00031 - 0.00046(c)	0.0010 - 0.0027(c)	0.00021 - 0.00032(c)	0.000024	0.000017	0.000025	0.000023	0.000018	0.000023	0.000021	0.17	0.00002
Chromium	mg/L	-	-	-	0.00017	0.00017	0.00021	0.00014	0.00018	0.00019	0.00018	0.15	0.00015
Cobalt	mg/L	-	-	-	<0.00010	<0.00010	<0.00010	<0.00010	0.00011	<0.00010	0.0001	0.044	0.00012
Copper	mg/L	0.0002 - 0.0012(j)	0.001 - 0.0073(j)	-	<0.00020	**0.00034**(Mn)	<0.00020	<0.00020	<0.00020	<0.00020	0.00023	0.27	<0.00020
Iron	mg/L	-	0.35	-	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.01	0	<0.010
Lead	mg/L	-	-	-	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0	<0.000050
Lithium	mg/L	-	-	-	0.013	0.012	0.011	0.011	0.013	0.012	0.012	0.07	0.013
Manganese	mg/L	-	-	-	0.00051	0.00053	0.00087	0.00074	0.00093	0.00098	0.00081	0.22	0.0012
Mercury	mg/L	-	-	-	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.000005	0	<0.0000050
Molybdenum	mg/L	-	-	-	0.00081	0.00078	0.0008	0.00077	0.0008	0.00081	0.00079	0.021	0.00088
Nickel	mg/L	-	-	-	0.0026	0.0022	0.0022	0.0023	0.0031	0.0021	0.0024	0.17	0.0031
Selenium	mg/L	-	-	-	0.0059	0.0055	0.0062	0.0061	0.0064	0.0059	0.006	0.055	0.0053
Silicon	mg/L	-	-	-	1.9	1.7	1.9	2.0	2.0	2.0	1.9	0.059	2.0
Silver	mg/L	-	-	-	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	0	<0.000010
Strontium	mg/L	2.5(f)	-	-	0.34	0.36	0.32	0.33	0.33	0.35	0.34	0.049	0.36
Sulphur	mg/L	-	-	-	80	72	77	81	85	71	77	0.077	68
Thallium	mg/L	-	-	-	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	0	0.000011
Tin	mg/L	-	-	-	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.00010
Titanium	mg/L	-	-	-	<0.00030	<0.010	<0.00030	<0.00030	<0.00030	<0.00030	<0.00224	1.9	<0.00030
Uranium	mg/L	-	-	-	0.0021	0.0019	0.0021	0.002	0.002	0.0019	0.002	0.037	0.002
Vanadium	mg/L	-	-	-	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	0	<0.00050
Zinc	mg/L	-	-	-	0.0012	<0.0010	0.0011	<0.0010	0.0087	0.0034	0.003	1.1	<0.0010

Parameter	Q2 RG_MIDAG *C. dubia* 18-May-21	25-May-21	1-Jun-21	8-Jun-21	May 18, 25, June 1, 8 *H. azteca* Mean	CV	Q3 RG_MIDAG *C. dubia* 10-Aug-21	17-Aug-21	24-Aug-21	31-Aug-21	7-Sep-21	Aug 10, 17, 24, 31 *H. azteca* Mean	CV	Aug 10, 17, 24, 31 Sept 7 *P. promelas* Mean	CV
Field Measured															
pH	7.5	7.8	7.4	7.2	7.5	0.033	8.0	7.7	8.1	8.2	7.8	8.0	0.026	8.0	0.026
Specific conductivity	330	427	324	403	371	0.14	534	608	447	604	616	548	0.13	562	0.13
Temperature	3.3	3.4	4.1	4.0	3.7	0.11	10	9.8	5.9	7.3	7.4	8.3	0.22	8.1	0.23
Dissolved oxygen	14	14	14	14	14	0.025	11	11	15	13	13	12	0.12	13	0.12
Turbidity	34	8.6	14	6.4	16	0.81	1.1	3.4	2.7	2.3	4.5	2.4	0.35	2.8	0.45
Oxidation-reduction potential field	225	169	138	159	173	0.22	90	233	166	155	184	161	0.32	166	0.31
Conventional Parameters															
pH	8.1	8.1	8.2	8.3	8.2	0.012	8.4	8.3	8.1	8.2	8.4	8.3	0.014	8.3	0.016
Hardness, as $CaCO_3$	170	211	168	197	187	0.11	256	309	228	293	289	272	0.12	275	0.12
Total alkalinity, as $CaCO_3$	138	137	115	131	130	0.082	154	167	150	147	175	155	0.054	159	0.075
Total dissolved solids	188	261	211	248	227	0.15	346	380	290	386	386	351	0.12	358	0.12
Total suspended solids	24	8.6	14	6.5	13	0.59	<1.0	1.2	<1.0	<1.0	<1.0	1.1	0.085	1.0	0.086
Total organic carbon	3.3	2.4	1.5	1.1	2.1	0.48	1.2	0.61	1.4	0.57	1.2	0.94	0.42	0.99	0.38
Dissolved organic carbon	1.9	2.3	1.2	0.96	1.6	0.38	1.1	0.64	1.4	0.57	0.96	0.93	0.4	0.93	0.36
Turbidity	19	5.7	8.5	2.6	9.0	0.81	0.32	1.1	0.33	0.46	0.34	0.56	0.61	0.52	0.68
Total acidity	<2.0	<2.0	<2.0	<2.0	<2	0	<2.0	<2.0	2.9	<2.0	<2.0	2.2	0.18	2.2	0.18
Cation - anion balance	3.8	<0.010	1.9	3.1	2.2	0.76	5.1	3.3	2.0	0.56	6.5	2.7	0.7	3.5	0.68
Ion balance	93	100	104	94	98	0.054	90	94	104	101	88	97	0.059	95	0.073
Conductivity	326	419	306	388	360	0.15	514	573	422	567	605	519	0.12	536	0.13
Oxidation-reduction potential	269	499	424	436	407	0.24	453	374	361	261	516	362	0.23	393	0.25
Major Ions															
Bicarbonate	-	-	-	-	-	-	180	196	183	179	198	185	0.039	187	0.049
Bromide	<0.050	<0.050	<0.050	<0.050	<0.05	0	<0.050	<0.050	<0.050	<0.050	<0.050	0.05	0	<0.05	0
Calcium	46	53	44	49	48	0.084	64	76	58	73	72	68	0.11	69	0.11
Carbonate, as $CaCO_3$	-	-	-	-	-	-	4.1	4.0	<1.0	<1.0	7.6	2.5	0.66	3.5	0.77
Chloride	0.72	0.86	0.3	0.88	0.69	0.39	0.57	0.93	0.59	0.82	1.1	0.73	0.22	0.81	0.29
Fluoride	**0.13**(Mn)	**0.16**(Mn)	**0.14**(Mn)	**0.14**(Mn)	**0.14**(Mn)	0.088	**0.17**(Mn)	**0.14**(Mn)	**0.20**(Mn)	**0.17**(Mn)	**0.20**(Mn)	**0.17**(Mn)	0.12	**0.18**(Mn)	0.14
Hydroxide	-	-	-	-	-	-	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	0	<1	0
Magnesium	13	19	14	18	16	0.17	23	29	20	27	27	25	0.15	25	0.14
Potassium	0.57	0.68	0.52	0.72	0.62	0.15	0.85	1.2	0.64	0.93	0.96	0.9	0.21	0.91	0.21
Sodium	5.2	5.6	3.6	3.9	4.6	0.21	6.7	9.0	5.1	8.7	9.1	7.4	0.23	7.7	0.23
Sulphate	53	81	51	82	67	0.25	137	174	74	152	166	134	0.28	141	0.28
Major anion sum	3.9	4.5	3.4	4.4	4.0	0.12	6.0	7.1	4.6	6.2	7.1	6.0	0.15	6.2	0.16
Major cation sum	3.6	4.5	3.5	4.1	3.9	0.11	5.4	6.6	4.8	6.3	6.2	5.8	0.13	5.9	0.13
Bicarbonate Alkalinity, as $CaCO_3$	138	137	115	131	130	0.082	147	161	150	147	162	151	0.04	153	0.049
Carbonate Alkalinity, as $CaCO_3$	<1.0	<1.0	<1.0	<1.0	<1	0	6.8	6.6	<1.0	<1.0	13	3.9	0.81	5.6	0.86
Hydroxide Alkalinity, as $CaCO_3$	<1.0	<1.0	<1.0	<1.0	<1	0	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	0	<1	0
Nutrients															
Nitrate	0.48	0.58	0.38	0.48	0.48	0.17	0.57	0.75	0.42	0.73	0.76	0.62	0.23	0.65	0.23
Nitrite	0.0022	<0.0010	0.002	0.0015	0.0017	0.32	<0.0010	0.0029	0.0015	0.0018	<0.0010	0.0018	0.39	0.0016	0.48
Total ammonia	0.028	<0.0050	0.005	0.0095	0.012	0.93	0.034	0.005	0.0057	<0.0050	<0.0050	0.012	1.0	0.011	1.2
Total Kjeldahl nitrogen	0.24	0.2	<0.050	0.56	0.26	0.82	0.096	0.31	0.099	0.09	0.098	0.15	0.64	0.14	0.68
Total phosphorus	0.057	0.0098	0.019	0.012	0.024	0.91	0.0044	0.0068	0.0022	0.0035	<0.0020	0.0042	0.4	0.0038	0.52
Orthophosphate	0.0019	<0.0010	0.0018	0.0047	0.0024	0.69	0.0016	<0.0010	0.0016	0.0013	0.0014	0.0014	0.18	0.0014	0.18
Total Metals															
Aluminum	0.74	0.21	0.47	0.17	0.4	0.67	0.011	0.018	0.017	0.01	0.0089	0.014	0.28	0.013	0.33
Antimony	0.00012	<0.00010	<0.00010	<0.00010	0.00011	0.095	0.00013	0.00013	0.00011	0.00013	0.00012	0.00013	0.072	0.00012	0.072
Arsenic	0.00072	0.00037	0.00044	0.0003	0.00046	0.4	0.00035	0.00027	0.00044	0.00031	0.00023	0.00034	0.19	0.00032	0.25
Barium	0.037	0.037	0.027	0.035	0.034	0.15	0.053	0.061	0.037	0.062	0.061	0.053	0.2	0.055	0.19
Beryllium	0.000053	<0.000020	0.000027	<0.000020	0.00003	0.52	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	0.00002	0	<0.00002	0
Bismuth	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	0.00005	0	<0.00005	0
Boron	0.012	0.014	0.011	0.013	0.013	0.1	0.02	0.023	0.016	0.025	0.023	0.021	0.18	0.021	0.16
Cadmium	0.000077	0.000054	0.000048	0.000052	0.000058	0.23	0.000022	0.000021	0.000012	0.000024	0.000018	0.00002	0.25	0.000019	0.24
Calcium	48	56	43	53	50	0.11	66	75	67	79	80	72	0.086	73	0.089
Chromium	**0.0011**(Mn)	0.00041	**0.0017**(Mn)	0.00034	0.00089	0.72	0.00023	0.0002	0.00023	0.00021	0.00019	0.00022	0.062	0.00021	0.084
Cobalt	0.0013	0.00092	0.00074	0.00073	0.00093	0.31	0.00022	0.00026	0.00013	0.0001	0.0001	0.00018	0.41	0.00016	0.45
Copper	0.0015	<0.00050	0.00052	<0.00050	0.00075	0.64	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.0005	0	<0.0005	0
Iron	0.85	0.22	0.4	0.19	0.41	0.74	0.014	0.025	0.018	<0.010	<0.010	0.017	0.38	0.015	0.41
Lead	0.00054	0.00015	0.00026	0.000076	0.00026	0.79	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	0.00005	0	<0.00005	0
Lithium	0.0066	0.0068	0.0052	0.0066	0.0063	0.12	0.0098	0.012	0.0081	0.013	0.012	0.011	0.19	0.011	0.17
Magnesium	14	18	12	19	16	0.21	24	28	21	29	29	25	0.14	26	0.14
Manganese	0.029	0.0095	0.013	0.0086	0.015	0.63	0.003	0.0051	0.0022	0.0015	0.0018	0.0029	0.51	0.0027	0.53
Mercury	0.000003	0.0000011	0.000001	0.00000096	0.0000015	0.63	<0.00000050	0.0000011	0.0000005	<0.00000050	<0.00000050	0.00000066	0.43	0.00000063	0.46
Molybdenum	0.0006	0.00067	0.00055	0.00063	0.00061	0.08	0.00088	0.00085	0.00071	0.00082	0.00086	0.00082	0.078	0.00082	0.081
Nickel	**0.0060**(Mn)	**0.0064**(Mn)	**0.0051**	**0.0060**(Mn)	**0.0059**(Mn)	0.095	0.0046	0.0052	0.0039	0.0042	0.0044	0.0045	0.12	0.0045	0.12
Potassium	0.85	0.75	0.64	0.73	0.74	0.11	0.87	1.1	0.68	0.96	0.94	0.9	0.17	0.91	0.17
Selenium	**0.0023**(Mn)	**0.0032**(Mn)	**0.0021**(Mn)	**0.0032**(Mn)	**0.0027**(Mn)	0.22	**0.0031**(Mn)	**0.0035**(Mn)	**0.0030**(Mn)	**0.0038**(Mn)	**0.0039**(Mn)	**0.0034**(Mn)	0.11	**0.0035**(Mn)	0.12
Silicon	2.6	2.0	2.2	1.8	2.2	0.15	1.8	1.9	1.6	1.8	1.6	1.8	0.059	1.7	0.074
Silver	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	0	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	0.00001	0	<0.00001	0
Sodium	5.3	5.3	2.9	4.5	4.5	0.25	6.9	8.7	5.4	9.1	9.6	7.5	0.21	7.9	0.22
Strontium	0.14	0.18	0.12	0.16	0.15	0.18	0.25	0.27	0.21	0.28	0.3	0.25	0.13	0.26	0.13
Sulphur	20	32	17	30	25	0.3	49	59	34	56	58	49	0.21	51	0.21
Thallium	0.000057	0.00003	0.000044	0.000017	0.000037	0.47	0.000027	0.000021	0.000033	0.00002	0.000019	0.000025	0.23	0.000024	0.25
Tin	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.0001	0	<0.0001	0
Titanium	<0.0090	<0.0066	0.011	<0.00090	0.0069	0.63	<0.00030	0.00034	<0.00030	<0.00030	<0.00030	0.00031	0.058	0.00031	0.058
Uranium	0.00071	0.001	0.00067	0.00095	0.00084	0.21	0.0014	0.0014	0.0011	0.0015	0.0015	0.0014	0.11	0.0014	0.11
Vanadium	0.0018	0.00066	0.0014	<0.00050	0.0011	0.57	<0.00050	<0.00050	0.00061	<0.00050	<0.00050	0.00053	0.093	0.00052	0.094
Zinc	0.0091	0.026	0.0052	0.0047	0.011	0.9	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	0.003	0	<0.003	0
Dissolved Metals															
Aluminum	0.006	0.004	0.004	0.0041	0.0045	0.22	0.0015	0.0021	0.0016	0.0011	0.0018	0.0016	0.26	0.0016	0.23
Antimony	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	0.00012	0.00014	0.00011	0.00013	0.00012	0.00013	0.091	0.00012	0.092
Arsenic	0.00027	0.00025	0.00028	0.0002	0.00025	0.14	0.00032	0.00025	0.00036	0.00022	0.00023	0.00029	0.22	0.00028	0.22
Barium	0.032	0.036	0.03	0.035	0.033	0.089	0.053	0.062	0.037	0.06	0.063	0.053	0.2	0.055	0.2
Beryllium	<0.000020	<0.000020	<0.000020	<0.000020	<0.00002	0	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	0.00002	0	<0.00002	0
Bismuth	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	0.00005	0	<0.00005	0
Boron	0.011	0.012	<0.010	0.011	0.011	0.074	0.019	0.023	0.014	0.022	0.022	0.02	0.19	0.02	0.18
Cadmium	0.000019	0.000035	0.000024	0.000044	0.00003	0.38	0.000016	0.000019	0.000012	0.000018	0.0000079	0.000016	0.17	0.000014	0.31
Chromium	0.00019	0.00021	0.00022	0.00018	0.0002	0.091	0.00017	0.00022	0.0002	0.00019	0.00016	0.0002	0.093	0.00019	0.13
Cobalt	0.00037	0.00069	0.00036	0.00061	0.00051	0.33	0.00013	0.00017	<0.00010	<0.00010	<0.00010	0.00013	0.25	0.00012	0.26
Copper	0.00025	0.00039	<0.00020	<0.00020	0.00026	0.35	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.0002	0	<0.0002	0
Iron	<0.010	<0.010	<0.010	<0.010	<0.01	0	<0.010	<0.010	<0.010	<0.010	<0.010	<0.01	0	<0.01	0
Lead	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0	<0.00005	0
Lithium	0.0063	0.0069	0.005	0.0062	0.0061	0.13	0.0093	0.012	0.0079	0.013	0.011	0.01	0.21	0.011	0.19
Manganese	0.0027	0.0039	0.0022	0.0036	0.0031	0.25	0.0018	0.0032	0.0012	0.00094	0.0012	0.0018	0.54	0.0017	0.56
Mercury	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.000005	0	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.000005	0	<0.000005	0
Molybdenum	0.00049	0.00066	0.00051	0.00065	0.00058	0.16	0.00085	0.00086	0.00075	0.00084	0.00078	0.00082	0.056	0.00082	0.06
Nickel	0.0033	0.0059	0.0035	0.0056	0.0046	0.3	0.0042	0.005	0.0033	0.0039	0.0036	0.0041	0.15	0.004	0.17
Selenium	0.0023	0.0034	0.0024	0.0035	0.0029	0.22	0.0031	0.0036	0.0028	0.0037	0.004	0.0033	0.13	0.0034	0.14
Silicon	1.6	1.7	1.6	1.7	1.6	0.04	1.7	1.8	1.4	1.6	1.7	1.6	0.084	1.6	0.083
Silver	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	0	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	0	<0.00001	0
Strontium	0.14	0.18	0.13	0.15	0.15	0.16	0.24	0.29	0.2	0.3	0.27	0.26	0.17	0.26	0.15
Sulphur	17	29	19	27	23	0.28	45	55	32	51	57	46	0.2	48	0.21
Thallium	0.00002	0.000017	0.000019	0.000014	0.000018	0.15	0.000024	0.000022	0.000033	0.000022	0.000018	0.000025	0.19	0.000024	0.23
Tin	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.0001	0
Titanium	<0.00030	<0.00030	<0.00030	<0.00030	<0.0003	0	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.0003	0	<0.0003	0
Uranium	0.00063	0.00092	0.00069	0.0009	0.00079	0.19	0.0013	0.0015	0.0011	0.0015	0.0015	0.0014	0.12	0.0014	0.12
Vanadium	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	0	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	0	<0.0005	0
Zinc	0.0021	0.0034	0.002	0.0036	0.0028	0.3	0.0012	0.0014	0.0013	<0.0010	0.0011	0.0012	0.15	0.0012	0.13

Parameter	Q4 RG_MIDAG *C. dubia* 12-Oct-21	19-Oct-21	26-Oct-21	2-Nov-21	Oct 12, 19, 26, Nov 2 *H. azteca* Mean	CV
Field Measured						
pH	8.1	8.4	8.6	7.9	8.3	0.038
Specific conductivity	652	693	649	544	634	0.1
Temperature	4.4	4.4	4.5	1.5	3.7	0.4
Dissolved oxygen	14	13	13	15	14	0.045
Turbidity	1.7	1.7	2.1	1.1	1.6	0.24
Oxidation-reduction potential field	213	94	82	74	116	0.56
Conventional Parameters						-
pH	8.3	8.2	8.3	8.1	8.2	0.012
Hardness, as $CaCO_3$	360	376	344	291	343	0.11
Total alkalinity, as $CaCO_3$	201	188	191	160	185	0.095
Total dissolved solids	454	482	442	340	430	0.14
Total suspended solids	<1.0	<1.0	<1.0	<1.0	<1	0
Total organic carbon	0.89	0.62	1.1	1.7	1.1	0.42
Dissolved organic carbon	1.0	0.64	1.1	1.5	1.1	0.33
Turbidity	0.16	<0.10	0.17	0.4	0.21	0.64
Total acidity	<2.0	<2.0	<2.0	<2.0	<2	0
Cation - anion balance	2.3	2.3	4.1	2.8	2.9	0.29
Ion balance	96	96	92	106	97	0.062
Conductivity	644	697	669	524	634	0.12
Oxidation-reduction potential	455	448	478	450	458	0.03
Major Ions						-
Bicarbonate	245	230	228	196	225	0.092
Bromide	<0.050	<0.050	<0.050	<0.050	<0.05	0
Calcium	91	92	85	76	86	0.087
Carbonate, as $CaCO_3$	<1.0	<1.0	2.6	<1.0	1.4	0.57
Chloride	0.98	1.1	1.3	1.1	1.1	0.12
Fluoride	**0.13**(Mn)	**0.15**(Mn)	**0.21**(Mn)	**0.14**(Mn)	**0.16**(Mn)	0.23
Hydroxide	<1.0	<1.0	<1.0	<1.0	<1	0
Magnesium	32	35	32	25	31	0.15
Potassium	1.0	0.99	0.93	0.83	0.94	0.086
Sodium	8.4	8.0	7.7	6.9	7.8	0.081
Sulphate	184	211	188	122	176	0.22
Major anion sum	7.9	8.3	7.8	5.8	7.5	0.15
Major cation sum	7.6	7.9	7.2	6.2	7.2	0.11
Bicarbonate Alkalinity, as $CaCO_3$	201	188	187	160	184	0.094
Carbonate Alkalinity, as $CaCO_3$	<1.0	<1.0	4.4	<1.0	1.9	0.92
Hydroxide Alkalinity, as $CaCO_3$	<1.0	<1.0	<1.0	<1.0	<1	0
Nutrients						-
Nitrate	0.78	0.91	0.93	0.68	0.83	0.15
Nitrite	<0.0010	<0.0010	<0.0010	0.0016	0.0012	0.26
Total ammonia	0.032	<0.0050	<0.0050	0.0067	0.012	1.1
Total Kjeldahl nitrogen	0.21	0.1	0.14	0.23	0.17	0.35
Total phosphorus	0.011	0.23	0.0034	0.0035	0.062	1.8
Orthophosphate	0.0015	0.0029	0.0034	0.0028	0.0027	0.31
Total Metals						-
Aluminum	0.0055	0.0034	0.0088	0.011	0.0073	0.49
Antimony	0.00013	0.00011	0.00012	0.00011	0.00012	0.081
Arsenic	0.00024	0.00019	0.00024	0.00028	0.00024	0.16
Barium	0.082	0.088	0.075	0.045	0.072	0.26
Beryllium	<0.000020	<0.000020	<0.000020	<0.000020	<0.00002	0
Bismuth	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0
Boron	0.021	0.017	0.016	0.014	0.017	0.17
Cadmium	0.000023	0.000029	0.000017	0.000016	0.000021	0.28
Calcium	97	90	84	65	84	0.16
Chromium	0.00027	0.00021	0.00018	0.00019	0.00021	0.19
Cobalt	<0.00010	<0.00010	<0.00010	0.00013	0.00011	0.14
Copper	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	0
Iron	<0.010	<0.010	0.012	0.017	0.012	0.27
Lead	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0
Lithium	0.012	0.011	0.01	0.0084	0.01	0.15
Magnesium	34	36	33	22	31	0.2
Manganese	0.0018	0.00082	0.0019	0.0021	0.0017	0.35
Mercury	<0.00000050	<0.00000050	<0.00000050	<0.00000050	<0.0000005	0
Molybdenum	0.00081	0.00076	0.00079	0.00075	0.00078	0.037
Nickel	0.0026	0.0018	0.0024	0.0026	0.0023	0.16
Potassium	1.0	0.98	1.0	0.76	0.94	0.13
Selenium	**0.0052**(Mn)	**0.0048**(Mn)	**0.0049**(Mn)	**0.0038**(Mn)	**0.0047**(Mn)	0.13
Silicon	2.0	1.9	1.9	1.8	1.9	0.049
Silver	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	0
Sodium	8.5	7.9	7.8	6.4	7.7	0.12
Strontium	0.33	0.3	0.28	0.22	0.28	0.16
Sulphur	76	76	72	42	67	0.25
Thallium	<0.000010	0.000011	0.000012	0.000019	0.000013	0.31
Tin	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0
Titanium	<0.00030	<0.00030	<0.00030	0.00048	0.00035	0.26
Uranium	0.0018	0.0017	0.0019	0.0013	0.0017	0.17
Vanadium	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	0
Zinc	<0.0030	<0.0030	<0.0030	<0.0030	<0.003	0
Dissolved Metals						-
Aluminum	0.001	<0.0010	<0.0010	0.0015	0.0011	0.22
Antimony	0.0001	0.00011	0.0001	<0.00010	0.0001	0.049
Arsenic	0.00021	0.00017	0.00021	0.00024	0.00021	0.14
Barium	0.087	0.09	0.071	0.06	0.077	0.18
Beryllium	<0.000020	<0.000020	<0.000020	<0.000020	<0.00002	0
Bismuth	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0
Boron	0.018	0.017	0.016	0.015	0.017	0.078
Cadmium	0.000021	0.000022	0.000019	0.000019	0.000021	0.073
Chromium	0.00019	0.00018	<0.00050	0.0003	0.00029	0.51
Cobalt	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0
Copper	<0.00020	<0.00020	<0.00020	<0.00020	<0.0002	0
Iron	<0.010	<0.010	<0.010	<0.010	<0.01	0
Lead	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0
Lithium	0.011	0.011	0.0082	0.0085	0.0098	0.17
Manganese	0.00094	0.00066	0.00095	0.00096	0.00088	0.17
Mercury	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.000005	0
Molybdenum	0.00081	0.00079	0.00079	0.00074	0.00078	0.042
Nickel	0.0018	0.0018	0.0026	0.0021	0.0021	0.18
Selenium	0.005	0.005	0.0053	0.0034	0.0047	0.19
Silicon	1.9	1.9	1.8	1.8	1.9	0.04
Silver	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	0
Strontium	0.31	0.31	0.28	0.23	0.28	0.13
Sulphur	67	69	69	41	61	0.22
Thallium	<0.000010	0.000012	<0.000010	0.000016	0.000012	0.24
Tin	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0
Titanium	<0.00030	<0.00030	<0.00030	<0.00030	<0.0003	0
Uranium	0.0017	0.0016	0.0018	0.0013	0.0016	0.15
Vanadium	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	0
Zinc	<0.0010	<0.0010	<0.0010	0.0012	0.0011	0.095

(a) = guideline is a minimum value, unless the background concentration or value is lower.
(b) = guideline is adopted from CCME Canadian Environmental Quality Guidelines (CCME, 1999).
(c) = guideline is hardness dependent. The guideline range shown is based on the hardness range observed in the dataset (170 to 433 mg/L). The guideline is calculated based on the individual hardness value for each sample.
(d) = for some samples, water hardness was greater than 250 mg/L. At this hardness, no BC ENV water quality guideline has been established for sulphate; however, the observed data were screened against the guideline for very hard water (i.e., 429 mg/L) for comparative purposes.
(e) = guideline is chloride dependent. The guideline range shown is based on the chloride concentration range observed in the dataset (0.5700 to 6.3600 mg/L). The guideline is calculated based on the individual chloride concentration in each sample.
(f) = guideline is adopted from the ECCC PNECs (ECCC, 2018) or draft FEQGs (ECCC, 2017).
(g) = guideline is for chromium VI.
(h) = guideline is pH dependent. The guideline range shown is based on the pH range observed in the dataset (7.2 to 8.6). The guideline is calculated based on the individual pH for each sample.
(i) = guideline is a level 1 interim screening value.
(j) = dissolved copper guideline was calculated using the simplified Biotic Ligand Midel (BC ENV, 2019). Where values were missing, the temporally nearest value from the same location was taken.
(Mn) = concentration is higher than the 30-day mean BC ENV guideline or outside the recommended pH, DO or total alkalinity range.
(Mx) = concentration is higher than the maximum BC ENV guideline or outside the recommended pH, DO or total alkalinity range.
(E) = concentration is higher than the EVWQP benchmarks guideline.
Bolded concentrations are higher than water quality guidelines.
Shaded concentrations are higher than the EVWQP benchmark (e.g., for nitrate, total selenium, dissolved cadmium or sulphate).
Water quality data and guidelines shown in this table were rounded to reflect laboratory or field instrument precision after comparisons to guidelines. Therefore, values slightly above guidelines may be displayed as being equal to the guidelines and identified as exceedances. Concentrations equal to the guideline values were not identified as exceedances.
Concentrations were screened against available Working and Approved British Columbia Ministry of Environment and Climate Change Strategy (BC ENV) Water Quality Guidelines for the Protection of Aquatic Life; Accessed January 2020 from: https://www2.gov.bc.ca/gov/content/environment/air-land-water/water/water-quality/water-quality-guidelines.
\- = no guideline or no data
BC ENV = British Columbia Ministry of Environment & Climate Change Strategy; EVWQP = Elk Valley Water Quality Plan guidelines; *C. dubia* = *Ceriodaphnia dubia* ; *P. subcapitata* = *Pseudokirchneriella subcapitata* ; *H. azteca* = *Hyallela azteca* ; *P. promelas* = *Pimephales promelas* ; *O. mykiss* = *Oncorhynchus mykiss* ; CV = coefficient of variation; ∑ = sum of; WQGs = Water Quality Guidelines; CaCO3 = calcium carbonate; mg/L = milligrams per litre; µS/cm = microsiemens per centimeter; NTU = nephelometric turbidity units; meq/L = milliequivalents per litre; mg-N/L = milligrams of Nitrogen per litre; mg=P/L = milligrams of Phosphorus per litre.
BC ENV (B.C. Ministry of Climate Chande Strategy). 2019. Copper Water Quality guideline for the Protection of Aquatic Life-Technical Report. Water Quality Guideline Series, WQG-03-1. Prov. B.C., Victoria B.C.

Parameter	Unit	Guidelines for the protection of: Aquatic Life			Q1 EV_MC2									Q2 EV_MC2									Q3 EV_MC2						
		30-day mean	Maximum	EVWQP Benchmarks	*P. subcapitata* 23-Feb-21	2-Mar-21	9-Mar-21	16-Mar-21	23-Mar-21	30-Mar-21	Mar 2, 9, 16, 23, 30 *P. promelas* Mean	CV	*C. dubia* 14-Apr-21	*C. dubia* and *P. subcapitata* 18-May-21	25-May-21	1-Jun-21	8-Jun-21	15-Jun-21	May 18, 25, June 1, 8 *H. azteca* Mean	CV	May 18, 25, June 1, 8, 15 *O. mykiss* Mean	CV	*C. dubia* and *P. subcapitata* 10-Aug-21	17-Aug-21	24-Aug-21	31-Aug-21	7-Sep-21	Aug 10, 17, 24, 31 *H. azteca* Mean	CV
Field Measured																													
pH	-	6.5 - 9.0	6.5 - 9.0	-	8.2	8.0	8.2	8.2	7.5	8.0	8.0	0.036	7.8	7.8	8.0	8.0	7.2	8.1	7.8	0.049	7.8	0.046	8.2	8.2	8.3	8.4	8.4	8.3	0.012
Specific conductivity	µS/cm at 25 C	-	-	-	620	636	658	646	581	1343	773	0.41	557	219	300	254	306	284	270	0.15	272	0.13	555	509	495	551	526	527	0.057
Temperature	°C	-	-	-	0.3	0.5	1.5	2.5	1.6	3.1	1.8	0.54	2.1	5.8	4.9	5.1	4.6	7.2	5.1	0.10	5.5	0.19	12	10	8.8	10	11	10	0.12
Dissolved oxygen	mg/L	11	9.0	-	13	12	13	12	12	11	12	0.044	12	11	11	**11**(Mn)	11	**10**(Mn)	11	0.0062	**11**(Mn)	0.043	**9.2**(Mn)	**9.4**(Mn)	**11**(Mn)	**10**(Mn)	**10**(Mn)	**9.9**(Mn)	0.082
Turbidity	NTU	-	-	-	0.42	0.69	1.1	0.61	1.0	1.3	0.93	0.3	1.3	62	13	20	7.6	7.7	26	0.96	22	1.0	1.8	11	0.55	0.71	1.4	3.6	1.4
Oxidation-reduction potential field	mv	-	-	-	159	127	155	162	171	190	161	0.14	214	140	112	102	131	107	121	0.14	118	0.14	163	167	146	157	88	158	0.059
Conventional Parameters																													
pH	-	6.5 - 9.0	6.5 - 9.0	-	8.2	8.4	8.2	8.4	8.0	8.1	8.2	0.022	8.3	7.8	8.1	8.1	8.1	8.2	8.0	0.019	8.1	0.019	8.3	8.3	8.3	8.4	8.3	8.3	0.006
Hardness, as $CaCO_3$	mg/L	-	-	-	336	343	384	355	361	282	345	0.11	277	113	156	141	164	158	144	0.16	146	0.14	283	241	247	275	291	262	0.079
Total alkalinity, as $CaCO_3$	mg/L	20(a)	-	-	202	193	204	191	207	188	197	0.043	176	102	114	116	110	118	111	0.056	112	0.056	170	166	166	182	180	171	0.044
Total dissolved solids	mg/L	-	-	-	374	416	447	448	448	374	427	0.076	314	141	194	226	186	219	187	0.19	193	0.17	323	319	296	118	380	264	0.37
Total suspended solids	mg/L	-	-	-	1.7	<1.0	11	5.7	1.3	1.5	4.0	1.0	<1.0	522	18	40	11	11	148	1.7	120	1.9	<1.0	9.3	<1.0	<1.0	<1.0	3.1	1.3
Total organic carbon	mg/L	-	-	-	<0.50	0.6	1.0	0.54	1.2	1.0	0.87	0.33	1.5	7.6	3.8	2.6	2.5	2.3	4.1	0.58	3.8	0.59	2.6	1.5	1.4	1.0	1.4	1.6	0.41
Dissolved organic carbon	mg/L	-	-	-	<0.50	0.66	0.75	<0.50	0.97	1.2	0.82	0.34	1.9	4.4	3.3	2.1	2.4	2.0	3.1	0.34	2.9	0.35	3.2	1.6	1.5	1.1	1.7	1.8	0.5
Turbidity	NTU	-	-	-	0.18	0.39	1.5	0.53	0.41	0.95	0.76	0.64	0.89	226	11	16	5.8	4.0	65	1.7	53	1.8	0.39	12	0.33	0.28	0.28	3.2	1.8
Total acidity	mg/L	-	-	-	1.2	<2.0	<2.0	<2.0	2.3	<2.0	2.1	0.065	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2	0	<2	0	<2.0	<2.0	<2.0	<2.0	2.7	<2	0
Cation - anion balance	%	-	-	-	<0.10	0.85	3.2	0.41	3.5	8.7	3.3	1.0	2.9	5.4	1.8	16	3.0	7.8	6.7	1.0	6.9	0.84	1.0	6.3	2.5	4.5	1.5	3.6	0.64
Ion balance	%	-	-	-	100	102	106	101	-	84	98	0.46	94	90	96	72	106	85	91	0.16	90	0.14	102	88	105	91	97	97	0.084
Conductivity	µS/cm	-	-	-	569	603	634	628	696	605	633	0.06	540	228	309	374	294	351	301	0.2	311	0.18	509	484	436	534	550	491	0.085
Oxidation-reduction potential	mv	-	-	-	485	410	444	438	280	387	392	0.17	382	219	420	413	412	397	366	0.27	372	0.23	490	373	377	450	458	423	0.14
Major Ions																													
Bicarbonate	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	210	214	210	0.5
Bromide	mg/L	-	-	-	0.12	0.14	0.22	0.14	0.16	<0.25	0.18	0.27	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.05	0	<0.05	0	<0.050	0.06	<0.050	0.052	<0.050	0.053	0.09
Calcium	mg/L	-	-	-	81	83	97	81	88	69	84	0.12	68	30	41	36	43	40	38	0.15	38	0.13	70	58	61	68	69	64	0.093
Carbonate, as $CaCO_3$	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6.1	3.0	6.1	0.5
Chloride	mg/L	150	600	-	4.7	5.3	7.8	7.5	10.0	7.1	7.5	0.22	5.5	0.86	1.5	6.0	2.0	4.1	2.6	0.9	2.9	0.73	3.3	3.5	2.3	3.6	4.0	3.2	0.18
Fluoride	mg/L	0.12(b)	0.40 - 1.9(c)	-	0.11	**0.14**(Mn)	0.12	**0.13**(Mn)	**0.15**(Mn)	**0.15**(Mn)	**0.14**(Mn)	0.11	0.11	0.074	0.085	0.11	0.11	0.098	0.095	0.19	0.095	0.17	0.1	**0.15**(Mn)	**0.15**(Mn)	**0.14**(Mn)	**0.16**(Mn)	**0.14**(Mn)	0.16
Hydroxide	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<1.0	<1.0	1.0	0.5
Magnesium	mg/L	-	-	-	32	33	35	37	35	27	33	0.12	26	9.1	13	13	14	14	12	0.17	13	0.16	26	24	23	26	29	25	0.059
Potassium	mg/L	-	-	-	1.0	1.1	1.2	1.2	1.2	0.9	1.1	0.11	0.87	0.55	0.57	0.52	0.59	0.62	0.56	0.054	0.57	0.068	1.1	1.0	0.84	0.98	1.1	0.99	0.11
Sodium	mg/L	-	-	-	5.9	6.3	6.6	6.8	7.0	4.9	6.3	0.13	5.0	2.1	2.5	2.3	2.3	2.8	2.3	0.069	2.4	0.11	4.7	3.9	3.6	4.3	4.6	4.1	0.11
Sulphate	mg/L	128 - 429(c,d)	-	481	132	140	149	154	169	140	150	0.08	113	27	48	73	43	63	48	0.4	51	0.35	106	105	69	118	117	100	0.21
Major anion sum	meq/l	-	-	-	7.0	7.0	7.5	7.4	8.1	7.0	7.4	0.06	6.1	2.7	3.4	4.1	3.2	3.9	3.3	0.18	3.4	0.16	5.8	5.7	4.9	6.3	6.2	5.6	0.1
Major cation sum	meq/l	-	-	-	7.0	7.2	8.0	7.4	7.6	5.9	7.2	0.11	5.8	2.4	3.2	2.9	3.4	3.3	3.0	0.15	3.1	0.13	5.9	5.0	5.1	5.7	6.0	5.4	0.08
Bicarbonate Alkalinity, as $CaCO_3$	mg/l	-	-	-	202	182	204	180	207	188	192	0.065	175	102	114	116	110	118	111	0.056	112	0.056	165	160	166	172	175	166	0.03
Carbonate Alkalinity, as $CaCO_3$	mg/l	-	-	-	<1.0	11	<1.0	11	<1.0	<1.0	4.9	1.1	1.8	<1.0	<1.0	<1.0	<1.0	<1.0	<1	0	1.0	0	4.8	5.8	<1.0	10	5.0	5.5	0.69
Hydroxide Alkalinity, as $CaCO_3$	mg/l	-	-	-	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1	0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1	0	1.0	0	<1.0	<1.0	<1.0	<1.0	<1.0	<1	0
Nutrients																													
Nitrate	mg-N/L	3.0	33	3.0 - 5.8(c)	1.2	1.4	1.4	1.7	2.1	1.7	1.6	0.18	1.2	0.3	0.43	1.2	0.55	0.8	0.61	0.62	0.65	0.52	0.76	0.89	0.53	0.82	0.97	0.75	0.21
Nitrite	mg-N/L	0.020 - 0.10(e)	0.060 - 0.30(e)	-	0.0022	0.0018	0.0029	0.0017	<0.0010	<0.0050	0.0025	0.63	<0.0010	0.001	<0.0010	<0.0010	0.0012	<0.0010	0.0011	0.095	0.001	0.086	0.0021	0.0043	<0.0010	0.0026	0.0011	0.0025	0.55
Total ammonia	mg-N/L	2.1	14	-	0.011	0.012	0.0067	0.044	<0.0050	<0.0050	0.014	1.2	0.0086	0.0086	0.015	<0.0050	0.0064	0.02	0.0087	0.5	0.011	0.58	0.013	0.014	<0.0050	0.026	<0.0050	0.015	0.6
Total Kjeldahl nitrogen	mg-N/L	-	-	-	0.27	0.46	0.19	0.25	0.27	0.54	0.34	0.44	0.23	1.6	0.09	0.15	0.086	0.28	0.49	1.6	0.45	1.5	0.057	0.21	0.36	0.18	0.21	0.2	0.62
Total phosphorus	mg-P/L	-	-	-	<0.0020	<0.0020	0.0067	0.0033	0.004	0.0021	0.0036	0.53	0.003	0.24	0.024	0.05	0.018	0.028	0.083	1.3	0.072	1.3	0.0068	0.021	0.0058	0.0033	0.0031	0.0093	0.87
Orthophosphate	mg-P/L	-	-	-	0.0021	0.0029	0.002	0.0014	0.0022	0.0026	0.0022	0.26	0.0017	0.011	0.008	0.0091	0.012	0.0024	0.010	0.17	0.0085	0.44	0.0023	0.0016	0.0018	0.0011	<0.0010	0.0017	0.29
Total Metals																													
Aluminum	mg/L	-	-	-	0.0055	0.015	0.0083	0.011	0.017	0.038	0.018	0.67	0.044	5.8	0.34	0.23	0.16	0.26	1.6	1.7	1.4	1.8	0.016	0.21	0.0092	0.0074	0.0055	0.06	1.6
Antimony	mg/L	0.0090	-	-	<0.00010	<0.00010	<0.00010	<0.00010	0.0001	<0.00010	0.0001	0	<0.00010	0.00042	0.00011	<0.00010	<0.00010	<0.00010	0.00018	0.87	0.00017	0.86	0.00012	0.00013	0.00011	0.00011	0.00011	0.00012	0.081
Arsenic	mg/L	0.0050	0.0050	-	0.00017	0.00018	0.00017	0.0002	0.00014	0.00019	0.00018	0.13	0.00017	0.0044	0.00035	0.0003	0.00026	0.00035	0.0013	1.5	0.0011	1.6	0.00023	0.00029	0.00028	0.00023	0.00019	0.00026	0.12
Barium	mg/L	1.0	-	-	0.12	0.12	0.12	0.11	0.098	0.12	0.11	0.075	0.11	0.28	0.071	0.055	0.056	0.055	0.12	0.96	0.1	0.97	0.11	0.1	0.089	0.098	0.11	0.099	0.084
Beryllium	mg/L	0.00013	-	-	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.00002	0	<0.000020	**0.00056**(Mn)	0.000024	<0.000020	<0.000020	<0.000020	**0.00016**(Mn)	1.7	0.00013	1.9	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.00002	0
Bismuth	mg/L	0.0005(f)	-	-	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0	<0.000050	0.00011	<0.000050	<0.000050	<0.000050	<0.000050	0.000065	0.45	0.000062	0.42	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0
Boron	mg/L	1.2	29(b)	-	0.013	0.013	0.013	0.013	0.014	0.013	0.013	0.034	0.011	0.014	<0.010	<0.010	<0.010	<0.010	0.011	0.18	0.011	0.17	0.014	0.015	0.013	0.014	0.013	0.014	0.058
Cadmium	mg/L	-	-	-	0.000028	0.000028	0.00004	0.00003	0.000042	0.000033	0.000034	0.18	0.000034	0.0017	0.000069	0.000089	0.000042	0.000059	0.00047	1.7	0.00039	1.9	0.000028	0.000056	0.00003	0.000025	0.000029	0.000035	0.42
Calcium	mg/L	-	-	-	81	84	79	80	94	75	82	0.088	65	60	39	54	39	42	48	0.22	47	0.2	61	64	67	70	70	65	0.058
Chromium	mg/L	0.0010(g)	-	-	0.00013	0.00021	0.00012	0.00012	<0.00050	0.00019	0.00023	0.69	0.00019	**0.0093**(Mn)	0.00058	0.00041	0.00034	0.00054	**0.0026**(Mn)	1.7	**0.0022**(Mn)	1.8	0.00018	0.00043	0.0002	0.00016	0.0001	0.00024	0.52
Cobalt	mg/L	0.0040	0.11	-	0.00014	0.00014	0.00024	0.00015	0.00016	0.00014	0.00017	0.25	<0.00010	**0.0078**(Mn)	0.00037	0.00033	0.00018	0.00028	0.0022	1.7	0.0018	1.9	0.00011	0.00027	<0.00010	<0.00010	<0.00010	0.00015	0.58
Copper	mg/L	-	-	-	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	0	<0.00050	0.015	0.001	0.00086	0.00056	0.00065	0.0045	1.6	0.0037	1.8	<0.00050	0.00056	<0.00050	<0.00050	<0.00050	0.00052	0.058
Iron	mg/L	0.67 - 2.74(f,h)	1.0	-	<0.010	0.029	0.013	0.015	0.014	0.029	0.02	0.41	0.033	**11**(Mn, Mx)	0.43	0.26	0.17	0.32	**2.96**(Mn)	1.8	**2.43**(Mn)	2.0	0.024	0.21	0.014	0.012	0.024	0.065	1.5
Lead	mg/L	0.020(c)	0.0030 - 0.42(c)	-	<0.000050	<0.000050	<0.000050	<0.000050	<0.000030	<0.000050	<0.000046	0.19	<0.000050	**0.0092**(Mn)	0.00035	0.00032	0.00013	0.00025	0.0025	1.8	0.002	2.0	<0.000050	0.00018	<0.000050	0.00013	<0.000050	0.0001	0.61
Lithium	mg/L	0.1216(f)	-	-	0.018	0.016	0.019	0.018	0.024	0.014	0.018	0.2	0.011	0.012	0.0058	0.011	0.0052	0.0078	0.0085	0.41	0.0083	0.36	0.012	0.013	0.011	0.012	0.013	0.012	0.056
Magnesium	mg/L	-	-	-	33	31	33	33	36	31	33	0.064	24	16	13	18	13	15	15	0.15	15	0.13	24	24	22	27	30	24	0.08
Manganese	mg/L	0.77 - 2.3(c)	0.82 - 3.4(c)	-	0.003	0.0035	0.0043	0.0034	0.0032	0.003	0.0035	0.15	0.0022	0.39	0.013	0.017	0.0079	0.01	0.11	1.8	0.088	1.9	0.003	0.012	0.0021	0.0023	0.0028	0.0047	0.96
Mercury	mg/L	0.000010	-	-	<0.00000050	<0.00000050	<0.00000050	<0.00000050	<0.00000050	0.0000005	0.0000005	0	0.00000068	**0.000015**(Mn)	0.0000036	0.0000031	0.0000022	0.000002	0.000006	1.0	0.0000052	1.1	<0.00000050	0.0000023	<0.00000050	<0.00000050	<0.00000050	0.00000095	0.95
Molybdenum	mg/L	1.0	2.0	-	0.0014	0.0014	0.0017	0.0015	0.0013	0.0010	0.0014	0.18	0.00085	0.00083	0.00067	0.00042	0.00064	0.00062	0.00064	0.26	0.00064	0.23	0.0015	0.0016	0.0013	0.0016	0.0018	0.0015	0.072
Nickel	mg/L	0.0053(i)	-	-	0.0012	0.0016	0.0016	0.0018	0.0016	0.0014	0.0016	0.079	0.0014	**0.026**(Mn)	0.0026	0.0016	0.0017	0.0019	**0.0080**(Mn)	1.5	**0.0067**(Mn)	1.6	0.0019	0.0027	0.0016	0.0018	0.0021	0.002	0.24
Potassium	mg/L	-	-	-	1.0	1.1	1.1	1.2	1.2	1.0	1.1	0.065	0.85	2.0	0.71	0.76	0.61	0.69	1.0	0.64	0.95	0.61	0.99	1.1	0.86	1.0	1.1	1.0	0.12
Selenium	mg/L	0.0020	-	0.019	**0.011**(Mn)	**0.011**(Mn)	**0.011**(Mn)	**0.015**(Mn)	**0.017**(Mn)	**0.016**(Mn)	**0.014**(Mn)	0.2	**0.013**(Mn)	**0.0030**(Mn)	**0.0036**(Mn)	**0.0095**(Mn)	**0.0032**(Mn)	**0.0051**(Mn)	**0.0048**(Mn)	0.65	**0.0049**(Mn)	0.56	**0.0067**(Mn)	**0.0081**(Mn)	**0.0055**(Mn)	**0.0078**(Mn)	**0.0098**(Mn)	**0.0070**(Mn)	0.17
Silicon	mg/L	-	-	-	2.5	2.4	2.3	2.6	2.6	2.6	2.5	0.054	2.6	9.5	2.5	2.6	2.3	2.3	4.2	0.84	3.8	0.83	2.3	2.7	2.2	2.2	2.3	2.4	0.094
Silver	mg/L	0.000050 - 0.0015(c)	0.00010 - 0.0030(c)	-	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	0	<0.000010	0.00029	0.000013	<0.000010	<0.000010	<0.000010	0.000082	1.7	0.000067	1.9	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	0
Sodium	mg/L	-	-	-	6.4	6.0	6.9	6.7	7.3	5.8	6.5	0.095	5.0	2.1	2.9	3.4	2.3	2.7	2.7	0.23	2.7	0.2	4.4	4.0	3.7	4.5	4.9	4.2	0.09
Strontium	mg/L	-	-	-	0.19	0.19	0.2	0.21	0.23	0.19	0.2	0.096	0.18	0.13	0.11	0.12	0.099	0.11	0.12	0.11	0.11	0.1	0.18	0.17	0.17	0.18	0.19	0.17	0.041
Sulphur	mg/L	-	-	-	49	50	53	57	63	49	54	0.11	39	10	17	26	15	19	17	0.39	18	0.33	38	41	31	43	47	38	0.14
Thallium	mg/L	0.00080	-	-	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	0	<0.000010	0.00032	0.000017	0.000015	<0.000010	0.000016	0.00009	1.7	0.000075	1.8	<0.000010	0.000014	<0.000010	<0.000010	<0.000010	0.000011	0.18
Tin	mg/L	0.3(f)	-	-	<0.00010	<0.00010	<0.00010	<0.00010	<0.000050	<0.00010	<0.00009	0.25	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	0.0001	0	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0
Titanium	mg/L	0.85(f)	-	-	<0.010	0.00031	<0.00030	<0.00030	0.00039	0.00081	0.00042	0.52	<0.0021	0.023	0.0034	0.0031	0.0015	0.0048	0.0076	1.3	0.0071	1.2	0.00032	0.003	<0.00030	<0.00030	<0.00030	0.00098	1.4
Uranium	mg/L	0.0085	0.033(b)	-	0.0017	0.0016	0.0018	0.0016	0.0014	0.0014	0.0015	0.099	0.0011	0.0014	0.00062	0.00056	0.00054	0.00058	0.00077	0.52	0.00073	0.49	0.0013	0.0012	0.0011	0.0013	0.0015	0.0012	0.075
Vanadium	mg/L	0.12(f)	-	-	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00056	0.00051	0.052	<0.00050	0.025	0.0016	0.0011	0.00074	0.0013	0.007	1.7	0.0059	1.8	<0.00050	0.0011	0.00056	<0.00050	<0.00050	0.00066	0.43
Zinc	mg/L	0.0075 - 0.19	0.033 - 0.25	-	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.003	0	<0.0030	**0.095**(Mn, Mx)	0.009	0.0032	<0.0030	0.0042	0.028	1.6	0.023	1.8	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.003	0
Dissolved Metals																													
Aluminum	mg/L	0.0061 - 0.050(h)	0.021 - 0.10(h)	-	<0.0030	<0.0010	0.0011	<0.0010	<0.0010	0.001	0.001	0.044	0.0012	0.014	0.0089	0.012	0.0088	0.0068	0.011	0.21	0.0099	0.27	0.0012	0.0025	0.0014	0.0011	<0.0010	0.0016	0.42
Antimony	mg/L	-	-	-	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	0.0001	0	0.00011	0.00011	0.0001	0.00011	0.0001	0.00011	0.047
Arsenic	mg/L	-	-	-	0.00015	0.00016	0.00014	0.00014	0.00014	0.00013	0.00014	0.077	0.00016	0.00022	0.00018	0.0002	0.00019	0.0002	0.0002	0.086	0.0002	0.075	0.00018	0.00017	0.0002	0.0002	0.00015	0.00019	0.08
Barium	mg/L	-	-	-	0.12	0.12	0.12	0.11	0.098	0.093	0.11	0.12	0.11	0.053	0.06	0.047	0.053	0.052	0.053	0.11	0.053	0.092	0.12	0.095	0.094	0.098	0.11	0.1	0.1
Beryllium	mg/L	-	-	-	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.00002	0	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.00002	0	0.00002	0	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.00002	0
Bismuth	mg/L	-	-	-	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0	0.00005	0	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0
Boron	mg/L	-	-	-	0.012	0.012	0.015	0.012	0.014	0.01	0.013	0.15	0.012	<0.010	<0.010	<0.010	<0.010	<0.010	<0.01	0	0.01	0	0.014	0.013	0.011	0.013	0.014	0.013	0.099
Cadmium	mg/L	0.000018 - 0.00046(c)	0.000038 - 0.0024(c)	0.00000093 - 0.00032(c)	0.000023	0.000022	0.000026	0.000028	0.000035	0.000024	0.000027	0.19	0.000021	0.000026	0.000028	0.000026	0.000024	0.000024	0.000026	0.065	0.000025	0.065	0.000028	0.000025	0.000019	0.000021	0.000015	0.000023	0.17
Chromium	mg/L	-	-	-	0.00011	0.00017	0.00011	0.00012	0.00013	0.00011	0.00013	0.19	0.0001	0.00012	0.00014	0.00015	0.00013	0.00016	0.00014	0.096	0.00014	0.11	0.00012	0.00013	0.00013	0.00033	0.0001	0.00018	0.57
Cobalt	mg/L	-	-	-	0.00013	0.00015	0.00022	0.00014	0.00015	<0.00010	0.00015	0.28	<0.00010	<0.00010	0.00012	<0.00010	<0.00010	<0.00010	0.00011	0.095	0.0001	0.086	<0.00010	0.0001	<0.00010	<0.00010	<0.00010	0.0001	0
Copper	mg/L	0.0004 - 0.0026(j)	0.0023 - 0.015(j)	-	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.0002	0	0.00021	0.00046	0.0003	0.00029	0.00024	0.00024	0.00032	0.3	0.00031	0.3	0.00023	0.00023	0.00021	<0.00020	0.0004	0.00022	0.069
Iron	mg/L	-	0.35	-	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.01	0	<0.010	0.013	<0.010	<0.010	<0.010	<0.010	0.011	0.14	0.011	0.13	<0.010	<0.010	<0.010	<0.010	<0.010	<0.01	0
Lead	mg/L	-	-	-	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0	<0.00005	0	<0.000050	0.000056	<0.000050	<0.000050	<0.000050	0.000052	0.058
Lithium	mg/L	-	-	-	0.017	0.018	0.022	0.02	0.02	0.013	0.019	0.2	0.011	0.0041	0.005	0.0051	0.0058	0.0073	0.005	0.14	0.0055	0.22	0.013	0.012	0.01	0.014	0.013	0.012	0.12
Manganese	mg/L	-	-	-	0.0026	0.0028	0.0039	0.0029	0.0026	0.002	0.0029	0.24	0.0012	0.0027	0.002	0.0012	0.0016	0.0016	0.0019	0.35	0.0018	0.32	0.0018	0.0029	0.0013	0.0015	0.0017	0.0019	0.38
Mercury	mg/L	-	-	-	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.000005	0	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.000005	0	<0.000005	0	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.000005	0
Molybdenum	mg/L	-	-	-	0.0014	0.0014	0.0017	0.0014	0.0012	0.00087	0.0013	0.23	0.00089	0.00049	0.0007	0.00048	0.00062	0.00062	0.00057	0.19	0.00058	0.17	0.0015	0.0016	0.0014	0.0017	0.0016	0.0015	0.073
Nickel	mg/L	-	-	-	0.0011	0.0015	0.0018	0.0017	0.0014	0.0012	0.0015	0.14	0.0012	0.00096	0.0016	0.001	0.0012	0.0012	0.0012	0.24	0.0012	0.21	0.0018	0.0019	0.0012	0.0017	0.0018	0.0016	0.18
Selenium	mg/L	-	-	-	0.011	0.012	0.013	0.014	0.016	0.014	0.014	0.12	0.014	0.0019	0.0031	0.0042	0.0037	0.0052	0.0032	0.3	0.0036	0.34	0.0066	0.0079	0.0057	0.0071	0.0093	0.0068	0.13
Silicon	mg/L	-	-	-	2.2	2.4	2.3	2.4	2.6	2.1	2.3	0.077	2.4	1.8	2.0	1.9	2.0	1.9	1.9	0.047	1.9	0.041	2.3	2.2	2.0	2.0	2.3	2.1	0.066
Silver	mg/L	-	-	-	<0.000010	0.000016	<0.000010	<0.000010	<0.000010	<0.000010	0.000011	0.24	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	0	<0.00001	0	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	0
Strontium	mg/L	2.5(f)	-	-	0.18	0.21	0.21	0.21	0.21	0.16	0.2	0.12	0.17	0.077	0.11	0.094	0.1	0.1	0.096	0.16	0.097	0.14	0.19	0.17	0.17	0.19	0.18	0.18	0.085
Sulphur	mg/L	-	-	-	43	49	53	54	59	41	51	0.13	40	8.4	16	14	15	18	13	0.25	14	0.25	36	37	30	38	44	35	0.099
Thallium	mg/L	-	-	-	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	0	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	0	<0.00001	0	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	0
Tin	mg/L	-	-	-	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.0001	0	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0
Titanium	mg/L	-	-	-	<0.010	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.0003	0	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.0003	0	<0.0003	0	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.0003	0
Uranium	mg/L	-	-	-	0.0015	0.0016	0.0017	0.0017	0.0013	0.0012	0.0015	0.15	0.0011	0.00035	0.00057	0.00045	0.00056	0.00054	0.00048	0.21	0.00049	0.18	0.0013	0.0012	0.001	0.0014	0.0014	0.0012	0.11
Vanadium	mg/L	-	-	-	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	0	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	0	<0.0005	0	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	0
Zinc	mg/L	-	-	-	<0.0010	0.0011	<0.0010	<0.0010	<0.0010	0.0013	0.0011	0.12	<0.0010	0.0013	<0.0010	<0.0010	0.0011	<0.0010	0.0011	0.13	0.0011	0.12	0.0035	0.0039	<0.0010	<0.0010	<0.0010	0.0024	0.67

(a) = guideline is a minimum value, unless the background concentration or value is lower.
(b) = guideline is adopted from CCME Canadian Environmental Quality Guidelines (CCME, 1999).
(c) = guideline is hardness dependent. The guideline range shown is based on the hardness range observed in the dataset (0.3 to 384 mg/L). The guideline is calculated based on the individual hardness value for each sample.
(d) = for some samples, water hardness was greater than 250 mg/L. At this hardness, no BC ENV water quality guideline has been established for sulphate; however, the observed data were screened against the guideline for very hard water (i.e., 429 mg/L) for comparative purposes.
(e) = guideline is chloride dependent. The guideline range shown is based on the chloride concentration range observed in the dataset (0.0500 to 9.9900 mg/L). The guideline is calculated based on the individual chloride concentration in each sample.
(f) = guideline is adopted from the ECCC PNECs (ECCC, 2018) or draft FEQGs (ECCC, 2017).
(g) = guideline is for chromium VI.
(h) = guideline is pH dependent. The guideline range shown is based on the pH range observed in the dataset (4.8 to 8.4). The guideline is calculated based on the individual pH for each sample.
(i) = guideline is a level 1 interim screening value.
(j) = dissolved copper guideline was calculated using the simplified Biotic Ligand Midel (BC ENV, 2019). Where values were missing, the temporally nearest value from the same location was taken.
(Mn) = concentration is higher than the 30-day mean BC ENV guideline or outside the recommended pH, DO or total alkalinity range.
(Mx) = concentration is higher than the maximum BC ENV guideline or outside the recommended pH, DO or total alkalinity range.
(E) = concentration is higher than the EVWQP benchmarks guideline.
Bolded concentrations are higher than water quality guidelines.
Shaded concentrations are higher than the EVWQP benchmark (e.g., for nitrate, total selenium, dissolved cadmium or sulphate).
(DL>Mn) = analytical detection limit is higher than the 30-day mean BC ENV guideline.
(DL>E) = analytical detection limit is higher than the EVWQP benchmarks guideline.
Water quality data and guidelines shown in this table were rounded to reflect laboratory or field instrument precision after comparisons to guidelines. Therefore, values slightly above guidelines may be displayed as being equal to the guidelines and identified as exceedances. Concentrations equal to the guideline values were not identified as exceedances.
Concentrations were screened against available Working and Approved British Columbia Ministry of Environment and Climate Change Strategy (BC ENV) Water Quality Guidelines for the Protection of Aquatic Life; Accessed January 2020 from: https://www2.gov.bc.ca/gov/content/environment/air-land-water/water/water-quality/water-quality-guidelines.
\- = no guideline or no data
BC ENV = British Columbia Ministry of Environment & Climate Change Strategy; EVWQP = Elk Valley Water Quality Plan guidelines; *C. dubia* = *Ceriodaphnia dubia* ; *P. subcapitata* = *Pseudokirchneriella subcapitata* ; *H. azteca* = *Hyallela azteca* ; *P. promelas* = *Pimephales promelas* ; *O. mykiss* = *Oncorhynchus mykiss* ; CV = coefficient of variation; ∑ = sum of; WQGs = Water Quality Guidelines; CaCO3 = calcium carbonate; mg/L = milligrams per litre; µS/cm = microsiemens per centimeter; NTU = nephelometric turbidity units; meq/L = milliequivalents per litre; mg-N/L = milligrams of Nitrogen per litre; mg=P/L = milligrams of Phosphorus per litre.
BC ENV (B.C. Ministry of Climate Chande Strategy). 2019. Copper Water Quality guideline for the Protection of Aquatic Life-Technical Report. Water Quality Guideline Series, WQG-03-1. Prov. B.C., Victoria B.C.

Parameter	Unit	Guidelines for the protection of:			Aug 10, 17, 24, 31 Sept 7 *P. promelas*		Q4 EV_MC2 *C. dubia* and *P. subcapitata*					Oct 12, 19, 26, Nov 2 *H. azteca*		Oct 12, 19, 26, Nov 2, 9 *O. mykiss*	
		Aquatic Life		EVWQP Benchmarks											
		30-day mean	Maximum		Mean	CV	12-Oct-21	19-Oct-21	26-Oct-21	2-Nov-21	9-Nov-21	Mean	CV	Mean	CV
Field Measured															
pH	-	6.5 - 9.0	6.5 - 9.0	-	8.3	0.012	8.0	8.3	8.2	8.2	8.3	8.2	0.015	8.2	0.015
Specific conductivity	µS/cm at 25 C	-	-	-	527	0.05	686	622	564	412	418	571	0.21	540	0.23
Temperature	°C	-	-	-	10	0.11	3.2	4.7	5.4	1.2	1.1	3.6	0.51	3.1	0.63
Dissolved oxygen	mg/L	11	9.0	-	**9.92**[Mn]	0.071	**11**[Mn]	**11**[Mn]	**11**[Mn]	12	12	11	0.063	11	0.059
Turbidity	NTU	-	-	-	3.2	1.4	2.3	0.43	1.1	2.4	2.5	1.6	0.62	1.7	0.54
Oxidation-reduction potential field	mv	-	-	-	144	0.23	137	122	140	143	146	135	0.068	138	0.067
Conventional Parameters															
pH	-	6.5 - 9.0	6.5 - 9.0	-	8.3	0.0054	8.2	8.3	8.2	8.2	8.1	8.2	0.0061	8.2	0.0086
Hardness, as $CaCO_3$	mg/L	-	-	-	267	0.083	382	335	288	225	276	308	0.22	301	0.2
Total alkalinity, as $CaCO_3$	mg/L	20[(a)]	-	-	173	0.045	216	195	176	139	157	182	0.18	177	0.17
Total dissolved solids	mg/L	-	-	-	287	0.35	460	417	351	260	249	372	0.23	347	0.27
Total suspended solids	mg/L	-	-	-	2.7	1.4	<1.0	2.2	1.1	5.9	<1.0	2.6	0.9	2.2	0.94
Total organic carbon	mg/L	-	-	-	1.6	0.36	<0.50	4.5	0.78	2.9	1.9	2.2	0.87	2.1	0.77
Dissolved organic carbon	mg/L	-	-	-	1.8	0.44	0.66	1.3	0.86	3.0	1.3	1.5	0.72	1.4	0.65
Turbidity	NTU	-	-	-	2.6	2.0	<0.10	0.24	0.18	1.6	0.8	0.53	1.4	0.58	1.1
Total acidity	mg/L	-	-	-	2.1	0.15	3.5	2.2	2.2	2.4	<2.0	2.6	0.24	2.5	0.24
Cation - anion balance	%	-	-	-	3.2	0.7	1.0	2.9	2.8	2.3	7.4	2.3	0.39	3.3	0.74
Ion balance	%	-	-	-	97	0.073	98	94	95	105	116	98	0.051	102	0.09
Conductivity	µS/cm	-	-	-	503	0.089	603	643	555	411	410	553	0.18	524	0.21
Oxidation-reduction potential	mv	-	-	-	430	0.12	452	468	463	464	451	462	0.015	460	0.017
Major Ions															
Bicarbonate	mg/L	-	-	-	212	0.55	263	233	215	170	157	220	0.18	208	0.21
Bromide	mg/L	-	-	-	0.052	0.083	0.086	0.088	<0.050	<0.050	<0.050	0.069	0.31	0.065	0.31
Calcium	mg/L	-	-	-	65	0.085	93	84	72	55	67	76	0.22	74	0.2
Carbonate, as $CaCO_3$	mg/L	-	-	-	4.6	0.6	<1.0	2.4	<1.0	<1.0	<1.0	1.4	0.52	1.3	0.49
Chloride	mg/L	150	600	-	3.4	0.19	8.7	5.4	4.2	2.4	2.8	5.2	0.51	4.7	0.54
Fluoride	mg/L	0.12[(b)]	0.40 - 1.0[(c)]	-	**0.14**[Mn]	0.15	0.11	**0.12**[Mn]	**0.15**[Mn]	0.1	**0.14**[Mn]	**0.12**[Mn]	0.18	**0.12**[Mn]	0.17
Hydroxide	mg/L	-	-	-	1.0	0.55	<1.0	<1.0	<1.0	<1.0	<1.0	<1	0	<1	0
Magnesium	mg/L	-	-	-	25	0.092	36	31	26	21	27	29	0.23	28	0.2
Potassium	mg/L	-	-	-	1.0	0.11	1.4	1.2	1.0	0.81	0.96	1.1	0.21	1.1	0.19
Sodium	mg/L	-	-	-	4.2	0.11	6.6	4.8	4.2	3.7	4.6	4.8	0.26	4.8	0.23
Sulphate	mg/L	128 - 429[(d),(d)]	-	481	103	0.19	163	154	124	75	81	129	0.31	120	0.34
Major anion sum	meq/l	-	-	-	5.8	0.098	8.1	7.4	6.3	4.5	5.0	6.6	0.24	6.2	0.25
Major cation sum	meq/l	-	-	-	5.6	0.084	8.0	6.9	6.0	4.7	5.8	6.4	0.22	6.3	0.2
Bicarbonate Alkalinity, as $CaCO_3$	mg/l	-	-	-	168	0.035	216	191	176	139	129	146	0.67	143	0.6
Carbonate Alkalinity, as $CaCO_3$	mg/l	-	-	-	5.4	0.61	<1.0	4.0	<1.0	<1.0	<1.0	36	1.9	29	2.1
Hydroxide Alkalinity, as $CaCO_3$	mg/l	-	-	-	<1	0	<1.0	<1.0	<1.0	<1.0	<1.0	<1	0	<1	0
Nutrients															
Nitrate	mg-N/L	3.0	33	3.0 - 5.8[(e)]	0.79	0.21	2.1	1.3	0.9	0.61	0.63	1.2	0.54	1.1	0.57
Nitrite	mg-N/L	0.020 - 0.10[(e)]	0.060 - 0.30[(e)]	-	0.0022	0.61	0.0018	0.0011	0.0018	<0.0010	<0.0010	0.0014	0.31	0.0013	0.31
Total ammonia	mg-N/L	2.1	14	-	0.013	0.69	<0.0050	0.0056	0.011	0.0061	0.0053	0.007	0.42	0.0067	0.4
Total Kjeldahl nitrogen	mg-N/L	-	-	-	0.2	0.53	0.22	0.15	0.11	0.25	0.11	0.18	0.36	0.17	0.38
Total phosphorus	mg-P/L	-	-	-	0.0081	0.94	0.0064	0.0025	0.0033	0.0093	0.0067	0.0054	0.58	0.0056	0.49
Orthophosphate	mg-P/L	-	-	-	0.0016	0.34	<0.0010	0.0018	0.0022	0.009	0.0063	0.0035	1.1	0.0041	0.85
Total Metals															
Aluminum	mg/L	-	-	-	0.049	1.8	0.0098	<0.0030	0.0045	0.063	0.039	0.02	1.4	0.024	1.1
Antimony	mg/L	0.0090	-	-	0.00012	0.077	0.00011	0.0001	0.00011	<0.00010	<0.00010	0.00011	0.055	0.0001	0.053
Arsenic	mg/L	0.0050	0.0050	-	0.00024	0.17	0.00015	0.00017	0.00018	0.00019	0.00019	0.00017	0.099	0.00018	0.095
Barium	mg/L	1.0	-	-	0.1	0.086	0.11	0.11	0.12	0.084	0.084	0.1	0.13	0.098	0.14
Beryllium	mg/L	0.00013	-	-	<0.00002	0	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.00002	0	<0.00002	0
Bismuth	mg/L	0.0005[(f)]	-	-	<0.00005	0	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0	<0.00005	0
Boron	mg/L	1.2	29[(h)]	-	0.014	0.061	0.016	0.014	0.012	<0.010	0.01	0.013	0.2	0.012	0.21
Cadmium	mg/L	-	-	-	0.000034	0.38	0.00004	0.000029	0.000025	0.000031	0.000039	0.000031	0.2	0.000033	0.2
Calcium	mg/L	-	-	-	66	0.058	98	84	72	55	63	77	0.24	74	0.23
Chromium	mg/L	0.0010[(g)]	-	-	0.00021	0.59	0.00012	0.00015	0.0001	0.0002	0.00018	0.00014	0.31	0.00015	0.27
Cobalt	mg/L	0.0040	0.11	-	0.00014	0.55	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0	<0.0001	0
Copper	mg/L	-	-	-	0.00051	0.052	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0	<0.0005	0
Iron	mg/L	0.67 - 2.74[(d)]	1.0	-	0.057	1.5	0.017	<0.010	0.013	0.046	0.034	0.022	0.77	0.024	0.64
Lead	mg/L	0.020[(d)]	0.0030 - 0.42[(c)]	-	0.000091	0.64	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0	<0.00005	0
Lithium	mg/L	0.1218[(f)]	-	-	0.012	0.056	0.023	0.016	0.013	0.0077	0.012	0.015	0.43	0.014	0.39
Magnesium	mg/L	-	-	-	25	0.12	38	33	27	19	25	29	0.28	28	0.26
Manganese	mg/L	0.77 - 2.3[(c)]	0.82 - 3.4[(c)]	-	0.0044	0.92	0.0024	0.0021	0.0022	0.0023	0.0018	0.0023	0.047	0.0022	0.11
Mercury	mg/L	0.000010	-	-	0.00000086	0.94	<0.00000050	<0.00000050	<0.00000050	0.00000013	0.00000088	0.00000071	0.58	0.00000074	0.49
Molybdenum	mg/L	1.0	2.0	-	0.0015	0.095	0.0015	0.0018	0.0015	0.001	0.001	0.0015	0.22	0.0014	0.24
Nickel	mg/L	0.0053[(i)]	-	-	0.002	0.2	0.0015	0.0022	0.0017	0.0012	0.0013	0.0016	0.26	0.0016	0.26
Potassium	mg/L	-	-	-	1.0	0.11	1.3	1.1	1.0	0.74	0.92	1.0	0.22	1.0	0.2
Selenium	mg/L	0.0020	-	0.019	**0.0076**[Mn]	0.21	**0.017**[Mn]	**0.0099**[Mn]	**0.0069**[Mn]	**0.0046**[Mn]	**0.0093**[Mn]	**0.0096**[Mn]	0.56	**0.0095**[Mn]	0.49
Silicon	mg/L	-	-	-	2.3	0.084	2.6	2.4	2.4	2.3	2.3	2.4	0.062	2.4	0.057
Silver	mg/L	0.000050 - 0.0015[(c)]	0.00010 - 0.0030[(c)]	-	<0.00001	0	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	0	<0.00001	0
Sodium	mg/L	-	-	-	4.3	0.1	6.4	4.6	4.3	3.2	4.3	4.6	0.29	4.6	0.25
Strontium	mg/L	-	-	-	0.18	0.06	0.23	0.2	0.18	0.15	0.17	0.19	0.2	0.18	0.18
Sulphur	mg/L	-	-	-	40	0.15	64	55	43	27	37	47	0.34	45	0.33
Thallium	mg/L	0.00080	-	-	0.000011	0.17	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	0	<0.00001	0
Tin	mg/L	0.3[(f)]	-	-	<0.0001	0	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.0001	0
Titanium	mg/L	0.85[(f)]	-	-	0.00084	1.4	<0.00030	<0.00030	<0.00030	0.00015	0.00076	0.00059	0.99	0.00063	0.82
Uranium	mg/L	0.0085	0.033[(h)]	-	0.0013	0.11	0.0014	0.0016	0.0015	0.00088	0.00095	0.0013	0.24	0.0013	0.26
Vanadium	mg/L	0.12[(f)]	-	-	0.00063	0.4	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	0	<0.0005	0
Zinc	mg/L	0.0075 - 0.19	0.033 - 0.25	-	<0.003	0	0.0032	0.0043	<0.0030	<0.0030	0.005	0.0034	0.18	0.0037	0.24
Dissolved Metals															
Aluminum	mg/L	0.0061 - 0.050[(h)]	0.021 - 0.10[(h)]	-	0.0014	0.42	<0.0010	<0.0010	0.0013	0.008	0.0035	0.0028	1.2	0.003	1.0
Antimony	mg/L	-	-	-	0.00011	0.052	<0.00010	0.0001	0.0001	<0.00010	<0.00010	0.0001	0	0.0001	0
Arsenic	mg/L	-	-	-	0.00018	0.12	0.00013	0.00016	0.00015	0.00017	0.00017	0.00015	0.11	0.00016	0.11
Barium	mg/L	-	-	-	0.1	0.091	0.091	0.12	0.1	0.093	0.09	0.1	0.11	0.099	0.11
Beryllium	mg/L	-	-	-	<0.00002	0	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.00002	0	<0.00002	0
Bismuth	mg/L	-	-	-	<0.00005	0	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0	<0.00005	0
Boron	mg/L	-	-	-	0.013	0.094	0.016	0.013	0.011	<0.010	0.01	0.013	0.21	0.012	0.21
Cadmium	mg/L	0.000018 - 0.00046[(h)]	0.000038 - 0.0024[(c)]	0.00000093 - 0.00032[(h)]	0.000022	0.23	0.000038	0.000028	0.000023	0.000026	0.000028	0.000029	0.24	0.000029	0.21
Chromium	mg/L	-	-	-	0.00016	0.58	0.00012	0.00012	0.00013	0.00012	0.00014	0.00012	0.041	0.00013	0.071
Cobalt	mg/L	-	-	-	0.0001	0	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0	<0.0001	0
Copper	mg/L	0.0004 - 0.0026[(j)]	0.0023 - 0.015[(j)]	-	0.00025	0.33	<0.00020	<0.00020	<0.00020	0.00045	0.00028	0.00026	0.48	0.00027	0.41
Iron	mg/L	-	0.35	-	<0.01	0	<0.010	<0.010	<0.010	0.012	<0.010	0.011	0.095	0.01	0.086
Lead	mg/L	-	-	-	0.00051	0.052	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0	<0.00005	0
Lithium	mg/L	-	-	-	0.012	0.12	0.024	0.017	0.012	0.0083	0.012	0.015	0.45	0.015	0.41
Manganese	mg/L	-	-	-	0.0018	0.34	0.0015	0.0017	0.0014	0.0014	0.0011	0.0015	0.1	0.0014	0.16
Mercury	mg/L	-	-	-	<0.000005	0	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.000005	0	<0.000005	0
Molybdenum	mg/L	-	-	-	0.0016	0.069	0.0014	0.0018	0.0015	0.00097	0.001	0.0014	0.25	0.0013	0.26
Nickel	mg/L	-	-	-	0.0017	0.16	0.0015	0.0022	0.0015	0.0014	0.0012	0.0016	0.22	0.0015	0.24
Selenium	mg/L	-	-	-	0.0073	0.19	0.022	0.011	0.008	0.0056	0.0097	0.012	0.63	0.011	0.57
Silicon	mg/L	-	-	-	2.1	0.063	2.8	2.3	2.2	2.3	2.4	2.4	0.1	2.4	0.091
Silver	mg/L	-	-	-	<0.00001	0	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000001	0	<0.00001	0
Strontium	mg/L	2.5[(f)]	-	-	0.18	0.074	0.23	0.21	0.17	0.15	0.17	0.19	0.2	0.19	0.18
Sulphur	mg/L	-	-	-	37	0.14	69	52	37	27	37	46	0.39	44	0.37
Thallium	mg/L	-	-	-	<0.00001	0	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000001	0	<0.00001	0
Tin	mg/L	-	-	-	<0.0001	0	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.0001	0
Titanium	mg/L	-	-	-	<0.0003	0	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.0003	0	<0.0003	0
Uranium	mg/L	-	-	-	0.0012	0.11	0.0015	0.0016	0.0013	0.00086	0.00094	0.0013	0.25	0.0012	0.26
Vanadium	mg/L	-	-	-	<0.0005	0	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	0	<0.0005	0
Zinc	mg/L	-	-	-	0.0021	0.71	0.0015	<0.0010	0.0012	0.0011	0.0025	0.0012	0.18	0.0015	0.42

(a) = guideline is a minimum value, unless the background concentration or value is lower.
(b) = guideline is adopted from CCME Canadian Environmental Quality Guidelines (CCME, 1999).
(c) = guideline is hardness dependent. The guideline range shown is based on the hardness range observed in the dataset (0.3 to 384 mg/L). The guideline is calculated based on the individual hardness value for each sample.
(d) = for some samples, water hardness was greater than 250 mg/L. At this hardness, no BC ENV water quality guideline has been established for sulphate; however, the observed data were screened against the guideline for very hard water (i.e., 429 mg/L) for comparative purposes.
(e) = guideline is chloride dependent. The guideline range shown is based on the chloride concentration range observed in the dataset (0.0500 to 9.9900 mg/L). The guideline is calculated based on the individual chloride concentration in each sample.
(f) = guideline is adopted from the ECCC PNECs (ECCC, 2018) or draft FEQGs (ECCC, 2017).
(g) = guideline is for chromium VI.
(h) = guideline is pH dependent. The guideline range shown is based on the pH range observed in the dataset (4.8 to 8.4). The guideline is calculated based on the individual pH for each sample.
(i) = guideline is a level 1 interim screening value.
(j) = dissolved copper guideline was calculated using the simplified Biotic Ligand Midel (BC ENV, 2019). Where values were missing, the temporally nearest value from the same location was taken.
(Mn) = concentration is higher than the 30-day mean BC ENV guideline or outside the recommended pH, DO or total alkalinity range.
(Mx) = concentration is higher than the maximum BC ENV guideline or outside the recommended pH, DO or total alkalinity range.
(E) = concentration is higher than the EVWQP benchmarks guideline.
Bolded concentrations are higher than water quality guidelines.
Shaded concentrations are higher than the EVWQP benchmark (e.g., for nitrate, total selenium, dissolved cadmium or sulphate).
(DL>Mn) = analytical detection limit is higher than the 30-day mean BC ENV guideline.
(DL>E) = analytical detection limit is higher than the EVWQP benchmarks guideline.
Water quality data and guidelines shown in this table were rounded to reflect laboratory or field instrument precision after comparisons to guidelines. Therefore, values slightly above guidelines may be displayed as being equal to the guidelines and identified as exceedances. Concentrations equal to the guideline values were not identified as exceedances.
Concentrations were screened against available Working and Approved British Columbia Ministry of Environment and Climate Change Strategy (BC ENV) Water Quality Guidelines for the Protection of Aquatic Life; Accessed January 2020 from: https://www2.gov.bc.ca/gov/content/environment/air-land-water/water/water-quality/water-quality-guidelines.
- = no guideline or no data
BC ENV = British Columbia Ministry of Environment & Climate Change Strategy; EVWQP = Elk Valley Water Quality Plan guidelines; *C. dubia* = *Ceriodaphnia dubia* ; *P. subcapitata* = *Pseudokirchneriella subcapitata* ; *H. azteca* = *Hyalella azteca* ; *P. promelas* = *Pimephales promelas* ; *O. mykiss* = *Oncorhynchus mykiss* ; CV = coefficient of variation; ∑ = sum of; WQGs = Water Quality Guidelines; CaCO3 = calcium carbonate; mg/L = milligrams per litre; µS/cm = microsiemens per centimeter; NTU = nephelometric turbidity units; meq/L = milliequivalents per litre; mg-N/L = milligrams of Nitrogen per litre; mg-P/L = milligrams of Phosphorus per litre.
BC ENV (B.C. Ministry of Climate Chande Strategy). 2019. Copper Water Quality guideline for the Protection of Aquatic Life-Technical Report. Water Quality Guideline Series, WQG-03-1. Prov. B.C., Victoria B.C.

Parameter	Unit	Guidelines for the protection of: Aquatic Life 30-day mean	Aquatic Life Maximum	EVWQP Benchmarks	Q1 EV_HC1 *P. subcapitata* 23-Feb-21	2-Mar-21	9-Mar-21	16-Mar-21	23-Mar-21	30-Mar-21	Mar 2, 9, 16, 23, 30 *P. promelas* Mean	CV	*C. dubia* 14-Apr-21
Field Measured													
pH	-	6.5 - 9.0	6.5 - 9.0	-	8.1	8.2	8.0	8.3	8.1	8.0	8.1	0.016	8.1
Specific conductivity	µS/cm at 25 C	-	-	-	760	762	746	686	703	1687	917	0.47	834
Temperature	°C	-	-	-	0.2	0.6	0.9	1.4	2.1	0.5	1.1	0.6	2.6
Dissolved oxygen	mg/L	11	9.0	-	11	12	12	11	12	12	12	0.015	11
Turbidity	NTU	-	-	-	0.51	0.11	1.4	0.93	0.75	1.9	1.0	0.66	0.84
Oxidation-reduction potential field	mv	-	-	-	222	164	178	147	211	210	182	0.16	160
Conventional Parameters													
pH	-	6.5 - 9.0	6.5 - 9.0	-	8.2	8.4	8.2	8.3	8.3	8.2	8.3	0.01	8.6
Hardness, as $CaCO_3$	mg/L	-	-	-	445	447	449	376	387	424	417	0.081	414
Total alkalinity, as $CaCO_3$	mg/L	20[a]	-	-	205	197	212	205	200	212	205	0.033	202
Total dissolved solids	mg/L	-	-	-	499	528	485	446	466	528	491	0.075	500
Total suspended solids	mg/L	-	-	-	<1.0	<1.0	5.8	1.4	<1.0	2.8	2.4	0.85	2.0
Total organic carbon	mg/L	-	-	-	<0.50	<0.50	0.72	1.3	1.6	1.5	1.1	0.43	1.6
Dissolved organic carbon	mg/L	-	-	-	<0.50	<0.50	1.2	0.86	1.4	1.6	1.1	0.4	1.6
Turbidity	NTU	-	-	-	0.28	0.21	0.48	0.79	0.54	1.2	0.64	0.57	31
Total acidity	mg/L	-	-	-	<1.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2	0	<2.0
Cation - anion balance	%	-	-	-	1.9	2.7	2.5	1.9	3.5	5.1	3.2	0.39	3.6
Ion balance	%	-	-	-	104	106	105	96	-	90	99	0.45	93
Conductivity	µS/cm	-	-	-	699	719	700	641	690	787	707	0.075	777
Oxidation-reduction potential	mv	-	-	-	466	438	406	418	268	389	384	0.17	288
Major Ions													
Bicarbonate	mg/L	-	-	-	-	-	-	-	-	-	-	-	-
Bromide	mg/L	-	-	-	<0.050	<0.050	<0.050	<0.050	<0.25	<0.25	<0.13	0.84	<0.050
Calcium	mg/L	-	-	-	92	97	98	75	82	87	88	0.11	85
Carbonate, as $CaCO_3$	mg/L	-	-	-	-	-	-	-	-	-	-	-	-
Chloride	mg/L	150	600	-	1.2	1.2	1.3	0.96	<2.5	1.6	1.5	0.4	1.2
Fluoride	mg/L	0.12[b]	1.6 - 1.9[c]	-	**0.16**[Mn]	**0.21**[Mn]	**0.17**[Mn]	**0.18**[Mn]	**0.21**[Mn]	**0.21**[Mn]	**0.20**[Mn]	0.099	**0.13**[Mn]
Hydroxide	mg/L	-	-	-	-	-	-	-	-	-	-	-	-
Magnesium	mg/L	-	-	-	52	50	49	46	44	51	48	0.057	49
Potassium	mg/L	-	-	-	0.9	0.89	0.87	0.79	0.88	0.99	0.88	0.08	1.0
Sodium	mg/L	-	-	-	1.9	1.8	1.6	1.6	1.6	1.8	1.7	0.046	1.8
Sulphate	mg/L	429[c,d]	-	481	214	216	206	178	208	247	211	0.12	233
Major anion sum	meq/l	-	-	-	8.7	8.6	8.6	7.9	8.4	9.5	8.6	0.068	9.0
Major cation sum	meq/l	-	-	-	9.0	9.0	9.1	7.6	7.8	8.6	8.4	0.08	8.4
Bicarbonate Alkalinity, as $CaCO_3$	mg/l	-	-	-	205	185	212	198	200	212	201	0.056	175
Carbonate Alkalinity, as $CaCO_3$	mg/l	-	-	-	<1.0	12	<1.0	6.8	<1.0	<1.0	4.4	1.1	27
Hydroxide Alkalinity, as $CaCO_3$	mg/l	-	-	-	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1	0	<1.0
Nutrients													
Nitrate	mg-N/L	3.0	33	3.3 - 6.8[c]	0.91	0.93	0.9	0.81	0.95	1.1	0.94	0.12	1.1
Nitrite	mg-N/L	0.020[e]	0.060[e]	-	0.0044	<0.0010	0.0019	<0.0010	<0.0050	<0.0050	0.0028	0.74	<0.0010
Total ammonia	mg-N/L	2.1	14	-	0.025	0.0061	0.0097	0.015	0.026	0.0065	0.013	0.64	0.0057
Total Kjeldahl nitrogen	mg-N/L	-	-	-	0.35	0.44	0.28	0.099	0.21	0.38	0.28	0.48	0.13
Total phosphorus	mg-P/L	-	-	-	0.0058	0.0046	0.0091	0.0089	0.0099	0.0045	0.0074	0.36	0.0039
Orthophosphate	mg-P/L	-	-	-	0.0069	0.0051	0.0071	0.0069	0.0065	0.0064	0.0064	0.12	0.0043
Total Metals													
Aluminum	mg/L	-	-	-	0.0063	0.0057	0.015	0.087	0.034	0.088	0.046	0.86	0.021
Antimony	mg/L	0.0090	-	-	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.0001	0.0001	0	<0.00010
Arsenic	mg/L	0.0050	0.0050	-	0.00016	0.00016	0.0002	0.0002	0.00018	0.00022	0.00019	0.12	0.00016
Barium	mg/L	1.0	-	-	0.071	0.068	0.069	0.059	0.058	0.059	0.063	0.091	0.055
Beryllium	mg/L	0.00013	-	-	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.00002	0	<0.000020
Bismuth	mg/L	0.0005[f]	-	-	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0	<0.000050
Boron	mg/L	1.2	29[b]	-	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.01	0	<0.010
Cadmium	mg/L	-	-	-	0.000017	0.000017	0.00002	0.000028	0.000019	0.000024	0.000021	0.21	0.00002
Calcium	mg/L	-	-	-	96	94	84	76	87	91	87	0.081	83
Chromium	mg/L	0.0010[g]	-	-	0.00016	0.0002	0.00016	0.00025	<0.00050	0.00034	0.00029	0.47	0.00016
Cobalt	mg/L	0.0040	0.11	-	<0.00010	<0.00010	<0.00010	<0.00010	<0.000050	<0.00010	<0.00009	0.25	<0.00010
Copper	mg/L	-	-	-	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	0	<0.00050
Iron	mg/L	0.67 - 2.93[f,h]	1.0	-	<0.010	<0.010	0.021	0.1	0.028	0.11	0.055	0.89	0.024
Lead	mg/L	0.012 - 0.020[c]	0.22 - 0.42[c]	-	<0.000050	<0.000050	<0.000050	0.000084	<0.000030	0.0001	0.000064	0.47	<0.000050
Lithium	mg/L	0.1216[f]	-	-	0.0072	0.0064	0.0068	0.0058	0.0069	0.0083	0.0068	0.14	0.0072
Magnesium	mg/L	-	-	-	54	48	49	42	48	54	48	0.091	47
Manganese	mg/L	1.6 - 2.6[c]	3.0 - 3.4[c]	-	0.0032	0.0034	0.0039	0.0041	0.0073	0.0063	0.005	0.34	0.0024
Mercury	mg/L	0.000010	-	-	<0.00000050	<0.00000050	<0.00000050	0.00000054	0.00000059	0.00000056	0.00000054	0.072	<0.00000050
Molybdenum	mg/L	1.0	2.0	-	0.00094	0.00095	0.00092	0.00089	0.0009	0.00097	0.00092	0.037	0.00091
Nickel	mg/L	0.0053[i]	-	-	0.00054	0.00056	<0.00050	0.00076	0.00076	0.00093	0.0007	0.25	0.00077
Potassium	mg/L	-	-	-	0.91	0.86	0.9	0.86	0.87	1.1	0.92	0.11	0.95
Selenium	mg/L	0.0020	-	0.019	**0.043**[Mn, E]	**0.041**[Mn, E]	**0.038**[Mn, E]	**0.036**[Mn, E]	**0.038**[Mn, E]	**0.049**[Mn, E]	**0.040**[Mn, E]	0.13	**0.048**[Mn, E]
Silicon	mg/L	-	-	-	2.3	2.1	2.1	2.3	2.1	2.3	2.2	0.051	2.0
Silver	mg/L	0.0015[c]	0.0030[c]	-	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	0	<0.000010
Sodium	mg/L	-	-	-	1.9	1.7	1.8	1.7	1.6	1.9	1.7	0.074	1.8
Strontium	mg/L	-	-	-	0.15	0.14	0.14	0.13	0.14	0.13	0.13	0.045	0.13
Sulphur	mg/L	-	-	-	83	79	78	69	75	89	78	0.095	82
Thallium	mg/L	0.00080	-	-	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	0	<0.000010
Tin	mg/L	0.3[f]	-	-	<0.00010	<0.00010	<0.00010	<0.00010	<0.000050	<0.00010	<0.00009	0.25	<0.00010
Titanium	mg/L	0.85[f]	-	-	<0.010	<0.00030	<0.00030	0.0012	0.00061	0.0024	0.00097	0.92	0.00041
Uranium	mg/L	0.0085	0.033[b]	-	0.0028	0.0026	0.0027	0.0023	0.0026	0.0032	0.0027	0.12	0.003
Vanadium	mg/L	0.12[f]	-	-	<0.00050	<0.00050	<0.00050	0.00053	<0.00050	0.00062	0.00053	0.098	<0.00050
Zinc	mg/L	0.10 - 0.19	0.13 - 0.30	-	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.003	0	<0.0030
Dissolved Metals													
Aluminum	mg/L	0.050[h]	0.10[h]	-	<0.0030	<0.0010	<0.0010	<0.0010	0.0014	0.0018	0.0012	0.29	0.0013
Antimony	mg/L	-	-	-	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.00010
Arsenic	mg/L	-	-	-	0.00015	0.00018	0.00014	0.00013	0.00015	0.00016	0.00015	0.13	0.00013
Barium	mg/L	-	-	-	0.071	0.074	0.066	0.058	0.057	0.053	0.062	0.14	0.057
Beryllium	mg/L	-	-	-	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.00002	0	<0.000020
Bismuth	mg/L	-	-	-	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0	<0.000050
Boron	mg/L	-	-	-	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.01	0	<0.010
Cadmium	mg/L	0.00038 - 0.00046[c]	0.0013 - 0.0028[c]	0.00026 - 0.00032[c]	0.000014	0.000014	0.000015	0.000015	0.000013	0.000016	0.000015	0.083	0.000018
Chromium	mg/L	-	-	-	0.00023	0.00019	0.00013	0.00012	0.00015	0.0001	0.00014	0.25	0.00013
Cobalt	mg/L	-	-	-	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.00010
Copper	mg/L	0.0004 - 0.0039[i]	0.0022 - 0.0224[i]	-	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.0002	0	<0.00020
Iron	mg/L	-	0.35	-	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.01	0	<0.010
Lead	mg/L	-	-	-	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0	<0.000050
Lithium	mg/L	-	-	-	0.0067	0.007	0.0073	0.0054	0.0063	0.0077	0.0067	0.13	0.0076
Manganese	mg/L	-	-	-	0.003	0.0031	0.0031	0.0019	0.0065	0.0035	0.0036	0.47	0.0017
Mercury	mg/L	-	-	-	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.000005	0	<0.0000050
Molybdenum	mg/L	-	-	-	0.00098	0.00097	0.00094	0.00079	0.00079	0.00084	0.00087	0.096	0.0009
Nickel	mg/L	-	-	-	0.00054	<0.00050	0.00055	0.00056	0.00058	0.00065	0.00057	0.096	0.00073
Selenium	mg/L	-	-	-	0.04	0.044	0.042	0.036	0.036	0.043	0.04	0.096	0.048
Silicon	mg/L	-	-	-	2.0	2.1	2.0	2.0	2.0	1.7	2.0	0.073	1.8
Silver	mg/L	-	-	-	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	0	<0.000010
Strontium	mg/L	2.5[f]	-	-	0.13	0.15	0.14	0.12	0.13	0.12	0.13	0.088	0.13
Sulphur	mg/L	-	-	-	71	77	75	65	71	77	73	0.073	82
Thallium	mg/L	-	-	-	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	0	<0.000010
Tin	mg/L	-	-	-	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.00010
Titanium	mg/L	-	-	-	<0.010	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.0003	0	<0.00030
Uranium	mg/L	-	-	-	0.0026	0.0028	0.0026	0.0024	0.0025	0.0029	0.0026	0.076	0.0029
Vanadium	mg/L	-	-	-	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	0	<0.00050
Zinc	mg/L	-	-	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0014	0.0011	0.17	<0.0010

Parameter	Q2 EV_HC1 *C. dubia* and *P. subcapitata* 18-May-21	25-May-21	1-Jun-21	8-Jun-21	15-Jun-21	May 18, 25, June 1, 8 *H. azteca* Mean	CV	May 18, 25, June 1, 8, 15 *O. mykiss* Mean	CV
Field Measured									
pH	8.0	8.3	8.0	8.3	8.3	8.2	0.021	8.2	0.02
Specific conductivity	411	512	417	461	532	450	0.1	467	0.12
Temperature	6.6	4.1	5.0	4.1	6.8	5.0	0.24	5.3	0.25
Dissolved oxygen	13	**11**[Mn]	**11**[Mn]	**11**[Mn]	**10**[Mn]	12	0.088	11	0.099
Turbidity	19	4.8	6.9	2.6	1.6	8.3	0.87	6.9	1.0
Oxidation-reduction potential field	108	101	91	105	123	101	0.075	106	0.11
Conventional Parameters									
pH	8.2	8.4	8.2	8.4	8.4	8.3	0.014	8.3	0.013
Hardness, as $CaCO_3$	219	286	232	226	275	241	0.13	248	0.12
Total alkalinity, as $CaCO_3$	163	173	150	164	174	163	0.058	165	0.059
Total dissolved solids	250	306	243	268	334	267	0.11	280	0.14
Total suspended solids	27	3.5	5.0	2.7	2.0	9.6	1.2	8.1	1.3
Total organic carbon	6.3	3.3	2.7	1.8	1.7	3.5	0.55	3.2	0.58
Dissolved organic carbon	4.3	2.9	1.9	1.8	1.6	2.7	0.42	2.5	0.44
Turbidity	22	2.9	5.4	2.4	1.1	8.1	1.1	6.7	1.3
Total acidity	<2.0	<2.0	<2.0	<2.0	<2.0	<2	0	<2	0
Cation - anion balance	3.6	0.61	1.7	4.1	4.3	2.5	0.65	2.9	0.56
Ion balance	93	101	104	92	92	98	0.06	96	0.059
Conductivity	401	511	395	437	515	436	0.12	452	0.13
Oxidation-reduction potential	211	477	393	410	409	373	0.31	380	0.26
Major Ions									
Bicarbonate	-	-	-	-	-	-	-	-	-
Bromide	<0.050	<0.050	<0.050	<0.050	<0.050	<0.05	0	<0.05	0
Calcium	52	66	55	52	60	56	0.11	57	0.099
Carbonate, as $CaCO_3$	-	-	-	-	-	-	-	-	-
Chloride	0.33	0.47	0.43	0.43	0.51	0.42	0.14	0.43	0.15
Fluoride	0.12	**0.14**[Mn]	**0.17**[Mn]	**0.16**[Mn]	**0.16**[Mn]	**0.15**[Mn]	0.16	**0.15**[Mn]	0.14
Hydroxide	-	-	-	-	-	-	-	-	-
Magnesium	21	30	23	23	31	24	0.15	26	0.17
Potassium	0.67	0.74	0.61	0.63	0.77	0.66	0.088	0.68	0.1
Sodium	1.1	1.3	1.0	1.0	1.3	1.1	0.12	1.1	0.12
Sulphate	70	106	71	79	122	82	0.21	90	0.26
Major anion sum	4.8	5.7	4.5	5.0	6.1	5.0	0.1	5.2	0.13
Major cation sum	4.4	5.8	4.7	4.6	5.6	4.9	0.13	5.0	0.12
Bicarbonate Alkalinity, as $CaCO_3$	163	168	150	160	165	160	0.047	161	0.043
Carbonate Alkalinity, as $CaCO_3$	<1.0	5.6	<1.0	3.2	9.2	2.7	0.81	4.0	0.87
Hydroxide Alkalinity, as $CaCO_3$	<1.0	<1.0	<1.0	<1.0	<1.0	<1	0	<1	0
Nutrients									
Nitrate	0.39	0.5	0.35	0.38	0.49	0.4	0.16	0.42	0.16
Nitrite	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.001	0	<0.001	0
Total ammonia	0.012	0.0052	0.0076	0.015	0.018	0.01	0.44	0.012	0.44
Total Kjeldahl nitrogen	0.32	0.18	0.099	0.065	0.2	0.17	0.68	0.17	0.57
Total phosphorus	0.033	0.0078	0.012	0.0085	0.0063	0.015	0.79	0.014	0.83
Orthophosphate	0.0064	0.0068	0.0052	0.0065	<0.0010	0.0062	0.11	0.0052	0.47
Total Metals									
Aluminum	0.51	0.16	0.11	0.041	0.023	0.2	1.0	0.17	1.2
Antimony	0.0001	<0.00010	<0.00010	<0.00010	<0.00010	0.0001	0	0.0001	0
Arsenic	0.00045	0.00019	0.00019	0.00019	0.00017	0.00026	0.51	0.00024	0.5
Barium	0.041	0.042	0.036	0.038	0.042	0.039	0.074	0.04	0.071
Beryllium	0.000044	<0.000020	<0.000020	<0.000020	<0.000020	0.000026	0.46	0.000025	0.43
Bismuth	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0	<0.00005	0
Boron	<0.010	<0.010	<0.010	<0.010	<0.010	<0.01	0	<0.01	0
Cadmium	0.000071	0.000026	0.00003	0.000018	0.00002	0.000036	0.65	0.000033	0.66
Calcium	52	60	53	58	64	56	0.07	57	0.085
Chromium	0.00075	0.00027	0.0002	0.00019	0.00028	0.00035	0.76	0.00034	0.69
Cobalt	0.0003	<0.00010	<0.00010	<0.00010	<0.00010	0.00015	0.67	0.00014	0.64
Copper	0.0012	<0.00050	0.00055	<0.00050	<0.00050	0.00068	0.47	0.00064	0.45
Iron	0.67	0.12	0.12	0.038	0.039	0.24	1.2	0.2	1.4
Lead	0.00047	0.000076	0.00011	<0.000050	<0.000050	0.00018	1.1	0.00015	1.2
Lithium	0.0045	0.0056	0.0039	0.0045	0.0054	0.0046	0.15	0.0048	0.15
Magnesium	21	28	20	25	31	24	0.16	25	0.18
Manganese	0.017	0.0034	0.0046	0.0027	0.0035	0.0069	0.98	0.0062	0.97
Mercury	0.0000043	0.0000017	0.0000017	0.00000088	0.00000064	0.0000021	0.7	0.0000018	0.79
Molybdenum	0.0006	0.00079	0.00056	0.00067	0.00076	0.00065	0.16	0.00067	0.15
Nickel	0.0018	0.00091	0.00059	0.00061	0.001	0.00099	0.59	0.00099	0.51
Potassium	0.85	0.82	0.61	0.65	0.74	0.73	0.17	0.73	0.14
Selenium	**0.017**[Mn]	**0.026**[Mn, E]	**0.016**[Mn]	**0.019**[Mn]	**0.026**[Mn, E]	**0.020**[Mn, E]	0.23	**0.021**[Mn, E]	0.23
Silicon	2.6	2.4	2.1	2.0	1.9	2.3	0.12	2.2	0.13
Silver	0.000015	<0.000010	<0.000010	<0.000010	<0.000010	0.000011	0.22	0.000011	0.2
Sodium	1.0	1.6	0.94	1.1	1.2	1.1	0.25	1.2	0.22
Strontium	0.086	0.11	0.087	0.094	0.1	0.093	0.099	0.095	0.092
Sulphur	26	39	23	31	41	30	0.23	32	0.25
Thallium	0.000032	<0.000010	<0.000010	<0.000010	<0.000010	0.000016	0.71	0.000014	0.68
Tin	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.0001	0
Titanium	0.0033	0.0031	0.0015	0.00061	0.00063	0.0021	0.61	0.0018	0.71
Uranium	0.0011	0.0016	0.0011	0.0014	0.0018	0.0013	0.17	0.0014	0.2
Vanadium	0.0017	0.0006	<0.00050	<0.00050	<0.00050	0.00084	0.72	0.00077	0.71
Zinc	0.0052	<0.0030	<0.0030	<0.0030	<0.0030	0.0036	0.31	0.0034	0.29
Dissolved Metals									
Aluminum	0.0047	0.0031	0.0032	0.0019	0.0022	0.0032	0.36	0.003	0.36
Antimony	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.0001	0
Arsenic	0.00016	0.00014	0.00018	0.00016	0.00017	0.00016	0.1	0.00016	0.092
Barium	0.035	0.041	0.034	0.039	0.044	0.037	0.084	0.039	0.11
Beryllium	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.00002	0	<0.00002	0
Bismuth	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0	<0.00005	0
Boron	<0.010	<0.010	<0.010	<0.010	<0.010	<0.01	0	<0.01	0
Cadmium	0.000015	0.000021	0.000014	0.000013	0.000012	0.000016	0.24	0.000015	0.26
Chromium	<0.00010	0.00011	<0.00010	0.00012	0.00015	0.00011	0.089	0.00012	0.18
Cobalt	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.0001	0
Copper	0.00033	0.00023	0.00021	<0.00020	<0.00020	0.00024	0.25	0.00023	0.24
Iron	<0.010	<0.010	<0.010	<0.010	<0.010	<0.01	0	<0.01	0
Lead	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0	<0.00005	0
Lithium	0.0044	0.0052	0.0039	0.0044	0.0053	0.0045	0.12	0.0046	0.13
Manganese	0.0012	0.001	0.00087	0.0012	0.0026	0.0011	0.15	0.0014	0.51
Mercury	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.000005	0	<0.000005	0
Molybdenum	0.00057	0.00075	0.00065	0.00069	0.0007	0.00066	0.12	0.00067	0.11
Nickel	0.00061	0.00074	0.0006	0.0005	0.00064	0.00061	0.16	0.00062	0.14
Selenium	0.016	0.024	0.017	0.019	0.026	0.019	0.18	0.021	0.21
Silicon	1.8	2.1	1.8	1.9	1.9	1.9	0.074	1.9	0.064
Silver	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	0	<0.00001	0
Strontium	0.082	0.11	0.098	0.091	0.094	0.095	0.12	0.094	0.1
Sulphur	22	37	25	28	39	28	0.23	30	0.25
Thallium	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	0	<0.00001	0
Tin	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.0001	0
Titanium	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.0003	0	<0.0003	0
Uranium	0.0011	0.0016	0.0013	0.0014	0.0017	0.0013	0.16	0.0014	0.18
Vanadium	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	0	<0.0005	0
Zinc	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.001	0	<0.001	0

Parameter	Q3 EV_HC1 *C. dubia* and *P. subcapitata* 10-Aug-21	17-Aug-21	24-Aug-21	31-Aug-21	7-Sep-21	Aug 10, 17, 24, 31 *H. azteca* Mean	CV	Aug 10, 17, 24, 31 Sept 7 *P. promelas* Mean	CV	Q4 EV_HC1 *C. dubia* and *P. subcapitata* 12-Oct-21	19-Oct-21	26-Oct-21	2-Nov-21	9-Nov-21
Field Measured														
pH	8.3	8.3	8.3	8.4	8.4	8.3	0.006	8.3	0.0066	8.4	8.3	8.3	8.4	8.4
Specific conductivity	644	615	676	670	678	651	0.043	657	0.041	720	721	725	782	747
Temperature	9.9	8.7	8.0	8.5	8.5	8.8	0.092	8.7	0.081	1.7	2.8	4.2	0.5	1.1
Dissolved oxygen	**9.6**[Mn]	**9.5**[Mn]	**9.9**[Mn]	**10**[Mn]	**11**[Mn]	**9.8**[Mn]	0.024	**10**[Mn]	0.06	12	11	**11**[Mn]	12	11
Turbidity	2.9	34	1.3	2.5	1.9	10	1.6	8.4	1.7	1.5	0.73	1.5	1.5	1.6
Oxidation-reduction potential field	179	145	166	170	83	165	0.089	149	0.26	113	159	187	184	140
Conventional Parameters														
pH	8.4	8.3	8.3	8.4	8.3	8.4	0.0069	8.3	0.0066	8.3	8.4	8.3	8.3	8.2
Hardness, as $CaCO_3$	355	340	360	362	351	354	0.028	354	0.025	385	386	402	447	451
Total alkalinity, as $CaCO_3$	186	184	193	196	189	190	0.03	190	0.026	200	198	188	207	225
Total dissolved solids	424	396	459	447	483	432	0.064	442	0.075	468	481	482	514	515
Total suspended solids	4.0	31	<1.0	1.0	<1.0	9.3	1.6	7.7	1.7	<1.0	<1.0	<1.0	1.0	1.0
Total organic carbon	3.8	5.2	1.4	3.8	1.8	3.5	0.44	3.2	0.49	<0.50	1.4	0.9	1.5	0.63
Dissolved organic carbon	3.7	1.1	1.3	4.5	2.1	2.7	0.64	2.5	0.59	0.86	1.2	0.68	1.5	0.59
Turbidity	1.6	41	1.1	1.3	0.82	11	1.8	9.1	1.9	0.3	0.39	0.5	0.52	0.62
Total acidity	<2.0	<2.0	<2.0	<2.0	2.9	<2	0	2.2	0.18	<2.0	<2.0	<2.0	<2.0	<2.0
Cation - anion balance	0.28	1.5	3.9	3.9	3.1	2.4	0.75	2.5	0.63	1.4	4.8	1.6	0.78	0.16
Ion balance	99	97	93	93	94	95	0.036	95	0.032	97	91	97	102	100
Conductivity	632	591	621	666	655	628	0.049	633	0.047	589	698	710	772	725
Oxidation-reduction potential	453	382	450	468	452	438	0.087	441	0.077	470	459	479	429	454
Major Ions														
Bicarbonate	-	-	-	227	222	227	0.5	225	0.55	231	230	225	253	225
Bromide	<0.050	0.052	<0.050	<0.050	<0.050	0.051	0.02	0.05	0.018	<0.050	<0.050	<0.050	<0.050	<0.050
Calcium	74	70	75	76	71	74	0.038	73	0.038	81	84	82	93	89
Carbonate, as $CaCO_3$	-	-	-	6.0	4.6	6.0	0.5	5.3	0.56	6.4	5.5	2.0	<1.0	<1.0
Chloride	0.94	0.78	0.94	0.78	0.83	0.86	0.11	0.85	0.095	0.77	0.92	1.1	0.99	1.1
Fluoride	**0.20**[Mn]	**0.20**[Mn]	**0.25**[Mn]	**0.17**[Mn]	**0.19**[Mn]	**0.21**[Mn]	0.16	**0.20**[Mn]	0.15	**0.16**[Mn]	**0.17**[Mn]	**0.21**[Mn]	**0.16**[Mn]	**0.22**[Mn]
Hydroxide	-	-	-	<1.0	<1.0	1.0	0.5	1.0	0.55	<1.0	<1.0	<1.0	<1.0	<1.0
Magnesium	41	40	42	42	42	41	0.019	41	0.02	45	43	48	52	56
Potassium	0.99	1.1	0.87	0.88	0.9	0.96	0.1	0.94	0.094	0.97	0.88	0.97	0.96	1.0
Sodium	1.5	1.6	1.4	1.5	1.5	1.5	0.036	1.5	0.031	1.7	1.6	1.6	1.7	1.9
Sulphate	165	161	189	188	178	176	0.084	176	0.073	190	218	218	224	219
Major anion sum	7.2	7.1	7.9	7.9	7.6	7.5	0.056	7.5	0.049	8.0	8.6	8.4	8.9	9.2
Major cation sum	7.2	6.9	7.3	7.3	7.1	7.2	0.027	7.2	0.024	7.8	7.8	8.1	9.0	9.1
Bicarbonate Alkalinity, as $CaCO_3$	180	175	193	186	182	184	0.042	183	0.037	189	188	184	207	184
Carbonate Alkalinity, as $CaCO_3$	5.4	8.6	<1.0	10	7.6	6.3	0.64	6.5	0.54	11	9.2	3.4	<1.0	<1.0
Hydroxide Alkalinity, as $CaCO_3$	<1.0	<1.0	<1.0	<1.0	<1.0	<1	0	<1	0	<1.0	<1.0	<1.0	<1.0	<1.0
Nutrients														
Nitrate	0.48	0.49	0.6	0.56	0.53	0.53	0.11	0.53	0.091	0.6	0.7	0.71	0.79	0.81
Nitrite	0.0011	0.0022	<0.0010	0.0018	0.0012	0.0015	0.38	0.0015	0.35	<0.0010	0.0013	<0.0010	<0.0010	<0.0010
Total ammonia	0.0097	0.046	0.0099	0.017	<0.0050	0.021	0.83	0.018	0.94	<0.0050	0.0079	<0.0050	0.0055	0.0061
Total Kjeldahl nitrogen	0.053	0.42	0.09	0.14	0.052	0.18	0.95	0.15	1.0	0.1	0.083	0.24	0.18	0.13
Total phosphorus	0.0096	0.067	0.022	0.006	0.0062	0.026	1.1	0.022	1.2	0.011	0.0052	0.0065	0.0055	0.0064
Orthophosphate	0.0019	0.0044	0.0063	0.0034	0.0012	0.004	0.46	0.0034	0.59	0.0034	0.0051	0.0049	0.0066	0.0053
Total Metals														
Aluminum	0.032	0.69	0.022	0.017	0.019	0.19	1.8	0.16	1.9	0.023	0.0096	0.0081	0.0084	0.019
Antimony	<0.00010	0.00014	<0.00010	<0.00010	<0.00010	0.00011	0.18	0.00011	0.17	<0.00010	0.0001	<0.00010	<0.00010	<0.00010
Arsenic	0.00023	0.00054	0.00026	0.00023	0.00021	0.00032	0.48	0.00029	0.47	0.00016	0.00018	0.00017	0.00017	0.00021
Barium	0.058	0.068	0.057	0.057	0.059	0.06	0.088	0.06	0.077	0.064	0.062	0.066	0.06	0.059
Beryllium	<0.000020	0.000051	<0.000020	<0.000020	<0.000020	0.000028	0.56	0.000026	0.53	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
Bismuth	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0	<0.00005	0	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Boron	<0.010	<0.010	<0.010	<0.010	<0.010	<0.01	0	<0.01	0	<0.010	<0.010	<0.010	<0.010	<0.010
Cadmium	0.000017	0.000079	0.000015	0.000016	0.000016	0.000032	1.0	0.000029	0.99	0.000019	0.000016	0.000015	0.000017	0.000018
Calcium	69	69	85	78	75	75	0.1	75	0.09	89	80	82	88	85
Chromium	0.00027	**0.0010**[Mn]	0.00018	0.00019	0.00019	0.00041	0.96	0.00037	0.97	0.00028	0.00017	0.00019	0.00017	0.00019
Cobalt	<0.00010	0.00048	<0.00010	<0.00010	<0.00010	0.0002	0.97	0.00018	0.97	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Copper	<0.00050	0.0016	<0.00050	<0.00050	<0.00050	0.00077	0.7	0.00071	0.67	0.0036	<0.00050	<0.00050	<0.00050	<0.00050
Iron	0.042	0.89	0.026	0.023	0.028	0.24	1.8	0.2	1.9	0.043	0.016	0.016	0.013	0.024
Lead	<0.000050	0.00073	<0.000050	0.000059	<0.000050	0.00022	1.5	0.00019	1.6	0.00013	<0.000050	<0.000050	<0.000050	<0.000050
Lithium	0.0068	0.0071	0.0076	0.0066	0.0063	0.007	0.062	0.0069	0.072	0.0074	0.0071	0.0071	0.0075	0.0071
Magnesium	38	39	42	43	45	40	0.059	41	0.07	50	47	48	52	51
Manganese	0.006	0.024	0.0055	0.0049	0.0045	0.01	0.92	0.009	0.94	0.0048	0.0031	0.0034	0.0027	0.0029
Mercury	0.0000006	0.0000063	0.00000053	<0.00000050	<0.00000050	0.000002	1.5	0.0000017	1.5	0.00000058	<0.00000050	<0.00000050	<0.00000050	<0.00000050
Molybdenum	0.00088	0.00093	0.00098	0.00088	0.00092	0.00092	0.052	0.00092	0.045	0.00094	0.00093	0.00095	0.0011	0.00098
Nickel	0.0007	0.002	0.00072	0.0007	0.00066	0.001	0.64	0.00096	0.62	0.00067	0.00059	0.00064	0.00068	0.00066
Potassium	0.9	1.2	0.9	0.93	0.91	0.99	0.16	0.98	0.15	0.97	0.87	0.99	0.99	0.98
Selenium	**0.030**[Mn, E]	**0.030**[Mn, E]	**0.032**[Mn, E]	**0.033**[Mn, E]	**0.035**[Mn, E]	**0.031**[Mn, E]	0.048	**0.032**[Mn, E]	0.066	**0.036**[Mn, E]	**0.036**[Mn, E]	**0.038**[Mn, E]	**0.041**[Mn, E]	**0.038**[Mn, E]
Silicon	2.2	3.1	2.3	2.3	2.2	2.5	0.16	2.4	0.15	2.2	2.1	2.1	2.2	2.1
Silver	<0.000010	0.000022	<0.000010	<0.000010	<0.000010	0.000013	0.46	0.000012	0.43	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Sodium	1.5	1.4	1.5	1.6	1.5	1.5	0.047	1.5	0.042	1.7	1.5	1.8	1.7	1.8
Strontium	0.12	0.12	0.13	0.12	0.12	0.12	0.029	0.12	0.026	0.14	0.13	0.13	0.14	0.14
Sulphur	59	61	64	70	73	63	0.081	65	0.094	79	79	79	82	77
Thallium	<0.000010	0.000034	<0.000010	<0.000010	<0.000010	0.000016	0.75	0.000015	0.73	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Tin	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.0001	0	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Titanium	<0.00090	0.0047	0.00038	0.00041	0.00032	0.0016	1.3	0.0013	1.4	<0.00060	<0.00030	<0.00030	<0.00030	0.00036
Uranium	0.0021	0.0021	0.0023	0.0022	0.0023	0.0022	0.039	0.0022	0.044	0.0024	0.0027	0.0029	0.0029	0.0028
Vanadium	<0.00050	0.0026	0.00056	<0.00050	<0.00050	0.001	0.99	0.00093	0.99	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Zinc	0.0038	0.0071	<0.0030	<0.0030	<0.0030	0.0042	0.46	0.004	0.45	0.0046	0.0033	<0.0030	<0.0030	<0.0030
Dissolved Metals						-		-						
Aluminum	0.0014	0.0088	0.0021	0.0017	0.0012	0.0035	1.0	0.003	1.1	0.0016	<0.0010	0.0011	0.002	0.0011
Antimony	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.0001	0	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Arsenic	0.00018	0.00019	0.00019	0.00018	0.00018	0.00019	0.031	0.00018	0.03	0.00016	0.00016	0.00016	0.00016	0.00016
Barium	0.061	0.063	0.058	0.058	0.058	0.06	0.038	0.059	0.037	0.063	0.063	0.063	0.061	0.063
Beryllium	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.00002	0	<0.00002	0	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
Bismuth	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0	<0.00005	0	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Boron	<0.010	<0.010	<0.010	<0.010	<0.010	<0.01	0	<0.01	0	<0.010	<0.010	<0.010	<0.010	<0.010
Cadmium	0.000013	0.000014	0.000014	0.000014	0.0000095	0.000014	0.055	0.000013	0.16	0.000014	0.0000098	0.000013	0.000019	0.000016
Chromium	0.00013	0.00015	0.00013	0.00015	0.00014	0.00014	0.082	0.00014	0.071	0.00018	0.00014	0.00014	0.00024	0.00019
Cobalt	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.0001	0	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Copper	<0.00020	0.00023	0.00081	<0.00020	<0.00020	0.00036	0.83	0.00033	0.82	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Iron	<0.010	<0.010	<0.010	<0.010	<0.010	<0.01	0	<0.01	0	<0.010	<0.010	<0.010	<0.010	<0.010
Lead	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0	<0.00005	0	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Lithium	0.0067	0.0067	0.0073	0.0074	0.0064	0.007	0.054	0.0069	0.062	0.0075	0.0068	0.0071	0.0075	0.007
Manganese	0.0033	0.0059	0.0041	0.0037	0.0029	0.0043	0.27	0.004	0.29	0.0034	0.0027	0.0029	0.0022	0.0026
Mercury	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.000005	0	<0.000005	0	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Molybdenum	0.00089	0.00086	0.00095	0.00094	0.00089	0.00091	0.044	0.00091	0.04	0.00096	0.00095	0.00092	0.00093	0.00095
Nickel	0.00057	0.00062	<0.00050	0.00061	0.00051	0.00058	0.095	0.00056	0.099	0.00068	0.00054	<0.00050	0.00069	0.00066
Selenium	0.031	0.027	0.031	0.031	0.032	0.03	0.066	0.03	0.067	0.038	0.041	0.042	0.045	0.042
Silicon	2.1	2.1	2.0	2.0	2.0	2.1	0.021	2.0	0.021	2.1	2.0	2.1	2.1	2.1
Silver	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	0	<0.00001	0	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Strontium	0.13	0.12	0.12	0.13	0.12	0.12	0.021	0.12	0.036	0.13	0.13	0.13	0.14	0.14
Sulphur	56	54	63	63	65	59	0.074	60	0.076	75	74	68	84	80
Thallium	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	0	<0.00001	0	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Tin	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.0001	0	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Titanium	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.0003	0	<0.0003	0	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
Uranium	0.0022	0.0021	0.0022	0.0024	0.0024	0.0022	0.054	0.0022	0.054	0.0026	0.0026	0.0026	0.0028	0.0027
Vanadium	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	0	<0.0005	0	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Zinc	<0.0010	<0.0010	0.0021	<0.0010	<0.0010	0.0013	0.43	0.0012	0.4	0.0017	<0.0010	<0.0010	<0.0010	<0.0010

(a) = guideline is a minimum value, unless the background concentration or value is lower.
(b) = guideline is adopted from CCME Canadian Environmental Quality Guidelines (CCME, 1999).
(c) = guideline is hardness dependent. The guideline range shown is based on the hardness range observed in the dataset (219 to 451 mg/L). The guideline is calculated based on the individual hardness value for each sample.
(d) = for some samples, water hardness was greater than 250 mg/L. At this hardness, no BC ENV water quality guideline has been established for sulphate; however, the observed data were screened against the guideline for very hard water (i.e., 429 mg/L) for comparative purposes.
(e) = guideline is chloride dependent. The guideline range shown is based on the chloride concentration range observed in the dataset (1.2500 to 1.5600 mg/L). The guideline is calculated based on the individual chloride concentration in each sample.
(f) = guideline is adopted from the ECCC PNECs (ECCC, 2018) or draft FEQGs (ECCC, 2017).
(g) = guideline is for chromium VI.
(h) = guideline is pH dependent. The guideline range shown is based on the pH range observed in the dataset (8.0 to 8.4). The guideline is calculated based on the individual pH for each sample.
(i) = guideline is a level 1 interim screening value.
(j) = dissolved copper guideline was calculated using the simplified Biotic Ligand Midel (BC ENV, 2019). Where values were missing, the temporally nearest value from the same location was taken.
(Mn) = concentration is higher than the 30-day mean BC ENV guideline or outside the recommended pH, DO or total alkalinity range.
(Mx) = concentration is higher than the maximum BC ENV guideline or outside the recommended pH, DO or total alkalinity range.
(E) = concentration is higher than the EVWQP benchmarks guideline.
Bolded concentrations are higher than water quality guidelines.
Shaded concentrations are higher than the EVWQP benchmark (e.g., for nitrate, total selenium, dissolved cadmium or sulphate).
Water quality data and guidelines shown in this table were rounded to reflect laboratory or field instrument precision after comparisons to guidelines. Therefore, values slightly above guidelines may be displayed as being equal to the guidelines and identified as exceedances. Concentrations equal to the guideline values were not identified as exceedances.
Concentrations were screened against available Working and Approved British Columbia Ministry of Environment and Climate Change Strategy (BC ENV) Water Quality Guidelines for the Protection of Aquatic Life; Accessed January 2020 from: https://www2.gov.bc.ca/gov/content/environment/air-land-water/water/water-quality/water-quality-guidelines.
\- = no guideline or no data
BC ENV = British Columbia Ministry of Environment & Climate Change Strategy; EVWQP = Elk Valley Water Quality Plan guidelines; *C. dubia* = *Ceriodaphnia dubia* ; *P. subcapitata* = *Pseudokirchneriella subcapitata* ; *H. azteca* = *Hyallela azteca* ; *P. promelas* = *Pimephales promelas* ; *O. mykiss* = *Oncorhynchus mykiss* ; CV = coefficient of variation;∑ = sum of; WQGs = Water Quality Guidelines; CaCO3 = calcium carbonate; mg/L = milligrams per litre; µS/cm = microsiemens per centimeter; NTU = nephelometric turbidity units; meq/L = milliequivalents per litre; mg-N/L = milligrams of Nitrogen per litre; mg=P/L = milligrams of Phosphorus per litre.
BC ENV (B.C. Ministry of Climate Chande Strategy). 2019. Copper Water Quality guideline for the Protection of Aquatic Life-Technical Report. Water Quality Guideline Series, WQG-03-1. Prov. B.C., Victoria B.C.

Parameter	Unit	Guidelines for the protection of: Aquatic Life 30-day mean	Aquatic Life Maximum	EVWQP Benchmarks	Oct 12, 19, 26, Nov 2 *H. azteca* Mean	Oct 12, 19, 26, Nov 2 *H. azteca* CV	Oct 12, 19, 26, Nov 2, 9 *O. mykiss* Mean	Oct 12, 19, 26, Nov 2, 9 *O. mykiss* CV
Field Measured								
pH		6.5 - 9.0	6.5 - 9.0	-	8.4	0.0069	8.4	0.0066
Specific conductivity	µS/cm at 25 C	-	-	-	737	0.041	739	0.036
Temperature	°C	-	-	-	2.3	0.69	2.1	0.71
Dissolved oxygen	mg/L	11	9.0	-	11	0.043	11	0.037
Turbidity	NTU	-	-	-	1.3	0.3	1.4	0.26
Oxidation-reduction potential field	mv	-	-	-	161	0.21	157	0.2
Conventional Parameters								
pH	-	6.5 - 9.0	6.5 - 9.0	-	8.3	0.006	8.3	0.0085
Hardness, as $CaCO_3$	mg/L	-	-	-	405	0.072	414	0.078
Total alkalinity, as $CaCO_3$	mg/L	20[(c)]	-	-	198	0.04	204	0.068
Total dissolved solids	mg/L	-	-	-	486	0.04	492	0.043
Total suspended solids	mg/L	-	-	-	1.0	0	1.0	0
Total organic carbon	mg/L	-	-	-	1.1	0.43	0.99	0.46
Dissolved organic carbon	mg/L	-	-	-	1.1	0.35	0.97	0.4
Turbidity	NTU	-	-	-	0.43	0.24	0.47	0.27
Total acidity	mg/L	-	-	-	<2	0	<2	0
Cation - anion balance	%	-	-	-	2.1	0.84	1.7	1.0
Ion balance	%	-	-	-	97	0.047	97	0.043
Conductivity	µS/cm	-	-	-	692	0.11	699	0.097
Oxidation-reduction potential	mv	-	-	-	459	0.047	458	0.041
Major Ions								
Bicarbonate	mg/L	-	-	-	235	0.053	233	0.05
Bromide	mg/L	-	-	-	<0.05	0	<0.05	0
Calcium	mg/L	-	-	-	85	0.069	86	0.063
Carbonate, as $CaCO_3$	mg/L	-	-	-	3.7	0.71	3.2	0.81
Chloride	mg/L	150	600	-	0.96	0.16	0.99	0.16
Fluoride	mg/L	0.12[(f)]	1.6 - 1.9[(d)]	-	**0.18**[(Mn)]	0.14	**0.18**[(Mn)]	0.16
Hydroxide	mg/L	-	-	-	<1	0	<1	0
Magnesium	mg/L	-	-	-	47	0.084	49	0.11
Potassium	mg/L	-	-	-	0.94	0.048	0.96	0.055
Sodium	mg/L	-	-	-	1.6	0.04	1.7	0.08
Sulphate	mg/L	429[(d),(f)]	-	481	213	0.072	214	0.063
Major anion sum	meq/l	-	-	-	8.5	0.043	8.6	0.051
Major cation sum	meq/l	-	-	-	8.2	0.071	8.4	0.078
Bicarbonate Alkalinity, as $CaCO_3$	mg/l	-	-	-	192	0.053	190	0.05
Carbonate Alkalinity, as $CaCO_3$	mg/l	-	-	-	6.1	0.76	5.0	0.91
Hydroxide Alkalinity, as $CaCO_3$	mg/l	-	-	-	<1	0	<1	0
Nutrients								
Nitrate	mg-N/L	3.0	33	3.3 - 6.8[(c)]	0.7	0.11	0.72	0.11
Nitrite	mg-N/L	0.020[(e)]	0.060[(e)]	-	0.0011	0.14	0.0011	0.13
Total ammonia	mg-N/L	2.1	14	-	0.0059	0.24	0.0059	0.2
Total Kjeldahl nitrogen	mg-N/L	-	-	-	0.15	0.49	0.15	0.44
Total phosphorus	mg-P/L	-	-	-	0.007	0.36	0.0068	0.32
Orthophosphate	mg-P/L	-	-	-	0.005	0.26	0.0051	0.23
Total Metals								
Aluminum	mg/L	-	-	-	0.012	0.57	0.013	0.5
Antimony	mg/L	0.0090	-	-	0.0001	0	0.0001	0
Arsenic	mg/L	0.0050	0.0050	-	0.00017	0.048	0.00018	0.11
Barium	mg/L	1.0	-	-	0.063	0.041	0.062	0.044
Beryllium	mg/L	0.00013	-	-	<0.00002	0	<0.00002	0
Bismuth	mg/L	0.0005[(f)]	-	-	<0.00005	0	<0.00005	0
Boron	mg/L	1.2	29[(h)]	-	<0.01	0	<0.01	0
Cadmium	mg/L	-	-	-	0.000017	0.12	0.000017	0.1
Calcium	mg/L	-	-	-	85	0.054	85	0.047
Chromium	mg/L	0.0010[(g)]	-	-	0.0002	0.26	0.0002	0.23
Cobalt	mg/L	0.0040	0.11	-	<0.0001	0	<0.0001	0
Copper	mg/L	-	-	-	0.0013	1.2	0.0011	1.2
Iron	mg/L	0.67 - 2.93[(f),(i)]	1.0	-	0.022	0.64	0.022	0.55
Lead	mg/L	0.012 - 0.020[(c)]	0.22 - 0.42[(c)]	-	0.000071	0.59	0.000067	0.56
Lithium	mg/L	0.1216[(f)]	-	-	0.0073	0.028	0.0072	0.027
Magnesium	mg/L	-	-	-	49	0.044	50	0.042
Manganese	mg/L	1.6 - 2.6[(c)]	3.0 - 3.4[(c)]	-	0.0035	0.25	0.0034	0.24
Mercury	mg/L	0.000010	-	-	0.00000052	0.077	0.00000052	0.069
Molybdenum	mg/L	1.0	2.0	-	0.00097	0.067	0.00097	0.058
Nickel	mg/L	0.0053[(f)]	-	-	0.00065	0.063	0.00065	0.055
Potassium	mg/L	-	-	-	0.95	0.062	0.96	0.055
Selenium	mg/L	0.0020	-	0.019	**0.038**[(Mn, E)]	0.063	**0.038**[(Mn, E)]	0.054
Silicon	mg/L	-	-	-	2.1	0.035	2.1	0.033
Silver	mg/L	0.0015[(f)]	0.0030[(f)]	-	<0.00001	0	<0.00001	0
Sodium	mg/L	-	-	-	1.7	0.057	1.7	0.058
Strontium	mg/L	-	-	-	0.13	0.037	0.13	0.035
Sulphur	mg/L	-	-	-	80	0.022	79	0.025
Thallium	mg/L	0.00080	-	-	<0.00001	0	<0.00001	0
Tin	mg/L	0.3[(f)]	-	-	<0.0001	0	<0.0001	0
Titanium	mg/L	0.85[(f)]	-	-	<0.000375	0.4	0.00037	0.35
Uranium	mg/L	0.0085	0.033[(h)]	-	0.0027	0.086	0.0027	0.075
Vanadium	mg/L	0.12[(f)]	-	-	<0.0005	0	<0.0005	0
Zinc	mg/L	0.10 - 0.19	0.13 - 0.30	-	0.0035	0.22	0.0034	0.21
Dissolved Metals								
Aluminum	mg/L	0.050[(h)]	0.10[(h)]	-	0.0014	0.33	0.0014	0.31
Antimony	mg/L	-	-	-	<0.0001	0	<0.0001	0
Arsenic	mg/L	-	-	-	0.00016	0	0.00016	0
Barium	mg/L	-	-	-	0.063	0.013	0.063	0.012
Beryllium	mg/L	-	-	-	<0.00002	0	<0.00002	0
Bismuth	mg/L	-	-	-	<0.00005	0	<0.00005	0
Boron	mg/L	-	-	-	<0.01	0	<0.01	0
Cadmium	mg/L	0.00038 - 0.00046[(c)]	0.0013 - 0.0028[(c)]	0.00026 - 0.00032[(c)]	0.000014	0.27	0.000014	0.23
Chromium	mg/L	-	-	-	0.00018	0.27	0.00018	0.23
Cobalt	mg/L	-	-	-	<0.0001	0	<0.0001	0
Copper	mg/L	0.0004 - 0.0039[(j)]	0.0022 - 0.0224[(c)]	-	<0.0002	0	<0.0002	0
Iron	mg/L	-	0.35	-	<0.01	0	<0.01	0
Lead	mg/L	-	-	-	<0.00005	0	<0.00005	0
Lithium	mg/L	-	-	-	0.0072	0.047	0.0072	0.043
Manganese	mg/L	-	-	-	0.0028	0.17	0.0028	0.15
Mercury	mg/L	-	-	-	<0.000005	0	<0.000005	0
Molybdenum	mg/L	-	-	-	0.00094	0.021	0.00094	0.019
Nickel	mg/L	-	-	-	0.0006	0.16	0.00061	0.14
Selenium	mg/L	-	-	-	0.042	0.065	0.042	0.057
Silicon	mg/L	-	-	-	2.1	0.02	2.1	0.017
Silver	mg/L	-	-	-	<0.00001	0	<0.00001	0
Strontium	mg/L	2.5[(f)]	-	-	0.13	0.023	0.13	0.04
Sulphur	mg/L	-	-	-	75	0.089	76	0.081
Thallium	mg/L	-	-	-	<0.00001	0	<0.00001	0
Tin	mg/L	-	-	-	<0.0001	0	<0.0001	0
Titanium	mg/L	-	-	-	<0.0003	0	<0.0003	0
Uranium	mg/L	-	-	-	0.0026	0.05	0.0026	0.047
Vanadium	mg/L	-	-	-	<0.0005	0	<0.0005	0
Zinc	mg/L	-	-	-	0.0012	0.3	0.0011	0.27

(a) = guideline is a minimum value, unless the background concentration or value is lower.
(b) = guideline is adopted from CCME Canadian Environmental Quality Guidelines (CCME, 1999).

(c) = guideline is hardness dependent. The guideline range shown is based on the hardness range observed in the dataset (219 to 451 mg/L). The guideline is calculated based on the individual hardness value for each sample.

(d) = for some samples, water hardness was greater than 250 mg/L. At this hardness, no BC ENV water quality guideline has been established for sulphate; however, the observed data were screened against the guideline for very hard water (i.e., 429 mg/L) for comparative purposes.

(e) = guideline is chloride dependent. The guideline range shown is based on the chloride concentration range observed in the dataset (1.2500 to 1.5600 mg/L). The guideline is calculated based on the individual chloride concentration in each sample.
(f) = guideline is adopted from the ECCC PNECs (ECCC, 2018) or draft FEQGs (ECCC, 2017).
(g) = guideline is for chromium VI.

(h) = guideline is pH dependent. The guideline range shown is based on the pH range observed in the dataset (8.0 to 8.4). The guideline is calculated based on the individual pH for each sample.
(i) = guideline is a level 1 interim screening value.

(j) = dissolved copper guideline was calculated using the simplified Biotic Ligand Midel (BC ENV, 2019). Where values were missing, the temporally nearest value from the same location was taken.
(Mn) = concentration is higher than the 30-day mean BC ENV guideline or outside the recommended pH, DO or total alkalinity range.
(Mx) = concentration is higher than the maximum BC ENV guideline or outside the recommended pH, DO or total alkalinity range.
(E) = concentration is higher than the EVWQP benchmarks guideline.
Bolded concentrations are higher than water quality guidelines.
Shaded concentrations are higher than the EVWQP benchmark (e.g., for nitrate, total selenium, dissolved cadmium or sulphate).
Water quality data and guidelines shown in this table were rounded to reflect laboratory or field instrument precision after comparisons to guidelines. Therefore, values slightly above guidelines may be displayed as being equal to the guidelines and identified as exceedances. Concentrations equal to the guideline values were not identified as exceedances.
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- = no guideline or no data
BC ENV = British Columbia Ministry of Environment & Climate Change Strategy; EVWQP = Elk Valley Water Quality Plan guidelines; *C. dubia* = *Ceriodaphnia dubia* ; *P. subcapitata* = *Pseudokirchneriella subcapitata* ; *H. azteca* = *Hyalella azteca* ; *P. promelas* = *Pimephales promelas* ; *O. mykiss* = *Oncorhynchus mykiss* ; CV = coefficient of variation;∑ = sum of; WQGs = Water Quality Guidelines; CaCO3 = calcium carbonate; mg/L = milligrams per litre; µS/cm = microsiemens per centimeter; NTU = nephelometric turbidity units; meq/L = milliequivalents per litre; mg-N/L = milligrams of Nitrogen per litre; mg-P/L = milligrams of Phosphorus per litre.
BC ENV (B.C. Ministry of Climate Chande Strategy). 2019. Copper Water Quality guideline for the Protection of Aquatic Life-Technical Report. Water Quality Guideline Series, WQG-03-1. Prov. B.C., Victoria B.C.

Guidelines and Q1 LC_SLC

Parameter	Unit	Aquatic Life 30-day mean	Aquatic Life Maximum	EVWQP Benchmarks	P. subcapitata 23-Feb-21	2-Mar-21	9-Mar-21	16-Mar-21	23-Mar-21	30-Mar-21	Mar 2, 9, 16, 23, 30 P. promelas Mean	Mar 2, 9, 16, 23, 30 P. promelas CV	C. dubia 13-Apr-21
Field Measured													
pH	-	6.5 - 9.0	6.5 - 9.0	-	8.0	8.2	8.2	8.0	8.1	-	8.1	0.012	8.1
Specific conductivity	µS/cm at 25 C	-	-	-	390	417	415	420	494	-	436	0.088	407
Temperature	°C	-	-	-	0.2	0.4	0.3	0.3	0.5	-	0.38	0.26	0.8
Dissolved oxygen	mg/L	11	9.0	-	13	**11**(Mn)	11	12	11	-	11	0.054	12
Turbidity	NTU	-	-	-	0.33	0.1	0.16	0.1	0.1	-	0.12	0.26	0.19
Dissolved oxygen	%	-	-	-	105	75	76	85	78	-	78	0.059	81
Oxidation-reduction potential field	mv	-	-	-	77	182	165	266	109	-	180	0.36	145
Conventional Parameters													
pH	-	6.5 - 9.0	6.5 - 9.0	-	8.2	8.3	8.1	8.1	8.2	8.2	8.2	0.01	8.4
Hardness, as $CaCO_3$	mg/L	-	-	-	235	225	224	240	227	212	226	0.044	207
Total alkalinity, as $CaCO_3$	mg/L	20(a)	-	-	142	144	147	146	144	149	146	0.015	150
Total dissolved solids	mg/L	-	-	-	260	251	265	273	249	223	252	0.076	257
Total suspended solids	mg/L	-	-	-	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1	0	<1.0
Total organic carbon	mg/L	-	-	-	<0.50	<0.50	<0.50	<0.50	<0.50	0.63	0.53	0.11	1.1
Dissolved organic carbon	mg/L	-	-	-	<0.50	<0.50	<0.50	<0.50	<0.50	0.7	0.54	0.17	0.96
Turbidity	NTU	-	-	-	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.1	0	<0.10
Total acidity	mg/L	-	-	-	1.0	<1.0	<1.0	1.3	<1.0	<2.0	1.3	0.34	<2.0
Cation - anion balance	%	-	-	-	2.7	0.8	0	2.4	1.5	2.6	1.5	0.75	3.0
Ion balance	%	-	-	-	106	102	100	105	103	95	101	0.038	94
Conductivity	µS/cm	-	-	-	387	394	390	394	384	400	392	0.015	402
Oxidation-reduction potential	mv	-	-	-	455	314	369	441	452	399	395	0.14	283
Major Ions													
Bicarbonate	mg/L	-	-	-	-	-	-	-	-	-	-	-	-
Bromide	mg/L	-	-	-	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.05	0	<0.050
Calcium	mg/L	-	-	-	61	59	58	63	61	58	60	0.035	54
Carbonate, as $CaCO_3$	mg/L	-	-	-	-	-	-	-	-	-	-	-	-
Chloride	mg/L	150	600	-	0.77	0.55	0.52	0.69	0.56	0.53	0.57	0.12	0.46
Fluoride	mg/L	0.12(b)	1.4 - 1.7(c)	-	**0.35**(Mn)	**0.31**(Mn)	**0.26**(Mn)	**0.38**(Mn)	**0.34**(Mn)	**0.25**(Mn)	**0.31**(Mn)	0.18	**0.30**(Mn)
Hydroxide	mg/L	-	-	-	-	-	-	-	-	-	-	-	-
Magnesium	mg/L	-	-	-	20	19	19	20	18	17	19	0.069	17
Potassium	mg/L	-	-	-	0.42	0.41	0.43	0.4	0.45	0.4	0.42	0.052	0.43
Sodium	mg/L	-	-	-	1.2	1.2	1.3	1.2	1.2	1.1	1.2	0.075	1.2
Sulphate	mg/L	309 - 429(c,d)	-	481	77	75	75	80	74	73	75	0.036	68
Sulphide	mg/L	0.0040 - 0.029(e)	-	-	-	-	-	-	-	-	-	-	-
Major anion sum	meq/l	-	-	-	4.5	4.5	4.5	4.6	4.5	4.5	4.5	0.014	4.5
Major cation sum	meq/l	-	-	-	4.8	4.6	4.5	4.9	4.6	4.3	4.6	0.043	4.2
Bicarbonate Alkalinity, as $CaCO_3$	mg/l	-	-	-	142	142	147	146	144	149	146	0.019	145
Carbonate Alkalinity, as $CaCO_3$	mg/l	-	-	-	<1.0	2.0	<1.0	<1.0	<1.0	<1.0	1.2	0.37	5.4
Hydroxide Alkalinity, as $CaCO_3$	mg/l	-	-	-	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1	0	<1.0
Nutrients and Biological Indicators													
Nitrate	mg-N/L	3.0	33	3.2 - 7.3(c)	0.21	0.13	0.11	0.11	0.13	0.1	0.12	0.11	0.084
Nitrite	mg-N/L	0.020(f)	0.060(f)	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.001	0	<0.0010
Total ammonia	mg-N/L	2.1	14	-	<0.0050	<0.0050	<0.0050	0.0093	<0.0050	<0.0050	0.0059	0.33	<0.0050
Total Kjeldahl nitrogen	mg-N/L	-	-	-	<0.050	<0.050	<0.050	0.067	<0.050	1.5	0.34	1.9	0.12
Total phosphorus	mg-P/L	-	-	-	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.002	0	<0.0020
Orthophosphate	mg-P/L	-	-	-	0.0022	0.0026	<0.0010	0.0022	<0.0010	0.0029	0.0019	0.46	0.0018
Biochemical oxygen demand	mg/L	-	-	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2	0	<2.0
Total Metals													
Aluminum	mg/L	-	-	-	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	0.0065	0.0037	0.42	<0.0030
Antimony	mg/L	0.0090	-	-	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.00010
Arsenic	mg/L	0.0050	0.0050	-	0.00013	0.00014	0.00011	0.00012	0.00011	0.00016	0.00013	0.17	0.00011
Barium	mg/L	1.0	-	-	0.046	0.049	0.052	0.05	0.049	0.044	0.049	0.06	0.046
Beryllium	mg/L	0.00013	-	-	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.00002	0	<0.000020
Bismuth	mg/L	0.0005(g)	-	-	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0	<0.000050
Boron	mg/L	1.2	29(b)	-	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.01	0	<0.010
Cadmium	mg/L	-	-	-	0.000016	0.000014	0.000013	0.000013	0.0000079	0.00001	0.000012	0.21	0.000012
Calcium	mg/L	-	-	-	62	65	64	58	59	56	60	0.065	52
Chromium	mg/L	0.0010(h)	-	-	0.00014	0.00016	0.00014	0.00014	0.00014	0.00015	0.00015	0.061	0.00016
Cobalt	mg/L	0.0040	0.11	-	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.00010
Copper	mg/L	-	-	-	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	0	<0.00050
Iron	mg/L	0.66 - 3.09(e,g)	1.0	-	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.01	0	<0.010
Lead	mg/L	0.0068 - 0.013(c)	0.089 - 0.25(c)	-	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0	<0.000050
Lithium	mg/L	0.1216(g)	-	-	0.0043	0.0042	0.0042	0.0044	0.0045	0.0042	0.0043	0.033	0.0043
Magnesium	mg/L	-	-	-	20	20	19	20	19	18	19	0.034	18
Manganese	mg/L	1.1 - 1.7(c)	1.7 - 3.2(c)	-	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.00019	0.00012	0.34	<0.00010
Mercury	mg/L	0.000010	-	-	<0.00000050	<0.00000050	<0.00000050	<0.00000050	<0.00000050	0.0000007	0.00000054	0.17	<0.00000050
Molybdenum	mg/L	1.0	2.0	-	0.0013	0.0013	0.0014	0.0014	0.0013	0.0013	0.0013	0.044	0.0014
Nickel	mg/L	0.0053(i)	-	-	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	0	<0.00050
Potassium	mg/L	-	-	-	0.42	0.42	0.42	0.42	0.4	0.41	0.41	0.019	0.4
Selenium	mg/L	0.0020	-	0.019	0.0017	0.0018	0.0018	0.0017	0.0018	0.0017	0.0018	0.032	0.0015
Silicon	mg/L	-	-	-	2.2	2.3	2.3	2.3	2.4	2.3	2.3	0.019	2.1
Silver	mg/L	0.0015(c)	0.0030(c)	-	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	0	<0.000010
Sodium	mg/L	-	-	-	1.2	1.2	1.2	1.2	1.1	1.1	1.2	0.038	1.1
Strontium	mg/L	-	-	-	0.19	0.21	0.18	0.19	0.2	0.18	0.19	0.066	0.18
Sulphur	mg/L	-	-	-	28	29	32	31	28	25	29	0.095	24
Thallium	mg/L	0.00080	-	-	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	0	<0.000010
Tin	mg/L	0.3(g)	-	-	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.00010
Titanium	mg/L	0.85(g)	-	-	<0.010	<0.010	<0.010	<0.010	<0.010	<0.00030	<0.00806	0.54	<0.00030
Uranium	mg/L	0.0085	0.033(b)	-	0.0019	0.0018	0.0017	0.0019	0.0016	0.0016	0.0017	0.073	0.0017
Vanadium	mg/L	0.12(g)	-	-	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	0	<0.00050
Zinc	mg/L	0.020 - 0.12	0.046 - 0.15	-	0.0031	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.003	0	<0.0030
Dissolved Metals													
Aluminum	mg/L	0.050(e)	0.10(e)	-	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0010	<0.0026	0.34	<0.0010
Antimony	mg/L	-	-	-	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.00010
Arsenic	mg/L	-	-	-	0.00011	0.00012	0.0001	<0.00010	<0.00010	0.00011	0.00011	0.084	<0.00010
Barium	mg/L	-	-	-	0.05	0.051	0.047	0.048	0.05	0.045	0.048	0.052	0.047
Beryllium	mg/L	-	-	-	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.00002	0	<0.000020
Bismuth	mg/L	-	-	-	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0	<0.000050
Boron	mg/L	-	-	-	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.01	0	<0.010
Cadmium	mg/L	0.00022 - 0.00040(c)	0.00063 - 0.0014(c)	0.00014 - 0.00028(c)	0.00001	0.000014	0.000014	0.000011	0.0000099	0.0000094	0.000012	0.18	0.000012
Chromium	mg/L	-	-	-	0.00012	0.00016	0.00013	0.00013	0.00014	0.00011	0.00013	0.14	0.00016
Cobalt	mg/L	-	-	-	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.00010
Copper	mg/L	0.0003 - 0.0031(j)	0.0017 - 0.0181(j)	-	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.0002	0	<0.00020
Iron	mg/L	-	0.35	-	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.01	0	<0.010
Lead	mg/L	-	-	-	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0	<0.000050
Lithium	mg/L	-	-	-	0.0042	0.0045	0.0038	0.0042	0.0043	0.0043	0.0042	0.061	0.0043
Manganese	mg/L	-	-	-	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.00010
Mercury	mg/L	-	-	-	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.000005	0	<0.0000050
Molybdenum	mg/L	-	-	-	0.0013	0.0013	0.0013	0.0013	0.0012	0.0012	0.0013	0.04	0.0013
Nickel	mg/L	-	-	-	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	0	<0.00050
Selenium	mg/L	-	-	-	0.0018	0.0017	0.0016	0.0016	0.0016	0.0014	0.0016	0.08	0.0017
Silicon	mg/L	-	-	-	2.2	2.2	2.3	2.1	2.1	2.0	2.2	0.045	2.2
Silver	mg/L	-	-	-	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	0	<0.000010
Strontium	mg/L	2.5(g)	-	-	0.19	0.19	0.2	0.19	0.2	0.17	0.19	0.063	0.19
Sulphur	mg/L	-	-	-	27	27	28	29	25	23	26	0.087	25
Thallium	mg/L	-	-	-	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	0	<0.000010
Tin	mg/L	-	-	-	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.00010
Titanium	mg/L	-	-	-	<0.010	<0.010	<0.010	<0.010	<0.010	<0.00030	<0.00806	0.54	<0.00030
Uranium	mg/L	-	-	-	0.0017	0.0018	0.0017	0.0017	0.0016	0.0016	0.0017	0.052	0.0016
Vanadium	mg/L	-	-	-	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	0	<0.00050
Zinc	mg/L	-	-	-	0.0017	0.0032	0.0014	0.0023	0.0011	0.0012	0.0018	0.49	0.0016

Q2 LC_SLC

Parameter	C. dubia and P. subcapitata 18-May-21	25-May-21	1-Jun-21	8-Jun-21	15-Jun-21	May 18, 25, June 1, 8 H. azteca Mean	May 18, 25, June 1, 8 H. azteca CV	May 18, 25, June 1, 8, 15 O. mykiss Mean	May 18, 25, June 1, 8, 15 O. mykiss CV
Field Measured									
pH	8.3	8.3	8.2	8.4	8.2	8.3	0.01	8.3	0.01
Specific conductivity	219	252	214	236	211	230	0.066	226	0.077
Temperature	2.8	3.0	3.3	3.1	4.3	3.1	0.06	3.3	0.18
Dissolved oxygen	**11**(Mn)	**10**(Mn)	11	**10**(Mn)	**11**(Mn)	**11**(Mn)	0.053	**11**(Mn)	0.052
Turbidity	35	0.95	5.4	0.46	0.27	10	1.4	8.5	1.8
Dissolved oxygen	81	81	83	77	81	81	0.031	81	0.025
Oxidation-reduction potential field	75	153	134	66	106	107	0.39	107	0.35
Conventional Parameters									
pH	7.9	8.2	8.2	8.2	8.3	8.1	0.017	8.2	0.019
Hardness, as $CaCO_3$	107	130	111	126	114	119	0.087	118	0.084
Total alkalinity, as $CaCO_3$	119	127	108	119	102	118	0.057	115	0.086
Total dissolved solids	132	133	128	133	127	132	0.016	131	0.022
Total suspended solids	5.5	1.8	3.6	1.4	<1.0	3.1	0.58	2.7	0.7
Total organic carbon	3.0	3.3	3.0	1.9	1.9	2.8	0.24	2.6	0.26
Dissolved organic carbon	2.9	3.3	2.7	1.9	1.9	2.7	0.22	2.5	0.24
Turbidity	3.3	1.4	1.4	0.51	0.35	1.6	0.7	1.4	0.86
Total acidity	<2.0	<2.0	<2.0	<2.0	<2.0	<2	0	<2	0
Cation - anion balance	8.4	3.8	2.2	1.7	0.44	4.0	0.7	3.3	0.93
Ion balance	84	93	96	97	101	92	0.056	94	0.066
Conductivity	216	249	209	233	209	227	0.07	223	0.078
Oxidation-reduction potential	206	432	454	439	464	383	0.28	399	0.27
Major Ions									
Bicarbonate	-	-	-	-	125	-	-	125	0.45
Bromide	<0.050	<0.050	<0.050	<0.050	<0.050	<0.05	0	<0.05	0
Calcium	30	36	31	35	33	33	0.078	33	0.073
Carbonate, as $CaCO_3$	-	-	-	-	<1.0	-	-	1.0	0.45
Chloride	0.11	0.14	0.12	0.14	0.1	0.13	0.11	0.12	0.15
Fluoride	**0.16**(Mn)	**0.19**(Mn)	**0.14**(Mn)	**0.23**(Mn)	**0.16**(Mn)	**0.18**(Mn)	0.23	**0.18**(Mn)	0.2
Hydroxide	-	-	-	-	<1.0	-	-	1.0	0.45
Magnesium	7.6	9.8	7.9	9.3	7.8	8.7	0.11	8.5	0.12
Potassium	0.27	0.3	0.24	0.3	0.27	0.28	0.096	0.28	0.092
Sodium	0.45	0.62	0.45	0.49	0.4	0.5	0.14	0.48	0.18
Sulphate	8.2	14	7.7	12	11	10	0.26	11	0.25
Sulphide	-	-	-	-	-	-	-	-	-
Major anion sum	2.6	2.8	2.3	2.7	2.3	2.6	0.069	2.5	0.09
Major cation sum	2.2	2.6	2.2	2.6	2.3	2.4	0.088	2.4	0.085
Bicarbonate Alkalinity, as $CaCO_3$	119	127	108	119	102	118	0.057	115	0.086
Carbonate Alkalinity, as $CaCO_3$	<1.0	<1.0	<1.0	<1.0	<1.0	<1	0	<1	0
Hydroxide Alkalinity, as $CaCO_3$	<1.0	<1.0	<1.0	<1.0	<1.0	<1	0	<1	0
Nutrients and Biological Indicators									
Nitrate	0.11	0.083	0.098	0.075	0.096	0.091	0.16	0.092	0.14
Nitrite	<0.0010	<0.0010	<0.0010	0.0015	<0.0010	0.0011	0.24	0.0011	0.2
Total ammonia	<0.0050	0.0099	0.021	<0.0050	0.026	0.01	0.68	0.013	0.72
Total Kjeldahl nitrogen	0.14	0.079	<0.050	<0.050	<0.050	0.079	0.47	0.073	0.51
Total phosphorus	0.0052	0.0026	0.0022	<0.0020	0.0057	0.003	0.45	0.0035	0.5
Orthophosphate	0.0015	0.0013	0.0011	0.0027	0.0013	0.0017	0.47	0.0016	0.41
Biochemical oxygen demand	<2.0	<2.0	<2.0	<2.0	<2.0	<2	0	<2	0
Total Metals									
Aluminum	0.11	0.058	0.048	0.013	0.03	0.057	0.7	0.052	0.71
Antimony	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.0001	0
Arsenic	0.00019	0.00016	0.00017	0.00014	0.00014	0.00017	0.13	0.00016	0.13
Barium	0.025	0.029	0.024	0.028	0.024	0.026	0.09	0.026	0.10
Beryllium	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.00002	0	<0.00002	0
Bismuth	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0	<0.00005	0
Boron	<0.010	<0.010	<0.010	<0.010	<0.010	<0.01	0	<0.01	0
Cadmium	0.000039	0.000017	0.000028	0.000021	0.000011	0.000026	0.32	0.000023	0.46
Calcium	34	37	31	36	32	35	0.059	34	0.068
Chromium	0.00032	0.00022	0.00026	0.0002	0.00024	0.00025	0.2	0.00025	0.19
Cobalt	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.0001	0
Copper	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	0	<0.0005	0
Iron	0.094	0.045	0.042	<0.010	0.03	0.048	0.72	0.044	0.7
Lead	0.000079	<0.000050	<0.000050	<0.000050	<0.000050	0.000057	0.23	0.000056	0.23
Lithium	0.0015	0.0018	0.0012	0.0014	0.0012	0.0015	0.15	0.0014	0.18
Magnesium	8.5	9.5	8.2	9.5	7.8	8.9	0.071	8.7	0.088
Manganese	0.0034	0.0011	0.0019	0.00073	0.0011	0.0018	0.63	0.0017	0.64
Mercury	0.0000019	0.0000011	0.0000012	-	0.0000008	0.0000014	0.59	0.0000013	0.55
Molybdenum	0.0005	0.00063	0.00045	0.00063	0.00055	0.00055	0.16	0.00055	0.15
Nickel	0.00058	<0.00050	<0.00050	<0.00050	<0.00050	0.00052	0.069	0.00052	0.069
Potassium	0.32	0.33	0.27	0.29	0.27	0.3	0.092	0.3	0.10
Selenium	0.00057	0.00071	0.00049	0.00059	0.00059	0.00059	0.13	0.00059	0.13
Silicon	1.8	2.0	1.5	1.8	1.6	1.8	0.091	1.7	0.11
Silver	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	0	<0.00001	0
Sodium	0.48	0.65	0.44	0.51	0.39	0.52	0.15	0.49	0.2
Strontium	0.072	0.081	0.062	0.068	0.065	0.071	0.1	0.07	0.11
Sulphur	3.1	4.6	2.6	4.9	3.7	3.8	0.29	3.8	0.26
Thallium	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	0	<0.00001	0
Tin	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.0001	0
Titanium	0.0028	0.0013	0.00093	<0.00030	0.00049	0.0013	0.78	0.0012	0.87
Uranium	0.00058	0.00079	0.00056	0.00071	0.00065	0.00066	0.15	0.00066	0.14
Vanadium	0.00054	<0.00050	<0.00050	<0.00050	<0.00050	0.00051	0.035	0.00051	0.035
Zinc	0.0051	0.0032	0.005	0.0033	0.0033	0.0042	0.24	0.004	0.25
Dissolved Metals									
Aluminum	0.003	0.0028	<0.0050	0.0024	0.0022	0.0033	0.33	0.0031	0.36
Antimony	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.0001	0
Arsenic	0.00012	0.00013	0.00014	0.00012	0.00012	0.00013	0.07	0.00013	0.071
Barium	0.022	0.029	0.022	0.026	0.023	0.025	0.12	0.024	0.12
Beryllium	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.00002	0	<0.00002	0
Bismuth	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0	<0.00005	0
Boron	<0.010	<0.010	<0.010	<0.010	<0.010	<0.01	0	<0.01	0
Cadmium	0.0000098	0.000013	0.000013	0.000016	0.000013	0.000013	0.22	0.000013	0.18
Chromium	<0.00010	0.00013	0.00015	0.00018	0.00025	0.00014	0.24	0.00016	0.35
Cobalt	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.0001	0
Copper	<0.00020	0.00021	0.00021	<0.00020	<0.00020	0.00021	0.027	0.0002	0.027
Iron	<0.010	<0.010	<0.010	<0.010	<0.010	<0.01	0	<0.01	0
Lead	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0	<0.00005	0
Lithium	0.0012	0.0017	0.0011	0.0014	0.0013	0.0014	0.17	0.0013	0.17
Manganese	0.00015	0.00011	<0.00010	<0.00010	<0.00010	0.00012	0.19	0.00011	0.19
Mercury	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.000005	0	<0.000005	0
Molybdenum	0.00043	0.00059	0.00049	0.00064	0.00051	0.00053	0.18	0.00053	0.16
Nickel	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	0	<0.0005	0
Selenium	0.00052	0.00064	0.00045	0.00056	0.00049	0.00054	0.13	0.00053	0.14
Silicon	1.5	1.8	1.5	1.7	1.4	1.6	0.079	1.6	0.11
Silver	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	0	<0.00001	0
Strontium	0.063	0.083	0.061	0.074	0.066	0.07	0.13	0.069	0.13
Sulphur	3.0	4.7	2.8	4.4	3.5	3.7	0.25	3.7	0.23
Thallium	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	0	<0.00001	0
Tin	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.0001	0
Titanium	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.0003	0	<0.0003	0
Uranium	0.00054	0.00067	0.00056	0.00069	0.00066	0.00061	0.13	0.00062	0.12
Vanadium	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	0	<0.0005	0
Zinc	0.0034	0.0035	0.0033	0.0022	0.0026	0.0031	0.21	0.003	0.19

Q3 LC_SLC

Parameter	C. dubia and P. subcapitata 10-Aug-21	17-Aug-21	24-Aug-21	31-Aug-21	7-Sep-21	Aug 10, 17, 24, 31 H. azteca Mean	Aug 10, 17, 24, 31 H. azteca CV	Aug 10, 17, 24, 31 Sept 7 P. promelas Mean	Aug 10, 17, 24, 31 Sept 7 P. promelas CV
Field Measured									
pH	8.0	8.0	7.8	8.1	8.0	8.0	0.015	8.0	0.014
Specific conductivity	343	326	307	334	469	328	0.041	356	0.18
Temperature	6.6	6.8	4.8	4.9	5.3	5.8	0.17	5.7	0.17
Dissolved oxygen	**10**(Mn)	**9.9**(Mn)	11	**11**(Mn)	**8.2**(Mn, Mx)	**11**(Mn)	0.057	**10**(Mn)	0.12
Turbidity	0.01	2.4	0.1	0.6	0.56	0.78	1.2	0.73	1.3
Dissolved oxygen	82	81	87	82	83	83	0.026	83	0.026
Oxidation-reduction potential field	102	190	190	109	147	148	0.31	148	0.29
Conventional Parameters									
pH	8.3	8.3	8.1	8.2	8.4	8.2	0.01	8.3	0.014
Hardness, as $CaCO_3$	171	172	167	177	164	172	0.025	170	0.029
Total alkalinity, as $CaCO_3$	142	140	134	118	141	134	0.088	135	0.074
Total dissolved solids	187	185	192	197	212	190	0.029	195	0.055
Total suspended solids	<1.0	1.7	<1.0	<1.0	<1.0	1.2	0.27	1.1	0.27
Total organic carbon	0.93	1.4	1.1	6.0	1.2	2.4	1.1	2.1	1.0
Dissolved organic carbon	1.1	1.3	0.98	4.9	1.2	2.1	1.0	1.9	0.89
Turbidity	0.17	2.1	0.45	0.12	<0.10	0.72	1.2	0.6	1.5
Total acidity	<2.0	<2.0	<2.0	<2.0	<2.0	<2	0	<2	0
Cation - anion balance	4.0	2.5	1.3	4.4	6.2	3.1	0.44	3.7	0.51
Ion balance	92	95	97	109	88	98	0.08	96	0.081
Conductivity	329	308	288	313	343	310	0.048	316	0.066
Oxidation-reduction potential	455	376	378	223	468	358	0.29	380	0.26
Major Ions									
Bicarbonate	173	164	163	144	162	161	0.081	161	0.066
Bromide	<0.050	<0.050	<0.050	<0.050	<0.050	<0.05	0	<0.05	0
Calcium	45	46	48	48	44	47	0.029	46	0.042
Carbonate, as $CaCO_3$	<1.0	3.2	<1.0	<1.0	4.9	1.6	0.63	2.2	0.8
Chloride	0.29	0.33	0.22	0.17	0.31	0.25	0.29	0.26	0.25
Fluoride	**0.29**(Mn)	**0.30**(Mn)	**0.31**(Mn)	**0.27**(Mn)	**0.26**(Mn)	**0.29**(Mn)	0.061	**0.29**(Mn)	0.073
Hydroxide	<1.0	<1.0	<1.0	<1.0	<1.0	<1	0	<1	0
Magnesium	14	14	11	14	14	13	0.085	13	0.083
Potassium	0.36	0.43	0.33	0.35	0.37	0.37	0.11	0.37	0.11
Sodium	0.76	0.83	0.54	0.65	0.7	0.69	0.16	0.7	0.16
Sulphate	43	40	36	42	44	40	0.072	41	0.079
Sulphide	-	-	-	<0.0015	-	0.0015	0.55	0.0015	0.45
Major anion sum	3.8	3.7	3.5	3.3	3.8	3.5	0.064	3.6	0.06
Major cation sum	3.5	3.5	3.4	3.6	3.3	3.5	0.024	3.4	0.029
Bicarbonate Alkalinity, as $CaCO_3$	142	135	134	118	133	132	0.082	132	0.066
Carbonate Alkalinity, as $CaCO_3$	<1.0	5.4	<1.0	<1.0	8.2	2.1	0.94	3.3	1.0
Hydroxide Alkalinity, as $CaCO_3$	<1.0	<1.0	<1.0	<1.0	<1.0	<1	0	<1	0
Nutrients and Biological Indicators									
Nitrate	0.1	0.12	0.18	0.13	0.099	0.13	0.22	0.13	0.26
Nitrite	<0.0010	<0.0010	0.0015	<0.0010	0.001	0.0011	0.2	0.0011	0.2
Total ammonia	0.0071	0.0076	<0.0050	<0.0050	<0.0050	0.0062	0.21	0.0059	0.22
Total Kjeldahl nitrogen	0.054	0.25	0.058	<0.050	<0.050	0.1	0.86	0.093	0.96
Total phosphorus	0.0052	0.0068	0.0026	0.0028	0.0027	0.0044	0.43	0.004	0.47
Orthophosphate	<0.0010	0.0023	0.0017	0.0018	0.0017	0.0017	0.27	0.0017	0.27
Biochemical oxygen demand	<2.0	<2.0	<2.0	<2.0	<2.0	<2	0	<2	0
Total Metals									
Aluminum	<0.0030	0.031	0.029	<0.0030	<0.0030	0.016	0.9	0.014	1.1
Antimony	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.0001	0
Arsenic	0.00014	0.00014	0.00014	0.0001	0.00012	0.00013	0.17	0.00013	0.14
Barium	0.046	0.041	0.034	0.039	0.039	0.04	0.1	0.04	0.1
Beryllium	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.00002	0	<0.00002	0
Bismuth	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0	<0.00005	0
Boron	<0.010	<0.010	<0.010	<0.010	<0.010	<0.01	0	<0.01	0
Cadmium	0.000011	0.000016	0.000014	0.000013	0.000013	0.000013	0.14	0.000013	0.14
Calcium	50	46	44	48	47	47	0.05	47	0.049
Chromium	0.00023	0.00017	0.00018	0.00012	0.00014	0.00018	0.26	0.00017	0.25
Cobalt	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.0001	0
Copper	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	0	<0.0005	0
Iron	<0.010	0.029	0.036	<0.010	<0.010	0.021	0.59	0.019	0.66
Lead	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0	<0.00005	0
Lithium	0.0031	0.003	0.0025	0.0026	0.0025	0.0028	0.096	0.0027	0.11
Magnesium	15	14	12	14	15	14	0.093	14	0.095
Manganese	<0.00010	0.0014	0.00086	<0.00010	<0.00010	0.00063	0.98	0.00052	1.2
Mercury	<0.00000050	0.0000011	0.00000064	<0.00000050	<0.00000050	0.00000068	0.37	0.00000064	0.39
Molybdenum	0.0013	0.0011	0.0011	0.0012	0.0012	0.0012	0.064	0.0012	0.068
Nickel	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	0	<0.0005	0
Potassium	0.39	0.42	0.35	0.34	0.36	0.38	0.091	0.37	0.086
Selenium	0.0013	0.0011	0.0015	0.0014	0.0015	0.0013	0.092	0.0014	0.11
Silicon	2.2	2.3	2.0	2.1	2.0	2.1	0.056	2.1	0.059
Silver	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	0	<0.00001	0
Sodium	0.84	0.8	0.57	0.65	0.72	0.71	0.16	0.71	0.15
Strontium	0.14	0.13	0.12	0.14	0.15	0.13	0.083	0.13	0.088
Sulphur	16	15	14	16	18	15	0.083	16	0.10
Thallium	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	0	<0.00001	0
Tin	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.0001	0
Titanium	<0.00030	0.00047	0.00066	<0.00030	<0.00030	0.00043	0.37	0.00041	0.39
Uranium	0.0014	0.0011	0.0016	0.0017	0.0016	0.0014	0.18	0.0015	0.16
Vanadium	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	0	<0.0005	0
Zinc	<0.0030	<0.0030	0.003	<0.0030	<0.0030	0.003	0	0.003	0
Dissolved Metals									
Aluminum	0.0013	0.0017	0.0012	<0.0010	0.001	0.0013	0.22	0.0012	0.23
Antimony	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.0001	0
Arsenic	0.0001	0.00012	0.00012	0.00012	<0.00010	0.00012	0.078	0.00011	0.098
Barium	0.04	0.041	0.034	0.038	0.038	0.038	0.079	0.038	0.079
Beryllium	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.00002	0	<0.00002	0
Bismuth	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0	<0.00005	0
Boron	<0.010	<0.010	<0.010	<0.010	<0.010	<0.01	0	<0.01	0
Cadmium	0.000016	0.000013	0.000011	0.00001	0.00001	0.000012	0.19	0.000012	0.2
Chromium	0.00014	0.00013	0.00014	0.00014	0.00014	0.00014	0.033	0.00014	0.032
Cobalt	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.0001	0
Copper	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.0002	0	<0.0002	0
Iron	<0.010	<0.010	<0.010	<0.010	<0.010	<0.01	0	<0.01	0
Lead	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0	<0.00005	0
Lithium	0.0029	0.0031	0.0024	0.0026	0.0025	0.0028	0.1	0.0027	0.11
Manganese	<0.00010	0.00017	<0.00010	<0.00010	<0.00010	0.00012	0.27	0.00011	0.27
Mercury	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.000005	0	<0.000005	0
Molybdenum	0.0012	0.001	0.0011	0.0012	0.0012	0.0011	0.083	0.0011	0.075
Nickel	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	0	<0.0005	0
Selenium	0.0012	0.0012	0.0014	0.0016	0.0015	0.0013	0.16	0.0014	0.14
Silicon	2.1	2.1	1.7	2.1	1.9	2.0	0.085	2.0	0.084
Silver	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	0	<0.00001	0
Strontium	0.14	0.13	0.12	0.14	0.13	0.13	0.046	0.13	0.046
Sulphur	15	13	13	16	16	14	0.11	15	0.11
Thallium	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	0	<0.00001	0
Tin	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.0001	0
Titanium	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.0003	0	<0.0003	0
Uranium	0.0013	0.0012	0.0016	0.0017	0.0016	0.0014	0.16	0.0015	0.14
Vanadium	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	0	<0.0005	0
Zinc	0.0026	0.004	0.0037	0.0018	0.0024	0.003	0.34	0.0029	0.32

Q4 LC_SLC

Parameter	C. dubia and P. subcapitata 12-Oct-21	19-Oct-21	26-Oct-21	2-Nov-21	9-Nov-21	Oct 12, 19, 26, Nov 2 H. azteca Mean	Oct 12, 19, 26, Nov 2 H. azteca CV
Field Measured							
pH	7.3	8.0	7.8	7.9	8.2	7.8	0.036
Specific conductivity	368	374	372	369	381	371	0.007
Temperature	1.3	5.1	3.0	0.6	0.9	2.5	0.77
Dissolved oxygen	12	**8.1**(Mn, Mx)	**11**(Mn)	13	12	**11**(Mn)	0.17
Turbidity	0.6	0.44	0.53	0.64	0.55	0.55	0.15
Dissolved oxygen	83	84	81	87	84	84	0.031
Oxidation-reduction potential field	165	144	167	161	113	159	0.056
Conventional Parameters							
pH	8.1	8.5	8.3	8.2	8.3	8.3	0.018
Hardness, as $CaCO_3$	197	204	197	195	192	198	0.019
Total alkalinity, as $CaCO_3$	163	150	144	144	149	150	0.055
Total dissolved solids	228	222	232	230	230	228	0.017
Total suspended solids	<1.0	<1.0	<1.0	2.9	<1.0	1.5	0.71
Total organic carbon	-	0.65	0.98	0.83	1.1	0.82	0.47
Dissolved organic carbon	0.86	0.68	0.88	1.4	0.94	0.95	0.35
Turbidity	<0.10	<0.10	<0.10	<0.10	<0.10	<0.1	0
Total acidity	<2.0	<2.0	<2.0	<2.0	<2.0	<2	0
Cation - anion balance	5.2	2.5	2.9	3.1	5.0	3.4	0.32
Ion balance	90	95	94	94	91	93	0.022
Conductivity	359	379	378	371	385	372	0.021
Oxidation-reduction potential	438	433	471	457	444	450	0.035
Major Ions							
Bicarbonate	199	170	170	176	149	179	0.067
Bromide	<0.050	<0.050	<0.050	<0.050	<0.050	<0.05	0
Calcium	51	55	53	52	50	53	0.032
Carbonate, as $CaCO_3$	<1.0	6.6	3.0	<1.0	<1.0	2.9	0.84
Chloride	0.29	0.44	0.45	0.48	0.46	0.42	0.19
Fluoride	**0.27**(Mn)	**0.36**(Mn)	**0.36**(Mn)	**0.37**(Mn)	**0.33**(Mn)	**0.34**(Mn)	0.13
Hydroxide	<1.0	<1.0	<1.0	<1.0	<1.0	<1	0
Magnesium	17	16	16	16	17	16	0.029
Potassium	0.39	0.39	0.37	0.35	0.38	0.38	0.054
Sodium	0.94	0.95	0.95	0.9	1.0	0.93	0.028
Sulphate	55	63	63	62	62	60	0.057
Sulphide	-	-	-	-	-	-	-
Major anion sum	4.4	4.3	4.2	4.2	4.3	4.3	0.023
Major cation sum	4.0	4.1	4.0	4.0	3.9	4.0	0.019
Bicarbonate Alkalinity, as $CaCO_3$	163	139	139	144	122	146	0.068
Carbonate Alkalinity, as $CaCO_3$	<1.0	11	5.0	<1.0	<1.0	4.5	0.97
Hydroxide Alkalinity, as $CaCO_3$	<1.0	<1.0	<1.0	<1.0	<1.0	<1	0
Nutrients and Biological Indicators							
Nitrate	0.099	0.11	0.11	0.12	0.11	0.11	0.068
Nitrite	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.001	0
Total ammonia	<0.0050	<0.0050	0.026	<0.0050	0.0057	0.01	0.92
Total Kjeldahl nitrogen	<0.050	0.066	0.072	<0.050	<0.050	0.06	0.18
Total phosphorus	<0.0020	0.0049	<0.0020	0.0021	<0.0020	0.0028	0.46
Orthophosphate	<0.0010	0.0016	0.0018	0.0022	0.0018	0.0017	0.3
Biochemical oxygen demand	<2.0	<2.0	<2.0	<2.0	<2.0	<2	0
Total Metals							
Aluminum	0.0037	0.003	0.003	<0.0030	<0.0030	0.0032	0.099
Antimony	<0.00010	0.00012	<0.00010	<0.00010	<0.00010	0.00011	0.085
Arsenic	0.0001	<0.00010	0.00014	0.00011	0.00014	0.00011	0.15
Barium	0.044	0.098	0.046	0.041	0.042	0.057	0.43
Beryllium	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.00002	0
Bismuth	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0
Boron	<0.010	<0.010	<0.010	<0.010	<0.010	<0.01	0
Cadmium	0.000013	0.000028	0.000016	0.000011	0.000011	0.000017	0.41
Calcium	56	100	52	50	52	64	0.34
Chromium	0.00019	0.00015	0.00017	0.00016	0.00016	0.00017	0.091
Cobalt	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0
Copper	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	0
Iron	<0.010	<0.010	<0.010	<0.010	<0.010	<0.01	0
Lead	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0
Lithium	0.0038	0.027	0.0034	0.0037	0.0036	0.0095	1.1
Magnesium	15	49	17	15	17	24	0.62
Manganese	<0.00010	0.00054	0.00013	0.00014	<0.00010	0.00023	0.81
Mercury	<0.00000050	<0.00000050	<0.00000050	<0.00000050	<0.00000050	<0.0000005	0
Molybdenum	0.0013	0.0013	0.0013	0.0013	0.0013	0.0013	0.024
Nickel	<0.00050	0.0011	<0.00050	<0.00050	<0.00050	0.00065	0.4
Potassium	0.38	1.3	0.38	0.37	0.38	0.61	0.68
Selenium	0.0015	**0.044**(Mn, E)	0.0015	0.0016	0.0015	**0.012**(Mn)	1.6
Silicon	2.2	2.3	2.2	2.2	2.2	2.2	0.018
Silver	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	0
Sodium	0.91	4.0	0.95	0.97	0.92	1.7	0.8
Strontium	0.17	0.18	0.16	0.16	0.17	0.17	0.065
Sulphur	22	78	22	21	22	36	0.71
Thallium	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	0
Tin	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0
Titanium	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.0003	0
Uranium	0.0017	0.0026	0.0018	0.0017	0.0017	0.002	0.2
Vanadium	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	0
Zinc	0.0033	<0.0030	<0.0030	<0.0030	<0.0030	0.0031	0.044
Dissolved Metals							
Aluminum	0.001	0.0012	0.0013	<0.0010	<0.0010	0.0011	0.13
Antimony	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0
Arsenic	<0.00010	0.00011	<0.00010	0.00011	0.00012	0.00011	0.052
Barium	0.044	0.044	0.043	0.042	0.044	0.043	0.025
Beryllium	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.00002	0
Bismuth	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0
Boron	<0.010	<0.010	<0.010	<0.010	<0.010	<0.01	0
Cadmium	0.000012	0.000012	0.0000098	0.000012	0.000012	0.000011	0.084
Chromium	0.0002	0.00013	<0.00040	0.00016	0.00016	0.00022	0.49
Cobalt	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0
Copper	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.0002	0
Iron	<0.010	<0.010	<0.010	<0.010	<0.010	<0.01	0
Lead	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0
Lithium	0.0034	0.0037	0.003	0.0036	0.0034	0.0034	0.082
Manganese	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0
Mercury	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.000005	0
Molybdenum	0.0013	0.0013	0.0013	0.0013	0.0013	0.0013	0.013
Nickel	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	0
Selenium	0.0015	0.0015	0.0015	0.0014	0.0016	0.0015	0.038
Silicon	2.1	2.1	2.1	2.0	2.2	2.1	0.024
Silver	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	0
Strontium	0.16	0.16	0.16	0.16	0.16	0.16	0.02
Sulphur	20	20	22	19	22	20	0.059
Thallium	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	0
Tin	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0
Titanium	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.0003	0
Uranium	0.0017	0.0017	0.0018	0.0016	0.0017	0.0017	0.041
Vanadium	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	0
Zinc	0.0032	0.0015	0.0023	0.0017	0.002	0.0022	0.32

(a) = guideline is a minimum value, unless the background concentration or value is lower.
(b) = guideline is adopted from CCME Canadian Environmental Quality Guidelines (CCME, 1999).
(c) = guideline is hardness dependent. The guideline range shown is based on the hardness range observed in the dataset (107 to 240 mg/L). The guideline is calculated based on the individual hardness value for each sample.
(d) = for some samples, water hardness was greater than 250 mg/L. At this hardness, no BC ENV water quality guideline has been established for sulphate; however, the observed data were screened against the guideline for very hard water (i.e., 429 mg/L) for comparative purposes.
(e) = guideline is pH dependent. The guideline range shown is based on the pH range observed in the dataset (7.3 to 8.4). The guideline is calculated based on the individual pH for each sample.
(f) = guideline is chloride dependent. The guideline range shown is based on the chloride concentration range observed in the dataset (0.1000 to 0.7700 mg/L). The guideline is calculated based on the individual chloride concentration in each sample.
(g) = guideline is adopted from the ECCC PNECs (ECCC, 2018) or draft FEQGs (ECCC, 2017).
(h) = guideline is for chromium VI.
(i) = guideline is a level 1 interim screening value.
(j) = dissolved copper guideline was calculated using the simplified Biotic Ligand Midel (BC ENV, 2019). Where values were missing, the temporally nearest value from the same location was taken.
(Mn) = concentration is higher than the 30-day mean BC ENV guideline or outside the recommended pH, DO or total alkalinity range.
(Mx) = concentration is higher than the maximum BC ENV guideline or outside the recommended pH, DO or total alkalinity range.
(E) = concentration is higher than the EVWQP benchmarks guideline.
Bolded concentrations are higher than water quality guidelines.
Shaded concentrations are higher than the EVWQP benchmark (e.g., for nitrate, total selenium, dissolved cadmium or sulphate).
Water quality data and guidelines shown in this table were rounded to reflect laboratory or field instrument precision after comparisons to guidelines. Therefore, values slightly above guidelines may be displayed as being equal to the guidelines and identified as exceedances. Concentrations equal to the guideline values were not identified as exceedances.
Concentrations were screened against available Working and Approved British Columbia Ministry of Environment and Climate Change Strategy (BC ENV) Water Quality Guidelines for the Protection of Aquatic Life; Accessed January 2020 from: https://www2.gov.bc.ca/gov/content/environment/air-land-water/water/water-quality/water-quality-guidelines.
\- = no guideline or no data
BC ENV = British Columbia Ministry of Environment & Climate Change Strategy; EVWQP = Elk Valley Water Quality Plan guidelines; *C. dubia* = *Ceriodaphnia dubia* ; *P. subcapitata* = *Pseudokirchneriella subcapitata* ; *H. azteca* = *Hyallela azteca* ; *P. promelas* = *Pimephales promelas* ; *O. mykiss* = *Oncorhynchus mykiss* ; CV = coefficient of variation; ∑ = sum of; WQGs = Water Quality Guidelines; CaCO3 = calcium carbonate; mg/L = milligrams per litre; µS/cm = microsiemens per centimeter; NTU = nephelometric turbidity units; meq/L = milliequivalents per litre; mg-N/L = milligrams of Nitrogen per litre; mg=P/L = milligrams of Phosphorus per litre.
BC ENV (B.C. Ministry of Climate Chande Strategy). 2019. Copper Water Quality guideline for the Protection of Aquatic Life-Technical Report. Water Quality Guideline Series, WQG-03-1. Prov. B.C., Victoria B.C.

Parameter	Unit	Guidelines for the protection of:			Oct 12, 19, 26, Nov 2, 9 *O. mykiss*	
		Aquatic Life		EVWQP Benchmarks		
		30-day mean	Maximum		Mean	CV
Field Measured						
pH	-	6.5 - 9.0	6.5 - 9.0	-	7.8	0.043
Specific conductivity	µS/cm at 25 C	-	-	-	373	0.014
Temperature	°C	-	-	-	2.2	0.86
Dissolved oxygen	mg/L	11	9.0	-	11	0.16
Turbidity	NTU	-	-	-	0.55	0.14
Dissolved oxygen	%	-	-	-	84	0.025
Oxidation-reduction potential field	mv	-	-	-	150	0.15
Conventional Parameters						
pH	-	6.5 - 9.0	6.5 - 9.0	-	8.3	0.018
Hardness, as $CaCO_3$	mg/L	-	-	-	197	0.022
Total alkalinity, as $CaCO_3$	mg/L	20[(e)]	-	-	150	0.052
Total dissolved solids	mg/L	-	-	-	228	0.017
Total suspended solids	mg/L	-	-	-	1.4	0.62
Total organic carbon	mg/L	-	-	-	0.88	0.48
Dissolved organic carbon	mg/L	-	-	-	0.95	0.28
Turbidity	NTU	-	-	-	<0.1	0
Total acidity	mg/L	-	-	-	<2	0
Calton - anion balance	%	-	-	-	3.7	0.34
Ion balance	%	-	-	-	93	0.026
Conductivity	µS/cm	-	-	-	374	0.027
Oxidation-reduction potential	mv	-	-	-	449	0.034
Major Ions						
Bicarbonate	mg/L	-	-	-	173	0.1
Bromide	mg/L	-	-	-	<0.05	0
Calcium	mg/L	-	-	-	52	0.04
Carbonate, as $CaCO_3$	mg/L	-	-	-	2.5	0.97
Chloride	mg/L	150	600	-	0.42	0.18
Fluoride	mg/L	0.12[(b)]	1.4 - 1.7[(c)]	-	**0.34**[(Mn)]	0.12
Hydroxide	mg/L	-	-	-	<1	0
Magnesium	mg/L	-	-	-	16	0.031
Potassium	mg/L	-	-	-	0.38	0.046
Sodium	mg/L	-	-	-	0.95	0.036
Sulphate	mg/L	309 - 429[(c,d)]	-	481	61	0.057
Sulphide	mg/L	0.0040 - 0.029[(w)]	-	-	-	-
Major anion sum	meq/l	-	-	-	4.3	0.02
Major cation sum	meq/l	-	-	-	4.0	0.021
Bicarbonate Alkalinity, as $CaCO_3$	mg/l	-	-	-	141	0.1
Carbonate Alkalinity, as $CaCO_3$	mg/l	-	-	-	3.8	1.2
Hydroxide Alkalinity, as $CaCO_3$	mg/l	-	-	-	<1	0
Nutrients and Biological Indicators						
Nitrate	mg-N/L	3.0	33	3.2 - 7.3[(h)]	0.11	0.059
Nitrite	mg-N/L	0.020[(f)]	0.060[(f)]	-	<0.001	0
Total ammonia	mg-N/L	2.1	14	-	0.0094	1.0
Total Kjeldahl nitrogen	mg-N/L	-	-	-	0.058	0.18
Total phosphorus	mg-P/L	-	-	-	0.0026	0.49
Orthophosphate	mg-P/L	-	-	-	0.0017	0.26
Biochemical oxygen demand	mg/L	-	-	-	<2	0
Total Metals						
Aluminum	mg/L	-	-	-	0.0031	0.10
Antimony	mg/L	0.0090	-	-	0.0001	0.086
Arsenic	mg/L	0.0050	0.0050	-	0.00012	0.17
Barium	mg/L	1.0	-	-	0.054	0.45
Beryllium	mg/L	0.00013	-	-	<0.00002	0
Bismuth	mg/L	0.0005[(g)]	-	-	<0.00005	0
Boron	mg/L	1.2	29[(h)]	-	<0.01	0
Cadmium	mg/L	-	-	-	0.000016	0.45
Calcium	mg/L	-	-	-	62	0.34
Chromium	mg/L	0.0010[(h)]	-	-	0.00017	0.091
Cobalt	mg/L	0.0040	0.11	-	<0.0001	0
Copper	mg/L	-	-	-	<0.0005	0
Iron	mg/L	0.66 - 3.09[(w,e)]	1.0	-	<0.01	0
Lead	mg/L	0.0068 - 0.013[(c)]	0.089 - 0.25[(c)]	-	<0.00005	0
Lithium	mg/L	0.1216[(g)]	-	-	0.0083	1.3
Magnesium	mg/L	-	-	-	22	0.65
Manganese	mg/L	1.1 - 1.7[(c)]	1.7 - 3.2[(c)]	-	0.0002	0.94
Mercury	mg/L	0.000010	-	-	<0.0000005	0
Molybdenum	mg/L	1.0	2.0	-	0.0013	0.022
Nickel	mg/L	0.0053[(c)]	-	-	0.00062	0.42
Potassium	mg/L	-	-	-	0.56	0.73
Selenium	mg/L	0.0020	-	0.019	**0.010**[(Mn)]	1.9
Silicon	mg/L	-	-	-	2.2	0.019
Silver	mg/L	0.0015[(c)]	0.0030[(c)]	-	<0.00001	0
Sodium	mg/L	-	-	-	1.6	0.89
Strontium	mg/L	-	-	-	0.17	0.062
Sulphur	mg/L	-	-	-	33	0.76
Thallium	mg/L	0.00080	-	-	<0.00001	0
Tin	mg/L	0.3[(g)]	-	-	<0.0001	0
Titanium	mg/L	0.85[(g)]	-	-	<0.0003	0
Uranium	mg/L	0.0085	0.033[(h)]	-	0.0019	0.2
Vanadium	mg/L	0.12[(g)]	-	-	<0.0005	0
Zinc	mg/L	0.020 - 0.12	0.046 - 0.15	-	0.0031	0.044
Dissolved Metals						
Aluminum	mg/L	0.050[(w)]	0.10[(w)]	-	0.0011	0.13
Antimony	mg/L	-	-	-	<0.0001	0
Arsenic	mg/L	-	-	-	0.00011	0.077
Barium	mg/L	-	-	-	0.043	0.022
Beryllium	mg/L	-	-	-	<0.00002	0
Bismuth	mg/L	-	-	-	<0.00005	0
Boron	mg/L	-	-	-	<0.01	0
Cadmium	mg/L	0.00022 - 0.00040[(c)]	0.00063 - 0.0014[(c)]	0.00014 - 0.00028[(c)]	0.000012	0.086
Chromium	mg/L	-	-	-	0.00021	0.52
Cobalt	mg/L	-	-	-	<0.0001	0
Copper	mg/L	0.0003 - 0.0031[(j)]	0.0017 - 0.0181[(j)]	-	<0.0002	0
Iron	mg/L	-	0.35	-	<0.01	0
Lead	mg/L	-	-	-	<0.00005	0
Lithium	mg/L	-	-	-	0.0034	0.078
Manganese	mg/L	-	-	-	<0.0001	0
Mercury	mg/L	-	-	-	<0.000005	0
Molybdenum	mg/L	-	-	-	0.0013	0.012
Nickel	mg/L	-	-	-	<0.0005	0
Selenium	mg/L	-	-	-	0.0015	0.052
Silicon	mg/L	-	-	-	2.1	0.04
Silver	mg/L	-	-	-	<0.00001	0
Strontium	mg/L	2.5[(g)]	-	-	0.16	0.026
Sulphur	mg/L	-	-	-	21	0.063
Thallium	mg/L	-	-	-	<0.00001	0
Tin	mg/L	-	-	-	<0.0001	0
Titanium	mg/L	-	-	-	<0.0003	0
Uranium	mg/L	-	-	-	0.0017	0.036
Vanadium	mg/L	-	-	-	<0.0005	0
Zinc	mg/L	-	-	-	0.0021	0.31

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BC ENV = British Columbia Ministry of Environment & Climate Change Strategy; EVWQP = Elk Valley Water Quality Plan guidelines; *C. dubia* = *Ceriodaphnia dubia* ; *P. subcapitata* = *Pseudokirchneriella subcapitata* ; *H. azteca* = *Hyalella azteca* ; *P. promelas* = *Pimephales promelas* ; *O. mykiss* = *Oncorhynchus mykiss* ; CV = coefficient of variation; $\sum$ = sum of; WQGs = Water Quality Guidelines; CaCO3 = calcium carbonate; mg/L = milligrams per litre; µS/cm = microsiemens per centimeter; NTU = nephelometric turbidity units; meq/L = milliequivalents per litre; mg-N/L = milligrams of Nitrogen per litre; mg-P/L = milligrams of Phosphorus per litre. BC ENV (B.C. Ministry of Climate Chande Strategy). 2019. Copper Water Quality guideline for the Protection of Aquatic Life-Technical Report. Water Quality Guideline Series, WQG-03-1. Prov. B.C., Victoria B.C.

Parameter	Unit	Guidelines for the protection of: Aquatic Life 30-day mean	Aquatic Life Maximum	EVWQP Benchmarks	Q1 LC_LC3 P. subcapitata 23-Feb-21	2-Mar-21	9-Mar-21	16-Mar-21	23-Mar-21	30-Mar-21	Mar 2, 9, 16, 23, 30 P. promelas Mean	CV	C. dubia 13-Apr-21
Field Measured													
pH	-	6.5 - 9.0	6.5 - 9.0	-	7.8	7.9	7.8	7.6	7.8	7.8	7.8	0.014	7.9
Specific conductivity	µS/cm at 25 C	-	-	-	1339	1402	1335	1283	1430	1378	1366	0.042	1171
Temperature	°C	-	-	-	4.5	4.7	5.4	5.2	4.5	4.7	4.9	0.078	5.2
Dissolved oxygen	mg/L	11	9.0	-	12	**10**[Mn]	**11**[Mn]	12	**11**[Mn]	**11**[Mn]	**11**[Mn]	0.053	**11**[Mn]
Turbidity	NTU	-	-	-	1.1	0.26	0.29	0.97	0.1	0.3	0.38	0.88	0.03
Dissolved oxygen	%	-	-	-	112	79	85	92	82	82	84	0.056	86
Oxidation-reduction potential field	mv	-	-	-	74	175	174	276	146	113	177	0.35	158
Conventional Parameters													
pH	-	6.5 - 9.0	6.5 - 9.0	-	8.1	8.3	8.1	8.0	8.1	8.0	8.1	0.015	8.4
Hardness, as $CaCO_3$	mg/L	-	-	-	848	849	775	763	685	641	743	0.11	613
Total alkalinity, as $CaCO_3$	mg/L	20[a]	-	-	222	223	219	228	221	219	222	0.017	223
Total dissolved solids	mg/L	-	-	-	1090	996	974	916	828	794	902	0.098	804
Total suspended solids	mg/L	-	-	-	<1.0	<1.0	<1.0	1.5	<1.0	<1.0	1.1	0.2	<1.0
Total organic carbon	mg/L	-	-	-	<0.50	<0.50	0.7	<0.50	0.79	0.67	0.63	0.2	1.2
Dissolved organic carbon	mg/L	-	-	-	<0.50	<0.50	0.55	<0.50	0.78	0.6	0.59	0.2	1.2
Turbidity	NTU	-	-	-	0.36	0.26	0.37	0.62	0.28	0.2	0.35	0.48	0.3
Total acidity	mg/L	-	-	-	7.0	<1.0	<1.0	7.7	3.6	2.0	3.1	0.92	<2.0
Cation - anion balance	%	-	-	-	3.1	3.7	1.7	2.1	0	7.9	3.1	0.97	2.6
Ion balance	%	-	-	-	106	108	103	104	100	85	100	0.087	95
Conductivity	µS/cm	-	-	-	1340	1340	1280	1210	1120	1120	1214	0.08	1140
Oxidation-reduction potential	mv	-	-	-	470	288	316	446	431	394	375	0.19	290
Major Ions													
Bicarbonate	mg/L	-	-	-	-	-	-	-	-	-	-	-	-
Bromide	mg/L	-	-	-	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	0.25	0	<0.25
Calcium	mg/L	-	-	-	182	188	168	173	154	143	165	0.11	135
Carbonate, as $CaCO_3$	mg/L	-	-	-	-	-	-	-	-	-	-	-	-
Chloride	mg/L	150	600	-	42	40	39	35	27	32	35	0.15	26
Fluoride	mg/L	0.12[b]	1.8 - 2.2[c]	-	<0.10	**0.23**[Mn]	<0.10	**0.21**[Mn]	**0.17**[Mn]	**0.21**[Mn]	**0.18**[Mn]	0.28	**0.14**[Mn]
Hydroxide	mg/L	-	-	-	-	-	-	-	-	-	-	-	-
Magnesium	mg/L	-	-	-	95	93	86	81	73	69	80	0.12	67
Potassium	mg/L	-	-	-	2.2	2.3	2.2	2.0	2.2	2.2	2.2	0.043	2.1
Sodium	mg/L	-	-	-	15	15	16	15	14	14	15	0.059	14
Sulphate	mg/L	429[c,d]	-	481	**483**[Mn, E]	**477**[Mn]	**452**[Mn]	422	395	**453**[Mn]	**440**[Mn]	0.072	364
Sulphide	mg/L	0.0053 - 0.013[e]	-	-	-	-	-	-	-	<0.0015	0.0015	0.45	<0.0015
Major anion sum	meq/l	-	-	-	17	16	16	15	14	16	16	0.048	14
Major cation sum	meq/l	-	-	-	18	18	16	16	14	14	16	0.11	13
Bicarbonate Alkalinity, as $CaCO_3$	mg/l	-	-	-	222	212	219	228	221	219	220	0.026	211
Carbonate Alkalinity, as $CaCO_3$	mg/l	-	-	-	<1.0	10	<1.0	<1.0	<1.0	<1.0	2.9	1.5	12
Hydroxide Alkalinity, as $CaCO_3$	mg/l	-	-	-	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	0	<1.0
T-sulphide (as s)	mg/l	-	-	-	-	<0.0015	<0.0015	<0.0015	<0.0015	-	0.0015	0.45	-
Nutrients and Biological Indicators													
Nitrate	mg-N/L	3.0	33	9.3 - 15[c]	**13**[Mn]	**12**[Mn]	**12**[Mn]	**13**[Mn]	**14**[Mn]	**14**[Mn]	**13**[Mn]	0.077	**13**[Mn]
Nitrite	mg-N/L	0.040 - 0.20[f]	0.12 - 0.60[f]	-	0.0052	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.005	0	<0.0050
Total ammonia	mg-N/L	2.1	14	-	0.011	<0.0050	0.0061	0.01	<0.0050	<0.0050	0.0062	0.35	<0.0050
Total Kjeldahl nitrogen	mg-N/L	-	-	-	<0.25	0.41	<0.050	<0.050	0.34	0.33	0.24	0.73	<0.050
Total phosphorus	mg-P/L	-	-	-	0.0028	0.0048	0.0031	<0.0020	<0.0020	<0.0020	0.0028	0.44	0.0024
Orthophosphate	mg-P/L	-	-	-	0.0021	0.0017	<0.0010	<0.0010	0.001	0.0024	0.0014	0.44	0.0016
Biochemical oxygen demand	mg/L	-	-	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	0	<2.0
Total Metals													
Aluminum	mg/L	-	-	-	0.0045	0.0043	0.0078	0.0085	0.0055	<0.0030	0.0058	0.4	0.012
Antimony	mg/L	0.0090	-	-	0.00031	0.00033	0.00033	0.00035	0.00033	0.00035	0.00034	0.032	0.00032
Arsenic	mg/L	0.0050	0.0050	-	0.00016	0.00015	0.00011	0.00012	0.00014	0.00021	0.00015	0.27	0.00012
Barium	mg/L	1.0	-	-	0.064	0.069	0.064	0.062	0.048	0.049	0.058	0.16	0.05
Beryllium	mg/L	0.00013	-	-	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	0.00002	0	<0.000020
Bismuth	mg/L	0.0005[g]	-	-	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	0.00005	0	<0.000050
Boron	mg/L	1.2	29[b]	-	0.017	0.017	0.019	0.02	0.019	0.021	0.019	0.077	0.018
Cadmium	mg/L	-	-	-	0.00017	0.00017	0.00018	0.00018	0.00022	0.00022	0.00019	0.12	0.00021
Calcium	mg/L	-	-	-	179	197	176	157	146	150	165	0.13	131
Chromium	mg/L	0.0010[h]	-	-	0.00015	0.00017	0.00013	<0.00010	0.00013	0.0001	0.00013	0.23	0.00012
Cobalt	mg/L	0.0040	0.11	-	0.00025	0.00024	0.00029	0.00026	0.00021	0.0002	0.00024	0.15	0.00017
Copper	mg/L	-	-	-	<0.00050	<0.00050	<0.00050	<0.00050	0.00067	<0.00050	0.00053	0.14	<0.00050
Iron	mg/L	0.61 - 3.1[e,g]	1.0	-	0.11	0.12	0.11	0.088	0.059	0.054	0.086	0.34	0.061
Lead	mg/L	0.017 - 0.020[c]	0.34 - 0.42[c]	-	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	0.00005	0	<0.000050
Lithium	mg/L	0.1216[g]	-	-	0.068	0.064	0.066	0.067	0.064	0.068	0.066	0.026	0.061
Magnesium	mg/L	-	-	-	97	96	90	82	73	70	82	0.13	65
Manganese	mg/L	2.0 - 2.6[c]	3.4[c]	-	0.055	0.05	0.061	0.046	0.036	0.04	0.047	0.21	0.032
Mercury	mg/L	0.000010	-	-	<0.00000050	<0.00000050	<0.00000050	<0.00000050	<0.00000050	<0.00000050	0.0000005	0	-
Molybdenum	mg/L	1.0	2.0	-	0.0048	0.0049	0.0055	0.0047	0.0037	0.0038	0.0045	0.17	0.0036
Nickel	mg/L	0.0053[i]	-	-	**0.0090**[Mn]	**0.0098**[Mn]	**0.0095**[Mn]	**0.0092**[Mn]	**0.0085**[Mn]	**0.0077**[Mn]	**0.0089**[Mn]	0.094	**0.0078**[Mn]
Potassium	mg/L	-	-	-	2.2	2.3	2.3	2.1	2.0	2.1	2.2	0.058	2.0
Selenium	mg/L	0.0020	-	0.019	**0.050**[Mn, E]	**0.055**[Mn, E]	**0.054**[Mn, E]	**0.055**[Mn, E]	**0.052**[Mn, E]	**0.047**[Mn, E]	**0.053**[Mn, E]	0.064	**0.044**[Mn, E]
Silicon	mg/L	-	-	-	2.3	2.2	2.3	2.3	2.2	2.2	2.3	0.024	2.1
Silver	mg/L	0.0015[c]	0.0030[c]	-	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	0.00001	0	<0.000010
Sodium	mg/L	-	-	-	16	16	17	14	13	14	15	0.1	13
Strontium	mg/L	-	-	-	0.27	0.31	0.28	0.26	0.26	0.24	0.27	0.09	0.23
Sulphur	mg/L	-	-	-	190	182	202	163	134	140	164	0.17	126
Thallium	mg/L	0.00080	-	-	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	0.00001	0	0.00001
Tin	mg/L	0.3[g]	-	-	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.0001	0	<0.00010
Titanium	mg/L	0.85[g]	-	-	<0.010	<0.010	<0.010	<0.010	<0.010	<0.00030	0.0081	0.54	<0.00030
Uranium	mg/L	0.0085	0.033[b]	-	0.0056	0.0061	0.0049	0.0053	0.0043	0.0045	0.005	0.14	0.0043
Vanadium	mg/L	0.12[g]	-	-	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.0005	0	<0.00050
Zinc	mg/L	0.17 - 0.19	0.20 - 0.34	-	0.0079	0.0073	0.0067	0.0079	0.0097	0.008	0.0079	0.14	0.0076
Dissolved Metals													
Aluminum	mg/L	0.050[e]	0.10[e]	-	<0.0030	0.0041	<0.0030	<0.0030	<0.0030	<0.0010	0.0028	0.4	<0.0010
Antimony	mg/L	-	-	-	0.00029	0.00032	0.0003	0.00035	0.00035	0.00033	0.00033	0.064	0.00034
Arsenic	mg/L	-	-	-	<0.00010	0.00012	<0.00010	<0.00010	0.00012	0.00011	0.00011	0.091	<0.00010
Barium	mg/L	-	-	-	0.065	0.067	0.059	0.058	0.051	0.052	0.057	0.11	0.054
Beryllium	mg/L	-	-	-	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	0.00002	0	<0.000020
Bismuth	mg/L	-	-	-	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	0.00005	0	<0.000050
Boron	mg/L	-	-	-	0.018	0.018	0.016	0.017	0.018	0.018	0.017	0.051	0.018
Cadmium	mg/L	0.00046[c]	0.0019 - 0.0028[c]	0.00032[c]	0.00016	0.00018	0.00016	0.00016	0.00024	0.00022	0.00019	0.19	0.00022
Chromium	mg/L	-	-	-	0.00011	0.00013	<0.00010	<0.00010	0.00011	<0.00010	0.00011	0.12	0.00011
Cobalt	mg/L	-	-	-	0.00021	0.00022	0.00025	0.00022	0.0002	0.00019	0.00022	0.11	0.00017
Copper	mg/L	0.0003 - 0.003[j]	0.0016 - 0.0169[j]	-	0.0002	0.00025	0.00022	0.00023	0.00033	0.00023	0.00025	0.18	0.00024
Iron	mg/L	-	0.35	-	<0.010	0.018	<0.010	<0.010	<0.010	<0.010	0.012	0.31	0.01
Lead	mg/L	-	-	-	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	0.00005	0	<0.000050
Lithium	mg/L	-	-	-	0.066	0.073	0.06	0.061	0.061	0.06	0.063	0.091	0.063
Manganese	mg/L	-	-	-	0.048	0.047	0.055	0.041	0.034	0.037	0.043	0.2	0.032
Mercury	mg/L	-	-	-	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	0.000005	0	<0.0000050
Molybdenum	mg/L	-	-	-	0.0047	0.0048	0.0049	0.0045	0.0036	0.0036	0.0043	0.15	0.0037
Nickel	mg/L	-	-	-	0.009	0.0094	0.0088	0.0088	0.0085	0.0075	0.0086	0.079	0.008
Selenium	mg/L	-	-	-	0.054	0.064	0.056	0.053	0.052	0.047	0.054	0.12	0.047
Silicon	mg/L	-	-	-	2.2	2.2	2.2	2.1	2.1	2.1	2.1	0.032	2.1
Silver	mg/L	-	-	-	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	0.00001	0	<0.000010
Strontium	mg/L	2.5[g]	-	-	0.26	0.27	0.28	0.25	0.26	0.23	0.26	0.074	0.24
Sulphur	mg/L	-	-	-	178	185	175	147	124	131	152	0.18	132
Thallium	mg/L	-	-	-	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	0.00001	0	0.00001
Tin	mg/L	-	-	-	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.0001	0	<0.00010
Titanium	mg/L	-	-	-	<0.010	<0.010	<0.010	<0.010	<0.010	<0.00030	0.0081	0.54	<0.00030
Uranium	mg/L	-	-	-	0.0054	0.006	0.0049	0.0047	0.0046	0.0045	0.0049	0.13	0.0044
Vanadium	mg/L	-	-	-	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.0005	0	<0.00050
Zinc	mg/L	-	-	-	0.0068	0.0065	0.006	0.007	0.011	0.0076	0.0075	0.24	0.0085

Parameter	Q2 LC_LC3 C. dubia and P. subcapitata 18-May-21	25-May-21	1-Jun-21	8-Jun-21	15-Jun-21	May 18, 25, June 1, 8 H. azteca Mean	CV	May 18, 25, June 1, 8, 15 O. mykiss Mean	CV
Field Measured									
pH	7.8	7.9	7.8	7.9	7.7	7.9	0.0074	7.8	0.011
Specific conductivity	737	760	648	584	743	682	0.12	694	0.11
Temperature	4.5	4.3	4.5	4.6	5.2	4.5	0.028	4.6	0.074
Dissolved oxygen	**11**[Mn]	**11**[Mn]	**11**[Mn]	**10**[Mn]	**11**[Mn]	**11**[Mn]	0.047	**11**[Mn]	0.041
Turbidity	0.65	0	2.9	0.06	0.01	0.91	1.5	0.73	1.7
Dissolved oxygen	82	83	84	79	83	82	0.024	82	0.023
Oxidation-reduction potential field	65	199	153	118	160	134	0.42	139	0.36
Conventional Parameters									
pH	8.2	8.2	8.2	8.3	8.3	8.2	0.0061	8.2	0.0066
Hardness, as $CaCO_3$	360	390	327	308	372	346	0.1	351	0.095
Total alkalinity, as $CaCO_3$	172	188	169	163	181	173	0.062	175	0.057
Total dissolved solids	457	506	421	380	484	441	0.12	450	0.11
Total suspended solids	<1.0	<1.0	5.4	<1.0	51	2.1	1.0	12	1.8
Total organic carbon	1.2	1.4	1.2	0.55	1.0	1.1	0.34	1.1	0.29
Dissolved organic carbon	1.0	1.4	1.2	0.61	1.1	1.1	0.32	1.1	0.27
Turbidity	1.4	0.31	0.25	0.26	0.22	0.56	1.0	0.49	1.0
Total acidity	<2.0	<2.0	2.4	<2.0	<2.0	2.1	0.095	2.1	0.086
Cation - anion balance	4.5	2.9	3.0	0.39	4.2	2.7	0.64	3.0	0.54
Ion balance	91	94	94	99	92	95	0.035	94	0.033
Conductivity	716	747	625	566	711	664	0.13	673	0.11
Oxidation-reduction potential	403	436	356	496	408	423	0.14	420	0.12
Major Ions									
Bicarbonate	-	-	-	-	220	-	-	220	0.45
Bromide	<0.050	<0.050	<0.050	<0.050	<0.050	0.05	0	0.05	0
Calcium	79	87	73	70	85	77	0.099	79	0.095
Carbonate, as $CaCO_3$	-	-	-	-	<1.0	-	-	1.0	0.45
Chloride	5.3	8.0	5.6	3.6	7.6	5.6	0.32	6.0	0.3
Fluoride	**0.22**[Mn]	**0.21**[Mn]	**0.18**[Mn]	**0.22**[Mn]	**0.19**[Mn]	**0.21**[Mn]	0.091	**0.20**[Mn]	0.089
Hydroxide	-	-	-	-	<1.0	-	-	1.0	0.45
Magnesium	40	42	35	32	39	37	0.11	38	0.099
Potassium	1.4	1.4	1.3	1.4	1.4	1.4	0.044	1.4	0.038
Sodium	5.2	6.2	5.2	4.1	5.8	5.2	0.17	5.3	0.15
Sulphate	194	194	156	128	191	168	0.19	173	0.17
Sulphide	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	0.0015	0	0.0015	0
Major anion sum	8.2	8.6	7.2	6.4	8.4	7.6	0.13	7.8	0.12
Major cation sum	7.5	8.1	6.8	6.4	7.7	7.2	0.11	7.3	0.096
Bicarbonate Alkalinity, as $CaCO_3$	172	188	169	163	181	173	0.062	175	0.057
Carbonate Alkalinity, as $CaCO_3$	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	0	1.0	0
Hydroxide Alkalinity, as $CaCO_3$	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	0	1.0	0
T-sulphide (as s)	-	-	-	-	-	-	-	-	-
Nutrients and Biological Indicators									
Nitrate	**7.4**[Mn]	**7.5**[Mn]	**6.0**[Mn]	**5.4**[Mn]	**8.2**[Mn]	**6.6**[Mn]	0.16	**6.9**[Mn]	0.17
Nitrite	<0.0010	<0.0010	<0.0010	0.001	<0.0010	0.001	0	0.001	0
Total ammonia	0.012	<0.0050	<0.0050	<0.0050	0.0082	0.0067	0.51	0.007	0.44
Total Kjeldahl nitrogen	<0.050	<0.050	0.13	0.15	<0.050	0.093	0.54	0.084	0.56
Total phosphorus	0.003	<0.0020	<0.0020	<0.0020	<0.0020	0.0023	0.22	0.0022	0.2
Orthophosphate	0.0026	0.0011	<0.0010	0.0021	<0.0010	0.0017	0.46	0.0016	0.48
Biochemical oxygen demand	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	0	2.0	0
Total Metals									
Aluminum	0.018	0.0053	0.0039	0.0069	0.0033	0.0084	0.74	0.0074	0.79
Antimony	0.00037	0.00031	0.00031	0.00028	0.00031	0.00032	0.12	0.00032	0.1
Arsenic	0.00016	0.00014	0.00014	0.00012	0.00014	0.00014	0.12	0.00014	0.1
Barium	0.026	0.03	0.026	0.025	0.034	0.027	0.082	0.028	0.14
Beryllium	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	0.00002	0	0.00002	0
Bismuth	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	0.00005	0	0.00005	0
Boron	0.014	0.013	0.012	0.012	0.014	0.013	0.075	0.013	0.077
Cadmium	0.00034	0.00036	0.00034	0.00041	0.00044	0.00036	0.089	0.00038	0.12
Calcium	83	86	73	69	91	78	0.1	80	0.11
Chromium	0.00011	0.00014	0.00014	0.00013	0.00014	0.00013	0.11	0.00013	0.099
Cobalt	0.00022	0.00014	0.00012	0.00012	0.00013	0.00015	0.32	0.00015	0.29
Copper	0.00064	<0.00050	<0.00050	0.00055	<0.00050	0.00055	0.12	0.00054	0.11
Iron	0.032	0.019	0.015	<0.010	0.022	0.019	0.5	0.02	0.42
Lead	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	0.00005	0	0.00005	0
Lithium	0.037	0.038	0.029	0.029	0.042	0.033	0.15	0.035	0.17
Magnesium	43	39	36	32	41	37	0.12	38	0.11
Manganese	0.0077	0.0078	0.0053	0.0021	0.0097	0.0057	0.46	0.0065	0.45
Mercury	0.00000084	<0.00000050	0.00000064	0.00000084	0.00000051	0.00000071	0.24	0.00000067	0.25
Molybdenum	0.0024	0.0022	0.002	0.0015	0.0023	0.002	0.19	0.0021	0.17
Nickel	**0.0080**[Mn]	**0.0079**[Mn]	**0.0078**[Mn]	**0.0080**[Mn]	**0.0090**[Mn]	**0.0079**[Mn]	0.012	**0.0081**[Mn]	0.06
Potassium	1.5	1.4	1.3	1.3	1.5	1.4	0.062	1.4	0.068
Selenium	**0.049**[Mn, E]	**0.034**[Mn, E]	**0.032**[Mn, E]	**0.030**[Mn, E]	**0.037**[Mn, E]	**0.036**[Mn, E]	0.24	**0.036**[Mn, E]	0.21
Silicon	1.9	1.9	1.8	1.8	2.0	1.8	0.039	1.9	0.054
Silver	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	0.00001	0	0.00001	0
Sodium	5.5	6.4	5.2	4.2	6.2	5.3	0.17	5.5	0.16
Strontium	0.16	0.16	0.15	0.13	0.18	0.15	0.11	0.15	0.13
Sulphur	76	69	56	50	69	62	0.19	64	0.17
Thallium	0.000014	0.000011	0.000013	0.000012	0.000014	0.000013	0.1	0.000013	0.1
Tin	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.0001	0	0.0001	0
Titanium	0.00056	<0.00030	<0.00030	<0.00030	<0.00030	0.00037	0.36	0.00035	0.33
Uranium	0.0032	0.0033	0.0026	0.0023	0.0033	0.0029	0.17	0.003	0.15
Vanadium	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.0005	0	0.0005	0
Zinc	0.015	0.015	0.017	0.018	0.019	0.016	0.1	0.017	0.11
Dissolved Metals									
Aluminum	<0.0010	0.0013	<0.0020	0.0012	0.0016	0.0014	0.32	0.0014	0.27
Antimony	0.00035	0.0003	0.00031	0.00029	0.00026	0.00031	0.084	0.0003	0.11
Arsenic	0.00014	0.00011	0.00014	0.00013	0.00012	0.00013	0.11	0.00013	0.1
Barium	0.024	0.03	0.025	0.025	0.031	0.026	0.097	0.027	0.11
Beryllium	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	0.00002	0	0.00002	0
Bismuth	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	0.00005	0	0.00005	0
Boron	0.013	0.012	0.012	0.011	0.013	0.012	0.068	0.012	0.069
Cadmium	0.00029	**0.00036**[E]	**0.00036**[E]	**0.00040**[E]	**0.00044**[E]	**0.00035**[E]	0.12	**0.00037**[E]	0.15
Chromium	<0.00010	0.00011	0.00015	0.00013	0.00013	0.00012	0.18	0.00012	0.16
Cobalt	0.00016	0.00013	0.00011	0.0001	0.00012	0.00013	0.21	0.00012	0.19
Copper	0.00045	0.00042	0.00054	**0.00053**[Mn]	0.00048	0.00049	0.12	0.00048	0.11
Iron	<0.010	<0.010	<0.010	<0.010	<0.010	0.01	0	0.01	0
Lead	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	0.00005	0	0.00005	0
Lithium	0.036	0.037	0.03	0.028	0.038	0.033	0.14	0.034	0.14
Manganese	0.005	0.0072	0.005	0.0017	0.0076	0.0047	0.47	0.0053	0.44
Mercury	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	0.000005	0	0.000005	0
Molybdenum	0.0023	0.0022	0.0019	0.0015	0.0019	0.0019	0.18	0.0019	0.15
Nickel	0.0074	0.0078	0.0076	0.008	0.0087	0.0077	0.037	0.0079	0.065
Selenium	0.051	0.036	0.03	0.027	0.033	0.036	0.29	0.035	0.26
Silicon	1.8	1.9	1.8	1.7	1.8	1.8	0.035	1.8	0.03
Silver	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	0.00001	0	0.00001	0
Strontium	0.15	0.17	0.14	0.13	0.17	0.15	0.1	0.15	0.1
Sulphur	73	70	56	46	63	61	0.2	61	0.18
Thallium	0.000012	0.00001	0.000013	0.000012	0.00001	0.000012	0.11	0.000011	0.12
Tin	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.0001	0	0.0001	0
Titanium	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	0.0003	0	0.0003	0
Uranium	0.003	0.0029	0.0026	0.0023	0.0029	0.0027	0.11	0.0028	0.1
Vanadium	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.0005	0	0.0005	0
Zinc	0.015	0.015	0.017	0.018	0.02	0.016	0.091	0.017	0.13

Parameter	Q3 LC_LC3 C. dubia and P. subcapitata 10-Aug-21	17-Aug-21	24-Aug-21	31-Aug-21	7-Sep-21	Aug 10, 17, 24, 31 H. azteca Mean	CV	Aug 10, 17, 24, 31 Sept 7 P. promelas Mean	CV
Field Measured									
pH	7.6	8.0	7.5	7.6	7.7	7.7	0.029	7.7	0.025
Specific conductivity	1019	326	882	953	911	795	0.4	818	0.34
Temperature	8.3	6.8	7.4	7.6	7.9	7.5	0.082	7.6	0.074
Dissolved oxygen	**10**[Mn]	**9.9**[Mn]	**11**[Mn]	**10**[Mn]	**11**[Mn]	**10**[Mn]	0.051	**10**[Mn]	0.055
Turbidity	0.17	2.4	0.22	0.68	0.48	0.87	1.2	0.79	1.2
Dissolved oxygen	86	81	91	87	90	87	0.048	87	0.044
Oxidation-reduction potential field	132	190	234	118	204	168	0.32	175	0.28
Conventional Parameters									
pH	8.4	8.2	8.0	8.1	8.4	8.2	0.021	8.2	0.022
Hardness, as $CaCO_3$	516	544	461	590	498	528	0.1	522	0.093
Total alkalinity, as $CaCO_3$	219	227	206	185	226	209	0.088	213	0.083
Total dissolved solids	716	704	640	639	711	675	0.061	682	0.057
Total suspended solids	<1.0	2.4	<1.0	<1.0	<1.0	1.4	0.52	1.3	0.49
Total organic carbon	0.72	0.76	0.62	5.6	1.2	1.9	1.3	1.8	1.2
Dissolved organic carbon	0.7	0.68	0.7	5.6	1.2	1.9	1.3	1.8	1.2
Turbidity	0.32	1.5	0.3	0.21	0.38	0.57	1.0	0.53	0.97
Total acidity	<2.0	<2.0	<2.0	<2.0	5.0	2.0	0	2.6	0.52
Cation - anion balance	8.5	1.7	0.93	7.4	7.1	4.6	0.83	5.1	0.69
Ion balance	84	97	98	116	87	99	0.13	96	0.13
Conductivity	985	970	816	901	1000	918	0.084	934	0.082
Oxidation-reduction potential	490	395	448	284	460	404	0.22	415	0.2
Major Ions									
Bicarbonate	255	277	252	226	261	253	0.083	254	0.073
Bromide	<0.25	<0.050	<0.050	<0.25	<0.25	0.15	0.77	0.17	0.64
Calcium	116	121	106	135	109	120	0.1	117	0.098
Carbonate, as $CaCO_3$	6.4	<1.0	<1.0	<1.0	7.7	2.4	1.1	3.4	0.98
Chloride	71	19	14	15	24	30	0.92	29	0.83
Fluoride	**0.20**[Mn]	**0.21**[Mn]	**0.22**[Mn]	**0.17**[Mn]	<0.10	**0.20**[Mn]	0.11	**0.18**[Mn]	0.27
Hydroxide	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	0	1.0	0
Magnesium	55	59	48	61	55	56	0.11	56	0.093
Potassium	1.8	2.0	1.7	2.0	1.8	1.9	0.088	1.9	0.077
Sodium	9.3	10	8.1	10	9.4	9.5	0.11	9.5	0.10
Sulphate	274	288	223	278	294	266	0.11	271	0.1
Sulphide	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	0.0015	0	0.0015	0
Major anion sum	13	12	9.8	11	12	11	0.12	11	0.11
Major cation sum	11	11	9.6	12	10	11	0.1	11	0.094
Bicarbonate Alkalinity, as $CaCO_3$	209	227	206	185	214	207	0.083	208	0.073
Carbonate Alkalinity, as $CaCO_3$	11	<1.0	<1.0	<1.0	13	3.4	1.4	5.3	1.1
Hydroxide Alkalinity, as $CaCO_3$	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	0	1.0	0
T-sulphide (as s)	-	-	-	-	-	-	-	-	-
Nutrients and Biological Indicators									
Nitrate	**9.9**[Mn]	**9.5**[Mn]	**8.6**[Mn]	**9.3**[Mn]	**10**[Mn]	**9.3**[Mn]	0.058	**9.5**[Mn]	0.059
Nitrite	<0.0050	<0.0010	0.0014	<0.0050	<0.0050	0.0031	0.71	0.0035	0.6
Total ammonia	0.0071	0.0081	<0.0050	<0.0050	<0.0050	0.0063	0.25	0.006	0.24
Total Kjeldahl nitrogen	0.12	0.44	0.21	0.29	0.33	0.26	0.52	0.28	0.44
Total phosphorus	0.0048	0.005	<0.0020	0.0028	0.0026	0.0037	0.41	0.0034	0.4
Orthophosphate	<0.0010	<0.0010	0.0018	0.0015	0.0015	0.0013	0.3	0.0014	0.26
Biochemical oxygen demand	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	0	2.0	0
Total Metals									
Aluminum	<0.0030	0.014	0.0074	<0.0030	<0.0030	0.0068	0.75	0.006	0.78
Antimony	0.00036	0.00032	0.00032	0.00034	0.00032	0.00034	0.057	0.00033	0.054
Arsenic	0.00014	0.00012	0.00014	<0.00010	0.00011	0.00013	0.15	0.00012	0.15
Barium	0.055	0.053	0.042	0.047	0.053	0.049	0.13	0.05	0.11
Beryllium	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	0.00002	0	0.00002	0
Bismuth	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	0.00005	0	0.00005	0
Boron	0.02	0.02	0.019	0.02	0.018	0.02	0.025	0.019	0.046
Cadmium	0.00034	0.00034	0.00034	0.00035	0.00035	0.00034	0.015	0.00034	0.021
Calcium	124	123	101	114	117	116	0.092	116	0.08
Chromium	0.00013	0.00012	0.00014	0.0001	0.00012	0.00012	0.14	0.00012	0.12
Cobalt	0.00011	0.00014	0.00011	0.00013	0.00013	0.00012	0.12	0.00012	0.11
Copper	0.00054	<0.00050	<0.00050	<0.00050	<0.00050	0.00051	0.039	0.00051	0.035
Iron	0.041	0.054	0.03	0.033	0.026	0.04	0.27	0.037	0.3
Lead	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	0.00005	0	0.00005	0
Lithium	0.057	0.059	0.05	0.059	0.053	0.056	0.079	0.055	0.074
Magnesium	57	59	48	56	61	55	0.087	56	0.088
Manganese	0.016	0.021	0.012	0.019	0.019	0.017	0.23	0.017	0.2
Mercury	<0.00000050	0.00000068	0.00000053	<0.00000050	<0.00000050	0.00000055	0.16	0.00000054	0.14
Molybdenum	0.0037	0.0037	0.0029	0.0034	0.0036	0.0034	0.11	0.0034	0.095
Nickel	**0.0096**[Mn]	**0.010**[Mn]	**0.0092**[Mn]	**0.0096**[Mn]	**0.010**[Mn]	**0.0096**[Mn]	0.034	**0.0097**[Mn]	0.035
Potassium	1.9	2.0	1.7	1.7	1.8	1.8	0.067	1.8	0.058
Selenium	**0.038**[Mn, E]	**0.037**[Mn, E]	**0.035**[Mn, E]	**0.036**[Mn, E]	**0.041**[Mn, E]	**0.036**[Mn, E]	0.035	**0.037**[Mn, E]	0.062
Silicon	2.2	2.3	2.3	2.4	2.3	2.3	0.034	2.3	0.03
Silver	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	0.00001	0	0.00001	0
Sodium	9.4	10	8.2	9.8	10	9.4	0.091	9.5	0.087
Strontium	0.22	0.21	0.18	0.21	0.22	0.21	0.083	0.21	0.075
Sulphur	107	110	85	104	114	102	0.11	104	0.11
Thallium	0.000015	0.000013	0.000014	0.000015	0.000012	0.000014	0.067	0.000014	0.094
Tin	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.0001	0	0.0001	0
Titanium	<0.00030	<0.00060	<0.00030	<0.00030	<0.00030	0.00038	0.4	0.00036	0.37
Uranium	0.004	0.0038	0.0034	0.0039	0.0041	0.0038	0.073	0.0038	0.075
Vanadium	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.0005	0	0.0005	0
Zinc	0.016	0.015	0.015	0.015	0.015	0.015	0.044	0.015	0.043
Dissolved Metals									
Aluminum	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.001	0	0.001	0
Antimony	0.00031	0.00032	0.00033	0.00033	0.0003	0.00032	0.03	0.00032	0.041
Arsenic	<0.00010	0.0001	0.0001	0.00012	<0.00010	0.00011	0.095	0.0001	0.086
Barium	0.052	0.054	0.044	0.05	0.05	0.05	0.087	0.05	0.076
Beryllium	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	0.00002	0	0.00002	0
Bismuth	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	0.00005	0	0.00005	0
Boron	0.019	0.019	0.018	0.02	0.018	0.019	0.043	0.019	0.045
Cadmium	**0.00035**[E]	**0.00033**[E]	**0.00037**[E]	**0.00037**[E]	**0.00033**[E]	**0.00036**[E]	0.054	**0.00035**[E]	0.057
Chromium	0.0001	0.0001	0.00012	<0.00010	0.0001	0.00011	0.095	0.0001	0.086
Cobalt	<0.00010	0.00013	0.0001	0.00012	0.00011	0.00011	0.13	0.00011	0.12
Copper	**0.00047**[Mn]	0.0003	**0.00038**[Mn]	0.00037	0.00031	0.00038	0.18	0.00037	0.19
Iron	<0.010	<0.010	<0.010	<0.010	<0.010	0.01	0	0.01	0
Lead	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	0.00005	0	0.00005	0
Lithium	0.056	0.055	0.05	0.061	0.05	0.055	0.081	0.054	0.082
Manganese	0.014	0.019	0.011	0.02	0.017	0.016	0.26	0.016	0.22
Mercury	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	0.000005	0	0.000005	0
Molybdenum	0.0036	0.0037	0.003	0.0033	0.0034	0.0034	0.094	0.0034	0.082
Nickel	0.0094	0.0095	0.0091	0.01	0.0095	0.0095	0.051	0.0095	0.044
Selenium	0.038	0.038	0.037	0.035	0.041	0.037	0.033	0.038	0.058
Silicon	2.1	2.2	2.1	2.1	2.0	2.1	0.029	2.1	0.03
Silver	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	0.00001	0	0.00001	0
Strontium	0.22	0.22	0.2	0.23	0.2	0.21	0.059	0.21	0.062
Sulphur	98	103	82	90	102	93	0.096	95	0.091
Thallium	0.000013	0.000012	0.000013	0.000016	0.000012	0.000014	0.13	0.000013	0.12
Tin	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.0001	0	0.0001	0
Titanium	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	0.0003	0	0.0003	0
Uranium	0.0038	0.004	0.0034	0.0039	0.004	0.0038	0.068	0.0038	0.064
Vanadium	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.0005	0	0.0005	0
Zinc	0.015	0.015	0.015	0.017	0.013	0.015	0.064	0.015	0.081

Parameter	Q4 LC_LC3 C. dubia and P. subcapitata 12-Oct-21	19-Oct-21	26-Oct-21	2-Nov-21	9-Nov-21	Oct 12, 19, 26, Nov 2 H. azteca Mean	CV
Field Measured							
pH	7.6	7.8	7.5	7.7	7.7	7.7	0.017
Specific conductivity	1117	1194	1161	1135	1180	1152	0.029
Temperature	6.5	6.7	6.2	5.9	5.5	6.3	0.055
Dissolved oxygen	11	12	**11**[Mn]	12	11	11	0.03
Turbidity	0.59	0.67	0.74	0.46	0.67	0.62	0.2
Dissolved oxygen	92	86	87	93	89	90	0.04
Oxidation-reduction potential field	165	250	152	222	119	197	0.24
Conventional Parameters							
pH	8.3	8.4	8.2	8.0	8.1	8.2	0.021
Hardness, as $CaCO_3$	619	620	623	623	631	621	0.0033
Total alkalinity, as $CaCO_3$	263	233	236	228	249	240	0.065
Total dissolved solids	796	796	867	817	822	819	0.041
Total suspended solids	1.8	<1.0	2.1	1.3	1.5	1.6	0.32
Total organic carbon	-	2.7	1.1	0.79	0.96	1.5	0.75
Dissolved organic carbon	0.94	2.7	1.1	0.94	0.84	1.4	0.6
Turbidity	0.3	0.26	0.42	0.2	0.18	0.3	0.31
Total acidity	<2.0	<2.0	2.7	<2.0	7.0	2.2	0.16
Cation - anion balance	1.5	3.7	4.4	3.7	4.0	3.3	0.37
Ion balance	97	93	92	93	92	94	0.025
Conductivity	1100	1140	1180	1140	1170	1140	0.029
Oxidation-reduction potential	462	437	397	470	439	442	0.074
Major Ions							
Bicarbonate	306	263	288	278	249	284	0.064
Bromide	<0.25	<0.25	<0.25	<0.25	<0.25	0.25	0
Calcium	132	140	134	143	137	137	0.037
Carbonate, as $CaCO_3$	7.4	11	<1.0	<1.0	<1.0	5.0	0.96
Chloride	21	27	28	28	28	26	0.13
Fluoride	**0.13**[Mn]	**0.22**[Mn]	**0.22**[Mn]	**0.27**[Mn]	**0.21**[Mn]	**0.21**[Mn]	0.28
Hydroxide	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	0
Magnesium	70	66	70	65	70	68	0.044
Potassium	2.1	2.0	2.1	2.0	2.1	2.1	0.041
Sodium	13	13	14	12	15	13	0.045
Sulphate	331	373	392	375	380	368	0.071
Sulphide	-	-	-	-	-	-	-
Major anion sum	13	14	14	14	14	14	0.027
Major cation sum	13	13	13	13	13	13	0.0038
Bicarbonate Alkalinity, as $CaCO_3$	250	216	236	228	204	233	0.061
Carbonate Alkalinity, as $CaCO_3$	12	18	<1.0	<1.0	<1.0	8.0	1.0
Hydroxide Alkalinity, as $CaCO_3$	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	0
T-sulphide (as s)	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	0.0015	0
Nutrients and Biological Indicators							
Nitrate	**8.8**[Mn]	**11**[Mn]	**9.2**[Mn]	**12**[Mn]	**10**[Mn]	**10**[Mn]	0.15
Nitrite	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.005	0
Total ammonia	<0.0050	<0.0050	0.0055	<0.0050	<0.0050	0.0051	0.049
Total Kjeldahl nitrogen	<0.050	0.57	0.4	0.19	<0.050	0.3	0.76
Total phosphorus	0.005	0.0034	0.0049	0.0032	0.002	0.0041	0.23
Orthophosphate	<0.0010	0.0014	0.0021	0.0024	0.0018	0.0017	0.37
Biochemical oxygen demand	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	0
Total Metals							
Aluminum	<0.0030	<0.0030	0.012	<0.0030	<0.0030	0.0053	0.86
Antimony	0.00032	0.00031	0.00031	0.00034	0.00031	0.00032	0.044
Arsenic	0.0001	<0.00010	0.0002	0.00012	0.00012	0.00013	0.37
Barium	0.06	0.06	0.061	0.057	0.057	0.06	0.035
Beryllium	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	0.00002	0
Bismuth	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	0.00005	0
Boron	0.022	0.021	0.021	0.02	0.021	0.021	0.039
Cadmium	0.00026	0.00026	0.00028	0.00024	0.00022	0.00026	0.064
Calcium	144	135	140	137	137	139	0.028
Chromium	0.00011	0.0001	0.00022	0.00014	0.00012	0.00014	0.38
Cobalt	0.00017	0.00016	0.00029	0.00014	0.00015	0.00019	0.36
Copper	<0.00050	<0.00050	0.00082	<0.00050	<0.00050	0.00058	0.28
Iron	0.082	0.065	0.22	0.053	0.052	0.11	0.74
Lead	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	0.00005	0
Lithium	0.073	0.065	0.07	0.079	0.069	0.071	0.08
Magnesium	65	74	73	64	70	69	0.074
Manganese	0.034	0.034	0.049	0.026	0.029	0.036	0.27
Mercury	<0.00000050	<0.00000050	0.0000008	<0.00000050	<0.00000050	0.00000058	0.26
Molybdenum	0.0048	0.0048	0.0047	0.0047	0.0049	0.0047	0.02
Nickel	**0.010**[Mn]	**0.010**[Mn]	**0.011**[Mn]	**0.0093**[Mn]	**0.0097**[Mn]	**0.010**[Mn]	0.069
Potassium	2.1	2.1	2.2	2.1	2.1	2.1	0.023
Selenium	**0.038**[Mn, E]	**0.040**[Mn, E]	**0.040**[Mn, E]	**0.043**[Mn, E]	**0.041**[Mn, E]	**0.040**[Mn, E]	0.051
Silicon	2.2	2.2	2.3	2.2	2.2	2.2	0.018
Silver	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	0.00001	0
Sodium	14	14	14	13	14	14	0.033
Strontium	0.24	0.24	0.24	0.24	0.25	0.24	0.0034
Sulphur	137	135	140	126	133	135	0.045
Thallium	<0.000010	0.000011	0.000014	0.000011	0.00001	0.000012	0.15
Tin	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.0001	0
Titanium	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	0.0003	0
Uranium	0.0048	0.005	0.0051	0.0048	0.0048	0.0049	0.035
Vanadium	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.0005	0
Zinc	0.011	0.009	0.012	0.15	0.013	0.046	1.5
Dissolved Metals							
Aluminum	<0.0010	<0.0010	0.0018	<0.0010	0.0012	0.0012	0.33
Antimony	0.0003	0.0003	0.00029	0.00032	0.00032	0.0003	0.042
Arsenic	<0.00010	<0.00010	<0.00010	0.00011	0.00011	0.0001	0.049
Barium	0.059	0.056	0.059	0.059	0.062	0.058	0.022
Beryllium	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	0.00002	0
Bismuth	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	0.00005	0
Boron	0.02	0.02	0.019	0.021	0.02	0.02	0.041
Cadmium	0.00024	0.00023	0.00024	0.00023	0.00022	0.00024	0.022
Chromium	0.00013	0.00011	<0.00030	0.00012	<0.00010	0.00017	0.55
Cobalt	0.00016	0.00015	0.00016	0.00012	0.00015	0.00015	0.13
Copper	0.0003	0.00035	**0.00214**[Mn]	0.00027	0.00022	0.00077	1.2
Iron	<0.010	<0.010	<0.010	<0.010	<0.010	0.01	0
Lead	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	0.00005	0
Lithium	0.067	0.063	0.063	0.072	0.07	0.066	0.069
Manganese	0.031	0.03	0.029	0.024	0.032	0.028	0.11
Mercury	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	0.000005	0
Molybdenum	0.0047	0.0045	0.0045	0.0046	0.005	0.0046	0.026
Nickel	0.0097	0.0092	0.01	0.0089	0.0094	0.0095	0.059
Selenium	0.038	0.042	0.041	0.041	0.046	0.04	0.049
Silicon	2.2	2.2	2.2	2.0	2.3	2.1	0.037
Silver	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	0.00001	0
Strontium	0.23	0.24	0.22	0.24	0.25	0.23	0.034
Sulphur	126	123	138	117	138	126	0.07
Thallium	0.000011	0.00001	<0.000010	0.000011	0.000011	0.000011	0.055
Tin	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.0001	0
Titanium	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	0.0003	0
Uranium	0.0049	0.0046	0.005	0.0048	0.0045	0.0048	0.034
Vanadium	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.0005	0
Zinc	0.01	0.0093	0.013	0.0089	0.0088	0.011	0.19

(a) = guideline is a minimum value, unless the background concentration or value is lower.
(b) = guideline is adopted from CCME Canadian Environmental Quality Guidelines (CCME, 1999).
(c) = guideline is hardness dependent. The guideline range shown is based on the hardness range observed in the dataset (308 to 849 mg/L). The guideline is calculated based on the individual hardness value for each sample.
(d) = for some samples, water hardness was greater than 250 mg/L. At this hardness, no BC ENV water quality guideline has been established for sulphate; however, the observed data were screened against the guideline for very hard water (i.e., 429 mg/L) for comparative purposes.
(e) = guideline is pH dependent. The guideline range shown is based on the pH range observed in the dataset (7.5 to 8.0). The guideline is calculated based on the individual pH for each sample.
(f) = guideline is chloride dependent. The guideline range shown is based on the chloride concentration range observed in the dataset (3.6300 to 70.5000 mg/L). The guideline is calculated based on the individual chloride concentration in each sample.
(g) = guideline is adopted from the ECCC PNECs (ECCC, 2018) or draft FEQGs (ECCC, 2017).
(h) = guideline is for chromium VI.
(i) = guideline is a level 1 interim screening value.
(j) = dissolved copper guideline was calculated using the simplified Biotic Ligand Midel (BC ENV, 2019). Where values were missing, the temporally nearest value from the same location was taken.
(Mn) = concentration is higher than the 30-day mean BC ENV guideline or outside the recommended pH, DO or total alkalinity range.
(Mx) = concentration is higher than the maximum BC ENV guideline or outside the recommended pH, DO or total alkalinity range.
(E) = concentration is higher than the EVWQP benchmarks guideline.
Bolded concentrations are higher than water quality guidelines.
Shaded concentrations are higher than the EVWQP benchmark (e.g., for nitrate, total selenium, dissolved cadmium or sulphate).
Water quality data and guidelines shown in this table were rounded to reflect laboratory or field instrument precision after comparisons to guidelines. Therefore, values slightly above guidelines may be displayed as being equal to the guidelines and identified as exceedances. Concentrations equal to the guideline values were not identified as exceedances.
Concentrations were screened against available Working and Approved British Columbia Ministry of Environment and Climate Change Strategy (BC ENV) Water Quality Guidelines for the Protection of Aquatic Life; Accessed January 2020 from: https://www2.gov.bc.ca/gov/content/environment/air-land-water/water/water-quality/water-quality-guidelines.
\- = no guideline or no data
BC ENV = British Columbia Ministry of Environment & Climate Change Strategy; EVWQP = Elk Valley Water Quality Plan guidelines; *C. dubia* = *Ceriodaphnia dubia* ; *P. subcapitata* = *Pseudokirchneriella subcapitata* ; *H. azteca* = *Hyallela azteca* ; *P. promelas* = *Pimephales promelas* ; *O. mykiss* = *Oncorhynchus mykiss* ; CV = coefficient of variation; ∑ = sum of; WQGs = Water Quality Guidelines; CaCO3 = calcium carbonate; mg/L = milligrams per litre; µS/cm = microsiemens per centimeter; NTU = nephelometric turbidity units; meq/L = milliequivalents per litre; mg-N/L = milligrams of Nitrogen per litre; mg=P/L = milligrams of Phosphorus per litre.
BC ENV (B.C. Ministry of Climate Chande Strategy). 2019. Copper Water Quality guideline for the Protection of Aquatic Life-Technical Report. Water Quality Guideline Series, WQG-03-1. Prov. B.C., Victoria B.C.

Parameter	Unit	Guidelines for the protection of:			Oct 12, 19, 26, Nov 2, 9 *O. mykiss*	
		Aquatic Life		EVWQP Benchmarks		
		30-day mean	Maximum		Mean	CV
Field Measured						
pH	-	6.5 - 9.0	6.5 - 9.0	-	7.7	0.015
Specific conductivity	µS/cm at 25 C	-	-	-	1157	0.027
Temperature	°C	-	-	-	6.2	0.078
Dissolved oxygen	mg/L	11	9.0	-	11	0.027
Turbidity	NTU	-	-	-	0.63	0.17
Dissolved oxygen	%	-	-	-	89	0.035
Oxidation-reduction potential field	mv	-	-	-	181	0.29
Conventional Parameters						
pH	-	6.5 - 9.0	6.5 - 9.0	-	8.2	0.019
Hardness, as $CaCO_3$	mg/L	-	-	-	623	0.0076
Total alkalinity, as $CaCO_3$	mg/L	20[(e)]	-	-	242	0.059
Total dissolved solids	mg/L	-	-	-	820	0.035
Total suspended solids	mg/L	-	-	-	1.5	0.28
Total organic carbon	mg/L	-	-	-	1.4	0.71
Dissolved organic carbon	mg/L	-	-	-	1.3	0.6
Turbidity	NTU	-	-	-	0.27	0.35
Total acidity	mg/L	-	-	-	3.1	0.69
Calton - anion balance	%	-	-	-	3.5	0.32
Ion balance	%	-	-	-	93	0.023
Conductivity	µS/cm	-	-	-	1146	0.027
Oxidation-reduction potential	mv	-	-	-	441	0.065
Major Ions						
Bicarbonate	mg/L	-	-	-	277	0.08
Bromide	mg/L	-	-	-	0.25	0
Calcium	mg/L	-	-	-	137	0.032
Carbonate, as $CaCO_3$	mg/L	-	-	-	4.2	1.1
Chloride	mg/L	150	600	-	26	0.12
Fluoride	mg/L	0.12[(b)]	1.8 - 2.2 [(c)]	-	**0.21**[(Mn)]	0.24
Hydroxide	mg/L	-	-	-	1.0	0
Magnesium	mg/L	-	-	-	68	0.042
Potassium	mg/L	-	-	-	2.1	0.039
Sodium	mg/L	-	-	-	13	0.065
Sulphate	mg/L	429[(c,d)]	-	481	370	0.062
Sulphide	mg/L	0.0053 - 0.013[(e)]	-	-	-	-
Major anion sum	meq/l	-	-	-	14	0.028
Major cation sum	meq/l	-	-	-	13	0.010
Bicarbonate Alkalinity, as $CaCO_3$	mg/l	-	-	-	227	0.078
Carbonate Alkalinity, as $CaCO_3$	mg/l	-	-	-	6.6	1.2
Hydroxide Alkalinity, as $CaCO_3$	mg/l	-	-	-	1.0	0
T-sulphide (as s)	mg/l	-	-	-	0.0015	0
Nutrients and Biological Indicators						
Nitrate	mg-N/L	3.0	33	9.3 - 15[(b)]	**10**[(Mn)]	0.13
Nitrite	mg-N/L	0.040 - 0.20[(f)]	0.12 - 0.60[(f)]	-	0.005	0
Total ammonia	mg-N/L	2.1	14	-	0.0051	0.044
Total Kjeldahl nitrogen	mg-N/L	-	-	-	0.25	0.91
Total phosphorus	mg-P/L	-	-	-	0.0037	0.34
Orthophosphate	mg-P/L	-	-	-	0.0017	0.32
Biochemical oxygen demand	mg/L	-	-	-	2.0	0
Total Metals						
Aluminum	mg/L	-	-	-	0.0048	0.84
Antimony	mg/L	0.0090	-	-	0.00032	0.041
Arsenic	mg/L	0.0050	0.0050	-	0.00013	0.32
Barium	mg/L	1.0	-	-	0.059	0.036
Beryllium	mg/L	0.00013	-	-	0.00002	0
Bismuth	mg/L	0.0005[(g)]	-	-	0.00005	0
Boron	mg/L	1.2	29[(b)]	-	0.021	0.034
Cadmium	mg/L	-	-	-	0.00025	0.094
Calcium	mg/L	-	-	-	139	0.025
Chromium	mg/L	0.0010[(h)]	-	-	0.00014	0.35
Cobalt	mg/L	0.0040	0.11	-	0.00018	0.34
Copper	mg/L	-	-	-	0.00056	0.25
Iron	mg/L	0.61 - 3.1[(e,g)]	1.0	-	0.095	0.76
Lead	mg/L	0.017 - 0.020[(c)]	0.34 - 0.42[(c)]	-	0.00005	0
Lithium	mg/L	0.1216[(g)]	-	-	0.071	0.071
Magnesium	mg/L	-	-	-	69	0.064
Manganese	mg/L	2.0 - 2.6[(c)]	3.4[(c)]	-	0.034	0.26
Mercury	mg/L	0.000010	-	-	0.00000056	0.24
Molybdenum	mg/L	1.0	2.0	-	0.0048	0.024
Nickel	mg/L	0.0053[(i)]	-	-	**0.01**[(Mn)]	0.063
Potassium	mg/L	-	-	-	2.1	0.02
Selenium	mg/L	0.0020	-	0.019	**0.040**[(Mn, E)]	0.045
Silicon	mg/L	-	-	-	2.2	0.019
Silver	mg/L	0.0015[(c)]	0.0030[(c)]	-	0.00001	0
Sodium	mg/L	-	-	-	14	0.029
Strontium	mg/L	-	-	-	0.24	0.021
Sulphur	mg/L	-	-	-	134	0.039
Thallium	mg/L	0.00080	-	-	0.000011	0.15
Tin	mg/L	0.3[(g)]	-	-	0.0001	0
Titanium	mg/L	0.85[(g)]	-	-	0.0003	0
Uranium	mg/L	0.0085	0.033[(c)]	-	0.0049	0.032
Vanadium	mg/L	0.12[(g)]	-	-	0.0005	0
Zinc	mg/L	0.17 - 0.19	0.20 - 0.34	-	0.039	1.6
Dissolved Metals						
Aluminum	mg/L	0.050[(e)]	0.10[(e)]	-	0.0012	0.29
Antimony	mg/L	-	-	-	0.00031	0.044
Arsenic	mg/L	-	-	-	0.0001	0.053
Barium	mg/L	-	-	-	0.059	0.031
Beryllium	mg/L	-	-	-	0.00002	0
Bismuth	mg/L	-	-	-	0.00005	0
Boron	mg/L	-	-	-	0.02	0.035
Cadmium	mg/L	0.00046[(c)]	0.0019 - 0.0028[(c)]	0.00032[(c)]	0.00023	0.03
Chromium	mg/L	-	-	-	0.00015	0.55
Cobalt	mg/L	-	-	-	0.00015	0.11
Copper	mg/L	0.0003 - 0.003[(j)]	0.0016 - 0.0169[(j)]	-	0.00066	1.3
Iron	mg/L	-	0.35	-	0.01	0
Lead	mg/L	-	-	-	0.00005	0
Lithium	mg/L	-	-	-	0.067	0.063
Manganese	mg/L	-	-	-	0.029	0.1
Mercury	mg/L	-	-	-	0.000005	0
Molybdenum	mg/L	-	-	-	0.0046	0.046
Nickel	mg/L	-	-	-	0.0094	0.051
Selenium	mg/L	-	-	-	0.042	0.075
Silicon	mg/L	-	-	-	2.2	0.041
Silver	mg/L	-	-	-	0.00001	0
Strontium	mg/L	2.5[(g)]	-	-	0.23	0.044
Sulphur	mg/L	-	-	-	128	0.073
Thallium	mg/L	-	-	-	0.000011	0.052
Tin	mg/L	-	-	-	0.0001	0
Titanium	mg/L	-	-	-	0.0003	0
Uranium	mg/L	-	-	-	0.0048	0.044
Vanadium	mg/L	-	-	-	0.0005	0
Zinc	mg/L	-	-	-	0.01	0.19

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Parameter	Unit	Guidelines for the protection of:			Q1 LC_LCDSSLCC									Q2 LC_LCDSSLCC									Q3 LC_LCDSSLCC									Q4 LC			
		Aquatic Life		EVWQP Benchmarks	*P. subcapitata*	2-Mar-21	9-Mar-21	16-Mar-21	23-Mar-21	30-Mar-21	Mar 2, 9, 16, 23, 30 *P. promelas*		*C. dubia*	*C. dubia* and *P. subcapitata*	25-May-21	1-Jun-21	8-Jun-21	15-Jun-21	May 18, 25, June 1, 8 *H. azteca*		May 18, 25, June 1, 8, 15 *O. mykiss*		*C. dubia* and *P. subcapitata*	17-Aug-21	24-Aug-21	31-Aug-21	7-Sep-21	Aug 10, 17, 24, 31 *H. azteca*		Aug 10, 17, 24, 31 Sept 7 *P. promelas*		*C. dubia* and *P. subcapitata*	19-Oct-21	26-Oct-21	2-Nov-21
		30-day mean	Maximum		23-Feb-21						Mean	CV	13-Apr-21	18-May-21					Mean	CV	Mean	CV	10-Aug-21					Mean	CV	Mean	CV	12-Oct-21			
Field Measured																																			
pH	-	6.5 - 9.0	6.5 - 9.0	-	8.2	8.3	8.2	8.1	8.3	8.3	8.2	0.011	8.3	8.2	8.3	8.2	8.3	8.2	8.3	0.007	8.2	0.0066	8.1	8.3	8.0	8.2	8.2	8.2	0.016	8.2	0.014	8.4	8.3	8.0	8.1
Specific conductivity	µS/cm at 25 C	-	-	-	995	1087	1072	1068	1238	1201	1133	0.071	995	477	530	433	481	496	480	0.083	483	0.073	813	737	693	765	705	752	0.067	743	0.065	888	916	918	912
Temperature	°C	-	-	-	2.2	2.8	3.0	2.7	2.7	2.9	2.8	0.046	4.8	4.0	4.2	4.7	4.6	5.6	4.4	0.076	4.6	0.13	8.8	8.0	7.5	7.2	8.7	7.9	0.089	8.0	0.088	5.0	5.9	5.3	4.1
Dissolved oxygen	mg/L	11	9.0	-	12	**10**(Mn)	**10**(Mn)	12	**11**(Mn)	**11**(Mn)	**11**(Mn)	0.066	**11**(Mn)	**11**(Mn)	**11**(Mn)	**11**(Mn)	**10**(Mn)	**10**(Mn)	**11**(Mn)	0.047	**11**(Mn)	0.052	**9.6**(Mn)	**9.7**(Mn)	**11**(Mn)	**10**(Mn)	11	**10**(Mn)	0.063	**10**(Mn)	0.069	**11**(Mn)	**11**(Mn)	**11**(Mn)	12
Turbidity	NTU	-	-	-	0.78	0.2	0.05	0.21	0.1	<0.030	0.11	0.79	0.04	2.1	0.23	4.0	0.3	0.01	1.7	1.1	1.3	1.3	0	1.2	0.28	0.68	0.56	0.54	0.96	0.54	0.83	0.49	0.54	0.56	0.61
Dissolved oxygen	%	-	-	-	106	76	78	86	79	79	80	0.047	84	82	83	84	80	83	82	0.022	82	0.019	83	82	88	84	86	84	0.03	84	0.027	85	87	84	89
Oxidation-reduction potential field	mv	-	-	-	81	182	170	130	130	140	150	0.16	105	69	146	153	122	132	122	0.31	124	0.27	125	182	254	184	247	186	0.28	199	0.27	209	211	131	137
Conventional Parameters																																			
pH	-	6.5 - 9.0	6.5 - 9.0	-	8.2	8.4	8.1	8.2	8.3	8.2	8.2	0.014	8.5	8.1	8.3	8.2	8.3	8.4	8.2	0.012	8.3	0.014	8.4	8.4	8.2	8.2	8.4	8.3	0.014	8.3	0.013	8.3	8.6	8.4	8.3
Hardness, as $CaCO_3$	mg/L	-	-	-	640	633	597	626	586	514	591	0.08	514	232	268	217	252	253	242	0.092	244	0.082	404	399	362	398	390	391	0.05	391	0.043	453	500	498	481
Total alkalinity, as $CaCO_3$	mg/L	20(a)	-	-	207	202	202	207	212	210	207	0.022	204	150	156	140	151	146	149	0.045	149	0.04	199	196	187	166	198	187	0.08	189	0.073	224	210	215	209
Total dissolved solids	mg/L	-	-	-	792	757	738	735	693	689	722	0.041	675	288	333	268	316	318	301	0.096	305	0.086	546	488	484	512	555	508	0.056	517	0.063	640	650	654	646
Total suspended solids	mg/L	-	-	-	<1.0	<1.0	1.2	1.1	2.1	<1.0	1.3	0.36	<1.0	3.8	1.4	3.8	1.3	1.2	2.6	0.55	2.3	0.6	<1.0	<1.0	<1.0	<1.0	1.9	<1	0	1.2	0.34	<1.0	1.8	<1.0	1.9
Total organic carbon	mg/L	-	-	-	<0.50	<0.50	<0.50	<0.50	0.55	0.68	0.55	0.14	1.2	2.5	2.3	2.1	1.2	1.5	2.0	0.29	1.9	0.3	0.62	0.94	0.72	6.1	1.1	2.1	1.3	1.9	1.3	-	2.1	0.77	1.2
Dissolved organic carbon	mg/L	-	-	-	<0.50	<0.50	<0.50	<0.50	0.68	0.61	0.56	0.15	1.1	2.7	2.3	2.0	1.1	1.5	2.0	0.34	1.9	0.34	0.64	0.93	0.88	6.4	1.1	2.2	1.3	2.0	1.2	0.76	1.1	0.89	1.4
Turbidity	NTU	-	-	-	<0.10	0.13	0.17	0.17	0.11	<0.10	0.14	0.24	0.13	1.8	0.96	1.3	0.4	0.32	1.1	0.53	0.96	0.65	0.24	0.96	0.18	0.17	0.22	0.39	0.99	0.35	0.96	0.18	0.14	<0.10	0.19
Total acidity	mg/L	-	-	-	<1.0	<1.0	<1.0	1.3	<1.0	<2.0	1.3	0.34	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2	0	<2	0	<2.0	<2.0	<2.0	<2.0	<2.0	<2	0	<2	0	<2.0	<2.0	<2.0	<2.0
Cation - anion balance	%	-	-	-	2.0	3.8	0.4	3.9	2.2	2.3	2.5	0.57	1.8	5.5	2.4	2.9	0.96	2.4	2.9	0.65	2.8	0.59	3.4	1.4	1.5	2.2	3.9	2.1	0.45	2.5	0.47	3.8	2.8	4.2	6.1
Ion balance	%	-	-	-	104	108	101	108	104	96	103	0.051	96	90	95	94	98	95	94	0.038	95	0.033	93	97	97	104	93	98	0.045	97	0.047	93	95	92	89
Conductivity	µS/cm	-	-	-	1020	1030	1010	995	968	983	997	0.024	980	466	522	420	469	479	469	0.089	471	0.077	786	714	647	719	787	717	0.079	731	0.08	870	919	929	925
Oxidation-reduction potential	mv	-	-	-	441	303	342	448	400	398	378	0.15	290	428	423	457	440	465	437	0.035	443	0.041	298	409	461	312	455	370	0.21	387	0.2	450	438	381	468
Major Ions																																			
Bicarbonate	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	172	-	-	172	0.45	231	226	228	203	220	222	0.058	222	0.05	262	233	249	255
Bromide	mg/L	-	-	-	<0.25	<0.25	<1.0	<0.050	<0.050	<0.050	<0.28	1.5	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.05	0	<0.05	0	<0.050	<0.050	<0.050	<0.050	<0.050	<0.05	0	<0.05	0	<0.050	<0.25	<0.25	<0.25
Calcium	mg/L	-	-	-	144	143	135	145	137	110	134	0.1	117	56	64	51	60	61	58	0.094	58	0.083	95	93	88	94	91	92	0.034	92	0.03	104	117	116	112
Carbonate, as $CaCO_3$	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.9	-	-	2.9	0.45	5.8	6.7	<1.0	<1.0	10	3.6	0.84	5.0	0.8	5.8	12	6.1	<1.0
Chloride	mg/L	150	600	-	22	23	19	22	18	17	20	0.13	17	2.7	4.1	2.6	2.6	3.3	3.0	0.25	3.0	0.22	10	9.4	7.7	8.8	8.7	9.0	0.12	9.0	0.1	12	16	17	18
Fluoride	mg/L	0.12(b)	1.6 - 2.1(c)	-	**0.19**(Mn)	**0.24**(Mn)	<0.4(DL>Mn)	**0.23**(Mn)	**0.23**(Mn)	**0.14**(Mn)	**0.25**(Mn)	0.38	**0.18**(Mn)	**0.20**(Mn)	**0.21**(Mn)	**0.16**(Mn)	**0.21**(Mn)	**0.18**(Mn)	**0.20**(Mn)	0.12	**0.19**(Mn)	0.11	**0.23**(Mn)	**0.23**(Mn)	**0.24**(Mn)	**0.19**(Mn)	**0.17**(Mn)	**0.22**(Mn)	0.10	**0.21**(Mn)	0.14	**0.17**(Mn)	**0.23**(Mn)	**0.24**(Mn)	**0.28**(Mn)
Hydroxide	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<1.0	-	-	1.0	0.45	<1.0	<1.0	<1.0	<1.0	<1.0	<1	0	<1	0	<1.0	<1.0	<1.0	<1.0
Magnesium	mg/L	-	-	-	68	67	63	64	59	58	62	0.057	54	23	26	22	25	25	24	0.09	24	0.079	41	40	35	40	40	39	0.073	39	0.064	47	50	51	49
Potassium	mg/L	-	-	-	1.5	1.6	1.6	1.6	1.7	1.7	1.6	0.048	1.6	0.8	0.87	0.74	0.99	0.87	0.85	0.13	0.85	0.11	1.3	1.4	1.2	1.3	1.4	1.3	0.079	1.3	0.071	1.4	1.5	1.5	1.4
Sodium	mg/L	-	-	-	10	10	11	11	11	10	11	0.036	9.8	2.8	3.6	2.7	2.9	3.4	3.0	0.14	3.1	0.13	6.5	6.6	5.3	6.7	6.7	6.3	0.1	6.4	0.092	8.5	9.3	9.3	8.9
Sulphate	mg/L	429(c,d)	-	481	348	325	337	313	293	281	310	0.074	278	96	109	79	92	104	94	0.13	96	0.12	200	186	159	187	195	183	0.094	185	0.086	232	278	284	288
Major anion sum	meq/l	-	-	-	13	12	12	12	12	11	12	0.034	11	5.3	5.8	4.7	5.3	5.5	5.3	0.082	5.3	0.072	9.0	8.5	7.7	7.9	8.8	8.3	0.069	8.4	0.065	10	11	11	11
Major cation sum	meq/l	-	-	-	13	13	12	13	12	11	12	0.075	11	4.8	5.5	4.5	5.2	5.2	5.0	0.093	5.0	0.082	8.4	8.3	7.5	8.3	8.1	8.1	0.052	8.1	0.045	9.5	10	10	10
Bicarbonate Alkalinity, as $CaCO_3$	mg/l	-	-	-	207	191	202	207	212	210	204	0.041	193	150	156	140	149	141	149	0.044	147	0.045	189	185	187	166	181	182	0.058	182	0.051	215	191	204	209
Carbonate Alkalinity, as $CaCO_3$	mg/l	-	-	-	<1.0	10	<1.0	<1.0	<1.0	<1.0	2.8	1.4	12	<1.0	<1.0	<1.0	2.0	4.8	1.3	0.4	2.0	0.84	9.6	11	<1.0	<1.0	17	5.7	0.96	8.0	0.87	9.6	19	10	<1.0
Hydroxide Alkalinity, as $CaCO_3$	mg/l	-	-	-	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1	0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1	0	<1	0	<1.0	<1.0	<1.0	<1.0	<1.0	<1	0	<1	0	<1.0	<1.0	<1.0	<1.0
Nutrients and Biological Indicators																																			
Nitrate	mg-N/L	3.0	33	6.6 - 15(c)	**11**(Mn)	**10**(Mn)	**11**(Mn)	**11**(Mn)	**12**(Mn)	**10**(Mn)	**11**(Mn)	0.077	**11**(Mn)	**3.5**(Mn)	**4.0**(Mn)	2.9	**3.6**(Mn)	**4.2**(Mn)	**3.5**(Mn)	0.13	**3.6**(Mn)	0.14	**7.5**(Mn)	**6.4**(Mn)	**6.0**(Mn)	**6.7**(Mn)	**7.2**(Mn)	**6.6**(Mn)	0.096	**6.8**(Mn)	0.089	**6.9**(Mn)	**8.4**(Mn)	**8.0**(Mn)	**8.6**(Mn)
Nitrite	mg-N/L	0.040 - 0.20(e)	0.12 - 0.60(e)	-	<0.0050	<0.0050	<0.020	0.0014	<0.0010	0.002	0.0059	1.4	0.0032	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.001	0	<0.001	0	0.001	<0.0010	0.0013	<0.0010	<0.0010	0.0011	0.14	0.0011	0.13	<0.0010	<0.0050	<0.0050	<0.0050
Total ammonia	mg-N/L	2.1	14	-	<0.0050	<0.0050	<0.0050	0.018	<0.0050	<0.0050	0.0075	0.75	0.013	0.0076	0.0051	0.0062	0.0068	0.0087	0.0064	0.16	0.0069	0.2	<0.0050	0.02	<0.0050	<0.0050	<0.0050	0.0089	0.87	0.0081	0.85	<0.0050	<0.0050	<0.0050	<0.0050
Total Kjeldahl nitrogen	mg-N/L	-	-	-	0.17	<0.050	<0.050	<0.050	0.5	<0.050	0.14	1.4	<0.050	0.63	0.22	0.15	<0.050	0.37	0.26	0.97	0.28	0.8	0.12	0.44	<0.050	0.26	0.36	0.22	0.79	0.25	0.65	0.34	0.23	0.32	0.22
Total phosphorus	mg-P/L	-	-	-	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.002	0	<0.0020	<0.0020	0.0023	<0.0020	<0.0020	0.011	0.0021	0.072	0.0039	1.0	<0.0020	0.0029	<0.0020	0.0024	0.002	0.0023	0.18	0.0023	0.18	0.0024	<0.0020	<0.0020	<0.0020
Orthophosphate	mg-P/L	-	-	-	0.0014	0.0015	<0.0010	0.0015	<0.0010	0.002	0.0014	0.3	<0.0010	<0.0010	<0.0010	<0.0010	0.0018	<0.0010	0.0012	0.33	0.0012	0.31	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.001	0	<0.001	0	<0.0010	0.0012	0.0015	0.0016
Biochemical oxygen demand	mg/L	-	-	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2	0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2	0	<2	0	<2.0	<2.0	<2.0	<2.0	<2.0	<2	0	<2	0	<2.0	<2.0	<2.0	<2.0
Total Metals																																			
Aluminum	mg/L	-	-	-	<0.0030	<0.0030	0.0035	0.005	<0.0030	<0.0030	0.0035	0.25	<0.0030	0.035	0.03	0.023	0.0078	0.015	0.024	0.49	0.022	0.5	<0.0030	0.01	0.0043	<0.0030	<0.0030	0.0051	0.67	0.0047	0.67	<0.0030	0.0032	<0.0030	<0.0030
Antimony	mg/L	0.0090	-	-	0.00021	0.00021	0.00021	0.00023	0.00026	0.00027	0.00024	0.12	0.00026	0.00018	0.00016	0.00016	0.0002	0.00016	0.00018	0.11	0.00017	0.1	0.00024	0.00021	0.00021	0.00024	0.00023	0.00023	0.077	0.00023	0.067	0.00022	0.00024	0.00023	0.00024
Arsenic	mg/L	0.0050	0.0050	-	0.00013	0.00013	0.00011	0.00011	0.00012	0.00017	0.00013	0.19	0.00012	0.00014	0.00015	0.00012	0.00014	0.00012	0.00014	0.092	0.00013	0.1	0.00012	0.00014	0.00015	<0.00010	0.00012	0.00013	0.17	0.00013	0.15	<0.00010	0.00012	0.00014	0.00011
Barium	mg/L	1.0	-	-	0.084	0.09	0.088	0.079	0.07	0.067	0.079	0.13	0.066	0.03	0.035	0.029	0.031	0.035	0.031	0.08	0.032	0.082	0.062	0.059	0.049	0.053	0.059	0.056	0.11	0.056	0.094	0.071	0.066	0.068	0.065
Beryllium	mg/L	0.00013	-	-	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.00002	0	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.00002	0	<0.00002	0	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.00002	0	<0.00002	0	<0.000020	<0.000020	<0.000020	<0.000020
Bismuth	mg/L	0.0005(f)	-	-	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0	<0.00005	0	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0	<0.00005	0	<0.000050	<0.000050	<0.000050	<0.000050
Boron	mg/L	1.2	29(b)	-	0.014	0.013	0.014	0.015	0.019	0.017	0.016	0.15	0.014	<0.010	<0.010	<0.010	<0.010	<0.010	<0.01	0	<0.01	0	0.015	0.014	0.014	0.015	0.014	0.015	0.04	0.014	0.038	0.016	0.015	0.015	0.015
Cadmium	mg/L	-	-	-	0.000095	0.0001	0.00011	0.00011	0.00015	0.00014	0.00012	0.18	0.00013	0.00016	0.00016	0.00015	0.00023	0.00018	0.00017	0.21	0.00017	0.18	0.00018	0.00018	0.0002	0.00021	0.00018	0.00019	0.068	0.00019	0.064	0.00016	0.00016	0.00013	0.00012
Calcium	mg/L	-	-	-	149	152	142	130	135	127	137	0.073	118	61	63	52	61	64	59	0.081	60	0.078	98	90	83	94	94	91	0.071	92	0.062	116	114	114	112
Chromium	mg/L	0.0010(g)	-	-	0.00018	0.00015	0.00012	0.00012	0.00014	<0.00010	0.00013	0.15	0.00012	0.00015	0.00017	0.00016	0.00017	0.0002	0.00016	0.059	0.00017	0.11	0.00013	0.00016	0.00018	0.00011	0.00012	0.00015	0.21	0.00014	0.21	0.00014	0.00013	0.00012	0.00013
Cobalt	mg/L	0.0040	0.11	-	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.00010	0.00015	<0.00010	<0.00010	<0.00010	<0.00010	0.00011	0.22	0.00011	0.2	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.0001	0	<0.00010	<0.00010	<0.00010	<0.00010
Copper	mg/L	-	-	-	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	0	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	0	<0.0005	0	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	0	<0.0005	0	<0.00050	<0.00050	<0.00050	<0.00050
Iron	mg/L	0.67 - 3.7(f,h)	1	-	<0.010	0.011	0.014	0.031	0.026	0.023	0.021	0.4	0.018	0.054	0.038	0.028	0.012	0.02	0.033	0.53	0.03	0.54	<0.010	0.029	0.013	<0.010	<0.010	0.016	0.59	0.014	0.57	0.011	0.011	0.013	<0.010
Lead	mg/L	0.012 - 0.020(c)	0.22 - 0.42(c)	-	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0	<0.00005	0	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0	<0.00005	0	<0.000050	<0.000050	<0.000050	<0.000050
Lithium	mg/L	0.1216(f)	-	-	0.049	0.044	0.048	0.048	0.054	0.052	0.049	0.077	0.049	0.018	0.019	0.015	0.02	0.021	0.018	0.13	0.018	0.13	0.039	0.035	0.034	0.042	0.036	0.038	0.092	0.037	0.083	0.049	0.048	0.047	0.053
Magnesium	mg/L	-	-	-	68	68	68	64	63	56	63	0.076	54	24	25	21	25	25	24	0.065	24	0.06	43	39	34	41	44	39	0.093	40	0.096	47	56	51	49
Manganese	mg/L	1.6 - 2.6(c)	2.9 - 3.4(c)	-	0.0028	0.0034	0.0067	0.0084	0.011	0.0096	0.0077	0.37	0.0081	0.011	0.0044	0.0048	0.0021	0.0035	0.0055	0.67	0.0051	0.65	0.0038	0.0057	0.0039	0.0043	0.0038	0.0044	0.19	0.0043	0.18	0.0054	0.0055	0.0047	0.0028
Mercury	mg/L	0.000010	-	-	<0.00000050	<0.00000050	<0.00000050	<0.00000050	<0.00000050	<0.00000050	<0.0000005	0	<0.00000050	0.0000012	0.00000076	0.00000099	0.00000096	0.00000074	0.00000098	0.19	0.00000093	0.21	<0.00000050	0.00000059	<0.00000050	<0.00000050	<0.00000050	0.00000052	0.086	0.00000052	0.078	<0.00000050	<0.00000050	<0.00000050	<0.00000050
Molybdenum	mg/L	1.0	2.0	-	0.0028	0.0026	0.003	0.0029	0.0026	0.0025	0.0027	0.074	0.0026	0.0014	0.0014	0.0012	0.0012	0.0013	0.0013	0.087	0.0013	0.077	0.0023	0.0022	0.002	0.0022	0.0023	0.0022	0.075	0.0022	0.069	0.0028	0.0029	0.0028	0.0029
Nickel	mg/L	0.0053(i)	-	-	0.0032	0.0044	0.0041	0.0045	0.0053	0.0044	0.0045	0.095	0.0044	0.0037	0.0036	0.0036	0.0046	0.004	0.0039	0.13	0.0039	0.11	0.0051	0.005	0.0049	0.0052	0.0051	0.005	0.029	0.0051	0.027	0.0051	0.0051	0.0049	0.0048
Potassium	mg/L	-	-	-	1.6	1.6	1.6	1.6	1.6	1.6	1.6	0.022	1.6	0.83	0.88	0.76	0.93	0.9	0.85	0.084	0.86	0.077	1.4	1.4	1.2	1.3	1.4	1.3	0.057	1.3	0.05	1.5	1.5	1.5	1.5
Selenium	mg/L	0.0020	-	0.019	**0.046**(Mn, E)	**0.048**(Mn, E)	**0.052**(Mn, E)	**0.049**(Mn, E)	**0.050**(Mn, E)	**0.045**(Mn, E)	**0.049**(Mn, E)	0.053	**0.040**(Mn, E)	**0.022**(Mn, E)	**0.019**(Mn)	**0.016**(Mn)	**0.021**(Mn, E)	**0.020**(Mn, E)	**0.020**(Mn, E)	0.14	**0.020**(Mn, E)	0.12	**0.033**(Mn, E)	**0.028**(Mn, E)	**0.026**(Mn, E)	**0.029**(Mn, E)	**0.034**(Mn, E)	**0.029**(Mn, E)	0.1	**0.03**(Mn, E)	0.11	**0.033**(Mn, E)	**0.036**(Mn, E)	**0.035**(Mn, E)	**0.038**(Mn, E)
Silicon	mg/L	-	-	-	2.5	2.3	2.5	2.5	2.4	2.4	2.4	0.029	2.1	1.9	2.0	1.7	1.8	1.8	1.8	0.071	1.8	0.062	2.4	2.4	2.2	2.4	2.3	2.3	0.047	2.3	0.045	2.3	2.3	2.3	2.3
Silver	mg/L	0.0015(c)	0.0030(c)	-	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	0	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	0	<0.00001	0	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	0	<0.00001	0	<0.000010	<0.000010	<0.000010	<0.000010
Sodium	mg/L	-	-	-	11	11	11	10	10	9.6	10	0.051	9.7	3.0	3.6	2.7	3.0	3.4	3.1	0.12	3.1	0.11	6.8	6.3	5.5	6.9	7.2	6.4	0.097	6.5	0.098	9.1	9.6	9.5	9.6
Strontium	mg/L	-	-	-	0.27	0.29	0.24	0.25	0.26	0.23	0.25	0.084	0.23	0.12	0.13	0.11	0.11	0.13	0.12	0.069	0.12	0.085	0.2	0.18	0.17	0.2	0.2	0.19	0.082	0.19	0.078	0.22	0.22	0.22	0.22
Sulphur	mg/L	-	-	-	129	125	145	126	113	111	124	0.11	101	37	37	28	36	36	35	0.12	35	0.11	79	69	58	75	79	71	0.13	72	0.12	96	99	98	92
Thallium	mg/L	0.00080	-	-	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	0	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	0	<0.00001	0	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	0	<0.00001	0	<0.000010	<0.000010	<0.000010	<0.000010
Tin	mg/L	0.3(f)	-	-	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.0001	0	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.0001	0	<0.00010	<0.00010	<0.00010	<0.00010
Titanium	mg/L	0.85(f)	-	-	<0.010	<0.010	<0.010	<0.010	<0.010	<0.00030	<0.00806	0.54	<0.00030	<0.00090	0.00071	0.00036	<0.00030	<0.00030	0.00057	0.5	0.00051	0.54	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.0003	0	<0.0003	0	<0.00030	<0.00030	<0.00030	<0.00030
Uranium	mg/L	0.0085	0.033(b)	-	0.0044	0.0044	0.0038	0.0042	0.0037	0.0038	0.004	0.071	0.0036	0.0018	0.002	0.0016	0.0018	0.002	0.0018	0.11	0.0018	0.1	0.003	0.0025	0.0026	0.0028	0.0031	0.0027	0.08	0.0028	0.085	0.0035	0.0039	0.0039	0.0037
Vanadium	mg/L	0.12(f)	-	-	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	0	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	0	<0.0005	0	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	0	<0.0005	0	<0.00050	<0.00050	<0.00050	<0.00050
Zinc	mg/L	0.10 - 0.19	0.13 - 0.34	-	0.0031	0.0039	0.0042	0.0044	0.0045	0.0051	0.0044	0.1	0.0045	0.009	0.0077	0.0096	0.011	0.0096	0.0093	0.15	0.0094	0.13	0.008	0.036	0.0082	0.0088	0.0072	0.015	0.91	0.014	0.92	0.006	0.0052	0.0056	0.0047
Dissolved Metals																																			
Aluminum	mg/L	0.050(h)	0.10(h)	-	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0010	<0.0026	0.34	0.0014	0.0018	0.0015	<0.0030	0.0018	0.0012	0.002	0.33	0.0019	0.37	0.001	0.001	0.0012	<0.0010	<0.0010	0.0011	0.095	0.001	0.086	<0.0010	<0.0010	0.0031	<0.0010
Antimony	mg/L	-	-	-	0.00019	0.00021	0.0002	0.00022	0.00026	0.00021	0.00022	0.11	0.00026	0.00016	0.00017	0.00015	0.00018	0.00014	0.00017	0.078	0.00016	0.099	0.00022	0.0002	0.00022	0.00022	0.00022	0.00022	0.047	0.00022	0.041	0.0002	0.00024	0.00023	0.00021
Arsenic	mg/L	-	-	-	0.0001	0.00011	<0.00010	<0.00010	0.00012	0.00012	0.00011	0.091	<0.00010	0.00013	0.00012	0.00012	0.00012	0.00011	0.00012	0.041	0.00012	0.059	0.0001	0.00011	0.00012	0.0001	<0.00010	0.00011	0.089	0.00011	0.084	<0.00010	<0.00010	<0.00010	<0.00010
Barium	mg/L	-	-	-	0.091	0.096	0.08	0.077	0.069	0.072	0.079	0.13	0.069	0.027	0.034	0.028	0.03	0.033	0.03	0.11	0.03	0.099	0.058	0.06	0.049	0.053	0.057	0.055	0.096	0.055	0.084	0.064	0.065	0.068	0.064
Beryllium	mg/L	-	-	-	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.00002	0	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.00002	0	<0.00002	0	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.00002	0	<0.00002	0	<0.000020	<0.000020	<0.000020	<0.000020
Bismuth	mg/L	-	-	-	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0	<0.00005	0	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0	<0.00005	0	<0.000050	<0.000050	<0.000050	<0.000050
Boron	mg/L	-	-	-	0.013	0.014	0.012	0.014	0.015	0.012	0.013	0.1	0.015	<0.010	<0.010	<0.010	<0.010	<0.010	<0.01	0	<0.01	0	0.015	0.014	0.013	0.015	0.014	0.014	0.067	0.014	0.059	0.014	0.015	0.015	0.015
Cadmium	mg/L	0.00037 - 0.00046(c)	0.0013 - 0.0028(c)	0.00026 - 0.00032(c)	0.000079	0.000097	0.0001	0.00013	0.00014	0.00014	0.00012	0.16	0.00012	0.00011	0.00015	0.00015	0.00022	0.00018	0.00016	0.29	0.00016	0.25	0.00018	0.00016	0.00017	0.00018	0.00018	0.00017	0.077	0.00017	0.067	0.00013	0.00014	0.00014	0.00014
Chromium	mg/L	-	-	-	0.00011	0.00015	0.0001	0.00011	0.00013	0.00016	0.00013	0.2	0.0001	<0.00010	0.00012	0.00016	0.00014	0.00014	0.00013	0.2	0.00013	0.17	0.00012	0.00013	0.0001	0.00011	0.00011	0.00012	0.11	0.00011	0.1	0.00013	0.00012	<0.00040	0.0001
Cobalt	mg/L	-	-	-	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.0001	0	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.0001	0	<0.00010	<0.00010	<0.00010	<0.00010
Copper	mg/L	0.0004 - 0.005(j)	0.0023 - 0.0285(j)	-	<0.00020	<0.00020	<0.00020	<0.00020	0.00021	<0.00020	0.0002	0.022	<0.00020	0.00029	0.00029	0.00033	0.00035	0.00025	0.00032	0.095	0.0003	0.13	0.00023	0.00022	0.00029	<0.00020	<0.00020	0.00024	0.16	0.00023	0.16	<0.00020	<0.00020	0.00027	<0.00020
Iron	mg/L	-	0.35	-	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.01	0	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.01	0	<0.01	0	<0.010	<0.010	<0.010	<0.010	<0.010	<0.01	0	<0.01	0	<0.010	<0.010	<0.010	<0.010
Lead	mg/L	-	-	-	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0	<0.00005	0	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00005	0	<0.00005	0	<0.000050	<0.000050	<0.000050	<0.000050
Lithium	mg/L	-	-	-	0.047	0.05	0.044	0.047	0.048	0.044	0.047	0.055	0.049	0.017	0.02	0.015	0.019	0.019	0.017	0.13	0.018	0.12	0.039	0.035	0.032	0.039	0.036	0.036	0.092	0.036	0.08	0.045	0.048	0.04	0.047
Manganese	mg/L	-	-	-	0.002	0.0022	0.0048	0.0057	0.006	0.0071	0.0051	0.36	0.0057	0.0016	0.0023	0.0016	0.00084	0.0021	0.0016	0.37	0.0017	0.33	0.0028	0.0037	0.0024	0.0035	0.0026	0.0031	0.2	0.003	0.19	0.004	0.0041	0.0034	0.0033
Mercury	mg/L	-	-	-	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.000005	0	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.000005	0	<0.000005	0	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.000005	0	<0.000005	0	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Molybdenum	mg/L	-	-	-	0.0027	0.0028	0.0027	0.003	0.0026	0.0021	0.0026	0.13	0.0026	0.0013	0.0013	0.0011	0.0012	0.0012	0.0012	0.065	0.0012	0.06	0.0023	0.0021	0.0019	0.0022	0.0021	0.0021	0.082	0.0021	0.071	0.0027	0.0028	0.0028	0.0029
Nickel	mg/L	-	-	-	0.0035	0.0037	0.0039	0.0043	0.0048	0.0045	0.0042	0.099	0.0044	0.0029	0.0035	0.0033	0.0043	0.0039	0.0035	0.17	0.0036	0.15	0.0049	0.0047	0.0046	0.005	0.0048	0.0048	0.04	0.0048	0.035	0.0045	0.0047	0.0052	0.0045
Selenium	mg/L	-	-	-	0.051	0.052	0.049	0.049	0.049	0.042	0.048	0.076	0.042	0.023	0.02	0.015	0.02	0.019	0.019	0.17	0.019	0.15	0.032	0.027	0.026	0.031	0.033	0.029	0.095	0.03	0.1	0.032	0.037	0.037	0.034
Silicon	mg/L	-	-	-	2.3	2.4	2.3	2.2	2.2	2.1	2.2	0.05	2.1	1.7	1.9	1.7	1.8	1.7	1.7	0.059	1.7	0.054	2.2	2.3	2.0	2.3	2.1	2.2	0.059	2.2	0.053	2.1	2.2	2.1	2.1
Silver	mg/L	-	-	-	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	0	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	0	<0.00001	0	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	0	<0.00001	0	<0.000010	<0.000010	<0.000010	<0.000010
Strontium	mg/L	2.5(f)	-	-	0.25	0.26	0.25	0.25	0.25	0.2	0.24	0.11	0.23	0.11	0.13	0.11	0.12	0.13	0.12	0.086	0.12	0.088	0.2	0.19	0.17	0.2	0.18	0.19	0.058	0.19	0.054	0.2	0.22	0.22	0.22
Sulphur	mg/L	-	-	-	119	123	126	117	103	100	114	0.1	101	34	37	28	33	35	33	0.11	34	0.10	71	63	56	71	71	65	0.11	66	0.1	86	88	99	86
Thallium	mg/L	-	-	-	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	0	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	0	<0.00001	0	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	0	<0.00001	0	<0.000010	<0.000010	<0.000010	<0.000010
Tin	mg/L	-	-	-	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.0001	0	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0	<0.0001	0	<0.00010	<0.00010	0.00013	<0.00010
Titanium	mg/L	-	-	-	<0.010	<0.010	<0.010	<0.010	<0.010	<0.00030	<0.00806	0.54	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.0003	0	<0.0003	0	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.0003	0	<0.0003	0	<0.00030	<0.00030	<0.00030	<0.00030
Uranium	mg/L	-	-	-	0.004	0.0043	0.0038	0.0038	0.0039	0.0031	0.0038	0.11	0.0037	0.0017	0.0018	0.0015	0.0018	0.0019	0.0017	0.069	0.0017	0.074	0.0028	0.0027	0.0026	0.0029	0.003	0.0027	0.049	0.0028	0.057	0.0034	0.0036	0.004	0.0034
Vanadium	mg/L	-	-	-	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	0	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	0	<0.0005	0	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	0	<0.0005	0	<0.00050	<0.00050	<0.00050	<0.00050
Zinc	mg/L	-	-	-	0.0034	0.0045	0.0034	0.005	0.0047	0.0044	0.0044	0.14	0.0052	0.0065	0.0076	0.0077	0.0098	0.0081	0.0079	0.17	0.0079	0.15	0.0077	0.0082	0.008	0.008	0.0065	0.008	0.026	0.0077	0.089	0.0058	0.005	0.0097	0.0045

(a) = guideline is a minimum value, unless the background concentration or value is lower.
(b) = guideline is adopted from CCME Canadian Environmental Quality Guidelines (CCME, 1999).
(c) = guideline is hardness dependent. The guideline range shown is based on the hardness range observed in the dataset (217 to 640 mg/L). The guideline is calculated based on the individual hardness value for each sample.
(d) = for some samples, water hardness was greater than 250 mg/L. At this hardness, no BC ENV water quality guideline has been established for sulphate; however, the observed data were screened against the guideline for very hard water (i.e., 429 mg/L) for comparative purposes.
(e) = guideline is chloride dependent. The guideline range shown is based on the chloride concentration range observed in the dataset (2.5500 to 23.1000 mg/L). The guideline is calculated based on the individual chloride concentration in each sample.
(f) = guideline is adopted from the ECCC PNECs (ECCC, 2018) or draft FEQGs (ECCC, 2017).
(g) = guideline is for chromium VI.
(h) = guideline is pH dependent. The guideline range shown is based on the pH range observed in the dataset (8.0 to 8.4). The guideline is calculated based on the individual pH for each sample.
(i) = guideline is a level 1 interim screening value.
(j) = dissolved copper guideline was calculated using the simplified Biotic Ligand Midel (BC ENV, 2019). Where values were missing, the temporally nearest value from the same location was taken.
(Mn) = concentration is higher than the 30-day mean BC ENV guideline or outside the recommended pH, DO or total alkalinity range.
(Mx) = concentration is higher than the maximum BC ENV guideline or outside the recommended pH, DO or total alkalinity range.
(E) = concentration is higher than the EVWQP benchmarks guideline.
Bolded concentrations are higher than water quality guidelines.
Shaded concentrations are higher than the EVWQP benchmark (e.g., for nitrate, total selenium, dissolved cadmium or sulphate).
(DL>Mn) = analytical detection limit is higher than the 30-day mean BC ENV guideline.
Water quality data and guidelines shown in this table were rounded to reflect laboratory or field instrument precision after comparisons to guidelines. Therefore, values slightly above guidelines may be displayed as being equal to the guidelines and identified as exceedances. Concentrations equal to the guideline values were not identified as exceedances.
Concentrations were screened against available Working and Approved British Columbia Ministry of Environment and Climate Change Strategy (BC ENV) Water Quality Guidelines for the Protection of Aquatic Life; Accessed January 2020 from: https://www2.gov.bc.ca/gov/content/environment/air-land-water/water/water-quality/water-quality-guidelines.
\- = no guideline or no data
BC ENV = British Columbia Ministry of Environment & Climate Change Strategy; EVWQP = Elk Valley Water Quality Plan guidelines; *C. dubia = Ceriodaphnia dubia*; *P. subcapitata = Pseudokirchneriella subcapitata*; *H. azteca = Hyallela azteca*; *P. promelas = Pimephales promelas*; *O. mykiss = Oncorhynchus mykiss*; CV = coefficient of variation; ∑ = sum of; WQGs = Water Quality Guidelines; CaCO3 = calcium carbonate; mg/L = milligrams per litre; µS/cm = microsiemens per centimeter; NTU = nephelometric turbidity units; meq/L = milliequivalents per litre; mg-N/L = milligrams of Nitrogen per litre; mg=P/L = milligrams of Phosphorus per litre.
BC ENV (B.C. Ministry of Climate Chande Strategy). 2019. Copper Water Quality guideline for the Protection of Aquatic Life-Technical Report. Water Quality Guideline Series, WQG-03-1. Prov. B.C., Victoria B.C.

Parameter	Unit	Guidelines for the protection of:			LCDSSLCC				
		Aquatic Life		EVWQP Benchmarks	9-Nov-21	Oct 12, 19, 26, Nov 2 *H. azteca*		Oct 12, 19, 26, Nov 2, 9 *O. mykiss*	
		30-day mean	Maximum			Mean	CV	Mean	CV
Field Measured									
pH	-	6.5 - 9.0	6.5 - 9.0	-	8.2	8.2	0.022	8.2	0.019
Specific conductivity	µS/cm at 25 C	-	-	-	949	909	0.015	917	0.024
Temperature	°C	-	-	-	3.9	5.1	0.15	4.8	0.17
Dissolved oxygen	mg/L	11	9.0	-	11	11	0.026	11	0.024
Turbidity	NTU	-	-	-	0.6	0.55	0.09	0.56	0.087
Dissolved oxygen	%	-	-	-	87	86	0.026	86	0.022
Oxidation-reduction potential field	mv	-	-	-	132	172	0.26	164	0.26
Conventional Parameters									
pH	-	6.5 - 9.0	6.5 - 9.0	-	8.3	8.4	0.017	8.4	0.016
Hardness, as $CaCO_3$	mg/L	-	-	-	498	483	0.045	486	0.041
Total alkalinity, as $CaCO_3$	mg/L	20[a]	-	-	231	215	0.032	218	0.043
Total dissolved solids	mg/L	-	-	-	656	648	0.0092	649	0.0099
Total suspended solids	mg/L	-	-	-	1.0	1.4	0.35	1.3	0.35
Total organic carbon	mg/L	-	-	-	0.84	1.3	0.64	1.2	0.62
Dissolved organic carbon	mg/L	-	-	-	0.98	1.0	0.27	1.0	0.24
Turbidity	NTU	-	-	-	<0.10	0.15	0.27	0.14	0.3
Total acidity	mg/L	-	-	-	2.1	<2	0	2.0	0.022
Cation - anion balance	%	-	-	-	6.7	4.2	0.33	4.7	0.35
Ion balance	%	-	-	-	87	92	0.027	91	0.033
Conductivity	µS/cm	-	-	-	947	911	0.03	918	0.031
Oxidation-reduction potential	mv	-	-	-	455	434	0.087	438	0.077
Major Ions									
Bicarbonate	mg/L	-	-	-	231	250	0.05	246	0.055
Bromide	mg/L	-	-	-	<0.25	<0.2	0.5	<0.21	0.43
Calcium	mg/L	-	-	-	112	112	0.053	112	0.046
Carbonate, as $CaCO_3$	mg/L	-	-	-	<1.0	6.1	0.71	5.1	0.86
Chloride	mg/L	150	600	-	17	16	0.16	16	0.14
Fluoride	mg/L	0.12[a]	1.6 - 2.1[c]	-	**0.23**[MAC]	**0.23**[MAC]	0.2	**0.23**[MAC]	0.17
Hydroxide	mg/L	-	-	-	<1.0	<1	0	<1	0
Magnesium	mg/L	-	-	-	53	49	0.035	50	0.045
Potassium	mg/L	-	-	-	1.6	1.5	0.034	1.5	0.04
Sodium	mg/L	-	-	-	10	9.0	0.044	9.3	0.068
Sulphate	mg/L	429[d,e,d]	-	481	296	271	0.096	276	0.092
Major anion sum	meq/l	-	-	-	12	11	0.047	11	0.056
Major cation sum	meq/l	-	-	-	10	10	0.045	10	0.041
Bicarbonate Alkalinity, as $CaCO_3$	mg/l	-	-	-	190	205	0.05	202	0.055
Carbonate Alkalinity, as $CaCO_3$	mg/l	-	-	-	<1.0	10	0.75	8.2	0.93
Hydroxide Alkalinity, as $CaCO_3$	mg/l	-	-	-	<1.0	<1	0	<1	0
Nutrients and Biological Indicators									
Nitrate	mg-N/L	3.0	33	6.6 - 15[c]	**8.4**[MAC]	**8.0**[MAC]	0.095	**8.1**[MAC]	0.085
Nitrite	mg-N/L	0.040 - 0.20[a]	0.12 - 0.60[a]	-	<0.0050	<0.004	0.5	<0.0042	0.43
Total ammonia	mg-N/L	2.1	14	-	<0.0050	<0.005	0	<0.005	0
Total Kjeldahl nitrogen	mg-N/L	-	-	-	0.16	0.28	0.23	0.25	0.3
Total phosphorus	mg-P/L	-	-	-	<0.0020	0.0021	0.095	0.0021	0.086
Orthophosphate	mg-P/L	-	-	-	0.0015	0.0013	0.21	0.0014	0.18
Biochemical oxygen demand	mg/L	-	-	-	<2.0	<2	0	<2	0
Total Metals									
Aluminum	mg/L	-	-	-	<0.0030	0.0031	0.033	0.003	0.029
Antimony	mg/L	0.0090	-	-	0.00023	0.00023	0.041	0.00023	0.036
Arsenic	mg/L	0.0050	0.0050	-	0.00014	0.00012	0.15	0.00012	0.15
Barium	mg/L	1.0	-	-	0.065	0.068	0.042	0.067	0.04
Beryllium	mg/L	0.00013	-	-	<0.000020	<0.00002	0	<0.00002	0
Bismuth	mg/L	0.00050[i]	-	-	<0.000050	<0.00005	0	<0.00005	0
Boron	mg/L	1.2	29[a,i]	-	0.015	0.015	0.033	0.015	0.029
Cadmium	mg/L	-	-	-	0.00013	0.00014	0.13	0.00014	0.12
Calcium	mg/L	-	-	-	114	114	0.014	114	0.012
Chromium	mg/L	0.0010[g,i]	-	-	0.00013	0.00013	0.063	0.00013	0.054
Cobalt	mg/L	0.0040	0.11	-	<0.00010	<0.0001	0	<0.0001	0
Copper	mg/L	-	-	-	<0.00050	<0.0005	0	<0.0005	0
Iron	mg/L	0.67 - 3.7[a,h]	1	-	<0.010	0.011	0.11	0.011	0.11
Lead	mg/L	0.012 - 0.020[a,h]	0.22 - 0.42[a]	-	<0.000050	<0.00005	0	<0.00005	0
Lithium	mg/L	0.1216[f]	-	-	0.049	0.049	0.059	0.049	0.051
Magnesium	mg/L	-	-	-	54	51	0.077	52	0.07
Manganese	mg/L	1.6 - 2.6[a,h]	2.9 - 3.4[a]	-	0.004	0.0046	0.28	0.0045	0.25
Mercury	mg/L	0.000010	-	-	<0.00000050	<0.0000005	0	<0.0000005	0
Molybdenum	mg/L	1.0	2.0	-	0.003	0.0029	0.024	0.0029	0.03
Nickel	mg/L	0.0053[f]	-	-	0.0049	0.005	0.033	0.005	0.03
Potassium	mg/L	-	-	-	1.5	1.5	0.0083	1.5	0.0088
Selenium	mg/L	0.0020	-	0.019	**0.037**[MAC, Mn]	**0.036**[MAC, Mn]	0.059	**0.036**[MAC, Mn]	0.054
Silicon	mg/L	-	-	-	2.4	2.3	0.0097	2.3	0.016
Silver	mg/L	0.0015[a,i]	0.0030[a,i]	-	<0.000010	<0.00001	0	<0.00001	0
Sodium	mg/L	-	-	-	9.5	9.4	0.027	9.5	0.024
Strontium	mg/L	-	-	-	0.24	0.22	0.008	0.22	0.038
Sulphur	mg/L	-	-	-	100	96	0.03	97	0.031
Thallium	mg/L	0.00080	-	-	<0.000010	<0.00001	0	<0.00001	0
Tin	mg/L	0.3[f]	-	-	<0.00010	<0.0001	0	<0.0001	0
Titanium	mg/L	0.85[f]	-	-	<0.00030	<0.0003	0	<0.0003	0
Uranium	mg/L	0.0065	0.033[a,i]	-	0.0037	0.0037	0.055	0.0037	0.048
Vanadium	mg/L	0.12[f]	-	-	<0.00050	<0.0005	0	<0.0005	0
Zinc	mg/L	0.10 - 0.19	0.13 - 0.34	-	0.0056	0.0054	0.1	0.0054	0.091
Dissolved Metals									
Aluminum	mg/L	0.050[a,i]	0.10[a,i]	-	<0.0010	0.0015	0.69	0.0014	0.66
Antimony	mg/L	-	-	-	0.00024	0.00022	0.083	0.00022	0.081
Arsenic	mg/L	-	-	-	0.00039	<0.0001	0	0.00016	0.82
Barium	mg/L	-	-	-	0.07	0.065	0.035	0.066	0.045
Beryllium	mg/L	-	-	-	<0.000020	<0.00002	0	<0.00002	0
Bismuth	mg/L	-	-	-	<0.000050	<0.00005	0	<0.00005	0
Boron	mg/L	-	-	-	0.014	0.015	0.034	0.015	0.038
Cadmium	mg/L	0.00037 - 0.00046[a,h]	0.0013 - 0.0028[a,h]	0.00026 - 0.00032[a,h]	0.00014	0.00014	0.031	0.00014	0.028
Chromium	mg/L	-	-	-	0.00011	0.00019	0.76	0.00017	0.74
Cobalt	mg/L	-	-	-	<0.00010	<0.0001	0	<0.0001	0
Copper	mg/L	0.0004 - 0.005[a,h]	0.0023 - 0.0285[a,h]	-	<0.00020	0.00022	0.16	0.00021	0.15
Iron	mg/L	-	0.35	-	<0.010	<0.01	0	<0.01	0
Lead	mg/L	-	-	-	<0.000050	<0.00005	0	<0.00005	0
Lithium	mg/L	-	-	-	0.049	0.045	0.078	0.046	0.076
Manganese	mg/L	-	-	-	0.004	0.0037	0.11	0.0038	0.11
Mercury	mg/L	-	-	-	<0.0000050	<0.000005	0	<0.000005	0
Molybdenum	mg/L	-	-	-	0.0031	0.0028	0.032	0.0028	0.05
Nickel	mg/L	-	-	-	0.0048	0.0047	0.068	0.0048	0.059
Selenium	mg/L	-	-	-	0.045	0.035	0.075	0.037	0.14
Silicon	mg/L	-	-	-	2.4	2.1	0.033	2.2	0.068
Silver	mg/L	-	-	-	<0.000010	<0.00001	0	<0.00001	0
Strontium	mg/L	2.5[f]	-	-	0.24	0.22	0.043	0.22	0.062
Sulphur	mg/L	-	-	-	106	90	0.071	93	0.098
Thallium	mg/L	-	-	-	<0.000010	<0.00001	0	<0.00001	0
Tin	mg/L	-	-	-	<0.00010	0.00011	0.14	0.00011	0.13
Titanium	mg/L	-	-	-	<0.00030	<0.0003	0	<0.0003	0
Uranium	mg/L	-	-	-	0.0035	0.0036	0.072	0.0036	0.063
Vanadium	mg/L	-	-	-	<0.00050	<0.0005	0	<0.0005	0
Zinc	mg/L	-	-	-	0.005	0.0063	0.38	0.006	0.35

(a) = guideline is a minimum value, unless the background concentration or value is lower.
(b) = guideline is adopted from CCME Canadian Environmental Quality Guidelines (CCME, 1999).
(c) = guideline is hardness dependent. The guideline range shown is based on the hardness range observed in the dataset (217 to 640 mg/L). The guideline is calculated based on the individual hardness value for each sample.
(d) = for some samples, water hardness was greater than 250 mg/L. At this hardness, no BC ENV water quality guideline has been established for sulphate; however, the observed data were screened against the guideline for very hard water (i.e., 429 mg/L) for comparative purposes.
(e) = guideline is chloride dependent. The guideline range shown is based on the chloride concentration range observed in the dataset (2,5500 to 23,1000 mg/L). The guideline is calculated based on the individual chloride concentration in each sample.
(f) = guideline is adopted from the ECCC PNECs (ECCC, 2018) or draft FEQGs (ECCC, 2017).
(g) = guideline is for chromium VI.
(h) = guideline is pH-dependent. The guideline range shown is based on the pH range observed in the dataset (8.0 to 8.4). The guideline is calculated based on the individual pH for each sample.
(i) = guideline is a level 1 interim screening value.
(j) = dissolved copper guideline was calculated using the simplified Biotic Ligand Midel (BC ENV, 2019). Where values were missing, the temporally nearest value from the same location was taken.
(Mn) = concentration is higher than the 30-day mean BC ENV guideline or outside the recommended pH, DO or total alkalinity range.
(Mx) = concentration is higher than the maximum BC ENV guideline or outside the recommended pH, DO or total alkalinity range.
(E) = concentration is higher than the EVWQP benchmarks guideline.
Bolded concentrations are higher than water quality guidelines.
Shaded concentrations are higher than the EVWQP benchmark (e.g., for nitrate, total selenium, dissolved cadmium or sulphate).
DL>MAC = analytical detection limit is higher than the 30-day mean BC ENV guideline.
Water quality data and guidelines shown in this table were rounded to reflect laboratory or field instrument precision after comparisons to guidelines. Therefore, values slightly above guidelines may be displayed as being equal to the guidelines and identified as exceedances. Concentrations equal to the guideline values were not identified as exceedances.
Concentrations were screened against available Working and Approved British Columbia Ministry of Environment and Climate Change Strategy (BC ENV) Water Quality Guidelines for the Protection of Aquatic Life; Accessed January 2020 from: https://www2.gov.bc.ca/gov/content/environment/air-land-water/water/water-quality/water-quality-guidelines.
- = no guideline or no data
BC ENV = British Columbia Ministry of Environment & Climate Change Strategy; EVWQP = Elk Valley Water Quality Plan guidelines; *C. dubia* = *Ceriodaphnia dubia* ; *P. subcapitata* = *Pseudokirchneriella subcapitata* ; *H. azteca* = *Hyalella azteca* ; *P. promelas* = *Pimephales promelas* ; *O. mykiss* = *Oncorhynchus mykiss* ; CV = coefficient of variation; ∑ = sum of; WQGs = Water Quality Guidelines; CaCO3 = calcium carbonate; mg/L = milligrams per litre; µS/cm = microsiemens per centimeter; NTU = nephelometric turbidity units; meq/L = milliequivalents per litre; mg-N/L = milligrams of Nitrogen per litre; mg-P/L = milligrams of Phosphorus per litre.
BC ENV (B.C. Ministry of Climate Chande Strategy). 2019. Copper Water Quality guideline for the Protection of Aquatic Life-Technical Report. Water Quality Guideline Series, WQG-03-1. Prov. B.C., Victoria B.C.

APPENDIX D

Water Quality Response

Year	Quarter	Sample ID	Mean Survival (Control Normalized)	Mean Reproduction (Control Normalized)	ACIDITY TO pH 8.3 (As CaCO3)-N-mg/l	ALKALINITY BICARBONATE (As CaCO3) lab measured.-N-mg/l	ALKALINITY CARBONATE (As CaCO3) lab measured.-N-mg/l	ALKALINITY HYDROXIDE (As CaCO3) lab measured.-N-mg/l	ALKALINITY TOTAL (As CaCO3) lab measured.-N-mg/l	ALUMINUM-D-mg/l
Reference (2015 to 2021)										
2015	Q1	Reference (FR_UFR1)	111	103	< 1.0	147	2.3	< 1.0	149	< 0.0030
2015	Q1	Reference (FR_UFR1)	100	93	< 1.0	147	2.3	< 1.0	149	< 0.0030
2015	Q1	Reference (FR_UFR1)	100	102	< 1.0	144	1.3	< 1.0	145	< 0.0030
2015	Q2	Reference (FR_UFR1)	100	92	< 1.0	116	2.8	< 1.0	119	0.0092
2015	Q2	Reference (GH_ER2)	100	93	< 1.0	151	6.2	< 1.0	157	< 0.0030
2015	Q3	Reference (FR_UFR1)	111	106	< 1.0	152	7.4	< 1.0	159	< 0.0030
2015	Q4	Reference (FR_UFR1)	100	112	< 1.0	138	7.6	< 1.0	146	< 0.0030
2015	Q4	Reference (GH_ER2)	100	110	< 1.0	147	< 1.0	< 1.0	147	< 0.0030
2016	Q1	Reference (FR_UFR1)	111	114	< 1.0	138	< 1.0	< 1.0	138	< 0.0030
2016	Q2	Reference (FR_UFR1)	100	98	< 1.0	110	< 1.0	< 1.0	110	0.015
2016	Q2	Reference (GH_ER2)	90	74	< 1.0	143	< 1.0	< 1.0	143	0.0036
2016	Q3	Reference (FR_UFR1)	100	99	< 1.0	160	< 1.0	< 1.0	160	< 0.0030
2016	Q4	Reference (FR_UFR1)	100	92	< 1.0	141	< 1.0	< 1.0	141	0.011
2016	Q4	Reference (GH_ER2)	100	95	< 1.0	143	< 1.0	< 1.0	143	< 0.0030
2017	Q1	Reference (FR_UFR1)	100	131	-	-	-	-	146	<0.001
2017	Q2	Reference (FR_UFR1)	100	104	-	-	-	-	113	0.089
2017	Q2	Reference (GH_ER2)	90	83	-	-	-	-	153	<0.003
2017	Q2	Reference (CM_MC1)	100	118	-	-	-	-	133	0.004
2017	Q3	Reference (FR_UFR1)	100	109	-	-	-	-	148	0.0015
2017	Q3	Reference (GH_ER2)	100	122	-	-	-	-	130	0.0027
2017	Q3	Reference (CM_MC1)	100	118	-	-	-	-	141	0.0026
2017	Q4	Reference (FR_UFR1)	100	102	-	-	-	-	138	<0.003
2017	Q4	Reference (GH_ER2)	100	97	-	-	-	-	155	<0.003
2017	Q4	Reference (CM_MC1)	100	101	-	-	-	-	134	<0.003
2018	Q1	Reference (FR_UFR1)	100	88	<1	126	11	<1	137	<0.003
2018	Q1	Reference (GH_ER2)	80	68	1.5	153	<1	<1	153	<0.003
2018	Q1	Reference (CM_MC1)	100	77	<1	163	10	<1	173	<0.003
2018	Q2	Reference (FR_UFR1)	100	101	<1	103	2.8	<1	106	0.022
2018	Q2	Reference (GH_ER2)	90	76	<1	130	10	<1	140	0.0039
2018	Q2	Reference (CM_MC1)	100	127	<1	111	6.0	<1	117	0.023
2018	Q2	Reference (LC_SLC)	100	77	<1	120	6.8	<1	126	<0.003
2018	Q3	Reference (FR_UFR1)	90	111	<1	147	4.2	<1	152	<0.003
2018	Q3	Reference (GH_ER2)	100	96	<1	134	<1	<1	134	<0.003
2018	Q3	Reference (CM_MC1)	80	97	<1	143	1.8	<1	145	<0.003
2018	Q3	Reference (LC_SLC)	100	107	<1	137	2.6	<1	140	<0.003
2018	Q4	Reference (FR_UFR1)	100	111	<1	146	4.0	<1	150	<0.003
2018	Q4	Reference (GH_ER2)	111	113	<1	146	<1	<1	146	<0.003
2018	Q4	Reference (CM_MC1)	111	126	<1	131	<1	<1	131	<0.003
2018	Q4	Reference (LC_SLC)	111	104	<1	143	<1	<1	143	<0.003
2019	Q1	Reference (FR_UFR1)	100	70	<1	182	<1	<1	182	<0.003
2019	Q1	Reference (GH_ER2)	100	83	<1	150	<1	<1	150	<0.003
2019	Q1	Reference (CM_MC1)	90	89	1.6	179	<1	<1	179	<0.003
2019	Q1	Reference (LC_SLC)	100	93	1.4	154	<1	<1	154	<0.003
2019	Q2	Reference (FR_UFR1)	100	79	<1	126	<1	<1	126	0.012
2019	Q2	Reference (GH_ER2)	90	75	<1	144	<1	<1	144	<0.003
2019	Q2	Reference (CM_MC1)	90	69	1.8	125	<1	<1	125	0.0036
2019	Q2	Reference (LC_SLC)	100	83	<1	140	<1	<1	140	<0.003
2019	Q3	Reference (FR_UFR1)	100	94	<1	138	5	<1	143	<0.003
2019	Q3	Reference (GH_ER2)	90	101	8	133	<1	<1	133	<0.003
2019	Q3	Reference (CM_MC1)	100	73	<1	141	4.8	<1	146	<0.003
2019	Q3	Reference (LC_SLC)	80	72	1.5	138	<1	<1	138	<0.003
2019	Q4	Reference (FR_UFR1)	100	90	<1	143	<1	<1	143	<0.003
2019	Q4	Reference (GH_ER2)	100	98	1.6	145	<1	<1	145	<0.003
2019	Q4	Reference (CM_MC1)	100	87	<1	141	<1	<1	141	<0.003
2019	Q4	Reference (LC_SLC)	100	83	<1	145	<1	<1	145	<0.003
2020	Q1	Reference (FR_UFR1)	89	80	<1	145	<1	<1	145	<0.003
2020	Q1	Reference (GH_ER2)	111	105	<1	155	<1	<1	155	<0.003
2020	Q1	Reference (CM_MC1)	89	92	<1	151	<1	<1	151	<0.003
2020	Q1	Reference (LC_SLC)	111	109	<1	146	<1	<1	146	<0.003
2020	Q2	Reference (FR_UFR1)	90	86	<1	121	5	<1	126	0.004
2020	Q2	Reference (GH_ER2)	100	97	<1	153	2.8	<1	156	<0.003
2020	Q2	Reference (CM_MC1)	100	105	<1	123	2.2	<1	125	0.0047
2020	Q2	Reference (LC_SLC)	100	103	<1	139	5	<1	144	<0.003
2020	Q3	Reference (FR_UFR1)	100	100	<1	146	<1	<1	146	<0.003
2020	Q3	Reference (GH_ER2)	90	93	<1	132	<1	<1	132	<0.003
2020	Q3	Reference (CM_MC1)	100	107	<1	144	<1	<1	144	<0.003
2020	Q3	Reference (LC_SLC)	100	100	<1	142	<1	<1	142	<0.003
2020	Q4	Reference (FR_UFR1)	100	92	<1	143	5.6	<1	149	<0.003
2020	Q4	Reference (GH_ER2)	100	93	<1	149	<1	<1	149	<0.003
2020	Q4	Reference (CM_MC1)	100	87	<1	145	<1	<1	145	<0.003
2020	Q4	Reference (LC_SLC)	100	92	<1	142	4.6	<1	147	<0.003
2021	Q1	Reference (FR_UFR1)	100	95	<2	123	2.2	<1	125	0.0044
2021	Q1	Reference (GH_ER2)	90	101	<2	157	<1	<1	157	<0.001
2021	Q1	Reference (CM_MC1)	90	93	<2	155	<1	<1	155	0.002
2021	Q1	Reference (LC_SLC)	80	66	<2	145	5.4	<1	150	<0.001
2021	Q2	Reference (FR_UFR1)	100	104	<2	117	<1	<1	117	0.0047
2021	Q2	Reference (GH_ER2)	90	109	<2	149	<1	<1	149	0.0029
2021	Q2	Reference (CM_MC1)	90	106	<2	88	<1	<1	88	0.0162
2021	Q2	Reference (LC_SLC)	100	105	<2	119	<1	<1	119	0.003
2021	Q3	Reference (FR_UFR1)	100	100	<2	147	3.8	<1	151	0.0014
2021	Q3	Reference (GH_ER2)	90	95	<2	130	1.6	<1	132	<0.001
2021	Q3	Reference (CM_MC1)	100	104	<2	143	3.6	<1	147	0.0023
2021	Q3	Reference (LC_SLC)	100	104	<2	142	<1	<1	142	0.0013
2021	Q4	Reference (FR_UFR1)	100	100	<2	168	<1	<1	168	0.0015
2021	Q4	Reference (GH_ER2)	100	101	<2	158	<1	<1	158	0.0017
2021	Q4	Reference (CM_MC1)	90	95	<2	159	<1	<1	159	<0.001
2021	Q4	Reference (LC_SLC)	100	97	<2	163	<1	<1	163	0.001
Tests categorized as no adverse response (2015 to 2021)										
2015	Q1	GH_FR1	111	99	1.7	202	<1	<1	202	< 0.0030
2015	Q1	GH_ERC	100	96	2.6	155	<1	<1	155	< 0.0030
2015	Q1	CM_MC2	111	87	1.8	205	8.4	< 0.00010	213	0.0097
2015	Q1	EV_MC2	100	96	3.4	193	<1	<1	193	0.0037
2015	Q1	EV_HC1	100	97	1.0	131	4.3	1.0	135	0.003
2015	Q1	LC_LCDSSLCC	111	98	<1	193	2.7	<1	195	< 0.0030
2015	Q2	FR_FRCP1	100	94	<1	142	5.0	<1	147	< 0.0030
2015	Q2	GH_FR1	100	103	<1	159	8.0	<1	167	< 0.0030
2015	Q2	GH_ERC	100	91	<1	157	4.8	<1	161	< 0.0030
2015	Q2	EV_MC2	100	90	1.6	112	3.7	<1	116	< 0.0070
2015	Q2	EV_HC1	100	97	1.3	103	6.7	1.0	110	0.0032
2015	Q2	LC_DCDS	111	87	<1.0	92	<1.0	<1.0	92	0.0288
2015	Q2	LC_LC3	90	77	1.9	165	2.5	<1.0	168	<0.0030
2015	Q2	LC_LC5	111	93	<1.0	159	8.2	<1.0	167	0.0041
2015	Q2	LC_LCDSSLCC	100	92	<1	144	5.5	<1	150	< 0.0030
2015	Q3	FR_FRCP1	111	119	<1	187	11	<1	198	< 0.0030
2015	Q3	GH_FR1	111	114	<1	174	8.2	<1	182	< 0.0030
2015	Q3	GH_ERC	111	100	<1	142	<1	<1	142	< 0.0030
2015	Q3	CM_MC2	111	104	<1	188	11	<1	198	< 0.0030
2015	Q3	EV_MC2	111	114	3.2	194	<1	<1	194	0.003
2015	Q3	EV_HC1	111	123	<1	182	9.8	<1	192	0.0049
2015	Q3	LC_LCDSSLCC	111	107	<1	171	10	<1	181	< 0.0030
2015	Q4	GH_FR1	100	124	<1	183	4.8	<1	188	< 0.0030
2015	Q4	GH_ERC	100	120	<1	151	<1	<1	151	< 0.0030
2015	Q4	EV_MC2	100	111	3.0	193	<1	<1	193	< 0.0030
2015	Q4	EV_HC1	100	119	<1	187	8.0	<1	195	< 0.0030
2015	Q4	LC_DCDS	111	103	<1.0	133	<1.0	<1.0	133	<0.0050
2015	Q4	LC_LC5	100	77	<1.0	167	<1.0	<1.0	167	<0.0050
2015	Q4	LC_LCDSSLCC	100	85	< 1.0	197	< 1.0	< 1.0	197	< 0.0050
2016	Q1	GH_FR1	89	92	< 1.0	190	< 1.0	< 1.0	190	< 0.0030
2016	Q1	GH_ERC	100	101	< 1.0	152	< 1.0	< 1.0	152	< 0.0030
2016	Q1	CM_MC2	111	97	< 1.0	199	7.0	< 1.0	206	< 0.0030
2016	Q1	EV_MC2	111	109	3.5	179	< 1.0	< 1.0	179	< 0.0030
2016	Q1	EV_HC1	111	113	< 1.0	191	< 1.0	< 1.0	191	< 0.0030
2016	Q1	LC_LCDSSLCC	111	109	< 1.0	193	< 1.0	< 1.0	193	< 0.0030
2016	Q2	FR_FRCP1	100	80	< 1.0	147	< 1.0	< 1.0	147	< 0.0030
2016	Q2	GH_ERC	100	77	< 1.0	146	< 1.0	< 1.0	146	0.0045
2016	Q2	EV_MC2	100	77	1.4	98	< 1.0	< 1.0	98	0.018
2016	Q2	EV_HC1	90	79	< 1.0	173	6.0	< 1.0	179	0.0046
2016	Q2	LC_LC5	100	95	<1.0	148	4.8	<1.0	153	<0.0030
2016	Q2	LC_LCDSSLCC	100	77	< 1.0	153	< 1.0	< 1.0	153	< 0.0030
2016	Q3	GH_FR1	100	100	< 1.0	198	< 1.0	< 1.0	198	< 0.0030
2016	Q3	GH_ERC	100	95	1.1	144	< 1.0	< 1.0	144	< 0.0030
2016	Q3	EV_MC2	100	96	1.6	204	< 1.0	< 1.0	204	< 0.0030
2016	Q3	EV_HC1	100	89	< 1.0	192	< 1.0	< 1.0	192	0.014
2016	Q3	LC_LCDSSLCC	100	83	1.1	187	< 1.0	< 1.0	187	< 0.0030
2016	Q4	GH_FR1	100	83	<1	188	<1	<1	188	<0.003
2016	Q4	GH_ERC	100	84	< 1.0	148	< 1.0	< 1.0	148	< 0.0030
2016	Q4	EV_HC1	100	88	< 1.0	190	2.0	< 1.0	192	0.0054
2016	Q4	LC_LC5	111	97	<1.0	173	3	<1.0	176	<0.0030
2016	Q4	LC_LCDSSLCC	100	94	< 1.0	174	2.2	< 1.0	176	< 0.0030
2017	Q1	GH_FR1	100	108	-	-	-	-	202	<0.003
2017	Q1	GH_ERC	100	126	-	-	-	-	156	<0.003
2017	Q1	EV_HC1	100	121	-	-	-	-	197	<0.003
2017	Q2	GH_FR1	100	85	-	-	-	-	194	0.0069
2017	Q2	GH_ERC	100	98	-	-	-	-	157	<0.003
2017	Q2	LC_DCDS	100	87	2.1	95.7	<1.0	<1.0	95.7	0.0265
2017	Q2	LC_LC5	112.5	82	<1.0	174	9.2	<1.0	183	0.0065
2017	Q2	LC_LCDSSLCC	100	124	-	-	-	-	199	0.0011
2017	Q3	GH_ERC	100	95	-	-	-	-	140	0.0031
2017	Q3	EV_MC2	100	96	-	-	-	-	167	<0.003
2017	Q3	EV_HC1	100	105	-	-	-	-	182	<0.003
2017	Q3	LC_LCDSSLCC	100	104	-	-	-	-	192	0.0015
2017	Q4	GH_FR1	100	116	-	-	-	-	160	<0.003
2017	Q4	GH_ERC	100	101	-	-	-	-	145	<0.003
2017	Q4	EV_MC2	100	126	-	-	-	-	137	<0.003
2017	Q4	EV_HC1	100	100	-	-	-	-	171	<0.003
2017	Q4	LC_DCDS	111	97	<1.0	142	<1.0	<1.0	142	0.0134
2017	Q4	LC_LC5	100	89	<1.0	146	<1.0	<1.0	146	<0.0030
2017	Q4	LC_LCDSSLCC	100	127	-	-	-	-	156	<0.003
2018	Q1	GH_FR1	100.00	79	<1	197	5.6	<1	203	<0.003
2018	Q1	GH_ERC	100.00	73	2.2	154	<1	<1	154	<0.003
2018	Q1	CM_MC3	100.00	87	<1	214	2.4	<1	216	<0.003
2018	Q1	EV_HC1	100.00	60	<1	177	21	<1	198	<0.003
2018	Q1	LC_LCDSSLCC	100.00	75	<1	193	1.2	<1	194	<0.003
2018	Q2	EV_MC2	90.00	94	<5.5	118	5.4	<1	123	0.016
2018	Q2	EV_HC1	100.00	97	<1	155	15	<1	170	0.0046
2018	Q2	LC_DCDS	100	77	<1.0	104	<1.0	<1.0	104	0.0183
2018	Q3	GH_FR1	90.00	100	<1	204	<1	<1	204	<0.003
2018	Q3	GH_ERC	90.00	107	<1	142	<1	<1	142	<0.003
2018	Q3	EV_MC2	100.00	89	<1	179	6.8	<1	186	<0.003
2018	Q3	EV_HC1	100.00	125	<1	177	11	<1	187	<0.003

Year	Quarter	Sample ID	ALUMINUM-T-mg/l	ANTIMONY-D-mg/l	ANTIMONY-T-mg/l	ARSENIC-D-mg/l	ARSENIC-T-mg/l	BARIUM-D-mg/l	BARIUM-T-mg/l	BERYLLIUM-D-mg/l	BERYLLIUM-T-mg/l	BISMUTH-D-mg/l	BISMUTH-T-mg/l	BORON-D-mg/l	BORON-T-mg/l	BROMIDE-D-mg/l	CADMIUM-D-mg/l
Reference (2015 to 2021)																	
2015	Q1	Reference (FR_UFR1)	0.0032	< 0.00010	< 0.00010	< 0.00010	< 0.00010	0.077	0.077	< 0.00010	< 0.00010	< 0.00050	< 0.00050	< 0.010	< 0.010	< 0.050	< 0.000010
2015	Q1	Reference (FR_UFR1)	0.0032	< 0.00010	< 0.00010	< 0.00010	< 0.00010	0.077	0.077	< 0.00010	< 0.00010	< 0.00050	< 0.00050	< 0.010	< 0.010	< 0.050	< 0.000010
2015	Q1	Reference (FR_UFR1)	0.0059	< 0.00010	< 0.00010	< 0.00010	< 0.00010	0.075	0.078	< 0.00010	< 0.00010	< 0.00050	< 0.00050	< 0.010	< 0.010	< 0.050	0.000011
2015	Q2	Reference (FR_UFR1)	0.083	< 0.00010	< 0.00010	0.00012	0.00014	0.042	0.043	< 0.00010	< 0.00010	< 0.000050	< 0.000050	< 0.010	< 0.010	< 0.050	0.0000074
2015	Q2	Reference (GH_ER2)	0.076	< 0.00010	< 0.00010	0.00011	0.00016	0.046	0.048	< 0.00010	< 0.00010	< 0.000050	< 0.000050	< 0.010	< 0.010	< 0.050	< 0.0000050
2015	Q3	Reference (FR_UFR1)	0.0078	< 0.00010	< 0.00010	0.00011	0.00012	0.076	0.076	< 0.00010	< 0.00010	< 0.000050	< 0.000050	< 0.010	< 0.010	< 0.050	0.0000057
2015	Q4	Reference (FR_UFR1)	0.0046	< 0.00010	< 0.00010	< 0.00010	0.0001	0.074	0.075	< 0.00010	< 0.00010	< 0.000050	< 0.000050	< 0.010	< 0.010	< 0.050	< 0.0000050
2015	Q4	Reference (GH_ER2)	0.0046	< 0.00010	< 0.00010	< 0.00010	< 0.00010	0.047	0.049	< 0.00010	< 0.00010	< 0.000050	< 0.000050	< 0.010	< 0.010	< 0.050	0.0000053
2016	Q1	Reference (FR_UFR1)	0.0048	< 0.00010	< 0.00010	< 0.00010	< 0.00010	0.074	0.073	< 0.00010	< 0.00010	< 0.000050	< 0.000050	< 0.010	< 0.010	< 0.050	0.0000054
2016	Q2	Reference (FR_UFR1)	0.11	< 0.00010	< 0.00010	0.00011	0.00014	0.04	0.042	< 0.00010	< 0.00010	< 0.000050	< 0.000050	< 0.010	< 0.010	< 0.050	0.0000062
2016	Q2	Reference (GH_ER2)	0.2	< 0.00010	< 0.00010	0.00011	0.00024	0.042	0.044	< 0.00010	< 0.00010	< 0.000050	< 0.000050	< 0.010	< 0.010	< 0.050	0.0000076
2016	Q3	Reference (FR_UFR1)	0.013	< 0.00010	< 0.00010	< 0.00010	0.0001	0.074	0.077	< 0.000020	< 0.000020	< 0.000050	< 0.000050	< 0.010	< 0.010	< 0.050	0.0000055
2016	Q4	Reference (FR_UFR1)	0.051	< 0.00010	< 0.00010	< 0.00010	0.00015	0.069	0.064	< 0.000020	< 0.000020	< 0.000050	< 0.000050	< 0.010	< 0.010	< 0.050	0.0000057
2016	Q4	Reference (GH_ER2)	0.0075	< 0.00010	< 0.00010	< 0.00010	< 0.00010	0.042	0.038	< 0.000020	< 0.000020	< 0.000050	< 0.000050	< 0.010	< 0.010	< 0.050	< 0.0000050
2017	Q1	Reference (FR_UFR1)	0.0046	<0.0001	0.00026	<0.0001	0.00012	0.073	0.073	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.00001
2017	Q2	Reference (FR_UFR1)	0.15	<0.0001	<0.0001	0.00015	0.00019	0.053	0.051	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.000016
2017	Q2	Reference (GH_ER2)	0.077	<0.0001	<0.0001	<0.0001	0.00014	0.05	0.051	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000098
2017	Q2	Reference (CM_MC1)	0.02	<0.0001	<0.0001	0.00022	0.0002	0.048	0.046	<0.00002	<0.00002	<0.00005	<0.00005	0.013	0.013	<0.05	0.000012
2017	Q3	Reference (FR_UFR1)	0.0071	<0.0001	0.00011	<0.0001	0.00013	0.068	0.069	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.000008
2017	Q3	Reference (GH_ER2)	0.012	<0.0001	0.00019	0.00011	0.00012	0.043	0.043	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000081
2017	Q3	Reference (CM_MC1)	0.021	<0.0001	<0.0001	0.00022	0.00024	0.05	0.046	<0.00002	<0.00002	<0.00005	<0.00005	0.018	0.013	<0.05	0.00001
2017	Q4	Reference (FR_UFR1)	0.0037	<0.0001	<0.0001	<0.0001	0.00011	0.072	0.072	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000069
2017	Q4	Reference (GH_ER2)	0.0061	<0.0001	<0.0001	<0.0001	0.00011	0.049	0.048	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000056
2017	Q4	Reference (CM_MC1)	0.0086	<0.0001	<0.0001	0.00016	0.00019	0.051	0.051	<0.00002	<0.00002	<0.00005	<0.00005	0.013	0.014	<0.05	0.0000068
2018	Q1	Reference (FR_UFR1)	<0.003	<0.0001	<0.0001	<0.0001	0.00011	0.085	0.068	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000062
2018	Q1	Reference (GH_ER2)	<0.003	<0.0001	<0.0001	<0.0001	0.00013	0.046	0.048	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000058
2018	Q1	Reference (CM_MC1)	<0.003	<0.0001	<0.0001	0.00017	0.00018	0.058	0.053	<0.00002	<0.00002	<0.00005	<0.00005	0.013	0.014	<0.05	0.0000078
2018	Q2	Reference (FR_UFR1)	0.13	<0.0001	<0.0001	0.00012	0.00016	0.042	0.045	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.000011
2018	Q2	Reference (GH_ER2)	0.24	<0.0001	<0.0001	0.00011	0.00025	0.048	0.049	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000086
2018	Q2	Reference (CM_MC1)	0.14	<0.0001	<0.0001	0.00023	0.00024	0.042	0.039	<0.00002	<0.00002	<0.00005	<0.00005	0.011	0.013	<0.05	0.00001
2018	Q2	Reference (LC_SLC)	0.012	<0.0001	<0.0001	0.00013	0.0002	0.039	0.035	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	<0.000005
2018	Q3	Reference (FR_UFR1)	0.0046	<0.0001	<0.0001	0.00011	0.0001	0.076	0.066	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	<0.000005
2018	Q3	Reference (GH_ER2)	0.64	<0.0001	<0.0001	0.00011	0.00061	0.043	0.054	<0.00002	0.000066	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.000009
2018	Q3	Reference (CM_MC1)	0.011	<0.0001	<0.0001	0.00018	0.0002	0.055	0.054	<0.00002	<0.00002	<0.00005	<0.00005	0.015	0.016	<0.05	0.000012
2018	Q3	Reference (LC_SLC)	0.003	<0.0001	<0.0001	0.00012	0.00011	0.048	0.041	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.000011
2018	Q4	Reference (FR_UFR1)	<0.003	<0.0001	<0.0001	<0.0001	<0.0001	0.071	0.067	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000055
2018	Q4	Reference (GH_ER2)	0.031	<0.0001	<0.0001	<0.0001	0.00014	0.05	0.046	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000055
2018	Q4	Reference (CM_MC1)	0.01	<0.0001	<0.0001	0.00017	0.0002	0.045	0.043	<0.00002	<0.00002	<0.00005	<0.00005	0.014	0.015	<0.05	0.0000068
2018	Q4	Reference (LC_SLC)	<0.003	<0.0001	<0.0001	0.00011	0.00015	0.041	0.045	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.000011
2019	Q1	Reference (FR_UFR1)	0.003	<0.0001	<0.0001	<0.0001	<0.0001	0.0743	0.0758	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000078
2019	Q1	Reference (GH_ER2)	0.0048	<0.0001	<0.0001	<0.0001	0.00011	0.0493	0.0479	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000058
2019	Q1	Reference (CM_MC1)	0.0041	<0.0001	<0.0001	0.00015	0.00015	0.0579	0.053	<0.00002	<0.00002	<0.00005	<0.00005	0.013	0.013	<0.05	0.0000084
2019	Q1	Reference (LC_SLC)	<0.003	<0.0001	<0.0001	0.00013	<0.0001	0.0468	0.0483	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000123
2019	Q2	Reference (FR_UFR1)	0.0568	<0.0001	<0.0001	0.00011	0.00011	0.0488	0.0476	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000073
2019	Q2	Reference (GH_ER2)	0.0412	<0.0001	<0.0001	0.00011	0.00014	0.0448	0.0452	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000067
2019	Q2	Reference (CM_MC1)	0.032	<0.0001	<0.0001	0.0002	0.00022	0.0392	0.0406	<0.00002	<0.00002	<0.00005	<0.00005	0.013	0.014	<0.05	0.0000079
2019	Q2	Reference (LC_SLC)	0.0032	<0.0001	<0.0001	0.00011	0.00011	0.0361	0.0347	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.000007
2019	Q3	Reference (FR_UFR1)	0.0097	<0.0001	<0.0001	0.00012	<0.0001	0.0605	0.0586	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.000006
2019	Q3	Reference (GH_ER2)	0.0105	<0.0001	<0.0001	0.00011	0.00011	0.0421	0.0404	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000075
2019	Q3	Reference (CM_MC1)	0.0075	<0.0001	<0.0001	0.00023	0.00023	0.0522	0.0514	<0.00002	<0.00002	<0.00005	<0.00005	0.016	0.016	<0.05	0.0000103
2019	Q3	Reference (LC_SLC)	<0.003	<0.0001	<0.0001	0.00013	0.00011	0.0383	0.0377	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000095
2019	Q4	Reference (FR_UFR1)	0.0048	<0.0001	<0.0001	<0.0001	0.00011	0.0683	0.064	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000113
2019	Q4	Reference (GH_ER2)	0.0149	<0.0001	<0.0001	<0.0001	0.00011	0.0432	0.0474	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000059
2019	Q4	Reference (CM_MC1)	0.0096	<0.0001	<0.0001	0.00017	0.00018	0.0437	0.047	<0.00002	<0.00002	<0.00005	<0.00005	0.013	0.014	<0.05	0.0000083
2019	Q4	Reference (LC_SLC)	0.0045	<0.0001	<0.0001	0.00011	0.00014	0.042	0.0401	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000097
2020	Q1	Reference (FR_UFR1)	0.0051	<0.0001	<0.0001	0.0001	<0.0001	0.0726	0.0701	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.000009
2020	Q1	Reference (GH_ER2)	0.0147	<0.0001	<0.0001	<0.0001	<0.0001	0.0476	0.044	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000055
2020	Q1	Reference (CM_MC1)	0.005	<0.0001	<0.0001	0.00017	0.00023	0.0513	0.0517	<0.00002	<0.00002	<0.00005	<0.00005	0.013	0.014	<0.05	0.0000084
2020	Q1	Reference (LC_SLC)	0.016	<0.0001	<0.0001	0.00011	0.00011	0.0473	0.0465	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000169
2020	Q2	Reference (FR_UFR1)	0.0467	<0.0001	<0.0001	0.00012	0.00014	0.0446	0.0383	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000077
2020	Q2	Reference (GH_ER2)	0.0493	<0.0001	<0.0001	<0.0001	0.00015	0.0448	0.0472	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000085
2020	Q2	Reference (CM_MC1)	0.0421	<0.0001	<0.0001	0.00019	0.00019	0.0407	0.0419	<0.00002	<0.00002	<0.00005	<0.00005	0.011	0.012	<0.05	0.0000084
2020	Q2	Reference (LC_SLC)	0.0037	<0.0001	<0.0001	0.00014	0.00015	0.0343	0.0328	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000118
2020	Q3	Reference (FR_UFR1)	0.0035	<0.0001	<0.0001	0.00013	0.00011	0.0662	0.0711	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000117
2020	Q3	Reference (GH_ER2)	0.0278	<0.0001	<0.0001	<0.0001	0.00023	0.0412	0.045	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000061
2020	Q3	Reference (CM_MC1)	0.0072	<0.0001	<0.0001	0.00022	0.00028	0.0562	0.0576	<0.00002	<0.00002	<0.00005	<0.00005	0.019	0.019	<0.05	0.0000136
2020	Q3	Reference (LC_SLC)	<0.003	<0.0001	<0.0001	0.0001	0.00012	0.0422	0.0416	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000094
2020	Q4	Reference (FR_UFR1)	<0.003	<0.0001	<0.0001	<0.0001	0.00012	0.0686	0.0673	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000068
2020	Q4	Reference (GH_ER2)	0.0318	<0.0001	<0.0001	<0.0001	0.00013	0.0462	0.0545	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	<0.000005
2020	Q4	Reference (CM_MC1)	0.0051	<0.0001	<0.0001	0.00018	0.00023	0.0514	0.0494	<0.00002	<0.00002	<0.00005	<0.00005	0.019	0.021	<0.05	0.0000105
2020	Q4	Reference (LC_SLC)	<0.003	<0.0001	<0.0001	0.00011	0.00015	0.0446	0.0457	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000119
2021	Q1	Reference (FR_UFR1)	0.0668	<0.0001	<0.0001	0.0001	0.00013	0.0574	0.0563	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000112
2021	Q1	Reference (GH_ER2)	0.0087	<0.0001	<0.0001	<0.0001	<0.0001	0.0507	0.0471	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	<0.000005
2021	Q1	Reference (CM_MC1)	0.108	<0.0001	<0.0001	0.00018	0.00018	0.0585	0.054	<0.00002	<0.00002	<0.00005	<0.00005	0.016	0.015	<0.05	0.0000116
2021	Q1	Reference (LC_SLC)	<0.003	<0.0001	<0.0001	<0.0001	0.00011	0.0474	0.0462	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000122
2021	Q2	Reference (FR_UFR1)	0.181	<0.0001	<0.0001	0.00014	0.0002	0.0359	0.038	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000085
2021	Q2	Reference (GH_ER2)	0.948	<0.0001	0.00013	0.00013	0.00078	0.0391	0.0646	<0.00002	0.000094	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000088
2021	Q2	Reference (CM_MC1)	0.434	<0.0001	<0.0001	0.00021	0.00047	0.0277	0.0433	<0.00002	0.000054	<0.00005	<0.00005	0.01	<0.01	<0.05	0.0000105
2021	Q2	Reference (LC_SLC)	0.11	<0.0001	<0.0001	0.00012	0.00019	0.0218	0.0245	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000098
2021	Q3	Reference (FR_UFR1)	0.0035	<0.0001	<0.0001	0.0001	0.00014	0.0739	0.076	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000112
2021	Q3	Reference (GH_ER2)	0.0687	<0.0001	<0.0001	<0.0001	0.00017	0.04	0.043	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000054
2021	Q3	Reference (CM_MC1)	0.0088	<0.0001	<0.0001	0.00022	0.00024	0.0527	0.052	<0.00002	<0.00002	<0.00005	<0.00005	0.017	0.018	<0.05	0.0000078
2021	Q3	Reference (LC_SLC)	<0.003	<0.0001	<0.0001	0.0001	0.00014	0.0404	0.0456	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000158
2021	Q4	Reference (FR_UFR1)	0.0073	<0.0001	<0.0001	<0.0001	0.00011	0.072	0.0755	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000054
2021	Q4	Reference (GH_ER2)	0.0092	<0.0001	<0.0001	<0.0001	0.00011	0.0472	0.0478	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000076
2021	Q4	Reference (CM_MC1)	0.0033	<0.0001	<0.0001	0.00015	0.0002	0.0538	0.0542	<0.00002	<0.00002	<0.00005	<0.00005	0.015	0.014	<0.05	0.0000078
2021	Q4	Reference (LC_SLC)	0.0037	<0.0001	<0.0001	<0.0001	0.0001	0.0438	0.0442	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000119
Tests categorized as no adverse response (2015 to 2021)																	
2015	Q1	GH_FR1	0.0048	0.00014	0.00014	< 0.00010	0.00014	0.12	0.13	< 0.00010	< 0.00010	< 0.00050	< 0.00050	0.012	< 0.010	< 0.10	0.000021
2015	Q1	GH_ERC	0.028	< 0.00010	0.00012	< 0.00010	0.00015	0.055	0.056	< 0.00010	< 0.00010	< 0.00050	< 0.00050	< 0.010	< 0.010	< 0.050	< 0.000010
2015	Q1	CM_MC2	0.032	0.00017	0.00019	0.00017	0.00022	0.072	0.072	< 0.00010	< 0.00010	< 0.00050	< 0.00050	0.024	0.025	< 0.10	0.000022
2015	Q1	EV_MC2	0.019	< 0.00010	< 0.00010	0.00015	0.00018	0.11	0.11	< 0.00010	< 0.00010	< 0.00050	< 0.00050	0.014	0.016	< 0.050	0.000055
2015	Q1	EV_HC1	0.009	0.0001	0.0001	0.00013	0.00014	0.041	0.042	0.0001	0.0001	0.0005	0.0005	0.01	0.01	0.05	0.000017
2015	Q1	LC_LCDSSLCC	0.0052	0.00022	0.00022	0.00011	0.00013	0.096	0.093	< 0.00010	< 0.00010	< 0.00050	< 0.00050	0.013	0.014	< 0.10	0.000086
2015	Q2	FR_FRCP1	0.073	0.00022	0.00022	< 0.00010	0.00015	0.064	0.065	< 0.00010	< 0.00010	< 0.000050	< 0.000050	< 0.010	< 0.010	< 0.050	0.00003
2015	Q2	GH_FR1	0.053	0.00017	0.00017	0.0001	0.00014	0.085	0.087	< 0.00010	< 0.00010	< 0.000050	< 0.000050	< 0.010	< 0.010	< 0.050	0.000021
2015	Q2	GH_ERC	0.13	< 0.00010	< 0.00010	< 0.00010	0.00017	0.05	0.051	< 0.00010	< 0.00010	< 0.000050	< 0.000050	< 0.010	< 0.010	< 0.050	0.000007
2015	Q2	EV_MC2	0.36	< 0.00010	0.00011	0.00018	0.00033	0.062	0.067	< 0.00010	< 0.00010	< 0.000050	< 0.000050	< 0.010	< 0.010	< 0.050	0.000018
2015	Q2	EV_HC1	0.05	0.0001	0.0001	0.00013	0.00016	0.025	0.025	0.0001	0.0001	0.00005	0.00005	0.01	0.01	0.05	0.000013
2015	Q2	LC_DCDS	0.176	0.00015	0.00019	0.00027	0.00036	0.0933	0.0961	<0.00010	<0.00010	<0.000050	<0.000050	<0.010	<0.010	<0.050	0.0000385
2015	Q2	LC_LC3	0.0108	0.00029	0.0003	0.00013	0.00015	0.0354	0.0353	<0.00010	<0.00010	<0.000050	<0.000050	0.012	0.012	<0.10	0.000353
2015	Q2	LC_LC5	0.0222	0.00012	0.00014	0.00011	0.00013	0.0765	0.0786	<0.00010	<0.00010	<0.000050	<0.000050	<0.010	<0.010	<0.050	0.000035
2015	Q2	LC_LCDSSLCC	0.016	0.00015	0.00017	0.00011	0.00014	0.041	0.042	< 0.00010	< 0.00010	< 0.000050	< 0.000050	< 0.010	< 0.010	< 0.050	0.00014
2015	Q3	FR_FRCP1	0.022	0.00027	0.00033	0.0001	0.00019	0.076	0.076	< 0.00010	< 0.00010	< 0.000050	< 0.000050	0.013	0.014	< 0.10	0.000038
2015	Q3	GH_FR1	0.013	0.00022	0.00025	0.00014	0.0002	0.098	0.10	< 0.00010	< 0.00010	< 0.000050	< 0.000050	0.01	0.011	< 0.050	0.000019
2015	Q3	GH_ERC	0.083	< 0.00010	< 0.00010	< 0.00010	0.00017	0.046	0.049	< 0.00010	< 0.00010	< 0.000050	< 0.000050	< 0.010	< 0.010	< 0.050	0.0000059
2015	Q3	CM_MC2	0.016	0.00018	0.00021	0.00019	0.00021	0.069	0.069	< 0.00010	< 0.00010	< 0.000050	< 0.000050	0.027	0.029	< 0.10	0.0000099
2015	Q3	EV_MC2	0.0085	0.00041	0.00044	0.00016	0.00023	0.1	0.1	< 0.00010	< 0.00010	< 0.000050	< 0.000050	0.016	0.018	< 0.10	0.000049
2015	Q3	EV_HC1	0.034	< 0.00010	0.00011	0.00017	0.00024	0.058	0.059	< 0.00010	< 0.00010	< 0.000050	< 0.000050	< 0.010	0.011	< 0.050	0.000017
2015	Q3	LC_LCDSSLCC	0.013	0.00019	0.00026	< 0.00010	0.00011	0.06	0.063	< 0.00010	< 0.00010	< 0.000050	< 0.000050	0.012	0.013	< 0.10	0.00025
2015	Q4	GH_FR1	0.004	0.00011	0.00015	< 0.00010	0.00014	0.12	0.12	< 0.00010	< 0.00010	< 0.000050	< 0.000050	< 0.010	0.011	< 0.25	0.000015
2015	Q4	GH_ERC	0.007	< 0.00010	< 0.00010	< 0.00010	< 0.00010	0.058	0.06	< 0.00010	< 0.00010	< 0.000050	< 0.000050	< 0.010	< 0.010	< 0.050	< 0.0000050
2015	Q4	EV_MC2	0.0056	0.00035	0.00038	0.00014	0.00019	0.11	0.11	< 0.00010	< 0.00010	< 0.000050	< 0.000050	0.016	0.016	< 0.25	0.000037
2015	Q4	EV_HC1	0.0058	< 0.00010	0.00012	0.00014	0.00015	0.06	0.063	< 0.00010	< 0.00010	< 0.000050	< 0.000050	< 0.010	0.01	< 0.25	0.000013
2015	Q4	LC_DCDS	<0.015	<0.00050	<0.00050	<0.00050	<0.00050	0.139	0.146	<0.00050	<0.00050	<0.00025	<0.00025	<0.050	<0.050	<0.050	<0.000025
2015	Q4	LC_LC5	<0.015	<0.00050	<0.00050	<0.00050	<0.00050	0.107	0.11	<0.00050	<0.00050	<0.00025	<0.00025	<0.050	<0.050	<0.050	<0.000025
2015	Q4	LC_LCDSSLCC	< 0.015	< 0.00050	< 0.00050	< 0.00050	< 0.00050	0.085	0.091	< 0.00050	< 0.00050	< 0.00025	< 0.00025	< 0.050	< 0.050	< 0.050	0.00024
2016	Q1	GH_FR1	0.004	0.00012	0.00014	< 0.00010	< 0.00010	0.12	0.11	< 0.00010	< 0.00010	< 0.000050	< 0.000050	< 0.010	< 0.010	< 0.25	0.000014
2016	Q1	GH_ERC	0.0031	< 0.00010	< 0.00010	< 0.00010	< 0.00010	0.067	0.066	< 0.00010	< 0.00010	< 0.000050	< 0.000050	< 0.010	< 0.010	< 0.050	< 0.0000050
2016	Q1	CM_MC2	0.012	0.00018	0.00018	0.00015	0.00021	0.077	0.075	< 0.00010	< 0.00010	< 0.000050	< 0.000050	0.026	0.026	< 0.25	0.000016
2016	Q1	EV_MC2	0.031	0.00025	0.00025	0.00013	0.00016	0.11	0.11	< 0.00010	< 0.00010	< 0.000050	< 0.000050	0.013	0.013	< 0.25	0.000035
2016	Q1	EV_HC1	0.0096	< 0.00010	< 0.00010	0.00015	0.00016	0.067	0.065	< 0.00010	< 0.00010	< 0.000050	< 0.000050	< 0.010	< 0.010	< 0.25	0.000017
2016	Q1	LC_LCDSSLCC	0.0074	0.0002	0.00025	< 0.00010	0.00013	0.086	0.089	< 0.00010	< 0.00010	< 0.000050	< 0.000050	0.012	0.013	< 0.25	0.000083
2016	Q2	FR_FRCP1	0.11	0.00018	0.00025	< 0.00010	0.00016	0.065	0.068	< 0.00010	< 0.00010	< 0.000050	< 0.000050	< 0.010	< 0.010	< 0.050	0.000031
2016	Q2	GH_ERC	0.31	< 0.00010	0.00011	< 0.00010	0.0003	0.051	0.053	< 0.00010	< 0.00010	< 0.000050	< 0.000050	< 0.010	< 0.010	< 0.050	0.000011
2016	Q2	EV_MC2	0.42	< 0.00010	0.0002	0.00017	0.00037	0.058	0.063	< 0.00010	< 0.00010	< 0.000050	< 0.000050	< 0.010	< 0.010	< 0.050	0.000038
2016	Q2	EV_HC1	0.15	< 0.00010	0.00013	0.00013	0.00024	0.038	0.04	< 0.00010	< 0.00010	< 0.000050	< 0.000050	< 0.010	< 0.010	< 0.050	0.000027
2016	Q2	LC_LC5	0.115	0.00015	0.00024	0.00011	0.00018	0.069	0.0714	<0.00010	<0.00010	<0.000050	<0.000050	<0.010	<0.010	<0.050	0.0000217
2016	Q2	LC_LCDSSLCC	0.029	0.00024	0.00033	0.00012	0.00015	0.037	0.038	< 0.00010	< 0.00010	< 0.000050	< 0.000050	< 0.010	0.011	< 0.050	0.0002
2016	Q3	GH_FR1	0.0079	0.00013	0.00014	< 0.00010	0.00012	0.1	0.1	< 0.000020	< 0.000020	< 0.000050	< 0.000050	< 0.010	< 0.010	< 0.25	0.000015
2016	Q3	GH_ERC	0.021	< 0.00010	< 0.00010	< 0.00010	0.00011	0.049	0.05	< 0.000020	< 0.000020	< 0.000050	< 0.000050	< 0.010	< 0.010	< 0.050	< 0.0000050
2016	Q3	EV_MC2	0.0054	0.00021	0.00022	0.00018	0.00018	0.1	0.1	< 0.000020	< 0.000020	< 0.000050	< 0.000050	0.017	0.018	< 0.25	0.0000066
2016	Q3	EV_HC1	0.073	< 0.00010	< 0.00010	0.00016	0.00021	0.065	0.066	< 0.000020	< 0.000020	< 0.000050	< 0.000050	< 0.010	< 0.010	< 0.050	0.000016
2016	Q3	LC_LCDSSLCC	0.0047	0.00021	0.00024	< 0.00010	0.00011	0.072	0.066	< 0.000020	< 0.000020	< 0.000050	< 0.000050	0.013	0.012	< 0.25	0.00017
2016	Q4	GH_FR1	0.012	0.00015	0.00034	<0.0001	0.00014	0.1	0.097	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.25	0.000017
2016	Q4	GH_ERC	0.019	< 0.00010	< 0.00010	< 0.00010	0.00012	0.055	0.051	< 0.000020	< 0.000020	< 0.000050	< 0.000050	< 0.010	< 0.010	< 0.050	< 0.0000050
2016	Q4	EV_HC1	0.076	< 0.00010	0.0001	0.00015	0.00019	0.06	0.06	< 0.000020	< 0.000020	< 0.000050	< 0.000050	< 0.010	< 0.010	< 0.25	0.000019
2016	Q4	LC_LC5	0.0068	0.00012	0.00013	<0.00010	0.00011	0.089	0.089	<0.000020	<0.000020	<0.000050	<0.000050	<0.010	<0.010	<0.25	0.000016
2016	Q4	LC_LCDSSLCC	0.0056	0.00019	0.00026	< 0.00010	0.0002	0.055	0.053	< 0.000020	< 0.000020	< 0.000050	< 0.000050	< 0.010	0.01	< 0.25	0.00014
2017	Q1	GH_FR1	0.0085	0.00012	0.00011	<0.0001	0.00011	0.12	0.12	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.25	0.000014
2017	Q1	GH_ERC	0.0065	<0.0001	<0.0001	<0.0001	<0.0001	0.062	0.064	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	<0.000005
2017	Q1	EV_HC1	0.0097	<0.0001	<0.0001	0.00014	0.00017	0.065	0.066	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.000014
2017	Q2	GH_FR1	0.71	0.00022	0.00027	0.00015	0.00038	0.081	0.095	<0.00002	0.000038	<0.00005	<0.00005	<0.01	<0.01	<0.25	0.000035
2017	Q2	GH_ERC	0.12	<0.0001	<0.0001	<0.0001	0.00017	0.057	0.063	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000089
2017	Q2	LC_DCDS	0.102	0.00023	0.00025	0.00035	0.00041	0.0966	0.104	<0.000020	<0.000020	<0.000050	<0.000050	<0.010	<0.010	<0.050	0.000049
2017	Q2	LC_LC5	0.0686	0.00012	0.00014	<0.00010	0.00021	0.101	0.0927	<0.000020	<0.000020	<0.000050	<0.000050	<0.010	<0.010	<0.050	0.0000176
2017	Q2	LC_LCDSSLCC	0.014	0.00028	0.00028	0.00012	0.00015	0.073	0.07	<0.00002	<0.00002	<0.00005	<0.00005	0.014	0.014	<0.05	0.00015
2017	Q3	GH_ERC	0.042	<0.0001	0.00016	0.00011	0.00015	0.047	0.048	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000073
2017	Q3	EV_MC2	0.0083	0.00018	0.0002	0.00017	0.00018	0.11	0.098	<0.00002	<0.00002	<0.00005	<0.00005	0.012	0.012	<0.05	0.000031
2017	Q3	EV_HC1	0.0097	<0.0001	<0.0001	0.0002	0.0002	0.061	0.057	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.000019
2017	Q3	LC_LCDSSLCC	0.0031	0.00026	0.00024	<0.0001	0.00012	0.062	0.059	<0.00002	<0.00002	<0.00005	<0.00005	0.013	0.013	<0.05	0.00025
2017	Q4	GH_FR1	<0.003	0.00015	0.00015	<0.0001	<0.0001	0.11	0.11	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.000015
2017	Q4	GH_ERC	0.0045	<0.0001	<0.0001	<0.0001	<0.0001	0.056	0.054	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000058
2017	Q4	EV_MC2	0.011	<0.0001	0.00012	0.00017	0.00018	0.094	0.12	<0.00002	<0.00002	<0.00005	<0.00005	0.014	0.014	<0.05	<0.000005
2017	Q4	EV_HC1	0.004	<0.0001	<0.0001	0.00016	0.00018	0.063	0.063	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000096
2017	Q4	LC_DCDS	0.024	0.00029	0.00032	0.0003	0.00033	0.177	0.176	<0.000020	<0.000020	<0.000050	<0.000050	<0.010	<0.010	<0.050	0.0000324
2017	Q4	LC_LC5	<0.0030	0.00012	0.00012	0.00015	0.00014	0.0987	0.102	<0.000020	<0.000020	<0.000050	<0.000050	<0.010	<0.010	<0.050	0.0000082
2017	Q4	LC_LCDSSLCC	0.0038	0.00026	0.00029	0.00014	0.00018	0.074	0.075	<0.00002	<0.00002	<0.00005	<0.00005	0.013	0.014	<0.05	0.00015
2018	Q1	GH_FR1	<0.003	0.00011	0.00012	<0.0001	0.00014	0.12	0.12	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.25	0.000017
2018	Q1	GH_ERC	<0.003	<0.0001	<0.0001	<0.0001	0.00012	0.054	0.058	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	<0.000005
2018	Q1	CM_MC3	<0.003	0.0001	<0.0001	0.00017	0.00017	0.06	0.051	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.000016
2018	Q1	EV_HC1	<0.003	<0.0001	0.00015	0.00014	0.00016	0.075	0.071	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.000017
2018	Q1	LC_LCDSSLCC	<0.003	0.00023	0.00024	<0.0002	0.00012	0.088	0.083	<0.00004	<0.00002	<0.0001	<0.00005	<0.02	0.015	<0.05	0.00011
2018	Q2	EV_MC2	0.5	0.00011	0.00016	0.00019	0.00047	0.077	0.087	<0.00002	0.000032	<0.00005	<0.00005	<0.0105	<0.011	<0.05	0.000033
2018	Q2	EV_HC1	0.13	<0.0001	<0.0001	0.00017	0.00022	0.039	0.038	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.000018
2018	Q2	LC_DCDS	0.254	0.00051	0.00059	0.00038	0.00064	0.14	0.143	<0.000020	0.000024	<0.000050	<0.000050	<0.010	<0.010	<0.050	0.0000741
2018	Q3	GH_FR1	0.0099	0.0002	0.0002	0.00012	0.00013	0.1	0.098	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.000025
2018	Q3	GH_ERC	0.03	<0.0001	<0.0001	0.00012	0.00013	0.054	0.051	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000086
2018	Q3	EV_MC2	0.0043	0.00038	0.00039	0.00017	0.00017	0.11	0.1	<0.00002	<0.00002	<0.00005	<0.00005	0.017	0.019	0.058	0.000049
2018	Q3	EV_HC1	0.011	<0.0001	0.00011	0.0002	0.00022	0.065	0.058	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.000015

Year	Quarter	Sample ID	CADMIUM-T-mg/l	CALCIUM-D-mg/l	CALCIUM-T-mg/l	CARBON DISSOLVED ORGANIC-D-mg/l	CHLORIDE-D-mg/l	CHROMIUM-D-mg/l	CHROMIUM-T-mg/l	COBALT-D-mg/l	COBALT-T-mg/l	CONDUCTIVITY LAB-N-us/cm	COPPER-D-mg/l	COPPER-T-mg/l	FLUORIDE-D-mg/l
Reference (2015 to 2021)															
2015	Q1	Reference (FR_UFR1)	0.000011	56	56	0.84	< 1.0	0.00017	0.00017	< 0.00010	< 0.00010	367	< 0.00050	< 0.00050	0.14
2015	Q1	Reference (FR_UFR1)	0.000011	56	56	0.84	< 1.0	0.00017	0.00017	< 0.00010	< 0.00010	367	< 0.00050	< 0.00050	0.14
2015	Q1	Reference (FR_UFR1)	< 0.000010	56	57	< 0.50	< 1.0	0.00013	0.00015	< 0.00010	< 0.00010	353	< 0.00050	< 0.00050	0.14
2015	Q2	Reference (FR_UFR1)	0.000013	37	38	1.8	< 1.0	0.00014	0.00046	< 0.00010	< 0.00010	245	< 0.00050	< 0.00050	0.15
2015	Q2	Reference (GH_ER2)	0.000016	47	48	0.84	1.0	0.00022	0.00037	< 0.00010	< 0.00010	303	< 0.00050	< 0.00050	0.15
2015	Q3	Reference (FR_UFR1)	0.0000083	54	55	0.75	1.0	0.00013	0.00013	< 0.00010	< 0.00010	342	< 0.00050	< 0.00050	0.15
2015	Q4	Reference (FR_UFR1)	0.0000083	54	56	0.6	< 1.0	0.00011	0.00036	< 0.00010	< 0.00010	354	< 0.00050	< 0.00050	0.16
2015	Q4	Reference (GH_ER2)	0.0000069	50	51	0.61	1.2	0.00022	0.00034	< 0.00010	< 0.00010	314	< 0.00050	< 0.00050	0.16
2016	Q1	Reference (FR_UFR1)	0.0000062	57	58	< 0.50	1.1	0.00012	< 0.00020	< 0.00010	< 0.00010	358	< 0.00050	< 0.00050	0.16
2016	Q2	Reference (FR_UFR1)	0.000016	35	37	2.5	< 0.10	0.00011	0.00029	< 0.00010	< 0.00010	233	< 0.00050	< 0.00050	0.15
2016	Q2	Reference (GH_ER2)	0.000025	47	48	1.4	0.61	0.00017	0.00062	< 0.00010	< 0.00010	289	< 0.00050	< 0.00050	0.16
2016	Q3	Reference (FR_UFR1)	0.000011	49	51	0.86	0.13	< 0.00010	0.00018	< 0.00010	< 0.00010	338	< 0.00050	< 0.00050	0.17
2016	Q4	Reference (FR_UFR1)	0.0000058	50	48	1.1	0.18	< 0.00010	0.00021	< 0.00010	< 0.00010	330	< 0.00050	< 0.00050	0.16
2016	Q4	Reference (GH_ER2)	0.0000079	48	48	0.64	0.36	0.00021	0.00024	< 0.00010	< 0.00010	297	< 0.00050	< 0.00050	0.17
2017	Q1	Reference (FR_UFR1)	0.000011	-	52	0.96	<0.5	<0.0001	0.00011	<0.0001	<0.0001	341	<0.0002	<0.0005	0.14
2017	Q2	Reference (FR_UFR1)	0.000023	-	31	3.3	<0.5	0.00022	0.0004	<0.0001	<0.0001	239	0.0004	0.00067	0.11
2017	Q2	Reference (GH_ER2)	0.000019	-	51	0.83	0.27	0.00021	0.00038	<0.0001	<0.0001	321	<0.0005	<0.0005	0.16
2017	Q2	Reference (CM_MC1)	0.000015	-	36	1.8	<0.5	0.00012	0.00018	<0.0001	<0.0001	267	<0.0002	<0.0005	0.052
2017	Q3	Reference (FR_UFR1)	0.000012	-	45	1.8	<0.5	<0.0001	0.00028	<0.0001	<0.0001	319	<0.0002	<0.0005	0.14
2017	Q3	Reference (GH_ER2)	0.0000078	-	40	0.79	<0.5	0.00019	0.00024	<0.0001	<0.0001	276	<0.0002	<0.0005	0.14
2017	Q3	Reference (CM_MC1)	0.000015	-	36	1.2	<0.5	<0.0001	0.00028	<0.0001	<0.0001	265	<0.0002	<0.0005	0.054
2017	Q4	Reference (FR_UFR1)	0.00001	-	50	1.1	<0.5	<0.0001	0.00012	<0.0001	<0.0001	333	<0.0005	<0.0005	0.11
2017	Q4	Reference (GH_ER2)	0.0000074	-	47	0.81	<0.5	0.00022	0.00026	<0.0001	<0.0001	282	<0.0005	<0.0005	0.13
2017	Q4	Reference (CM_MC1)	0.0000083	-	41	1.6	<0.5	0.00018	0.00018	<0.0001	<0.0001	280	<0.0005	<0.0005	0.055
2018	Q1	Reference (FR_UFR1)	0.0000096	55	53	0.5	<0.5	<0.0001	0.00011	<0.0001	<0.0001	371	<0.0005	<0.0005	0.11
2018	Q1	Reference (GH_ER2)	0.0000062	51	45	0.66	0.26	0.00019	0.00025	<0.0001	<0.0001	327	<0.0005	<0.0005	0.16
2018	Q1	Reference (CM_MC1)	0.0000058	42	39	0.73	<0.5	0.00013	0.00018	<0.0001	<0.0001	307	<0.0005	<0.0005	0.055
2018	Q2	Reference (FR_UFR1)	0.000031	34	35	2.9	<0.5	0.00011	0.00027	<0.0001	<0.0001	235	<0.0005	0.00056	0.14
2018	Q2	Reference (GH_ER2)	0.000043	47	46	1.6	<0.5	0.00018	0.00077	<0.0001	0.00012	304	<0.0005	0.00077	0.16
2018	Q2	Reference (CM_MC1)	0.000019	35	36	3.3	<0.5	0.00013	0.00029	<0.0001	<0.0001	238	<0.0005	0.00056	0.07
2018	Q2	Reference (LC_SLC)	0.000015	44	42	2.3	<0.5	0.00012	0.00015	<0.0001	<0.0001	299	<0.0005	<0.0005	0.3
2018	Q3	Reference (FR_UFR1)	0.000011	50	48	1.6	<0.5	0.00012	0.00012	<0.0001	<0.0001	325	<0.0005	<0.0005	0.18
2018	Q3	Reference (GH_ER2)	0.00013	42	49	1.5	<0.5	0.00021	0.0016	<0.0001	0.00051	270	<0.0005	0.0012	0.17
2018	Q3	Reference (CM_MC1)	0.000012	44	39	1.7	<0.5	0.00021	0.0003	<0.0001	<0.0001	267	<0.0005	<0.0005	0.08
2018	Q3	Reference (LC_SLC)	0.000014	56	46	1.2	<0.5	0.00014	0.00016	<0.0001	<0.0001	350	<0.0005	<0.0005	0.34
2018	Q4	Reference (FR_UFR1)	0.000008	52	51	0.72	<0.5	0.0001	0.00019	<0.0001	<0.0001	347	<0.0005	<0.0005	0.15
2018	Q4	Reference (GH_ER2)	0.0000097	47	47	<0.5	<0.5	0.00023	0.00038	<0.0001	<0.0001	306	<0.0005	<0.0005	0.17
2018	Q4	Reference (CM_MC1)	0.0000085	39	38	2.1	<0.5	0.00018	0.00027	<0.0001	<0.0001	268	<0.0005	<0.0005	0.07
2018	Q4	Reference (LC_SLC)	0.000013	50	49	0.51	<0.5	0.00013	0.00021	<0.0001	<0.0001	369	<0.0005	<0.0005	0.37
2019	Q1	Reference (FR_UFR1)	0.0000116	54.9	53.8	0.92	<0.5	<0.0001	<0.0001	<0.0001	<0.0001	363	<0.0005	<0.0005	0.136
2019	Q1	Reference (GH_ER2)	0.0000053	50	51.2	<0.5	<0.5	0.00021	0.00028	<0.0001	<0.0001	305	<0.0005	<0.0005	0.158
2019	Q1	Reference (CM_MC1)	0.0000097	43.2	41.3	0.55	0.68	0.00016	0.0003	<0.0001	<0.0001	302	<0.0005	<0.0005	0.07
2019	Q1	Reference (LC_SLC)	0.0000149	55.4	60.2	0.67	0.71	0.00014	0.00021	<0.0001	<0.0001	428	<0.0005	<0.0005	0.372
2019	Q2	Reference (FR_UFR1)	0.0000102	34.9	37.6	1.75	<0.5	0.00014	0.00024	<0.0001	<0.0001	278	<0.0005	<0.0005	0.146
2019	Q2	Reference (GH_ER2)	0.0000126	46.9	50.1	<0.5	<0.5	0.00021	0.00036	<0.0001	<0.0001	298	<0.0005	<0.0005	0.165
2019	Q2	Reference (CM_MC1)	0.0000144	37.6	36.3	3.57	<0.5	0.00013	0.0002	<0.0001	<0.0001	253	<0.0005	<0.0005	0.071
2019	Q2	Reference (LC_SLC)	0.0000126	44.3	45.2	0.94	<0.5	0.00016	0.00015	<0.0001	<0.0001	343	<0.0005	<0.0005	0.351
2019	Q3	Reference (FR_UFR1)	0.000009	47	50	1.04	<0.5	0.00011	0.00016	<0.0001	<0.0001	309	<0.0005	<0.0005	0.16
2019	Q3	Reference (GH_ER2)	0.0000088	43.9	42	0.65	<0.5	0.0002	0.00033	<0.0001	<0.0001	274	<0.0005	<0.0005	0.152
2019	Q3	Reference (CM_MC1)	0.0000157	42.6	44	0.99	<0.5	0.00022	0.00026	<0.0001	<0.0001	287	<0.0005	<0.0005	0.079
2019	Q3	Reference (LC_SLC)	0.0000153	45.6	45.7	0.72	<0.5	0.00016	0.0002	<0.0001	<0.0001	320	<0.0005	<0.0005	0.326
2019	Q4	Reference (FR_UFR1)	0.0000096	49.2	49.6	0.71	<0.5	0.00012	0.00011	<0.0001	<0.0001	302	0.00028	<0.0005	0.157
2019	Q4	Reference (GH_ER2)	0.0000098	44	47.7	<0.5	<0.5	0.00027	0.00028	<0.0001	<0.0001	279	0.00021	<0.0005	0.17
2019	Q4	Reference (CM_MC1)	0.0000081	38.1	40.3	0.84	<0.5	0.00027	0.00029	<0.0001	<0.0001	246	0.00021	<0.0005	0.077
2019	Q4	Reference (LC_SLC)	0.0000139	55.7	51.1	0.81	<0.5	0.00016	0.00016	<0.0001	<0.0001	333	0.00022	<0.0005	0.373
2020	Q1	Reference (FR_UFR1)	0.0000119	48.1	49.7	<0.5	<0.5	<0.0001	0.00011	<0.0001	<0.0001	342	0.0004	<0.0005	0.13
2020	Q1	Reference (GH_ER2)	0.0000103	45.3	45.4	0.6	<0.5	0.00023	0.0003	<0.0001	<0.0001	309	<0.0002	<0.0005	0.198
2020	Q1	Reference (CM_MC1)	0.0000094	39.7	40.8	0.78	0.54	0.00015	0.00019	<0.0001	<0.0001	292	<0.0002	<0.0005	0.058
2020	Q1	Reference (LC_SLC)	0.0000179	59.8	53.3	1.77	0.67	0.00014	0.00019	<0.0001	<0.0001	395	0.00022	<0.0005	0.305
2020	Q2	Reference (FR_UFR1)	0.0000113	35.1	33.6	2.3	<0.5	<0.0001	0.00017	<0.0001	<0.0001	226	0.00022	<0.0005	0.127
2020	Q2	Reference (GH_ER2)	0.0000148	44	46.4	1.78	<0.5	0.00016	0.0003	<0.0001	<0.0001	268	<0.0002	<0.0005	0.138
2020	Q2	Reference (CM_MC1)	0.0000129	34.5	34.1	2.42	<0.5	0.00013	0.00019	<0.0001	<0.0001	214	0.00027	<0.0005	0.061
2020	Q2	Reference (LC_SLC)	0.0000106	42.5	45.5	1.93	<0.5	0.00013	0.00015	<0.0001	<0.0001	256	<0.0002	<0.0005	0.208
2020	Q3	Reference (FR_UFR1)	0.0000096	53.6	48.6	<0.5	<0.5	<0.0001	0.00016	<0.0001	<0.0001	324	<0.0002	<0.0005	0.149
2020	Q3	Reference (GH_ER2)	0.0000104	41.5	47	<0.5	<0.5	0.00018	0.00029	<0.0001	<0.0001	264	0.0002	<0.0005	0.158
2020	Q3	Reference (CM_MC1)	0.0000139	45.2	44.5	1	<0.5	0.00019	0.00025	<0.0001	<0.0001	277	0.0002	<0.0005	0.078
2020	Q3	Reference (LC_SLC)	0.0000117	50.7	48.8	<0.5	<0.5	0.00013	0.00013	<0.0001	<0.0001	328	<0.0002	<0.0005	0.291
2020	Q4	Reference (FR_UFR1)	0.0000079	51.3	51.8	0.61	0.13	<0.0001	0.00013	<0.0001	<0.0001	312	<0.0002	<0.0005	0.127
2020	Q4	Reference (GH_ER2)	0.0000123	47.6	44	0.66	0.31	0.00024	0.00033	<0.0001	<0.0001	265	<0.0002	<0.0005	0.146
2020	Q4	Reference (CM_MC1)	0.0000086	40.9	42.2	1.91	0.59	0.00017	0.0002	<0.0001	<0.0001	258	<0.0002	<0.0005	0.076
2020	Q4	Reference (LC_SLC)	0.0000115	51.9	55.2	1.07	0.35	0.00017	0.00016	<0.0001	<0.0001	359	<0.0002	<0.0005	0.307
2021	Q1	Reference (FR_UFR1)	0.0000105	39.5	39.5	2.72	<0.1	0.00011	0.00025	<0.0001	<0.0001	283	0.00026	<0.0005	0.091
2021	Q1	Reference (GH_ER2)	0.0000062	49.9	47.4	<0.5	0.22	0.00022	0.00026	<0.0001	<0.0001	319	<0.0002	<0.0005	0.11
2021	Q1	Reference (CM_MC1)	0.0000074	45	44.2	<0.5	0.67	0.00018	0.0003	<0.0001	<0.0001	312	0.0006	<0.0005	0.066
2021	Q1	Reference (LC_SLC)	0.0000119	54.1	52.2	0.96	0.46	0.00016	0.00016	<0.0001	<0.0001	402	<0.0002	<0.0005	0.3
2021	Q2	Reference (FR_UFR1)	0.000032	31.6	31.4	3.35	<0.1	0.00015	0.00038	<0.0001	0.00012	210	0.00026	0.00052	0.108
2021	Q2	Reference (GH_ER2)	0.000212	40.7	54.6	2.67	0.45	0.00014	0.0023	<0.0001	0.00078	274	<0.0002	0.00234	0.117
2021	Q2	Reference (CM_MC1)	0.000112	26.9	25.6	6	0.12	0.00022	0.00064	<0.0001	0.00043	145	0.00048	0.00129	0.041
2021	Q2	Reference (LC_SLC)	0.0000385	30.4	34.4	2.94	0.11	<0.0001	0.00032	<0.0001	<0.0001	216	<0.0002	<0.0005	0.16
2021	Q3	Reference (FR_UFR1)	0.0000111	49.8	50.2	2.37	0.12	0.00011	0.00014	<0.0001	<0.0001	328	0.00038	<0.0005	0.15
2021	Q3	Reference (GH_ER2)	0.0000215	41.7	40.5	1.83	0.29	0.0002	0.00037	<0.0001	<0.0001	261	<0.0002	<0.0005	0.16
2021	Q3	Reference (CM_MC1)	<0.000005	40.8	41.2	1.38	0.46	0.00014	0.00019	<0.0001	<0.0001	273	0.00021	<0.0005	0.077
2021	Q3	Reference (LC_SLC)	0.0000109	45.4	49.5	1.1	0.29	0.00014	0.00023	<0.0001	<0.0001	329	<0.0002	<0.0005	0.29
2021	Q4	Reference (FR_UFR1)	0.0000092	50.2	53.6	<0.5	0.12	<0.0001	<0.0001	<0.0001	<0.0001	343	<0.0002	<0.0005	0.108
2021	Q4	Reference (GH_ER2)	0.0000068	44.4	47.2	<0.5	0.26	0.0003	0.00036	<0.0001	<0.0001	289	<0.0002	<0.0005	0.13
2021	Q4	Reference (CM_MC1)	0.0000092	44.8	40.4	1.17	0.35	0.00019	0.00017	<0.0001	<0.0001	295	<0.0002	<0.0005	0.046
2021	Q4	Reference (LC_SLC)	0.0000134	51.1	55.9	0.86	0.29	0.0002	0.00019	<0.0001	<0.0001	359	<0.0002	<0.0005	0.27
Tests categorized as no adverse response (2015 to 2021)															
2015	Q1	GH_FR1	0.000024	112	114	1.1	2.6	0.00021	0.00015	< 0.00010	< 0.00010	851	< 0.00050	< 0.00050	0.18
2015	Q1	GH_ERC	< 0.000010	55	55	0.64	<1	0.00029	0.00034	< 0.00010	< 0.00010	345	< 0.00050	< 0.00050	0.15
2015	Q1	CM_MC2	0.000023	105	106	0.93	3.4	0.00019	0.00024	0.00074	0.00079	826	< 0.00050	< 0.00050	0.14
2015	Q1	EV_MC2	0.000044	95	91	1.7	11	0.00012	< 0.00020	< 0.00010	< 0.00010	665	0.0012	0.00076	0.15
2015	Q1	EV_HC1	0.000016	60	60	0.82	1.5	0.00014	0.00018	0.0001	0.0001	453	0.0005	0.0005	0.15
2015	Q1	LC_LCDSSLCC	0.00011	126	123	1.1	2.7	0.00016	0.00021	< 0.00010	< 0.00010	940	< 0.00050	< 0.00050	0.24
2015	Q2	FR_FRCP1	0.00005	73	73	1.6	1.2	< 0.00010	0.00028	< 0.00010	0.00012	573	< 0.00050	< 0.00050	0.2
2015	Q2	GH_FR1	0.000035	79	81	1.4	1.4	< 0.00010	0.0002	< 0.00010	< 0.00010	614	< 0.00050	< 0.00050	0.17
2015	Q2	GH_ERC	0.000022	52	53	0.96	<1	0.00017	0.00054	< 0.00010	< 0.00010	338	< 0.00050	< 0.00050	0.15
2015	Q2	EV_MC2	0.000064	43	44	1.9	2.9	0.0002	0.0007	< 0.00010	0.00022	299	< 0.00050	0.00073	0.12
2015	Q2	EV_HC1	0.000021	48	47	1.1	1.3	0.00013	0.00021	0.0001	0.0001	350	0.0005	0.0005	0.13
2015	Q2	LC_DCDS	0.0000671	24.6	24.8	2.2	1.1	0.00012	0.00042	<0.00010	<0.00010	189	<0.00050	0.00059	0.093
2015	Q2	LC_LC3	0.000382	93.2	93.2	0.74	1.9	0.00017	0.00019	0.0001	0.00011	760	<0.00050	<0.00050	0.21
2015	Q2	LC_LC5	0.0000336	72.9	74.8	1.17	1.5	0.00016	0.00021	<0.00010	<0.00010	576	<0.00050	<0.00050	0.193
2015	Q2	LC_LCDSSLCC	0.00014	67	68	1.2	1.4	0.00014	0.00019	< 0.00010	< 0.00010	535	< 0.00050	< 0.00050	0.22
2015	Q3	FR_FRCP1	0.000047	107	109	0.93	1.5	0.0001	0.00017	< 0.00010	< 0.00010	815	< 0.00050	< 0.00050	0.2
2015	Q3	GH_FR1	0.000021	89	90	0.87	1.6	0.00012	0.00015	< 0.00010	< 0.00010	657	< 0.00050	< 0.00050	0.18
2015	Q3	GH_ERC	0.000016	47	49	0.75	<1	0.00019	0.00037	< 0.00010	< 0.00010	284	< 0.00050	< 0.00050	0.16
2015	Q3	CM_MC2	0.000018	102	104	0.86	2.1	0.00019	0.00023	0.00026	0.00034	802	< 0.00050	< 0.00050	0.12
2015	Q3	EV_MC2	0.000056	95	87	1.0	9.6	0.00013	0.00019	< 0.00010	< 0.00010	686	< 0.00050	< 0.00050	0.18
2015	Q3	EV_HC1	0.000025	82	75	1.1	1.4	0.00015	0.00024	< 0.00010	< 0.00010	625	< 0.00050	< 0.00050	0.21
2015	Q3	LC_LCDSSLCC	0.00026	88	92	0.83	2.0	0.00011	0.0002	< 0.00010	< 0.00010	660	< 0.00050	< 0.00050	0.24
2015	Q4	GH_FR1	0.000024	105	106	< 0.50	1.7	0.00012	0.00013	< 0.00010	< 0.00010	760	< 0.00050	< 0.00050	0.16
2015	Q4	GH_ERC	0.0000073	56	58	< 0.50	1.2	0.00022	0.00026	< 0.00010	< 0.00010	355	< 0.00050	< 0.00050	0.16
2015	Q4	EV_MC2	0.000047	102	102	0.6	8.7	0.00012	0.00015	< 0.00010	< 0.00010	733	< 0.00050	< 0.00050	0.16
2015	Q4	EV_HC1	0.000018	92	93	0.63	1.8	0.00013	0.00022	< 0.00010	< 0.00010	732	< 0.00050	< 0.00050	0.2
2015	Q4	LC_DCDS	0.00006	36.8	36.2	2.33	<0.50	<0.00050	<0.00050	<0.00050	<0.00050	251	<0.0010	<0.0025	0.075
2015	Q4	LC_LC5	0.00004	102	99.2	0.84	1.53	<0.00050	<0.00050	<0.00050	<0.00050	627	<0.0010	<0.0025	0.166
2015	Q4	LC_LCDSSLCC	0.00026	116	117	0.74	2.2	< 0.00050	< 0.00050	< 0.00050	< 0.00050	770	< 0.0010	< 0.0025	0.18
2016	Q1	GH_FR1	0.000018	119	119	0.51	2.5	0.00012	0.00013	< 0.00010	< 0.00010	885	< 0.00050	< 0.00050	0.18
2016	Q1	GH_ERC	0.0000065	67	67	< 0.50	1.3	0.00024	< 0.00030	< 0.00010	< 0.00010	419	< 0.00050	< 0.00050	0.16
2016	Q1	CM_MC2	0.000018	117	117	0.58	4.9	0.00018	< 0.00030	0.00072	0.00081	927	< 0.00050	< 0.00050	0.14
2016	Q1	EV_MC2	0.000036	97	94	0.85	9.2	0.00013	0.00018	< 0.00010	< 0.00010	700	< 0.00050	< 0.00050	0.15
2016	Q1	EV_HC1	0.000019	96	95	0.65	2.1	0.00016	< 0.00020	< 0.00010	< 0.00010	745	< 0.00050	< 0.00050	0.21
2016	Q1	LC_LCDSSLCC	0.000076	134	134	< 0.50	17	0.00014	< 0.00020	< 0.00010	< 0.00010	1010	< 0.00050	< 0.00050	0.24
2016	Q2	FR_FRCP1	0.000052	71	73	2.0	0.51	0.0001	0.00027	< 0.00010	0.00011	555	< 0.00050	0.00054	0.2
2016	Q2	GH_ERC	0.000035	53	53	1.3	0.79	0.00019	0.00085	< 0.00010	0.00015	342	< 0.00050	0.00065	0.16
2016	Q2	EV_MC2	0.000078	38	37	2.6	1.2	0.00014	0.00076	< 0.00010	0.00027	266	< 0.00050	0.001	0.11
2016	Q2	EV_HC1	0.000047	70	72	1.9	0.79	0.00011	0.00031	< 0.00010	< 0.00010	547	< 0.00050	< 0.00050	0.19
2016	Q2	LC_LC5	0.000063	69.3	71.3	1.55	1.45	0.00011	0.00038	<0.00010	0.00011	540	<0.00050	<0.00050	0.196
2016	Q2	LC_LCDSSLCC	0.00022	71	72	1.6	2.8	0.00014	0.00021	< 0.00010	< 0.00010	557	< 0.00050	< 0.00050	0.22
2016	Q3	GH_FR1	0.000016	89	89	0.8	1.5	< 0.00010	0.00017	< 0.00010	< 0.00010	732	< 0.00050	< 0.00050	0.2
2016	Q3	GH_ERC	0.0000053	46	45	0.58	0.37	0.0002	0.00027	< 0.00010	< 0.00010	317	< 0.00050	< 0.00050	0.18
2016	Q3	EV_MC2	0.000069	106	111	0.83	13	0.00012	0.00015	< 0.00010	< 0.00010	793	< 0.00050	< 0.00050	0.17
2016	Q3	EV_HC1	0.000027	78	81	0.95	1.1	0.00016	0.00025	< 0.00010	< 0.00010	652	< 0.00050	< 0.00050	0.23
2016	Q3	LC_LCDSSLCC	0.00016	98	91	< 0.50	4.7	0.00012	0.00027	< 0.00010	< 0.00010	754	< 0.00050	< 0.00050	0.25
2016	Q4	GH_FR1	0.000021	93	94	0.75	1.5	0.0001	0.00019	<0.0001	<0.0001	735	<0.0005	<0.0005	0.16
2016	Q4	GH_ERC	< 0.0000050	55	51	< 0.50	0.44	0.0002	0.00035	< 0.00010	< 0.00010	327	< 0.00050	0.00054	0.16
2016	Q4	EV_HC1	0.000024	79	82	1.4	1.3	0.00014	0.00023	< 0.00010	< 0.00010	668	< 0.00050	< 0.00050	0.2
2016	Q4	LC_LC5	0.0000379	87.9	85.1	0.58	2.52	<0.00010	0.00018	<0.00010	<0.00010	649	<0.00050	<0.00050	0.21
2016	Q4	LC_LCDSSLCC	0.00015	94	83	0.91	6.8	0.0001	0.00019	< 0.00010	< 0.00010	700	< 0.00050	< 0.00050	0.21
2017	Q1	GH_FR1	0.000018	-	115	0.57	1.8	<0.0001	0.00014	<0.0001	<0.0001	843	<0.0005	<0.0005	0.14
2017	Q1	GH_ERC	0.0000071	-	56	<0.5	0.38	0.00026	0.00027	<0.0001	<0.0001	354	<0.0005	<0.0005	0.14
2017	Q1	EV_HC1	0.000021	-	89	0.72	1.3	0.00015	0.00023	<0.0001	<0.0001	704	<0.0005	<0.0005	0.22
2017	Q2	GH_FR1	0.000083	-	92	3.4	1.7	<0.0001	0.0012	<0.0001	0.00037	735	<0.0005	0.0013	0.13
2017	Q2	GH_ERC	0.000019	-	56	0.79	0.5	0.00023	0.0005	<0.0001	<0.0001	368	<0.0005	<0.0005	0.16
2017	Q2	LC_DCDS	0.0000951	25.1	26.7	3.4	0.56	<0.00010	0.00024	<0.00010	0.00016	190	0.00027	0.00063	0.07
2017	Q2	LC_LC5	0.0000471	90	86.1	1.85	2.65	<0.00010	0.00023	<0.00010	0.00011	698	<0.00020	<0.00050	0.15
2017	Q2	LC_LCDSSLCC	0.00017	-	108	1.2	8.0	<0.0001	0.00016	<0.0001	<0.0001	889	<0.0002	<0.0005	0.2
2017	Q3	GH_ERC	0.000013	-	42	0.89	<0.5	0.00015	0.00029	<0.0001	<0.0001	295	<0.0002	<0.0005	0.14
2017	Q3	EV_MC2	0.000039	-	78	1.3	4.9	<0.0001	0.00015	<0.0001	<0.0001	531	<0.0005	<0.0005	0.16
2017	Q3	EV_HC1	0.000022	-	83	0.97	0.81	0.00011	0.00022	<0.0001	<0.0001	610	<0.0005	<0.0005	0.21
2017	Q3	LC_LCDSSLCC	0.0002	-	92	1.8	5.5	<0.0001	0.00017	<0.0001	<0.0001	796	0.00021	<0.0005	0.2
2017	Q4	GH_FR1	0.000019	-	102	1.6	1.2	<0.0001	0.00015	<0.0001	<0.0001	749	<0.0005	<0.0005	0.13
2017	Q4	GH_ERC	0.0000075	-	48	1.1	<0.5	0.00022	0.00025	<0.0001	<0.0001	303	<0.0005	<0.0005	0.12
2017	Q4	EV_MC2	0.000034	-	87	1.0	6.1	0.00011	0.00019	<0.0001	<0.0001	565	<0.0005	<0.0005	0.12
2017	Q4	EV_HC1	0.000019	-	82	1.0	0.8	<0.0001	0.00018	<0.0001	<0.0001	660	<0.0005	<0.0005	0.17
2017	Q4	LC_DCDS	0.0000547	50.6	47.8	2.37	4.09	<0.00010	0.00018	0.00011	0.00013	373	<0.00050	<0.00050	0.073
2017	Q4	LC_LC5	0.0000252	91.5	93.4	1.02	2.9	<0.00010	<0.00030	<0.00010	<0.00010	652	<0.00050	<0.00050	0.162
2017	Q4	LC_LCDSSLCC	0.00016	-	111	0.97	8.0	<0.0001	0.00022	<0.0001	<0.0001	777	<0.0005	<0.0005	0.18
2018	Q1	GH_FR1	0.000017	116	105	1.2	2.2	<0.0001	0.00011	<0.0001	<0.0001	909	0.00052	<0.0005	0.16
2018	Q1	GH_ERC	0.0000055	50	48	0.76	0.37	0.00022	0.00027	<0.0001	<0.0001	349	<0.0005	<0.0005	0.16
2018	Q1	CM_MC3	0.000015	70	70	0.63	1.5	0.00023	0.0003	<0.0001	<0.0001	524	<0.0005	<0.0005	0.17
2018	Q1	EV_HC1	0.000018	93	89	0.82	0.97	0.00016	0.00012	<0.0001	<0.0001	777	<0.0005	<0.0005	0.18
2018	Q1	LC_LCDSSLCC	0.000091	122	129	0.57	7.9	<0.0002	0.00013	<0.0002	<0.0001	1000	<0.0005	<0.0005	0.17
2018	Q2	EV_MC2	0.000095	58	58	4.1	4.7	0.00011	0.00092	<0.0001	0.00041	397	<0.00051	0.0013	0.13
2018	Q2	EV_HC1	0.00003	67	66	2.5	0.66	<0.0001	0.00025	<0.0001	<0.0001	510	<0.0005	<0.0005	0.19
2018	Q2	LC_DCDS	0.000204	46.2	44	3.41	3.25	<0.00010	0.00111	0.0004	0.00092	364	<0.00050	0.00151	0.116
2018	Q3	GH_FR1	0.000021	101	96	1.2	1.5	0.0001	0.0002	<0.0001	<0.0001	806	<0.0005	<0.0005	0.19
2018	Q3	GH_ERC	0.000014	46	43	1.1	<0.5	0.00023	0.00033	<0.0001	<0.0001	298	<0.0005	<0.0005	0.19
2018	Q3	EV_MC2	0.000063	103	97	1.2	5.5	0.00012	0.00031	0.00014	0.00019	663	<0.0005	0.00078	0.18
2018	Q3	EV_HC1	0.000017	84	78	1.4	1.0	0.00013	0.00021	<0.0001	<0.0001	668	<0.0005	<0.0005	0.22

Year	Quarter	Sample ID	Mean Survival (Control Normalized)	Mean Reproduction (Control Normalized)	ACIDITY TO pH 8.3 (As CaCO3)-N-mg/l	ALKALINITY BICARBONATE (As CaCO3) lab measured.-N-mg/l	ALKALINITY CARBONATE (As CaCO3) lab measured.-N-mg/l	ALKALINITY HYDROXIDE (As CaCO3) lab measured.-N-mg/l	ALKALINITY TOTAL (As CaCO3) lab measured.-N-mg/l	ALUMINUM-D-mg/l	ALUMINUM-T-mg/l	ANTIMONY-D-mg/l	ANTIMONY-T-mg/l	ARSENIC-D-mg/l	ARSENIC-T-mg/l	BARIUM-D-mg/l	BARIUM-T-mg/l	BERYLLIUM-D-mg/l	BERYLLIUM-T-mg/l	BISMUTH-D-mg/l	BISMUTH-T-mg/l	BORON-D-mg/l	BORON-T-mg/l	BROMIDE-D-mg/l	CADMIUM-D-mg/l	CADMIUM-T-mg/l	CALCIUM-D-mg/l	CALCIUM-T-mg/l	CARBON DISSOLVED ORGANIC-D-mg/l	CHLORIDE-D-mg/l	CHROMIUM-D-mg/l	CHROMIUM-T-mg/l	COBALT-D-mg/l	COBALT-T-mg/l	CONDUCTIVITY LAB-N-us/cm	COPPER-D-mg/l	COPPER-T-mg/l	FLUORIDE-D-mg/l
2018	Q3	LC_LCDSSLCC	100.00	106	<1	190	9.0	<1	199	<0.003	0.0035	0.00024	0.00026	0.00011	0.00021	0.071	0.077	<0.00002	<0.00002	<0.00005	<0.00005	0.013	0.015	<0.05	0.00027	0.00031	108	106	1.3	3.1	0.00016	<0.0003	<0.0001	<0.0001	799	<0.0005	<0.0005	0.25
2018	Q4	FR_FRABCH	100	97	<1	247	<1	<1	247	<0.003	0.0052	<0.0001	0.00011	<0.0001	<0.0001	0.11	0.11	<0.00002	<0.00002	<0.00005	<0.00005	0.012	0.013	<0.25	0.000033	0.000038	145	143	0.96	<2.5	0.00011	0.00012	<0.0001	<0.0001	1080	<0.0005	<0.0005	0.15
2018	Q4	GH_FR1	111	92	<1	197	10	<1	208	<0.003	0.0045	0.00014	0.00015	<0.0001	0.00013	0.11	0.11	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.25	0.000015	0.000018	109	110	0.86	<2.5	0.0001	0.00016	<0.0001	<0.0001	876	<0.0005	<0.0005	0.17
2018	Q4	GH_ERC	100	97	<1	149	4.6	<1	154	<0.003	0.15	<0.0001	<0.0001	<0.0001	0.0002	0.056	0.057	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000051	0.000021	49	51	<0.5	<0.5	0.00022	0.00061	<0.0001	<0.0001	334	<0.0005	<0.0005	0.16
2018	Q4	EV_MC2	111	92	<1	156	5.8	<1	162	<0.003	0.0095	0.0002	0.00022	0.00017	0.00024	0.11	0.11	<0.00002	<0.00002	<0.00005	<0.00005	0.014	0.015	0.36	0.00002	0.000028	73	76	1.7	3.6	0.00011	0.00022	<0.0001	<0.0001	585	<0.0005	<0.0005	0.17
2018	Q4	EV_HC1	111	121	<1	176	9.0	<1	185	<0.003	0.022	<0.0001	<0.0001	0.00017	0.00022	0.068	0.066	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.25	0.000016	0.000022	82	85	1.4	1.4	0.00019	0.00018	<0.0001	<0.0001	708	<0.0005	<0.0005	0.21
2019	Q1	GH_FR1	100	72	2	216	<1	<1	216	<0.003	<0.003	0.00013	0.00012	<0.0001	0.00013	0.119	0.123	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.25	0.0000182	0.0000216	127	129	0.76	<2.5	0.00011	0.00013	<0.0001	<0.0001	977	<0.0005	<0.0005	0.16
2019	Q1	GH_ERC	100	84	1.3	154	<1	<1	154	<0.003	<0.003	<0.0001	<0.0001	<0.0001	<0.0001	0.0573	0.0614	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000077	0.0000065	50.9	52.1	<0.5	<0.5	0.00022	0.00028	<0.0001	<0.0001	337	<0.0005	<0.0005	0.146
2019	Q1	RG_MIDAG	100	81	2.3	185	<1	<1	185	<0.003	<0.003	0.00012	0.00017	0.00022	0.00021	0.0865	0.0801	<0.00002	<0.00002	<0.00005	<0.00005	0.016	0.016	<0.05	0.0000168	0.0000215	92.8	86.4	<0.5	2.57	0.0002	0.00018	<0.0001	<0.0001	419	<0.0005	<0.0005	0.168
2019	Q1	EV_MC2	100	78	2.7	188	<1	<1	188	<0.003	<0.003	<0.0001	<0.0001	0.00015	0.00016	0.124	0.114	<0.00002	<0.00002	<0.00005	<0.00005	0.011	0.011	<0.05	0.0000198	0.000024	76.3	73.7	1.39	3.59	0.00013	0.00013	<0.0001	<0.0001	600	<0.0005	<0.0005	0.14
2019	Q1	EV_HC1	100	90	2.3	197	<1	<1	197	<0.003	0.0066	<0.0001	<0.0001	0.00016	0.00022	0.0702	0.0692	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000171	0.0000168	87.8	87.4	0.96	1.29	0.00017	0.00019	<0.0001	<0.0001	757	<0.0005	<0.0005	0.221
2019	Q1	LC_DCDS	100	91	1.3	201	<1	<1	201	<0.003	0.0085	0.00046	0.00049	0.00036	0.00035	0.226	0.219	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000821	0.0000885	73.7	75.5	1.52	7.78	<0.0001	<0.0001	<0.0001	0.00011	592	<0.0005	<0.0005	0.097
2019	Q1	LC_LC3	100	83	4	227	<1	<1	227	<0.003	0.0041	0.00023	0.00026	<0.0001	<0.0001	0.0592	0.0587	<0.00002	<0.00002	<0.00005	<0.00005	0.014	0.015	<0.25	0.0000882	0.000093	154	168	0.85	42	0.00012	0.00015	0.0003	0.00033	1390	<0.0005	<0.0005	0.21
2019	Q1	LC_LC5	100	79	<1	192	<1	<1	192	<0.003	0.004	<0.0001	<0.0001	0.0001	<0.0001	0.104	0.101	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.000011	0.0000168	97.6	109	0.66	4.69	0.00013	0.00013	<0.0001	<0.0001	812	<0.0005	<0.0005	0.205
2019	Q1	LC_LCDSSLCC	100	93	1.8	198	<1	<1	198	<0.003	<0.003	0.00015	0.00017	0.0001	<0.0001	0.0853	0.0843	<0.00002	<0.00002	<0.00005	<0.00005	0.011	0.012	<0.25	0.0000812	0.0000806	123	127	0.62	19.4	0.00012	0.00011	<0.0001	<0.0001	1010	<0.0005	<0.0005	0.21
2019	Q2	FR_FRABCH	100	70	<1	223	<1	<1	223	<0.003	0.0757	0.00012	0.00019	<0.0001	0.00014	0.0939	0.0925	<0.00002	<0.00002	<0.00005	<0.00005	0.01	0.015	<0.25	0.0000384	0.0000685	121	140	0.65	<2.5	0.00013	0.00033	0.00023	0.0003	1090	<0.0005	0.00101	0.15
2019	Q2	FR_FRCP1	100	80	<1	187	6.8	<1	194	<0.003	0.0135	0.00034	0.00037	<0.0001	0.00013	0.0694	0.0688	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000426	0.0000484	102	109	1.17	1.18	0.00012	0.00016	0.00017	0.00018	917	<0.0005	<0.0005	0.187
2019	Q2	GH_FR1	100	80	<1	206	<1	<1	206	<0.003	0.0114	0.0002	0.00019	0.00012	0.00015	0.103	0.103	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000214	0.0000249	113	116	1.45	2.03	0.0001	0.00013	0.00011	0.00012	888	<0.0005	<0.0005	0.158
2019	Q2	GH_ERC	80	82	<1	149	<1	<1	149	<0.003	0.0334	<0.0001	<0.0001	<0.0001	0.00014	0.0537	0.0545	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.000008	0.0000115	49.4	52	<0.5	0.63	0.00022	0.00032	<0.0001	<0.0001	334	<0.0005	<0.0005	0.162
2019	Q2	CM_MC2	90	71	<1	159	5.2	<1	164	0.0037	0.0716	0.00013	0.00013	0.00014	0.00017	0.0547	0.056	<0.00002	<0.00002	<0.00005	<0.00005	0.019	0.019	<0.05	0.0000204	0.0000265	89.8	85.9	1.98	2.25	0.00015	0.00024	0.00056	0.00088	723	<0.0005	<0.0005	0.115
2019	Q2	RG_MIDAG	100	81	<1	151	<1	<1	151	<0.003	0.0348	0.00012	0.00011	0.00019	0.00019	0.0557	0.062	<0.00002	<0.00002	<0.00005	<0.00005	0.013	0.014	<0.05	0.0000109	0.0000196	65.8	66.4	1.16	1.55	0.00017	0.0002	<0.0001	0.00014	481	<0.0005	<0.0005	0.18
2019	Q2	EV_MC2	100	83	<1	119	1.2	<1	120	0.0076	0.0835	<0.0001	0.0001	0.00018	0.00018	0.0831	0.0837	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000157	0.0000327	45.7	46.9	1.71	2.21	<0.0007	0.00025	<0.0001	<0.0001	359	<0.0005	<0.0005	0.116
2019	Q2	EV_HC1	100	77	<1	184	8.8	<1	193	<0.003	0.0443	0.0001	0.0001	0.00016	0.00017	0.0485	0.05	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000171	0.0000235	79.5	83.6	0.87	1.06	<0.0006	0.00023	<0.0001	<0.0001	693	<0.0005	<0.0005	0.205
2019	Q2	LC_DCDS	90	81	<1	115	9.8	<1	125	<0.003	0.0185	0.00048	0.00044	0.00032	0.00032	0.16	0.155	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.000025	0.0000779	57.7	55.3	2.67	4.58	<0.0005	0.00014	<0.0001	0.00016	453	<0.0005	<0.0005	0.107
2019	Q2	LC_LC3	100	85	<1	198	<1	<1	198	<0.003	0.0033	0.00024	0.00027	<0.0001	0.00013	0.0426	0.0424	<0.00002	<0.00002	<0.00005	<0.00005	0.013	0.015	<0.25	0.000157	0.000198	112	128	<0.5	13.1	0.00016	0.00013	<0.0001	0.00011	958	<0.0005	<0.0005	0.26
2019	Q2	LC_LC5	100	79	<1	188	<1	<1	188	<0.003	0.022	<0.0001	0.00013	0.0001	0.00012	0.0911	0.0896	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000155	0.0000299	94.3	102	0.77	3.81	0.00015	0.00018	<0.0001	0.0001	770	<0.0005	<0.0005	0.235
2019	Q2	LC_LCDSSLCC	100	81	<1	179	<1	<1	179	<0.003	<0.003	0.00017	0.0002	<0.0001	0.00011	0.0542	0.0522	<0.00002	<0.00002	<0.00005	<0.00005	0.01	0.011	<0.05	0.000079	0.0000899	91.8	100	0.61	9.55	0.00018	0.00029	<0.0001	<0.0001	803	<0.0005	<0.0005	0.254
2019	Q3	FR_FRABCH	100	84	1.6	216	5.4	<1	221	<0.003	0.0049	0.00016	0.00018	<0.0001	0.00011	0.0815	0.081	<0.00002	<0.00002	<0.00005	<0.00005	0.011	0.012	<0.05	0.0000409	0.0000357	108	116	0.84	1.1	0.00014	0.00023	0.00011	0.00011	855	<0.0005	0.00075	0.194
2019	Q3	GH_FR1	100	91	<1	188	6.4	<1	195	<0.003	0.0041	0.00014	0.00015	0.00013	0.0001	0.0891	0.0857	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000209	0.0000229	90	88.7	0.97	1.08	0.00011	0.00042	<0.0001	<0.0001	705	<0.0005	<0.0005	0.164
2019	Q3	GH_ERC	90	103	<1	146	<1	<1	146	<0.003	0.0092	<0.0001	<0.0001	0.0001	0.0001	0.0485	0.047	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.00001	0.00001	45.2	44.5	0.61	<0.5	0.0002	0.00034	<0.0001	<0.0001	297	<0.0005	<0.0005	0.151
2019	Q3	CM_MC2	80	84	<1	197	7	<1	204	<0.003	0.006	0.00021	0.00021	0.00019	0.00019	0.0663	0.0659	<0.00002	<0.00002	<0.00005	<0.00005	0.028	0.027	<0.05	0.0000133	0.0000155	121	124	0.95	2.11	0.00016	0.00019	0.00053	0.00067	931	<0.0005	<0.0005	0.126
2019	Q3	RG_MIDAG	90	98	<1	157	5.4	<1	163	<0.003	0.01	0.00012	0.00014	0.00031	0.00029	0.0571	0.059	<0.00002	<0.00002	<0.00005	<0.00005	0.014	0.015	<0.05	0.0000133	0.0000121	72.6	77.2	0.78	0.98	0.00019	0.00024	0.00011	0.00016	549	<0.0005	<0.0005	0.147
2019	Q3	EV_MC2	100	96	<1	160	7.6	<1	168	<0.003	0.0066	0.00011	0.00011	0.00019	0.00016	0.11	0.101	<0.00002	<0.00002	<0.00005	<0.00005	0.012	0.012	<0.05	0.0000225	0.0000272	67.5	62.5	1.4	2.65	0.00013	0.00018	<0.0001	<0.0001	509	<0.0005	<0.0005	0.119
2019	Q3	EV_HC1	70	79	<1	184	9.6	<1	194	<0.003	0.0082	<0.0001	<0.0001	0.00018	0.00018	0.0592	0.0547	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000114	0.0000182	76.7	72.9	1.07	0.98	0.00013	0.0002	<0.0001	<0.0001	662	<0.0005	<0.0005	0.17
2019	Q3	LC_DCDS	90	111	<1	127	6	<1	133	<0.003	0.0066	0.00048	0.00051	0.00033	0.00039	0.194	0.221	<0.00002	<0.00002	<0.00005	<0.00005	0.01	0.011	<0.05	0.0000498	0.0000773	67.5	74.3	2.14	6.63	<0.0001	0.00012	0.00012	0.00016	558	<0.0005	0.00052	0.082
2019	Q3	LC_LC3	100	105	6.2	201	<1	<1	201	<0.003	<0.003	0.00027	0.00028	<0.0001	<0.0001	0.0516	0.0493	<0.00002	<0.00002	<0.00005	<0.00005	0.016	0.015	<0.05	0.000302	0.00035	110	107	0.55	16.6	<0.0001	0.00017	0.00012	0.00013	901	<0.0005	<0.0005	0.229
2019	Q3	LC_LC5	80	82	<1	178	4.2	<1	182	<0.003	0.0039	0.00012	0.00012	0.00011	0.0001	0.0866	0.0827	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000189	0.0000352	80.8	80.5	0.92	2.59	0.00011	0.00021	<0.0001	<0.0001	635	<0.0005	<0.0005	0.223
2019	Q3	LC_LCDSSLCC	80	92	1.5	184	<1	<1	184	<0.003	<0.003	0.00019	0.00019	0.00012	<0.0001	0.0574	0.0539	<0.00002	<0.00002	<0.00005	<0.00005	0.012	0.012	<0.05	0.000151	0.000189	87.8	87	0.69	8.51	0.00013	0.00018	<0.0001	<0.0001	703	<0.0005	<0.0005	0.255
2019	Q4	FR_FRABCH	90	81	<1	240	<1	<1	240	<0.003	0.036	<0.0001	0.00013	<0.0001	0.00017	0.0943	0.0924	<0.00002	<0.00002	<0.00005	<0.00005	0.01	0.012	<0.25	<0.000005	0.0000647	125	134	<0.5	<2.5	0.00012	0.00016	0.00014	0.00023	876	<0.0002	0.00052	0.18
2019	Q4	FR_FRCP1	90	84	<1	233	4	<1	237	<0.003	0.0034	0.00029	0.00034	0.00011	0.00012	0.0683	0.0707	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	0.011	<0.25	<0.000005	0.0000685	139	165	0.94	<2.5	<0.0001	0.00012	<0.0001	0.00012	1080	<0.0002	<0.0005	0.24
2019	Q4	GH_FR1	100	96	<1	200	3	<1	203	<0.003	0.0054	0.00011	0.00012	<0.0001	0.00011	0.101	0.105	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000142	0.0000277	106	107	0.55	1.72	0.00013	0.00013	<0.0001	<0.0001	743	<0.0002	0.00111	0.165
2019	Q4	GH_ERC	90	87	<1	151	<1	<1	151	<0.003	0.0042	<0.0001	<0.0001	<0.0001	0.00011	0.0605	0.0641	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000054	0.0000076	50.6	53.6	<0.5	<0.5	0.00025	0.00026	<0.0001	<0.0001	315	<0.0002	<0.0005	0.167
2019	Q4	CM_MC2	90	86	<1	211	6.2	<1	217	<0.003	0.231	0.00019	0.00021	0.00017	0.00028	0.0586	0.0663	<0.00002	<0.00002	<0.00005	<0.00005	0.028	0.031	<0.05	0.0000239	0.0000399	127	131	0.78	3.25	0.00021	0.00052	0.00137	0.00272	868	<0.0002	<0.0005	0.14
2019	Q4	RG_MIDAG	100	100	<1	172	3	<1	175	<0.003	0.0686	0.00011	0.00013	0.00022	0.00025	0.0633	0.0646	<0.00002	<0.00002	<0.00005	<0.00005	0.014	0.014	<0.05	0.0000144	0.0000211	84.8	90.8	0.62	2.2	0.00025	0.00036	0.00017	0.00034	585	<0.0002	<0.0005	0.186
2019	Q4	EV_MC2	80	102	<1	181	3.8	<1	185	<0.003	0.0037	0.00011	0.0001	0.00016	0.00015	0.117	0.108	<0.00002	<0.00002	<0.00005	<0.00005	0.01	0.012	0.061	0.0000195	0.0000246	73.9	74.8	0.75	4.38	0.00012	0.00014	<0.0001	<0.0001	519	<0.0002	<0.0005	0.152
2019	Q4	EV_HC1	90	105	<1	204	<1	<1	204	<0.003	0.0064	<0.0001	<0.0001	0.00014	0.00015	0.0638	0.0555	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000095	0.0000172	87.4	84.9	<0.5	1.44	0.00015	0.00016	<0.0001	<0.0001	652	<0.0002	<0.0005	0.219
2019	Q4	LC_DCDS	90	100	<1	149	<1	<1	149	<0.003	0.0036	0.00047	0.00053	0.00033	0.00032	0.234	0.264	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.25	0.000108	0.000126	96	93.9	1.59	13.2	0.00023	<0.0001	0.00011	0.00011	665	<0.0002	<0.0005	0.12
2019	Q4	LC_LC3	90	76	1.3	214	<1	<1	214	<0.003	<0.003	0.0003	0.00028	<0.0001	<0.0001	0.0565	0.0628	<0.00002	<0.00002	<0.00005	<0.00005	0.016	0.016	<0.25	0.000166	0.000182	142	144	0.56	30.8	0.00014	0.00015	0.00019	0.00022	1010	0.0003	0.00066	0.24
2019	Q4	LC_LC5	100	104	<1	208	4.8	<1	212	<0.003	0.0042	0.00011	0.00011	<0.0001	0.00011	0.0941	0.0868	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000145	0.0000287	104	93.8	<0.5	4.77	0.00012	0.00014	<0.0001	<0.0001	684	0.00028	<0.0005	0.241
2019	Q4	LC_LCDSSLCC	100	88	<1	192	<1	<1	192	<0.003	0.0067	0.00018	0.00019	<0.0001	0.00012	0.0664	0.0707	<0.00002	<0.00002	<0.00005	<0.00005	0.012	0.012	<0.05	0.000108	0.000156	106	110	<0.5	15.1	0.00016	0.00015	<0.0001	<0.0001	772	0.00068	0.00071	0.236
2020	Q1	FR_FRABCH	100	85	3.6	242	<1	<1	242	<0.003	0.0793	<0.0001	<0.0001	<0.0001	0.00012	0.103	0.104	<0.00002	<0.00002	<0.00005	<0.00005	0.01	0.011	<0.25	0.0000305	0.0000652	133	138	<0.5	<2.5	0.00011	0.00027	0.00015	0.00023	1060	<0.0002	0.0009	0.14
2020	Q1	GH_ERC	111	95	<1	154	<1	<1	154	0.0039	0.0074	<0.0001	<0.0001	<0.0001	<0.0001	0.0645	0.0593	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000071	0.0000075	50.8	51	0.58	<0.5	0.00027	0.00026	<0.0001	<0.0001	366	<0.0002	<0.0005	0.137
2020	Q1	CM_MC2	111	96	<1	214	6.4	<1	220	<0.003	0.0099	0.00029	0.0003	0.00017	0.00024	0.0647	0.0634	<0.00002	<0.00002	<0.00005	<0.00005	0.039	0.043	<0.25	0.0000274	0.0000295	140	144	0.66	3.5	0.00015	0.00018	0.00497	0.0053	1140	<0.0002	<0.0005	0.13
2020	Q1	RG_MIDAG	111	84	<1	192	<1	<1	192	<0.003	0.0063	0.00019	0.00016	0.0002	0.0002	0.0777	0.0839	<0.00002	<0.00002	<0.00005	<0.00005	0.019	0.02	<0.05	0.0000256	0.0000265	103	105	<0.5	2.56	0.0002	0.0002	0.00049	0.0005	825	0.00023	<0.0005	0.203
2020	Q1	EV_MC2	111	100	<1	179	<1	<1	179	0.0031	0.0051	0.00013	0.00014	0.00017	0.00015	0.13	0.125	<0.00002	<0.00002	<0.00005	<0.00005	0.011	0.012	<0.05	0.000029	0.0000256	78.1	76.1	0.85	4.03	0.00014	0.00015	<0.0001	<0.0001	587	0.0002	<0.0005	0.123
2020	Q1	EV_HC1	111	88	<1	198	<1	<1	198	<0.003	0.0044	<0.0001	<0.0001	0.00015	0.00016	0.0673	0.0677	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000167	0.0000187	87.2	82	0.9	1.41	0.00014	0.00017	<0.0001	<0.0001	727	0.00022	<0.0005	0.179
2020	Q1	LC_LC3	111	88	1.5	226	<1	<1	226	<0.003	<0.003	0.00023	0.00024	<0.0001	<0.0001	0.0634	0.0604	<0.00002	<0.00002	<0.00005	<0.00005	0.015	0.016	<0.25	0.000128	0.00012	165	151	0.9	44.3	0.00014	0.00015	0.00032	0.00032	1320	0.00036	0.00054	0.17
2020	Q1	LC_LC5	111	95	<1	196	<1	<1	196	<0.003	0.0043	<0.0001	<0.0001	<0.0001	<0.0001	0.102	0.093	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000143	0.0000727	100	93.5	0.78	5.27	0.00011	0.0002	<0.0001	<0.0001	765	<0.0002	<0.0005	0.167
2020	Q1	LC_LCDSSLCC	111	93	<1	203	<1	<1	203	<0.003	<0.003	0.00016	0.00017	<0.0001	0.00012	0.0782	0.0786	<0.00002	<0.00002	<0.00005	<0.00005	0.011	0.013	<0.05	0.0000814	0.0000805	130	126	0.67	21.9	0.00014	0.00016	<0.0001	<0.0001	994	0.00021	<0.0005	0.172
2020	Q1	FR_FR4	100	81	<1	254	<1	<1	254	<0.003	<0.003	0.00026	0.00028	<0.0001	0.00012	0.079	0.0767	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	0.011	<0.25	0.0000623	0.0000712	177	177	0.82	2.9	<0.0001	0.00014	0.00011	0.00011	1350	0.00021	<0.0005	0.14
2020	Q2	FR_FRABCH	100	91	2.4	183	9.8	<1	193	<0.003	0.0441	0.00022	0.00023	0.00011	0.00013	0.0733	0.063	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000642	0.0000673	112	106	2.65	1.18	<0.0001	0.00013	0.00018	0.00019	768	0.00024	<0.0005	0.149
2020	Q2	FR_FRCP1	100	90	<1	169	10.8	<1	180	<0.003	0.0494	0.00035	0.00033	0.00013	0.00017	0.0557	0.0529	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.000104	0.000118	97.9	92.6	1.7	0.66	<0.0001	0.00014	0.00033	0.0004	701	0.00034	<0.0005	0.161
2020	Q2	GH_FR1	100	96	<1	167	7.2	<1	175	0.0036	0.111	0.0002	0.00023	0.00016	0.0002	0.0728	0.0721	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000317	0.0000435	75	86.1	3.15	1.36	<0.0001	0.00026	<0.0001	0.00013	580	0.00035	<0.0005	0.136
2020	Q2	GH_ERC	100	100	<1	157	<1	<1	157	<0.003	0.142	<0.0001	<0.0001	<0.0001	0.00022	0.0539	0.0582	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000079	0.0000311	48.9	54.8	1.54	0.65	0.0002	0.00049	<0.0001	<0.0001	305	<0.0002	<0.0005	0.13
2020	Q2	CM_MC2	100	84	<1	176	6.4	<1	182	0.0043	0.0639	0.00014	0.00015	0.00015	0.00021	0.0521	0.0578	<0.00002	<0.00002	<0.00005	<0.00005	0.019	0.021	<0.05	0.0000542	0.000069	85.3	93.8	1.4	2.72	0.00014	0.00035	0.0019	0.00231	642	<0.0002	<0.0005	0.109
2020	Q2	RG_MIDAG	100	81	<1	160	11.2	<1	171	<0.003	0.0473	<0.0001	0.00012	0.00022	0.00026	0.045	0.0475	<0.00002	<0.00002	<0.00005	<0.00005	0.013	0.012	<0.05	0.0000224	0.0000357	69.1	67.5	1.51	1.81	0.00014	0.00019	0.0006	0.00083	461	<0.0002	<0.0005	0.146
2020	Q2	EV_MC2	100	109	<1	117	4.8	<1	121	0.0079	0.169	<0.0001	0.00011	0.00018	0.00029	0.0731	0.0758	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.000022	0.0000497	50	44	3.39	2.15	0.00012	0.00037	<0.0001	0.00017	283	0.00045	0.00056	0.127
2020	Q2	EV_HC1	100	97	<1	173	15	<1	188	<0.003	0.035	<0.0001	<0.0001	0.00016	0.00022	0.0396	0.0395	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000199	0.0000243	80	74.4	2.31	1.34	0.00011	0.00017	<0.0001	<0.0001	529	0.00026	<0.0005	0.062
2020	Q2	LC_DCDS	100	92	<1	111	<1	<1	111	0.0047	0.14	0.00038	0.0004	0.00032	0.00044	0.118	0.124	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000854	0.000159	49.5	52.8	2.97	4.26	<0.0001	0.00034	0.00027	0.00045	379	0.00031	0.00062	0.101
2020	Q2	LC_LC3	100	87	2.5	182	<1	<1	182	<0.003	0.0038	0.00029	0.00031	0.00013	0.00014	0.0291	0.0281	<0.00002	<0.00002	<0.00005	<0.00005	0.012	0.013	<0.05	0.000306	0.000288	104	106	0.8	10.5	0.00011	0.00012	0.00014	0.00017	723	0.00031	<0.0005	0.188
2020	Q2	LC_LC5	100	93	<1	167	9.4	<1	177	<0.003	0.022	0.00014	0.00015	<0.0001	0.00015	0.0766	0.0744	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000264	0.0000431	84.5	84.4	1.72	2.58	0.00012	0.00012	<0.0001	<0.0001	575	<0.0002	<0.0005	0.163
2020	Q2	LC_LCDSSLCC	90	86	<1	168	6.8	<1	175	<0.003	0.0046	0.0002	0.00021	0.00014	0.00014	0.0404	0.0395	<0.00002	<0.00002	<0.00005	<0.00005	0.01	0.011	<0.05	0.00016	0.000163	88.8	86.4	1.2	6.31	0.00012	0.00016	<0.0001	<0.0001	584	0.00022	<0.0005	0.193
2020	Q3	FR_FRABCH	90	86	<1	225	<1	<1	225	<0.003	0.006	0.00014	0.00014	<0.0001	<0.0001	0.087	0.0909	<0.00002	<0.00002	<0.00005	<0.00005	0.012	0.011	<0.25	0.0000416	0.0000407	129	124	<0.5	<2.5	<0.0001	0.0001	<0.0001	<0.0001	942	<0.0002	<0.0005	0.17
2020	Q3	FR_FRCP1	100	95	<1	211	<1	<1	211	<0.003	0.0035	0.00027	0.00029	0.0001	<0.0001	0.0765	0.0796	<0.00002	<0.00002	<0.00005	<0.00005	0.012	0.011	<0.25	0.000101	0.0001	130	119	<0.5	<2.5	0.0001	0.00011	<0.0001	<0.0001	947	0.00021	<0.0005	0.2
2020	Q3	GH_FR1	100	92	<1	198	<1	<1	198	<0.003	0.0398	0.00012	0.00014	<0.0001	0.00028	0.0932	0.104	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	0.01	<0.05	0.00002	0.0000413	97.9	101	<0.5	1.47	<0.0001	0.00024	<0.0001	<0.0001	732	0.0002	<0.0005	0.171
2020	Q3	GH_ERC	100	92	<1	141	<1	<1	141	<0.003	0.0168	<0.0001	<0.0001	<0.0001	0.00021	0.05	0.0529	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000056	0.0000132	46.7	49.9	<0.5	<0.5	0.00021	0.00027	<0.0001	<0.0001	296	<0.0002	0.00076	0.168
2020	Q3	RG_MIDAG	100	85	<1	193	<1	<1	193	<0.003	0.0077	0.00019	0.0002	0.00026	0.00026	0.0873	0.0857	<0.00002	<0.00002	<0.00005	<0.00005	0.032	0.033	<0.05	0.0000263	0.0000258	109	103	0.53	1.28	0.00014	0.00017	0.00044	0.00053	764	<0.0002	<0.0005	0.19
2020	Q3	EV_MC2	100	100	<1	176	<1	<1	176	<0.003	0.0054	<0.0001	0.00012	0.00018	0.00023	0.108	0.106	<0.00002	<0.00002	<0.00005	<0.00005	0.014	0.015	<0.05	0.0000263	0.0000319	75.2	72.9	0.87	3.28	0.00012	0.00016	<0.0001	<0.0001	543	0.00026	<0.0005	0.156
2020	Q3	EV_HC1	100	92	<1	187	<1	<1	187	<0.003	0.0096	<0.0001	0.0001	0.00019	0.00023	0.0546	0.0565	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000183	0.0000169	80.7	79.7	0.53	0.93	0.00014	0.00018	<0.0001	<0.0001	626	<0.0002	<0.0005	0.212
2020	Q3	LC_DCDS	100	89	<1	117	<1	<1	117	<0.003	0.0259	0.00055	0.00055	0.00029	0.00036	0.176	0.174	<0.00002	<0.00002	<0.00005	<0.00005	0.01	0.012	<0.25	0.0000851	0.000101	85.5	91.9	2.85	12.2	<0.0001	<0.0001	0.00027	0.00034	729	0.0003	<0.0005	0.11
2020	Q3	LC_LC3	100	82	<1	219	<1	<1	219	<0.003	0.0033	0.00033	0.00034	<0.0001	0.00011	0.057	0.055	<0.00002	<0.00002	<0.00005	<0.00005	0.018	0.019	<0.25	0.000313	0.000314	133	132	1.73	21.2	0.00012	0.00013	0.00015	0.00017	1020	0.00027	<0.0005	0.21
2020	Q3	LC_LC5	100	87	<1	179	6	<1	185	<0.003	0.0071	0.00014	0.00014	0.0001	0.00011	0.0967	0.0907	<0.00002	<0.00002	<0.00005	<0.00005	0.011	0.01	<0.05	0.0000241	0.0000285	96.1	87.2	0.52	3.31	0.00013	0.00012	<0.0001	<0.0001	667	0.0002	<0.0005	0.202
2020	Q4	FR_FRABCH	90	76	<1	238	9.2	<1	248	<0.003	0.0032	0.0001	<0.0001	<0.0001	0.00017	0.102	0.0957	<0.00002	<0.00002	<0.00005	<0.00005	0.012	0.013	<0.25	0.0000329	0.000036	147	143	0.62	1.29	0.00013	0.00012	<0.0001	0.0001	979	<0.0002	0.0005	0.12
2020	Q4	GH_FR1	100	80	<1	204	6.6	<1	211	<0.003	0.346	0.00011	0.00014	<0.0001	0.00033	0.108	0.123	<0.00002	0.000032	<0.00005	<0.00005	<0.01	0.01	<0.05	0.0000214	0.000105	114	118	0.7	1.69	0.00017	0.0008	<0.0001	0.0003	788	<0.0002	0.00105	0.15
2020	Q4	GH_ERC	90	83	<1	152	<1	<1	152	0.0049	0.012	<0.0001	<0.0001	<0.0001	<0.0001	0.0558	0.063	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000082	0.0000109	49.5	50.1	<0.5	0.32	0.00022	0.00027	<0.0001	<0.0001	292	0.0004	<0.0005	0.143
2020	Q4	RG_MIDAG	100	91	<1	162	<1	<1	162	0.0037	0.0658	0.0001	0.00011	0.00025	0.00035	0.0507	0.0541	<0.00002	<0.00002	<0.00005	<0.00005	0.02	0.02	<0.05	0.0000139	0.0000251	73.2	69.9	1.41	1.41	0.00018	0.0003	0.0004	0.00063	525	<0.0002	<0.0005	0.202
2020	Q4	EV_MC2	100	98	<1	172	8.2	<1	180	<0.003	0.0043	<0.0001	0.00014	0.00015	0.00031	0.115	0.113	<0.00002	<0.00002	<0.00005	0.000067	0.011	0.013	<0.05	0.0000216	0.0000388	72.4	71.6	1.17	3.52	0.00014	0.00017	<0.0001	<0.0001	511	<0.0002	<0.0005	0.124
2020	Q4	EV_HC1	100	86	<1	185	10.2	<1	195	<0.003	0.0051	<0.0001	<0.0001	0.00015	0.00023	0.0611	0.0583	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000112	0.0000173	80.7	82.2	0.88	0.96	0.00017	0.00017	<0.0001	<0.0001	624	<0.0002	<0.0005	0.19
2020	Q4	LC_DCDS	100	76	<1	145	<1	<1	145	<0.003	0.0045	0.00048	0.00051	0.00031	0.00035	0.256	0.265	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	0.01	<0.25	0.000191	0.000197	127	123	1.46	17.8	<0.0001	<0.0001	0.00031	0.00034	897	<0.0002	<0.0005	<0.1
2020	Q4	LC_LC3	100	78	<1	216	8.2	<1	224	<0.003	0.0042	0.0003	0.00032	<0.0001	0.00019	0.0563	0.0582	<0.00002	<0.00002	<0.00005	<0.00005	0.016	0.018	<0.25	0.000219	0.000215	151	159	0.64	32	<0.0001	0.00014	0.0002	0.00022	1190	0.00027	<0.0005	0.14
2020	Q4	LC_LC5	90	89	<1	188	9	<1	197	<0.003	<0.003	<0.0001	<0.0001	<0.0001	0.00016	0.0951	0.0963	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000149	0.0000215	98.2	99.3	1.04	4.12	0.00014	0.00015	<0.0001	<0.0001	749	<0.0002	<0.0005	0.175
2020	Q4	LC_LCDSSLCC	100	74	0.5	80.1	1.68	120.6	201.6	0.0015	0.0015	0.000216	0.000224	0.00006	0.00011	0.06602	0.06678	0.00001	0.00001	0.000025	0.000025	0.0144	0.0152	0.025	0.0001404	0.0001594	111.12	108	0.394	12.22	0.000166	0.000128	0.00005	0.00005	801	0.0001	0.00025	0.2074
2021	Q1	FR_FRABCH	100	99	<2	237	<1	<1	237	0.0012	0.0631	0.00016	0.00017	<0.0001	0.00013	0.0992	0.0946	<0.00002	<0.00002	<0.00005	<0.00005	0.012	0.011	<0.25	0.0000562	0.0000706	151	156	1.61	2.28	0.00019	0.0002	0.00011	0.00016	1230	<0.0002	<0.0005	<0.1
2021	Q1	GH_FR1	100	102	<2	221	<1	<1	221	<0.001	0.0084	0.00013	0.00013	<0.0001	0.0001	0.131	0.124	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.25	0.0000257	0.0000281	127	128	0.92	3.02	<0.0001	<0.0001	<0.0001	<0.0001	967	<0.0002	<0.0005	0.115
2021	Q1	GH_ERC	100	83	2.7	158	<1	<1	158	<0.001	0.0094	<0.0001	<0.0001	<0.0001	<0.0001	0.061	0.0584	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000074	0.0000054	54	58.6	<0.5	0.48	0.00023	0.00024	<0.0001	<0.0001	371	<0.0002	<0.0005	0.12
2021	Q1	RG_MIDAG	100	78	<2	195	8.2	<1	203	<0.001	0.0938	0.00011	0.0001	0.00018	0.00025	0.0769	0.0749	<0.00002	<0.00002	<0.00005	<0.00005	0.024	0.022	<0.05	0.0000196	0.0000282	102	93	1.42	6.36	0.00015	0.00034	0.00012	0.00029	711	<0.0002	<0.0005	0.15
2021	Q1	EV_MC2	100	107	<2	175	1.8	<1	176	0.0012	0.044	<0.0001	<0.0001	0.00016	0.00017	0.11	0.108	<0.00002	<0.00002	<0.00005	<0.00005	0.012	0.011	<0.05	0.0000211	0.0000339	67.5	64.8	1.88	5.48	0.0001	0.00019	<0.0001	<0.0001	540	0.00021	<0.0005	0.111
2021	Q1	EV_HC1	100	130	<2	175	26.8	<1	202	0.0013	0.0209	<0.0001	<0.0001	0.00013	0.00016	0.0565	0.055	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.000018	0.0000195	84.8	82.6	1.55	1.24	0.00013	0.00016	<0.0001	<0.0001	777	<0.0002	<0.0005	0.13
2021	Q1	LC_DCDS	90	90	<2	138	<1	<1	138	0.0118	0.167	0.00059	0.00064	0.00026	0.00034	0.213	0.217	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	0.01	<0.05	0.000041	0.000115	79	80	2.26	8.07	<0.0001	0.00023	0.00026	0.00031	572	0.00021	0.0005	0.075
2021	Q1	LC_LC3	90	93	<2	211	11.6	<1	223	<0.001	0.0121	0.00034	0.00032	<0.0001	0.00012	0.054	0.0503	<0.00002	<0.00002	<0.00005	<0.00005	0.018	0.018	<0.25	0.000216	0.000207	135	131	1.18	25.5	0.00011	0.00012	0.00017	0.00017	1140	0.00024	<0.0005	0.14
2021	Q1	LC_LC5	100	99	<2	196	7.6	<1	204	<0.001	0.0103	0.00012	0.00013	<0.0001	0.00011	0.114	0.106	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000242	0.0000237	114	109	1.3	5.63	0.00011	0.00011	<0.0001	<0.0001	910	<0.0002	<0.0005	0.15
2021	Q1	LC_LCDSSLCC	100	91	<2	193	11.6	<1	204	0.0014	<0.003	0.00026	0.00026	<0.0001	0.00012	0.0688	0.0662	<0.00002	<0.00002	<0.00005	<0.00005	0.015	0.014	<0.05	0.000123	0.000128	117	118	1.09	17.1	0.0001	0.00012	<0.0001	<0.0001	980	<0.0002	<0.0005	0.18
2021	Q2	FR_FRABCH	100	103	<2	159	<1	<1	159	0.0036	0.598	0.00014	0.00016	0.00013	0.00037	0.0501	0.06	<0.00002	0.000035	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000368	0.00016	71.6	73.5	2.27	0.63	0.00011	0.0011	<0.0001	0.00051	579	0.00032	0.00105	0.14
2021	Q2	FR_FRCP1	100	105	<2	144	<1	<1	144	0.0034	0.346	0.00015	0.00018	0.00014	0.0003	0.0401	0.0516	<0.00002	0.000031	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000348	0.0002	61.9	66.6	2.29	0.4	0.0001	0.00066	<0.0001	0.00068	483	0.00025	0.001	0.15
2021	Q2	GH_FR1	100	98	<2	153	<1	<1	153	0.0015	0.268	0.00012	0.00014	0.00012	0.00029	0.0576	0.067	<0.00002	0.000024	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000245	0.000114	61.6	62.7	3.19	0.68	<0.0001	0.00046	<0.0001	0.00031	497	0.00032	0.00094	0.13
2021	Q2	GH_ERC	100	104	<2	144	<1	<1	144	0.0113	1.31	<0.0001	0.00014	0.00013	0.00112	0.0431	0.0733	<0.00002	0.000122	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000087	0.00023	44	57.9	2.07	0.47	0.00016	0.003	<0.0001	0.00097	290	0.00023	0.00301	0.119
2021	Q2	CM_MC2	100	95	<2	135	<1	<1	135	0.0086	0.584	0.0001	0.00013	0.00014	0.00057	0.041	0.0489	<0.00002	0.000056	<0.00005	<0.00005	0.023	0.024	<0.05	0.0000385	0.000125	60	58.5	2.92	0.54	0.00017	0.00085	0.00154	0.00295	442	0.00029	0.00124	0.072
2021	Q2	RG_MIDAG	100	104	<2	138	<1	<1	138	0.006	0.738	<0.0001	0.00012	0.00027	0.00072	0.0317	0.037	<0.00002	0.000053	<0.00005	<0.00005	0.011	0.012	<0.05	0.0000187	0.0000768	46.3	48	1.93	0.72	0.00019	0.0011	0.00037	0.00134	326	0.00025	0.00146	0.13
2021	Q2	EV_MC2	100	86	<2	102	<1	<1	102	0.0135	5.82	<0.0001	0.00042	0.00022	0.00437	0.0525	0.284	<0.00002	0.00056	<0.00005	0.000108	<0.01	0.014	<0.05	0.000026	0.00168	30.4	59.9	4.4	0.86	0.00012	0.0093	<0.0001	0.0078	228	0.00046	0.0154	0.074
2021	Q2	EV_HC1	100	94	<2	163	<1	<1	163	0.0047	0.506	<0.0001	0.0001	0.00016	0.00045	0.0354	0.0408	<0.00002	0.000044	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.000015	0.0000711	52.3	51.8	4.29	0.33	<0.0001	0.00075	<0.0001	0.0003	401	0.00033	0.00115	0.117
2021	Q2	LC_DCDS	100	96	<2	111	<1	<1	111	0.0133	0.471	0.00076	0.00081	0.0003	0.0005	0.153	0.174	<0.00002	0.00003	<0.00005	<0.00005	<0.01	0.011	<0.05	0.0000444	0.000266	56.3	56.5	3.21	3.87	<0.0001	0.00091	0.00039	0.00078	455	0.00036	0.0013	0.078
2021	Q2	LC_LC3	100	99	<2	172	<1	<1	172	<0.001	0.0176	0.00035	0.00037	0.00014	0.00016	0.0244	0.0258	<0.00002	<0.00002	<0.00005	<0.00005	0.013	0.014	<0.05	0.000294	0.000342	78.9	82.6	1.02	5.34	<0.0001	0.00011	0.00016	0.00022	716	0.00045	0.00064	0.22
2021	Q2	LC_LC5	90	81	<2	160	<1	<1	160	0.0013	0.538	0.00012	0.00016	0.00012	0.00051	0.0545	0.0792	<0.00002	0.000056	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000236	0.000197	58.4	66.8	2.01	1.42	<0.0001	0.001	<0.0001	0.00059	505	0.00021	0.00144	0.18
2021	Q2	LC_LCDSSLCC	90	87	<2	150	<1	<1	150	0.0018	0.0353	0.00016	0.00018	0.00013	0.00014	0.0273	0.0299	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.00011	0.000156	55.7	61.1	2.65	2.68	<0.0001	0.00015	<0.0001	0.00015	466	0.00029	<0.0005	0.2
2021	Q3	FR_FRABCH	100	86	<2	237	<1	<1	237	<0.001	0.004	0.00012	0.00014	<0.0001	0.00012	0.0946	0.0916	<0.00002	<0.00002	<0.00005	<0.00005	0.014	0.014	<0.25	0.0000437	0.0000414	139	140	2.42	2.03	<0.0001	0.00013	<0.0001	<0.0001	1050	0.00177	0.00166	0.17
2021	Q3	GH_FR1	100	86	<2	193	11.2	<1	204	<0.001	0.0095	0.00012	0.00012	<0.0001	0.00013	0.106	0.106	<0.00002	<0.00002	<0.00005	<0.00005	0.011	<0.01	<0.05	0.0000252	0.000022	105	92.2	2.34	1.75	0.00013	0.00015	<0.0001	<0.0001	793	0.00146	0.002	0.17
2021	Q3	GH_ERC	100	95	<2	141	2.2	<1	143	0.0059	0.0202	<0.0001	<0.0001	0.00011	0.00014	0.0482	0.0493	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000056	0.0000058	44.5	42	1.82	0.3	0.00022	0.00022	<0.0001	<0.0001	285	<0.0002	<0.0005	0.16
2021	Q3	CM_MC2	90	87	<2	196	<1	<1	196	0.0014	0.0161	0.00022	0.00022	0.00018	0.00021	0.0649	0.0658	<0.00002	<0.00002	<0.00005	<0.00005	0.045	0.047	<0.05	0.0000154	0.0000206	111	110	1.13	1.4	0.00015	0.00026	0.00089	0.00098	918	<0.0002	<0.0005	0.13
2021	Q3	RG_MIDAG	100	100	<2	147	6.8	<1	154	0.0015	0.0108	0.00012	0.00013	0.00032	0.00035	0.0526	0.0532	<0.00002	<0.00002	<0.00005	<0.00005	0.019	0.02	<0.05	0.0000156	0.000022	63.9	66.4	1.14	0.57	0.00017	0.00023	0.00013	0.00022	514	<0.0002	<0.0005	0.17
2021	Q3	EV_MC2	100	113	<2	165	4.8	<1	170	0.0012	0.0162	0.00011	0.00012	0.00018	0.00023	0.116	0.109	<0.00002	<0.00002	<0.00005	<0.00005	0.014	0.014	<0.05	0.0000281	0.0000276	70.2	61.1	3.16	3.3	0.00012	0.00018	<0.0001	0.00011	509	0.00023	<0.0005	0.104
2021	Q3	EV_HC1	90	105	<2	180	5.4	<1	186	0.0014	0.0323	<0.0001	<0.0001	0.00018	0.00023	0.0608	0.0577	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000128	0.0000166	73.9	69.2	3.67	0.94	0.00013	0.00027	<0.0001	<0.0001	632	<0.0002	<0.0005	0.2
2021	Q3	LC_LC3	100	91	<2	209	10.6	<1	219	<0.001	<0.003	0.00031	0.00036	<0.0001	0.00014	0.0515	0.0554	<0.00002	<0.00002	<0.00005	<0.00005	0.019	0.02	<0.25	0.00035	0.000344	116	124	0.7	70.5	0.0001	0.00013	<0.0001	0.00011	985	0.00047	0.00054	0.2
2021	Q3	LC_LC5	100	95	<2	180	12	<1	192	0.0011	<0.003	0.00012	0.00014	0.0001	0.00012	0.099	0.0956	<0.00002	<0.00002	<0.00005	<0.00005	0.012	0.011	<0.05	0.0000306	0.0000382	93	93.6	3.49	3.84	0.00012	0.00013	<0.0001	<0.0001	726	<0.0002	<0.0005	0.21
2021	Q3	LC_LCDSSLCC	90	91	<2	189	9.6	<1	199	0.001	<0.003	0.00022	0.00024	0.0001	0.00012	0.0582	0.062	<0.00002	<0.00002	<0.00005	<0.00005	0.015	0.015	<0.05	0.000182	0.000181	94.8	98.3	0.64	10.2	0.00012	0.00013	<0.0001	<0.0001	786	0.00023	<0.0005	0.23
2021	Q4	FR_FRABCH	100	87	2.4	252	<1	<1	252	0.0011	0.0102	0.00012	0.00016	<0.0001	<0.0001	0.103	0.109	<0.00002	<0.00002	<0.00005	<0.00005	0.013	0.013	<0.25	0.0000413	0.0000486	148	154	0.74	1.58	0.00012	0.00013	<0.0001	<0.0001	1100	<0.0002	<0.0005	0.109
2021	Q4	GH_FR1	100	91	<2	234	5.4	<1	239	<0.001	0.0033	0.00011	0.00011	<0.0001	0.00012	0.121	0.132	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000172	0.0000222	109	115	0.52	1.56	0.00016	0.00022	<0.0001	<0.0001	857	<0.0002	<0.0005	0.12
2021	Q4	GH_ERC	100	107	<2	152	<1	<1	151	<0.001	0.0042	<0.0001	<0.0001	<0.0001	0.00012	0.0563	0.0623	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000061	0.0000052	48	51.6	<0.5	0.28	0.00033	0.00036	<0.0001	<0.0001	301	<0.0002	<0.0005	0.13
2021	Q4	RG_MIDAG	100	80	<2	201	<1	<1	201	0.001	0.0055	0.0001	0.00013	0.00021	0.00024	0.0865	0.082	<0.00002	<0.00002	<0.00005	<0.00005	0.018	0.021	<0.05	0.0000213	0.0000234	90.9	96.9	1.04	0.98	0.00019	0.00027	<0.0001	<0.0001	644	<0.0002	<0.0005	0.13
2021	Q4	EV_MC2	100	110	3.5	216	<1	<1	216	<0.001	0.0098	<0.0001	0.00011	0.00013	0.00015	0.0908	0.0982	<0.00002	<0.00002	<0.00005	<0.00005	0.016	0.016	0.086	0.0000384	0.0000399	93.4	97.9	0.66	8.73	0.00012	0.00012	<0.0001	<0.0001	603	<0.0002	<0.0005	0.107
2021	Q4	EV_HC1	100	81	<2	189	10.6	<1	200	0.0016	0.0226	<0.0001	<0.0001	0.00016	0.00016	0.0628	0.0641	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000135	0.0000193	80.5	89.4	0.86	0.77	0.00018	0.00028	<0.0001	<0.0001	589	<0.0002	0.00364	0.16
2021	Q4	LC_LC5	100	96	<2	200	12.8	<1	213	0.001	0.0463	0.00011	0.00014	<0.0001	<0.0001	0.0968	0.102	<0.00002	<0.00002	<0.00005	<0.00005	0.01	0.011	<0.05	0.0000183	0.0000632	99.1	109	0.94	3.87	0.00019	0.0002	<0.0001	<0.0001	779	0.00035	<0.0005	0.15
2021	Q4	LC_LCDSSLCC	100	93	<2	215	9.6	<1	224	<0.001	<0.003	0.0002	0.00022	<0.0001	<0.0001	0.0635	0.0714	<0.00002	<0.00002	<0.00005	<0.00005	0.014	0.016	<0.05	0.000132	0.000155	104	116	0.76	12.3	0.00013	0.00014	<0.0001	<0.0001	870	<0.0002	<0.0005	0.17

Year	Quarter	Sample ID	Mean Survival (Control Normalized)	Mean Reproduction (Control Normalized)	ACIDITY TO pH 8.3 (As CaCO3)-N-mg/l	ALKALINITY BICARBONATE (As CaCO3) lab measured.-N-mg/l	ALKALINITY CARBONATE (As CaCO3) lab measured.-N-mg/l	ALKALINITY HYDROXIDE (As CaCO3) lab measured.-N-mg/l	ALKALINITY TOTAL (As CaCO3) lab measured.-N-mg/l	ALUMINUM-D-mg/l	ALUMINUM-T-mg/l
Test categorized as possible or likely response (2015 to 2020)											
2015	Q1	FR_FRCP1	100	47	5.1	337	<1	<1	337	< 0.0030	< 0.0060
2015	Q2	CM_MC2	100	55	<1	143	4.9	<1	148	0.0044	0.31
2015	Q4	FR_FRCP1	100	57	<1	211	<1	<1	211	< 0.0030	0.0035
2015	Q4	CM_MC2	100	69	<1	209	6.4	<1	215	< 0.0030	0.0054
2016	Q1	FR_FRCP1	100	60	2.2	254	< 1.0	< 1.0	254	< 0.0030	< 0.0030
2016	Q2	GH_FR1	90	74	< 1.0	160	< 1.0	< 1.0	160	< 0.0030	0.09
2016	Q2	CM_MC2	100	43	1.1	152	< 1.0	< 1.0	152	0.0076	0.34
2016	Q2	LC_DCDS	90	62	<1.0	88.6	<1.0	<1.0	88.6	0.0226	0.19
2016	Q3	FR_FRCP1	100	67	< 1.0	193	4.8	< 1.0	198	< 0.0030	0.014
2016	Q3	CM_MC2	100	73	< 1.0	193	8.8	< 1.0	201	< 0.0030	0.0053
2016	Q4	FR_FRCP1	100	63	< 1.0	190	3.4	< 1.0	193	0.0046	0.015
2016	Q4	CM_MC2	100	68	< 1.0	165	< 1.0	< 1.0	165	0.0088	0.15
2016	Q4	EV_MC2	100	66	1.1	122	< 1.0	< 1.0	122	0.023	0.23
2016	Q4	LC_DCDS	100	39	<1.0	131	<1.0	<1.0	131	0.0268	0.168
2017	Q1	FR_FRCP1	100	67	-	-	-	-	251	<0.001	0.005
2017	Q1	CM_MC2	100	40	-	-	-	-	211	0.0012	0.0081
2017	Q1	EV_MC2	100	94	-	-	-	-	176	<0.003	0.022
2017	Q1	LC_LCDSSLCC	100	92	-	-	-	-	196	<0.003	0.0086
2017	Q2	FR_FRCP1	100	41	-	-	-	-	169	0.013	0.36
2017	Q2	CM_MC2	90	50	-	-	-	-	197	0.0057	0.11
2017	Q2	CM_MC2	100	76	-	-	-	-	194	0.0047	0.095
2017	Q2	EV_MC2	90	80	-	-	-	-	143	0.018	0.11
2017	Q2	EV_HC1	100	72	-	-	-	-	201	0.0078	0.072
2017	Q3	FR_FRCP1	100	75	-	-	-	-	196	0.0011	0.0082
2017	Q3	GH_FR1	100	91	-	-	-	-	191	0.0017	0.007
2017	Q3	CM_MC2	70	33	-	-	-	-	180	0.0019	0.018
2017	Q4	FR_FRCP1	100	54	-	-	-	-	146	<0.003	<0.003
2017	Q4	CM_MC2	80	41	-	-	-	-	196	<0.003	0.01
2018	Q1	FR_FRCP1	80.00	21	<1	223	<1	<1	223	<0.003	0.0033
2018	Q1	CM_MC2	100.00	48	<1	268	13	<1	282	<0.003	0.0037
2018	Q1	EV_MC2	100.00	56	<1	204	17	<1	221	<0.003	0.004
2018	Q2	FR_FRCP1	100.00	64	<1	136	6.8	<1	143	0.0065	0.3
2018	Q2	GH_FR1	100.00	71.6	<1	140	8.6	<1	149	0.0095	0.88
2018	Q2	GH_ERC	100.00	62	<1	133	8.6	<1	142	0.0044	0.59
2018	Q2	CM_MC2	100.00	42	<1	156	13	<1	169	0.0051	0.22
2018	Q2	CM_MC3	100.00	69	<1	137	13	<1	150	0.0072	0.13
2018	Q2	LC_LC5	100	60	<1.0	150	8.6	<1.0	159	<0.0030	0.39
2018	Q2	LC_LCDSSLCC	100.00	40	<1	155	9.2	<1	164	<0.003	0.039
2018	Q3	FR_FRCP1	80.00	46	<1	202	5.2	<1	207	<0.003	0.026
2018	Q3	CM_MC2	90.00	30	<1	187	<1	<1	187	<0.003	0.0052
2018	Q3	CM_MC3	100.00	77	<1	163	5.2	<1	168	<0.003	0.0065
2018	Q4	FR_FRCP1	100	6	12	301	<1	<1	301	<0.003	0.017
2018	Q4	CM_MC2	89	0	<1	190	5.0	<1	195	<0.003	0.012
2018	Q4	CM_MC3	111	19	<1	154	3.6	<1	158	<0.003	0.0074
2018	Q4	LC_DCDS	100	85	<1.0	156	8	<1.0	164	<0.0030	0.0064
2018	Q4	LC_LC5	100	74	<1.0	181	8	<1.0	189	<0.0030	0.0038
2018	Q4	LC_LCDSSLCC	100	63	<1	192	6.2	<1	198	<0.003	0.0044
2019	Q1	FR_FRABCH	100	58	3.8	243	<1	<1	243	<0.003	<0.003
2019	Q1	FR_FRCP1	0	0	13.8	403	<1	<1	403	<0.003	<0.006
2019	Q1	CM_MC2	100	49	3.4	229	<1	<1	229	<0.003	0.0053
2019	Q3	FR_FRCP1	90	75	<1	187	6	<1	193	<0.003	0.0047
2020	Q1	FR_FRCP1	111	62	3	241	<1	<1	241	<0.003	0.0668
2020	Q1	GH_FR1	100	44	<1	209	<1	<1	209	<0.003	<0.003
2020	Q1	LC_DCDS	100	68	<1	152	<1	<1	152	<0.003	0.0047
2020	Q3	CM_MC2	100	79	<1	231	<1	<1	231	<0.003	0.0058
2020	Q3	LC_LCDSSLCC	90	70	<1	195	<1	<1	195	<0.003	<0.003
2020	Q4	FR_FRCP1	100	58	<1	229	12.6	<1	242	<0.003	0.0056
2020	Q4	CM_MC2	90	43	<1	239	4.8	<1	244	<0.003	0.0077
Test categorized as possible or likely response (2021)											
2021	Q1	FR_FRCP1	90	52	<2	217	15.2	<1	232	0.0021	0.029

Year	Quarter	Sample ID	ANTIMONY-D-mg/l	ANTIMONY-T-mg/l	ARSENIC-D-mg/l	ARSENIC-T-mg/l	BARIUM-D-mg/l	BARIUM-T-mg/l	BERYLLIUM-D-mg/l	BERYLLIUM-T-mg/l	BISMUTH-D-mg/l	BISMUTH-T-mg/l	BORON-D-mg/l	BORON-T-mg/l	BROMIDE-D-mg/l	CADMIUM-D-mg/l
Test categorized as possible or likely response (2015 to 2020)																
2015	Q1	FR_FRCP1	0.00048	0.00051	< 0.00020	0.00022	0.036	0.037	< 0.00020	< 0.00020	< 0.0010	< 0.0010	< 0.020	< 0.020	<1	< 0.000020
2015	Q2	CM_MC2	0.00012	0.00013	0.00017	0.00031	0.044	0.046	< 0.00010	< 0.00010	< 0.000050	< 0.000050	0.014	0.015	< 0.050	0.000036
2015	Q4	FR_FRCP1	0.00025	0.00026	< 0.00010	< 0.00010	0.08	0.078	< 0.00010	< 0.00010	< 0.000050	< 0.000050	0.011	0.016	< 0.25	0.00004
2015	Q4	CM_MC2	0.00013	0.00013	0.00018	0.00022	0.09	0.092	< 0.00010	< 0.00010	< 0.000050	< 0.000050	0.026	0.027	< 0.25	0.0000075
2016	Q1	FR_FRCP1	0.00027	0.0003	< 0.00010	0.0001	0.075	0.075	< 0.00010	< 0.00010	< 0.000050	< 0.000050	0.01	0.011	< 0.50	0.000036
2016	Q2	GH_FR1	0.00017	0.00023	0.00011	0.00017	0.079	0.078	< 0.00010	< 0.00010	< 0.000050	< 0.000050	< 0.010	< 0.010	< 0.050	0.000025
2016	Q2	CM_MC2	0.00014	0.00015	0.00017	0.00029	0.05	0.052	< 0.00010	< 0.00010	< 0.000050	< 0.000050	0.016	0.017	< 0.050	0.000069
2016	Q2	LC_DCDS	0.00018	0.00027	0.00028	0.00035	0.0843	0.0856	<0.00010	<0.00010	<0.000050	<0.000050	<0.010	<0.010	<0.050	0.0000367
2016	Q3	FR_FRCP1	0.0002	0.00022	< 0.00010	0.00012	0.071	0.073	< 0.000020	< 0.000020	< 0.000050	< 0.000050	< 0.010	0.011	< 0.25	0.000024
2016	Q3	CM_MC2	0.00019	0.00025	0.00019	0.0002	0.077	0.075	< 0.000020	< 0.000020	< 0.000050	< 0.000050	0.028	0.029	< 0.25	0.0000075
2016	Q4	FR_FRCP1	0.00019	0.0002	< 0.00010	0.00018	0.072	0.067	< 0.000020	< 0.000020	< 0.000050	< 0.000050	< 0.010	< 0.010	< 0.25	0.000045
2016	Q4	CM_MC2	0.00014	0.00016	0.00017	0.00026	0.054	0.057	< 0.000020	< 0.000020	< 0.000050	< 0.000050	0.018	0.02	< 0.050	0.000013
2016	Q4	EV_MC2	< 0.00010	0.00011	0.00019	0.00027	0.074	0.081	< 0.000020	< 0.000020	< 0.000050	< 0.000050	< 0.010	< 0.010	< 0.050	0.000025
2016	Q4	LC_DCDS	0.00021	0.00036	0.00028	0.00042	0.128	0.136	<0.000020	0.000024	<0.000050	<0.000050	<0.010	<0.010	<0.050	0.0000408
2017	Q1	FR_FRCP1	0.00023	0.00066	<0.0001	0.00013	0.072	0.077	<0.00002	<0.00002	<0.00005	<0.00005	0.01	0.011	<0.25	0.000052
2017	Q1	CM_MC2	0.00032	0.00066	0.00016	0.00021	0.072	0.075	<0.00002	<0.00002	<0.00005	<0.00005	0.029	0.031	<0.05	0.000038
2017	Q1	EV_MC2	0.00023	0.00022	0.00012	0.00017	0.12	0.12	<0.00002	<0.00002	<0.00005	<0.00005	0.012	0.012	<0.05	0.000029
2017	Q1	LC_LCDSSLCC	0.00021	0.00024	<0.0001	0.0001	0.084	0.084	<0.00002	<0.00002	<0.00005	<0.00005	0.013	0.014	<0.25	0.0001
2017	Q2	FR_FRCP1	0.00021	0.00025	0.00013	0.00038	0.076	0.081	<0.00002	0.000031	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.000061
2017	Q2	CM_MC2	0.00028	0.00025	0.00016	0.00027	0.067	0.063	<0.00002	<0.00002	<0.00005	<0.00005	0.027	0.027	<0.05	0.000045
2017	Q2	CM_MC2	0.00028	0.00035	0.00016	0.00027	0.067	0.08	<0.00002	<0.00002	<0.00005	<0.00005	0.032	0.039	<0.05	0.000043
2017	Q2	EV_MC2	0.0001	0.00012	0.00021	0.00029	0.091	0.091	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.00003
2017	Q2	EV_HC1	<0.0001	0.00011	0.00018	0.00028	0.05	0.051	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.000025
2017	Q3	FR_FRCP1	0.0002	0.00027	<0.0001	0.00012	0.069	0.069	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	0.01	<0.05	0.000044
2017	Q3	GH_FR1	0.00016	0.00023	<0.0001	0.00012	0.1	0.1	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.000019
2017	Q3	CM_MC2	0.00031	0.00036	0.00018	0.00024	0.058	0.059	<0.00002	<0.00002	<0.00005	<0.00005	0.031	0.031	<0.05	0.0000068
2017	Q4	FR_FRCP1	0.00024	0.00026	<0.0001	0.00012	0.07	0.073	<0.00002	<0.00002	<0.00005	<0.00005	0.011	0.011	<0.25	0.000012
2017	Q4	CM_MC2	0.00027	0.0003	0.00017	0.00018	0.073	0.074	<0.00002	<0.00002	<0.00005	<0.00005	0.036	0.038	0.065	0.0000092
2018	Q1	FR_FRCP1	0.00026	0.00026	<0.0001	<0.0001	0.089	0.074	<0.00002	<0.00002	<0.00005	<0.00005	0.011	0.011	<0.05	0.00007
2018	Q1	CM_MC2	0.00024	0.00023	0.00018	0.0002	0.08	0.07	<0.00002	<0.00002	<0.00005	<0.00005	0.03	0.033	<0.05	0.000021
2018	Q1	EV_MC2	0.00023	0.00026	<0.0002	0.00016	0.11	0.11	<0.00004	<0.00002	<0.0001	<0.00005	<0.02	0.013	<0.05	0.000027
2018	Q2	FR_FRCP1	0.00022	0.00024	0.00011	0.00028	0.058	0.065	<0.00002	0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0001
2018	Q2	GH_FR1	0.0003	0.00037	0.00018	0.00061	0.068	0.082	<0.00002	0.000055	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.000038
2018	Q2	GH_ERC	<0.0001	0.0001	0.00012	0.00047	0.059	0.065	<0.00002	0.000033	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.000012
2018	Q2	CM_MC2	0.00021	0.00023	0.00017	0.00029	0.064	0.062	<0.00002	<0.00002	<0.00005	<0.00005	0.026	0.029	<0.05	0.000059
2018	Q2	CM_MC3	0.00012	0.00014	0.0003	0.00034	0.051	0.047	<0.00002	<0.00002	<0.00005	<0.00005	0.015	0.016	<0.05	0.000018
2018	Q2	LC_LC5	<0.00010	0.00018	0.00013	0.0004	0.0801	0.0808	<0.000020	0.000029	<0.000050	<0.000050	<0.010	<0.010	<0.050	0.0000274
2018	Q2	LC_LCDSSLCC	0.00019	0.00025	0.00014	0.00023	0.047	0.042	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	0.01	<0.05	0.0002
2018	Q3	FR_FRCP1	0.00024	0.00028	<0.0001	0.00011	0.077	0.065	<0.00002	<0.00002	<0.00005	<0.00005	0.011	0.012	0.061	0.00005
2018	Q3	CM_MC2	0.00054	0.00054	0.00018	0.00019	0.066	0.066	<0.00002	<0.00002	<0.00005	<0.00005	0.053	0.058	<0.25	<0.000005
2018	Q3	CM_MC3	0.00026	0.00027	0.00031	0.00028	0.06	0.058	<0.00002	<0.00002	<0.00005	<0.00005	0.028	0.028	<0.05	0.000017
2018	Q4	FR_FRCP1	0.0005	0.0005	<0.0002	<0.0002	0.015	0.018	<0.00004	<0.00004	<0.0001	<0.0001	<0.02	<0.02	<0.25	<0.00001
2018	Q4	CM_MC2	0.00047	0.0005	0.00024	0.00028	0.068	0.066	<0.00002	<0.00002	<0.00005	<0.00005	0.051	0.055	<0.25	0.000031
2018	Q4	CM_MC3	0.00021	0.00023	0.0003	0.00034	0.048	0.045	<0.00002	<0.00002	<0.00005	<0.00005	0.021	0.023	<0.05	0.000011
2018	Q4	LC_DCDS	0.00054	0.00055	0.00032	0.00033	0.245	0.272	<0.000020	<0.000020	<0.000050	<0.000050	<0.010	<0.010	<0.050	0.0000386
2018	Q4	LC_LC5	0.00011	0.00012	<0.00010	0.00013	0.0993	0.102	<0.000020	<0.000020	<0.000050	<0.000050	<0.010	0.01	<0.050	0.0000195
2018	Q4	LC_LCDSSLCC	0.00026	0.00026	0.00011	0.00013	0.066	0.074	<0.00002	<0.00002	<0.00005	<0.00005	0.015	0.016	<0.25	0.00017
2019	Q1	FR_FRABCH	<0.0001	<0.0001	<0.0001	0.0001	0.108	0.113	<0.00002	<0.00002	<0.00005	<0.00005	0.01	0.011	<0.25	0.0000313
2019	Q1	FR_FRCP1	0.00048	0.00045	<0.0002	<0.0002	0.0171	0.0193	<0.00004	<0.00004	<0.0001	<0.0001	<0.02	<0.02	<0.5	<0.00001
2019	Q1	CM_MC2	0.00022	0.00023	0.00021	0.00021	0.08	0.0778	<0.00002	<0.00002	<0.00005	<0.00005	0.028	0.028	<0.25	0.0000166
2019	Q3	FR_FRCP1	0.00023	0.00024	0.00012	0.00011	0.0636	0.065	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	0.011	<0.05	0.0000418
2020	Q1	FR_FRCP1	0.00027	0.00035	0.00011	0.00018	0.0796	0.093	<0.00002	<0.00002	<0.00005	<0.00005	0.011	0.012	<0.25	0.0000624
2020	Q1	GH_FR1	<0.0001	<0.0001	<0.0001	<0.0001	0.113	0.103	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000487
2020	Q1	LC_DCDS	0.00045	0.00047	0.00032	0.00035	0.268	0.264	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.000148
2020	Q3	CM_MC2	0.00036	0.0004	0.0002	0.00034	0.0599	0.0601	<0.00002	<0.00002	<0.00005	<0.00005	0.058	0.062	<0.25	0.0000154
2020	Q3	LC_LCDSSLCC	0.00024	0.00023	<0.0001	0.00012	0.0631	0.0627	<0.00002	<0.00002	<0.00005	<0.00005	0.015	0.014	<0.05	0.000157
2020	Q4	FR_FRCP1	0.00026	0.00029	0.00013	0.00019	0.0774	0.0736	<0.00002	<0.00002	<0.00005	<0.00005	0.011	0.012	<0.25	0.000128
2020	Q4	CM_MC2	0.00019	0.00018	0.00017	0.00024	0.071	0.0657	<0.00002	<0.00002	<0.00005	<0.00005	0.061	0.065	<0.25	0.0000169
Test categorized as possible or likely response (2021)																
2021	Q1	FR_FRCP1	0.00044	0.00044	0.00012	0.00015	0.0964	0.0835	<0.00002	<0.00002	<0.00005	<0.00005	0.014	0.013	<0.25	0.00014

Year	Quarter	Sample ID	CADMIUM-T-mg/l	CALCIUM-D-mg/l	CALCIUM-T-mg/l	CARBON DISSOLVED ORGANIC-D-mg/l	CHLORIDE-D-mg/l	CHROMIUM-D-mg/l	CHROMIUM-T-mg/l	COBALT-D-mg/l	COBALT-T-mg/l	CONDUCTIVITY LAB-N-us/cm	COPPER-D-mg/l	COPPER-T-mg/l	FLUORIDE-D-mg/l
Test categorized as possible or likely response (2015 to 2020)															
2015	Q1	FR_FRCP1	0.000053	331	337	1.4	2.6	< 0.00020	< 0.00020	< 0.00020	< 0.00020	2680	< 0.00050	< 0.0010	0.45
2015	Q2	CM_MC2	0.00006	61	60	1.5	1.2	0.0002	0.00058	0.00037	0.00061	484	< 0.00050	0.00053	0.1
2015	Q4	FR_FRCP1	0.000055	131	130	0.65	2.2	< 0.00010	0.00027	< 0.00010	< 0.00010	1030	< 0.00050	< 0.00050	0.17
2015	Q4	CM_MC2	0.0000093	118	115	0.56	3.2	0.00019	0.0002	< 0.00010	< 0.00010	876	< 0.00050	< 0.00050	0.11
2016	Q1	FR_FRCP1	0.000048	221	221	0.8	3.5	< 0.00010	< 0.00010	< 0.00010	< 0.00010	1720	< 0.00050	< 0.00050	< 0.20
2016	Q2	GH_FR1	0.000035	74	71	2.0	0.99	< 0.00010	0.00029	< 0.00010	< 0.00010	573	< 0.00050	< 0.00050	0.18
2016	Q2	CM_MC2	0.00011	69	67	1.9	1.5	0.00016	0.00058	0.00077	0.0013	549	< 0.00050	0.00079	0.1
2016	Q2	LC_DCDS	0.0000758	25.4	24.9	2.57	0.19	0.00011	0.00047	<0.00010	0.00012	192	<0.00050	0.00062	0.098
2016	Q3	FR_FRCP1	0.000042	101	103	0.99	1.5	< 0.00010	0.00012	< 0.00010	< 0.00010	874	< 0.00050	< 0.00050	0.22
2016	Q3	CM_MC2	0.0000086	101	105	0.99	3.4	0.00011	0.00018	0.00026	0.00034	901	< 0.00050	< 0.00050	0.12
2016	Q4	FR_FRCP1	0.000051	104	97	0.9	1.3	< 0.00010	0.00015	< 0.00010	< 0.00010	810	< 0.00050	< 0.00050	0.19
2016	Q4	CM_MC2	0.000016	79	79	2.3	2.1	0.00017	0.00035	0.00065	0.0011	622	< 0.00050	< 0.00050	0.11
2016	Q4	EV_MC2	0.000039	45	48	2.8	2.9	0.00012	0.00045	< 0.00010	0.00013	359	< 0.00050	0.00065	0.12
2016	Q4	LC_DCDS	0.000125	35	36.3	2.13	1.35	<0.00010	0.00043	<0.00010	0.00021	268	<0.00050	0.00105	0.102
2017	Q1	FR_FRCP1	0.000062	-	179	1.5	<2.5	<0.0001	0.00078	<0.0001	<0.0001	1430	<0.0002	<0.0005	0.13
2017	Q1	CM_MC2	0.000039	-	128	0.85	3.9	0.00012	0.00021	0.0022	0.0024	999	<0.0002	<0.0005	0.13
2017	Q1	EV_MC2	0.000035	-	84	0.8	7.1	0.00013	0.00023	<0.0001	<0.0001	615	<0.0005	<0.0005	0.15
2017	Q1	LC_LCDSSLCC	0.000094	-	125	<0.5	13	0.00012	0.00021	<0.0001	<0.0001	954	<0.0005	<0.0005	0.21
2017	Q2	FR_FRCP1	0.00013	-	86	2.1	0.72	0.00011	0.00082	<0.0001	0.00027	725	0.00034	0.0011	0.14
2017	Q2	CM_MC2	0.000072	-	85	1.4	2.5	<0.0001	0.00028	0.005	0.0052	756	<0.0002	0.00068	0.1
2017	Q2	CM_MC2	0.00007	-	115	1.4	2.7	0.00013	0.00031	0.0044	0.0056	783	<0.0002	<0.0005	0.12
2017	Q2	EV_MC2	0.000063	-	48	2.9	4.3	<0.0001	0.00025	0.00011	0.00025	402	0.00031	0.00074	0.099
2017	Q2	EV_HC1	0.000043	-	71	2.6	0.79	<0.0001	0.00025	<0.0001	<0.0001	630	0.0002	0.00055	0.14
2017	Q3	FR_FRCP1	0.000051	-	100	1.6	0.87	<0.0001	0.00012	<0.0001	<0.0001	857	<0.0002	<0.0005	0.18
2017	Q3	GH_FR1	0.000019	-	86	1.0	1.1	<0.0001	0.00016	<0.0001	<0.0001	742	<0.0002	<0.0005	0.15
2017	Q3	CM_MC2	0.000017	-	96	0.97	1.0	0.00017	0.00026	0.0029	0.0035	840	<0.0002	<0.0005	0.11
2017	Q4	FR_FRCP1	0.000051	-	153	0.96	<2.5	<0.0001	<0.0001	<0.0001	<0.0001	1110	<0.0005	<0.0005	0.1
2017	Q4	CM_MC2	0.000011	-	124	0.97	5.9	<0.0001	0.00017	0.00058	0.00074	952	<0.0005	<0.0005	0.098
2018	Q1	FR_FRCP1	0.000072	196	195	1.0	2.3	<0.0001	<0.0001	0.00013	0.00013	1580	<0.0005	<0.0005	0.12
2018	Q1	CM_MC2	0.000021	124	132	1.2	3.2	<0.0001	0.0003	0.00085	0.00087	1060	<0.0005	<0.0005	0.096
2018	Q1	EV_MC2	0.000033	90	90	0.96	4.9	<0.0002	<0.0001	<0.0002	<0.0001	706	<0.0005	<0.0005	0.11
2018	Q2	FR_FRCP1	0.00017	72	79	2.1	0.6	<0.0001	0.00054	<0.0001	0.00039	618	<0.0005	0.0011	0.2
2018	Q2	GH_FR1	0.00014	71	69	4.0	1.5	<0.0001	0.0014	<0.0001	0.00077	599	0.00057	0.0023	0.15
2018	Q2	GH_ERC	0.000082	53	55	2.0	0.74	0.00018	0.0014	<0.0001	0.00029	357	<0.0005	0.0012	0.16
2018	Q2	CM_MC2	0.000082	93	85	1.6	4.9	<0.0001	0.00039	0.0033	0.0053	698	<0.0005	0.00067	0.14
2018	Q2	CM_MC3	0.000039	68	63	1.4	2.2	<0.0001	0.00034	0.0012	0.0017	476	<0.0005	<0.0005	0.2
2018	Q2	LC_LC5	0.000104	83.1	79.6	4.37	1.93	<0.00010	0.00076	<0.00010	0.00035	613	<0.00050	0.00108	0.203
2018	Q2	LC_LCDSSLCC	0.00022	98	87	1.5	3.1	<0.0001	0.00021	<0.0001	0.00018	715	<0.0005	0.00074	0.26
2018	Q3	FR_FRCP1	0.000073	125	115	1.4	1.2	<0.0001	0.00013	<0.0001	<0.0001	942	<0.0005	<0.0005	0.21
2018	Q3	CM_MC2	0.000016	144	135	1.4	3.4	0.00014	0.00022	0.0058	0.0075	1030	<0.0005	<0.0005	0.17
2018	Q3	CM_MC3	0.000019	91	83	1.3	1.6	0.00022	0.00024	0.0016	0.0019	660	<0.0005	<0.0005	0.22
2018	Q4	FR_FRCP1	0.000018	409	422	2.3	6.5	<0.0002	<0.0002	<0.0002	<0.0002	3370	<0.0005	<0.001	0.11
2018	Q4	CM_MC2	0.000037	127	128	1.2	4.0	0.00015	0.00018	0.0065	0.007	1000	<0.0005	<0.0005	0.15
2018	Q4	CM_MC3	0.00002	76	78	0.91	1.7	0.0002	0.00058	0.0015	0.0017	590	<0.0005	<0.0005	0.24
2018	Q4	LC_DCDS	0.0000889	74.3	76	2.03	9.01	<0.00010	<0.00010	0.00011	0.00021	603	<0.00050	<0.00050	0.101
2018	Q4	LC_LC5	0.0000366	90.9	91.3	<0.50	2.43	0.00011	0.00017	<0.00010	<0.00010	743	<0.00050	<0.00050	0.222
2018	Q4	LC_LCDSSLCC	0.00019	97	101	<0.5	4.8	0.00011	0.00014	<0.0001	<0.0001	811	<0.0005	<0.0005	0.24
2019	Q1	FR_FRABCH	0.0000339	158	156	0.89	<2.5	0.00012	0.00026	0.00022	0.0002	1170	<0.0005	<0.0005	0.14
2019	Q1	FR_FRCP1	<0.00001	440	433	1.96	6.6	<0.0002	<0.0002	<0.0002	<0.0002	3460	<0.0005	<0.001	<0.2
2019	Q1	CM_MC2	0.0000202	130	130	0.66	3.8	0.0002	0.00022	0.00052	0.00065	1060	<0.0005	<0.0005	0.12
2019	Q3	FR_FRCP1	0.0000416	91.4	103	0.92	0.71	<0.0001	0.00017	<0.0001	<0.0001	708	<0.0005	<0.0005	0.223
2020	Q1	FR_FRCP1	0.000139	159	174	2.38	2.5	0.00014	0.00083	0.00011	0.00021	1290	0.00143	0.00199	0.16
2020	Q1	GH_FR1	0.0000199	104	106	<0.5	1.9	0.00012	0.00011	<0.0001	<0.0001	863	0.00029	<0.0005	0.141
2020	Q1	LC_DCDS	0.000139	104	93.2	1.9	13.2	<0.0001	<0.0001	<0.0001	<0.0001	758	0.00027	<0.0005	0.083
2020	Q3	CM_MC2	0.0000186	144	141	0.93	2.8	0.00014	0.00016	0.0034	0.0037	1080	<0.0002	<0.0005	0.17
2020	Q3	LC_LCDSSLCC	0.000178	107	101	0.97	10.5	<0.0001	0.00014	<0.0001	<0.0001	777	<0.0002	<0.0005	0.224
2020	Q4	FR_FRCP1	0.000122	163	153	0.99	1.39	<0.0001	0.00012	<0.0001	<0.0001	1080	<0.0002	<0.0005	0.14
2020	Q4	CM_MC2	0.0000168	141	134	1.4	3.2	0.00013	0.00017	0.00223	0.0023	1040	0.00022	<0.0005	0.13
Test categorized as possible or likely response (2021)															
2021	Q1	FR_FRCP1	0.000158	155	154	1.99	1.6	<0.0001	0.00012	0.00032	0.0003	1260	0.00032	<0.0005	<0.1

Notes:

"-D-" = dissolved concentration; "-T-" = total concentration; "-N-" = normal concentration; $CaCO_3$ = calcium carbonate; ∑TU = sum of toxic units; WQG = water quality guideline; mg/l = milligrams per litre; ug/l = micrograms per litre; % = percent.

Screening

Concentrations of parameters in 2021 tests categorized as possible or likely response are shaded if the concentration is greater than the maximum concentration measured in references or tests categorized as no adverse response.

Year	Quarter	Sample ID	Hardness Total or Dissolved CaCO3-N-mg/l	IRON-D-mg/l	IRON-T-mg/l	LEAD-D-mg/l	LEAD-T-mg/l	LITHIUM-D-mg/l	LITHIUM-T-mg/l	MAGNESIUM-D-mg/l	MAGNESIUM-T-mg/l	MAJOR ANION SUM-N-meq/l	MAJOR CATION SUM-N-meq/l	MANGANESE-D-mg/l	MANGANESE-T-mg/l	MERCURY-D-mg/l	MERCURY-T-mg/l	MOLYBDENUM-D-mg/l	MOLYBDENUM-T-mg/l	NICKEL-D-mg/l	NICKEL-T-mg/l	NITRATE NITROGEN (NO3) AS N-N-mg/l	NITRITE NITROGEN (NO2) AS N-N-mg/l	NITROGEN AMMONIA (AS N)-N-mg/l	ORTHO-PHOSPHATE-N-mg/l	OXIDATION-REDUCTION POTENTIAL LAB-N-mv	pH LAB-N-ph units	PHOSPHORUS-N-mg/l	POTASSIUM-D-mg/l	POTASSIUM-T-mg/l	SELENIUM-D-mg/l	SELENIUM-T-mg/l	SILICON-D-mg/l	SILICON-T-mg/l	SILVER-D-mg/l	SILVER-T-mg/l	SODIUM-D-mg/l	SODIUM-T-mg/l
Reference (2015 to 2021)																																						
2015	Q1	Reference (FR_UFR1)	197	< 0.010	< 0.010	< 0.000050	< 0.000050	0.0019	0.0016	14	15	4.0	4.0	0.000054	0.00018	< 0.000010	< 0.000010	0.00053	0.00054	< 0.00050	< 0.00050	0.13	< 0.0010	< 0.0050	0.0032	344	8.4	0.0042	0.39	0.4	0.00069	0.00073	1.6	1.6	< 0.000010	< 0.000010	0.71	0.77
2015	Q1	Reference (FR_UFR1)	197	< 0.010	< 0.010	< 0.000050	< 0.000050	0.0019	0.0016	14	15	4.0	4.0	0.000054	0.00018	< 0.000010	< 0.000010	0.00053	0.00054	< 0.00050	< 0.00050	0.13	< 0.0010	< 0.0050	0.0032	344	8.4	0.0042	0.39	0.4	0.00069	0.00073	1.6	1.6	< 0.000010	< 0.000010	0.71	0.77
2015	Q1	Reference (FR_UFR1)	197	< 0.010	< 0.010	< 0.000050	< 0.000050	0.0015	0.0017	14	14	3.9	4.0	0.00017	0.00037	< 0.000010	< 0.000010	0.00056	0.00055	< 0.00050	< 0.00050	0.13	< 0.0010	< 0.0050	0.0027	371	8.3	0.0035	0.39	0.42	0.00076	0.00073	1.6	1.7	< 0.000010	< 0.000010	0.71	0.72
2015	Q2	Reference (FR_UFR1)	129	< 0.010	0.052	< 0.000050	< 0.000050	< 0.0010	0.0012	9.0	9.2	2.7	2.6	0.00064	0.0025	< 0.0000050	< 0.0000050	0.00052	0.00062	< 0.00050	< 0.00050	0.066	< 0.0010	< 0.0050	0.0042	470	8.4	0.01	0.33	0.37	0.00048	0.00049	1.7	1.9	< 0.000010	< 0.000010	0.55	0.56
2015	Q2	Reference (GH_ER2)	160	< 0.010	0.066	< 0.000050	< 0.000050	0.0017	0.0016	10	11	3.6	3.2	0.0033	0.0059	< 0.0000050	< 0.0000050	0.00092	0.00094	< 0.00050	< 0.00050	0.086	< 0.0010	< 0.0050	< 0.0010	312	8.3	0.008	0.36	0.37	0.00079	0.00087	1.6	1.8	< 0.000010	< 0.000010	0.73	0.73
2015	Q3	Reference (FR_UFR1)	188	< 0.010	< 0.010	0.000055	< 0.000050	0.002	0.002	13	13	3.9	3.8	0.00062	0.0015	< 0.0000050	< 0.0000050	0.00068	0.00068	< 0.00050	< 0.00050	0.019	< 0.0010	< 0.0050	0.0029	325	8.4	0.0054	0.53	0.52	0.00047	0.00043	2.1	2.1	< 0.000010	< 0.000010	0.7	0.69
2015	Q4	Reference (FR_UFR1)	190	< 0.010	< 0.010	< 0.000050	< 0.000050	0.0015	0.0015	14	14	3.9	3.9	0.0001	0.00031	< 0.0000050	< 0.0000050	0.00065	0.00059	< 0.00050	< 0.00050	0.022	< 0.0010	< 0.0050	0.0017	346	8.4	0.0022	0.46	0.42	0.00069	0.00062	1.5	1.6	< 0.000010	< 0.000010	0.73	0.69
2015	Q4	Reference (GH_ER2)	170	< 0.010	< 0.010	< 0.000050	< 0.000050	0.0016	0.0018	11	11	3.4	3.4	0.0021	0.0027	< 0.0000050	< 0.0000050	0.001	0.0010	< 0.00050	< 0.00050	0.078	< 0.0010	< 0.0050	0.0015	490	8.3	< 0.0020	0.33	0.35	0.00072	0.00078	1.7	1.8	< 0.000010	< 0.000010	0.63	0.67
2016	Q1	Reference (FR_UFR1)	202	< 0.010	< 0.010	< 0.000050	< 0.000050	0.0014	0.0015	15	15	3.9	4.1	0.0002	0.00034	< 0.0000050	< 0.00000050	0.00058	0.00056	< 0.00050	< 0.00050	0.17	< 0.0010	< 0.0050	0.0032	297	8.3	0.0036	0.38	0.37	0.0008	0.00078	1.8	1.8	< 0.000010	< 0.000010	0.68	0.68
2016	Q2	Reference (FR_UFR1)	126	< 0.010	0.075	< 0.000050	0.00006	0.0011	0.0013	9.3	9.8	2.5	2.5	0.00045	0.0021	< 0.0000050	0.0000014	0.00061	0.00062	< 0.00050	< 0.00050	0.034	< 0.0010	< 0.0050	0.0041	318	8.3	0.0078	0.3	0.34	0.00052	0.00055	1.9	2.1	< 0.000010	< 0.000010	0.6	0.63
2016	Q2	Reference (GH_ER2)	163	< 0.010	0.23	< 0.000050	0.00013	0.002	0.0021	11	11	3.2	3.3	0.0018	0.012	< 0.0000050	0.00000098	0.00091	0.00093	< 0.00050	0.0005	0.12	< 0.0010	< 0.0050	0.0011	321	8.2	0.016	0.35	0.46	0.00083	0.00083	1.9	2.2	< 0.000010	< 0.000010	0.74	0.75
2016	Q3	Reference (FR_UFR1)	177	< 0.010	0.013	< 0.000050	< 0.000050	0.0017	0.0018	13	14	3.9	3.6	0.00027	0.0011	< 0.0000050	< 0.00000050	0.00063	0.00063	< 0.00050	< 0.00050	0.057	< 0.0010	< 0.0050	0.0031	375	8.2	0.0038	0.44	0.47	0.00056	0.00063	2.1	2.1	< 0.000010	< 0.000010	0.64	0.68
2016	Q4	Reference (FR_UFR1)	177	< 0.010	0.022	< 0.000050	< 0.000050	0.0015	0.0018	13	12	3.7	3.6	0.00027	0.00073	< 0.0000050	0.00000056	0.00057	0.00056	< 0.00050	< 0.00050	0.1	< 0.0010	< 0.0050	0.0023	343	8.3	0.0028	0.38	0.38	0.00069	0.00068	1.8	1.9	< 0.000010	< 0.000010	0.64	0.7
2016	Q4	Reference (GH_ER2)	163	< 0.010	0.013	< 0.000050	< 0.000050	0.0019	0.0017	11	9.6	3.4	3.3	0.0012	0.0021	< 0.0000050	< 0.0000050	0.00097	0.001	< 0.00050	< 0.00050	0.071	< 0.0010	< 0.0050	< 0.0010	378	8.3	< 0.0020	0.34	0.36	0.00087	0.00083	1.7	1.7	< 0.000010	< 0.000010	0.65	0.61
2017	Q1	Reference (FR_UFR1)	185	<0.01	<0.01	<0.00005	<0.00005	0.0013	0.0014	-	14	-	-	<0.0001	0.00027	<0.000005	<0.0000005	0.00062	0.00062	<0.0005	<0.0005	0.22	<0.001	<0.005	0.0049	-	8.3	0.0071	-	0.38	0.0012	0.0010	-	-	<0.00001	<0.00001	-	0.77
2017	Q2	Reference (FR_UFR1)	121	0.054	0.13	<0.00005	0.000092	0.0011	0.0012	-	8.7	-	-	0.0012	0.0035	<0.000005	0.0000031	0.00048	0.0005	0.00052	0.00069	0.098	<0.001	0.011	0.0087	-	8.3	0.02	-	0.38	0.0007	0.0006	-	-	<0.00001	0.00002	-	0.62
2017	Q2	Reference (GH_ER2)	177	<0.01	0.074	<0.00005	0.000061	0.0019	0.002	-	12	-	-	0.00095	0.0054	<0.000005	0.00000082	0.00094	0.00095	<0.0005	<0.0005	0.12	<0.001	<0.005	<0.001	-	8.4	0.0058	-	0.41	0.00086	0.00098	-	-	<0.00001	<0.00001	-	0.73
2017	Q2	Reference (CM_MC1)	134	<0.01	0.021	<0.00005	<0.00005	0.0041	0.0042	-	10	-	-	0.00015	0.00057	<0.000005	0.0000011	0.00074	0.0008	<0.0005	<0.0005	0.012	<0.001	<0.005	0.0029	-	8.2	0.0094	-	0.43	0.00029	0.00025	-	-	<0.00001	<0.00001	-	2.7
2017	Q3	Reference (FR_UFR1)	159	<0.01	0.011	<0.00005	<0.00005	0.0015	0.0015	-	13	-	-	0.00036	0.0011	<0.000005	<0.0000005	0.00064	0.00068	<0.0005	<0.0005	0.011	<0.001	0.01	0.0027	-	8.4	0.0078	-	0.48	0.0006	0.00059	-	-	<0.00001	<0.00001	-	0.69
2017	Q3	Reference (GH_ER2)	137	<0.01	0.02	<0.00005	<0.00005	0.0017	0.0015	-	9.6	-	-	0.0021	0.0031	<0.000005	0.0000006	0.00096	0.00098	<0.0005	<0.0005	0.037	<0.001	0.0069	0.001	-	8.4	0.0059	-	0.38	0.00067	0.00064	-	-	<0.00001	<0.00001	-	0.6
2017	Q3	Reference (CM_MC1)	138	<0.01	0.033	<0.00005	<0.00005	0.0044	0.0045	-	9.5	-	-	<0.0001	0.001	<0.000005	0.00000067	0.00088	0.00085	<0.0005	<0.0005	0.012	<0.001	0.0067	0.005	-	8.2	0.06	-	0.45	0.00019	0.00024	-	-	<0.00001	<0.00001	-	2.0
2017	Q4	Reference (FR_UFR1)	185	<0.01	<0.01	<0.00005	<0.00005	0.0019	0.0017	-	14	-	-	<0.0001	0.00056	<0.000005	<0.0000005	0.00055	0.00054	<0.0005	<0.0005	0.0094	0.0011	<0.005	0.0016	-	8.4	0.0023	-	0.4	0.00058	0.00055	-	-	<0.00001	<0.00001	-	0.72
2017	Q4	Reference (GH_ER2)	161	<0.01	<0.01	<0.00005	<0.00005	0.0021	0.002	-	11	-	-	0.00061	0.0016	<0.000005	<0.0000005	0.0011	0.0011	<0.0005	<0.0005	0.037	<0.001	0.0089	<0.001	-	8.4	<0.002	-	0.38	0.00089	0.00087	-	-	<0.00001	<0.00001	-	0.7
2017	Q4	Reference (CM_MC1)	144	<0.01	<0.01	<0.00005	<0.00005	0.0045	0.0046	-	11	-	-	0.00012	0.00035	<0.000005	0.00000059	0.0009	0.00087	<0.0005	<0.0005	0.015	<0.001	<0.005	0.0035	-	8.3	0.0045	-	0.49	0.00019	0.00019	-	-	<0.00001	<0.00001	-	2.9
2018	Q1	Reference (FR_UFR1)	198	<0.01	<0.01	<0.00005	<0.00005	0.0015	0.0014	15	14	3.8	4.0	<0.0001	0.00024	<0.000005	<0.0000005	0.00058	0.00055	<0.0005	<0.0005	0.2	<0.001	0.0099	0.0029	436	8.4	0.0038	0.39	0.37	0.00091	0.00098	2.0	1.8	<0.00001	<0.00001	0.77	0.67
2018	Q1	Reference (GH_ER2)	170	<0.01	<0.01	<0.00005	<0.00005	0.0013	0.0017	11	11	3.6	3.4	0.0013	0.0015	<0.000005	<0.0000005	0.0009	0.0010	<0.0005	<0.0005	0.1	<0.001	<0.005	<0.001	276	8.2	<0.002	0.29	0.3	0.00093	0.00092	1.7	1.9	<0.00001	<0.00001	0.72	0.72
2018	Q1	Reference (CM_MC1)	153	<0.01	<0.01	<0.00005	<0.00005	0.0047	0.0048	12	11	3.8	3.2	<0.0001	0.00014	<0.000005	<0.0000005	0.00087	0.00096	<0.0005	<0.0005	0.04	<0.001	<0.005	0.0036	331	8.3	0.0046	0.46	0.45	0.00027	0.00029	2.2	2.1	<0.00001	<0.00001	3.6	3.5
2018	Q2	Reference (FR_UFR1)	123	0.014	0.13	<0.00005	0.00013	0.0011	0.0013	9.3	9.5	2.5	2.5	0.00039	0.0076	<0.000005	0.0000026	0.0006	0.00053	<0.0005	0.00062	0.13	<0.001	0.0067	0.0079	293	8.3	0.027	0.39	0.42	0.0008	0.00072	1.9	2.1	<0.00001	<0.00001	0.57	0.56
2018	Q2	Reference (GH_ER2)	164	<0.01	0.34	<0.00005	0.00017	0.002	0.0023	12	12	3.2	3.3	0.00023	0.012	<0.000005	0.000002	0.00095	0.00096	<0.0005	0.00085	0.15	<0.001	0.01	0.0015	272	8.5	0.026	0.42	0.54	0.001	0.00091	1.8	2.5	<0.00001	<0.00001	0.71	0.76
2018	Q2	Reference (CM_MC1)	125	0.024	0.11	<0.00005	0.000073	0.0037	0.0041	9.2	9.2	2.6	2.6	0.00035	0.0026	<0.000005	0.000002	0.00071	0.00072	<0.0005	<0.0005	0.018	<0.001	<0.005	0.0069	264	8.3	0.016	0.48	0.5	0.00024	0.00028	2.1	2.3	<0.00001	<0.00001	2.4	2.4
2018	Q2	Reference (LC_SLC)	163	<0.01	0.012	<0.00005	<0.00005	0.003	0.0029	13	12	3.1	3.3	<0.0001	0.00073	<0.000005	0.00000064	0.00082	0.00079	<0.0005	<0.0005	0.13	<0.001	0.01	0.001	293	8.4	0.005	0.36	0.35	0.00087	0.00078	2.0	2.1	<0.00001	<0.00001	0.88	0.81
2018	Q3	Reference (FR_UFR1)	183	<0.01	<0.01	<0.00005	<0.00005	0.0018	0.0018	14	13	3.8	3.7	0.00031	0.00067	<0.000005	<0.0000005	0.00064	0.00068	<0.0005	<0.0005	0.024	<0.001	0.056	<0.001	321	8.4	0.0095	0.49	0.45	0.0006	0.00062	2.1	2.0	<0.00001	<0.00001	0.73	0.67
2018	Q3	Reference (GH_ER2)	148	<0.01	0.99	<0.00005	0.00084	0.0018	0.0024	10	11	3.0	3.0	<0.0001	0.06	<0.000005	0.00000076	0.0011	0.00087	<0.0005	0.002	0.023	<0.001	0.014	<0.001	300	8.2	0.0086	0.36	0.6	0.00069	0.00071	1.6	2.7	<0.00001	0.000014	0.68	0.64
2018	Q3	Reference (CM_MC1)	156	<0.01	0.011	<0.00005	<0.00005	0.0045	0.0048	12	10	3.2	3.3	0.00015	0.0006	<0.000005	<0.0000005	0.00094	0.0009	<0.0005	<0.0005	0.019	<0.001	0.024	0.0041	175	8.4	0.0091	0.51	0.5	0.00018	0.00022	2.2	2.4	<0.00001	<0.00001	2.8	2.6
2018	Q3	Reference (LC_SLC)	211	<0.01	<0.01	<0.00005	<0.00005	0.0029	0.003	17	15	3.8	4.3	<0.0001	0.00017	<0.000005	<0.0000005	0.0013	0.0012	<0.0005	<0.0005	0.089	<0.001	0.026	<0.001	325	8.4	0.0043	0.44	0.36	0.0012	0.0013	2.0	2.1	<0.00001	<0.00001	0.9	0.8
2018	Q4	Reference (FR_UFR1)	187	<0.01	<0.01	<0.00005	<0.00005	0.0016	0.0017	14	14	3.9	3.8	0.0001	0.00026	<0.000005	<0.0000005	0.00059	0.00061	<0.0005	<0.0005	0.032	<0.001	0.026	0.0023	453	8.4	<0.002	0.38	0.36	0.00073	0.00069	1.5	1.5	<0.00001	<0.00001	0.69	0.69
2018	Q4	Reference (GH_ER2)	167	<0.01	0.037	<0.00005	<0.00005	0.0019	0.002	12	11	3.4	3.4	0.00039	0.0027	<0.000005	<0.0000005	0.001	0.001	<0.0005	<0.0005	0.054	<0.001	0.014	0.0022	453	8.3	<0.002	0.39	0.37	0.00091	0.00084	1.8	1.9	<0.00001	<0.00001	0.78	0.72
2018	Q4	Reference (CM_MC1)	140	<0.01	<0.01	<0.00005	<0.00005	0.0046	0.0045	11	11	2.9	2.9	<0.0001	0.00027	<0.000005	0.00000063	0.00089	0.00093	<0.0005	<0.0005	0.0088	<0.001	0.0081	0.0042	412	8.2	0.0037	0.43	0.42	0.00022	0.00023	2.3	2.1	<0.00001	<0.00001	3.2	3.2
2018	Q4	Reference (LC_SLC)	191	<0.01	<0.01	<0.00005	<0.00005	0.0033	0.0036	16	16	4.1	3.9	<0.0001	0.00012	<0.000005	<0.0000005	0.0012	0.0013	<0.0005	<0.0005	0.13	<0.001	0.023	0.0027	374	8.3	0.0026	0.34	0.39	0.0017	0.0015	1.9	2.0	<0.00001	<0.00001	0.88	0.89
2019	Q1	Reference (FR_UFR1)	194	<0.01	<0.01	<0.00005	<0.00005	0.0015	0.0016	13.9	14.8	4.68	3.92	<0.0001	0.00027	<0.000005	<0.0000005	0.000536	0.000547	<0.0005	<0.0005	0.229	<0.001	<0.005	0.0058	429	8.3	0.0049	0.339	0.342	0.000939	0.000714	1.83	1.86	<0.00001	<0.00001	0.687	0.69
2019	Q1	Reference (GH_ER2)	172	<0.01	<0.01	<0.00005	<0.00005	0.0016	0.0016	11.5	10.8	3.52	3.48	0.00034	0.00065	<0.000005	<0.0000005	0.00109	0.001	<0.0005	<0.0005	0.109	0.0015	<0.005	0.0023	410	8.2	0.0033	0.293	0.293	0.0011	0.001	1.64	1.63	<0.00001	<0.00001	0.674	0.637
2019	Q1	Reference (CM_MC1)	156	<0.01	<0.01	<0.00005	<0.00005	0.0048	0.0043	11.7	10.9	3.95	3.28	0.00014	0.00024	<0.000005	<0.0000005	0.000851	0.000821	<0.0005	<0.0005	0.0591	0.0011	0.0069	0.0033	420	8.2	0.0032	0.487	0.432	0.000268	0.000307	2.23	2.03	<0.00001	<0.00001	3.53	3.28
2019	Q1	Reference (LC_SLC)	216	<0.01	<0.01	<0.00005	<0.00005	0.0044	0.0048	19	18.2	4.84	4.39	<0.0001	<0.0001	<0.000005	<0.0000005	0.00129	0.00138	<0.0005	<0.0005	0.146	<0.001	0.005	0.0038	428	8.2	0.0034	0.39	0.396	0.00184	0.00188	2.24	2.32	<0.00001	<0.00001	1.23	1.21
2019	Q2	Reference (FR_UFR1)	133	<0.01	0.026	<0.00005	<0.00005	0.0012	0.0013	11.1	11.1	2.99	2.69	0.00013	0.0006	<0.000005	0.00000116	0.000506	0.000563	<0.0005	<0.0005	<0.005	<0.001	0.0162	0.0032	386	8.3	0.0064	0.32	0.324	0.00078	0.000712	1.84	1.95	<0.00001	<0.00001	0.662	0.664
2019	Q2	Reference (GH_ER2)	168	<0.01	0.045	<0.00005	<0.00005	0.0017	0.0019	12.4	11.7	3.36	3.4	0.00013	0.00311	<0.000005	<0.0000005	0.00101	0.000972	<0.0005	<0.0005	0.0733	<0.001	0.011	<0.001	452	8.2	0.006	0.315	0.325	0.00112	0.00103	1.72	1.74	<0.00001	<0.00001	0.756	0.701
2019	Q2	Reference (CM_MC1)	133	<0.01	0.03	<0.00005	<0.00005	0.004	0.004	9.58	9.89	2.76	2.79	0.00011	0.0012	<0.000005	0.0000008	0.00084	0.000844	<0.0005	<0.0005	0.0086	<0.001	<0.005	0.0041	411	8.2	0.0045	0.366	0.412	0.00027	0.000253	2.1	2.15	<0.00001	<0.00001	2.72	2.81
2019	Q2	Reference (LC_SLC)	167	<0.01	<0.01	<0.00005	<0.00005	0.0029	0.003	13.8	13.8	3.76	3.38	<0.0001	0.00013	<0.000005	<0.0000005	0.00101	0.00102	<0.0005	<0.0005	0.0591	<0.001	<0.005	0.0019	470	8.2	0.0022	0.335	0.337	0.00127	0.00129	1.83	1.87	<0.00001	<0.00001	0.799	0.799
2019	Q3	Reference (FR_UFR1)	172	<0.01	<0.01	<0.00005	<0.00005	0.0015	0.0016	13.2	13.8	3.45	3.47	0.0003	0.00068	<0.000005	0.00000068	0.000638	0.000663	<0.0005	<0.0005	0.005	<0.001	0.0213	<0.001	424	8.4	0.0026	0.408	0.401	0.0007	0.000629	1.9	2.23	<0.00001	<0.00001	0.713	0.688
2019	Q3	Reference (GH_ER2)	154	<0.01	0.014	<0.00005	<0.00005	0.0017	0.0016	10.9	9.97	3	3.12	0.00059	0.00231	<0.000005	<0.0000005	0.000959	0.000951	<0.0005	0.00066	0.0355	<0.001	0.0289	<0.001	360	8.3	<0.002	0.338	0.337	0.000855	0.000807	1.81	1.75	<0.00001	<0.00001	0.608	0.643
2019	Q3	Reference (CM_MC1)	156	<0.01	<0.01	<0.00005	<0.00005	0.0048	0.0049	12	11.3	3.2	3.27	0.00021	0.00078	<0.000005	<0.0000005	0.00102	0.000922	<0.0005	<0.0005	0.0117	<0.001	<0.005	0.0047	274	8.4	0.0048	0.538	0.472	0.000244	0.000201	2.27	2.47	<0.00001	<0.00001	3.12	2.97
2019	Q3	Reference (LC_SLC)	171	<0.01	<0.01	<0.00005	<0.00005	0.0026	0.0029	13.7	13.9	3.65	3.45	<0.0001	0.00017	<0.000005	<0.0000005	0.00116	0.0012	<0.0005	<0.0005	0.118	<0.001	0.0053	0.0016	450	8.3	0.0037	0.338	0.33	0.00139	0.0013	1.9	2.03	<0.00001	<0.00001	0.715	0.722
2019	Q4	Reference (FR_UFR1)	178	<0.01	<0.01	<0.00005	<0.00005	0.0016	0.0017	13.4	14	3.77	3.6	<0.0001	0.00047	<0.000005	<0.0000005	0.00052	0.000559	<0.0005	<0.0005	0.134	<0.001	0.0185	0.0026	386	8.3	0.0031	0.335	0.338	0.00101	0.000859	1.81	1.76	<0.00001	<0.00001	0.687	0.661
2019	Q4	Reference (GH_ER2)	158	<0.01	0.016	<0.00005	<0.00005	0.0017	0.0018	11.8	11.6	3.38	3.21	0.00054	0.00182	<0.000005	<0.0000005	0.000984	0.000978	<0.0005	<0.0005	0.0754	<0.001	0.013	<0.001	456	8.3	<0.002	0.328	0.353	0.00109	0.000949	1.82	1.88	<0.00001	<0.00001	0.72	0.697
2019	Q4	Reference (CM_MC1)	142	<0.01	<0.01	<0.00005	<0.00005	0.0041	0.0044	11.4	10.4	3.12	2.98	0.0001	0.00023	<0.000005	<0.0000005	0.000827	0.000853	<0.0005	<0.0005	0.0187	<0.001	0.0053	0.0041	382	8.3	0.004	0.397	0.402	0.000256	0.00025	2.17	2.16	<0.00001	<0.00001	3.08	3.05
2019	Q4	Reference (LC_SLC)	203	<0.01	<0.01	<0.00005	<0.00005	0.0037	0.0035	15.6	16.7	4.18	4.12	<0.0001	0.00069	<0.000005	<0.0000005	0.00127	0.00122	<0.0005	<0.0005	0.134	<0.001	0.0145	0.0018	503	8.1	<0.002	0.369	0.348	0.00158	0.0016	2.18	2.04	<0.00001	<0.00001	0.953	0.943
2020	Q1	Reference (FR_UFR1)	179	<0.01	<0.01	<0.00005	<0.00005	0.0017	0.0017	14.4	14.4	3.95	3.63	<0.0001	0.00027	<0.000005	<0.0000005	0.000518	0.000553	<0.0005	<0.0005	0.244	<0.001	0.147	0.0047	490	8.1	0.0067	0.39	0.387	0.000884	0.000823	2.06	2.12	<0.00001	<0.00001	0.733	0.734
2020	Q1	Reference (GH_ER2)	162	<0.01	0.021	<0.00005	<0.00005	0.0021	0.0018	11.9	11.7	3.64	3.28	0.00038	0.00166	<0.000005	<0.0000005	0.00101	0.00102	<0.0005	<0.0005	0.0896	<0.001	0.0146	<0.002	502	8.3	0.0019	0.35	0.327	0.00114	0.00111	1.85	1.87	<0.00001	<0.00001	0.753	0.757
2020	Q1	Reference (CM_MC1)	146	<0.01	<0.01	<0.00005	<0.00005	0.0043	0.0047	11.4	11.4	3.38	3.09	<0.0001	0.00022	<0.000005	<0.0000005	0.000864	0.000883	<0.0005	<0.0005	0.0444	<0.001	<0.005	0.0073	440	8.2	0.0049	0.444	0.436	0.000279	0.000251	2.11	2.18	<0.00001	<0.00001	3.54	3.66
2020	Q1	Reference (LC_SLC)	228	<0.01	0.016	<0.00005	<0.00005	0.0041	0.0044	19.1	17.3	4.59	4.62	<0.0001	0.00061	<0.000005	<0.0000005	0.00123	0.00121	<0.0005	<0.0005	0.133	<0.001	<0.005	0.0062	485	8.2	0.0026	0.391	0.406	0.00179	0.00158	2.12	2.36	<0.00001	<0.00001	1.26	1.18
2020	Q2	Reference (FR_UFR1)	130	<0.01	0.035	<0.00005	<0.00005	0.0011	0.0014	10.3	10	2.88	2.63	0.00023	0.00169	<0.000005	0.0000013	0.000527	0.000522	<0.0005	<0.0005	0.0539	<0.001	<0.005	0.0053	340	8.4	0.0071	0.342	0.319	0.000659	0.000784	1.89	1.92	<0.00001	<0.00001	0.62	0.561
2020	Q2	Reference (GH_ER2)	155	<0.01	0.064	<0.00005	<0.00005	0.0019	0.0021	10.9	11.8	3.51	3.13	0.00083	0.00381	<0.000005	0.00000091	0.000935	0.000935	<0.0005	<0.0005	0.104	<0.001	0.07	0.005	480	8.3	0.0016	0.368	0.417	0.00119	0.00116	1.88	1.99	<0.00001	<0.00001	0.798	0.848
2020	Q2	Reference (CM_MC1)	123	<0.01	0.028	<0.00005	<0.00005	0.0038	0.0039	8.97	9.47	2.71	2.57	0.00027	0.00101	<0.000005	0.00000104	0.000607	0.000613	<0.0005	<0.0005	0.0217	<0.001	0.0051	0.0057	329	8.3	0.0044	0.411	0.423	0.000288	0.000225	2.21	2.29	<0.00001	<0.00001	2.37	2.4
2020	Q2	Reference (LC_SLC)	157	<0.01	<0.01	<0.00005	<0.00005	0.0027	0.0029	12.3	12.3	3.3	3.18	<0.0001	0.00024	<0.000005	0.00000053	0.000753	0.000765	<0.0005	<0.0005	0.0969	<0.001	0.019	<0.002	403	8.3	0.002	0.354	0.345	0.000792	0.000862	1.92	1.97	<0.00001	<0.00001	0.787	0.78
2020	Q3	Reference (FR_UFR1)	191	<0.01	<0.01	<0.00005	<0.00005	0.0019	0.0018	13.8	13.4	3.65	3.85	0.00028	0.00047	<0.000005	<0.0000005	0.00066	0.00068	<0.0005	<0.0005	0.0089	<0.001	0.0139	0.0027	407	8.4	0.0023	0.442	0.44	0.000656	0.000605	2.02	2.14	<0.00001	<0.00001	0.659	0.637
2020	Q3	Reference (GH_ER2)	145	<0.01	0.034	<0.00005	<0.00005	0.0016	0.0018	10	10.8	2.96	2.93	0.00165	0.00386	<0.000005	<0.0000005	0.000943	0.00102	<0.0005	<0.0005	0.0432	<0.001	0.0076	0.0028	399	8.4	<0.001	0.343	0.373	0.000745	0.00071	1.8	1.84	<0.00001	<0.00001	0.573	0.669
2020	Q3	Reference (CM_MC1)	162	<0.01	<0.01	<0.00005	<0.00005	0.0052	0.0053	11.9	12.4	3.17	3.39	0.00018	0.00037	<0.000005	<0.0000005	0.0009	0.000963	<0.0005	<0.0005	0.0146	<0.001	<0.005	0.0034	485	8.3	0.0035	0.546	0.551	0.000242	0.000259	2.31	2.52	<0.00001	<0.00001	3.12	3.18
2020	Q3	Reference (LC_SLC)	184	<0.01	<0.01	<0.00005	0.000077	0.0031	0.0031	13.9	15	3.81	3.72	<0.0001	<0.0001	<0.000005	<0.0000005	0.0012	0.00122	<0.0005	<0.0005	0.0894	<0.001	<0.005	<0.002	446	8.4	0.0021	0.358	0.351	0.00125	0.00115	2.18	2.18	<0.00001	<0.00001	0.836	0.785
2020	Q4	Reference (FR_UFR1)	183	<0.01	<0.01	<0.00005	<0.00005	0.0016	0.0017	13.3	14.1	4.01	3.69	0.00022	0.00035	<0.000005	<0.0000005	0.000639	0.000664	<0.0005	<0.0005	0.0061	<0.001	<0.005	0.0027	501	8.3	0.0033	0.392	0.397	0.000713	0.000682	1.62	1.66	<0.00001	<0.00001	0.624	0.639
2020	Q4	Reference (GH_ER2)	163	<0.01	0.056	<0.00005	<0.00005	0.0017	0.0014	10.8	11.8	3.43	3.31	0.00156	0.00396	<0.000005	<0.0000005	0.000928	0.001	<0.0005	<0.0005	0.108	<0.001	0.0063	0.0132	367	8.3	<0.001	0.358	0.388	0.000804	0.00082	1.78	1.92	<0.00001	<0.00001	0.718	0.81
2020	Q4	Reference (CM_MC1)	145	<0.01	<0.01	<0.00005	<0.00005	0.0052	0.005	10.4	11.5	3.23	3.04	0.00015	0.0002	<0.000005	<0.0000005	0.000822	0.000923	<0.0005	<0.0005	0.0103	<0.001	0.0074	0.0046	158	8.2	0.0042	0.48	0.452	0.000216	0.000232	2.12	2.21	<0.00001	<0.00001	2.91	3.15
2020	Q4	Reference (LC_SLC)	193	<0.01	<0.01	<0.00005	<0.00005	0.0034	0.0038	15.4	16.4	4.34	3.9	<0.0001	<0.0001	<0.000005	<0.0000005	0.00126	0.00132	<0.0005	<0.0005	0.0844	<0.001	0.0116	<0.002	368	8.4	<0.001	0.381	0.395	0.00152	0.00154	1.89	2.07	<0.00001	<0.00001	0.897	0.971
2021	Q1	Reference (FR_UFR1)	145	<0.01	0.033	<0.00005	<0.00005	0.0014	0.0014	11.2	10.8	3.09	2.93	0.00014	0.00066	<0.000005	0.00000146	0.00055	0.000584	<0.0005	<0.0005	0.0131	<0.001	0.0056	0.0045	273	8.4	0.005	0.358	0.356	0.000875	0.000947	1.95	2.1	<0.00001	<0.00001	0.673	0.66
2021	Q1	Reference (GH_ER2)	174	<0.01	0.013	<0.00005	<0.00005	0.0018	0.0016	11.9	12	3.6	3.51	0.00112	0.0015	<0.000005	<0.0000005	0.00101	0.000989	<0.0005	<0.0005	0.09	0.0013	<0.005	0.0017	386	8.2	0.0037	0.345	0.331	0.00108	0.000982	1.85	1.76	<0.00001	<0.00001	0.73	0.684
2021	Q1	Reference (CM_MC1)	165	<0.01	<0.01	<0.00005	<0.00005	0.0053	0.0052	12.7	11.9	3.53	3.5	<0.0001	0.00026	<0.000005	<0.0000005	0.000892	0.000918	<0.0005	<0.0005	0.0221	<0.001	<0.005	<0.001	456	8.3	0.0025	0.497	0.462	0.000395	0.000328	2.31	2.08	<0.00001	<0.00001	4.44	4.14
2021	Q1	Reference (LC_SLC)	207	<0.01	<0.01	<0.00005	<0.00005	0.0043	0.0043	17.4	17.6	4.45	4.19	<0.0001	<0.0001	<0.000005	<0.0000005	0.00125	0.00135	<0.0005	<0.0005	0.0843	<0.001	<0.005	0.0018	283	8.4	<0.002	0.428	0.395	0.00172	0.00153	2.18	2.12	<0.00001	<0.00001	1.16	1.13
2021	Q2	Reference (FR_UFR1)	114	<0.01	0.159	<0.00005	0.000174	<0.001	0.0012	8.5	8.6	2.53	2.31	0.00032	0.0129	<0.000005	0.000003	0.000532	0.000489	<0.0005	0.00062	0.0859	<0.001	0.0115	0.0037	304	7.9	0.0282	0.33	0.397	0.000515	0.000423	1.67	2.09	<0.00001	<0.00001	0.503	0.523
2021	Q2	Reference (GH_ER2)	142	<0.01	1.5	<0.00005	0.00126	0.0015	0.0029	9.8	12.5	3.31	2.88	0.00157	0.0901	<0.000005	0.00000963	0.000872	0.000907	<0.0005	0.00354	0.13	<0.001	0.0109	0.0016	278	8.1	0.188	0.374	0.804	0.000849	0.000916	1.75	3.33	<0.00001	0.000032	0.723	0.785
2021	Q2	Reference (CM_MC1)	96.3	0.019	0.375	<0.00005	0.00152	0.0027	0.0025	7.08	6.75	1.87	1.99	0.00096	0.0453	<0.000005	0.00000513	0.000488	0.000452	<0.0005	0.00134	0.0244	<0.001	<0.005	0.0039	214	8.1	0.0832	0.385	0.488	0.000201	0.000229	2.04	2.76	<0.00001	<0.00001	1.27	1.24
2021	Q2	Reference (LC_SLC)	107	<0.01	0.094	<0.00005	0.000079	0.0012	0.0015	7.59	8.49	2.57	2.17	0.00015	0.00341	<0.000005	0.00000191	0.000427	0.000498	<0.0005	0.00058	0.107	<0.001	<0.005	0.0015	206	7.9	0.0052	0.266	0.319	0.000521	0.000565	1.49	1.76	<0.00001	<0.00001	0.446	0.478
2021	Q3	Reference (FR_UFR1)	177	<0.01	<0.01	<0.00005	<0.00005	0.0019	0.0019	12.9	13.3	3.75	3.59	0.0003	0.00054	<0.000005	<0.0000005	0.000682	0.000673	<0.0005	<0.0005	0.0169	<0.001	0.0272	0.0032	406	8.3	0.0044	0.474	0.475	0.000566	0.000604	2.16	2.15	<0.00001	<0.00001	0.657	0.676
2021	Q3	Reference (GH_ER2)	143	<0.01	0.114	<0.00005	0.000117	0.0016	0.0018	9.4	9.3	2.95	2.89	0.00129	0.00865	<0.000005	0.00000156	0.00102	0.000946	<0.0005	<0.0005	0.03	<0.001	<0.005	<0.001	451	8.3	0.0098	0.348	0.359	0.00064	0.000726	1.66	1.82	<0.00001	<0.00001	0.586	0.597
2021	Q3	Reference (CM_MC1)	148	<0.01	<0.01	<0.00005	<0.00005	0.0053	0.0055	11.1	11.5	3.23	3.1	0.00017	0.00052	<0.000005	0.00000062	0.000932	0.000965	<0.0005	<0.0005	0.0149	<0.001	<0.005	0.0048	462	8.3	0.007	0.56	0.568	0.000196	0.000172	2.4	2.48	<0.00001	<0.00001	3.04	3.13
2021	Q3	Reference (LC_SLC)	171	<0.01	<0.01	<0.00005	<0.00005	0.0029	0.0031	14.1	15.2	3.76	3.47	<0.0001	<0.0001	<0.000005	<0.0000005	0.00119	0.00126	<0.0005	<0.0005	0.101	<0.001	0.0071	<0.001	455	8.3	0.0052	0.355	0.391	0.00117	0.00133	2.05	2.15	<0.00001	<0.00001	0.758	0.839
2021	Q4	Reference (FR_UFR1)	181	<0.01	<0.01	<0.00005	<0.00005	0.0017	0.0018	13.6	15.4	4.32	3.66	0.0003	0.00046	<0.000005	<0.0000005	0.000703	0.000679	<0.0005	<0.0005	0.0599	<0.001	<0.005	0.0023	472	8.1	0.0037	0.414	0.417	0.000953	0.00075	1.83	1.83	<0.00001	<0.00001	0.688	0.692
2021	Q4	Reference (GH_ER2)	155	<0.01	0.018	<0.00005	<0.00005	0.0018	0.0018	10.8	11.2	3.56	3.14	0.00123	0.00212	<0.000005	<0.0000005	0.00108	0.00109	<0.0005	<0.0005	0.0629	<0.001	0.0131	<0.001	454	8.1	0.19	0.354	0.362	0.000876	0.000869	1.78	1.95	<0.00001	<0.00001	0.7	0.7
2021	Q4	Reference (CM_MC1)	159	<0.01	<0.01	<0.00005	<0.00005	0.0052	0.0048	11.4	11.1	3.47	3.33	0.00012	0.00018	<0.000005	<0.0000005	0.00089	0.000882	<0.0005	<0.0005	0.0176	<0.001	0.0051	0.003	472	8.3	0.0057	0.494	0.47	0.000218	0.000178	2.24	2.24	<0.00001	<0.00001	3.35	3.05
2021	Q4	Reference (LC_SLC)	197	<0.01	<0.01	<0.00005	<0.00005	0.0034	0.0038	16.8	15.3	4.42	3.98	<0.0001	<0.0001	<0.000005	<0.0000005	0.00129	0.0013	<0.0005	<0.0005	0.0992	<0.001	<0.005	<0.001	438	8.1	<0.002	0.392	0.379	0.00154	0.00147	2.07	2.16	<0.00001	<0.00001	0.937	0.912
Tests categorized as no adverse response (2015 to 2021)																																						
2015	Q1	GH_FR1	475	< 0.010	< 0.010	< 0.000050	< 0.000050	0.016	0.015	48	49	9.9	9.6	0.0017	0.0021	< 0.000010	< 0.000010	0.00095	0.00098	0.0022	0.0023	13	0.0039	< 0.0050	< 0.0010	305	8.3	0.0036	1.2	1.2	0.051	0.052	2.1	2.1	< 0.000010	< 0.000010	2.3	2.4
2015	Q1	GH_ERC	191	< 0.010	0.036	< 0.000050	0.0002	0.0019	0.002	13	13	3.8	3.9	0.00035	0.0026	< 0.000010	< 0.000010	0.00092	0.00099	< 0.00050	< 0.00050	0.44	< 0.0010	< 0.0050	< 0.0010	512	8.3	0.0043	0.36	0.37	0.0019	0.0019	1.8	1.9	< 0.000010	< 0.000010	0.94	0.95
2015	Q1	CM_MC2	445	< 0.010	0.031	< 0.000050	< 0.000050	0.011	0.011	44	46	9.7	9.4	0.0046	0.0064	< 0.000010	< 0.000010	0.001	0.0011	0.0095	0.0097	2.4	0.012	0.0055	0.001	491	8.4	0.005	1.4	1.4	0.0059	0.006	2.1	2.2	< 0.000010	< 0.000010	10	10
2015	Q1	EV_MC2	381	< 0.010	0.024	< 0.000050	< 0.000050	0.015	0.015	35	33	7.5	8.7	0.0024	0.0022	< 0.000010	< 0.000010	0.00079	0.00078	0.0007	0.00052	3.2	0.0013	< 0.0050	< 0.0010	302	8.3	0.0047	1.2	1.2	0.024	0.022	2.5	2.5	< 0.000010	< 0.000010	24	5.7
2015	Q1	EV_HC1	274	0.01	0.013	0.00005	0.00005	0.0047	0.0047	30	31	8.2	8.3	0.001	0.0015	0.00001	0.00001	0.00063	0.00065	0.0006	0.00064	0.8	0.001	0.005	0.0035	457	7.4	0.0047	0.61	0.62	0.022	0.022	1.3	1.3	0.00001	0.00001	1.1	1.2
2015	Q1	LC_LCDSSLCC	536	< 0.010	< 0.010	< 0.000050	< 0.000050	0.031	0.031	54	53	11	11	0.000074	0.00021	< 0.000010	< 0.000010	0.0017	0.0017	0.0036	0.0036	15	0.003	< 0.0050	< 0.0010	294	8.3	0.0029	1.2	1.2	0.072	0.071	2.1	2.1	< 0.000010	< 0.000010	5.9	5.9
2015	Q2	FR_FRCP1	302	< 0.010	0.11	< 0.000050	0.00014	0.019	0.018	29	29	6.1	6.1	0.0032	0.012	< 0.0000050	< 0.0000050	0.0013	0.0013	0.002	0.0024	7.4	0.0056	0.0095	0.0014	345	8.4	0.018	1.2	1.2	0.03	0.03	1.6	1.6	< 0.000010	< 0.000010	1.2	1.2
2015	Q2	GH_FR1	332	< 0.010	0.07	< 0.000050	0.000063	0.014	0.014	33	34	6.7	6.7	0.0011	0.0044	< 0.0000050	< 0.0000050	0.0011	0.0011	0.0019	0.002	7.5	0.0028	< 0.0050	< 0.0010	302	8.4	0.01	1.0	1.1	0.031	0.032	1.8	2.0	< 0.000010	< 0.000010	1.6	1.7
2015	Q2	GH_ERC	179	< 0.010	0.15	< 0.000050	0.00011	0.0022	0.0023	12	12	3.8	3.6	0.00072	0.0081	< 0.0000050	< 0.0000050	0.00095	0.00097	< 0.00050	< 0.00050	0.31	< 0.0010	< 0.0050	< 0.0010	473	8.4	0.016	0.38	0.41	0.0017	0.0018	1.8	2.0	< 0.000010	< 0.000010	0.98	0.97
2015	Q2	EV_MC2	159	< 0.010	0.39	< 0.000050	0.00028	0.0054	0.0052	12	13	3.3	3.3	0.0003	0.01	< 0.0000050	< 0.0000050	0.00059	0.00054	0.00077	0.0014	0.81	< 0.0010	< 0.0050	< 0.0010	355	8.1	0.037	0.54	0.67	0.0052	0.005	1.7	2.3	< 0.000010	0.000017	2.1	2.1
2015	Q2	EV_HC1	205	0.01	0.051	0.00005	0.000056	0.0044	0.0042	21	21	5.8	6.2	0.00053	0.0016	0.000005	0.000005	0.0005	0.00048	0.00075	0.00083	0.57	0.001	0.0084	0.0031	413	7.5	0.0081	0.53	0.55	0.019	0.018	1.1	1.2	0.00001	0.00001	0.81	0.82
2015	Q2	LC_DCDS	95.6	0.014	0.144	<0.000050	0.000126	0.0051	0.0051	8.33	8.42	2.07	1.96	0.0008	0.0025	<0.0000050	<0.0000050	0.000784	0.000826	0.0064	0.00102	0.236	<0.0010	<0.0050	0.0314	367	8.27	0.0479	0.812	0.871	0.0013	0.00135	2.42	2.77	<0.000010	<0.000010	0.585	0.584
2015	Q2	LC_LC3	401	<0.010	<0.010	<0.000050	<0.000050	0.0297	0.0304	40.9	41.4	8.35	8.26	0.0001	0.0003	<0.0000050	<0.0000050	0.00167	0.00172	0.00879	0.00915	11.5	<0.0020	<0.0050	0.0025	492	8.31	0.0034	1.31	1.34	0.0502	0.0501	1.95	2.01	<0.000010	<0.000010	4.92	5.06
2015	Q2	LC_LC5	300	0.013	0.031	<0.000050	<0.000050	0.0138	0.0142	28.5	29.7	6.38	6.1	0.00248	0.00257	<0.0000050	<0.0000050	0.00105	0.00105	0.00125	0.00174	6.69	0.0037	<0.0050	0.0012	491	8.48	0.0076	0.969	0.997	0.0264	0.0273	1.77	1.87	<0.000010	<0.000010	2.01	2.06
2015	Q2	LC_LCDSSLCC	269	< 0.010	0.018	< 0.000050	< 0.000050	0.016	0.016	25	25	5.7	5.5	0.00016	0.00051	< 0.0000050	< 0.0000050	0.0011	0.0012	0.0036	0.0036	5.8	0.0014	< 0.0050	0.0027	493	8.4	0.0056	0.82	0.82	0.025	0.025	1.8	1.9	< 0.000010	< 0.000010	2.9	2.9
2015	Q3	FR_FRCP1	471	< 0.010	0.033	< 0.000050	< 0.000050	0.03	0.031	50	51	9.5	9.5	0.0031	0.0069	< 0.0000050	< 0.0000050	0.0015	0.0015	0.0041	0.0043	8.2	0.0049	< 0.0050	< 0.0010	345	8.4	0.0027	1.9	1.8	0.057	0.057	1.9	2.0	< 0.000010	< 0.000010	1.6	1.6
2015	Q3	GH_FR1	374	< 0.010	0.016	< 0.000050	< 0.000050	0.015	0.015	37	37	7.6	7.6	0.00089	0.0023	< 0.0000050	< 0.0000050	0.00099	0.0010	0.0016	0.0017	9.1	0.0046	0.0071	< 0.0010	323	8.3	0.0036	1.2	1.2	0.035	0.036	2.0	2.1	< 0.000010	< 0.000010	1.8	1.8
2015	Q3	GH_ERC	160	< 0.010	0.088	< 0.000050	0.00007	0.0017	0.002	10	11	3.3	3.2	0.00058	0.0078	< 0.0000050	< 0.0000050	0.00095	0.001	< 0.00050	< 0.00050	0.17	< 0.0010	< 0.0050	< 0.0010	320	8.3	0.0077	0.38	0.42	0.0011	0.0012	1.7	1.9	< 0.000010	< 0.000010	0.7	0.74
2015	Q3	CM_MC2	458	< 0.010	0.022	< 0.000050	< 0.000050	0.013	0.014	49	51	9.4	9.6	0.0018	0.0032	< 0.0000050	< 0.0000050	0.001	0.0011	0.013	0.013	2.5	0.0088	< 0.0050	< 0.0010	349	8.4	0.003	1.5	1.5	0.0062	0.0064	2.0	2.1	< 0.000010	< 0.000010	8.7	8.7
2015	Q3	EV_MC2	384	< 0.010	0.018	< 0.000050	< 0.000050	0.022	0.021	36	35	8.1	7.9	0.00067	0.002	< 0.0000050	< 0.0000050	0.0022	0.0022	0.0047	0.0048	5.7	0.0027	0.01	0.0027	356	8.1	0.0052	1.5	1.5	0.023	0.023	2.5	2.3	< 0.000010	< 0.000010	4.7	4.6
2015	Q3	EV_HC1	373	< 0.010	0.027	< 0.000050	< 0.000050	0.0069	0.0068	41	41	7.4	7.6	0.0028	0.0051	< 0.0000050	< 0.0000050	0.00092	0.00092	0.00079	0.00079	0.87	0.0011	< 0.0050	0.004	352	8.4	0.0082	0.99	0.99	0.029	0.028	2.1	2.0	< 0.000010	< 0.000010	1.5	1.5
2015	Q3	LC_LCDSSLCC	355	< 0.010	< 0.010	< 0.000050	< 0.000050	0.021	0.023	33	34	7.5	7.3	0.0002	0.00054	< 0.0000050	< 0.0000050	0.0014	0.0015	0.0047	0.005	7.2	< 0.0020	< 0.0050	0.0018	354	8.4	0.0029	1.0	1.1	0.037	0.04	2.2	2.3	< 0.000010	< 0.000010	3.8	3.9
2015	Q4	GH_FR1	436	< 0.010	< 0.010	< 0.000050	< 0.000050	0.017	0.017	42	43	8.5	8.8	0.0011	0.0016	< 0.0000050	< 0.0000050	0.0009	0.00099	0.0012	0.0012	10	< 0.0050	< 0.0050	< 0.0010	288	8.4	< 0.0020	1.2	1.2	0.04	0.039	2.1	2.2	< 0.000010	< 0.000010	2.1	2.2
2015	Q4	GH_ERC	190	< 0.010	< 0.010	< 0.000050	< 0.000050	0.002	0.0021	12	13	3.9	3.9	0.00063	0.0013	< 0.0000050	< 0.0000050	0.00099	0.0011	< 0.00050	< 0.00050	0.46	< 0.0010	< 0.0050	0.0018	491	8.3	< 0.0020	0.39	0.39	0.0015	0.0016	1.9	1.9	< 0.000010	< 0.000010	0.89	0.94
2015	Q4	EV_MC2	415	< 0.010	0.014	< 0.000050	< 0.000050	0.023	0.022	39	39	8.3	8.5	0.0013	0.0018	< 0.00000050	< 0.00000050	0.002	0.0021	0.0039	0.0041	5.9	< 0.0050	< 0.0050	0.0035	370	8.2	0.0036	1.3	1.3	0.024	0.025	2.5	2.6	< 0.000010	< 0.000010	4.9	4.8
2015	Q4	EV_HC1	431	< 0.010	< 0.010	< 0.000050	< 0.000050	0.0069	0.0067	49	50	8.6	8.7	0.0018	0.002	< 0.00000050	< 0.00000050	0.00097	0.00098	0.00066	0.00069	1.2	< 0.0050	< 0.0050	0.0058	360	8.4	0.0057	0.85	0.9	0.033	0.037	2.0	2.1	< 0.000010	< 0.000010	1.6	1.7
2015	Q4	LC_DCDS	150	<0.050	<0.050	<0.00025	<0.00025	0.0074	0.0072	14.1	14	2.94	3.06	<0.00050	0.00077	<0.0000050	<0.0000050	0.00105	0.00103	<0.0025	<0.0025	<0.0050	0.0012	0.0094	0.0012	367	7.96	0.0173	1.14	1.17	0.00159	0.00157	1.42	1.61	<0.000050	<0.000050	0.69	0.73
2015	Q4	LC_LC5	424	<0.050	<0.050	<0.00025	<0.00025	0.0187	0.0189	41.3	42.6	7.79	8.61	<0.00050	<0.00050	<0.0000050	<0.0000050	0.00103	0.00108	<0.0025	<0.0025	9.78	<0.0010	<0.0050	0.001	376	7.94	0.063	1.1	1.15	0.0382	0.0379	2.16	2.19	<0.000050	<0.000050	2.72	3.08
2015	Q4	LC_LCDSSLCC	499	< 0.050	< 0.050	< 0.00025	< 0.00025	0.036	0.036	51	54	9.9	10	< 0.00050	< 0.00050	< 0.0000050	< 0.0000050	0.0017	0.0016	0.0065	0.0071	13	0.003	< 0.0050	< 0.0010	364	8.3	< 0.0050	1.3	1.4	0.052	0.054	2.2	2.3	< 0.000050	< 0.000050	5.8	6.2
2016	Q1	GH_FR1	507	< 0.010	< 0.010	< 0.000050	< 0.000050	0.015	0.014	51	52	9.9	10	0.001	0.0012	< 0.0000050	< 0.0000050	0.00084	0.00086	0.0014	0.0014	13	< 0.0050	< 0.0050	< 0.0010	304	8.3	< 0.0020	1.2	1.1	0.052	0.05	2.2	2.2	< 0.000010	< 0.000010	2.2	2.1
2016	Q1	GH_ERC	231	< 0.010	< 0.010	< 0.000050	< 0.000050	0.0023	0.0025	15	16	4.4	4.7	0.00026	0.00034	< 0.0000050	< 0.0000050	0.00094	0.00092	< 0.00050	< 0.00050	0.76	< 0.0010	< 0.0050	< 0.0010	312	8.2	< 0.0020	0.38	0.39	0.0023	0.0023	1.8	1.9	< 0.000010	< 0.000010	1.0	1.0
2016	Q1	CM_MC2	500	< 0.010	0.011	< 0.000050	< 0.000050	0.014	0.014	50	52	11	11	0.0045	0.0052	< 0.0000050	< 0.0000050	0.0010	0.0010	0.0094	0.0098	2.9	0.012	< 0.0050	< 0.0010	500	8.3	< 0.0020	1.5	1.6	0.0054	0.0058	2.2	2.3	< 0.000010	< 0.000010	12	13
2016	Q1	EV_MC2	395	< 0.010	0.038	< 0.000050	0.000053	0.018	0.018	37	37	7.8	8.1	0.0012	0.0021	< 0.00000050	< 0.00000050	0.0015	0.0015	0.0025	0.0026	5.1	< 0.0050	< 0.0050	< 0.0010	308	8.1	0.0023	1.2	1.1	0.022	0.021	2.3	2.4	< 0.000010	< 0.000010	5.1	4.9
2016	Q1	EV_HC1	443	< 0.010	< 0.020	< 0.000050	< 0.000050	0.0066	0.0065	49	51	8.6	9.0	0.0013	0.0016	< 0.00000050	< 0.00000050	0.00092	0.00092	0.00062	< 0.0010	1.2	< 0.0050	< 0.0050	0.0041	294	8.3	0.0045	0.87	0.86	0.04	0.037	2.0	2.0	< 0.000010	< 0.000010	1.7	1.7
2016	Q1	LC_LCDSSLCC	572	< 0.010	< 0.010	< 0.000050	< 0.000050	0.037	0.038	58	60	12	12	0.0058	0.0064	< 0.0000050	< 0.00000050	0.0016	0.0017	0.0034	0.0034	11	0.0098	< 0.0050	0.0011	295	8.3	< 0.0020	1.4	1.4	0.036	0.035	2.2	2.3	< 0.000010	< 0.000010	6.7	6.9
2016	Q2	FR_FRCP1	305	< 0.010	0.13	< 0.000050	0.000099	0.016	0.018	31	32	5.9	6.2	0.0028	0.0097	< 0.0000050	0.0000012	0.0012	0.0013	0.0021	0.003	7.4	0.0033	0.0086	0.0029	324	8.3	0.013	1.2	1.2	0.032	0.032	1.7	2.0	< 0.000010	< 0.000010	1.0	1.1
2016	Q2	GH_ERC	185	< 0.010	0.38	< 0.000050	0.00022	0.0021	0.0025	13	13	3.7	3.8	0.0013	0.018	< 0.0000050	0.0000016	0.00091	0.00092	< 0.00050	0.00067	0.41	< 0.0010	< 0.0050	< 0.0010	337	8.3	0.027	0.41	0.55	0.0023	0.002	1.9	2.4	< 0.000010	< 0.000010	0.95	0.94
2016	Q2	EV_MC2	141	0.012	0.46	< 0.000050	0.00039	0.0052	0.0056	12	11	2.8	2.9	0.00014	0.013	0.0000015	0.0000018	0.00064	0.00069	0.0014	0.0022	0.78	< 0.0010	< 0.0050	0.013	312	8.1	0.039	0.55	0.64	0.0036	0.0033	2.0	2.8	< 0.000010	0.000017	1.8	1.7
2016	Q2	EV_HC1	306	< 0.010	0.14	< 0.000050	0.000095	0.0064	0.0068	32	33	6.2	6.2	0.00048	0.0037	0.00000062	0.00000077	0.00074	0.00077	0.00097	0.0012	0.82	< 0.0010	< 0.0050	0.0054	323	8.3	0.01	0.78	0.87	0.031	0.031	1.9	2.2	< 0.000010	< 0.000010	1.3	1.3
2016	Q2	LC_LC5	285	<0.010	0.167	<0.000050	0.000119	0.0152	0.0151	27.2	27.7	5.71	5.8	0.00058	0.00904	<0.0000050	0.00000103	0.00101	0.00103	0.00155	0.00197	5.94	0.0012	<0.0050	<0.0010	378	8.32	0.0161	0.894	0.978	0.0219	0.0223	1.98	2.22	<0.000010	<0.000010	1.9	1.97
2016	Q2	LC_LCDSSLCC	293	< 0.010	0.027	< 0.000050	< 0.000050	0.023	0.024	28	28	5.9	6.0	0.0016	0.0033	< 0.0000050	0.00000069	0.0014	0.0014	0.0045	0.0048	6.3	< 0.0010	< 0.0050	< 0.0010	362	8.3	0.0027	0.94	0.99	0.018	0.019	2.0	2.1	< 0.000010	< 0.000010	3.4	3.6
2016	Q3	GH_FR1	379	< 0.010	0.016	< 0.000050	< 0.000050	0.017	0.017	38	40	8.2	7.7	0.00092	0.002	< 0.0000050	< 0.00000050	0.0009	0.00097	0.0015	0.0015	9.6	0.0056	< 0.0050	< 0.0010	374	8.3	0.0061	1.2	1.2	0.034	0.037	2.1	2.2	< 0.000010	< 0.000010	1.8	1.9
2016	Q3	GH_ERC	161	< 0.010	0.024	< 0.000050	< 0.000050	0.0024	0.0024	11	11	3.5	3.3	0.00045	0.0019	< 0.0000050	< 0.00000050	0.00091	0.00087	< 0.00050	< 0.00050	0.2	< 0.0010	< 0.0050	< 0.0010	370	8.2	0.0049	0.39	0.42	0.00098	0.0010	1.7	1.7	< 0.000010	< 0.000010	0.72	0.7
2016	Q3	EV_MC2	435	< 0.010	0.01	< 0.000050	< 0.000050	0.031	0.033	41	42	9.4	9.0	0.0009	0.0014	< 0.00000050	0.00000085	0.0012	0.0012	0.0022	0.0024	6.5	< 0.0050	0.0073	0.004	323	8.1	0.0052	1.5	1.6	0.026	0.026	2.8	2.8	< 0.000010	< 0.000010	6.5	6.6
2016	Q3	EV_HC1	368	< 0.010	0.063	< 0.000050	0.000076	0.0084	0.0083	42	44	7.6	7.4	0.0054	0.0081	< 0.00000050	0.0000012	0.00092	0.00091	0.00074	0.0009	0.84	0.0016	0.0088	0.0064	312	8.3	0.012	0.9	0.98	0.031	0.032	2.1	2.3	< 0.000010	< 0.000010	1.5	1.6
2016	Q3	LC_LCDSSLCC	403	< 0.010	< 0.010	< 0.000050	< 0.000050	0.034	0.032	38	37	8.4	8.3	0.0009	0.0018	< 0.0000050	< 0.00000050	0.0016	0.0015	0.0044	0.0046	8.6	< 0.0050	< 0.0050	0.0021	341	8.4	0.0027	1.1	1.4	0.027	0.027	2.2	2.1	< 0.000010	< 0.000010	5.3	5.1
2016	Q4	GH_FR1	411	<0.01	0.022	<0.00005	<0.00005	0.017	0.017	43	44	8.5	8.3	0.00072	0.0017	<0.000005	<0.000005	0.001	0.0011	0.0019	0.002	8.8	<0.005	<0.005	<0.001	360	8.3	0.0023	1.2	1.3	0.041	0.039	2.1	2.1	<0.00001	<0.00001	1.9	2.0
2016	Q4	GH_ERC	186	< 0.010	0.028	< 0.000050	< 0.000050	0.0026	0.0022	12	12	3.7	3.8	0.00044	0.0027	< 0.0000050	< 0.0000050	0.0011	0.001	< 0.00050	0.00086	0.28	< 0.0010	< 0.0050	< 0.0010	387	8.3	< 0.0020	0.39	0.41	0.0014	0.0014	1.8	1.8	< 0.000010	< 0.000010	0.8	0.85
2016	Q4	EV_HC1	386	< 0.010	0.058	< 0.000050	< 0.000050	0.0077	0.0081	46	46	8.0	7.8	0.0021	0.0033	< 0.0000005	0.00000085	0.00091	0.00093	0.00073	0.00087	1.0	< 0.0050	< 0.0050	0.0061	337	8.4	0.0079	0.99	1.0	0.032	0.032	2.0	2.3	< 0.000010	< 0.000010	1.9	1.9
2016	Q4	LC_LC5	356	<0.010	<0.010	<0.000050	<0.000050	0.0188	0.0199	33.2	37.5	7.38	7.26	0.00028	0.00083	<0.0000050	<0.00000050	0.00107	0.00107	0.00134	0.00145	7.85	<0.0050	<0.0050	<0.0010	357	8.35	<0.0020	1.09	1.12	0.0286	0.0293	1.95	2.12	<0.000010	<0.000010	2.52	2.8
2016	Q4	LC_LCDSSLCC	384	< 0.010	< 0.010	< 0.000050	< 0.000050	0.027	0.026	36	35	7.9	7.9	0.002	0.0032	< 0.0000050	< 0.0000005	0.0014	0.0015	0.004	0.0038	7.3	< 0.0050	< 0.0050	0.0013	367	8.3	< 0.0020	1.1	1.1	0.024	0.023	2.0	2.0	< 0.000010	< 0.000010	4.2	4.2
2017	Q1	GH_FR1	479	<0.01	0.011	<0.00005	<0.00005	0.016	0.016	-	49	-	-	0.0012	0.0015	<0.000005	<0.0000005	0.00081	0.00084	0.0014	0.0013	13	<0.005	<0.005	0.0011	-	8.3	0.0039	-	1.2	0.057	0.051	-	-	<0.00001	<0.00001	-	2.2
2017	Q1	GH_ERC	190	<0.01	<0.01	<0.00005	<0.00005	0.0031	0.0035	-	14	-	-	0.00012	0.00032	<0.000005	<0.0000005	0.00099	0.00099	<0.0005	<0.0005	0.45	<0.001	<0.005	0.001	-	8.2	<0.002	-	0.4	0.0018	0.0017	-	-	<0.00001	<0.00001	-	1.0
2017	Q1	EV_HC1	411	<0.01	0.017	<0.00005	<0.00005	0.0064	0.0065	-	47	-	-	0.0024	0.0027	<0.0000005	<0.0000005	0.00091	0.00093	0.00074	0.00078	1.2	<0.001	0.0052	0.0068	-	8.3	0.0077	-	0.92	0.036	0.038	-	-	<0.00001	<0.00001	-	1.7
2017	Q2	GH_FR1	404	0.013	0.55	<0.00005	0.00043	0.015	0.015	-	44	-	-	0.0032	0.014	<0.000005	0.0000047	0.0012	0.0014	0.0031	0.0048	6.7	<0.005	<0.005	0.0038	-	8.4	0.029	-	1.6	0.043	0.041	-	-	<0.00001	0.000021	-	2.2
2017	Q2	GH_ERC	187	<0.01	0.13	<0.00005	0.00008	0.0029	0.0032	-	15	-	-	0.00083	0.0062	<0.000005	0.00000073	0.00097	0.0011	<0.0005	<0.0005	0.5	<0.001	<0.005	<0.001	-	8.4	0.01	-	0.45	0.0024	0.0023	-	-	<0.00001	<0.00001	-	1.1
2017	Q2	LC_DCDS	96.5	0.027	0.148	<0.000050	0.000144	0.005	0.0053	8.25	8.57	2.11	1.99	0.00779	0.0124	<0.0000050	0.0000041	0.00113	0.00128	0.00135	0.00184	0.544	0.0014	0.0273	0.0316	375	8.11	0.0599	0.989	1.06	0.00134	0.00133	2.46	2.67	<0.000010	<0.000010	0.576	0.588
2017	Q2	LC_LC5	375	<0.010	0.117	<0.000050	0.000098	0.0209	0.0204	36.4	36.2	7.99	7.64	0.00126	0.00929	<0.0000050	0.00000131	0.00108	0.00103	0.00115	0.00154	9.48	0.0047	<0.0050	0.0041	342	8.36	0.0192	1.25	1.21	0.0409	0.0338	2.14	2.31	<0.000010	<0.000010	2.8	2.72
2017	Q2	LC_LCDSSLCC	477	<0.01	0.033	<0.00005	<0.00005	0.048	0.047	-	48	-	-	0.00081	0.0036	<0.000005	0.00000069	0.002	0.002	0.0052	0.0055	15	0.004	<0.005	0.0016	-	8.3	<0.002	-	1.6	0.046	0.041	-	-	<0.00001	<0.00001	-	7.3
2017	Q3	GH_ERC	149	<0.01	0.061	<0.00005	<0.00005	0.0025	0.0024	-	11	-	-	0.0011	0.004	<0.000005	0.0000007	0.00099	0.001	<0.0005	<0.0005	0.19	<0.001	0.0063	<0.001	-	8.4	0.0086	-	0.42	0.0013	0.0012	-	-	<0.00001	<0.00001	-	0.72
2017	Q3	EV_MC2	350	<0.01	0.012	<0.00005	<0.00005	0.016	0.015	-	31	-	-	0.0018	0.0022	<0.0000005	0.0000008	0.0012	0.0013	0.0019	0.0021	2.2	0.0032	0.0082	<0.001	-	8.4	0.0032	-	1.1	0.012	0.013	-	-	<0.00001	<0.00001	-	4.0
2017	Q3	EV_HC1	416	<0.01	0.011	<0.00005	<0.00005	0.0071	0.0066	-	46	-	-	0.0054	0.0057	0.0000006	0.0000012	0.00085	0.00085	0.00078	0.00093	0.79	<0.001	<0.005	0.0054	-	8.4	0.0072	-	0.87	0.033	0.035	-	-	<0.00001	<0.00001	-	1.4
2017	Q3	LC_LCDSSLCC	397	<0.01	<0.01	0.000097	<0.00005	0.036	0.036	-	37	-	-	0.00066	0.00087	<0.000005	0.0000005	0.0017	0.0016	0.0061	0.0059	10	0.0041	0.0067	0.0021	-	8.4	0.0052	-	1.2	0.041	0.036	-	-	<0.00001	<0.00001	-	5.4
2017	Q4	GH_FR1	476	<0.01	<0.01	<0.00005	<0.00005	0.018	0.018	-	51	-	-	0.0013	0.0014	<0.000005	<0.0000005	0.00089	0.00092	0.0017	0.0018	11	0.0057	0.0067	<0.001	-	8.2	0.0026	-	1.2	0.067	0.057	-	-	<0.00001	<0.00001	-	2.3
2017	Q4	GH_ERC	174	<0.01	<0.01	<0.00005	<0.00005	0.0027	0.0025	-	12	-	-	0.00044	0.0011	<0.000005	<0.0000005	0.0011	0.0011	<0.0005	<0.0005	0.25	0.0022	<0.005	<0.001	-	8.4	<0.002	-	0.39	0.0014	0.0012	-	-	<0.00001	<0.00001	-	0.84
2017	Q4	EV_MC2	262	<0.01	0.016	<0.00005	<0.00005	0.016	0.016	-	32	-	-	<0.0001	0.002	<0.000005	<0.0000005	0.00085	0.00092	<0.0005	0.00091	2.7	0.0017	0.025	0.0014	-	8.3	0.0029	-	1.1	0.019	0.018	-	-	<0.00001	<0.00001	-	4.8
2017	Q4	EV_HC1	388	<0.01	0.012	<0.00005	<0.00005	0.0065	0.0072	-	44	-	-	<0.0001	0.0057	<0.000005	<0.0000005	0.00089	0.00087	<0.0005	0.00078	0.86	<0.001	0.024	0.0048	-	8.5	0.0098	-	0.87	0.041	0.037	-	-	<0.00001	<0.00001	-	1.5
2017	Q4	LC_DCDS	202	<0.010	0.021	<0.000050	<0.000050	0.008	0.0089	18.3	17.7	4.16	4.12	0.00066	0.00291	<0.0000050	0.00000103	0.00182	0.00177	0.00113	0.00113	4.4	0.0621	0.0881	0.0063	250	8.27	0.0113	1.6	1.56	0.00878	0.00827	2.42	2.37	<0.000010	<0.000010	0.966	0.934
2017	Q4	LC_LC5	388	<0.010	<0.010	<0.000050	<0.000050	0.0199	0.0218	38.7	39.9	7.5	7.91	<0.00010	0.00041	<0.0000050	<0.00000050	0.00106	0.00111	0.00095	0.00128	8.88	0.0041	<0.0050	<0.0010	291	8.2	<0.0020	1.09	1.17	0.0442	0.0392	2.09	2.13	<0.000010	<0.000010	3.11	3.26
2017	Q4	LC_LCDSSLCC	471	<0.01	<0.01	<0.00005	<0.00005	0.037	0.04	-	49	-	-	0.0011	0.0022	<0.000005	<0.0000005	0.0016	0.0016	0.0053	0.0057	9.6	0.0013	0.0066	<0.001	-	8.2	<0.002	-	1.5	0.042	0.037	-	-	<0.00001	<0.00001	-	6.4
2018	Q1	GH_FR1	477	<0.01	<0.01	<0.00005	<0.00005	0.016	0.016	45	49	10	9.7	0.00083	0.0012	<0.000025	<0.0000005	0.0011	0.0013	0.0012	0.0014	12	<0.005	<0.005	0.0013	272	8.3	0.0027	1.1	1.2	0.059	0.059	2.3	2.5	<0.00001	<0.00001	2.4	2.4
2018	Q1	GH_ERC	172	<0.01	<0.01	<0.00005	<0.00005	0.0025	0.0032	12	13	3.8	3.5	0.00017	0.00027	<0.000000005	<0.0005	0.001	0.0011	<0.0005	<0.0005	0.55	<0.001	<0.005	<0.001	280	8.1	<0.002	0.32	0.35	0.002	0.0019	1.69	1.9	<0.00001	<0.00001	0.94	0.98
2018	Q1	CM_MC3	261	<0.01	<0.01	<0.00005	<0.00005	0.0052	0.0052	21	21	6.7	5.5	0.0007	0.00073	<0.000005	<0.0000005	0.00076	0.00078	0.0013	0.0013	1.1	<0.001	<0.005	0.0015	327	8.3	0.0026	0.57	0.58	0.0031	0.0032	1.7	1.6	<0.00001	<0.00001	5.0	5.0
2018	Q1	EV_HC1	438	<0.01	<0.01	<0.00005	<0.00005	0.0066	0.0064	50	52	8.9	8.9	0.0022	0.0028	<0.000005	<0.0000005	0.00097	0.00099	0.00054	0.00054	1.2	<0.001	0.016	0.0068	332	8.5	0.0089	0.87	0.85	0.042	0.044	2.2	2.3	<0.00001	<0.00001	1.8	1.8
2018	Q1	LC_LCDSSLCC	532	<0.02	<0.01	<0.0001	<0.00005	0.043	0.052	55	57	11	11	0.00031	0.00015	<0.000005	<0.0000005	0.0019	0.0019	0.0043	0.0041	12	0.0013	0.0075	<0.001	429	8.3	0.0014	1.4	1.5	0.059	0.062	2.2	2.3	<0.00002	<0.00001	8.6	8.6
2018	Q2	EV_MC2	228	0.019	0.6	<0.00005	0.00067	0.01	0.011	20	20	4.2	4.8	0.001	0.015	<0.000005	0.0053	0.00071	0.00073	0.0015	0.0028	1.4	0.0013	0.0099	0.0092	270	8.3	0.053	0.93	1.0	0.0099	0.011	2.4	3.3	<0.00001	0.000021	4.2	4.2
2018	Q2	EV_HC1	292	<0.01	0.13	<0.00005	0.000086	0.005	0.0054	30	27	5.7	5.9	0.00065	0.0043	<0.000005	0.0000015	0.00064	0.00067	0.00084	0.0011	0.63	<0.001	0.012	0.0049	294	8.5	0.018	0.78	0.78	0.022	0.021	2.0	2.1	<0.00001	<0.00001	1.2	1.2
2018	Q2	LC_DCDS	182	<0.010	0.455	<0.000050	0.000541	0.0094	0.0096	16.1	15	3.69	3.74	0.0138	0.0307	<0.0000050	0.00000764	0.00359	0.00356	0.00353	0.00561	8.46	0.0876	0.166	0.0281	280	8.12	0.07	1.95	1.84	0.0135	0.0126	2.53	2.83	<0.000010	0.000021	1.32	1.21
2018	Q3	GH_FR1	467	<0.01	0.016	<0.00005	<0.00005	0.02	0.02	52	46	9.5	9.5	0.00044	0.0024	<0.000005	<0.0000005	0.0016	0.0016	0.0026	0.0027	9.0	0.009	0.037	<0.001	390	8.3	0.0046	1.4	1.4	0.051	0.054	2.1	2.3	<0.00001	<0.00001	2.2	2.1
2018	Q3	GH_ERC	165	<0.01	0.052	<0.00005	<0.00005	0.0024	0.0023	12	10	3.4	3.3	0.00027	0.0033	<0.000000005	<0.0005	0.001	0.0011	<0.0005	0.00052	0.29	<0.001	0.012	<0.001	400	8.2	0.0058	0.4	0.39	0.0016	0.0015	1.99	1.9	<0.00001	<0.00001	0.77	0.71
2018	Q3	EV_MC2	438	<0.01	0.07	<0.00005	<0.00005	0.028	0.029	44	39	7.7	9.1	0.0014	0.0026	<0.000005	<0.0000005	0.0018	0.0019	0.0035	0.0055	3.2	0.0052	0.02	0.0015	367	8.4	0.0051	1.7	1.6	0.022	0.025	2.5	2.7	<0.00001	<0.00001	6.5	6.4
2018	Q3	EV_HC1	398	<0.01	0.022	<0.00005	<0.00005	0.0072	0.0079	46	42	8.0	8.0	0.0091	0.012	<0.000005	<0.0000005	0.00091	0.00098	<0.0005	0.00073	0.68	0.0025	0.018	<0.001	327	8.5	0.0052	0.97	0.92	0.033	0.037	2.1	2.3	<0.00001	<0.00001	1.5	1.6

Year	Quarter	Sample ID	Hardness Total or Dissolved CaCO3-N-mg/l	IRON-D-mg/l	IRON-T-mg/l	LEAD-D-mg/l	LEAD-T-mg/l	LITHIUM-D-mg/l	LITHIUM-T-mg/l	MAGNESIUM-D-mg/l	MAGNESIUM-T-mg/l
2018	Q3	LC_LCDSSLCC	465	<0.01	<0.01	<0.00005	<0.00005	0.038	0.038	47	49
2018	Q4	FR_FRABCH	626	<0.01	0.023	<0.00005	<0.00005	0.036	0.036	64	66
2018	Q4	GH_FR1	490	<0.01	<0.01	<0.00005	<0.00005	0.019	0.019	53	54
2018	Q4	GH_ERC	173	<0.01	0.2	<0.00005	0.00014	0.0027	0.003	12	13
2018	Q4	EV_MC2	315	<0.01	0.016	<0.00005	<0.00005	0.017	0.017	32	33
2018	Q4	EV_HC1	413	<0.01	0.031	<0.00005	<0.00005	0.007	0.0071	50	50
2019	Q1	GH_FR1	548	<0.01	<0.01	<0.00005	<0.00005	0.017	0.0166	56.1	56.2
2019	Q1	GH_ERC	179	<0.01	<0.01	<0.00005	<0.00005	0.0029	0.0028	12.6	12.7
2019	Q1	RG_MIDAG	377	<0.01	<0.01	<0.00005	<0.00005	0.0098	0.0088	35.2	32.2
2019	Q1	EV_MC2	321	<0.01	<0.01	<0.00005	<0.00005	0.0113	0.0111	31.6	28.5
2019	Q1	EV_HC1	425	<0.01	0.012	<0.00005	<0.00005	0.0061	0.0063	49.8	47.6
2019	Q1	LC_DCDS	298	<0.01	<0.01	<0.00005	<0.00005	0.0114	0.0123	27.6	26
2019	Q1	LC_LC3	746	<0.01	0.307	<0.00005	<0.00005	0.0473	0.0508	87.8	82.1
2019	Q1	LC_LC5	427	<0.01	<0.01	<0.00005	<0.00005	0.0179	0.0171	44.4	45
2019	Q1	LC_LCDSSLCC	543	<0.01	<0.01	<0.00005	<0.00005	0.0352	0.0364	57.4	54.9
2019	Q2	FR_FRABCH	568	<0.01	0.157	0.000368	0.00192	0.0281	0.034	64.4	66.9
2019	Q2	FR_FRCP1	478	<0.01	0.024	<0.00005	<0.00005	0.0298	0.0339	54.6	55.4
2019	Q2	GH_FR1	516	<0.01	0.021	<0.00005	<0.00005	0.0193	0.0185	57.1	56.8
2019	Q2	GH_ERC	179	<0.01	0.041	<0.00005	<0.00005	0.0024	0.0025	13.5	13.7
2019	Q2	CM_MC2	391	<0.01	0.071	<0.00005	<0.00005	0.0099	0.0096	40.5	39.7
2019	Q2	RG_MIDAG	263	<0.01	0.045	<0.00005	<0.00005	0.0066	0.007	24	24.2
2019	Q2	EV_MC2	179	<0.01	0.062	<0.00005	<0.00005	0.0061	0.0067	15.9	15.8
2019	Q2	EV_HC1	368	<0.01	0.056	<0.00005	0.000055	0.0063	0.0072	41.2	44.6
2019	Q2	LC_DCDS	228	<0.01	0.017	<0.00005	<0.00005	0.0101	0.0093	20.5	21.7
2019	Q2	LC_LC3	521	<0.01	0.086	<0.00005	<0.00005	0.0369	0.041	58.4	60.7
2019	Q2	LC_LC5	416	<0.01	0.04	<0.00005	<0.00005	0.0186	0.0193	43.9	44
2019	Q2	LC_LCDSSLCC	405	<0.01	0.022	<0.00005	<0.00005	0.0277	0.0288	42.8	43.3
2019	Q3	FR_FRABCH	481	<0.01	0.013	<0.00005	0.000057	0.0286	0.0304	51.6	53.1
2019	Q3	GH_FR1	406	<0.01	0.011	<0.00005	<0.00005	0.0207	0.0172	44	41.4
2019	Q3	GH_ERC	163	<0.01	0.014	<0.00005	<0.00005	0.0024	0.0023	12.2	11.2
2019	Q3	CM_MC2	542	<0.01	<0.01	<0.00005	<0.00005	0.0158	0.0161	58.5	58.9
2019	Q3	RG_MIDAG	292	<0.01	0.011	<0.00005	<0.00005	0.0081	0.008	27	25.3
2019	Q3	EV_MC2	281	<0.01	0.014	<0.00005	<0.00005	0.011	0.0089	27.3	25.3
2019	Q3	EV_HC1	377	<0.01	0.016	<0.00005	<0.00005	0.0072	0.006	45	41.4
2019	Q3	LC_DCDS	273	<0.01	<0.01	<0.00005	<0.00005	0.0157	0.0149	25.4	30.3
2019	Q3	LC_LC3	497	<0.01	0.064	<0.00005	<0.00005	0.0406	0.0394	53.9	54.9
2019	Q3	LC_LC5	345	<0.01	0.01	<0.00005	<0.00005	0.0193	0.0193	34.8	35.2
2019	Q3	LC_LCDSSLCC	375	<0.01	0.019	<0.00005	<0.00005	0.0279	0.0276	37.8	38.8
2019	Q4	FR_FRABCH	548	<0.01	0.118	<0.00005	0.000185	0.0296	0.0336	57	65.2
2019	Q4	FR_FRCP1	709	<0.01	0.023	<0.00005	<0.00005	0.0417	0.0467	87.7	94.5
2019	Q4	GH_FR1	474	<0.01	0.012	<0.00005	<0.00005	0.0185	0.0189	50.8	52.9
2019	Q4	GH_ERC	186	<0.01	<0.01	<0.00005	<0.00005	0.0031	0.0032	14.4	14.2
2019	Q4	CM_MC2	578	<0.01	0.196	<0.00005	0.000137	0.0169	0.0183	63.4	59.2
2019	Q4	RG_MIDAG	357	<0.01	0.08	<0.00005	0.000057	0.008	0.0087	35.2	32.1
2019	Q4	EV_MC2	317	<0.01	<0.01	<0.00005	<0.00005	0.0133	0.0138	32.2	29.7
2019	Q4	EV_HC1	423	<0.01	0.017	<0.00005	<0.00005	0.0066	0.0065	49.7	46.5
2019	Q4	LC_DCDS	386	<0.01	<0.01	<0.00005	<0.00005	0.0165	0.0156	35.5	36.1
2019	Q4	LC_LC3	663	<0.01	0.111	<0.00005	<0.00005	0.0486	0.0496	75.1	74.4
2019	Q4	LC_LC5	425	<0.01	0.011	<0.00005	<0.00005	0.021	0.0196	40.4	45.2
2019	Q4	LC_LCDSSLCC	482	<0.01	0.058	<0.00005	<0.00005	0.032	0.0328	52.7	48.5
2020	Q1	FR_FRABCH	597	0.019	0.188	<0.00005	0.000181	0.0326	0.033	64.2	63.8
2020	Q1	GH_ERC	187	<0.01	<0.01	<0.00005	<0.00005	0.0036	0.0033	14.6	14.5
2020	Q1	CM_MC2	613	<0.01	0.014	<0.00005	<0.00005	0.0238	0.0265	64.1	65.4
2020	Q1	RG_MIDAG	426	<0.01	0.011	0.000621	<0.00005	0.0123	0.0129	41.2	41.8
2020	Q1	EV_MC2	326	0.011	0.016	<0.00005	<0.00005	0.0137	0.0163	31.7	29.9
2020	Q1	EV_HC1	422	<0.01	0.013	<0.00005	<0.00005	0.0062	0.0069	49.6	46.1
2020	Q1	LC_LC3	784	<0.01	0.204	<0.00005	<0.00005	0.0538	0.0505	90.3	81.1
2020	Q1	LC_LC5	435	<0.01	<0.01	<0.00005	<0.00005	0.0171	0.019	44.8	41.1
2020	Q1	LC_LCDSSLCC	571	<0.01	0.011	<0.00005	<0.00005	0.0344	0.0384	59.8	54.9
2020	Q1	FR_FR4	840	0.022	0.039	<0.00005	<0.00005	0.0527	0.0591	97.1	104
2020	Q2	FR_FRABCH	496	<0.01	0.071	<0.00005	0.000062	0.0284	0.0264	52.5	48.2
2020	Q2	FR_FRCP1	436	<0.01	0.054	<0.00005	0.000058	0.0273	0.0249	46.5	44.3
2020	Q2	GH_FR1	336	<0.01	0.115	<0.00005	0.000085	0.015	0.0156	36.2	39
2020	Q2	GH_ERC	178	<0.01	0.175	<0.00005	0.000141	0.003	0.0033	13.5	14.3
2020	Q2	CM_MC2	364	<0.01	0.066	<0.00005	0.000058	0.0118	0.0128	36.8	41
2020	Q2	RG_MIDAG	268	<0.01	0.05	<0.00005	<0.00005	0.0073	0.007	23.3	24.9
2020	Q2	EV_MC2	196	<0.01	0.149	<0.00005	0.00013	0.006	0.0064	17.4	15.2
2020	Q2	EV_HC1	380	<0.01	0.035	<0.00005	<0.00005	0.006	0.0066	43.7	37.8
2020	Q2	LC_DCDS	202	<0.01	0.127	<0.00005	0.000128	0.0101	0.0112	19.1	20.5
2020	Q2	LC_LC3	460	<0.01	0.025	<0.00005	<0.00005	0.036	0.0355	48.8	47.5
2020	Q2	LC_LC5	362	<0.01	0.045	<0.00005	0.000053	0.0185	0.018	36.6	35.6
2020	Q2	LC_LCDSSLCC	375	<0.01	0.028	<0.00005	<0.00005	0.0283	0.0251	37.1	35.2
2020	Q3	FR_FRABCH	587	<0.01	0.016	<0.00005	<0.00005	0.0319	0.0311	64.7	59.1
2020	Q3	FR_FRCP1	597	<0.01	0.014	<0.00005	<0.00005	0.0343	0.0329	66	64.9
2020	Q3	GH_FR1	428	<0.01	0.065	<0.00005	0.000078	0.0206	0.0204	44.6	48.6
2020	Q3	GH_ERC	165	<0.01	0.023	<0.00005	<0.00005	0.0026	0.0026	11.7	12.3
2020	Q3	RG_MIDAG	438	<0.01	0.012	<0.00005	<0.00005	0.0196	0.0198	40.5	39.9
2020	Q3	EV_MC2	312	<0.01	0.011	<0.00005	<0.00005	0.0112	0.0127	30.3	27.7
2020	Q3	EV_HC1	379	<0.01	0.016	<0.00005	<0.00005	0.0065	0.0076	43	40
2020	Q3	LC_DCDS	362	<0.01	0.034	<0.00005	<0.00005	0.0219	0.0251	36	37.6
2020	Q3	LC_LC3	580	<0.01	0.097	<0.00005	<0.00005	0.0552	0.0524	60.1	64.5
2020	Q3	LC_LC5	395	<0.01	<0.01	<0.00005	<0.00005	0.0237	0.0205	37.7	38.7
2020	Q4	FR_FRABCH	629	<0.01	0.01	<0.00005	<0.00005	0.0383	0.0382	63.7	61.2
2020	Q4	GH_FR1	504	<0.01	0.603	<0.00005	0.000462	0.0208	0.0196	53.5	57.2
2020	Q4	GH_ERC	176	<0.01	0.016	<0.00005	<0.00005	0.0029	0.0027	12.7	14.2
2020	Q4	RG_MIDAG	283	<0.01	0.076	<0.00005	0.000071	0.0117	0.0112	24.3	24.8
2020	Q4	EV_MC2	290	<0.01	<0.01	<0.00005	0.00005	0.0112	0.012	26.5	26.9
2020	Q4	EV_HC1	386	<0.01	<0.01	<0.00005	<0.00005	0.0066	0.0072	44.8	42.6
2020	Q4	LC_DCDS	498	<0.01	<0.01	<0.00005	<0.00005	0.0295	0.0276	43.7	46.8
2020	Q4	LC_LC3	668	<0.01	0.081	<0.00005	<0.00005	0.0538	0.0571	70.9	75.7
2020	Q4	LC_LC5	415	<0.01	<0.01	<0.00005	<0.00005	0.0218	0.0226	41.4	42.9
2020	Q4	LC_LCDSSLCC	468.6	0.0003	0.0124	0.000025	0.000025	0.0368	0.0377	46.3	47.78
2021	Q1	FR_FRABCH	689	0.012	0.11	<0.00005	0.000063	0.0458	0.0452	75.8	73.9
2021	Q1	GH_FR1	550	<0.01	0.016	<0.00005	<0.00005	0.0288	0.0274	56.6	59
2021	Q1	GH_ERC	196	<0.01	0.011	<0.00005	<0.00005	0.0035	0.0037	14.8	15
2021	Q1	RG_MIDAG	401	<0.01	0.116	<0.00005	0.000096	0.0125	0.0112	35.5	33.8
2021	Q1	EV_MC2	277	<0.01	0.033	<0.00005	<0.00005	0.0114	0.0106	26.3	24.3
2021	Q1	EV_HC1	414	<0.01	0.024	<0.00005	<0.00005	0.0076	0.0072	49.1	47.2
2021	Q1	LC_DCDS	311	<0.01	0.145	<0.00005	0.000139	0.0144	0.0144	27.6	27.9
2021	Q1	LC_LC3	613	0.01	0.061	<0.00005	<0.00005	0.0632	0.0611	67	64.8
2021	Q1	LC_LC5	491	<0.01	0.017	<0.00005	<0.00005	0.0275	0.0265	50.1	49.9
2021	Q1	LC_LCDSSLCC	514	<0.01	0.018	<0.00005	<0.00005	0.0488	0.0486	53.8	53.5
2021	Q2	FR_FRABCH	307	<0.01	0.617	<0.00005	0.00052	0.017	0.0184	31.2	32.4
2021	Q2	FR_FRCP1	262	<0.01	0.426	<0.00005	0.00048	0.0148	0.0161	26	26.9
2021	Q2	GH_FR1	256	<0.01	0.301	<0.00005	0.000388	0.0124	0.0125	24.7	25.4
2021	Q2	GH_ERC	156	0.013	2.2	<0.00005	0.00169	0.002	0.0042	11.3	13.8
2021	Q2	CM_MC2	249	<0.01	0.85	<0.00005	0.000752	0.0145	0.014	24	23.7
2021	Q2	RG_MIDAG	170	<0.01	0.849	<0.00005	0.000544	0.0063	0.0066	13.3	14.3
2021	Q2	EV_MC2	113	0.013	11	<0.00005	0.0092	0.0041	0.0118	9.12	15.6
2021	Q2	EV_HC1	219	<0.01	0.667	<0.00005	0.000474	0.0044	0.0045	21.4	20.8
2021	Q2	LC_DCDS	225	0.012	0.402	<0.00005	0.000456	0.0124	0.0127	20.5	21.5
2021	Q2	LC_LC3	360	<0.01	0.032	<0.00005	<0.00005	0.0358	0.0372	39.7	42.8
2021	Q2	LC_LC5	245	<0.01	0.9	<0.00005	0.000743	0.0136	0.0146	24.2	25.6
2021	Q2	LC_LCDSSLCC	232	<0.01	0.054	<0.00005	<0.00005	0.0166	0.0178	22.6	24.4
2021	Q3	FR_FRABCH	610	<0.01	0.012	<0.00005	<0.00005	0.0438	0.0434	63.9	64.7
2021	Q3	GH_FR1	448	<0.01	0.015	<0.00005	<0.00005	0.0258	0.0242	45.2	44.9
2021	Q3	GH_ERC	155	<0.01	0.028	<0.00005	<0.00005	0.0024	0.0024	10.6	10.5
2021	Q3	CM_MC2	503	<0.01	0.019	<0.00005	<0.00005	0.0238	0.0244	54.8	55.4
2021	Q3	RG_MIDAG	256	<0.01	0.014	<0.00005	<0.00005	0.0093	0.0098	23.3	23.6
2021	Q3	EV_MC2	283	<0.01	0.024	<0.00005	<0.00005	0.0126	0.0122	26.1	24
2021	Q3	EV_HC1	355	<0.01	0.042	<0.00005	<0.00005	0.0067	0.0068	41.3	38.2
2021	Q3	LC_LC3	516	<0.01	0.041	<0.00005	<0.00005	0.0562	0.0569	55	57.1
2021	Q3	LC_LC5	395	<0.01	<0.01	<0.00005	<0.00005	0.0267	0.0263	39.6	39.2
2021	Q3	LC_LCDSSLCC	404	<0.01	<0.01	<0.00005	<0.00005	0.0388	0.0391	40.6	42.5
2021	Q4	FR_FRABCH	659	<0.01	0.03	<0.00005	<0.00005	0.0465	0.0454	70.3	80.7
2021	Q4	GH_FR1	483	<0.01	0.011	<0.00005	<0.00005	0.0271	0.0268	51.2	54.4
2021	Q4	GH_ERC	171	<0.01	<0.01	<0.00005	<0.00005	0.0028	0.003	12.5	13.3
2021	Q4	RG_MIDAG	360	<0.01	<0.01	<0.00005	<0.00005	0.011	0.0122	32.3	33.9
2021	Q4	EV_MC2	382	<0.01	0.017	<0.00005	<0.00005	0.0244	0.0227	36.2	37.7
2021	Q4	EV_HC1	385	<0.01	0.043	<0.00005	0.000133	0.0075	0.0074	44.8	49.6
2021	Q4	LC_LC5	432	<0.01	0.079	<0.00005	0.000064	0.0275	0.0298	44.9	42
2021	Q4	LC_LCDSSLCC	453	<0.01	0.011	<0.00005	<0.00005	0.0446	0.0493	46.9	47.3

Year	Quarter	Sample ID	MAJOR ANION SUM-N-meq/l	MAJOR CATION SUM-N-meq/l	MANGANESE-D-mg/l	MANGANESE-T-mg/l	MERCURY-D-mg/l	MERCURY-T-mg/l	MOLYBDENUM-D-mg/l	MOLYBDENUM-T-mg/l	NICKEL-D-mg/l	NICKEL-T-mg/l	NITRATE NITROGEN (NO3) AS N-N-mg/l	NITRITE NITROGEN (NO2) AS N-N-mg/l	NITROGEN AMMONIA (AS N)-N-mg/l	ORTHO-PHOSPHATE-N-mg/l	OXIDATION-REDUCTION POTENTIAL LAB-N-mv
2018	Q3	LC_LCDSSLCC	9.2	9.6	0.00021	<0.0005	<0.000005	<0.0005	0.0016	0.0016	0.0069	0.0078	9.6	0.0047	0.016	<0.001	323
2018	Q4	FR_FRABCH	13	13	0.0053	0.0063	<0.000005	<0.0000005	0.00069	0.00071	0.00053	0.00063	20	<0.005	0.015	0.0015	490
2018	Q4	GH_FR1	11	9.9	0.001	0.0015	<0.000005	<0.0000005	0.0013	0.0014	0.0018	0.002	11	<0.005	0.011	0.002	449
2018	Q4	GH_ERC	3.7	3.5	0.00033	0.013	<0.000000005	<0.0005	0.0011	0.0011	<0.0005	<0.0005	0.35	<0.001	0.014	0.0014	454
2018	Q4	EV_MC2	6.5	6.5	0.00083	0.0016	<0.000005	<0.0000005	0.0014	0.0014	0.0052	0.0057	1.9	0.0012	<0.005	0.002	307
2018	Q4	EV_HC1	7.9	8.4	0.0019	0.0037	<0.000005	<0.0000005	0.00093	0.00095	0.00056	0.00066	0.84	<0.005	<0.005	0.0044	306
2019	Q1	GH_FR1	11.1	11.1	0.00064	0.00116	<0.000005	<0.0000005	0.00121	0.00117	0.00173	0.00174	11	0.0086	0.0067	0.0019	438
2019	Q1	GH_ERC	3.76	3.62	<0.0001	0.00013	<0.000005	<0.0000005	0.00101	0.001	<0.0005	<0.0005	0.542	0.0019	0.0099	0.0011	425
2019	Q1	RG_MIDAG	8.01	7.89	0.00021	0.00041	<0.000005	<0.0000005	0.00121	0.00115	0.00203	0.00214	1.84	<0.001	<0.005	0.0034	433
2019	Q1	EV_MC2	6.69	6.6	0.00121	0.00133	<0.000005	<0.0000005	0.000859	0.00088	0.00072	0.00072	2.01	0.0017	0.0233	0.0039	347
2019	Q1	EV_HC1	8.53	8.58	0.00248	0.00299	<0.000005	<0.0000005	0.000991	0.000972	0.00051	0.00052	1.16	<0.001	0.0135	0.0073	407
2019	Q1	LC_DCDS	7.06	6.08	0.00069	0.00182	<0.000005	0.00000076	0.00335	0.0033	0.00332	0.00338	16	0.0086	0.0099	0.0308	370
2019	Q1	LC_LC3	16.5	15.5	0.0619	0.0678	<0.000005	<0.0000005	0.00749	0.00741	0.0057	0.0059	7.5	<0.005	0.0077	<0.001	382
2019	Q1	LC_LC5	9.07	8.7	0.00016	0.0007	<0.000005	<0.0000005	0.00122	0.0444	0.00063	0.00067	9.5	0.0019	0.0077	<0.001	375
2019	Q1	LC_LCDSSLCC	11.5	11.2	0.00353	0.00388	<0.000005	<0.0000005	0.00325	0.00329	0.00294	0.00282	8.1	0.0085	<0.005	0.002	392
2019	Q2	FR_FRABCH	13.4	11.5	0.00385	0.0126	<0.000005	<0.0000005	0.000714	0.000809	0.00134	0.00195	20	<0.005	0.008	<0.001	437
2019	Q2	FR_FRCP1	10.4	9.67	0.00492	0.00666	<0.000005	<0.0000005	0.0017	0.00188	0.00783	0.0085	12	0.0086	0.0358	<0.001	409
2019	Q2	GH_FR1	10.4	10.5	0.00077	0.00214	<0.000005	<0.0000005	0.00176	0.00175	0.00232	0.0025	9.6	0.007	0.0337	<0.001	421
2019	Q2	GH_ERC	3.77	3.63	0.00015	0.00274	<0.000005	<0.0000005	0.00104	0.00104	<0.0005	<0.0005	0.563	0.0011	0.0123	<0.001	499
2019	Q2	CM_MC2	8.05	8.14	0.00335	0.00809	<0.000005	0.00000088	0.000979	0.000938	0.00794	0.0084	1.98	0.0026	0.015	<0.001	406
2019	Q2	RG_MIDAG	5.43	5.47	0.00025	0.00183	<0.000005	0.00000054	0.00092	0.000917	0.00193	0.00108	0.915	0.0012	0.009	<0.001	394
2019	Q2	EV_MC2	3.78	3.71	0.00026	0.00211	<0.000005	0.0000012	0.000684	0.000718	0.00096	0.00097	0.614	<0.001	<0.005	<0.001	416
2019	Q2	EV_HC1	7.83	7.45	0.00057	0.0031	<0.000005	<0.0000005	0.000919	0.000964	0.00077	0.00082	0.862	<0.001	<0.005	0.0022	411
2019	Q2	LC_DCDS	4.82	4.67	0.00012	0.00457	<0.000005	0.0000012	0.00338	0.00313	0.00368	0.00451	12	0.0151	0.0224	<0.001	413
2019	Q2	LC_LC3	12.2	10.8	0.00049	0.0195	<0.000005	<0.0000005	0.00315	0.00357	0.0058	0.0064	13	<0.005	<0.005	0.0011	454
2019	Q2	LC_LC5	9.1	8.48	<0.0001	0.00262	<0.000005	<0.0000005	0.00116	0.0461	0.00079	0.00094	9.7	0.0031	<0.005	<0.001	437
2019	Q2	LC_LCDSSLCC	9.16	8.4	<0.0001	0.00414	<0.000005	<0.0000005	0.00204	0.00219	0.0029	0.00314	8.5	0.001	0.0201	0.001	490
2019	Q3	FR_FRABCH	9.87	9.74	0.00345	0.0042	<0.000005	<0.0000005	0.00108	0.00108	0.00172	0.00187	14	0.0045	0.0108	<0.001	464
2019	Q3	GH_FR1	7.91	8.23	0.00068	0.00225	<0.000005	<0.0000005	0.00135	0.0013	0.00127	0.00173	8	0.0062	0.0078	<0.001	365
2019	Q3	GH_ERC	3.39	3.3	0.00049	0.00209	<0.000005	<0.0000005	0.00105	0.00105	<0.0005	0.00066	0.215	<0.001	0.0092	<0.001	342
2019	Q3	CM_MC2	10.8	11.3	0.00166	0.00365	<0.000005	<0.0000005	0.00113	0.00113	0.0177	0.017	2.37	0.0043	<0.005	<0.001	292
2019	Q3	RG_MIDAG	6.02	6.07	0.00061	0.00195	<0.000005	<0.0000005	0.000844	0.000853	0.004	0.00414	0.892	0.0014	0.0105	<0.001	373
2019	Q3	EV_MC2	5.56	5.78	0.00061	0.00207	<0.000005	<0.0000005	0.000959	0.000794	0.0011	0.00112	1.21	0.0024	0.0131	0.0016	328
2019	Q3	EV_HC1	7.48	7.62	0.00266	0.0051	<0.000005	<0.0000005	0.000984	0.000861	0.00064	0.00068	0.635	0.0013	0.0089	0.0034	377
2019	Q3	LC_DCDS	5.83	5.61	0.00017	0.00133	<0.000005	0.00000089	0.00368	0.00358	0.00623	0.0074	16	0.0575	0.0378	<0.001	398
2019	Q3	LC_LC3	10.4	10.3	0.0211	0.0255	<0.000005	<0.0000005	0.00358	0.00365	0.00835	0.0085	9.1	<0.001	0.0087	0.0019	241
2019	Q3	LC_LC5	7.26	7.03	0.00028	0.00125	<0.000005	<0.0000005	0.00121	0.0304	0.0008	0.00096	7.4	0.0043	0.0056	<0.001	411
2019	Q3	LC_LCDSSLCC	8.05	7.76	0.00312	0.00631	<0.000005	<0.0000005	0.00209	0.00212	0.00414	0.00441	6.7	0.0011	0.0062	0.0014	267
2019	Q4	FR_FRABCH	12.4	11.1	0.00015	0.0177	<0.000005	0.00000243	0.000668	0.000628	0.00072	0.00115	19	<0.005	0.0164	0.0014	316
2019	Q4	FR_FRCP1	16	14.3	0.00171	0.00702	<0.000005	<0.0000005	0.00177	0.00188	0.00861	0.0098	17	0.0114	0.0592	<0.001	388
2019	Q4	GH_FR1	9.83	9.59	0.00154	0.00172	<0.000005	<0.0000005	0.000901	0.00089	0.00102	0.00122	10	0.0032	<0.005	<0.001	500
2019	Q4	GH_ERC	3.89	3.77	0.00029	0.00052	<0.000005	<0.0000005	0.00102	0.00106	<0.0005	<0.0005	0.731	<0.001	0.0055	<0.001	512
2019	Q4	CM_MC2	12.1	12.1	0.00647	0.0214	<0.000005	0.00000081	0.00103	0.0011	0.0193	0.021	2.92	0.0037	0.0072	<0.001	307
2019	Q4	RG_MIDAG	7.57	7.42	0.00102	0.00415	<0.000005	<0.0000005	0.000842	0.00086	0.00469	0.0051	1.44	0.0012	<0.005	0.0022	454
2019	Q4	EV_MC2	6.75	6.54	0.00123	0.00146	<0.000005	<0.0000005	0.000931	0.001	0.00164	0.00164	1.75	0.0014	0.0103	0.0038	356
2019	Q4	EV_HC1	8.64	8.54	0.00572	0.00567	<0.000005	<0.0000005	0.000939	0.00104	<0.0005	0.00055	0.959	0.001	0.0066	0.0065	325
2019	Q4	LC_DCDS	8.2	7.9	0.00065	0.00122	<0.000005	0.00000067	0.00398	0.0041	0.00578	0.0059	27	0.0191	0.0972	0.0257	315
2019	Q4	LC_LC3	14.5	13.9	0.0439	0.0476	<0.000005	<0.0000005	0.00566	0.00584	0.007	0.0074	12	<0.005	0.0121	0.0018	441
2019	Q4	LC_LC5	9.03	8.68	0.00033	0.00217	<0.000005	<0.0000005	0.00132	0.0386	0.0008	0.0009	8.8	0.0019	0.0229	0.0011	475
2019	Q4	LC_LCDSSLCC	10.2	10	0.00464	0.0116	<0.000005	<0.0000005	0.00296	0.00282	0.00367	0.00399	8.5	<0.001	0.0139	0.0012	516
2020	Q1	FR_FRABCH	13.3	12.1	0.0127	0.0178	<0.000005	0.00000245	0.000612	0.000574	0.00053	0.00109	22	<0.005	0.0155	0.0023	440
2020	Q1	GH_ERC	4.15	3.8	0.00016	0.00037	<0.000005	<0.0000005	0.000933	0.000946	<0.0005	<0.0005	1.01	<0.001	0.0075	0.0013	470
2020	Q1	CM_MC2	14.6	13.1	0.0205	0.0223	<0.000005	<0.0000005	0.00157	0.0016	0.0428	0.045	3.4	0.0145	0.0464	0.0024	434
2020	Q1	RG_MIDAG	9.74	8.98	0.00165	0.00201	<0.000005	<0.0000005	0.00104	0.00101	0.00891	0.0095	2	0.0028	0.0061	0.0025	498
2020	Q1	EV_MC2	6.84	6.72	0.00098	0.00144	<0.000005	<0.0000005	0.00105	0.00116	0.00205	0.00209	2.27	0.002	0.0075	0.006	520
2020	Q1	EV_HC1	8.72	8.53	0.00437	0.00506	<0.000005	0.00000053	0.000905	0.000906	<0.0005	0.00056	1.04	<0.001	0.0087	0.0083	430
2020	Q1	LC_LC3	17	16.4	0.0737	0.0784	<0.000005	<0.0000005	0.00721	0.00724	0.00793	0.008	11	<0.005	<0.005	0.0066	438
2020	Q1	LC_LC5	9.12	8.87	0.00012	0.00046	<0.000005	<0.0000005	0.00118	0.00115	0.00059	0.00068	9.3	0.0032	<0.005	<0.002	441
2020	Q1	LC_LCDSSLCC	12	11.8	0.0036	0.00506	<0.000005	<0.0000005	0.00346	0.00361	0.00318	0.00328	9	0.001	0.006	<0.002	406
2020	Q1	FR_FR4	18.1	17	0.00973	0.011	<0.000005	<0.0000005	0.00157	0.00166	0.00956	0.0099	21	<0.005	0.0173	<0.002	399
2020	Q2	FR_FRABCH	9.69	10	0.00633	0.00789	<0.000005	0.00000153	0.00153	0.00152	0.00579	0.0055	15	0.0081	0.0075	0.0011	425
2020	Q2	FR_FRCP1	8.84	8.82	0.00479	0.00841	<0.000005	0.00000089	0.00233	0.00231	0.0102	0.01	13	0.0151	0.0082	0.0062	326
2020	Q2	GH_FR1	7.3	6.83	0.00187	0.00516	<0.000005	0.00000174	0.00122	0.00125	0.00304	0.00368	7.2	0.0047	0.0135	0.0087	473
2020	Q2	GH_ERC	3.98	3.62	0.00058	0.00969	<0.000005	0.00000079	0.000904	0.000916	<0.0005	0.00053	0.596	<0.001	0.0102	0.0014	417
2020	Q2	CM_MC2	8.23	7.7	0.0115	0.017	<0.000005	0.00000078	0.000792	0.000851	0.0137	0.015	1.61	0.0026	0.0133	0.0021	299
2020	Q2	RG_MIDAG	5.81	5.6	0.00394	0.00664	<0.000005	0.00000077	0.00068	0.000752	0.00594	0.0066	0.838	0.0011	0.0066	0.0038	397
2020	Q2	EV_MC2	3.57	4.05	0.00114	0.00555	<0.000005	0.00000246	0.000627	0.000647	0.00142	0.00171	0.701	<0.001	0.0066	0.0166	246
2020	Q2	EV_HC1	6.88	7.67	0.00191	0.00287	<0.000005	0.00000097	0.000762	0.00082	0.0008	0.00086	0.804	<0.001	0.0091	0.0071	309
2020	Q2	LC_DCDS	4.56	4.14	0.00519	0.0126	<0.000005	0.00000222	0.00272	0.00267	0.00737	0.009	11	0.0063	0.0122	0.0463	416
2020	Q2	LC_LC3	8.97	9.52	0.0141	0.015	<0.000005	<0.0000005	0.00244	0.00257	0.00744	0.0076	9.2	<0.001	0.0061	<0.002	309
2020	Q2	LC_LC5	7.14	7.37	0.00114	0.006	<0.000005	0.00000082	0.00125	0.0012	0.00185	0.00224	7.7	0.0034	0.0057	0.0056	306
2020	Q2	LC_LCDSSLCC	7.25	7.74	0.00418	0.00728	<0.000005	<0.0000005	0.00176	0.00175	0.00422	0.0044	6.6	<0.001	0.009	<0.002	315
2020	Q3	FR_FRABCH	11.4	11.9	0.00515	0.0051	<0.000005	0.00000059	0.00117	0.00112	0.00154	0.00152	19	0.0068	0.0071	<0.001	418
2020	Q3	FR_FRCP1	11.6	12.1	0.00373	0.00433	<0.000005	<0.0000005	0.00264	0.00253	0.00569	0.00526	13	0.0109	0.0106	<0.002	432
2020	Q3	GH_FR1	8.66	8.68	0.00194	0.00474	<0.000005	0.00000206	0.00116	0.00113	0.00111	0.00145	10	0.0085	0.0197	0.0374	426
2020	Q3	GH_ERC	3.36	3.33	0.00126	0.00307	<0.000005	<0.0000005	0.00104	0.00105	<0.0005	<0.0005	0.36	<0.001	0.0092	<0.001	440
2020	Q3	RG_MIDAG	9.39	9.58	0.002	0.00289	<0.000005	<0.0000005	0.00101	0.00107	0.00948	0.01	1.52	0.0044	0.0215	0.003	498
2020	Q3	EV_MC2	6.2	6.49	0.00175	0.0022	<0.000005	<0.0000005	0.00079	0.000892	0.00102	0.00107	1.45	0.003	0.0079	0.002	410
2020	Q3	EV_HC1	7.26	7.65	0.00528	0.00564	<0.000005	<0.0000005	0.000896	0.000967	0.00064	0.00073	0.566	<0.001	0.0074	0.0044	361
2020	Q3	LC_DCDS	7.97	7.45	0.00161	0.0043	<0.000005	0.00000141	0.00404	0.00428	0.0118	0.013	28	0.109	0.0748	0.0122	433
2020	Q3	LC_LC3	12.5	12.1	0.0251	0.0273	<0.000005	<0.0000005	0.00412	0.00399	0.00933	0.0095	11	<0.005	0.0284	0.0027	481
2020	Q3	LC_LC5	7.84	8.07	0.00037	0.00086	<0.000005	<0.0000005	0.00139	0.00129	0.00088	0.00114	8.7	0.0058	0.0061	<0.002	476
2020	Q4	FR_FRABCH	13.8	12.7	0.00436	0.00441	<0.000005	<0.0000005	0.000968	0.000967	0.00091	0.00099	22	0.0073	0.0151	<0.001	417
2020	Q4	GH_FR1	11	10.2	0.00148	0.0102	<0.000005	0.00000348	0.00106	0.00115	0.00093	0.00226	13	0.0038	<0.005	<0.002	383
2020	Q4	GH_ERC	3.75	3.57	0.00073	0.00151	<0.000005	<0.0000005	0.00101	0.00109	<0.0005	<0.0005	0.461	0.0011	<0.005	<0.001	406
2020	Q4	RG_MIDAG	5.99	6.19	0.00166	0.00462	<0.000005	0.00000057	0.000851	0.000833	0.00531	0.0057	0.791	0.0011	0.0061	0.0031	215
2020	Q4	EV_MC2	6.62	6.04	0.00135	0.00174	<0.000005	<0.0000005	0.000808	0.000888	0.00063	0.00076	1.69	0.0014	0.0066	0.0026	497
2020	Q4	EV_HC1	8.52	7.8	0.00256	0.00282	<0.000005	<0.0000005	0.000962	0.000983	0.00062	0.00064	0.781	<0.001	<0.005	0.0043	423
2020	Q4	LC_DCDS	11.2	10.2	0.00185	0.00196	<0.000005	0.00000067	0.00394	0.00456	0.0146	0.015	45	0.0099	0.0086	0.0208	449
2020	Q4	LC_LC3	15.4	13.9	0.0368	0.0405	<0.000005	<0.0000005	0.00433	0.0045	0.00966	0.01	12	<0.005	0.0085	0.0057	440
2020	Q4	LC_LC5	9.41	8.47	0.00032	0.0004	<0.000005	<0.0000005	0.0012	0.00125	0.00088	0.0009	11	0.0031	0.0125	<0.002	413
2020	Q4	LC_LCDSSLCC	9.688	9.684	0.004162	0.005082	0.0000025	0.00000025	0.00249	0.002524	0.00452	0.00458	8.1	0.00212	0.01028	0.00168	437.8
2021	Q1	FR_FRABCH	14.8	14	0.0075	0.0103	<0.000005	<0.0000005	0.00125	0.00129	0.00334	0.00344	27	0.0103	0.0053	<0.001	251
2021	Q1	GH_FR1	11.9	11.2	0.00362	0.00199	<0.000005	<0.0000005	0.00105	0.00106	0.00166	0.00178	16	0.0067	<0.005	0.0017	433
2021	Q1	GH_ERC	4.11	3.97	0.00034	0.00111	<0.000005	<0.0000005	0.00102	0.00109	<0.0005	<0.0005	0.655	<0.001	<0.005	0.0013	396
2021	Q1	RG_MIDAG	8.21	8.6	0.0012	0.00512	<0.000005	<0.0000005	0.000879	0.00079	0.00306	0.00294	1.06	0.0017	0.0053	0.0026	479
2021	Q1	EV_MC2	6.12	5.77	0.00121	0.00216	<0.000005	0.00000068	0.000887	0.00085	0.00116	0.00136	1.24	<0.001	0.0086	0.0017	382
2021	Q1	EV_HC1	9	8.37	0.00174	0.00236	<0.000005	<0.0000005	0.000899	0.000909	0.00073	0.00077	1.05	<0.001	0.0057	0.0043	288
2021	Q1	LC_DCDS	6.41	6.38	0.0341	0.036	<0.000005	0.00000282	0.00537	0.00562	0.00244	0.00327	18	0.0509	0.0178	0.0132	299
2021	Q1	LC_LC3	13.6	12.9	0.0322	0.0317	<0.000005	-	0.00373	0.00364	0.00803	0.0078	13	<0.005	<0.005	0.0016	290
2021	Q1	LC_LC5	10.4	10	0.00047	0.00133	<0.000005	<0.0000005	0.00133	0.00138	0.0012	0.00123	14	0.0077	<0.005	<0.001	258
2021	Q1	LC_LCDSSLCC	11.1	10.7	0.00573	0.00813	<0.000005	<0.0000005	0.00256	0.0026	0.00436	0.00444	11	0.0032	0.0127	<0.001	290
2021	Q2	FR_FRABCH	6.62	6.22	0.00536	0.0441	<0.000005	0.00000579	0.00105	0.000965	0.00182	0.00405	9.7	<0.001	0.0184	<0.001	312
2021	Q2	FR_FRCP1	5.48	5.3	0.00211	0.0594	<0.000005	0.00000362	0.00119	0.000919	0.00248	0.0057	7.2	0.0059	0.0269	<0.001	411
2021	Q2	GH_FR1	5.71	5.19	0.00346	0.0311	<0.000005	0.00000379	0.00098	0.000823	0.00119	0.00261	5.9	0.0033	0.0184	<0.001	242
2021	Q2	GH_ERC	3.36	3.18	0.00251	0.117	<0.000005	0.00000881	0.00093	0.00097	<0.0005	0.00428	0.271	<0.001	0.0114	<0.001	263
2021	Q2	CM_MC2	5.65	5.51	0.00914	0.0571	<0.000005	0.00000353	0.000708	0.000654	0.0102	0.013	1.07	0.0061	0.0352	<0.001	178
2021	Q2	RG_MIDAG	3.93	3.64	0.00269	0.0287	<0.000005	0.00000296	0.000487	0.000603	0.00329	0.006	0.478	0.0022	0.0284	0.0019	269
2021	Q2	EV_MC2	2.65	2.38	0.00271	0.39	<0.000005	0.000015	0.000486	0.000826	0.00096	0.026	0.301	0.001	0.0086	0.0113	219
2021	Q2	EV_HC1	4.76	4.43	0.00121	0.0169	<0.000005	0.00000428	0.000565	0.000601	0.00061	0.00183	0.385	<0.001	0.0123	0.0064	211
2021	Q2	LC_DCDS	4.8	4.65	0.0632	0.078	<0.000005	0.0000057	0.0034	0.00303	0.0028	0.0056	12	0.044	0.0469	0.0134	378
2021	Q2	LC_LC3	8.17	7.46	0.00497	0.0077	<0.000005	0.00000084	0.00226	0.00244	0.00736	0.008	7.4	<0.001	0.0119	0.0026	403
2021	Q2	LC_LC5	5.78	5	0.00141	0.0696	<0.000005	0.00000531	0.000982	0.000962	0.00112	0.00382	5.7	0.0026	0.0098	<0.001	469
2021	Q2	LC_LCDSSLCC	5.34	4.78	0.00156	0.0107	<0.000005	0.00000122	0.00126	0.00135	0.00292	0.00373	3.5	<0.001	0.0076	<0.001	428
2021	Q3	FR_FRABCH	12.6	12.4	0.00454	0.00503	<0.000005	<0.0000005	0.00117	0.00122	0.00142	0.00147	23	0.0092	0.0522	<0.001	411
2021	Q3	GH_FR1	9.09	9.1	0.00142	0.00195	<0.000005	<0.0000005	0.00115	0.00103	0.00103	0.00109	13	0.006	0.0501	<0.001	412
2021	Q3	GH_ERC	3.29	3.14	0.00108	0.00293	<0.000005	<0.0000005	0.00111	0.00105	<0.0005	<0.0005	0.191	<0.001	0.0123	0.0011	479
2021	Q3	CM_MC2	10.6	11	0.00332	0.00455	<0.000005	<0.0000005	0.0011	0.00116	0.0201	0.021	1.5	0.0071	<0.005	<0.001	493
2021	Q3	RG_MIDAG	6	5.42	0.00178	0.00295	<0.000005	<0.0000005	0.000846	0.000875	0.00418	0.00461	0.574	<0.001	0.0335	0.0016	453
2021	Q3	EV_MC2	5.76	5.88	0.00179	0.00296	<0.000005	<0.0000005	0.00147	0.00151	0.0018	0.00193	0.76	0.0021	0.0134	0.0023	490
2021	Q3	EV_HC1	7.22	7.18	0.00333	0.00603	<0.000005	0.0000006	0.000891	0.000879	0.00057	0.0007	0.478	0.0011	0.0097	0.0019	453
2021	Q3	LC_LC3	12.8	10.8	0.0144	0.0162	<0.000005	<0.0000005	0.00358	0.00366	0.00935	0.0096	9.9	<0.005	0.0071	<0.001	490
2021	Q3	LC_LC5	8.27	8.08	0.00029	0.00071	<0.000005	<0.0000005	0.00135	0.00142	0.00117	0.00122	10	0.0044	0.0057	<0.001	486
2021	Q3	LC_LCDSSLCC	8.98	8.39	0.00276	0.00382	<0.000005	<0.0000005	0.00233	0.00234	0.00485	0.00506	7.5	0.001	<0.005	<0.001	298
2021	Q4	FR_FRABCH	13.4	13.4	0.00462	0.00508	<0.000005	0.00000055	0.000997	0.00106	0.00146	0.00168	23	<0.005	0.0073	0.0017	461
2021	Q4	GH_FR1	10.3	9.8	0.00137	0.00156	<0.000005	<0.0000005	0.000994	0.00106	0.00085	0.0009	13	0.0033	<0.005	<0.001	452
2021	Q4	GH_ERC	3.55	3.47	0.00053	0.00078	<0.000005	<0.0000005	0.0011	0.00124	<0.0005	<0.0005	0.279	<0.001	0.0065	<0.001	450
2021	Q4	RG_MIDAG	7.94	7.58	0.00094	0.00177	<0.000005	<0.0000005	0.000814	0.000814	0.00179	0.00258	0.784	<0.001	0.0322	0.0015	455
2021	Q4	EV_MC2	8.12	7.96	0.00147	0.00236	<0.000005	<0.0000005	0.00138	0.00145	0.00147	0.00147	2.14	0.0018	<0.005	<0.001	452
2021	Q4	EV_HC1	8.02	7.8	0.0034	0.00476	<0.000005	0.00000058	0.000961	0.000944	0.00068	0.00067	0.602	<0.001	<0.005	0.0034	470
2021	Q4	LC_LC5	9.04	8.85	0.00037	0.00572	<0.000005	<0.0000005	0.00135	0.00137	0.00124	0.00141	10	0.0032	<0.005	<0.001	453
2021	Q4	LC_LCDSSLCC	10.2	9.45	0.00404	0.00544	<0.000005	<0.0000005	0.00268	0.00277	0.00454	0.00512	6.9	<0.001	<0.005	<0.001	450

Year	Quarter	Sample ID	pH LAB-N-ph units	PHOSPHORUS-N-mg/l	POTASSIUM-D-mg/l	POTASSIUM-T-mg/l	SELENIUM-D-mg/l	SELENIUM-T-mg/l	SILICON-D-mg/l	SILICON-T-mg/l	SILVER-D-mg/l	SILVER-T-mg/l	SODIUM-D-mg/l	SODIUM-T-mg/l
2018	Q3	LC_LCDSSLCC	8.4	0.004	1.4	1.4	0.052	0.051	2.3	2.6	<0.00001	<0.00001	6.1	6.4
2018	Q4	FR_FRABCH	8.3	0.0021	1.9	1.8	0.095	0.091	2.3	2.4	<0.00001	<0.00001	2.7	2.6
2018	Q4	GH_FR1	8.5	<0.002	1.4	1.3	0.063	0.06	2.2	2.3	<0.00001	<0.00001	2.3	2.3
2018	Q4	GH_ERC	8.4	<0.002	0.41	0.46	0.0017	0.0016	1.80	2.3	<0.00001	<0.00001	0.89	0.89
2018	Q4	EV_MC2	8.4	0.0047	1.1	1.1	0.014	0.012	2.2	2.4	<0.00001	<0.00001	3.9	4.0
2018	Q4	EV_HC1	8.4	0.01	0.95	0.9	0.042	0.041	2.1	2.3	<0.00001	<0.00001	1.8	1.7
2019	Q1	GH_FR1	8.2	0.0025	1.12	1.17	0.074	0.06	2.33	2.41	<0.00001	<0.00001	2.44	2.38
2019	Q1	GH_ERC	8.1	<0.002	0.317	0.334	0.00198	0.0018	1.63	1.73	<0.00001	<0.00001	0.876	0.872
2019	Q1	RG_MIDAG	8.2	0.0037	0.925	0.873	0.0057	0.0049	1.93	1.8	<0.00001	<0.00001	7.8	6.94
2019	Q1	EV_MC2	8.2	0.0056	0.905	0.832	0.0198	0.016	2.48	2.33	<0.00001	<0.00001	3.92	3.58
2019	Q1	EV_HC1	8.2	0.0082	0.825	0.84	0.0475	0.04	2.13	2.17	<0.00001	<0.00001	1.78	1.75
2019	Q1	LC_DCDS	8.2	0.0264	2.17	2.06	0.0219	0.019	2.71	2.82	<0.00001	<0.00001	1.57	1.52
2019	Q1	LC_LC3	8.2	0.0057	2.04	1.95	0.0343	0.028	2.02	2.12	<0.00001	<0.00001	13.6	13.2
2019	Q1	LC_LC5	8.3	<0.002	0.994	1.01	0.0495	0.044	2.31	2.4	<0.00001	<0.00001	3.44	3.43
2019	Q1	LC_LCDSSLCC	8.2	<0.002	1.28	1.29	0.0375	0.032	2.29	2.36	<0.00001	<0.00001	8.46	8.32
2019	Q2	FR_FRABCH	8.3	0.0039	1.85	2.03	0.095	0.087	1.8	2	<0.00001	<0.00001	2.66	3.27
2019	Q2	FR_FRCP1	8.4	0.0024	1.73	1.72	0.0679	0.063	1.4	1.46	<0.00001	<0.00001	1.56	1.58
2019	Q2	GH_FR1	8.3	0.003	1.31	1.32	0.0718	0.059	1.98	2.06	<0.00001	<0.00001	2.34	2.48
2019	Q2	GH_ERC	8.2	0.0036	0.334	0.355	0.00286	0.0024	1.7	1.79	<0.00001	<0.00001	0.939	1
2019	Q2	CM_MC2	8.4	0.004	1.11	1.19	0.00861	0.0071	1.92	2.01	<0.00001	<0.00001	7.02	7.06
2019	Q2	RG_MIDAG	8.3	0.0062	0.739	0.726	0.00443	0.0043	1.72	1.81	<0.00001	<0.00001	4.58	5.23
2019	Q2	EV_MC2	8.3	0.0047	0.661	0.656	0.00582	0.0051	1.69	1.81	<0.00001	<0.00001	2.6	2.61
2019	Q2	EV_HC1	8.5	0.008	0.876	0.955	0.0433	0.037	1.68	1.88	<0.00001	<0.00001	1.64	1.72
2019	Q2	LC_DCDS	8.7	0.0119	1.65	1.66	0.0203	0.02	0.987	1.79	<0.00001	<0.00001	1.44	1.36
2019	Q2	LC_LC3	8.2	0.0033	1.52	1.55	0.0435	0.041	1.94	2.02	<0.00001	<0.00001	8.43	8.73
2019	Q2	LC_LC5	8.3	0.0037	1.11	1.13	0.0473	0.046	1.74	1.91	<0.00001	<0.00001	3.11	3.23
2019	Q2	LC_LCDSSLCC	8.3	0.0036	1.13	1.15	0.0327	0.03	2.01	2.04	<0.00001	<0.00001	6.11	6.14
2019	Q3	FR_FRABCH	8.4	<0.002	1.84	1.79	0.0687	0.057	1.95	2.28	<0.00001	<0.00001	2.02	2
2019	Q3	GH_FR1	8.4	<0.002	1.32	1.28	0.048	0.043	2.22	2.17	<0.00001	<0.00001	1.96	1.89
2019	Q3	GH_ERC	8.3	<0.002	0.381	0.377	0.00159	0.00144	1.92	1.87	<0.00001	<0.00001	0.746	0.738
2019	Q3	CM_MC2	8.4	0.0022	1.88	1.72	0.00979	0.0084	1.99	2.21	<0.00001	<0.00001	10.6	10.7
2019	Q3	RG_MIDAG	8.4	0.0023	0.888	0.833	0.00432	0.004	1.86	1.92	<0.00001	<0.00001	4.66	4.6
2019	Q3	EV_MC2	8.5	0.0026	0.915	0.823	0.0127	0.011	2.27	2.15	<0.00001	<0.00001	3.23	3.02
2019	Q3	EV_HC1	8.4	0.0085	0.951	0.879	0.0377	0.031	2.18	2.05	<0.00001	<0.00001	1.58	1.5
2019	Q3	LC_DCDS	8.4	0.019	1.94	2.2	0.0339	0.033	1.54	1.66	<0.00001	<0.00001	2.28	2.63
2019	Q3	LC_LC3	8.1	<0.002	1.58	1.6	0.0337	0.028	2.12	2.29	<0.00001	<0.00001	8.41	8.56
2019	Q3	LC_LC5	8.3	0.0029	1.13	1.16	0.0365	0.03	2.08	2.25	<0.00001	<0.00001	2.49	2.55
2019	Q3	LC_LCDSSLCC	8.2	<0.002	1.13	1.14	0.0291	0.024	2.16	2.28	<0.00001	<0.00001	5.43	5.54
2019	Q4	FR_FRABCH	8.3	0.0646	1.62	1.67	0.0819	0.077	2.56	2.36	<0.00001	<0.00001	2.32	2.29
2019	Q4	FR_FRCP1	8.3	0.0021	2.17	2.28	0.124	0.13	1.87	1.94	<0.00001	<0.00001	2.03	2.02
2019	Q4	GH_FR1	8.3	<0.002	1.21	1.32	0.0545	0.053	2.4	2.48	<0.00001	<0.00001	2.17	2.45
2019	Q4	GH_ERC	8.2	<0.002	0.413	0.439	0.00275	0.0024	1.99	2.06	<0.00001	<0.00001	1.07	1.07
2019	Q4	CM_MC2	8.4	0.0178	1.76	1.96	0.0116	0.0093	2.17	2.88	<0.00001	<0.00001	12.3	11.4
2019	Q4	RG_MIDAG	8.3	0.0059	0.893	0.915	0.00637	0.0054	1.79	1.97	<0.00001	<0.00001	6.26	6.24
2019	Q4	EV_MC2	8.3	0.0035	0.965	0.937	0.0146	0.014	2.33	2.44	<0.00001	<0.00001	4	4.01
2019	Q4	EV_HC1	8.3	0.0058	0.827	0.821	0.0409	0.04	2.08	2.12	<0.00001	<0.00001	1.62	1.57
2019	Q4	LC_DCDS	8.2	0.0261	2.21	2.37	0.053	0.048	2.54	2.69	<0.00001	<0.00001	2.75	2.61
2019	Q4	LC_LC3	8.2	0.005	1.75	1.89	0.0466	0.04	2.13	2.23	<0.00001	<0.00001	13	12.9
2019	Q4	LC_LC5	8.3	<0.002	1.09	1.06	0.0411	0.039	2.26	2.3	<0.00001	<0.00001	3.55	3.52
2019	Q4	LC_LCDSSLCC	8.2	0.0034	1.23	1.27	0.0382	0.034	2.23	2.34	<0.00001	<0.00001	8	7.67
2020	Q1	FR_FRABCH	8.2	0.036	1.73	1.72	0.0969	0.095	2.53	2.83	<0.00001	<0.00001	2.5	2.5
2020	Q1	GH_ERC	8.2	<0.002	0.41	0.377	0.00391	0.0036	1.99	1.83	<0.00001	<0.00001	1.21	1.22
2020	Q1	CM_MC2	8.3	0.0044	2.32	2.29	0.0082	0.0076	2.32	2.46	<0.00001	<0.00001	18.1	18.6
2020	Q1	RG_MIDAG	8.3	0.0027	1.13	1.19	0.00554	0.0057	1.92	2.18	<0.00001	<0.00001	9.95	10.6
2020	Q1	EV_MC2	8.2	0.0042	0.973	1.05	0.0159	0.016	2.36	2.54	<0.00001	<0.00001	4.33	4.18
2020	Q1	EV_HC1	8.3	0.0079	0.862	0.906	0.0419	0.04	2.04	2.3	<0.00001	<0.00001	1.79	1.75
2020	Q1	LC_LC3	7.9	0.001	1.93	1.92	0.0425	0.04	2.01	2.27	<0.00001	<0.00001	15.6	15
2020	Q1	LC_LC5	8.3	<0.001	1.03	1.04	0.0443	0.041	2.17	2.28	<0.00001	<0.00001	3.52	3.56
2020	Q1	LC_LCDSSLCC	8.3	0.0012	1.32	1.35	0.0412	0.04	2.2	2.43	<0.00001	<0.00001	9.42	9.03
2020	Q1	FR_FR4	8.2	<0.001	2.36	2.47	0.138	0.15	1.72	2.13	<0.00001	<0.00001	2.3	2.4
2020	Q2	FR_FRABCH	8.4	0.0091	1.86	1.57	0.0687	0.061	1.85	1.74	<0.00001	<0.00001	1.88	1.59
2020	Q2	FR_FRCP1	8.4	<0.001	1.9	1.69	0.0612	0.059	1.65	1.69	<0.00001	<0.00001	1.32	1.18
2020	Q2	GH_FR1	8.4	0.0022	1.23	1.31	0.046	0.047	2.28	2.7	<0.00001	<0.00001	1.92	2.03
2020	Q2	GH_ERC	8.3	0.0074	0.413	0.462	0.00417	0.0042	1.95	2.28	<0.00001	<0.00001	1.24	1.27
2020	Q2	CM_MC2	8.4	<0.002	1.32	1.45	0.00854	0.0077	2.21	2.38	<0.00001	<0.00001	8.76	9.67
2020	Q2	RG_MIDAG	8.4	0.0027	0.795	0.898	0.00362	0.0038	1.86	2.05	<0.00001	<0.00001	4.87	5.27
2020	Q2	EV_MC2	8.4	0.0089	0.662	0.743	0.0055	0.0053	2.16	2.62	<0.00001	<0.00001	2.51	2.44
2020	Q2	EV_HC1	8.5	0.0054	0.875	0.944	0.0343	0.033	1.74	1.97	<0.00001	<0.00001	1.4	1.42
2020	Q2	LC_DCDS	8.3	0.0331	1.61	1.61	0.0203	0.022	2.29	2.77	<0.00001	<0.00001	1.31	1.35
2020	Q2	LC_LC3	8.3	0.0015	1.54	1.41	0.0378	0.037	2.01	1.98	<0.00001	<0.00001	6.75	6.74
2020	Q2	LC_LC5	8.4	0.0014	1.19	1.1	0.0354	0.035	1.83	1.9	<0.00001	<0.00001	2.65	2.56
2020	Q2	LC_LCDSSLCC	8.4	0.0016	1.21	1.08	0.027	0.027	1.99	2	<0.00001	<0.00001	5.09	4.75
2020	Q3	FR_FRABCH	8.3	<0.002	1.86	1.8	0.08	0.08	2.14	2.21	<0.00001	<0.00001	2.31	2.05
2020	Q3	FR_FRCP1	8.4	<0.001	2.05	2.04	0.0879	0.085	1.98	2.07	<0.00001	<0.00001	1.62	1.54
2020	Q3	GH_FR1	8.5	<0.001	1.3	1.41	0.0509	0.049	2.31	2.4	<0.00001	<0.00001	2.03	2.38
2020	Q3	GH_ERC	8.4	0.0021	0.401	0.524	0.00161	0.00159	1.94	1.97	<0.00001	<0.00001	0.762	0.94
2020	Q3	RG_MIDAG	8.2	0.002	1.31	1.44	0.00571	0.0056	1.88	2.1	<0.00001	<0.00001	18.2	18.4
2020	Q3	EV_MC2	8.4	<0.001	0.945	0.974	0.0124	0.013	2.2	2.32	<0.00001	<0.00001	5.2	4.88
2020	Q3	EV_HC1	8.4	0.0039	0.888	0.909	0.0324	0.033	2.04	2.28	<0.00001	<0.00001	1.45	1.53
2020	Q3	LC_DCDS	8.3	0.0022	2.33	2.32	0.0532	0.054	1.24	1.34	<0.00001	<0.00001	3.72	3.86
2020	Q3	LC_LC3	8.4	0.0018	1.77	1.75	0.0384	0.039	2.3	2.33	<0.00001	<0.00001	9.91	9.96
2020	Q3	LC_LC5	8.4	<0.001	1.27	1.2	0.0373	0.038	2.36	2.39	<0.00001	<0.00001	3.21	3.06
2020	Q4	FR_FRABCH	8.3	0.0021	1.99	1.99	0.101	0.093	2.12	2.25	<0.00001	<0.00001	2.5	2.59
2020	Q4	GH_FR1	8.3	<0.001	1.46	1.62	0.0628	0.063	2.32	2.76	<0.00001	0.000014	2.29	2.52
2020	Q4	GH_ERC	8.3	<0.002	0.411	0.452	0.00186	0.00184	1.99	2.04	<0.00001	<0.00001	1	1.1
2020	Q4	RG_MIDAG	8.2	0.0026	0.821	0.863	0.00348	0.0032	1.68	1.84	<0.00001	<0.00001	12	12.1
2020	Q4	EV_MC2	8.3	<0.001	0.895	0.944	0.0135	0.013	2.02	2.15	<0.00001	0.00001	5.09	5.26
2020	Q4	EV_HC1	8.4	0.0037	0.91	0.913	0.0387	0.037	1.93	2.08	<0.00001	<0.00001	1.52	1.59
2020	Q4	LC_DCDS	8.2	0.0233	2.62	2.63	0.0681	0.075	2.37	2.34	<0.00001	<0.00001	4.94	5.23
2020	Q4	LC_LC3	8.4	0.0011	1.93	1.96	0.0483	0.049	2.01	2.05	<0.00001	<0.00001	11.2	11.7
2020	Q4	LC_LC5	8.4	<0.001	1.22	1.21	0.0458	0.047	2.08	2.14	<0.00001	<0.00001	3.23	3.35
2020	Q4	LC_LCDSSLCC	8.4	0.0014	1.326	1.368	0.0342	0.036	2.306	2.486	0.000005	0.000005	6.886	7.034
2021	Q1	FR_FRABCH	8.3	0.0024	2.08	2.11	0.118	0.11	2.02	2.28	<0.00001	<0.00001	2.98	2.98
2021	Q1	GH_FR1	8.3	0.003	1.53	1.49	0.0781	0.071	2.08	1.97	<0.00001	<0.00001	2.95	2.88
2021	Q1	GH_ERC	8.2	0.0054	0.398	0.37	0.00405	0.0037	1.85	1.74	<0.00001	<0.00001	1.19	1.14
2021	Q1	RG_MIDAG	8.4	0.0045	1.08	1.06	0.00532	0.0046	1.98	2.26	<0.00001	<0.00001	13	13
2021	Q1	EV_MC2	8.3	0.003	0.866	0.853	0.014	0.013	2.36	2.61	<0.00001	<0.00001	4.98	5.02
2021	Q1	EV_HC1	8.6	0.0039	1	0.945	0.0483	0.048	1.82	1.97	<0.00001	<0.00001	1.76	1.75
2021	Q1	LC_DCDS	8.2	0.0301	2.02	2	0.0305	0.033	2.61	2.79	<0.00001	<0.00001	2.71	2.58
2021	Q1	LC_LC3	8.4	0.0024	2.12	1.95	0.0465	0.044	2.13	2.05	<0.00001	<0.00001	13.6	12.9
2021	Q1	LC_LC5	8.4	0.0024	1.42	1.28	0.0598	0.055	2.17	2.08	<0.00001	<0.00001	4.28	3.96
2021	Q1	LC_LCDSSLCC	8.5	<0.002	1.64	1.56	0.0421	0.04	2.14	2.08	<0.00001	<0.00001	9.75	9.65
2021	Q2	FR_FRABCH	8.2	0.126	1.16	1.38	0.0362	0.036	1.69	2.98	<0.00001	0.000013	1.18	1.29
2021	Q2	FR_FRCP1	8.1	0.0308	1.06	1.16	0.0274	0.026	1.56	2.3	<0.00001	<0.00001	0.936	0.989
2021	Q2	GH_FR1	8.2	0.0271	1.09	1.13	0.0264	0.025	1.82	2.39	<0.00001	<0.00001	1.37	1.38
2021	Q2	GH_ERC	8.2	0.225	0.419	0.929	0.00167	0.00178	1.85	3.97	<0.00001	0.00005	0.858	0.899
2021	Q2	CM_MC2	8.2	0.0717	0.999	1.17	0.0049	0.0046	1.97	2.79	<0.00001	<0.00001	11.9	11.7
2021	Q2	RG_MIDAG	8.1	0.057	0.57	0.845	0.00228	0.0023	1.56	2.61	<0.00001	<0.00001	5.15	5.3
2021	Q2	EV_MC2	7.8	0.242	0.546	1.99	0.0019	0.003	1.82	9.54	<0.00001	0.000294	2.1	2.08
2021	Q2	EV_HC1	8.2	0.0334	0.666	0.853	0.0163	0.017	1.84	2.59	<0.00001	0.000015	1.06	1.03
2021	Q2	LC_DCDS	8.1	0.0539	1.97	2.05	0.0263	0.028	2.49	3.32	<0.00001	0.000016	2.14	2.13
2021	Q2	LC_LC3	8.2	0.003	1.4	1.46	0.0506	0.049	1.76	1.86	<0.00001	<0.00001	5.2	5.48
2021	Q2	LC_LC5	8.2	0.124	0.907	1.14	0.0254	0.025	1.83	2.84	<0.00001	0.000016	1.73	1.73
2021	Q2	LC_LCDSSLCC	8.1	<0.002	0.798	0.825	0.0227	0.022	1.66	1.85	<0.00001	<0.00001	2.84	2.95
2021	Q3	FR_FRABCH	8.3	<0.002	2.07	2.04	0.0918	0.092	2.1	2.19	<0.00001	<0.00001	2.71	2.74
2021	Q3	GH_FR1	8.4	0.0028	1.45	1.4	0.0568	0.054	2.19	2.32	<0.00001	<0.00001	2.4	2.43
2021	Q3	GH_ERC	8.3	0.0038	0.393	0.389	0.00145	0.00139	1.84	1.89	<0.00001	<0.00001	0.752	0.763
2021	Q3	CM_MC2	8.3	0.0091	1.97	2.02	0.00758	0.0067	2.02	2.14	<0.00001	<0.00001	19.8	19.7
2021	Q3	RG_MIDAG	8.4	0.0044	0.852	0.865	0.00308	0.0031	1.71	1.77	<0.00001	<0.00001	6.74	6.92
2021	Q3	EV_MC2	8.3	0.0068	1.1	0.987	0.00663	0.0067	2.26	2.33	<0.00001	<0.00001	4.66	4.41
2021	Q3	EV_HC1	8.4	0.0096	0.986	0.9	0.0312	0.03	2.11	2.21	<0.00001	<0.00001	1.5	1.49
2021	Q3	LC_LC3	8.4	0.0048	1.82	1.88	0.0375	0.038	2.06	2.2	<0.00001	<0.00001	9.33	9.42
2021	Q3	LC_LC5	8.4	0.0091	1.34	1.29	0.0422	0.04	2.3	2.32	<0.00001	<0.00001	3.4	3.25
2021	Q3	LC_LCDSSLCC	8.4	<0.002	1.31	1.39	0.0315	0.033	2.16	2.38	<0.00001	<0.00001	6.54	6.76
2021	Q4	FR_FRABCH	8.2	0.0055	2.21	2.22	0.108	0.1	2.39	2.51	<0.00001	<0.00001	3.16	3.41
2021	Q4	GH_FR1	8.3	0.0148	1.42	1.58	0.0612	0.062	2.21	2.51	<0.00001	<0.00001	2.57	2.78
2021	Q4	GH_ERC	8.3	0.0033	0.422	0.452	0.00188	0.0021	1.91	2.17	<0.00001	<0.00001	0.909	0.963
2021	Q4	RG_MIDAG	8.3	0.0106	1.01	1.03	0.00497	0.0052	1.93	1.99	<0.00001	<0.00001	8.4	8.51
2021	Q4	EV_MC2	8.2	0.0064	1.35	1.29	0.0224	0.017	2.76	2.61	<0.00001	<0.00001	6.55	6.44
2021	Q4	EV_HC1	8.3	0.0106	0.974	0.971	0.0384	0.036	2.1	2.24	<0.00001	<0.00001	1.66	1.66
2021	Q4	LC_LC5	8.4	0.0063	1.34	1.37	0.0434	0.044	2.25	2.47	<0.00001	<0.00001	4.03	4.07
2021	Q4	LC_LCDSSLCC	8.3	0.0024	1.42	1.52	0.0318	0.033	2.11	2.31	<0.00001	<0.00001	8.5	9.08

Year	Quarter	Sample ID	Hardness Total or Dissolved CaCO3-N-mg/l	IRON-D-mg/l	IRON-T-mg/l	LEAD-D-mg/l	LEAD-T-mg/l	LITHIUM-D-mg/l	LITHIUM-T-mg/l	MAGNESIUM-D-mg/l	MAGNESIUM-T-mg/l
Test categorized as possible or likely response (2015 to 2020)											
2015	Q1	FR_FRCP1	1880	< 0.020	< 0.020	< 0.00010	< 0.00010	0.054	0.056	257	261
2015	Q2	CM_MC2	248	< 0.010	0.3	< 0.000050	0.00017	0.0064	0.0067	23	23
2015	Q4	FR_FRCP1	597	< 0.010	0.019	< 0.000050	< 0.000050	0.042	0.037	65	65
2015	Q4	CM_MC2	505	< 0.010	< 0.010	< 0.000050	< 0.000050	0.011	0.012	51	51
2016	Q1	FR_FRCP1	1120	< 0.010	< 0.020	< 0.000050	< 0.000050	0.058	0.059	137	142
2016	Q2	GH_FR1	312	< 0.010	0.13	< 0.000050	0.000096	0.012	0.012	31	31
2016	Q2	CM_MC2	283	< 0.010	0.39	< 0.000050	0.00021	0.0083	0.0085	27	26
2016	Q2	LC_DCDS	100	0.014	0.215	<0.000050	0.000162	0.0052	0.0051	8.89	8.76
2016	Q3	FR_FRCP1	455	< 0.010	0.032	< 0.000050	< 0.000050	0.032	0.032	49	48
2016	Q3	CM_MC2	465	< 0.010	< 0.010	< 0.000050	< 0.000050	0.016	0.017	52	53
2016	Q4	FR_FRCP1	453	< 0.010	0.027	< 0.000050	< 0.000050	0.029	0.03	47	45
2016	Q4	CM_MC2	328	< 0.010	0.15	< 0.000050	0.000098	0.01	0.01	32	33
2016	Q4	EV_MC2	177	0.023	0.16	< 0.000050	0.00012	0.0064	0.0068	16	17
2016	Q4	LC_DCDS	139	0.014	0.245	<0.000050	0.000334	0.0084	0.0079	12.7	13
2017	Q1	FR_FRCP1	841	<0.01	0.03	<0.00005	<0.00005	0.056	0.056	-	106
2017	Q1	CM_MC2	529	<0.01	0.013	<0.00005	<0.00005	0.018	0.017	-	55
2017	Q1	EV_MC2	334	<0.01	0.029	<0.00005	<0.00005	0.018	0.017	-	32
2017	Q1	LC_LCDSSLCC	552	<0.01	0.025	<0.00005	<0.00005	0.04	0.039	-	58
2017	Q2	FR_FRCP1	392	0.018	0.49	<0.00005	0.00035	0.032	0.03	-	39
2017	Q2	CM_MC2	383	<0.01	0.16	<0.00005	0.00012	0.015	0.015	-	36
2017	Q2	CM_MC2	394	<0.01	0.11	<0.00005	0.000077	0.017	0.02	-	47
2017	Q2	EV_MC2	199	0.021	0.15	<0.00005	0.00016	0.0082	0.0077	-	17
2017	Q2	EV_HC1	335	<0.01	0.1	<0.00005	0.000076	0.0068	0.0068	-	38
2017	Q3	FR_FRCP1	447	<0.01	0.022	<0.00005	<0.00005	0.029	0.029	-	54
2017	Q3	GH_FR1	391	<0.01	0.013	<0.00005	<0.00005	0.019	0.018	-	43
2017	Q3	CM_MC2	426	<0.01	0.032	<0.00005	<0.00005	0.017	0.016	-	47
2017	Q4	FR_FRCP1	734	0.01	0.027	<0.00005	<0.00005	0.042	0.042	-	90
2017	Q4	CM_MC2	540	<0.01	0.013	<0.00005	<0.00005	0.022	0.023	-	58
2018	Q1	FR_FRCP1	984	<0.01	0.018	<0.00005	<0.00005	0.055	0.056	120	114
2018	Q1	CM_MC2	559	<0.01	0.011	<0.00005	<0.00005	0.017	0.017	60	60
2018	Q1	EV_MC2	387	<0.02	<0.01	<0.0001	<0.00005	0.019	0.02	37	40
2018	Q2	FR_FRCP1	317	<0.01	0.38	<0.00005	0.00028	0.019	0.022	33	34
2018	Q2	GH_FR1	322	0.019	1.1	<0.00005	0.00084	0.011	0.012	35	34
2018	Q2	GH_ERC	194	<0.01	0.74	<0.00005	0.00048	0.0031	0.0039	15	15
2018	Q2	CM_MC2	385	<0.01	0.24	<0.00005	0.00016	0.016	0.016	37	35
2018	Q2	CM_MC3	262	<0.01	0.13	<0.00005	0.000096	0.008	0.0084	23	22
2018	Q2	LC_LC5	346	<0.010	0.593	<0.000050	0.000426	0.017	0.0175	33.5	31.7
2018	Q2	LC_LCDSSLCC	412	<0.01	0.048	<0.00005	0.000077	0.034	0.033	41	37
2018	Q3	FR_FRCP1	589	<0.01	0.06	<0.00005	<0.00005	0.033	0.032	68	61
2018	Q3	CM_MC2	637	<0.01	<0.01	<0.00005	<0.00005	0.029	0.031	67	60
2018	Q3	CM_MC3	366	<0.01	<0.01	<0.00005	<0.00005	0.015	0.014	34	31
2018	Q4	FR_FRCP1	2510	<0.02	0.029	<0.0001	<0.0001	0.087	0.087	362	369
2018	Q4	CM_MC2	542	<0.01	0.016	<0.00005	<0.00005	0.027	0.028	55	56
2018	Q4	CM_MC3	299	<0.01	0.013	<0.00005	<0.00005	0.011	0.012	27	27
2018	Q4	LC_DCDS	308	<0.010	<0.010	<0.000050	<0.000050	0.0117	0.0126	29.7	29.7
2018	Q4	LC_LC5	393	<0.010	<0.010	<0.000050	<0.000050	0.0198	0.0216	40.3	41.5
2018	Q4	LC_LCDSSLCC	433	<0.01	<0.01	<0.00005	<0.00005	0.037	0.038	46	47
2019	Q1	FR_FRABCH	657	<0.01	0.015	<0.00005	<0.00005	0.0301	0.0305	64	68.9
2019	Q1	FR_FRCP1	2680	<0.02	<0.02	<0.0001	<0.0001	0.0744	0.0744	383	343
2019	Q1	CM_MC2	579	<0.01	<0.01	<0.00005	<0.00005	0.0169	0.0159	61.8	58.8
2019	Q3	FR_FRCP1	403	<0.01	0.012	<0.00005	<0.00005	0.0235	0.0262	42.5	43.1
2020	Q1	FR_FRCP1	794	0.024	0.527	<0.00005	0.000326	0.056	0.0567	96.8	98.1
2020	Q1	GH_FR1	470	<0.01	<0.01	<0.00005	<0.00005	0.0185	0.0181	50.9	51
2020	Q1	LC_DCDS	420	<0.01	<0.01	<0.00005	<0.00005	0.0136	0.0152	39	35.1
2020	Q3	CM_MC2	639	<0.01	0.015	<0.00005	<0.00005	0.0344	0.0346	67.6	70.6
2020	Q3	LC_LCDSSLCC	433	<0.01	0.015	<0.00005	<0.00005	0.0355	0.0329	40.3	44.9
2020	Q4	FR_FRCP1	742	0.017	0.026	<0.00005	<0.00005	0.0455	0.0447	81.6	85
2020	Q4	CM_MC2	597	<0.01	0.03	<0.00005	<0.00005	0.0382	0.0361	59.2	62.5
Test categorized as possible or likely response (2021)											
2021	Q1	FR_FRCP1	716	0.01	0.036	<0.00005	<0.00005	0.063	0.0646	79.9	74.9

Year	Quarter	Sample ID	MAJOR ANION SUM-N-meq/l	MAJOR CATION SUM-N-meq/l	MANGANESE-D-mg/l	MANGANESE-T-mg/l	MERCURY-D-mg/l	MERCURY-T-mg/l	MOLYBDENUM-D-mg/l	MOLYBDENUM-T-mg/l	NICKEL-D-mg/l	NICKEL-T-mg/l	NITRATE NITROGEN (NO3) AS N-N-mg/l	NITRITE NITROGEN (NO2) AS N-N-mg/l	NITROGEN AMMONIA (AS N)-N-mg/l	ORTHO-PHOSPHATE-N-mg/l
Test categorized as possible or likely response (2015 to 2020)																
2015	Q1	FR_FRCP1	40	38	0.0019	0.0027	< 0.000010	< 0.000010	0.0028	0.0029	0.031	0.032	30	< 0.020	< 0.0050	< 0.0010
2015	Q2	CM_MC2	5.4	5.2	0.0035	0.011	< 0.0000050	0.0000084	0.00076	0.00081	0.0062	0.0076	1.2	0.0029	< 0.0050	< 0.0010
2015	Q4	FR_FRCP1	12	12	0.0076	0.0081	< 0.0000050	< 0.0000050	0.0015	0.0014	0.0068	0.0066	15	< 0.0050	< 0.0050	< 0.0010
2015	Q4	CM_MC2	10	11	0.00064	0.0012	< 0.0000050	< 0.0000050	0.00092	0.00096	0.0059	0.006	2.2	< 0.0050	< 0.0050	< 0.0010
2016	Q1	FR_FRCP1	23	23	0.0068	0.0075	< 0.0000050	< 0.00000050	0.0017	0.0018	0.013	0.013	28	< 0.010	< 0.0050	< 0.0010
2016	Q2	GH_FR1	6.2	6.3	0.0015	0.0056	< 0.0000050	0.0000025	0.001	0.001	0.0019	0.0022	6.5	0.0025	< 0.0050	0.002
2016	Q2	CM_MC2	6.0	5.9	0.0062	0.019	< 0.0000050	0.0000011	0.00076	0.00074	0.011	0.011	2.0	0.0037	0.0074	0.0028
2016	Q2	LC_DCDS	1.98	2.05	0.00134	0.00452	<0.0000050	0.00000241	0.000866	0.000881	0.00079	0.00114	0.397	<0.0010	<0.0050	0.0321
2016	Q3	FR_FRCP1	10	9.2	0.0045	0.0074	< 0.0000050	< 0.00000050	0.0013	0.0013	0.0049	0.0052	12	< 0.0050	< 0.0050	0.0011
2016	Q3	CM_MC2	10	9.8	0.00052	0.0013	< 0.0000050	< 0.00000050	0.0011	0.0012	0.012	0.013	2.7	< 0.0050	< 0.0050	< 0.0010
2016	Q4	FR_FRCP1	9.7	9.2	0.0063	0.0083	< 0.0000050	< 0.0000005	0.0012	0.0012	0.0045	0.0047	10	< 0.0050	< 0.0050	< 0.0010
2016	Q4	CM_MC2	7.2	6.9	0.0062	0.014	< 0.0000050	0.0000012	0.00097	0.00098	0.0073	0.0083	1.8	0.01	0.0076	0.0016
2016	Q4	EV_MC2	3.9	3.7	0.001	0.0044	0.0000016	0.0000025	0.0006	0.00065	0.00078	0.0012	1.2	0.001	< 0.0050	0.0081
2016	Q4	LC_DCDS	3.09	2.86	0.00047	0.00891	<0.0000050	0.00000565	0.00136	0.00141	0.00077	0.00171	0.471	0.0077	0.0197	0.0207
2017	Q1	FR_FRCP1	-	-	0.008	0.01	<0.000005	<0.0000005	0.0017	0.0017	0.0097	0.01	20	0.02	0.0066	<0.001
2017	Q1	CM_MC2	-	-	0.011	0.013	<0.000005	<0.0000005	0.0014	0.0015	0.023	0.025	4.2	0.018	0.012	0.0022
2017	Q1	EV_MC2	-	-	0.00068	0.002	<0.0000005	<0.0000005	0.0015	0.0015	0.0021	0.0025	3.5	<0.001	0.0075	0.0044
2017	Q1	LC_LCDSSLCC	-	-	0.0016	0.0022	<0.000005	<0.0000005	0.0022	0.0023	0.0039	0.0038	12	<0.005	<0.005	0.0024
2017	Q2	FR_FRCP1	-	-	0.0057	0.022	<0.000005	0.0000038	0.0012	0.0015	0.0041	0.0056	12	0.0045	0.026	0.0028
2017	Q2	CM_MC2	-	-	0.026	0.031	<0.000005	0.0000011	0.0013	0.0013	0.024	0.024	2.2	0.013	0.073	<0.001
2017	Q2	CM_MC2	-	-	0.024	0.034	<0.000005	0.0000013	0.0014	0.0017	0.022	0.027	2.3	0.013	0.052	<0.001
2017	Q2	EV_MC2	-	-	0.0019	0.0085	0.0000012	0.0000032	0.00074	0.00066	0.0014	0.0019	1.1	0.0011	0.024	0.0041
2017	Q2	EV_HC1	-	-	0.0014	0.0034	0.00000061	0.0000013	0.00082	0.00086	0.001	0.0013	0.85	<0.001	<0.005	0.0044
2017	Q3	FR_FRCP1	-	-	0.0054	0.0075	<0.000005	<0.0000005	0.0013	0.0013	0.0045	0.005	8.9	0.0041	0.0084	0.002
2017	Q3	GH_FR1	-	-	0.0017	0.0023	<0.000005	0.0000005	0.00094	0.001	0.0025	0.0028	9.5	0.0072	0.0074	<0.001
2017	Q3	CM_MC2	-	-	0.0058	0.01	<0.000005	0.0000013	0.0015	0.0015	0.028	0.029	3.1	0.024	0.02	<0.001
2017	Q4	FR_FRCP1	-	-	0.0073	0.011	<0.000005	<0.0000005	0.0013	0.0013	0.0082	0.0088	15	0.0082	0.0051	<0.001
2017	Q4	CM_MC2	-	-	0.002	0.0034	<0.000005	<0.0000005	0.0014	0.0014	0.016	0.017	3.7	0.0099	0.0075	<0.001
2018	Q1	FR_FRCP1	19	20	0.012	0.012	<0.000005	<0.0000005	0.0017	0.0017	0.0099	0.0096	20	0.0028	0.017	<0.001
2018	Q1	CM_MC2	14	12	0.0046	0.0049	<0.000005	<0.0000005	0.0012	0.0013	0.014	0.014	4.1	0.012	0.0093	0.0015
2018	Q1	EV_MC2	8.4	7.8	<0.0008	0.0012	<0.000005	<0.0000005	0.0014	0.0014	0.0042	0.0042	3.2	0.0014	0.012	0.0016
2018	Q2	FR_FRCP1	6.6	6.4	0.0015	0.023	<0.000005	0.000003	0.0014	0.0014	0.0053	0.0067	8.1	0.0036	0.0085	0.0019
2018	Q2	GH_FR1	6.4	6.5	0.00065	0.029	<0.000005	0.0000085	0.0016	0.0017	0.0036	0.0065	4.8	0.0049	0.0085	0.0077
2018	Q2	GH_ERC	3.7	3.9	0.00015	0.028	<0.000000005	0.0034	0.00096	0.0011	<0.0005	0.0016	0.71	<0.001	0.0095	0.0016
2018	Q2	CM_MC2	7.6	8.3	0.016	0.035	<0.000005	0.0000013	0.0013	0.0014	0.021	0.022	1.7	0.011	0.048	0.0015
2018	Q2	CM_MC3	5.1	5.5	0.0059	0.014	<0.000005	0.000001	0.00097	0.00092	0.0089	0.0092	0.95	0.0051	0.02	0.0017
2018	Q2	LC_LC5	6.64	7.04	0.00041	0.0294	<0.0000050	0.00000375	0.00121	0.00123	0.0016	0.00298	6.91	0.0036	0.0084	0.0014
2018	Q2	LC_LCDSSLCC	7.7	8.5	0.0003	0.0035	<0.000005	0.0000013	0.002	0.0018	0.0054	0.0055	9.6	0.0011	0.0061	0.0014
2018	Q3	FR_FRCP1	12	12	0.0047	0.01	<0.000005	<0.0000005	0.0014	0.0013	0.0066	0.0067	11	0.0061	0.025	<0.001
2018	Q3	CM_MC2	13	14	0.0096	0.02	<0.000005	<0.0000005	0.0024	0.0024	0.055	0.057	4.1	0.038	0.061	<0.001
2018	Q3	CM_MC3	7.8	7.8	0.003	0.0053	<0.000005	<0.0000005	0.0014	0.0014	0.018	0.018	1.9	0.012	0.026	<0.001
2018	Q4	FR_FRCP1	49	51	0.0003	0.0022	<0.000005	<0.0000005	0.0024	0.0023	0.044	0.046	29	0.0052	0.025	<0.001
2018	Q4	CM_MC2	12	12	0.023	0.027	<0.000005	<0.0000005	0.0031	0.0032	0.044	0.046	3.6	0.034	0.091	0.0029
2018	Q4	CM_MC3	6.3	6.3	0.0052	0.0061	<0.000005	<0.0000005	0.0016	0.0017	0.013	0.013	1.4	0.0087	0.039	0.0022
2018	Q4	LC_DCDS	6.82	6.29	0.00015	0.00577	<0.0000050	0.00000089	0.00375	0.00376	0.00482	0.00566	18.6	0.0373	0.0355	0.0014
2018	Q4	LC_LC5	8.31	8.03	0.00012	0.00036	<0.0000050	<0.00000050	0.00118	0.00119	0.00106	0.00121	8.56	0.0031	0.0162	0.0022
2018	Q4	LC_LCDSSLCC	9.5	9.0	<0.0001	0.0005	<0.000005	<0.0005	0.0018	0.0018	0.0051	0.0054	8.6	<0.005	0.023	0.0018
2019	Q1	FR_FRABCH	13.4	13.3	0.00431	0.00491	<0.000005	<0.0000005	0.000668	0.000569	<0.0005	<0.0005	21	0.008	0.0084	0.0025
2019	Q1	FR_FRCP1	50.1	53.7	0.00053	0.00044	<0.000005	<0.0000005	0.0031	0.00287	0.0395	0.034	29	0.013	0.0078	0.003
2019	Q1	CM_MC2	12.1	12.2	0.00318	0.00412	<0.000005	<0.0000005	0.00209	0.002	0.0124	0.013	3.3	0.0116	0.0087	0.0024
2019	Q3	FR_FRCP1	8.11	8.16	0.00266	0.0046	<0.000005	<0.0000005	0.00138	0.00141	0.00341	0.00335	7.9	0.0064	0.0411	<0.001
2020	Q1	FR_FRCP1	17.3	16.1	0.00919	0.0214	<0.000005	<0.0000005	0.00152	0.00165	0.0107	0.012	20	0.0058	0.0149	0.013
2020	Q1	GH_FR1	10.3	9.54	0.00081	0.00083	<0.000005	<0.0000005	0.000875	0.000858	0.00094	0.00088	12	0.0031	0.0063	<0.002
2020	Q1	LC_DCDS	8.12	8.55	0.00072	0.00118	<0.000005	0.00000082	0.0039	0.00388	0.00452	0.00461	24	0.0119	0.0159	0.033
2020	Q3	CM_MC2	13.4	14.2	0.00948	0.0122	<0.000005	<0.0000005	0.00155	0.00164	0.0438	0.045	3.2	0.0068	0.0169	<0.001
2020	Q3	LC_LCDSSLCC	9.16	8.97	0.00442	0.00532	<0.000005	<0.0000005	0.00237	0.00228	0.00442	0.00428	7.8	0.0018	0.0337	<0.002
2020	Q4	FR_FRCP1	15.7	15	0.00846	0.00907	<0.000005	<0.0000005	0.00342	0.00342	0.0098	0.0098	15	0.0083	<0.005	<0.002
2020	Q4	CM_MC2	14.4	13.4	0.00574	0.00625	<0.000005	<0.0000005	0.000964	0.0011	0.027	0.026	2.9	0.0103	0.0898	<0.001
Test categorized as possible or likely response (2021)																
2021	Q1	FR_FRCP1	15	14.5	0.0113	0.0122	<0.000005	0.00000068	0.0032	0.00316	0.0136	0.013	26	0.024	<0.005	<0.001

Year	Quarter	Sample ID	OXIDATION-REDUCTION POTENTIAL LAB-N-mv	pH LAB-N-ph units	PHOSPHORUS-N-mg/l	POTASSIUM-D-mg/l	POTASSIUM-T-mg/l	SELENIUM-D-mg/l	SELENIUM-T-mg/l	SILICON-D-mg/l	SILICON-T-mg/l	SILVER-D-mg/l	SILVER-T-mg/l	SODIUM-D-mg/l	SODIUM-T-mg/l
Test categorized as possible or likely response (2015 to 2020)															
2015	Q1	FR_FRCP1	354	8.3	0.0021	3.8	4.0	0.49	0.5	2.3	2.3	< 0.000020	< 0.000020	2.0	2.1
2015	Q2	CM_MC2	359	8.4	0.017	0.9	0.98	0.0043	0.0043	1.8	2.4	< 0.000010	< 0.000010	4.4	4.5
2015	Q4	FR_FRCP1	354	8.3	< 0.0020	1.9	1.9	0.078	0.076	1.7	1.8	< 0.000010	< 0.000010	2.1	2.0
2015	Q4	CM_MC2	275	8.3	< 0.0020	1.5	1.5	0.006	0.0058	2.2	2.1	< 0.000010	< 0.000010	10	11
2016	Q1	FR_FRCP1	309	8.2	< 0.0020	2.5	2.5	0.21	0.21	2.1	2.1	< 0.000010	< 0.000010	2.2	2.2
2016	Q2	GH_FR1	337	8.3	0.013	1.1	1.1	0.028	0.029	2.0	2.1	< 0.000010	< 0.000010	1.4	1.4
2016	Q2	CM_MC2	345	8.2	0.022	1.0	1.1	0.0062	0.0057	2.1	2.6	< 0.000010	< 0.000010	5.6	5.5
2016	Q2	LC_DCDS	369	8.2	0.0481	0.86	0.907	0.00168	0.00174	2.52	2.82	<0.000010	0.00001	0.453	0.455
2016	Q3	FR_FRCP1	365	8.4	0.0027	1.5	1.6	0.054	0.056	1.8	1.9	< 0.000010	< 0.000010	1.5	1.6
2016	Q3	CM_MC2	385	8.4	< 0.0020	1.8	1.7	0.0059	0.006	1.8	1.8	< 0.000010	< 0.000010	11	11
2016	Q4	FR_FRCP1	344	8.4	< 0.0020	1.5	1.4	0.054	0.051	1.7	1.7	< 0.000010	< 0.000010	1.4	1.5
2016	Q4	CM_MC2	339	8.3	0.0063	1.2	1.3	0.0041	0.0044	2.0	2.4	< 0.000010	< 0.000010	6.4	6.7
2016	Q4	EV_MC2	281	8.2	0.014	0.63	0.75	0.0054	0.006	2.1	2.6	< 0.000010	< 0.000010	2.5	2.7
2016	Q4	LC_DCDS	328	8.24	0.0501	1.15	1.27	0.00242	0.00231	2.47	2.74	<0.000010	0.000015	0.931	0.935
2017	Q1	FR_FRCP1	-	8.3	0.0054	-	2.4	0.17	0.15	-	-	<0.00001	<0.00001	-	2.3
2017	Q1	CM_MC2	-	8.3	0.0043	-	1.9	0.0079	0.0072	-	-	<0.00001	<0.00001	-	15
2017	Q1	EV_MC2	-	8.2	0.0056	-	1.2	0.016	0.016	-	-	<0.00001	<0.00001	-	5.9
2017	Q1	LC_LCDSSLCC	-	8.3	0.0052	-	1.4	0.034	0.036	-	-	<0.00001	<0.00001	-	7.4
2017	Q2	FR_FRCP1	-	8.4	0.042	-	1.5	0.058	0.051	-	-	<0.00001	0.000025	-	1.3
2017	Q2	CM_MC2	-	8.2	0.018	-	1.4	0.0056	0.0048	-	-	<0.00001	<0.00001	-	11
2017	Q2	CM_MC2	-	8.3	0.0098	-	1.9	0.0058	0.0061	-	-	<0.00001	<0.00001	-	18
2017	Q2	EV_MC2	-	8.1	0.033	-	0.78	0.0072	0.0064	-	-	<0.00001	<0.00001	-	3.4
2017	Q2	EV_HC1	-	8.3	0.016	-	1.0	0.035	0.03	-	-	<0.00001	<0.00001	-	1.5
2017	Q3	FR_FRCP1	-	8.3	0.0071	-	1.8	0.065	0.063	-	-	<0.00001	<0.00001	-	1.5
2017	Q3	GH_FR1	-	8.4	0.005	-	1.3	0.047	0.044	-	-	<0.00001	<0.00001	-	1.9
2017	Q3	CM_MC2	-	8.5	0.009	-	1.7	0.0078	0.0075	-	-	<0.00001	<0.00001	-	11
2017	Q4	FR_FRCP1	-	8.2	<0.002	-	2.1	0.14	0.12	-	-	<0.00001	<0.00001	-	2.0
2017	Q4	CM_MC2	-	8.3	0.005	-	2.1	0.0092	0.0087	-	-	<0.00001	<0.00001	-	14
2018	Q1	FR_FRCP1	426	8.2	0.0024	2.7	2.5	0.17	0.17	2.3	2.1	<0.00001	<0.00001	2.6	2.3
2018	Q1	CM_MC2	302	8.4	0.0035	1.7	1.7	0.0087	0.0091	2.4	2.3	<0.00001	<0.00001	15	15
2018	Q1	EV_MC2	317	8.4	0.0039	1.1	1.2	0.02	0.021	2.5	2.6	<0.00002	<0.00001	5.0	4.9
2018	Q2	FR_FRCP1	289	8.4	0.031	1.3	1.3	0.046	0.044	1.9	2.3	<0.00001	0.000012	1.2	1.2
2018	Q2	GH_FR1	264	8.4	0.064	1.3	1.7	0.03	0.034	2.3	3.9	<0.00001	0.000037	1.6	1.9
2018	Q2	GH_ERC	282	8.4	0.055	0.5	0.77	0.0042	0.0046	1.97	3.2	<0.00001	0.000015	1.1	1.2
2018	Q2	CM_MC2	246	8.5	0.018	1.5	1.4	0.0048	0.0052	2.2	2.6	<0.00001	<0.00001	13	12
2018	Q2	CM_MC3	269	8.4	0.011	0.89	0.85	0.0026	0.0027	1.9	2.2	<0.00001	<0.00001	6.5	5.9
2018	Q2	LC_LC5	271	8.41	0.0508	1.17	1.19	0.0314	0.0326	2.17	2.9	<0.000010	<0.000010	2.41	2.22
2018	Q2	LC_LCDSSLCC	321	8.4	0.0065	1.4	1.2	0.044	0.045	2.0	2.1	<0.00001	<0.00001	5.5	4.8
2018	Q3	FR_FRCP1	325	8.4	0.0092	2.1	1.9	0.074	0.078	1.9	2.0	<0.00001	<0.00001	1.7	1.6
2018	Q3	CM_MC2	152	8.2	0.0038	2.6	2.5	0.0077	0.0088	2.0	2.3	<0.00001	<0.00001	20	20
2018	Q3	CM_MC3	154	8.4	0.0047	1.3	1.2	0.004	0.0046	1.7	1.9	<0.00001	<0.00001	9.6	9.1
2018	Q4	FR_FRCP1	478	7.9	0.0058	5.0	4.9	0.64	0.63	2.8	2.8	<0.00002	<0.00002	2.2	2.2
2018	Q4	CM_MC2	411	8.4	0.0041	2.2	2.1	0.0067	0.0066	2.3	2.4	<0.00001	<0.00001	17	17
2018	Q4	CM_MC3	445	8.4	<0.002	0.97	0.93	0.0037	0.0039	1.6	1.9	<0.00001	<0.00001	6.9	6.7
2018	Q4	LC_DCDS	331	8.4	0.0172	2.33	2.4	0.0304	0.027	1.63	1.9	<0.000010	<0.000010	1.83	1.89
2018	Q4	LC_LC5	388	8.41	0.0123	1.08	1.18	0.0497	0.042	1.96	2.21	<0.000010	<0.000010	3.34	3.57
2018	Q4	LC_LCDSSLCC	351	8.4	<0.002	1.6	1.8	0.054	0.044	2.0	2.3	<0.00001	<0.00001	7.2	7.6
2019	Q1	FR_FRABCH	410	8.2	0.0128	1.47	1.52	0.106	0.089	2.22	2.33	<0.00001	<0.00001	2.47	2.66
2019	Q1	FR_FRCP1	453	8	0.0028	4.88	4.2	0.647	0.53	2.72	2.58	<0.00002	<0.00002	2.28	1.83
2019	Q1	CM_MC2	417	8.2	0.0047	1.8	1.66	0.00941	0.0078	2.48	2.43	<0.00001	<0.00001	13.6	12.8
2019	Q3	FR_FRCP1	341	8.4	0.005	1.63	1.55	0.0506	0.042	1.77	2.08	<0.00001	<0.00001	1.36	1.3
2020	Q1	FR_FRCP1	364	8.2	0.0015	2.68	2.73	0.144	0.15	2.14	2.37	<0.00001	0.00001	2.88	2.89
2020	Q1	GH_FR1	485	8.3	0.0022	1.28	1.17	0.0625	0.062	2.5	2.42	<0.00001	<0.00001	2.4	2.39
2020	Q1	LC_DCDS	365	8.2	0.0344	2.27	2.32	0.0479	0.047	2.55	2.77	<0.00001	<0.00001	2.26	2.23
2020	Q3	CM_MC2	526	8.3	<0.002	2.43	2.39	0.00916	0.0088	1.99	2.17	<0.00001	<0.00001	31.1	31.3
2020	Q3	LC_LCDSSLCC	519	8.4	0.0015	1.25	1.26	0.0317	0.033	2.38	2.49	<0.00001	<0.00001	6.52	6.56
2020	Q4	FR_FRCP1	501	8.4	<0.001	2.48	2.36	0.115	0.12	1.74	1.79	<0.00001	<0.00001	2.01	2.02
2020	Q4	CM_MC2	179	8.3	0.002	2.09	1.96	0.00864	0.0092	2.2	2.27	<0.00001	<0.00001	32.4	33.9
Test categorized as possible or likely response (2021)															
2021	Q1	FR_FRCP1	260	8.5	0.0021	2.91	2.6	0.12	0.11	1.8	2	<0.00001	<0.00001	2.95	2.73

Notes:

"-D-" = dissolved concentration; "-T-" = total concentration; "-N-" = normal concentrat

Screening

Concentrations of parameters in 2021 tests categorized as possible or likely respons

Year	Quarter	Sample ID	STRONTIUM-D-mg/l	STRONTIUM-T-mg/l	SULFATE (AS SO4)-D-mg/l	THALLIUM-D-mg/l	THALLIUM-T-mg/l	TIN-D-mg/l	TIN-T-mg/l	TITANIUM-D-mg/l	TITANIUM-T-mg/l	TOTAL DISSOLVED SOLIDS (RESIDUE FILTERABLE)-N-mg/l	TOTAL KJELDAHL NITROGEN-N-mg/l	TOTAL ORGANIC CARBON-T-mg/l	TOTAL SUSPENDED SOLIDS LAB-N-mg/l	TURBIDITY LAB-N-ntu	URANIUM-D-mg/l	URANIUM-T-mg/l	VANADIUM-D-mg/l	VANADIUM-T-mg/l	ZINC-D-mg/l	ZINC-T-mg/l	∑TU-WQGs	∑TU-WQGs/Benchmarks	PC1_allyrs	PC2_allyrs	PC3_allyrs	PC1_2021	PC2_2021	PC3_2021	PC1_allyrs_UFR	PC2_allyrs_UFR	PC3_allyrs_UFR	PC4_allyrs_UFR	PC1_2021_UFR	PC2_2021_UFR	PC3_2021_UFR
Reference (2015 to 2021)																																					
2015	Q1	Reference (FR_UFR1)	0.088	0.091	47	< 0.000010	< 0.000010	< 0.00010	< 0.00010	< 0.010	< 0.010	229	< 0.050	0.69	< 1.0	0.13	0.00047	0.00047	< 0.0010	< 0.0010	< 0.0030	< 0.0030	2.76	2.76	-5.9	-1.3	5.7				-4.63	-0.03	5.44	1.23			
2015	Q1	Reference (FR_UFR1)	0.088	0.091	47	< 0.000010	< 0.000010	< 0.00010	< 0.00010	< 0.010	< 0.010	229	< 0.050	0.69	< 1.0	0.13	0.00047	0.00047	< 0.0010	< 0.0010	< 0.0030	< 0.0030	2.76	2.76	-5.9	-1.3	5.7				-4.63	-0.03	5.44	1.23			
2015	Q1	Reference (FR_UFR1)	0.089	0.092	46	< 0.000010	< 0.000010	< 0.00010	< 0.00010	< 0.010	< 0.010	222	< 0.050	< 0.50	< 1.0	0.33	0.00047	0.00047	< 0.0010	< 0.0010	< 0.0030	< 0.0030	2.74	2.75	-5.8	-1.2	5.4				-4.47	-0.03	5.18	1.25			
2015	Q2	Reference (FR_UFR1)	0.061	0.066	15	< 0.000010	0.00001	< 0.00010	< 0.00010	< 0.010	< 0.010	147	0.1	2.1	2.4	1.5	0.00031	0.00033	< 0.00050	< 0.00050	< 0.0030	< 0.0030	2.69	2.71	-8.3	1.3	0.53				-6.89	2.77	0.13	-0.21			
2015	Q2	Reference (GH_ER2)	0.2	0.21	18	< 0.000010	< 0.000010	< 0.00010	< 0.00010	< 0.010	< 0.010	191	0.067	1.8	4.4	3.9	0.00079	0.00078	< 0.00050	0.00051	< 0.0030	< 0.0030	2.51	2.52	-5.9	0.23	0.94				-4.35	1.52	0.55	-0.35			
2015	Q3	Reference (FR_UFR1)	0.093	0.093	32	< 0.000010	< 0.000010	< 0.00010	< 0.00010	< 0.010	< 0.010	211	0.08	1.0	1.1	0.2	0.00042	0.00042	< 0.00050	< 0.00050	< 0.0030	< 0.0030	2.15	2.15	-5.8	-1.7	1.8				-4.72	-0.73	1.31	-0.42			
2015	Q4	Reference (FR_UFR1)	0.095	0.091	48	< 0.000010	< 0.000010	< 0.00010	< 0.00010	< 0.010	< 0.010	215	0.095	0.6	< 1.0	0.26	0.00047	0.00044	< 0.00050	< 0.00050	< 0.0030	< 0.0030	2.41	2.41	-6.2	-2.4	2.1				-5.12	-1.22	1.26	0.39			
2015	Q4	Reference (GH_ER2)	0.21	0.22	22	< 0.000010	< 0.000010	< 0.00010	< 0.00010	< 0.010	< 0.010	171	< 0.050	< 0.50	< 1.0	0.26	0.00071	0.00072	< 0.00050	< 0.00050	< 0.0030	< 0.0030	2.40	2.41	-5.9	-2.3	2.5				-4.78	-1.01	2.19	0.00			
2016	Q1	Reference (FR_UFR1)	0.089	0.09	50	< 0.000010	< 0.000010	< 0.00010	< 0.00010	0.011	0.011	244	< 0.050	< 0.50	< 1.0	0.17	0.0005	0.00049	< 0.00050	< 0.00050	< 0.0030	< 0.0030	1.85	1.85	-6.1	-2.7	2.3				-5.17	-1.74	1.80	0.13			
2016	Q2	Reference (FR_UFR1)	0.063	0.065	13	< 0.000010	< 0.000010	< 0.00010	< 0.00010	< 0.010	< 0.010	135	0.086	2.8	1.9	1.6	0.00032	0.00033	< 0.00050	0.00051	< 0.0030	< 0.0030	2.27	2.29	-8.8	1.5	0.35				-7.36	2.89	-0.01	-0.33			
2016	Q2	Reference (GH_ER2)	0.2	0.2	17	< 0.000010	< 0.000010	< 0.00010	< 0.00010	< 0.010	< 0.010	174	0.077	2.2	15	4.7	0.00076	0.00079	< 0.00050	0.001	< 0.0030	< 0.0030	2.57	2.58	-6.1	2.4	0.065				-4.28	3.61	-0.22	-1.01			
2016	Q3	Reference (FR_UFR1)	0.095	0.098	35	< 0.000010	< 0.000010	< 0.00010	< 0.00010	< 0.010	< 0.010	222	0.077	0.92	1.2	0.22	0.00042	0.00044	< 0.00050	< 0.00050	< 0.0030	< 0.0030	1.20	1.21	-6.3	-2.2	0.68				-5.32	-1.31	0.46	-0.60			
2016	Q4	Reference (FR_UFR1)	0.093	0.095	40	< 0.000010	< 0.000010	< 0.00010	< 0.00010	< 0.010	< 0.010	204	0.069	1.1	< 1.0	0.85	0.00044	0.00046	< 0.00050	< 0.00050	< 0.0030	< 0.0030	1.43	1.44	-6.8	-1.3	0.41				-5.80	-0.32	0.10	-0.20			
2016	Q4	Reference (GH_ER2)	0.24	0.24	23	< 0.000010	< 0.000010	< 0.00010	< 0.00010	< 0.010	< 0.010	167	< 0.050	0.62	< 1.0	0.38	0.00076	0.00079	< 0.00050	< 0.00050	< 0.0030	< 0.0030	1.70	1.71	-6.1	-2.7	1.4				-5.12	-1.24	1.36	-0.07			
2017	Q1	Reference (FR_UFR1)	0.097	0.097	45	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	194	<0.05	1.0	<1	0.25	0.00046	0.00048	<0.0005	<0.0005	<0.001	<0.003	1.15	1.15	-6.9	-2.7	-0.58				-6.28	-1.45	-0.76	6.13			
2017	Q2	Reference (FR_UFR1)	0.064	0.062	22	<0.00001	<0.00001	0.00011	<0.0001	<0.01	<0.01	143	0.18	3.7	4.4	4.7	0.00035	0.00034	0.00053	0.001	0.0013	<0.003	3.67	3.70	-9.2	5.0	-0.84				-7.54	6.53	-1.10	5.96			
2017	Q2	Reference (GH_ER2)	0.21	0.21	21	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	180	0.068	1.1	6.2	3.8	0.00079	0.00079	<0.0005	0.00061	<0.003	<0.003	1.51	1.52	-6.7	-0.4	-1.1				-5.60	1.06	-1.48	5.60			
2017	Q2	Reference (CM_MC1)	0.14	0.14	11	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	148	0.098	1.9	<1	0.41	0.00018	0.0002	<0.0005	<0.0005	<0.001	<0.003	1.18	1.20	-8.2	-0.17	-0.46				-7.24	1.24	0.30	5.54			
2017	Q3	Reference (FR_UFR1)	0.088	0.09	32	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	164	0.078	2.7	1.1	0.36	0.00037	0.00038	<0.0005	<0.0005	<0.001	<0.003	1.26	1.28	-7.7	-1.4	-1.3				-6.86	-0.22	-1.50	5.79			
2017	Q3	Reference (GH_ER2)	0.19	0.19	15	<0.00001	<0.00001	0.00011	<0.0001	<0.01	<0.01	148	0.12	0.91	1.4	0.81	0.00053	0.00058	<0.0005	<0.0005	<0.001	<0.003	1.26	1.28	-7.4	-1.6	-0.53				-6.46	-0.14	-0.55	5.83			
2017	Q3	Reference (CM_MC1)	0.14	0.13	13	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	162	0.1	1.2	<1	0.37	0.0002	0.00019	<0.0005	<0.0005	<0.001	<0.003	1.22	1.24	-8.0	0.13	-0.62				-7.11	1.53	0.36	5.43			
2017	Q4	Reference (FR_UFR1)	0.1	0.095	44	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	221	<0.05	1.0	1.2	0.45	0.00051	0.00045	<0.0005	<0.0005	<0.003	<0.003	1.08	1.08	-7.4	-2.6	-0.23				-6.70	-1.37	-0.68	6.23			
2017	Q4	Reference (GH_ER2)	0.21	0.21	18	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	174	<0.05	0.91	<1	0.38	0.00077	0.00072	<0.0005	<0.0005	<0.003	<0.003	1.23	1.24	-6.8	-2.7	0.15				-6.11	-1.30	-0.01	5.95			
2017	Q4	Reference (CM_MC1)	0.16	0.16	13	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	166	<0.2	1.4	2.4	1.3	0.00023	0.00023	<0.0005	<0.0005	<0.003	<0.003	1.07	1.09	-7.7	-0.71	0.046				-6.82	0.54	0.63	5.73			
2018	Q1	Reference (FR_UFR1)	0.099	0.093	49	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	216	0.064	0.59	<1	0.14	0.00054	0.00049	<0.0005	<0.0005	<0.003	<0.003	1.13	1.13	-5.9	-3.3	1.1				-5.09	-2.55	0.75	-0.48			
2018	Q1	Reference (GH_ER2)	0.2	0.22	23	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	186	<0.05	<0.5	<1	0.13	0.00077	0.00079	<0.0005	<0.0005	<0.003	<0.003	1.27	1.28	-6.0	-3.1	1.7				-5.04	-1.87	1.65	-0.27			
2018	Q1	Reference (CM_MC1)	0.16	0.17	17	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	182	<0.2	0.81	<1	0.22	0.00024	0.00024	<0.0005	<0.0005	<0.003	<0.003	1.08	1.09	-5.8	-2.1	1.6				-4.62	-1.50	2.28	-1.08			
2018	Q2	Reference (FR_UFR1)	0.072	0.066	16	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	114	0.13	3.0	7.4	3.8	0.00033	0.00035	<0.0005	0.00065	<0.001	<0.003	2.09	2.12	-8.3	3.0	-1.4				-6.74	4.12	-1.49	-0.79			
2018	Q2	Reference (GH_ER2)	0.2	0.2	19	<0.00001	0.00001	<0.0001	<0.0001	<0.01	<0.01	186	0.2	1.9	17	14	0.00072	0.00075	<0.0005	0.0013	<0.001	0.0036	2.49	2.50	-5.8	3.1	-1.6				-3.95	4.15	-1.85	-1.84			
2018	Q2	Reference (CM_MC1)	0.13	0.12	10	<0.00001	0.000011	<0.0001	<0.0001	<0.01	<0.01	134	0.092	3.4	4.5	2.4	0.00018	0.0002	<0.0005	<0.0005	<0.001	<0.003	1.89	1.91	-7.6	3.0	-0.093				-5.85	3.85	0.50	-1.12			
2018	Q2	Reference (LC_SLC)	0.13	0.12	25	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	176	0.13	2.1	1.6	0.63	0.001	0.0011	<0.0005	<0.0005	0.0015	<0.003	1.34	1.35	-6.0	-1.4	0.17				-4.95	-0.19	0.22	-0.99			
2018	Q3	Reference (FR_UFR1)	0.1	0.095	35	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	222	0.24	2.4	<1	0.22	0.00045	0.00043	<0.0005	<0.0005	<0.001	<0.003	1.20	1.20	-6.0	-1.9	0.17				-4.98	-1.28	-0.02	-0.83			
2018	Q3	Reference (GH_ER2)	0.21	0.21	16	<0.00001	0.000028	<0.0001	<0.0001	<0.01	<0.01	179	0.057	1.6	6.9	0.61	0.00064	0.00081	<0.0005	0.0031	<0.001	0.0073	4.89	4.90	-5.9	6.1	-0.65				-3.44	7.95	-1.23	-2.19			
2018	Q3	Reference (CM_MC1)	0.15	0.14	13	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	174	0.052	1.5	<1	0.24	0.00023	0.00023	<0.0005	<0.0005	<0.001	0.0047	1.28	1.30	-6.2	-0.57	1.2				-4.99	0.13	2.17	-1.44			
2018	Q3	Reference (LC_SLC)	0.16	0.14	48	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	233	<0.05	1.9	<1	0.13	0.0016	0.0016	<0.0005	<0.0005	0.0025	0.0036	1.43	1.43	-4.6	-2.9	0.95				-3.78	-1.83	0.97	-0.86			
2018	Q4	Reference (FR_UFR1)	0.097	0.097	44	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	195	0.079	0.66	<1	0.19	0.00053	0.0005	<0.0005	<0.0005	<0.001	<0.003	1.22	1.21	-6.3	-3.2	0.93				-5.52	-2.33	0.50	0.08			
2018	Q4	Reference (GH_ER2)	0.21	0.21	21	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	168	0.24	<0.5	<1	0.28	0.00077	0.00077	<0.0005	<0.0005	<0.001	<0.003	1.43	1.43	-6.0	-2.1	0.88				-4.97	-1.05	0.85	-0.78			
2018	Q4	Reference (CM_MC1)	0.13	0.13	14	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	127	0.091	2.2	<1	0.29	0.00025	0.00023	<0.0005	<0.0005	<0.001	<0.003	1.18	1.20	-7.0	-0.77	1.4				-5.76	0.10	2.38	-1.32			
2018	Q4	Reference (LC_SLC)	0.16	0.16	57	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	214	<0.05	0.65	<1	0.27	0.0018	0.0019	<0.0005	<0.0005	0.0015	<0.003	1.58	1.59	-4.6	-3.3	1.2				-3.91	-2.20	1.25	-0.82			
2019	Q1	Reference (FR_UFR1)	0.108	0.106	48.6	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	249	<0.05	0.63	<1	0.51	0.000487	0.000474	<0.0005	<0.0005	<0.001	0.0137	2.05	2.04	-5.8	-2.5	0.91				-4.91	-1.62	0.76	-0.59			
2019	Q1	Reference (GH_ER2)	0.224	0.215	24.1	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	181	<0.05	<0.5	<1	0.45	0.000782	0.000754	<0.0005	<0.0005	<0.001	<0.003	3.75	3.75	-6.2	-3.1	1.6				-5.27	-1.97	1.67	-0.22			
2019	Q1	Reference (CM_MC1)	0.161	0.147	16.9	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	209	<0.05	0.62	<1	0.26	0.000229	0.000225	<0.0005	<0.0005	<0.001	<0.003	2.38	2.39	-5.9	-2.2	1.9				-4.75	-1.54	2.58	-1.34			
2019	Q1	Reference (LC_SLC)	0.186	0.195	82	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	277	<0.05	0.71	<1	0.45	0.00173	0.00197	<0.0005	<0.0005	0.0016	<0.003	2.54	2.53	-3.7	-3.4	1.4				-2.96	-2.37	1.72	-1.32			
2019	Q2	Reference (FR_UFR1)	0.065	0.0719	22.5	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	164	0.058	1.8	<1	1.36	0.000384	0.000406	<0.0005	<0.0005	<0.001	<0.003	1.92	1.94	-8.3	-0.36	0.24				-7.10	0.83	0.13	-0.59			
2019	Q2	Reference (GH_ER2)	0.216	0.209	22.6	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	174	0.064	0.86	5	3.19	0.000715	0.000767	<0.0005	<0.0005	<0.001	<0.003	3.84	3.85	-6.3	-1.2	0.6				-5.03	-0.02	0.59	-0.86			
2019	Q2	Reference (CM_MC1)	0.126	0.128	12.7	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	167	<0.05	7.35	1.3	0.77	0.000215	0.000206	<0.0005	<0.0005	<0.001	<0.003	1.32	1.33	-7.2	0.64	0.48				-5.79	1.60	1.49	-1.32			
2019	Q2	Reference (LC_SLC)	0.142	0.148	45.5	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	197	<0.05	0.77	<1	0.68	0.00132	0.00134	<0.0005	<0.0005	0.0011	0.0065	2.39	2.40	-5.6	-3.0	1.4				-4.75	-1.53	1.51	-0.66			
2019	Q3	Reference (FR_UFR1)	0.0948	0.102	27.7	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	190	0.057	1.21	1.1	0.55	0.000514	0.000469	<0.0005	<0.0005	<0.001	<0.003	1.83	1.84	-6.5	-2.3	0.65				-5.48	-1.35	0.40	-0.87			
2019	Q3	Reference (GH_ER2)	0.206	0.21	16.2	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	154	0.079	0.79	1.1	0.51	0.000647	0.000702	<0.0005	<0.0005	<0.001	<0.003	2.31	2.32	-6.3	-2.0	1.1				-5.12	-0.89	1.29	-0.97			
2019	Q3	Reference (CM_MC1)	0.154	0.163	13.3	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	135	<0.05	0.95	<1	0.25	0.000271	0.000244	<0.0005	<0.0005	<0.001	<0.003	1.80	1.82	-6.0	-1.2	1.7				-4.85	-0.41	2.72	-1.48			
2019	Q3	Reference (LC_SLC)	0.127	0.14	41.1	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	205	<0.05	0.84	<1	0.24	0.00134	0.00131	<0.0005	<0.0005	0.0016	<0.003	2.63	2.64	-5.5	-3.1	1.4				-4.65	-1.68	1.53	-0.73			
2019	Q4	Reference (FR_UFR1)	0.0847	0.0922	42.8	<0.00001	<0.00001	<0.0001	0.00014	<0.01	<0.01	188	0.064	0.67	1.4	0.17	0.000496	0.000488	<0.0005	<0.0005	<0.001	<0.003	1.84	1.86	-6.4	-2.7	1.3				-5.49	-1.79	1.14	-0.34			
2019	Q4	Reference (GH_ER2)	0.206	0.209	22.9	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	178	0.054	<0.5	1.4	0.64	0.000725	0.000729	<0.0005	<0.0005	<0.001	<0.003	2.29	2.30	-6.1	-2.7	1.1				-5.05	-1.51	1.20	-0.87			
2019	Q4	Reference (CM_MC1)	0.138	0.133	14	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	171	<0.05	0.76	<1	0.16	0.000233	0.000248	<0.0005	<0.0005	<0.001	<0.003	1.64	1.65	-6.9	-1.8	1.8				-5.83	-0.85	2.71	-1.33			
2019	Q4	Reference (LC_SLC)	0.164	0.162	60.6	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	230	0.054	1.01	<1	0.14	0.00174	0.00169	<0.0005	<0.0005	0.0018	<0.003	1.85	1.85	-4.5	-3.1	1.0				-3.71	-1.94	1.36	-1.19			
2020	Q1	Reference (FR_UFR1)	0.0953	0.0965	49.8	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	244	0.183	<0.5	<1	0.3	0.000483	0.000501	<0.0005	<0.0005	<0.001	<0.003	2.29	2.21	-6.0	-2.5	0.62				-5.17	-1.86	0.62	-1.10			
2020	Q1	Reference (GH_ER2)	0.215	0.21	25.2	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	200	0.051	0.63	1.3	0.29	0.000787	0.0008	<0.0005	<0.0005	<0.001	<0.003	1.79	1.77	-5.9	-2.8	0.96				-4.92	-1.69	1.09	-0.85			
2020	Q1	Reference (CM_MC1)	0.153	0.157	16.8	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	172	<0.05	0.85	<1	0.12	0.000241	0.000252	<0.0005	<0.0005	<0.001	<0.003	1.52	1.52	-6.3	-1.9	1.5				-5.25	-1.12	2.51	-1.25			
2020	Q1	Reference (LC_SLC)	0.18	0.179	78.1	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	243	<0.05	0.83	3.7	0.17	0.00166	0.00165	<0.0005	<0.0005	0.002	<0.003	1.64	1.62	-4.0	-2.4	0.48				-3.13	-1.52	0.80	-1.43			
2020	Q2	Reference (FR_UFR1)	0.0675	0.0673	16.7	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	166	0.081	2.25	2.7	1.77	0.00037	0.000317	<0.0005	0.00053	<0.001	<0.003	1.33	1.32	-8.2	-0.061	-0.73				-6.97	1.20	-0.71	-0.69			
2020	Q2	Reference (GH_ER2)	0.182	0.194	17.8	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	203	0.112	1.78	8	3.91	0.000823	0.000808	<0.0005	<0.0005	<0.001	<0.003	1.63	1.62	-5.7	-0.23	-0.91				-4.53	0.58	-0.72	-1.31			
2020	Q2	Reference (CM_MC1)	0.116	0.114	9.73	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	163	0.089	2.45	1.5	1.25	0.000192	0.000206	<0.0005	<0.0005	<0.001	<0.003	1.31	1.32	-7.6	0.32	0.066				-6.28	1.19	0.74	-1.26			
2020	Q2	Reference (LC_SLC)	0.116	0.12	19.1	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	186	<0.05	2.02	<1	0.33	0.00111	0.000978	<0.0005	<0.0005	0.0024	<0.003	1.34	1.33	-6.1	-2.2	0.57				-5.23	-0.94	0.83	-0.79			
2020	Q3	Reference (FR_UFR1)	0.104	0.0989	34.4	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	234	<0.05	<0.5	<1	0.15	0.000443	0.000458	<0.0005	<0.0005	<0.001	<0.003	1.57	1.58	-6.2	-3.3	0.4				-5.46	-2.46	0.59	0.48			
2020	Q3	Reference (GH_ER2)	0.201	0.213	15.2	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	175	<0.05	<0.5	2.8	0.59	0.000619	0.000688	<0.0005	0.00085	<0.001	<0.003	1.92	1.91	-6.5	-1.7	0.4				-5.42	-0.50	0.43	-0.63			
2020	Q3	Reference (CM_MC1)	0.169	0.175	14.2	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	172	0.065	1.02	<1	0.17	0.000228	0.000228	<0.0005	0.00067	<0.001	<0.003	1.38	1.39	-5.8	-1.2	1.7				-4.55	-0.36	3.10	-1.56			
2020	Q3	Reference (LC_SLC)	0.152	0.14	45.5	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	206	<0.05	<0.5	<1	<0.1	0.00126	0.00135	<0.0005	<0.0005	0.0023	<0.003	1.91	1.91	-5.2	-4.1	0.82				-4.49	-2.90	1.14	0.30			
2020	Q4	Reference (FR_UFR1)	0.0982	0.102	48.9	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	216	<0.05	0.68	<1	<0.1	0.00047	0.000519	<0.0005	<0.0005	<0.001	<0.003	1.53	1.53	-6.6	-3.3	0.96				-5.77	-2.27	0.69	-0.22			
2020	Q4	Reference (GH_ER2)	0.219	0.208	20.6	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	163	0.051	0.79	8.8	0.9	0.000672	0.000702	<0.0005	<0.0005	0.0044	<0.003	1.81	1.79	-6.2	-1.3	0.27				-5.10	-0.33	0.44	-0.73			
2020	Q4	Reference (CM_MC1)	0.157	0.151	15.5	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	179	0.082	2.08	<1	0.17	0.000242	0.000236	<0.0005	<0.0005	<0.001	<0.003	1.22	1.23	-6.2	-1.1	1.5				-5.06	-0.27	3.03	-0.97			
2020	Q4	Reference (LC_SLC)	0.162	0.163	65.8	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	232	<0.05	1.16	<1	<0.1	0.00147	0.00164	<0.0005	<0.0005	0.0017	<0.003	1.67	1.66	-4.5	-3.6	1.1				-3.77	-2.48	1.13	-0.85			
2021	Q1	Reference (FR_UFR1)	0.0762	0.0728	28.1	<0.00001	<0.00001	<0.0001	<0.0001	<0.0003	0.00154	179	0.092	3.1	<1	0.8	0.000425	0.000408	<0.0005	<0.0005	<0.001	<0.003	2.297150802	2.223026352	-7.6	-0.2	-0.7	-7.54	-4.08	-1.82	-6.42	0.88	-0.69	-1.32	-7.45	-3.10	-1.45
2021	Q1	Reference (GH_ER2)	0.224	0.212	21.4	<0.00001	<0.00001	<0.0001	<0.0001	<0.0003	<0.0003	190	0.077	<0.5	9.2	0.42	0.000809	0.000775	<0.0005	<0.0005	<0.001	<0.003	3.207317267	3.153949727	-5.8	-2.7	0.63	-5.10	-5.95	0.33	-4.68	-1.63	0.95	-1.49	-4.80	-5.26	-1.10
2021	Q1	Reference (CM_MC1)	0.182	0.179	19.7	<0.00001	<0.00001	<0.0001	0.00016	<0.0003	<0.0003	172	<0.05	<0.5	<1	<0.1	0.00026	0.000249	<0.0005	<0.0005	0.0021	0.0053	3.895692505	3.83207236	-5.2	-1.8	2.6	-4.91	-5.81	3.67	-3.76	-0.94	3.60	-1.95	-4.01	-5.41	-0.14
2021	Q1	Reference (LC_SLC)	0.188	0.184	68.3	<0.00001	<0.00001	<0.0001	<0.0001	<0.0003	<0.0003	257	0.116	1.05	<1	<0.1	0.00163	0.00166	<0.0005	<0.0005	0.0016	<0.003	4.206098819	4.140530888	-3.7	-4.0	0.68	-2.87	-5.91	-0.75	-2.86	-3.04	0.95	-1.81	-2.73	-5.23	-0.96
2021	Q2	Reference (FR_UFR1)	0.0634	0.0617	8.79	<0.00001	<0.00001	<0.0001	<0.0001	<0.0003	0.00325	127	0.155	2.99	18.1	7.27	0.000293	0.000304	<0.0005	0.0009	<0.001	<0.003	2.817528708	2.767198531	-9.0	3.9	-1.7	-10.56	-1.67	-1.86	-7.35	5.57	-1.46	-1.80	-10.50	-0.02	-1.19
2021	Q2	Reference (GH_ER2)	0.195	0.222	14.7	<0.00001	0.000048	<0.0001	<0.0001	<0.0003	0.00909	168	0.437	3.96	159	79	0.000711	0.000922	<0.0005	0.00442	<0.001	0.0157	8.191998928	8.12982746	-4.9	12	-2.8	-9.44	5.24	1.18	-1.64	13.58	-3.15	-3.31	-8.80	8.35	2.03
2021	Q2	Reference (CM_MC1)	0.0807	0.0844	4.92	<0.00001	0.000028	<0.0001	<0.0001	0.00035	0.00978	136	0.062	5.74	23.9	11.8	0.00013	0.000175	<0.0005	0.00117	0.0022	0.0064	4.427028355	4.370369467	-9.3	9.5	-1.4	-13.19	2.72	0.77	-6.50	11.47	-1.34	-2.40	-12.73	4.87	-1.58
2021	Q2	Reference (LC_SLC)	0.063	0.0723	8.24	<0.00001	<0.00001	<0.0001	<0.0001	<0.0003	0.00284	132	0.135	3.03	5.5	3.34	0.000535	0.000583	<0.0005	0.00054	0.0034	0.0051	3.123737399	3.067582769	-8.6	1.8	-1.2	-9.73	-2.71	-2.84	-7.19	3.96	-1.03	-0.88	-9.71	-0.66	-3.02
2021	Q3	Reference (FR_UFR1)	0.104	0.102	34.6	<0.00001	<0.00001	<0.0001	<0.0001	<0.0003	<0.0003	211	0.083	2.19	<1	0.28	0.000429	0.000458	<0.0005	<0.0005	<0.001	<0.003	2.60819986	2.530946491	-5.9	-1.9	-0.095	-5.31	-5.06	-1.35	-4.87	-1.23	-0.04	-1.83	-5.08	-4.55	-0.42
2021	Q3	Reference (GH_ER2)	0.206	0.2	14.1	<0.00001	<0.00001	<0.0001	<0.0001	<0.0003	<0.0012	148	<0.05	1.35	6.9	0.8	0.000601	0.000632	<0.0005	0.00064	<0.001	<0.003	3.015573883	2.976599121	-6.7	0.075	-0.68	-6.90	-4.16	-0.42	-5.17	1.46	-0.56	-1.54	-6.47	-2.63	-1.63
2021	Q3	Reference (CM_MC1)	0.157	0.159	13	<0.00001	<0.00001	<0.0001	<0.0001	<0.0003	<0.0003	164	0.078	1.33	<1	0.5	0.000219	0.000223	<0.0005	<0.0005	<0.001	<0.003	2.092181885	2.047903947	-5.9	-1.1	0.96	-5.65	-5.02	2.84	-4.62	-0.32	2.54	-2.38	-5.12	-5.18	-0.37
2021	Q3	Reference (LC_SLC)	0.14	0.142	42.9	<0.00001	<0.00001	<0.0001	<0.0001	<0.0003	<0.0003	187	0.054	0.93	<1	0.17	0.00128	0.00137	<0.0005	<0.0005	0.0026	<0.003	4.107471775	3.993425014	-4.9	-3.2	0.67	-4.25	-5.84	-1.27	-3.99	-1.96	0.89	-1.62	-4.09	-4.77	-1.13
2021	Q4	Reference (FR_UFR1)	0.101	0.104	45.8	<0.00001	<0.00001	<0.0001	<0.0001	<0.0003	<0.0003	202	<0.05	<0.5	<1	<0.1	0.000502	0.000525	<0.0005	<0.0005	0.0012	<0.003	2.66327393	2.626232377	-5.8	-3.4	0.79	-4.82	-6.11	-0.96	-4.98	-2.42	0.88	-1.21	-4.73	-5.53	-0.73
2021	Q4	Reference (GH_ER2)	0.219	0.223	18.7	<0.00001	<0.00001	<0.0001	<0.0001	<0.0003	<0.0003	169	<0.05	<0.5	6.4	0.43	0.000735	0.000727	<0.0005	<0.0005	<0.001	<0.003	3.151042783	3.095863638	-6.1	-1.6	0.52	-5.84	-5.38	0.67	-4.87	-0.47	0.91	-1.79	-5.44	-4.50	-0.60
2021	Q4	Reference (CM_MC1)	0.173	0.163	13.4	<0.00001	<0.00001	<0.0001	<0.0001	<0.0003	<0.0003	166	<0.05	1.05	<1	<0.1	0.000255	0.000227	<0.0005	<0.0005	<0.001	<0.003	1.783014119	1.739122458	-6.0	-2.2	1.4	-5.34	-6.02	2.76	-4.78	-1.51	2.58	-2.16	-4.75	-6.09	-0.19
2021	Q4	Reference (LC_SLC)	0.155	0.166	54.6	<0.00001	<0.00001	<0.0001	<0.0001	<0.0003	<0.0003	228	<0.05	-	<1	<0.1	0.00172	0.0017	<0.0005	<0.0005	0.0032	0.0033	4.283640453	4.219351092	-4.2	-3.8	1.2	-3.44	-6.08	-0.79	-3.33	-2.52	1.59	-1.78	-3.32	-5.18	-0.85
Tests categorized as no adverse response (2015 to 2021)																																					
2015	Q1	GH_FR1	0.16	0.16	233	< 0.000010	< 0.000010	< 0.00010	< 0.00010	0.011	0.011	621	< 0.050	1.1	<1	0.18	0.0022	0.0022	< 0.0010	< 0.0010	< 0.0030	< 0.0030	8.14	4.67	2.5	-0.94	4.7				3.54	-0.79	4.73	0.83			
2015	Q1	GH_ERC	0.2	0.21	30	< 0.000010	< 0.000010	< 0.00010	< 0.00010	< 0.010	< 0.010	203	< 0.050	0.5	2.6	0.41	0.00081	0.00084	< 0.0010	< 0.0010	< 0.0030	0.0041	3.10	3.10	-4.8	0.44	5.3										
2015	Q1	CM_MC2	0.29	0.3	249	0.000014	< 0.000010	< 0.00010	< 0.00010	< 0.010	< 0.010	551	< 0.050	0.82	1.7	0.53	0.0022	0.0023	< 0.0010	< 0.0010	< 0.0030	0.0032	6.71	6.06	3.9	1.9	5.9										
2015	Q1	EV_MC2	0.19	0.2	147	< 0.000010	< 0.000010	0.00018	< 0.00010	0.014	0.013	438	0.13	1.2	1.2	0.31	0.0013	0.0012	< 0.0010	< 0.0010	0.0041	< 0.0030	4.32	3.82	1.7	1.1	5.7										
2015	Q1	EV_HC1	0.085	0.087	130	0.00001	0.00001	0.0001	0.0001	0.011	0.011	325	0.05	0.84	1.0	0.24	0.0017	0.0017	0.001	0.001	0.003	0.003	3.32	3.23	-2.7	0.011	5.1										
2015	Q1	LC_LCDSSLCC	0.23	0.23	283	< 0.000010	< 0.000010	< 0.00010	< 0.00010	0.014	0.013	690	< 0.050	0.9	<1	0.29	0.0039	0.004	< 0.0010	< 0.0010	0.0038	0.0039	9.61	5.58	4.4	-1.1	4.8										
2015	Q2	FR_FRCP1	0.11	0.11	126	< 0.000010	< 0.000010	< 0.00010	< 0.00010	< 0.010	< 0.010	372	< 0.050	2.2	7.7	2.0	0.0015	0.0016	< 0.00050	0.00054	< 0.0030	< 0.0030	5.89	4.23	0.33	1.5	-1.2				1.53	1.85	-2.02	0.66			
2015	Q2	GH_FR1	0.12	0.12	136	< 0.000010	< 0.000010	< 0.00010	< 0.00010	< 0.010	< 0.010	398	< 0.050	1.6	3.6	2.2	0.0016	0.0016	< 0.00050	< 0.00050	< 0.0030	< 0.0030	5.56	3.80	0.32	0.061	-0.44				1.42	0.29	-1.17	0.10			
2015	Q2	GH_ERC	0.21	0.21	25	< 0.000010	< 0.000010	< 0.00010	< 0.00010	< 0.010	< 0.010	203	0.12	1.3	7.0	1.6	0.00083	0.00084	< 0.00050	0.0007	< 0.0030	< 0.0030	2.87	2.88	-5.1	0.96	0.39										
2015	Q2	EV_MC2	0.1	0.093	41	0.000011	0.000025	< 0.00010	< 0.00010	< 0.010	< 0.010	195	0.28	2.5	23	4.7	0.00051	0.00048	< 0.00050	0.0016	< 0.0030	0.0041	3.89	3.92	-4.6	6.2	-0.39										
2015	Q2	EV_HC1	0.062	0.061	79	0.00001	0.00001	0.0001	0.0001	0.01	0.01	233	0.13	1.4	2.6	1.2	0.0012	0.0012	0.0005	0.0005	0.003	0.003	2.68	2.67	-4.7	0.68	0.82										
2015	Q2	LC_DCDS	0.0321	0.033	8.65	<0.000010	0.000012	<0.00010	<0.00010	<0.010	<0.010	114	0.136	2.94	3.9	10.7	0.000178	0.000196	0.00128	0.00207	<0.0030	0.0034	4.24	4.34	-7.3	6.9	-0.24										
2015	Q2	LC_LC3	0.158	0.16	197	0.000013	0.000014	<0.00010	<0.00010	<0.010	<0.010	519	<0.050	0.77	1.1	0.42	0.0033	0.00336	<0.00050	<0.00050	0.0169	0.0174	10.48	7.74	3.9	-0.35	1.4										
2015	Q2	LC_LC5	0.124	0.128	120	<0.000010	<0.000010	<0.00010	<0.00010	<0.010	<0.010	368	<0.050	1.44	5.1	1.12	0.00156	0.00162	<0.00050	<0.00050	0.0032	<0.0030	5.79	5.03	-0.037	-0.39	0.22				1.03	-0.07	-0.48	0.10			
2015	Q2	LC_LCDSSLCC	0.13	0.13	107	< 0.000010	< 0.000010	< 0.00010	< 0.00010	< 0.010	< 0.010	337	< 0.050	1.5	1.6	0.48	0.002	0.002	< 0.00050	< 0.00050	0.0061	0.0066	5.45	4.33	0.064	-0.57	0.45										
2015	Q3	FR_FRCP1	0.13	0.13	234	< 0.000010	< 0.000010	< 0.00010	< 0.00010	< 0.010	< 0.010	566	0.14	0.93	2.6	0.47	0.0027	0.0028	< 0.00050	< 0.00050	< 0.0030	< 0.0030	6.74	4.55	3.7	-0.74	-0.053				4.52	-0.59	-0.37	0.58			
2015	Q3	GH_FR1	0.13	0.13	154	< 0.000010	< 0.000010	< 0.00010	0.00015	< 0.010	< 0.010	473	< 0.050	0.86	1.2	0.33	0.0018	0.0018	< 0.00050	< 0.00050	< 0.0030	< 0.0030	6.12	3.87	1.3	-1.1	1.4				2.18	-0.88	0.98	0.22			
2015	Q3	GH_ERC	0.19	0.2	20	< 0.000010	< 0.000010	< 0.00010	0.00016	< 0.010	< 0.010	179	< 0.050	0.79	5.1	1.3	0.00065	0.00071	< 0.00050	0.00058	< 0.0030	< 0.0030	2.57	2.58	-5.9	0.32	1.8										
2015	Q3	CM_MC2	0.27	0.29	249	0.000014	0.000019	< 0.00010	< 0.00010	< 0.010	< 0.010	626	0.1	0.75	1.2	0.61	0.0024	0.0025	< 0.00050	< 0.00050	< 0.0030	< 0.0030	6.55	5.85	3.8	-0.13	2.5										
2015	Q3	EV_MC2	0.21	0.21	169	0.000013	0.000014	< 0.00010	< 0.00010	< 0.010	< 0.010	477	0.16	0.83	1.2	0.34	0.0019	0.0019	< 0.00050	< 0.00050	< 0.0030	0.0031	5.63	4.72	3.8	0.055	1.5										
2015	Q3	EV_HC1	0.11	0.11	165	< 0.000010	< 0.000010	< 0.00010	< 0.00010	< 0.010	< 0.010	479	0.073	1.6	2.3	0.77	0.0023	0.0023	< 0.00050	< 0.00050	< 0.0030	< 0.0030	3.20	3.04	-0.59	-0.2	0.42										
2015	Q3	LC_LCDSSLCC	0.16	0.17	157	< 0.000010	< 0.000010	< 0.00010	< 0.00010	< 0.010	< 0.010	447	0.12	0.64	1.4	0.35	0.0026	0.0028	< 0.00050	< 0.00050	0.0092	0.011	6.66	5.11	2.8	-1.2	0.62										
2015	Q4	GH_FR1	0.14	0.15	189	< 0.000010	< 0.000010	< 0.00010	< 0.00010	< 0.010	< 0.010	520	0.091	0.57	<1	0.3	0.0019	0.0019	< 0.00050	< 0.00050	< 0.0030	< 0.0030	6.44	3.78	1.7	-2.7	1.1				2.41	-2.73	0.53	-0.04			
2015	Q4	GH_ERC	0.22	0.23	37	< 0.000010	< 0.000010	< 0.00010	< 0.00010	< 0.010	< 0.010	214	< 0.050	0.52	<1	0.26	0.00077	0.00081	< 0.00050	< 0.00050	< 0.0030	< 0.0030	2.47	2.46	-5.0	-2.6	2.5										
2015	Q4	EV_MC2	0.23	0.23	183	< 0.000010	< 0.000010	< 0.00010	< 0.00010	< 0.010	< 0.010	492	0.14	0.7	1.0	0.36	0.0019	0.0019	< 0.00050	< 0.00050	< 0.0030	< 0.0030	5.08	4.03	3.9	-1.2	1.3										
2015	Q4	EV_HC1	0.13	0.13	218	< 0.000010	< 0.000010	< 0.00010	< 0.00010	< 0.010	< 0.010	529	0.096	0.74	<1	0.29	0.0026	0.0027	< 0.00050	< 0.00050	< 0.0030	< 0.0030	3.10	2.84	0.46	-2.3	0.95										
2015	Q4	LC_DCDS	0.0474	0.0486	13.2	<0.000050	<0.000050	<0.00050	<0.00050	<0.010	<0.010	140	<0.050	2.67	4.2	1.93	0.000307	0.000327	<0.0025	<0.0025	0.0114	<0.015	7.33	7.38	-1.4	15	19										
2015	Q4	LC_LC5	0.171	0.169	178	<0.000050	<0.000050	<0.00050	<0.00050	<0.010	<0.010	440	<0.050	1.23	<1.0	0.35	0.00209	0.0021	<0.0025	<0.0025	<0.0050	<0.015	11.92	10.15	4.7	12	20				9.38	15.22	23.90	4.00			
2015	Q4	LC_LCDSSLCC	0.21	0.22	237	< 0.000050	< 0.000050	< 0.00050	< 0.00050	< 0.010	< 0.010	565	< 0.050	0.99	< 1.0	0.29	0.0038	0.004	< 0.0025	< 0.0025	0.0081	< 0.015	13.3	10.02	7.6	12	20										
2016	Q1	GH_FR1	0.16	0.16	247	< 0.000010	< 0.000010	< 0.00010	< 0.00010	0.017	0.017	622	< 0.050	0.71	< 1.0	0.35	0.0022	0.0022	< 0.00050	< 0.00050	< 0.0030	< 0.0030	7.37	3.92	2.0	-3.0	1.5				2.64	-2.94	0.93	0.01			
2016	Q1	GH_ERC	0.24	0.24	61	< 0.000010	< 0.000010	< 0.00010	< 0.00010	0.012	0.012	256	< 0.050	< 0.50	< 1.0	0.24	0.00099	0.00095	< 0.00050	< 0.00050	< 0.0030	< 0.0030	2.65	2.61	-4.4	-3.0	3.0										
2016	Q1	CM_MC2	0.33	0.32	291	0.00001	0.000018	< 0.00010	< 0.00010	< 0.010	< 0.010	639	0.095	0.69	< 1.0	0.57	0.0026	0.0024	< 0.00050	< 0.00050	< 0.0030	< 0.0030	6.36	5.52	4.6	-0.59	2.4										
2016	Q1	EV_MC2	0.2	0.21	174	< 0.000010	0.00001	< 0.00010	< 0.00010	0.015	0.016	482	0.11	0.77	< 1.0	0.77	0.0017	0.0017	< 0.00050	< 0.00050	< 0.0030	< 0.0030	4.49	3.63	2.8	-0.91	1.0										
2016	Q1	EV_HC1	0.13	0.13	222	< 0.000010	< 0.000010	< 0.00010	< 0.00010	0.015	0.015	504	0.081	1.0	< 1.0	0.25	0.0027	0.0028	< 0.00050	< 0.00050	< 0.0030	< 0.0030	3.07	2.81	0.37	-2.0	1.1										
2016	Q1	LC_LCDSSLCC	0.23	0.24	303	< 0.000010	< 0.000010	< 0.00010	< 0.00010	0.017	0.018	713	0.07	< 0.50	< 1.0	0.35	0.0039	0.0039	< 0.00050	< 0.00050	< 0.0030	0.0034	7.38	4.42	5.3	-2.4	0.98										
2016	Q2	FR_FRCP1	0.097	0.1	116	< 0.000010	0.000013	< 0.00010	< 0.00010	< 0.010	< 0.010	354	0.21	2.9	7.1	1.5	0.0016	0.0017	< 0.00050	0.00061	< 0.0030	0.0033	5.49	3.84	0.085	2.0	-1.4				1.25	2.36	-1.94	0.38			
2016	Q2	GH_ERC	0.21	0.2	33	< 0.000010	0.000014	< 0.00010	< 0.00010	< 0.010	< 0.010	191	0.19	2.2	23	5.7	0.00085	0.00085	< 0.00050	0.0014	< 0.0030	0.0035	3.25	3.25	-4.9	3.9	-0.44										
2016	Q2	EV_MC2	0.088	0.092	36	< 0.000010	0.000023	< 0.00010	< 0.00010	< 0.010	0.015	165	0.2	3.3	25	11	0.00052	0.00058	< 0.00050	0.0019	< 0.0030	0.0047	4.30	4.37	-5.1	7.9	-1.1										
2016	Q2	EV_HC1	0.096	0.099	120	< 0.000010	0.000014	< 0.00010	< 0.00010	0.013	0.015	378	0.19	2.5	5.9	3.1	0.002	0.0021	< 0.00050	0.00077	< 0.0030	< 0.0030	2.90	2.80	-1.7	1.9	-0.76										
2016	Q2	LC_LC5	0.114	0.117	105	<0.000010	<0.000010	<0.00010	<0.00010	0.013	0.014	359	0.223	2.15	15.7	4.21	0.00157	0.00161	<0.00050	0.00063	<0.0030	0.004	5.09	4.48	-0.38	2.0	-1.1				1.01	2.33	-1.71	-0.57			
2016	Q2	LC_LCDSSLCC	0.13	0.13	110	0.00001	< 0.000010	< 0.00010	< 0.00010	0.011	0.012	352	0.18	1.8	< 1.0	0.94	0.0022	0.0023	< 0.00050	< 0.00050	0.0089	0.01	5.62	4.38	1.5	0.36	-0.09										
2016	Q3	GH_FR1	0.13	0.14	168	< 0.000010	< 0.000010	< 0.00010	< 0.00010	< 0.010	< 0.010	477	0.15	1.3	< 1.0	0.43	0.002	0.002	< 0.00050	< 0.00050	< 0.0030	< 0.0030	5.29	2.89	1.3	-2.3	-0.4				2.01	-2.46	-0.65	-0.16			
2016	Q3	GH_ERC	0.21	0.2	26	< 0.000010	< 0.000010	< 0.00010	< 0.00010	< 0.010	< 0.010	195	0.055	0.65	< 1.0	1.1	0.0007	0.00067	< 0.00050	< 0.00050	< 0.0030	< 0.0030	1.35	1.35	-6.0	-2.2	1.1										
2016	Q3	EV_MC2	0.23	0.24	214	0.000011	0.000012	< 0.00010	< 0.00010	< 0.010	< 0.010	570	0.14	0.96	< 1.0	0.3	0.0015	0.0015	< 0.00050	< 0.00050	< 0.0030	0.0031	4.43	3.26	3.9	-1.4	0.47										
2016	Q3	EV_HC1	0.12	0.12	176	< 0.000010	< 0.000010	< 0.00010	< 0.00010	< 0.010	< 0.010	496	0.096	1.5	2.7	2.6	0.0023	0.0023	< 0.00050	< 0.00050	< 0.0030	< 0.0030	2.52	2.36	-0.59	0.32	-1.1										
2016	Q3	LC_LCDSSLCC	0.2	0.19	187	< 0.000010	< 0.000010	< 0.00010	< 0.00010	< 0.010	< 0.010	508	< 0.050	0.52	< 1.0	0.28	0.0029	0.0024	< 0.00050	< 0.00050	0.0089	0.0075	5.94	3.90	3.8	-2.4	-0.022										
2016	Q4	GH_FR1	0.14	0.14	196	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	517	0.13	1.1	<2	0.49	0.0021	0.0022	<0.0005	<0.0005	<0.003	<0.003	5.63	3.38	1.9	-1.9	-0.41				2.69	-1.84	-0.74	0.09			
2016	Q4	GH_ERC	0.25	0.24	32	< 0.000010	< 0.000010	< 0.00010	< 0.00010	< 0.010	< 0.010	203	< 0.050	0.8	3.4	1.2	0.00089	0.00084	< 0.00050	< 0.00050	< 0.0030	< 0.0030	1.97	1.96	-5.3	-1.9	0.98										
2016	Q4	EV_HC1	0.13	0.13	193	< 0.000010	0.00001	< 0.00010	< 0.00010	< 0.010	< 0.010	480	0.1	1.7	1.8	2.3	0.0026	0.0026	< 0.00050	< 0.00050	< 0.0030	< 0.0030	2.55	2.36	0.12	-0.49	-1.0										
2016	Q4	LC_LC5	0.159	0.153	154	<0.000010	<0.000010	<0.00010	<0.00010	<0.010	<0.010	441	<0.050	0.95	<1.0	0.46	0.00201	0.00209	<0.00050	<0.00050	<0.0030	<0.0030	5.43	4.24	1.2	-3.1	0.022				1.91	-3.23	-0.30	-0.14			
2016	Q4	LC_LCDSSLCC	0.18	0.17	176	0.00001	< 0.000010	< 0.00010	< 0.00010	< 0.010	< 0.010	487	0.13	0.91	< 1.0	0.39	0.0032	0.0031	< 0.00050	< 0.00050	0.0061	0.0078	5.23	3.52	3.3	-1.7	-0.75										
2017	Q1	GH_FR1	0.16	0.16	232	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	618	0.1	0.63	<1	0.47	0.0024	0.0023	<0.0005	<0.0005	<0.003	<0.003	6.47	2.99	-0.0001	-3.0	-1.4				0.17	-2.64	-1.78	7.52			
2017	Q1	GH_ERC	0.21	0.22	38	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	223	<0.05	<0.5	<1	0.13	0.00085	0.00083	<0.0005	<0.0005	<0.003	<0.003	1.40	1.39	-6.1	-3.4	0.87										
2017	Q1	EV_HC1	0.13	0.13	204	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	492	0.081	0.89	<1	0.4	0.0027	0.0027	<0.0005	<0.0005	<0.003	<0.003	2.32	2.07	-2.1	-2.0	-1.4										
2017	Q2	GH_FR1	0.13	0.14	170	<0.00001	0.000025	<0.0001	<0.0001	<0.01	<0.015	497	0.39	5.9	15	25	0.0024	0.0024	<0.0005	0.0027	<0.003	0.0072	7.47	5.77	0.36	7.6	-4.1				2.12	8.71	-4.72	6.89			
2017	Q2	GH_ERC	0.22	0.23	36	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	210	0.074	1.1	6.8	2.5	0.00094	0.00098	<0.0005	0.0007	<0.003	<0.003	1.84	1.85	-5.6	0.03	-1.4										
2017	Q2	LC_DCDS	0.0346	0.038	6.77	<0.000010	0.000017	<0.00010	<0.00010	<0.010	<0.010	90	0.27	4.29	8	10.4	0.000233	0.000286	0.00144	0.00213	0.0017	0.0056	3.19	3.33	-5.7	8.4	-1.7										
2017	Q2	LC_LC5	0.161	0.148	172	<0.000010	<0.000010	<0.00010	<0.00010	<0.010	<0.010	495	0.68	2.11	8.2	5.82	0.00173	0.00185	<0.00050	0.00056	<0.0010	0.016	5.43	3.91	1.3	1.6	-2.8				2.45	1.35	-2.93	-1.38			
2017	Q2	LC_LCDSSLCC	0.23	0.22	254	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	676	0.69	1.3	2.3	1.2	0.0033	0.0036	<0.0005	<0.0005	0.0084	0.012	8.25	4.47	3.1	-0.73	-2.8										
2017	Q3	GH_ERC	0.19	0.19	21	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	160	0.076	0.83	4.0	1.7	0.00058	0.00064	<0.0005	<0.0005	<0.001	<0.003	1.43	1.44	-6.8	-0.78	-1.4										
2017	Q3	EV_MC2	0.19	0.18	116	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	362	0.29	1.7	1.7	0.45	0.0012	0.0012	<0.0005	<0.0005	<0.003	<0.003	2.56	2.24	-0.81	-1.1	-1.9										
2017	Q3	EV_HC1	0.12	0.12	161	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	436	0.069	1.0	<1	0.31	0.0021	0.0021	<0.0005	<0.0005	<0.003	<0.003	2.09	1.93	-2.4	-1.6	-1.6										
2017	Q3	LC_LCDSSLCC	0.19	0.19	206	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	531	0.66	1.3	<1	0.43	0.0028	0.0028	<0.0005	<0.0005	0.014	0.0098	6.82	4.47	2.2	-1.1	-1.9										
2017	Q4	GH_FR1	0.16	0.15	232	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	586	0.53	1.9	1.1	0.77	0.0027	0.0025	<0.0005	<0.0005	<0.003	<0.003	5.79	2.97	-0.14	-2.0	-2.1				0.13	-1.70	-2.40	7.61			
2017	Q4	GH_ERC	0.21	0.21	23	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	193	<0.05	0.96	<1	0.56	0.00087	0.00079	<0.0005	<0.0005	<0.003	<0.003	1.35	1.36	-6.3	-2.6	0.0045										
2017	Q4	EV_MC2	0.18	0.2	133	<0.00001	<0.00001	<0.0001	0.00014	<0.01	<0.01	420	<0.2	0.9	1.6	1.2	0.001	0.0012	<0.0005	<0.0005	<0.003	<0.003	2.50	2.25	-2.0	-1.1	-0.71										
2017	Q4	EV_HC1	0.13	0.13	189	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	474	<0.2	0.97	<1	0.31	0.0022	0.0025	<0.0005	<0.0005	<0.003	<0.003	2.09	1.91	-2.5	-1.9	-1.6										
2017	Q4	LC_DCDS	0.0662	0.066	42.5	0.000012	0.000012	<0.00010	<0.00010	<0.010	<0.010	248	0.67	2.22	2.2	1.96	0.000771	0.000739	0.00121	0.00133	<0.0030	<0.0030	4.52	4.52	-0.57	3.6	-1.3										
2017	Q4	LC_LC5	0.17	0.173	185	<0.000010	<0.000010	<0.00010	<0.00010	<0.010	<0.010	525	0.583	0.86	1	0.27	0.00238	0.00213	<0.00050	<0.00050	<0.0030	<0.0030	5.50	4.01	0.99	-2.4	0.04				1.59	-2.57	0.06	-0.38			
2017	Q4	LC_LCDSSLCC	0.21	0.21	245	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	651	0.51	0.94	<1	0.28	0.0038	0.0038	<0.0005	<0.0005	0.0056	0.0076	6.63	4.18	2.3	-1.2	-1.8										
2018	Q1	GH_FR1	0.16	0.18	261	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	629	0.13	0.86	<1	0.24	0.0024	0.0024	<0.0005	<0.0005	<0.003	<0.003	6.10	3.71	2.5	-3.2	-0.1				3.09	-3.65	0.55	-0.36			
2018	Q1	GH_ERC	0.2	0.21	33	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	203	0.11	0.56	4.8	1.1	0.00085	0.00085	<0.0005	<0.0005	<0.003	<0.003	1.47	1.51	-5.9	-1.9	1.0										
2018	Q1	CM_MC3	0.21	0.22	107	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	331	<0.2	0.74	<1	0.21	0.0013	0.0013	<0.0005	<0.0005	<0.003	<0.003	2.05	1.94	-1.8	-2.8	1.3										
2018	Q1	EV_HC1	0.14	0.14	229	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	568	<0.2	0.76	<1	0.26	0.0029	0.0028	<0.0005	<0.0005	<0.003	<0.003	2.23	1.97	0.48	-2.6	-0.17										
2018	Q1	LC_LCDSSLCC	0.22	0.24	306	<0.00002	<0.00001	<0.0002	<0.0001	<0.01	<0.01	692	0.38	0.7	<1	0.16	0.0041	0.0039	<0.001	<0.0005	0.0035	0.0034	7.06	4.67	5.7	-0.98	6.3										
2018	Q2	EV_MC2	0.15	0.15	70	<0.00001	0.000027	<0.0001	<0.0001	<0.01	<0.01	262	0.28	4.1	37	15	0.00075	0.00077	<0.0005	0.0022	<0.0015	0.0056	4.75	4.70	-1.5	9.2	-2.2										
2018	Q2	EV_HC1	0.09	0.091	106	<0.00001	0.000011	<0.0001	<0.0001	<0.01	<0.01	333	0.16	2.8	8.0	4.3	0.0015	0.0017	<0.0005	0.00056	<0.001	<0.003	2.11	2.03	-2.5	1.3	-1.9										
2018	Q2	LC_DCDS	0.0726	0.0712	43.3	0.000016	0.000035	<0.00010	<0.00010	<0.010	<0.010	229	0.714	6.7	25.2	38.2	0.000714	0.000735	0.00138	0.00333	0.0013	0.0082	9.99	10.09	0.94	12	-3.0										
2018	Q3	GH_FR1	0.15	0.14	228	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	590	0.48	1.2	2.9	0.33	0.0027	0.0026	<0.0005	<0.0005	<0.001	<0.003	5.80	4.04	2.6	-1.5	-1.0				3.32	-1.97	-1.20	-0.53			
2018	Q3	GH_ERC	0.21	0.2	24	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	194	<0.05	1.1	1.7	0.4	0.00071	0.00072	<0.0005	<0.0005	<0.001	<0.003	1.50	1.54	-6.4	-0.67	0.14										
2018	Q3	EV_MC2	0.26	0.25	171	0.000016	0.000015	<0.0001	<0.0001	<0.01	<0.01	460	0.43	1.2	1.1	0.3	0.0019	0.0018	<0.0005	<0.0005	0.0013	<0.003	4.16	3.58	4.3	0.03	-0.037										
2018	Q3	EV_HC1	0.13	0.12	198	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	472	0.11	1.2	1.7	0.58	0.0024	0.0024	<0.0005	<0.0005	<0.001	<0.003	2.18	2.03	-0.018	-1.4	-0.77										

Year	Quarter	Sample ID	STRONTIUM-D-mg/l	STRONTIUM-T-mg/l	SULFATE (AS SO4)-D-mg/l	THALLIUM-D-mg/l	THALLIUM-T-mg/l	TIN-D-mg/l	TIN-T-mg/l	TITANIUM-D-mg/l	TITANIUM-T-mg/l	TOTAL DISSOLVED SOLIDS (RESIDUE FILTERABLE)-N-mg/l	TOTAL KJELDAHL NITROGEN-N-mg/l	TOTAL ORGANIC CARBON-T-mg/l	TOTAL SUSPENDED SOLIDS LAB-N-mg/l	TURBIDITY LAB-N-ntu	URANIUM-D-mg/l	URANIUM-T-mg/l	VANADIUM-D-mg/l	VANADIUM-T-mg/l	ZINC-D-mg/l	ZINC-T-mg/l	∑TU-WQGs	∑TU-WQGs/Benchmarks	PC1_allyrs	PC2_allyrs	PC3_allyrs	PC1_2021	PC2_2021	PC3_2021	PC1_allyrs_UFR	PC2_allyrs_UFR	PC3_allyrs_UFR	PC4_allyrs_UFR	PC1_2021_UFR	PC2_2021_UFR	PC3_2021_UFR
2018	Q3	LC_LCDSSLCC	0.21	0.2	211	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	610	<0.05	1.2	1.4	0.17	0.0034	0.0035	<0.0005	<0.0005	0.011	0.012	7.45	5.80	4.7	-0.77	-0.11										
2018	Q4	FR_FRABCH	0.18	0.18	324	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	788	0.2	0.83	<1	0.43	0.0035	0.0034	<0.0005	<0.0005	<0.001	<0.003	8.93	3.53	3.9	-2.9	-0.59				4.25	-3.41	-0.42	-1.04			
2018	Q4	GH_FR1	0.16	0.15	275	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	591	0.16	0.79	<1	0.39	0.0028	0.0027	<0.0005	<0.0005	<0.001	<0.003	6.01	3.77	2.9	-3.1	-0.5				3.38	-3.59	-0.78	-0.61			
2018	Q4	GH_ERC	0.21	0.21	27	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	179	<0.05	<0.5	<1	0.22	0.00082	0.00086	<0.0005	0.001	<0.001	<0.003	1.97	2.00	-5.7	-0.043	-0.23										
2018	Q4	EV_MC2	0.19	0.19	144	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	434	0.16	1.2	1.3	0.5	0.0018	0.0018	<0.0005	<0.0005	<0.001	<0.003	3.34	3.09	1.7	-1.1	-0.16										
2018	Q4	EV_HC1	0.14	0.13	198	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	552	0.16	1.1	1.7	0.42	0.0025	0.0025	<0.0005	<0.0005	<0.001	<0.003	2.30	2.12	0.29	-1.4	-0.45										
2019	Q1	GH_FR1	0.181	0.188	287	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	728	0.089	0.77	<1	0.45	0.00276	0.00275	<0.0005	<0.0005	<0.001	<0.003	7.01	4.01	3.0	-3.2	0.1				3.56	-3.63	0.08	-0.97			
2019	Q1	GH_ERC	0.219	0.214	30.8	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	216	<0.05	<0.5	<1	0.21	0.000813	0.000823	<0.0005	<0.0005	<0.001	<0.003	3.95	3.96	-5.3	-3.5	1.9										
2019	Q1	RG_MIDAG	0.3	0.296	197	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	526	0.147	0.61	<1	0.32	0.00198	0.00196	<0.0005	<0.0005	<0.001	<0.003	5.08	4.59	0.65	-2.6	1.7										
2019	Q1	EV_MC2	0.179	0.179	129	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	385	0.227	1.61	1	1.04	0.00134	0.00126	<0.0005	<0.0005	<0.001	<0.003	2.74	2.47	-0.12	-1.6	-0.17										
2019	Q1	EV_HC1	0.135	0.132	215	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	520	0.133	0.88	1.1	1.59	0.00264	0.00272	<0.0005	<0.0005	<0.001	<0.003	3.04	2.79	-0.15	-1.7	-0.055										
2019	Q1	LC_DCDS	0.104	0.102	81.8	0.000011	0.000012	<0.0001	<0.0001	<0.01	<0.01	384	0.55	1.7	2	1.52	0.00152	0.0017	0.00108	0.00115	0.0025	0.0031	8.19	6.45	2.8	2.2	-0.92										
2019	Q1	LC_LC3	0.253	0.256	490	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	1040	0.23	1.1	<1	1.14	0.0056	0.006	<0.0005	<0.0005	0.0026	0.0042	8.39	6.34	8.5	-1.0	-1.2										
2019	Q1	LC_LC5	0.188	0.182	211	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	571	0.242	0.68	<1	0.34	0.00228	0.00226	<0.0005	<0.0005	<0.001	<0.003	6.17	3.69	1.9	-3.8	0.14				2.30	-4.18	0.25	-1.21			
2019	Q1	LC_LCDSSLCC	0.244	0.25	306	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	740	0.059	0.81	2.5	0.24	0.00374	0.00404	<0.0005	<0.0005	0.0027	<0.003	6.75	4.58	5.4	-3.1	-0.14										
2019	Q2	FR_FRABCH	0.149	0.167	360	<0.00001	<0.00001	<0.0001	0.00012	<0.01	<0.01	824	0.132	0.79	1.6	0.81	0.00289	0.00331	<0.0005	<0.0005	0.0035	0.0112	11.0	5.61	4.6	1.6	0.87				6.19	2.12	0.74	-0.29			
2019	Q2	FR_FRCP1	0.135	0.146	271	<0.00001	0.00001	<0.0001	<0.0001	<0.01	<0.01	661	0.359	1.64	<1	1.21	0.00315	0.00348	<0.0005	<0.0005	<0.001	<0.003	8.75	5.55	4.2	-1.1	-1.6				4.92	-1.17	-2.02	1.27			
2019	Q2	GH_FR1	0.163	0.16	265	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	626	0.503	1.39	<1	0.82	0.00271	0.00277	<0.0005	<0.0005	<0.001	<0.003	6.16	3.55	3.1	-1.7	-1.1				3.80	-2.10	-1.18	-0.28			
2019	Q2	GH_ERC	0.213	0.216	34.7	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	193	0.059	<0.5	1.1	0.85	0.00082	0.00085	<0.0005	<0.0005	<0.001	<0.003	4.02	4.03	-5.2	-2.1	0.89										
2019	Q2	CM_MC2	0.274	0.256	219	<0.00001	0.000011	<0.0001	<0.0001	<0.01	<0.01	504	0.299	1.87	2.8	1.55	0.00193	0.0019	<0.0005	<0.0005	<0.001	<0.003	4.66	4.13	2.0	0.51	-0.47										
2019	Q2	RG_MIDAG	0.2	0.21	110	0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	316	0.126	1.4	11.8	0.93	0.00134	0.00146	<0.0005	<0.0005	<0.001	<0.003	2.51	2.30	-1.7	-0.64	0.17										
2019	Q2	EV_MC2	0.117	0.12	60.7	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	213	0.363	2.3	4	2.16	0.000677	0.000647	<0.0005	0.00054	<0.001	<0.003	2.31	2.33	-4.2	0.7	0.078										
2019	Q2	EV_HC1	0.11	0.115	186	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	453	0.151	0.97	8.7	1.96	0.00263	0.0027	<0.0005	<0.0005	<0.001	<0.003	2.97	2.81	-0.91	-1.1	-0.0064										
2019	Q2	LC_DCDS	0.0831	0.0793	65.3	<0.00001	0.000011	<0.0001	<0.0001	<0.01	<0.01	291	0.762	3.5	9.2	3.48	0.00117	0.00107	0.00121	0.00136	<0.001	<0.003	6.81	6.29	0.78	2.9	-0.91										
2019	Q2	LC_LC3	0.19	0.219	333	<0.00001	0.000011	<0.0001	<0.0001	<0.01	<0.01	693	<0.05	<0.5	<1	0.53	0.00358	0.00411	<0.0005	<0.0005	0.0048	0.0067	10.7	7.24	5.8	-2.0	-0.14										
2019	Q2	LC_LC5	0.165	0.175	218	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	543	0.466	0.62	4.1	0.6	0.0021	0.00227	<0.0005	<0.0005	<0.001	<0.003	6.19	3.69	1.9	-2.4	-0.65				2.46	-2.57	-0.75	-0.64			
2019	Q2	LC_LCDSSLCC	0.182	0.199	226	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	552	<0.05	<0.5	1.2	0.39	0.0027	0.00307	<0.0005	<0.0005	0.0023	0.0032	6.51	4.39	2.8	-2.7	0.11										
2019	Q3	FR_FRABCH	0.144	0.153	213	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	629	<0.25	0.84	<1	0.51	0.00312	0.00288	<0.0005	<0.0005	0.0017	0.0043	8.03	4.31	3.2	-2.0	-0.6				3.84	-2.08	-0.75	-0.57			
2019	Q3	GH_FR1	0.137	0.132	164	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	473	<0.25	1.16	2.1	1.18	0.0022	0.00231	<0.0005	<0.0005	<0.001	<0.003	5.65	3.61	1.4	-2.0	-0.79				2.08	-2.15	-1.01	-0.65			
2019	Q3	GH_ERC	0.201	0.207	21.6	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	170	<0.05	0.87	<1	0.65	0.000701	0.00075	<0.0005	<0.0005	<0.001	<0.003	2.62	2.63	-5.7	-2.5	0.94										
2019	Q3	CM_MC2	0.384	0.396	313	0.000017	0.000015	<0.0001	<0.0001	<0.01	<0.01	674	0.373	1.01	<1	0.53	0.00318	0.00284	<0.0005	<0.0005	<0.001	<0.003	6.93	6.23	4.8	-1.0	1.6										
2019	Q3	RG_MIDAG	0.225	0.234	128	0.00002	0.000022	<0.0001	<0.0001	<0.01	<0.01	331	0.294	0.97	<1	0.49	0.00141	0.00145	<0.0005	<0.0005	<0.001	<0.003	3.56	3.35	-0.24	-0.73	1.5										
2019	Q3	EV_MC2	0.17	0.156	98.2	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	304	0.463	1.25	<1	0.68	0.00118	0.00107	<0.0005	<0.0005	0.0036	<0.003	2.40	2.27	-0.53	-1.4	-0.34										
2019	Q3	EV_HC1	0.123	0.116	169	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	416	0.182	1.12	<1	0.84	0.00227	0.00216	<0.0005	<0.0005	<0.001	<0.003	2.48	2.35	-0.68	-1.6	-0.5										
2019	Q3	LC_DCDS	0.104	0.111	88.1	0.000015	0.000013	<0.0001	<0.0001	<0.01	<0.01	354	<0.25	2.42	1.7	0.98	0.00121	0.0012	0.00118	0.00156	<0.001	<0.003	9.30	7.86	3.1	2.4	-0.7										
2019	Q3	LC_LC3	0.191	0.2	254	0.000012	0.00001	<0.0001	<0.0001	<0.01	<0.01	675	0.148	0.73	<1	0.35	0.00353	0.00349	<0.0005	<0.0005	0.0126	0.015	9.06	6.85	6.4	-0.86	-0.68										
2019	Q3	LC_LC5	0.144	0.148	145	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	445	0.082	1.33	1.8	0.56	0.00185	0.00178	<0.0005	<0.0005	<0.001	<0.003	4.92	3.14	1.3	-2.7	-0.46				1.83	-2.90	-0.51	-0.80			
2019	Q3	LC_LCDSSLCC	0.178	0.183	175	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	511	<0.25	0.77	<1	0.17	0.00258	0.00252	<0.0005	<0.0005	0.0059	0.0078	6.02	4.48	3.4	-1.9	-0.38										
2019	Q4	FR_FRABCH	0.144	0.161	298	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	756	<0.05	1.33	35.4	4.64	0.00284	0.00302	<0.0005	<0.0005	<0.001	<0.003	9.88	4.73	2.6	0.12	-1.7				3.53	0.31	-1.56	-2.03			
2019	Q4	FR_FRCP1	0.156	0.185	483	0.000012	0.000012	<0.0001	<0.0001	<0.01	<0.01	1010	<0.05	1.11	1.9	0.25	0.005	0.00558	<0.0005	<0.0005	<0.001	0.0033	10.9	6.23	6.2	-2.4	-0.91				6.53	-2.70	-0.82	0.18			
2019	Q4	GH_FR1	0.146	0.153	239	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	614	<0.05	0.56	1.3	0.3	0.00273	0.00253	<0.0005	<0.0005	<0.001	<0.003	6.01	3.33	1.7	-3.1	-0.023				2.31	-3.18	-0.20	-1.34			
2019	Q4	GH_ERC	0.213	0.215	39.1	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	223	0.179	<0.5	15.5	1.16	0.000847	0.000849	<0.0005	<0.0005	<0.001	<0.003	2.44	2.44	-4.8	-2.6	0.86										
2019	Q4	CM_MC2	0.379	0.374	358	0.000011	0.000023	<0.0001	<0.0001	<0.01	<0.01	773	0.402	0.84	14.1	3.4	0.00309	0.00353	<0.0005	0.00067	0.0021	0.0042	8.94	8.09	5.4	2.8	-0.39										
2019	Q4	RG_MIDAG	0.266	0.261	187	0.00001	0.00002	<0.0001	<0.0001	<0.01	<0.01	459	0.304	0.75	<1	0.25	0.00182	0.00187	<0.0005	<0.0005	0.001	<0.003	3.82	3.44	0.57	-0.47	0.45										
2019	Q4	EV_MC2	0.177	0.187	134	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	388	0.404	0.81	1	0.34	0.00156	0.00144	<0.0005	<0.0005	0.0011	<0.003	2.63	2.39	0.35	-2.4	-0.29										
2019	Q4	EV_HC1	0.129	0.132	213	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	503	0.338	<0.5	1.1	0.4	0.00274	0.00268	<0.0005	<0.0005	0.0012	<0.003	3.06	2.84	-0.24	-2.7	-0.3										
2019	Q4	LC_DCDS	0.131	0.139	141	<0.00001	0.000011	<0.0001	<0.0001	<0.01	<0.01	546	<0.05	1.61	<1	0.31	0.00193	0.00203	0.00104	0.00114	0.0043	0.0049	12.4	8.08	4.8	1.3	-0.46										
2019	Q4	LC_LC3	0.227	0.23	408	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	896	<0.05	0.72	2.4	0.41	0.00503	0.00507	<0.0005	<0.0005	0.0068	0.0067	9.54	6.38	8.1	-1.2	-0.9										
2019	Q4	LC_LC5	0.181	0.174	193	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	538	<0.05	<0.5	2.1	0.33	0.00232	0.00231	<0.0005	<0.0005	0.0014	<0.003	6.14	3.85	2.9	-3.7	-0.41				3.18	-4.12	-0.28	-1.33			
2019	Q4	LC_LCDSSLCC	0.209	0.214	257	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	637	<0.05	<0.5	1.3	0.37	0.0035	0.00364	<0.0005	<0.0005	0.005	0.0065	9.23	7.01	4.5	-1.8	-0.24										
2020	Q1	FR_FRABCH	0.177	0.175	331	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	857	<0.05	1.51	38.8	17.1	0.00312	0.00315	<0.0005	<0.0005	0.0013	0.0045	10.8	4.90	3.6	1.5	-1.9				4.95	1.59	-1.82	-2.45			
2020	Q1	GH_ERC	0.212	0.208	48	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	259	0.119	0.54	<1	<0.1	0.000864	0.000895	<0.0005	<0.0005	<0.001	<0.003	2.06	2.06	-4.7	-3.4	1.4										
2020	Q1	CM_MC2	0.532	0.544	473	0.00002	0.00002	<0.0001	<0.0001	<0.01	<0.01	895	0.229	0.74	<1	0.69	0.00417	0.00433	<0.0005	<0.0005	0.0031	0.0034	14.2	13.2	8.5	0.5	1.3										
2020	Q1	RG_MIDAG	0.343	0.355	273	<0.00001	0.000013	<0.0001	<0.0001	<0.01	<0.01	616	0.208	<0.5	<1	0.23	0.00255	0.0025	<0.0005	<0.0005	0.004	<0.003	5.22	4.77	3.6	-1.1	3.7										
2020	Q1	EV_MC2	0.218	0.231	143	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	415	0.373	0.87	<1	0.24	0.00142	0.00151	<0.0005	<0.0005	<0.001	<0.003	2.87	2.59	0.82	-1.9	-0.1										
2020	Q1	EV_HC1	0.13	0.135	223	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	525	0.253	0.88	<1	0.27	0.00263	0.00259	<0.0005	<0.0005	<0.001	<0.003	2.96	2.74	-0.12	-2.2	-0.46										
2020	Q1	LC_LC3	0.244	0.242	504	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	993	0.474	0.94	<1	0.43	0.00513	0.0051	<0.0005	<0.0005	0.0047	0.006	9.27	6.41	8.6	-0.94	-1.0										
2020	Q1	LC_LC5	0.174	0.176	210	<0.00001	<0.00001	<0.0001	0.00018	<0.01	<0.01	557	0.356	0.66	<1	0.21	0.00222	0.00221	<0.0005	<0.0005	<0.001	<0.003	5.26	2.84	1.4	-3.2	0.72				2.05	-3.45	0.73	-0.98			
2020	Q1	LC_LCDSSLCC	0.233	0.244	320	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	728	<0.05	0.9	<1	<0.1	0.00362	0.0039	<0.0005	<0.0005	0.003	0.0032	6.30	3.93	5.0	-3.3	-0.19										
2020	Q1	FR_FR4	0.186	0.204	549	0.000012	0.000011	<0.0001	<0.0001	<0.01	<0.01	1110	<0.05	1.53	<1	0.16	0.00602	0.00635	<0.0005	<0.0005	0.0027	<0.003	12.4	6.77	7.1	-2.1	-0.51				7.60	-2.48	-0.53	0.76			
2020	Q2	FR_FRABCH	0.135	0.134	228	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	650	<0.05	4.35	8.9	4.94	0.00298	0.00262	<0.0005	0.00058	0.0035	0.004	8.45	4.51	3.6	0.71	-2.5				4.78	0.84	-2.52	-0.01			
2020	Q2	FR_FRCP1	0.124	0.123	207	0.000014	0.000011	<0.0001	<0.0001	<0.01	<0.01	596	<0.05	1.81	3.7	2.76	0.00291	0.00251	<0.0005	0.00065	0.006	0.0061	9.16	5.97	4.1	0.85	-1.9				5.28	1.42	-1.72	1.07			
2020	Q2	GH_FR1	0.109	0.118	157	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	477	0.394	3.33	8.7	3.77	0.00209	0.00218	<0.0005	0.00058	0.0019	0.0035	5.29	3.63	1.4	1.7	-2.6				2.40	1.64	-2.56	-1.08			
2020	Q2	GH_ERC	0.191	0.207	36.9	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	228	0.168	1.58	7	3.82	0.000929	0.000991	<0.0005	0.00073	<0.001	<0.003	2.10	2.08	-4.6	1.0	-1.2										
2020	Q2	CM_MC2	0.249	0.276	211	0.000012	0.000013	<0.0001	<0.0001	<0.01	<0.01	527	0.398	1.74	4.9	3.36	0.00208	0.00222	<0.0005	<0.0005	0.0058	0.0073	6.13	5.73	3.4	2.0	-0.94										
2020	Q2	RG_MIDAG	0.197	0.223	109	0.000018	0.000022	<0.0001	<0.0001	<0.01	<0.01	376	0.192	1.67	2.8	1.9	0.0012	0.00121	<0.0005	<0.0005	0.0025	0.0039	3.25	3.14	-0.014	1.1	-0.18										
2020	Q2	EV_MC2	0.136	0.13	49.5	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	198	0.135	3.46	8.7	5.64	0.000632	0.000714	<0.0005	0.00108	<0.001	<0.003	2.50	2.54	-3.7	3.3	-2.0										
2020	Q2	EV_HC1	0.116	0.115	145	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	424	0.154	2.33	2	1.48	0.00221	0.00224	<0.0005	0.00055	<0.001	<0.003	5.91	5.78	-1.1	-0.41	-1.5										
2020	Q2	LC_DCDS	0.0717	0.0755	67.6	<0.00001	0.000019	<0.0001	<0.0001	<0.01	<0.01	301	0.612	3.29	14	2.12	0.000901	0.00104	0.00124	0.00207	0.0046	0.0097	7.63	5.09	1.1	7.0	-2.7										
2020	Q2	LC_LC3	0.174	0.182	210	0.000012	0.00001	<0.0001	<0.0001	<0.01	<0.01	598	<0.25	0.78	2.4	0.45	0.00337	0.00304	<0.0005	<0.0005	0.0114	0.0111	7.62	5.71	5.2	-0.78	-0.99										
2020	Q2	LC_LC5	0.139	0.143	143	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	482	<0.25	1.78	8.3	1.86	0.00205	0.00181	<0.0005	<0.0005	0.0015	<0.003	4.62	2.77	1.2	-0.91	-1.9				1.95	-1.06	-1.98	-0.35			
2020	Q2	LC_LCDSSLCC	0.17	0.171	149	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	475	<0.05	1.2	1.4	0.48	0.00268	0.00237	<0.0005	<0.0005	0.0063	0.0062	5.09	3.64	2.8	-1.4	-1.1										
2020	Q3	FR_FRABCH	0.159	0.15	266	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	752	<0.25	<0.5	1.8	0.32	0.00306	0.0033	<0.0005	<0.0005	0.0024	<0.003	9.26	4.17	4.0	-3.4	-1.3				4.37	-3.67	-0.97	1.06			
2020	Q3	FR_FRCP1	0.161	0.15	311	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	743	<0.25	<0.5	1.8	0.28	0.00349	0.0037	<0.0005	<0.0005	0.0047	0.0056	8.15	4.75	5.6	-2.9	-1.6				5.95	-3.27	-1.35	1.93			
2020	Q3	GH_FR1	0.137	0.149	189	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	558	0.271	<0.5	31.9	2.75	0.00223	0.00227	<0.0005	0.00099	<0.001	<0.003	6.41	3.84	1.7	-0.19	-2.1				2.38	-0.46	-2.19	-1.51			
2020	Q3	GH_ERC	0.201	0.211	24.2	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	192	0.191	<0.5	5.2	1.04	0.000697	0.000724	<0.0005	0.00061	<0.001	0.005	2.05	2.03	-5.2	-1.3	0.13										
2020	Q3	RG_MIDAG	0.442	0.399	259	0.00002	0.000023	<0.0001	<0.0001	<0.01	<0.01	566	0.204	0.5	<1	0.54	0.00234	0.00235	<0.0005	<0.0005	0.0015	<0.003	5.01	4.69	4.3	-0.69	1.9										
2020	Q3	EV_MC2	0.188	0.191	119	<0.00001	<0.00001	<0.0001	0.00021	<0.01	<0.01	374	0.356	1.13	1.4	0.36	0.00116	0.0012	<0.0005	<0.0005	<0.001	<0.003	2.33	2.16	0.27	-1.8	0.58										
2020	Q3	EV_HC1	0.12	0.122	166	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	439	0.266	0.74	<1	0.65	0.00216	0.00216	<0.0005	<0.0005	<0.001	<0.003	3.40	3.29	-0.72	-2.2	-0.96										
2020	Q3	LC_DCDS	0.136	0.143	158	0.000021	0.000025	<0.0001	<0.0001	<0.01	<0.01	523	<0.25	3.6	5.2	2.82	0.00191	0.00203	0.00116	0.00134	0.0033	0.0043	14.5	7.46	5.9	3.7	-1.3										
2020	Q3	LC_LC3	0.231	0.223	324	0.000012	0.000014	<0.0001	<0.0001	<0.01	<0.01	765	<0.05	1.67	<1	0.29	0.00428	0.00443	<0.0005	<0.0005	0.0125	0.0135	8.85	6.23	7.9	-0.73	-1.7										
2020	Q3	LC_LC5	0.173	0.159	164	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	468	<0.25	0.5	2.2	0.16	0.00204	0.00211	<0.0005	<0.0005	0.0014	<0.003	5.08	2.90	1.7	-3.5	-0.25				2.29	-3.81	-0.28	-1.04			
2020	Q4	FR_FRABCH	0.194	0.181	347	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	833	<0.05	0.77	<1	0.14	0.00351	0.00354	<0.0005	<0.0005	0.001	<0.003	10.4	4.46	4.2	-3.5	-0.32				4.43	-3.88	-0.15	-0.98			
2020	Q4	GH_FR1	0.161	0.161	276	<0.00001	0.000012	<0.0001	<0.0001	<0.01	<0.01	635	<0.25	0.71	63.6	20.3	0.00256	0.00266	<0.0005	0.00161	0.0026	0.0076	8.89	5.39	2.5	3.5	-2.2				4.12	3.87	-2.90	-2.54			
2020	Q4	GH_ERC	0.213	0.215	32.1	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	189	<0.05	0.61	<1	0.17	0.000757	0.000807	<0.0005	<0.0005	<0.001	<0.003	2.75	2.73	-5.1	-2.9	1.2										
2020	Q4	RG_MIDAG	0.269	0.263	127	0.000019	0.000021	<0.0001	<0.0001	<0.01	<0.01	332	0.273	1.46	38.5	2.57	0.00134	0.00134	<0.0005	<0.0005	0.0013	<0.003	3.44	3.32	0.21	1.9	0.37										
2020	Q4	EV_MC2	0.195	0.19	134	<0.00001	0.000106	<0.0001	<0.0001	<0.01	<0.01	361	0.357	1.13	<1	0.32	0.00118	0.00122	<0.0005	<0.0005	<0.001	<0.003	2.47	2.28	0.14	-0.72	0.21										
2020	Q4	EV_HC1	0.134	0.134	218	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	485	0.238	0.84	<1	0.29	0.00235	0.00256	<0.0005	<0.0005	0.0014	<0.003	2.97	2.81	-0.36	-2.5	-0.22										
2020	Q4	LC_DCDS	0.182	0.184	219	0.000019	0.000016	<0.0001	<0.0001	<0.01	<0.01	751	<0.05	1.58	<1	0.34	0.00262	0.00266	0.00107	0.0012	0.0082	0.0086	20.5	8.76	7.3	2.1	-0.3										
2020	Q4	LC_LC3	0.247	0.251	439	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	919	<0.05	1.02	<1	0.33	0.00492	0.00552	<0.0005	<0.0005	0.0084	0.0086	10.0	7.03	8.5	-1.3	-1.3										
2020	Q4	LC_LC5	0.178	0.177	220	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	561	<0.05	0.79	<1	0.19	0.00223	0.00232	<0.0005	<0.0005	0.0018	<0.003	5.77	2.95	1.6	-3.6	0.00094				2.05	-3.90	-0.04	-1.00			
2020	Q4	LC_LCDSSLCC	0.212	0.2104	226.8	0.000005	0.000005	0.00005	0.00005	0.005	0.005	598.8	0.1712	0.45	0.5	0.176	0.003196	0.003308	0.00025	0.00025	0.00616	0.00634	5.53	3.52	3.8	-9.1	-9.6										
2021	Q1	FR_FRABCH	0.189	0.197	387	<0.00001	<0.00001	<0.0001	<0.0001	<0.0003	0.00172	981	<0.05	1.4	<1	0.64	0.00384	0.00418	<0.0005	<0.0005	0.0022	<0.003	13.76566339	6.330152844	5.7	-1.4	-1.4	5.02	0.48	-0.58	6.47	-1.66	-1.22	-0.89	5.26	0.29	1.06
2021	Q1	GH_FR1	0.178	0.172	298	<0.00001	<0.00001	<0.0001	<0.0001	<0.0003	<0.0003	716	<0.05	1.05	<1	0.48	0.00298	0.00298	<0.0005	<0.0005	<0.001	<0.003	9.16998631	4.763063435	3.9	-3.3	-1.0	4.17	-2.00	-1.07	4.42	-3.91	-0.93	-1.00	4.24	-2.40	1.76
2021	Q1	GH_ERC	0.223	0.234	42.4	<0.00001	<0.00001	<0.0001	<0.0001	<0.0003	<0.0003	207	0.077	<0.5	<1	0.1	0.000945	0.000973	<0.0005	<0.0005	<0.001	<0.003	3.186716315	3.046890056	-4.1	-3.6	0.95	-3.42	-6.03	0.52							
2021	Q1	RG_MIDAG	0.356	0.314	187	0.000011	0.000013	<0.0001	<0.0001	<0.0003	<0.0018	490	<0.05	1.57	<1	0.24	0.00199	0.00178	<0.0005	<0.0005	<0.001	<0.003	4.432369567	4.076471398	2.0	-0.6	0.058	1.49	-1.36	4.19							
2021	Q1	EV_MC2	0.17	0.175	113	<0.00001	<0.00001	<0.0001	<0.0001	<0.0003	<0.0021	314	0.226	1.54	<1	0.89	0.00109	0.00114	<0.0005	<0.0005	<0.001	<0.003	2.967221327	2.926933194	-0.26	-1.1	-1.1	-0.70	-1.94	0.62							
2021	Q1	EV_HC1	0.129	0.132	233	<0.00001	<0.00001	<0.0001	<0.0001	<0.0003	0.00041	500	0.132	1.61	2	30.9	0.0029	0.00296	<0.0005	<0.0005	<0.001	<0.003	3.574194672	3.209990065	0.31	-1.6	-1.7	0.45	-2.19	-1.62							
2021	Q1	LC_DCDS	0.101	0.105	101	0.000012	0.000018	<0.0001	<0.0001	<0.0003	0.00492	369	<0.05	2.49	8.7	6.64	0.00155	0.00164	0.00134	0.00188	0.0026	0.0047	10.3042054	6.102409779	3.8	6.1	-2.6	0.56	5.74	-1.16							
2021	Q1	LC_LC3	0.241	0.229	364	0.00001	0.00001	<0.0001	<0.0001	<0.0003	<0.0003	804	<0.05	1.22	<1	0.3	0.0044	0.00434	<0.0005	<0.0005	0.0085	0.0076	10.45532674	6.417769854	8.2	-0.42	-1.3	7.02	2.16	0.51							
2021	Q1	LC_LC5	0.195	0.195	246	<0.00001	<0.00001	<0.0001	<0.0001	<0.0003	<0.0003	642	<0.05	1.35	<1	0.27	0.00282	0.00274	<0.0005	<0.0005	0.0016	<0.003	8.439497624	4.600384706	3.3	-3.4	-0.93	3.53	-2.34	-0.92	3.95	-3.96	-0.87	-1.42	3.80	-2.55	1.11
2021	Q1	LC_LCDSSLCC	0.234	0.225	278	<0.00001	<0.00001	<0.0001	<0.0001	<0.0003	<0.0003	675	<0.05	1.15	<1	0.13	0.00368	0.00364	<0.0005	<0.0005	0.0052	0.0045	8.909700176	5.631426452	6.2	-2.7	-1.2	5.77	-0.51	-0.11							
2021	Q2	FR_FRABCH	0.104	0.104	131	<0.00001	0.000021	<0.0001	<0.0001	<0.0003	0.0135	370	0.889	2.79	138	27.3	0.0017	0.00174	<0.0005	0.00243	0.0031	0.0095	9.182249066	6.879966328	0.34	7.9	-3.9	-3.28	5.35	-1.77	2.38	9.16	-4.31	-2.25	-3.19	7.67	2.04
2021	Q2	FR_FRCP1	0.0968	0.0958	99.5	<0.00001	0.000015	<0.0001	<0.0001	<0.0003	<0.009	322	0.541	2.78	59	15.1	0.00146	0.00143	<0.0005	0.00162	0.0026	0.0179	8.104715224	6.50722778	-0.052	6.9	-3.8	-3.52	4.46	-2.41	1.85	8.26	-4.21	-1.65	-3.37	6.76	0.34
2021	Q2	GH_FR1	0.101	0.102	106	<0.00001	0.000012	<0.0001	<0.0001	<0.0003	0.0066	330	0.847	5.03	47.5	22.3	0.00139	0.00136	<0.0005	0.00116	0.0021	0.0076	6.156591609	4.867182608	-0.5	5.5	-3.9	-3.32	3.23	-2.24	1.31	6.33	-4.16	-1.83	-3.02	4.92	1.36
2021	Q2	GH_ERC	0.206	0.219	21.2	<0.00001	0.000073	<0.0001	<0.0001	<0.0003	0.0102	184	0.525	3.94	165	75	0.000784	0.001	<0.0005	0.0057	0.001	0.0197	10.28259654	10.19555562	-4.1	13	-2.7	-9.23	6.85	1.54							
2021	Q2	CM_MC2	0.239	0.238	137	0.000012	0.000036	<0.0001	<0.0001	<0.0003	0.00442	346	0.314	3.82	55.7	29	0.00118	0.00122	<0.0005	0.00146	0.0064	0.0122	8.20606612	7.864047378	1.1	9.4	-2.1	-3.38	6.54	5.43							
2021	Q2	RG_MIDAG	0.143	0.144	53.3	0.00002	0.000057	<0.0001	<0.0001	<0.0003	<0.009	188	0.239	3.29	23.8	19.4	0.000632	0.000713	<0.0005	0.00184	0.0021	0.0091	6.720503362	6.532707002	-2.7	9.2	-1.4	-6.88	4.82	3.12							
2021	Q2	EV_MC2	0.0765	0.129	26.8	<0.00001	0.000316	<0.0001	<0.0001	<0.0003	0.0225	141	1.64	7.59	522	226	0.000351	0.00137	<0.0005	0.0247	0.0013	0.095	35.46916993	35.38896206	-2.6	23	-2.8	-12.62	16.40	3.75							
2021	Q2	EV_HC1	0.0816	0.0861	70.1	<0.00001	0.000032	<0.0001	<0.0001	<0.0003	0.0033	250	0.318	6.26	27.2	21.9	0.00106	0.00114	<0.0005	0.00174	<0.001	0.0052	4.405145029	4.277490094	-3.6	7.4	-3.0	-6.58	3.21	-1.33							
2021	Q2	LC_DCDS	0.0823	0.0857	78.5	0.000016	0.000036	<0.0001	<0.0001	<0.0003	0.0153	292	<0.05	7.7	40.3	24.9	0.00106	0.00111	0.00142	0.00343	0.024	0.0115	10.73411884	8.362087126	2.9	12	-2.7	-2.29	9.64	-1.00							
2021	Q2	LC_LC3	0.152	0.161	194	0.000012	0.000014	<0.0001	<0.0001	<0.0003	0.00056	457	<0.05	1.2	<1	1.4	0.00301	0.00323	<0.0005	<0.0005	0.0145	0.0152	9.235932289	6.757618324	4.7	0.19	-1.1	2.98	1.36	-1.04							
2021	Q2	LC_LC5	0.107	0.115	102	<0.00001	0.000028	<0.0001	<0.0001	<0.0003	0.00797	336	0.65	2.58	76.3	10.9	0.00141	0.00152	<0.0005	0.00214	0.0025	0.0116	8.307223284	7.093015063	-0.057	8.0	-3.6	-3.76	4.83	-1.14	2.30	9.24	-4.06	-2.60	-3.38	7.28	2.73
2021	Q2	LC_LCDSSLCC	0.108	0.12	96.1	<0.00001	<0.00001	<0.0001	<0.0001	<0.0003	<0.0009	288	0.629	2.5	3.8	1.82	0.00166	0.00177	<0.0005	<0.0005	0.0065	0.009	5.494097737	4.522385262	0.4	0.71	-2.2	-1.20	0.05	-2.51							
2021	Q3	FR_FRABCH	0.173	0.172	297	<0.00001	<0.00001	<0.0001	<0.0001	<0.0003	<0.0003	820	0.467	2.14	<1	0.38	0.00365	0.00358	<0.0005	<0.0005	0.0024	<0.003	12.94991405	6.633310522	5.2	-1.5	-0.97	4.74	-0.16	-1.36	5.93	-2.02	-0.68	-1.22	5.02	-0.52	3.18
2021	Q3	GH_FR1	0.158	0.145	195	<0.00001	<0.00001	<0.0001	<0.0001	<0.0003	<0.0003	565	0.1	2.02	<1	0.3	0.00237	0.00239	<0.0005	<0.0005	0.0011	<0.003	8.846069482	5.367662337	2.5	-1.5	-0.79	2.33	-1.44	-1.52	3.35	-1.89	-0.99	-1.98	2.57	-1.47	2.77
2021	Q3	GH_ERC	0.207	0.199	19.3	<0.00001	<0.00001	<0.0001	<0.0001	<0.0003	<0.0003	163	<0.05	1.31	2.1	0.74	0.00067	0.000693	<0.0005	<0.0005	0.0015	<0.003	2.877629085	2.81321987	-5.8	-1.4	-0.052	-5.54	-4.87	-0.24							
2021	Q3	CM_MC2	0.473	0.49	314	0.000016	0.000019	<0.0001	<0.0001	<0.0003	0.0005	682	<0.05	1.12	1.3	0.62	0.00282	0.00297	<0.0005	<0.0005	<0.001	<0.003	8.727441618	8.213827914	5.6	-0.2	1.4	4.48	0.28	7.53							
2021	Q3	RG_MIDAG	0.242	0.248	137	0.000024	0.000027	<0.0001	<0.0001	<0.0003	<0.0003	346	0.096	1.21	<1	0.32	0.00132	0.00144	<0.0005	<0.0005	0.0012	<0.003	4.388801955	4.20019013	0.31	-0.17	1.1	-0.50	-1.73	3.83							
2021	Q3	EV_MC2	0.193	0.182	106	<0.00001	<0.00001	<0.0001	<0.0001	<0.0003	0.00032	323	0.057	2.56	<1	0.39	0.00125	0.00126	<0.0005	<0.0005	0.0035	<0.003	2.875445412	2.839617237	0.51	-0.68	-0.91	0.06	-1.72	0.94							
2021	Q3	EV_HC1	0.125	0.119	165	<0.00001	<0.00001	<0.0001	<0.0001	<0.0003	<0.0009	424	0.053	3.77	4	1.64	0.00215	0.00212	<0.0005	<0.0005	<0.001	0.0038	3.710693622	3.526327419	-0.72	-0.22	-1.7	-0.99	-1.75	-1.44							
2021	Q3	LC_LC3	0.216	0.222	274	0.000013	0.000015	<0.0001	<0.0001	<0.0003	<0.0003	716	0.118	0.72	<1	0.32	0.00382	0.00404	<0.0005	<0.0005	0.0145	0.0164	11.24877121	7.769597732	8.3	-1.2	-0.98	7.09	1.43	0.26							
2021	Q3	LC_LC5	0.172	0.169	173	<0.00001	<0.00001	<0.0001	<0.0001	<0.0003	<0.0003	489	0.374	2.64	<1	0.2	0.00219	0.00223	<0.0005	<0.0005	0.0014	<0.003	7.234067803	4.627099796	2.4	-2.5	-1.3	2.41	-2.30	-1.12	3.21	-2.86	-0.93	-1.73	2.76	-2.29	1.61
2021	Q3	LC_LCDSSLCC	0.197	0.197	200	<0.00001	<0.00001	<0.0001	<0.0001	<0.0003	<0.0003	546	0.12	0.62	<1	0.24	0.00279	0.00298	<0.0005	<0.0005	0.0077	0.008	8.240459077	5.906114095	4.9	-2.8	-0.74	4.41	-1.04	-0.15							
2021	Q4	FR_FRABCH	0.186	0.191	321	<0.00001	<0.00001	<0.0001	<0.0001	<0.0003	<0.0003	858	<0.05	0.92	2.2	0.38	0.00394	0.00417	<0.0005	<0.0005	0.0026	0.0083	12.04662148	5.729212532	5.4	-2.3	-1.0	5.20	-0.82	-0.15	5.91	-2.74	-0.46	-1.81	5.28	-1.35	2.92
2021	Q4	GH_FR1	0.162	0.173	216	<0.00001	<0.00001	<0.0001	<0.0001	<0.0003	<0.0003	590	0.256	<0.5	<1	0.19	0.0027	0.00265	<0.0005	<0.0005	<0.001	<0.003	8.153229342	4.617484433	2.6	-3.4	-0.57	2.98	-2.84	-0.31	3.10	-3.70	-0.54	-2.03	3.01	-2.96	3.08
2021	Q4	GH_ERC	0.208	0.233	24.1	<0.00001	<0.00001	<0.0001	<0.0001	<0.0003	<0.0003	175	0.089	<0.5	1.4	0.19	0.000764	0.000869	<0.0005	<0.0005	<0.001	<0.003	3.23319017	3.146838941	-5.0	-3.3	1.1	-4.34	-6.17	0.69							
2021	Q4	RG_MIDAG	0.307	0.33	184	<0.00001	<0.00001	<0.0001	<0.0001	<0.0003	<0.0003	454	0.21	0.89	<1	0.16	0.00168	0.00183	<0.0005	<0.0005	<0.001	<0.003	3.929948347	3.647704789	1.2	-2.0	0.53	1.04	-2.90	3.55							
2021	Q4	EV_MC2	0.231	0.233	163	<0.00001	<0.00001	<0.0001	<0.0001	<0.0003	<0.0003	460	0.22	<0.5	<1	<0.1	0.00148	0.0014	<0.0005	<0.0005	0.0015	0.0032	3.345424401	3.334305851	2.6	-2.8	-0.045	2.59	-2.77	2.30							
2021	Q4	EV_HC1	0.129	0.136	190	<0.00001	<0.00001	<0.0001	<0.0001	<0.0003	<0.0006	468	0.101	<0.5	<1	0.3	0.00256	0.0024	<0.0005	<0.0005	0.0017	0.0046	3.767209678	3.540857893	-0.019	-0.44	-0.48	-0.27	-2.02	-0.53							
2021	Q4	LC_LC5	0.181	0.194	190	<0.00001	<0.00001	<0.0001	<0.0001	<0.0003	<0.0009	576	0.297	-	2	0.19	0.00255	0.00259	<0.0005	<0.0005	0.0025	0.0036	7.264927622	4.608852569	2.8	-1.9	-1.1	2.57	-1.60	-0.38	3.69	-2.29	-1.13	-2.04	2.96	-1.59	2.15
2021	Q4	LC_LCDSSLCC	0.202	0.216	232	<0.00001	<0.00001	<0.0001	<0.0001	<0.0003	<0.0003	640	0.344	-	<1	0.18	0.00343	0.00345	<0.0005	<0.0005	0.0058	0.006	7.501910783	5.358551839	5.6	-2.7	-0.94	5.08	-0.90	0.24							

Year	Quarter	Sample ID	STRONTIUM-D-mg/l	STRONTIUM-T-mg/l	SULFATE (AS SO4)-D-mg/l	THALLIUM-D-mg/l	THALLIUM-T-mg/l	TIN-D-mg/l	TIN-T-mg/l	TITANIUM-D-mg/l	TITANIUM-T-mg/l	TOTAL DISSOLVED SOLIDS (RESIDUE FILTERABLE)-N-mg/l	TOTAL KJELDAHL NITROGEN-N-mg/l	TOTAL ORGANIC CARBON-T-mg/l	TOTAL SUSPENDED SOLIDS LAB-N-mg/l	TURBIDITY LAB-N-ntu	URANIUM-D-mg/l	URANIUM-T-mg/l	VANADIUM-D-mg/l	VANADIUM-T-mg/l	ZINC-D-mg/l	ZINC-T-mg/l	∑TU-WQGs	∑TU-WQGs/Benchmarks	PC1_allsyrs	PC2_allsyrs	PC3_allsyrs	PC1_2021	PC2_2021	PC3_2021	PC1_allsyrs_UFR	PC2_allsyrs_UFR	PC3_allsyrs_UFR	PC4_allsyrs_UFR	PC1_2021_UFR	PC2_2021_UFR	PC3_2021_UFR
Test categorized as possible or likely response (2015 to 2020)																																				
2015	Q1	FR_FRCP1	0.22	0.23	1460	0.00003	0.000032	<0.00020	<0.00020	0.017	0.017	2580	< 0.050	1.5	<1	0.12	0.015	0.016	< 0.0020	< 0.0020	< 0.0030	< 0.0060	25.6	17.3	13	4.3	13				14.75	5.97	14.93	2.67			
2015	Q2	CM_MC2	0.16	0.17	110	0.000011	0.000018	< 0.00010	< 0.00010	< 0.010	0.011	314	0.12	1.8	9.6	5.8	0.0011	0.0011	< 0.00050	0.00088	0.0031	0.0059	5.62	5.40	-0.68	4.5	-0.0940										
2015	Q4	FR_FRCP1	0.16	0.16	327	< 0.000010	< 0.000010	< 0.00010	< 0.00010	< 0.010	< 0.010	765	< 0.050	0.81	<1	0.29	0.0038	0.0037	< 0.00050	< 0.00050	< 0.0030	< 0.0030	9.62	5.64	4.9	-1.9	0.62				5.57	-1.85	0.37	1.19			
2015	Q4	CM_MC2	0.3	0.3	277	0.000011	< 0.000010	< 0.00010	< 0.00010	< 0.010	< 0.010	627	0.11	0.83	6.6	0.99	0.0022	0.0022	< 0.00050	< 0.00050	< 0.0030	< 0.0030	4.88	4.25	3.1	-1.5	2.6										
2016	Q1	FR_FRCP1	0.2	0.2	765	0.000016	0.000015	< 0.00010	< 0.00010	0.021	0.021	1520	< 0.050	0.95	< 1.0	0.28	0.0019	0.008	< 0.00050	< 0.00050	< 0.0030	< 0.0030	16.4	8.77	8.4	-2.4	0.90				8.84	-2.70	0.88	0.79			
2016	Q2	GH_FR1	0.11	0.1	121	< 0.000010	< 0.000010	< 0.00010	< 0.00010	< 0.010	< 0.010	365	0.2	2.0	7.1	3.0	0.0015	0.0015	< 0.00050	0.0006	< 0.0030	0.0033	5.11	3.63	-0.222	1.6	-0.995				1.01	1.86	-1.52	-0.09			
2016	Q2	CM_MC2	0.18	0.18	131	0.00001	0.00002	< 0.00010	< 0.00010	< 0.010	0.012	401	0.2	2.2	15	6.5	0.0013	0.0012	< 0.00050	0.00085	0.0076	0.013	6.45	6.06	0.89	6.1	-0.58										
2016	Q2	LC_DCDS	0.0326	0.0329	8.02	<0.000010	0.000015	<0.000010	<0.000010	0.01	0.014	131	0.131	3.96	6.5	9.25	0.000168	0.000204	0.00135	0.00239	<0.00030	0.0037	3.70	3.80	-7.1	7.6	-0.45										
2016	Q3	FR_FRCP1	0.14	0.14	249	< 0.000010	< 0.000010	< 0.00010	< 0.00010	< 0.010	< 0.010	611	0.17	1.3	1.4	0.36	0.003	0.003	< 0.00050	< 0.00050	< 0.0030	< 0.0030	7.03	3.89	3.5	-2.0	-1.1				4.06	-2.06	-1.45	0.61			
2016	Q3	CM_MC2	0.32	0.34	277	0.000017	0.00014	< 0.00010	< 0.00010	< 0.010	< 0.010	644	0.13	1.2	1.5	0.37	0.0026	0.0027	< 0.00050	< 0.00050	< 0.0030	< 0.0030	5.43	4.67	4.5	-1.5	1.7										
2016	Q4	FR_FRCP1	0.14	0.14	245	< 0.000010	< 0.000010	< 0.00010	< 0.00010	< 0.010	< 0.010	608	0.14	1.1	< 1.0	0.84	0.003	0.003	< 0.00050	< 0.00050	< 0.0030	< 0.0030	6.38	3.76	3.2	-1.7	-1.2				3.76	-1.68	-1.66	0.83			
2016	Q4	CM_MC2	0.22	0.22	178	0.00001	0.000017	< 0.00010	< 0.00010	< 0.010	< 0.010	451	0.15	2.4	9.1	3.8	0.0017	0.0017	< 0.00050	< 0.00050	< 0.0030	< 0.0030	4.72	4.27	1.4	2.8	-0.68										
2016	Q4	EV_MC2	0.11	0.12	63	< 0.000010	< 0.000015	< 0.00010	< 0.00010	< 0.010	< 0.010	228	0.2	3.4	6.8	5.5	0.00062	0.00066	< 0.00050	0.0011	< 0.0030	< 0.0030	2.98	3.01	-3.8	4.3	-1.3										
2016	Q4	LC_DCDS	0.0474	0.05	18.8	<0.000010	0.000027	<0.000010	<0.000010	<0.010	<0.010	171	0.247	3.34	10	22	0.000448	0.000482	0.00108	0.0022	<0.00030	0.005	3.56	3.64	-3.4	8.4	-1.9										
2017	Q1	FR_FRCP1	0.19	0.2	531	0.000013	0.000012	<0.0001	<0.0001	<0.01	<0.01	1140	<0.05	1.5	1.2	0.44	0.0059	0.006	<0.0005	<0.0005	0.0023	<0.003	12.8	7.28	4.7	-1.2	-2.8				4.97	-0.93	-2.91	8.69			
2017	Q1	CM_MC2	0.39	0.41	319	0.000014	0.000016	<0.0001	<0.0001	<0.01	<0.01	733	0.08	1.0	1.1	0.55	0.0031	0.0033	<0.0005	<0.0005	0.0041	0.004	9.51	8.33	4.4	0.17	-0.68										
2017	Q1	EV_MC2	0.2	0.2	148	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	429	0.11	0.73	<1	0.7	0.0016	0.0016	<0.0005	<0.0005	<0.003	<0.003	3.24	2.76	-0.51	-1.2	-1.5										
2017	Q1	LC_LCDSSLCC	0.23	0.22	295	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	707	0.12	0.71	1.4	0.36	0.0039	0.0041	<0.0005	<0.0005	0.0034	0.0042	7.13	3.94	2.9	-2.2	-1.7										
2017	Q2	FR_FRCP1	0.13	0.13	205	0.000011	0.00003	<0.0001	<0.0001	<0.01	<0.01	496	0.67	3.2	17	23	0.0024	0.0025	<0.0005	0.0032	0.002	0.0098	9.07	6.09	0.38	7.8	-4.2				2.06	8.92	-4.82	6.78			
2017	Q2	CM_MC2	0.35	0.33	236	0.000014	0.000022	<0.0001	<0.0001	<0.01	<0.01	541	0.3	2.3	9.0	6.9	0.0022	0.0021	<0.0005	0.00077	0.005	0.0071	9.32	8.76	2.8	4.8	-2.5										
2017	Q2	CM_MC2	0.36	0.44	237	0.000015	0.00004	<0.0001	<0.0001	<0.01	<0.01	544	0.24	1.6	4.4	2.3	0.0022	0.0027	<0.0005	<0.0005	0.0041	0.0059	10.1	9.56	3.8	3.8	-1.7										
2017	Q2	EV_MC2	0.15	0.14	68	<0.00001	0.000011	<0.0001	<0.0001	<0.01	<0.01	222	0.31	3.3	20	11	0.00078	0.00073	<0.0005	0.00096	0.0011	<0.003	2.84	2.86	-4.1	4.6	-3.2										
2017	Q2	EV_HC1	0.11	0.11	147	<0.00001	0.000017	<0.0001	<0.0001	<0.01	<0.01	398	0.22	3.1	4.2	3.4	0.0022	0.0023	<0.0005	0.00079	<0.001	0.0044	2.41	2.28	-2.8	1.9	-3.2										
2017	Q3	FR_FRCP1	0.13	0.13	260	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	587	0.85	3.4	1.8	0.47	0.0027	0.0027	<0.0005	<0.0005	<0.001	<0.003	5.91	3.58	1.0	-1.1	-3.4				1.27	-0.58	-3.59	7.62			
2017	Q3	GH_FR1	0.13	0.13	186	<0.00001	<0.00001	0.00011	<0.0001	<0.01	<0.01	502	0.62	0.99	1.2	0.54	0.0019	0.002	<0.0005	<0.0005	<0.001	<0.003	5.56	3.18	-0.25	-2.0	-2.3				0.09	-1.64	-2.73	7.51			
2017	Q3	CM_MC2	0.35	0.35	280	0.000017	0.000019	<0.0001	<0.0001	<0.01	<0.01	558	0.27	0.99	2.4	1.0	0.0023	0.0024	<0.0005	<0.0005	<0.001	<0.003	10.9	10.02	2.7	1.3	-0.6										
2017	Q4	FR_FRCP1	0.17	0.17	510	0.000012	0.000012	<0.0001	<0.0001	<0.01	<0.01	980	0.57	0.84	<1	0.7	0.0055	0.0054	<0.0005	<0.0005	<0.003	<0.003	9.57	5.42	3.2	-1.7	-2.2				3.31	-1.32	-2.25	8.61			
2017	Q4	CM_MC2	0.41	0.44	331	0.000016	0.000016	<0.0001	<0.0001	<0.01	<0.01	793	0.27	1.1	5.2	2.2	0.0034	0.0035	<0.0005	<0.0005	<0.003	<0.003	7.03	5.96	3.4	0.084	-0.3										
2018	Q1	FR_FRCP1	0.22	0.21	613	0.000013	0.000012	<0.0001	<0.0001	<0.01	<0.01	1280	0.49	1.0	<1	0.31	0.0071	0.0067	<0.0005	<0.0005	<0.003	<0.003	11.8	6.33	7.4	-2.1	-0.93				7.83	-2.56	-0.76	0.15			
2018	Q1	CM_MC2	0.41	0.42	362	0.000014	0.000013	<0.0001	<0.0001	<0.01	<0.01	772	0.31	1.0	<1	0.25	0.0038	0.0038	<0.0005	<0.0005	<0.003	<0.003	8.94	6.04	6.3	-0.83	1.1										
2018	Q1	EV_MC2	0.21	0.22	174	<0.00002	<0.00001	<0.0002	<0.0001	<0.01	<0.01	493	0.31	0.9	<1	0.25	0.002	0.0019	<0.001	<0.0005	<0.003	<0.003	3.41	2.87	3.6	-0.033	5.8										
2018	Q2	FR_FRCP1	0.12	0.13	149	<0.00001	0.000019	<0.0001	<0.0001	<0.01	<0.01	421	0.47	3.4	22	14	0.0019	0.0021	<0.0005	0.0016	0.0046	0.011	7.15	5.35	1.5	5.8	-3.4				3.34	6.60	-4.13	-0.70			
2018	Q2	GH_FR1	0.11	0.11	147	<0.00001	0.000039	<0.0001	<0.0001	<0.01	<0.01	417	0.69	6.7	52	47	0.0017	0.0018	<0.0005	0.0038	0.0013	0.012	8.73	8.11	1.4	11	-3.1				4.13	12.04	-3.67	-2.08			
2018	Q2	GH_ERC	0.21	0.23	39	<0.00001	0.000024	<0.0001	<0.0001	<0.01	<0.01	202	0.27	2.7	43	10	0.0008	0.00086	<0.0005	0.0025	<0.001	0.0059	4.34	4.36	-4.5	7.2	-2.5										
2018	Q2	CM_MC2	0.37	0.37	189	0.000015	0.000023	<0.0001	<0.0001	<0.01	<0.01	436	0.23	1.8	11	5.5	0.0019	0.002	<0.0005	0.00061	0.0075	0.012	8.89	8.62	5.0	5.0	-1.2										
2018	Q2	CM_MC3	0.25	0.24	95	0.000024	0.000029	<0.0001	<0.0001	<0.01	<0.01	296	0.62	1.6	7.1	3.0	0.0012	0.0013	<0.0005	0.0005	0.0037	0.0083	4.46	4.38	0.93	3.8	-0.68										
2018	Q2	LC_LCS	0.141	0.133	140	<0.000010	0.000018	<0.00010	<0.00010	<0.010	<0.010	394	0.537	4.57	39.8	21.9	0.00184	0.00182	<0.00050	0.00201	<0.0010	0.0065	5.99	5.00	0.74	6.1	-3.5				2.71	6.66	-4.03	-2.33			
2018	Q2	LC_LCDSSLCC	0.19	0.17	175	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	433	0.15	1.7	4.8	6.6	0.0031	0.0029	<0.0005	0.00054	0.0074	0.009	6.62	5.10	3.2	0.99	-1.8										
2018	Q3	FR_FRCP1	0.16	0.14	315	0.00001	0.000011	<0.0001	<0.0001	<0.01	<0.01	745	0.63	1.5	1.3	0.3	0.0038	0.0037	<0.0005	0.0013	<0.003	0.0053	7.46	4.48	4.5	-1.0	-1.8				5.11	-1.30	-2.00	0.14			
2018	Q3	CM_MC2	0.64	0.61	447	0.00003	0.00003	<0.0001	<0.0001	<0.01	<0.01	830	0.27	1.9	<1	0.45	0.0044	0.0045	<0.0005	<0.0005	<0.001	<0.003	18.2	17.3	9.1	1.3	2.2										
2018	Q3	CM_MC3	0.36	0.34	204	0.000025	0.000025	<0.0001	<0.0001	<0.01	<0.01	493	0.081	1.2	<1	0.44	0.0023	0.0023	<0.0005	<0.0005	0.0023	0.0051	7.08	6.75	4.0	0.73	-2.1										
2018	Q4	FR_FRCP1	0.23	0.24	1940	0.000045	0.000045	<0.0002	<0.0002	<0.01	<0.01	3260	0.87	2.5	33	21	0.023	0.023	<0.001	<0.001	<0.002	<0.006	27.3	19.1	13	5.6	7.4				14.55	7.10	10.54	-0.12			
2018	Q4	CM_MC2	0.53	0.54	372	0.000024	0.000023	<0.0001	<0.0001	<0.01	<0.01	692	0.19	1.4	1.5	0.84	0.0043	0.0041	<0.0005	<0.0005	0.0042	0.0092	15.2	14.4	9.1	2.1	1.4										
2018	Q4	CM_MC3	0.28	0.29	145	0.000027	0.000025	<0.0001	<0.0001	<0.01	<0.01	361	0.27	1.0	<1	0.5	0.0022	0.0021	<0.0005	<0.0005	0.0019	<0.003	5.87	5.69	2.6	1.1	1.7										
2018	Q4	LC_DCDS	0.11	0.118	94.1	0.000013	0.000014	<0.000010	<0.000010	<0.010	<0.010	388	0.461	2.63	3.7	1.82	0.0016	0.00157	0.00096	0.00132	<0.00010	<0.00030	5.69	7.44	3.6	2.3	-1.3										
2018	Q4	LC_LCS	0.17	0.179	184	<0.000010	<0.000010	<0.00010	<0.00010	<0.010	<0.010	495	0.141	<0.50	<1.0	0.3	0.00226	0.00234	<0.00050	<0.00050	<0.0010	<0.0030	5.96	4.51	1.4	-3.2	-0.1				1.92	-3.48	-0.37	-0.93			
2018	Q4	LC_LCDSSLCC	0.2	0.2	231	<0.00001	0.00001	<0.0001	<0.0001	<0.01	<0.01	544	<0.05	<0.5	<1	0.2	0.0035	0.0036	<0.0005	<0.0005	0.0059	0.0066	6.26	4.80	4.9	-2.2	0.34										
2019	Q1	FR_FRABCH	0.215	0.197	339	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	909	<0.05	0.63	1.2	0.42	0.00307	0.00305	<0.0005	<0.0005	0.0079	0.00305	10.4	4.73	3.7	-2.5	-0.159				4.41	-2.66	0.18	-1.37			
2019	Q1	FR_FRCP1	0.268	0.266	1,910	0.000041	0.000038	<0.0002	<0.0002	<0.01	<0.01	3470	<0.05	1.8	3	0.75	0.0201	0.019	<0.001	<0.001	<0.002	0.0079	25.0	16.8	13	3.2	8.9				14.58	4.83	11.98	0.19			
2019	Q1	CM_MC2	0.416	0.4	343	0.000011	<0.00001	<0.0001	<0.0001	<0.01	<0.01	809	0.333	1.66	<1	0.6	0.00125	0.00135	<0.0005	<0.0005	<0.001	<0.003	7.18	6.23	6.0	-0.94	1.5										
2019	Q3	FR_FRCP1	0.127	0.144	176	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	476	0.066	0.98	1.2	0.62	0.00266	0.00263	<0.0005	<0.0005	0.0011	<0.003	5.99	4.00	2.4	-2.0	-0.98				2.97	-2.00	-1.22	0.17			
2020	Q1	FR_FRCP1	0.191	0.206	526	0.000012	0.000017	<0.0001	0.00012	<0.01	<0.01	1130	0.136	2.39	4.7	1.57	0.00582	0.0062	<0.0005	<0.0005	0.0187	0.0296	14.3	9.01	7.7	4.2	-1.1				9.20	4.17	-1.10	-0.60			
2020	Q1	GH_FR1	0.157	0.155	251	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	676	0.495	0.52	<1	0.12	0.00246	0.00245	<0.0005	<0.0005	<0.001	<0.003	6.56	3.39	1.8	-3.7	-0.11				2.24	-4.03	-0.20	-1.14			
2020	Q1	LC_DCDS	0.137	0.133	144	0.000011	0.000012	<0.0001	0.00017	<0.01	<0.01	529	<0.05	1.92	<1	0.22	0.0022	0.00216	0.00108	0.00116	0.0041	0.0043	11.1	4.82	4.5	1.8	0.078										
2020	Q3	CM_MC2	0.584	0.607	408	0.000031	0.000028	<0.0001	<0.0001	<0.01	<0.01	912	0.661	0.87	<1	0.42	0.00392	0.00384	<0.0005	<0.0005	0.0071	0.0011	13.2	12.2	8.8	0.6	1.8										
2020	Q3	LC_LCDSSLCC	0.211	0.197	211	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	571	<0.25	1.25	<1	0.17	0.00294	0.00311	<0.0005	<0.0005	0.0069	0.0074	5.80	3.93	4.6	-2.1	-1.6										
2020	Q4	FR_FRCP1	0.187	0.179	468	0.000012	0.000011	<0.0001	<0.0001	<0.01	<0.01	932	<0.25	1.02	1	0.47	0.00484	0.00492	<0.0005	<0.0005	0.0059	0.0065	10.2	6.34	7.3	-1.5	-1.1				7.81	-1.77	-1.18	0.99			
2020	Q4	CM_MC2	0.554	0.569	444	0.000026	0.000024	<0.0001	<0.0001	<0.01	<0.01	855	0.331	1.2	<1	0.69	0.00337	0.00324	<0.0005	<0.0005	0.0023	0.0043	9.35	8.48	8.0	0.41	1.9										
Test categorized as possible or likely response (2021)																																				
2021	Q1	FR_FRCP1	0.213	0.207	406	0.000017	0.000018	<0.0001	<0.0001	<0.0003	0.00084	940	<0.05	2.03	2.7	1.03	0.00505	0.00521	<0.0005	<0.0005	0.0076	0.0079	16.70529996	9.349178239	8.8	0.22	-1.6	7.33	3.16	-0.67	10.13	0.05	-0.94	0.62	8.29	3.29	-4.48

Notes:

"-D-" = dissolved concentration; "-T-" = total concentration; "-N-" = normal concentrat

Screening

Concentrations of parameters in 2021 tests categorized as possible or likely respons

Year	Quarter	Sample ID	Mean Cell Yield (x 104 cells/mL) (Mean)	ACIDITY TO pH 8.3 (As CaCO3)-N-mg/l	ALKALINITY, BICARBONATE (As CaCO3), lab measured.-N-mg/l	ALKALINITY, CARBONATE (As CaCO3), lab measured.-N-mg/l	ALKALINITY, HYDROXIDE (As CaCO3), lab measured.-N-mg/l	ALKALINITY, TOTAL (As CaCO3), lab measured.-N-mg/l	ALUMINUM-D-mg/l	ALUMINUM-T-mg/l	ANTIMONY-D-mg/l	ANTIMONY-T-mg/l	ARSENIC-D-mg/l	ARSENIC-T-mg/l	BARIUM-D-mg/l	BARIUM-T-mg/l
Reference (2015 - 2021)																
2015	Q1	Reference (FR_UFR1)	108	<1.0	147	2.3	<1.0	149	<0.0030	0.0032	<0.00010	<0.00010	<0.00010	<0.00010	0.077	0.077
2015	Q1	Reference (FR_UFR1)	111	<1.0	147	2.3	<1.0	149	<0.0030	0.0032	<0.00010	<0.00010	<0.00010	<0.00010	0.077	0.077
2015	Q1	Reference (FR_UFR1)	106	<1.0	144	1.3	<1.0	145	<0.0030	0.0059	<0.00010	<0.00010	<0.00010	<0.00010	0.075	0.078
2015	Q2	Reference (FR_UFR1)	122	<1.0	116	2.8	<1.0	119	0.0092	0.083	<0.00010	<0.00010	0.00012	0.00014	0.042	0.043
2015	Q2	Reference (GH_ER2)	102	<1.0	151	6.2	<1.0	157	<0.0030	0.076	<0.00010	<0.00010	0.00011	0.00016	0.046	0.048
2015	Q3	Reference (FR_UFR1)	126	<1.0	152	7.4	<1.0	159	<0.0030	0.0078	<0.00010	<0.00010	0.00011	0.00012	0.076	0.076
2015	Q4	Reference (FR_UFR1)	122	<1.0	138	7.6	<1.0	146	<0.0030	0.0046	<0.00010	<0.00010	<0.00010	0.0001	0.074	0.075
2015	Q4	Reference (GH_ER2)	132	<1.0	147	<1.0	<1.0	147	<0.0030	0.0046	<0.00010	<0.00010	<0.00010	<0.00010	0.047	0.049
2016	Q1	Reference (FR_UFR1)	134.6	< 1.0	138	< 1.0	< 1.0	138	< 0.0030	0.0048	< 0.00010	< 0.00010	< 0.00010	< 0.00010	0.074	0.073
2016	Q2	Reference (FR_UFR1)	107.9	< 1.0	110	< 1.0	< 1.0	110	0.015	0.11	< 0.00010	< 0.00010	0.00011	0.00014	0.04	0.042
2016	Q2	Reference (GH_ER2)	98.8	< 1.0	143	< 1.0	< 1.0	143	0.0036	0.2	< 0.00010	< 0.00010	0.00011	0.00024	0.042	0.044
2016	Q3	Reference (FR_UFR1)	121.1	< 1.0	160	< 1.0	< 1.0	160	< 0.0030	0.013	< 0.00010	< 0.00010	< 0.00010	0.0001	0.074	0.077
2016	Q4	Reference (FR_UFR1)	154.3	< 1.0	141	< 1.0	< 1.0	141	0.011	0.051	< 0.00010	< 0.00010	< 0.00010	0.00015	0.069	0.064
2016	Q4	Reference (GH_ER2)	152	< 1.0	143	< 1.0	< 1.0	143	< 0.0030	0.0075	< 0.00010	< 0.00010	< 0.00010	< 0.00010	0.042	0.038
2017	Q1	Reference (FR_UFR1)	154.4	-	-	-	-	146	<0.001	0.0046	<0.0001	0.00026	<0.0001	0.00012	0.073	0.073
2017	Q2	Reference (FR_UFR1)	141.4	-	-	-	-	113	0.089	0.15	<0.0001	<0.0001	0.00015	0.00019	0.053	0.051
2017	Q2	Reference (GH_ER2)	147.5	-	-	-	-	153	<0.003	0.077	<0.0001	<0.0001	<0.0001	0.00014	0.05	0.051
2017	Q2	Reference (CM_MC1)	170	-	-	-	-	133	0.004	0.02	<0.0001	<0.0001	0.00022	0.0002	0.048	0.046
2017	Q3	Reference (FR_UFR1)	160.8	-	-	-	-	148	0.0015	0.0071	<0.0001	0.00011	<0.0001	0.00013	0.068	0.069
2017	Q3	Reference (GH_ER2)	158.1	-	-	-	-	130	0.0027	0.012	<0.0001	0.00019	0.00011	0.00012	0.043	0.043
2017	Q3	Reference (CM_MC1)	150.6	-	-	-	-	141	0.0026	0.021	<0.0001	<0.0001	0.00022	0.00024	0.05	0.046
2017	Q4	Reference (FR_UFR1)	108.1	-	-	-	-	138	<0.003	0.0037	<0.0001	<0.0001	<0.0001	0.00011	0.072	0.072
2017	Q4	Reference (GH_ER2)	109.6	-	-	-	-	155	<0.003	0.0061	<0.0001	<0.0001	<0.0001	0.00011	0.049	0.048
2017	Q4	Reference (CM_MC1)	111.4	-	-	-	-	134	<0.003	0.0086	<0.0001	<0.0001	0.00016	0.00019	0.051	0.051
2018	Q1	Reference (FR_UFR1)	167.1	<1	126	11	<1	137	<0.003	<0.003	<0.0001	<0.0001	<0.0001	<0.0001	0.085	0.068
2018	Q1	Reference (GH_ER2)	158.3	1.5	153	<1	<1	153	<0.003	<0.003	<0.0001	<0.0001	<0.0001	0.00013	0.046	0.048
2018	Q1	Reference (CM_MC1)	157	<1	163	10	<1	173	<0.003	<0.003	<0.0001	<0.0001	0.00017	0.00018	0.058	0.053
2018	Q2	Reference (FR_UFR1)	75.4	<1	103	2.8	<1	106	0.022	0.13	<0.0001	<0.0001	0.00012	0.00016	0.042	0.045
2018	Q2	Reference (GH_ER2)	123.3	<1	130	10	<1	140	0.0039	0.24	<0.0001	<0.0001	0.00011	0.00025	0.048	0.049
2018	Q2	Reference (CM_MC1)	145.3	<1	111	6.0	<1	117	0.023	0.14	<0.0001	<0.0001	0.00023	0.00024	0.042	0.039
2018	Q2	Reference (LC_SLC)	147.5	<1	120	6.8	<1	126	<0.003	0.012	<0.0001	<0.0001	0.00013	0.0002	0.039	0.035
2018	Q3	Reference (FR_UFR1)	100.4	<1	147	4.2	<1	152	<0.003	0.0046	<0.0001	<0.0001	0.00011	0.0001	0.076	0.066
2018	Q3	Reference (GH_ER2)	104.9	<1	134	<1	<1	134	<0.003	0.64	<0.0001	<0.0001	0.00011	0.00061	0.043	0.054
2018	Q3	Reference (CM_MC1)	99.9	<1	143	1.8	<1	145	<0.003	0.011	<0.0001	<0.0001	0.00018	0.0002	0.055	0.054
2018	Q3	Reference (LC_SLC)	106.2	<1	137	2.6	<1	140	<0.003	0.003	<0.0001	<0.0001	0.00012	0.00011	0.048	0.041
2018	Q4	Reference (FR_UFR1)	109.1	<1	146	4.0	<1	150	<0.003	<0.003	<0.0001	<0.0001	<0.0001	<0.0001	0.071	0.067
2018	Q4	Reference (GH_ER2)	104.8	<1	146	<1	<1	146	<0.003	0.031	<0.0001	<0.0001	<0.0001	0.00014	0.05	0.046
2018	Q4	Reference (CM_MC1)	111.2	<1	131	<1	<1	131	<0.003	0.01	<0.0001	<0.0001	0.00017	0.0002	0.045	0.043
2018	Q4	Reference (LC_SLC)	109.9	<1	143	<1	<1	143	<0.003	<0.003	<0.0001	<0.0001	0.00011	0.00015	0.041	0.045
2019	Q1	Reference (FR_UFR1)	60.9	<1	182	<1	<1	182	<0.003	0.003	<0.0001	<0.0001	<0.0001	<0.0001	0.0743	0.0758
2019	Q1	Reference (GH_ER2)	59.1	<1	150	<1	<1	150	<0.003	0.0048	<0.0001	<0.0001	<0.0001	0.00011	0.0493	0.0479
2019	Q1	Reference (CM_MC1)	72.1	1.6	179	<1	<1	179	<0.003	0.0041	<0.0001	<0.0001	0.00015	0.00015	0.0579	0.053
2019	Q1	Reference (LC_SLC)	76.5	1.4	154	<1	<1	154	<0.003	<0.003	<0.0001	<0.0001	0.00013	<0.0001	0.0468	0.0483
2019	Q2	Reference (FR_UFR1)	113.8	<1	126	<1	<1	126	0.012	0.057	<0.0001	<0.0001	0.00011	0.00011	0.049	0.048
2019	Q2	Reference (GH_ER2)	111.5	<1	144	<1	<1	144	<0.003	0.041	<0.0001	<0.0001	0.00011	0.00014	0.045	0.045
2019	Q2	Reference (CM_MC1)	123	1.8	125	<1	<1	125	0.0036	0.032	<0.0001	<0.0001	0.0002	0.00022	0.039	0.041
2019	Q2	Reference (LC_SLC)	121.2	<1	140	<1	<1	140	<0.003	0.0032	<0.0001	<0.0001	0.00011	0.00011	0.036	0.035
2019	Q3	Reference (FR_UFR1)	69.5	<1	138	5.0	<1	143	<0.003	0.0097	<0.0001	<0.0001	0.00012	<0.0001	0.061	0.059
2019	Q3	Reference (GH_ER2)	45.6	8.0	133	<1	<1	133	<0.003	0.011	<0.0001	<0.0001	0.00011	0.00011	0.042	0.04
2019	Q3	Reference (CM_MC1)	48	<1	141	4.8	<1	146	<0.003	0.0075	<0.0001	<0.0001	0.00023	0.00023	0.052	0.051
2019	Q3	Reference (LC_SLC)	51.4	1.5	138	<1	<1	138	<0.003	<0.003	<0.0001	<0.0001	0.00013	0.00011	0.038	0.038
2019	Q4	Reference (FR_UFR1)	121.6	<1	143	<1	<1	143	<0.003	0.0048	<0.0001	<0.0001	<0.0001	0.00011	0.068	0.064
2019	Q4	Reference (GH_ER2)	113.4	1.6	145	<1	<1	145	<0.003	0.015	<0.0001	<0.0001	<0.0001	0.00011	0.043	0.047
2019	Q4	Reference (CM_MC1)	117.9	<1	141	<1	<1	141	<0.003	0.0096	<0.0001	<0.0001	0.00017	0.00018	0.044	0.047
2019	Q4	Reference (LC_SLC)	113.6	<1	145	<1	<1	145	<0.003	0.0045	<0.0001	<0.0001	0.00011	0.00014	0.042	0.04
2020	Q1	Reference (FR_UFR1)	93.9	<1	145	<1	<1	145	<0.003	0.005	<0.0001	<0.0001	0.0001	<0.0001	0.073	0.07
2020	Q1	Reference (GH_ER2)	90.8	<1	155	<1	<1	155	<0.003	0.0147	<0.0001	<0.0001	<0.0001	<0.0001	0.0476	0.044
2020	Q1	Reference (CM_MC1)	91	<1	151	<1	<1	151	<0.003	0.005	<0.0001	<0.0001	0.00017	0.00023	0.0513	0.0517
2020	Q1	Reference (LC_SLC)	88.9	<1	146	<1	<1	146	<0.003	0.016	<0.0001	<0.0001	0.00011	0.00011	0.0473	0.0465
2020	Q2	Reference (FR_UFR1)	122.1	<1	121	5	<1	126	0.004	0.0467	<0.0001	<0.0001	0.00012	0.00014	0.0446	0.0383
2020	Q2	Reference (GH_ER2)	115.8	<1	153	2.8	<1	156	<0.003	0.0493	<0.0001	<0.0001	<0.0001	0.00015	0.0448	0.0472
2020	Q2	Reference (CM_MC1)	119.8	<1	123	2.2	<1	125	0.0047	0.0421	<0.0001	<0.0001	0.00019	0.00019	0.0407	0.0419
2020	Q2	Reference (LC_SLC)	112.9	<1	139	5	<1	144	<0.003	0.0037	<0.0001	<0.0001	0.00014	0.00015	0.0343	0.0328
2020	Q3	Reference (FR_UFR1)	122.1	<1	<1	<1	146	146	<0.003	0.0035	<0.0001	<0.0001	0.00013	0.00011	0.0662	0.0711
2020	Q3	Reference (GH_ER2)	103	<1	132	<1	<1	132	<0.003	0.0278	<0.0001	<0.0001	<0.0001	0.00023	0.0412	0.045
2020	Q3	Reference (CM_MC1)	106.9	<1	144	<1	<1	144	<0.003	0.0072	<0.0001	<0.0001	0.00022	0.00028	0.0562	0.0576
2020	Q3	Reference (LC_SLC)	105.5	<1	<1	<1	142	142	<0.003	<0.003	<0.0001	<0.0001	0.0001	0.00012	0.0422	0.0416
2020	Q4	Reference (FR_UFR1)	115	<1	143	5.6	<1	149	<0.003	<0.003	<0.0001	<0.0001	<0.0001	0.00012	0.0686	0.0673
2020	Q4	Reference (GH_ER2)	108	<1	149	<1	<1	149	<0.003	0.0318	<0.0001	<0.0001	<0.0001	0.00013	0.0462	0.0545
2020	Q4	Reference (CM_MC1)	111	<1	145	<1	<1	145	<0.003	0.0051	<0.0001	<0.0001	0.00018	0.00023	0.0514	0.0494
2020	Q4	Reference (LC_SLC)	120	<1	142	4.6	<1	147	<0.003	<0.003	<0.0001	<0.0001	0.00011	0.00015	0.0446	0.0457
2021	Q1	Reference (FR_UFR1)	114.6	<2	140	<1	<1	140	0.0041	0.0046	<0.0001	<0.0001	<0.0001	<0.0001	0.0729	0.0724
2021	Q1	Reference (GH_ER2)	107.2	2	156	<1	<1	156	0.0018	0.0042	<0.0001	<0.0001	<0.0001	0.00011	0.0499	0.0509
2021	Q1	Reference (CM_MC1)	100.9	<2	153	<1	<1	153	0.0013	0.0034	<0.0001	<0.0001	0.00017	0.00018	0.0558	0.0538
2021	Q1	Reference (LC_SLC)	102.8	1	142	<1	<1	142	<0.003	<0.003	<0.0001	<0.0001	0.00011	0.00013	0.05	0.0463
2021	Q2	Reference (FR_UFR1)	62.8	<2	117	<1	<1	117	0.0047	0.181	<0.0001	<0.0001	0.00014	0.0002	0.0359	0.038
2021	Q2	Reference (GH_ER2)	64.9	<2	149	<1	<1	149	0.0029	0.948	<0.0001	0.00013	0.00013	0.00078	0.0391	0.0646
2021	Q2	Reference (CM_MC1)	75.4	<2	88	<1	<1	88	0.0162	0.434	<0.0001	<0.0001	0.00021	0.00047	0.0277	0.0433
2021	Q2	Reference (LC_SLC)	63.1	<2	119	<1	<1	119	0.003	0.11	<0.0001	<0.0001	0.00012	0.00019	0.0218	0.0245
2021	Q3	Reference (FR_UFR1)	95.8	<2	147	3.8	<1	151	0.0014	0.0035	<0.0001	<0.0001	0.0001	0.00014	0.0739	0.076
2021	Q3	Reference (GH_ER2)	97.4	<2	130	1.6	<1	132	<0.001	0.0687	<0.0001	<0.0001	<0.0001	0.00017	0.04	0.043
2021	Q3	Reference (CM_MC1)	100.4	<2	143	3.6	<1	147	0.0023	0.0088	<0.0001	<0.0001	0.00022	0.00024	0.0527	0.052
2021	Q3	Reference (LC_SLC)	99.4	<2	142	<1	<1	142	0.0013	<0.003	<0.0001	<0.0001	0.0001	0.00014	0.0404	0.0456
2021	Q4	Reference (FR_UFR1)	86.8	<2	168	<1	<1	168	0.0015	0.0073	<0.0001	<0.0001	<0.0001	0.00011	0.072	0.0755
2021	Q4	Reference (GH_ER2)	88.5	<2	158	<1	<1	158	0.0017	0.0092	<0.0001	<0.0001	<0.0001	0.00011	0.0472	0.0478
2021	Q4	Reference (CM_MC1)	84.1	<2	159	<1	<1	159	<0.001	0.0033	<0.0001	<0.0001	0.00015	0.0002	0.0538	0.0542
2021	Q4	Reference (LC_SLC)	86	<2	163	<1	<1	163	0.001	0.0037	<0.0001	<0.0001	<0.0001	0.0001	0.0438	0.0442
Tests categorized as no adverse response (2015 - 2021)																
2015	Q1	GH_FR1	97	1.7	202	<1.0	<1.0	202	<0.0030	0.0048	0.00014	0.00014	<0.00010	0.00014	0.12	0.13
2015	Q1	GH_ERC	108	2.6	155	<1.0	<1.0	155	<0.0030	0.028	<0.00010	0.00012	<0.00010	0.00015	0.055	0.056
2015	Q1	CM_MC2	101	1.8	205	8.4	<1.0	213	0.0097	0.032	0.00017	0.00019	0.00017	0.00022	0.072	0.072
2015	Q1	EV_MC2	141	3.4	193	<1.0	<1.0	193	0.0037	0.019	<0.00010	<0.00010	0.00015	0.00018	0.11	0.11
2015	Q1	LC_LCDSSLCC	117	<1.0	193	2.7	<1.0	195	<0.0030	0.0052	0.00022	0.00022	0.00011	0.00013	0.096	0.093
2015	Q2	FR_FRCP1	140	<1.0	142	5.0	<1.0	147	<0.0030	0.073	0.00022	0.00022	<0.00010	0.00015	0.064	0.065
2015	Q2	GH_FR1	125	<1.0	159	8.0	<1.0	167	<0.0030	0.053	0.00017	0.00017	0.0001	0.00014	0.085	0.087
2015	Q2	GH_ERC	131	<1.0	157	4.8	<1.0	161	<0.0030	0.13	<0.00010	<0.00010	<0.00010	0.00017	0.05	0.051
2015	Q2	CM_MC2	108	<1.0	143	4.9	<1.0	148	0.0044	0.31	0.00012	0.00013	0.00017	0.00031	0.044	0.046
2015	Q2	EV_MC2	102	1.6	112	3.7	<1.0	116	<0.0070	0.36	<0.00010	0.00011	0.00018	0.00033	0.062	0.067
2015	Q2	EV_HC1	140	1.3	103	6.7	1.0	110	0.0032	0.05	0.0001	0.0001	0.00013	0.00016	0.025	0.025
2015	Q2	LC_DCDS	132.5	<1.0	92	<1.0	<1.0	92	0.029	0.18	0.00015	0.00019	0.00027	0.00036	0.093	0.096
2015	Q3	FR_FRCP1	127	<1.0	187	11	<1.0	198	<0.0030	0.022	0.00027	0.00033	0.0001	0.00019	0.076	0.076
2015	Q3	GH_FR1	107	<1.0	174	8.2	<1.0	182	<0.0030	0.013	0.00022	0.00025	0.00014	0.0002	0.098	0.10
2015	Q3	GH_ERC	129	<1.0	142	<1.0	<1.0	142	<0.0030	0.083	<0.00010	<0.00010	<0.00010	0.00017	0.046	0.049
2015	Q3	CM_MC2	109	<1.0	188	11	<1.0	198	<0.0030	0.016	0.00018	0.00021	0.00019	0.00021	0.069	0.069
2015	Q3	EV_MC2	110	3.2	194	<1.0	<1.0	194	0.003	0.0085	0.00041	0.00044	0.00016	0.00023	0.1	0.1
2015	Q3	EV_HC1	134	<1.0	182	9.8	<1.0	192	0.0049	0.034	<0.00010	0.00011	0.00017	0.00024	0.058	0.059
2015	Q3	LC_LCDSSLCC	101	<1.0	171	10	<1.0	181	<0.0030	0.013	0.00019	0.00026	<0.00010	0.00011	0.06	0.063
2015	Q4	GH_FR1	153	<1.0	183	4.8	<1.0	188	<0.0030	0.004	0.00011	0.00015	<0.00010	0.00014	0.12	0.12
2015	Q4	GH_ERC	147	<1.0	151	<1.0	<1.0	151	<0.0030	0.007	<0.00010	<0.00010	<0.00010	<0.00010	0.058	0.06
2015	Q4	CM_MC2	115	<1.0	209	6.4	<1.0	215	<0.0030	0.0054	0.00013	0.00013	0.00018	0.00022	0.09	0.092
2015	Q4	EV_MC2	136	3.0	193	<1.0	<1.0	193	<0.0030	0.0056	0.00035	0.00038	0.00014	0.00019	0.11	0.11
2015	Q4	EV_HC1	129	<1.0	187	8.0	<1.0	195	<0.0030	0.0058	<0.00010	0.00012	0.00014	0.00015	0.06	0.063
2015	Q4	LC_DCDS	118.3	<1.0	133	<1.0	<1.0	133	<0.0050	<0.015	<0.00050	<0.00050	<0.00050	<0.00050	0.14	0.15
2015	Q4	LC_LC5	102.3	<1.0	167	<1.0	<1.0	167	<0.0050	<0.015	<0.00050	<0.00050	<0.00050	<0.00050	0.11	0.11
2015	Q4	LC_LCDSSLCC	112	<1.0	197	<1.0	<1.0	197	<0.0050	<0.015	<0.00050	<0.00050	<0.00050	<0.00050	0.085	0.091
2016	Q1	GH_FR1	119.5	< 1.0	190	< 1.0	< 1.0	190	< 0.0030	0.004	0.00012	0.00014	< 0.00010	< 0.00010	0.12	0.11
2016	Q1	GH_ERC	129.5	< 1.0	152	< 1.0	< 1.0	152	< 0.0030	0.0031	< 0.00010	< 0.00010	< 0.00010	< 0.00010	0.067	0.066
2016	Q1	CM_MC2	121.8	< 1.0	199	7.0	< 1.0	206	< 0.0030	0.012	0.00018	0.00018	0.00015	0.00021	0.077	0.075
2016	Q1	EV_MC2	130.3	3.5	179	< 1.0	< 1.0	179	< 0.0030	0.031	0.00025	0.00025	0.00013	0.00016	0.11	0.11
2016	Q1	EV_HC1	120.3	< 1.0	191	< 1.0	< 1.0	191	< 0.0030	0.0096	< 0.00010	< 0.00010	0.00015	0.00016	0.067	0.065

Year	Quarter	Sample ID	BERYLLIUM-D-mg/l	BERYLLIUM-T-mg/l	BISMUTH-D-mg/l	BISMUTH-T-mg/l	BORON-D-mg/l	BORON-T-mg/l	BROMIDE-D-mg/l	CADMIUM-D-mg/l	CADMIUM-T-mg/l	CALCIUM-D-mg/l	CALCIUM-T-mg/l	CARBON, DISSOLVED ORGANIC-D-mg/l	CHLORIDE-D-mg/l	CHROMIUM-D-mg/l	CHROMIUM-T-mg/l	COBALT-D-mg/l	COBALT-T-mg/l	CONDUCTIVITY, LAB-N-us/cm	COPPER-D-mg/l	COPPER-T-mg/l	FLUORIDE-D-mg/l
Reference (2015 - 2021)																							
2015	Q1	Reference (FR_UFR1)	<0.00010	<0.00010	<0.00050	<0.00050	<0.010	<0.010	<0.050	<0.000010	0.000011	56	56	0.84	<1.0	0.00017	0.00017	<0.00010	<0.00010	367	<0.00050	<0.00050	0.14
2015	Q1	Reference (FR_UFR1)	<0.00010	<0.00010	<0.00050	<0.00050	<0.010	<0.010	<0.050	<0.000010	0.000011	56	56	0.84	<1.0	0.00017	0.00017	<0.00010	<0.00010	367	<0.00050	<0.00050	0.14
2015	Q1	Reference (FR_UFR1)	<0.00010	<0.00010	<0.00050	<0.00050	<0.010	<0.010	<0.050	0.000011	<0.000010	56	57	<0.50	<1.0	0.00013	0.00015	<0.00010	<0.00010	353	<0.00050	<0.00050	0.14
2015	Q2	Reference (FR_UFR1)	<0.00010	<0.00010	<0.000050	<0.000050	<0.010	<0.010	<0.050	0.0000074	0.000013	37	38	1.8	<1.0	0.00014	0.00046	<0.00010	<0.00010	245	<0.00050	<0.00050	0.15
2015	Q2	Reference (GH_ER2)	<0.00010	<0.00010	<0.000050	<0.000050	<0.010	<0.010	<0.050	<0.0000050	0.000016	47	48	0.84	1.0	0.00022	0.00037	<0.00010	<0.00010	303	<0.00050	<0.00050	0.15
2015	Q3	Reference (FR_UFR1)	<0.00010	<0.00010	<0.000050	<0.000050	<0.010	<0.010	<0.050	0.0000057	0.0000083	54	55	0.75	1.0	0.00013	0.00013	<0.00010	<0.00010	342	<0.00050	<0.00050	0.15
2015	Q4	Reference (FR_UFR1)	<0.00010	<0.00010	<0.000050	<0.000050	<0.010	<0.010	<0.050	<0.0000050	0.0000083	54	56	0.6	<1.0	0.00011	0.00036	<0.00010	<0.00010	354	<0.00050	<0.00050	0.16
2015	Q4	Reference (GH_ER2)	<0.00010	<0.00010	<0.000050	<0.000050	<0.010	<0.010	<0.050	0.0000053	0.0000069	50	51	0.61	1.2	0.00022	0.00034	<0.00010	<0.00010	314	<0.00050	<0.00050	0.16
2016	Q1	Reference (FR_UFR1)	< 0.00010	< 0.00010	< 0.000050	< 0.000050	< 0.010	< 0.010	< 0.050	0.0000054	0.0000062	57	58	< 0.50	1.1	0.00012	< 0.00020	< 0.00010	< 0.00010	358	< 0.00050	< 0.00050	0.16
2016	Q2	Reference (FR_UFR1)	< 0.00010	< 0.00010	< 0.000050	< 0.000050	< 0.010	< 0.010	< 0.050	0.0000062	0.000016	35	37	2.5	< 0.10	0.00011	0.00029	< 0.00010	< 0.00010	233	< 0.00050	< 0.00050	0.15
2016	Q2	Reference (GH_ER2)	< 0.00010	< 0.00010	< 0.000050	< 0.000050	< 0.010	< 0.010	< 0.050	0.0000076	0.000025	47	48	1.4	0.61	0.00017	0.00062	< 0.00010	< 0.00010	289	< 0.00050	< 0.00050	0.16
2016	Q3	Reference (FR_UFR1)	< 0.000020	< 0.000020	< 0.000050	< 0.000050	< 0.010	< 0.010	< 0.050	0.0000055	0.000011	49	51	0.86	0.13	< 0.00010	0.00018	< 0.00010	< 0.00010	338	< 0.00050	< 0.00050	0.17
2016	Q4	Reference (FR_UFR1)	< 0.000020	< 0.000020	< 0.000050	< 0.000050	< 0.010	< 0.010	< 0.050	0.0000057	0.0000058	50	48	1.1	0.18	< 0.00010	0.00021	< 0.00010	< 0.00010	330	< 0.00050	< 0.00050	0.16
2016	Q4	Reference (GH_ER2)	< 0.000020	< 0.000020	< 0.000050	< 0.000050	< 0.010	< 0.010	< 0.050	< 0.0000050	0.0000079	48	48	0.64	0.36	0.00021	0.00024	< 0.00010	< 0.00010	297	< 0.00050	< 0.00050	0.17
2017	Q1	Reference (FR_UFR1)	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.00001	0.000011	-	52	0.96	<0.5	<0.0001	0.00011	<0.0001	<0.0001	341	<0.0002	<0.0005	0.14
2017	Q2	Reference (FR_UFR1)	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.000016	0.000023	-	31	3.3	<0.5	0.00022	0.0004	<0.0001	<0.0001	239	0.0004	0.00067	0.11
2017	Q2	Reference (GH_ER2)	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000098	0.000019	-	51	0.83	0.27	0.00021	0.00038	<0.0001	<0.0001	321	<0.0005	<0.0005	0.16
2017	Q2	Reference (CM_MC1)	<0.00002	<0.00002	<0.00005	<0.00005	0.013	0.013	<0.05	0.000012	0.000015	-	36	1.8	<0.5	0.00012	0.00018	<0.0001	<0.0001	267	<0.0002	<0.0005	0.052
2017	Q3	Reference (FR_UFR1)	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.000008	0.000012	-	45	1.8	<0.5	<0.0001	0.00028	<0.0001	<0.0001	319	<0.0002	<0.0005	0.14
2017	Q3	Reference (GH_ER2)	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000081	0.0000078	-	40	0.79	<0.5	0.00019	0.00024	<0.0001	<0.0001	276	<0.0002	<0.0005	0.14
2017	Q3	Reference (CM_MC1)	<0.00002	<0.00002	<0.00005	<0.00005	0.018	0.013	<0.05	0.00001	0.000015	-	36	1.2	<0.5	<0.0001	0.00028	<0.0001	<0.0001	265	<0.0002	<0.0005	0.054
2017	Q4	Reference (FR_UFR1)	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000069	0.00001	-	50	1.1	<0.5	<0.0001	0.00012	<0.0001	<0.0001	333	<0.0005	<0.0005	0.11
2017	Q4	Reference (GH_ER2)	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000056	0.0000074	-	47	0.81	<0.5	0.00022	0.00026	<0.0001	<0.0001	282	<0.0005	<0.0005	0.13
2017	Q4	Reference (CM_MC1)	<0.00002	<0.00002	<0.00005	<0.00005	0.013	0.014	<0.05	0.0000068	0.0000083	-	41	1.6	<0.5	0.00018	0.00018	<0.0001	<0.0001	280	<0.0005	<0.0005	0.055
2018	Q1	Reference (FR_UFR1)	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000062	0.0000096	55	53	0.5	<0.5	<0.0001	0.00011	<0.0001	<0.0001	371	<0.0005	<0.0005	0.11
2018	Q1	Reference (GH_ER2)	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000058	0.0000062	51	45	0.66	0.26	0.00019	0.00025	<0.0001	<0.0001	327	<0.0005	<0.0005	0.16
2018	Q1	Reference (CM_MC1)	<0.00002	<0.00002	<0.00005	<0.00005	0.013	0.014	<0.05	0.0000078	0.0000058	42	39	0.73	<0.5	0.00013	0.00018	<0.0001	<0.0001	307	<0.0005	<0.0005	0.055
2018	Q2	Reference (FR_UFR1)	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.000011	0.000031	34	35	2.9	<0.5	0.00011	0.00027	<0.0001	<0.0001	235	<0.0005	0.00056	0.14
2018	Q2	Reference (GH_ER2)	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000086	0.000043	47	46	1.6	<0.5	0.00018	0.00077	<0.0001	0.00012	304	<0.0005	0.00077	0.16
2018	Q2	Reference (CM_MC1)	<0.00002	<0.00002	<0.00005	<0.00005	0.011	0.013	<0.05	0.00001	0.000019	35	36	3.3	<0.5	0.00013	0.00029	<0.0001	<0.0001	238	<0.0005	0.00056	0.07
2018	Q2	Reference (LC_SLC)	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	<0.000005	0.000015	44	42	2.3	<0.5	0.00012	0.00015	<0.0001	<0.0001	299	<0.0005	<0.0005	0.3
2018	Q3	Reference (FR_UFR1)	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	<0.000005	0.000011	50	48	1.6	<0.5	0.00012	0.00012	<0.0001	<0.0001	325	<0.0005	<0.0005	0.18
2018	Q3	Reference (GH_ER2)	<0.00002	0.000066	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.000009	0.00013	42	49	1.5	<0.5	0.00021	0.0016	<0.0001	0.00051	270	<0.0005	0.0012	0.17
2018	Q3	Reference (CM_MC1)	<0.00002	<0.00002	<0.00005	<0.00005	0.015	0.016	<0.05	0.000012	0.000012	44	39	1.7	<0.5	0.00021	0.0003	<0.0001	<0.0001	267	<0.0005	<0.0005	0.08
2018	Q3	Reference (LC_SLC)	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.000011	0.000014	56	46	1.2	<0.5	0.00014	0.00016	<0.0001	<0.0001	350	<0.0005	<0.0005	0.34
2018	Q4	Reference (FR_UFR1)	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000055	0.000008	52	51	0.72	<0.5	0.0001	0.00019	<0.0001	<0.0001	347	<0.0005	<0.0005	0.15
2018	Q4	Reference (GH_ER2)	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000055	0.0000097	47	47	<0.5	<0.5	0.00023	0.00038	<0.0001	<0.0001	306	<0.0005	<0.0005	0.17
2018	Q4	Reference (CM_MC1)	<0.00002	<0.00002	<0.00005	<0.00005	0.014	0.015	<0.05	0.0000068	0.0000085	39	38	2.1	<0.5	0.00018	0.00027	<0.0001	<0.0001	268	<0.0005	<0.0005	0.07
2018	Q4	Reference (LC_SLC)	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.000011	0.000013	50	49	0.51	<0.5	0.00013	0.00021	<0.0001	<0.0001	369	<0.0005	<0.0005	0.37
2019	Q1	Reference (FR_UFR1)	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000078	0.0000116	54.9	53.8	0.92	<0.5	<0.0001	<0.0001	<0.0001	<0.0001	363	<0.0005	<0.0005	0.136
2019	Q1	Reference (GH_ER2)	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000058	0.0000053	50	51.2	<0.5	<0.5	0.00021	0.00028	<0.0001	<0.0001	305	<0.0005	<0.0005	0.158
2019	Q1	Reference (CM_MC1)	<0.00002	<0.00002	<0.00005	<0.00005	0.013	0.013	<0.05	0.0000084	0.0000097	43.2	41.3	0.55	0.68	0.00016	0.0003	<0.0001	<0.0001	302	<0.0005	<0.0005	0.07
2019	Q1	Reference (LC_SLC)	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000123	0.0000149	55.4	60.2	0.67	0.71	0.00014	0.00021	<0.0001	<0.0001	428	<0.0005	<0.0005	0.372
2019	Q2	Reference (FR_UFR1)	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000073	0.00001	35	38	1.8	<0.5	0.00014	0.00024	<0.0001	<0.0001	278	<0.0005	<0.0005	0.15
2019	Q2	Reference (GH_ER2)	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000067	0.000013	47	50	<0.5	<0.5	0.00021	0.00036	<0.0001	<0.0001	298	<0.0005	<0.0005	0.17
2019	Q2	Reference (CM_MC1)	<0.00002	<0.00002	<0.00005	<0.00005	0.013	0.014	<0.05	0.0000079	0.000014	38	36	3.6	<0.5	0.00013	0.0002	<0.0001	<0.0001	253	<0.0005	<0.0005	0.071
2019	Q2	Reference (LC_SLC)	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.000007	0.000013	44	45	0.94	<0.5	0.00016	0.00015	<0.0001	<0.0001	343	<0.0005	<0.0005	0.35
2019	Q3	Reference (FR_UFR1)	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.000006	0.000009	47	50	1.0	<0.5	0.00011	0.00016	<0.0001	<0.0001	309	<0.0005	<0.0005	0.16
2019	Q3	Reference (GH_ER2)	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000075	0.0000088	44	42	0.65	<0.5	0.0002	0.00033	<0.0001	<0.0001	274	<0.0005	<0.0005	0.15
2019	Q3	Reference (CM_MC1)	<0.00002	<0.00002	<0.00005	<0.00005	0.016	0.016	<0.05	0.00001	0.000016	43	44	0.99	<0.5	0.00022	0.00026	<0.0001	<0.0001	287	<0.0005	<0.0005	0.079
2019	Q3	Reference (LC_SLC)	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000095	0.000015	46	46	0.72	<0.5	0.00016	0.0002	<0.0001	<0.0001	320	<0.0005	<0.0005	0.33
2019	Q4	Reference (FR_UFR1)	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.000011	0.0000096	49	50	0.71	<0.5	0.00012	0.00011	<0.0001	<0.0001	302	0.00028	<0.0005	0.16
2019	Q4	Reference (GH_ER2)	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000059	0.0000098	44	48	<0.5	<0.5	0.00027	0.00028	<0.0001	<0.0001	279	0.00021	<0.0005	0.17
2019	Q4	Reference (CM_MC1)	<0.00002	<0.00002	<0.00005	<0.00005	0.013	0.014	<0.05	0.0000083	0.0000081	38	40	0.84	<0.5	0.00027	0.00029	<0.0001	<0.0001	246	0.00021	<0.0005	0.077
2019	Q4	Reference (LC_SLC)	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000097	0.000014	56	51	0.81	<0.5	0.00016	0.00016	<0.0001	<0.0001	333	0.00022	<0.0005	0.37
2020	Q1	Reference (FR_UFR1)	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.000009	0.000012	48	50	<0.5	<0.5	<0.0001	0.00011	<0.0001	<0.0001	342	0.0004	<0.0005	0.13
2020	Q1	Reference (GH_ER2)	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000055	0.0000103	45.3	45.4	0.6	<0.5	0.00023	0.0003	<0.0001	<0.0001	309	<0.0002	<0.0005	0.198
2020	Q1	Reference (CM_MC1)	<0.00002	<0.00002	<0.00005	<0.00005	0.013	0.014	<0.05	0.0000084	0.0000094	39.7	40.8	0.78	0.54	0.00015	0.00019	<0.0001	<0.0001	292	<0.0002	<0.0005	0.058
2020	Q1	Reference (LC_SLC)	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000169	0.0000179	59.8	53.3	1.77	0.67	0.00014	0.00019	<0.0001	<0.0001	395	0.00022	<0.0005	0.305
2020	Q2	Reference (FR_UFR1)	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000077	0.0000113	35.1	33.6	2.3	<0.5	<0.0001	0.00017	<0.0001	<0.0001	226	0.00022	<0.0005	0.127
2020	Q2	Reference (GH_ER2)	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000085	0.0000148	44	46.4	1.78	<0.5	0.00016	0.0003	<0.0001	<0.0001	268	<0.0002	<0.0005	0.138
2020	Q2	Reference (CM_MC1)	<0.00002	<0.00002	<0.00005	<0.00005	0.011	0.012	<0.05	0.0000084	0.0000129	34.5	34.1	2.42	<0.5	0.00013	0.00019	<0.0001	<0.0001	214	0.00027	<0.0005	0.061
2020	Q2	Reference (LC_SLC)	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000118	0.0000106	42.5	45.5	1.93	<0.5	0.00013	0.00015	<0.0001	<0.0001	256	<0.0002	<0.0005	0.208
2020	Q3	Reference (FR_UFR1)	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000117	0.0000096	53.6	48.6	<0.5	<0.5	<0.0001	0.00016	<0.0001	<0.0001	324	<0.0002	<0.0005	0.149
2020	Q3	Reference (GH_ER2)	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000061	0.0000104	41.5	47	<0.5	<0.5	0.00018	0.00029	<0.0001	<0.0001	264	0.0002	<0.0005	0.158
2020	Q3	Reference (CM_MC1)	<0.00002	<0.00002	<0.00005	<0.00005	0.019	0.019	<0.05	0.0000136	0.0000139	45.2	44.5	1	<0.5	0.00019	0.00025	<0.0001	<0.0001	277	0.0002	<0.0005	0.078
2020	Q3	Reference (LC_SLC)	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000094	0.0000117	50.7	48.8	<0.5	<0.5	0.00013	0.00013	<0.0001	<0.0001	328	<0.0002	<0.0005	0.291
2020	Q4	Reference (FR_UFR1)	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000068	0.0000079	51.3	51.8	0.61	0.13	<0.0001	0.00013	<0.0001	<0.0001	312	<0.0002	<0.0005	0.127
2020	Q4	Reference (GH_ER2)	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	<0.000005	0.0000123	47.6	44	0.66	0.31	0.00024	0.00033	<0.0001	<0.0001	265	<0.0002	<0.0005	0.146
2020	Q4	Reference (CM_MC1)	<0.00002	<0.00002	<0.00005	<0.00005	0.019	0.021	<0.05	0.0000105	0.0000086	40.9	42.2	1.91	0.59	0.00017	0.0002	<0.0001	<0.0001	258	<0.0002	<0.0005	0.076
2020	Q4	Reference (LC_SLC)	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000119	0.0000115	51.9	55.2	1.07	0.35	0.00017	0.00016	<0.0001	<0.0001	359	<0.0002	<0.0005	0.307
2021	Q1	Reference (FR_UFR1)	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000077	0.0000111	53.4	54.2	<0.5	0.13	0.00014	0.00012	<0.0001	<0.0001	311	<0.0002	<0.0005	0.13
2021	Q1	Reference (GH_ER2)	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000062	0.000006	48.1	54	<0.5	0.35	0.00027	0.00031	<0.0001	<0.0001	284	<0.0002	<0.0005	0.14
2021	Q1	Reference (CM_MC1)	<0.00002	<0.00002	<0.00005	<0.00005	0.013	0.014	<0.05	0.0000077	0.000011	42.9	45.1	1.2	0.5	0.00017	0.00018	<0.0001	<0.0001	287	<0.0002	<0.0005	0.046
2021	Q1	Reference (LC_SLC)	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000104	0.0000156	61.2	61.8	<0.5	0.77	0.00012	0.00014	<0.0001	<0.0001	387	<0.0002	<0.0005	0.35
2021	Q2	Reference (FR_UFR1)	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000085	0.000032	31.6	31.4	3.35	<0.1	0.00015	0.00038	<0.0001	0.00012	210	0.00026	0.00052	0.108
2021	Q2	Reference (GH_ER2)	<0.00002	0.000094	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000088	0.000212	40.7	54.6	2.67	0.45	0.00014	0.0023	<0.0001	0.00078	274	<0.0002	0.00234	0.117
2021	Q2	Reference (CM_MC1)	<0.00002	0.000054	<0.00005	<0.00005	0.01	<0.01	<0.05	0.0000105	0.000112	26.9	25.6	6	0.12	0.00022	0.00064	<0.0001	0.00043	145	0.00048	0.00129	0.041
2021	Q2	Reference (LC_SLC)	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000098	0.0000385	30.4	34.4	2.94	0.11	<0.0001	0.00032	<0.0001	<0.0001	216	<0.0002	<0.0005	0.16
2021	Q3	Reference (FR_UFR1)	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000112	0.0000111	49.8	50.2	2.37	0.12	0.00011	0.00014	<0.0001	<0.0001	328	0.00038	<0.0005	0.15
2021	Q3	Reference (GH_ER2)	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000054	0.0000215	41.7	40.5	1.83	0.29	0.0002	0.00037	<0.0001	<0.0001	261	<0.0002	<0.0005	0.16
2021	Q3	Reference (CM_MC1)	<0.00002	<0.00002	<0.00005	<0.00005	0.017	0.018	<0.05	0.0000078	<0.000005	40.8	41.2	1.38	0.46	0.00014	0.00019	<0.0001	<0.0001	273	0.00021	<0.0005	0.077
2021	Q3	Reference (LC_SLC)	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000158	0.0000109	45.4	49.5	1.1	0.29	0.00014	0.00023	<0.0001	<0.0001	329	<0.0002	<0.0005	0.29
2021	Q4	Reference (FR_UFR1)	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000054	0.0000092	50.2	53.6	<0.5	0.12	<0.0001	<0.0001	<0.0001	<0.0001	343	<0.0002	<0.0005	0.108
2021	Q4	Reference (GH_ER2)	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000076	0.0000068	44.4	47.2	<0.5	0.26	0.0003	0.00036	<0.0001	<0.0001	289	<0.0002	<0.0005	0.13
2021	Q4	Reference (CM_MC1)	<0.00002	<0.00002	<0.00005	<0.00005	0.015	0.014	<0.05	0.0000078	0.0000092	44.8	40.4	1.17	0.35	0.00019	0.00017	<0.0001	<0.0001	295	<0.0002	<0.0005	0.046
2021	Q4	Reference (LC_SLC)	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000119	0.0000134	51.1	55.9	0.86	0.29	0.0002	0.00019	<0.0001	<0.0001	359	<0.0002	<0.0005	0.27
Tests categorized as no adverse response (2015 - 2021)																							
2015	Q1	GH_FR1	<0.00010	<0.00010	<0.00050	<0.00050	0.012	<0.010	<0.10	0.000021	0.000024	112	114	1.1	2.6	0.00021	0.00015	<0.00010	<0.00010	851	<0.00050	<0.00050	0.18
2015	Q1	GH_ERC	<0.00010	<0.00010	<0.00050	<0.00050	<0.010	<0.010	<0.050	<0.000010	<0.000010	55	55	0.64	<1.0	0.00029	0.00034	<0.00010	<0.00010	345	<0.00050	<0.00050	0.15
2015	Q1	CM_MC2	<0.00010	<0.00010	<0.00050	<0.00050	0.024	0.025	<0.10	0.000022	0.000023	105	106	0.93	3.4	0.00019	0.00024	0.00074	0.00079	826	<0.00050	<0.00050	0.14
2015	Q1	EV_MC2	<0.00010	<0.00010	<0.00050	<0.00050	0.014	0.016	<0.050	0.000055	0.000044	95	91	1.7	11	0.00012	<0.00020	<0.00010	<0.00010	665	0.0012	0.00076	0.15
2015	Q1	LC_LCDSSLCC	<0.00010	<0.00010	<0.00050	<0.00050	0.013	0.014	<0.10	0.000086	0.00011	126	123	1.1	2.7	0.00016	0.00021	<0.00010	<0.00010	940	<0.00050	<0.00050	0.24
2015	Q2	FR_FRCP1	<0.00010	<0.00010	<0.000050	<0.000050	<0.010	<0.010	<0.050	0.00003	0.00005	73	73	1.6	1.2	<0.00010	0.00028	<0.00010	0.00012	573	<0.00050	<0.00050	0.2
2015	Q2	GH_FR1	<0.00010	<0.00010	<0.000050	<0.000050	<0.010	<0.010	<0.050	0.000021	0.000035	79	81	1.4	1.4	<0.00010	0.0002	<0.00010	<0.00010	614	<0.00050	<0.00050	0.17
2015	Q2	GH_ERC	<0.00010	<0.00010	<0.000050	<0.000050	<0.010	<0.010	<0.050	0.000007	0.000022	52	53	0.96	<1.0	0.00017	0.00054	<0.00010	<0.00010	338	<0.00050	<0.00050	0.15
2015	Q2	CM_MC2	<0.00010	<0.00010	<0.000050	<0.000050	0.014	0.015	<0.050	0.000036	0.00006	61	60	1.5	1.2	0.0002	0.00058	0.00037	0.00061	484	<0.00050	0.00053	0.1
2015	Q2	EV_MC2	<0.00010	<0.00010	<0.000050	<0.000050	<0.010	<0.010	<0.050	0.000018	0.000064	43	44	1.9	2.9	0.0002	0.0007	<0.00010	0.00022	299	<0.00050	0.00073	0.12
2015	Q2	EV_HC1	0.0001	0.0001	0.00005	0.00005	0.01	0.01	0.05	0.000013	0.000021	48	47	1.1	1.3	0.00013	0.00021	0.0001	0.0001	350	0.0005	0.0005	0.13
2015	Q2	LC_DCDS	<0.00010	<0.00010	<0.000050	<0.000050	<0.010	<0.010	<0.050	0.000039	0.000067	25	25	2.2	1.1	0.00012	0.00042	<0.00010	<0.00010	189	<0.00050	0.00059	0.093
2015	Q3	FR_FRCP1	<0.00010	<0.00010	<0.000050	<0.000050	0.013	0.014	<0.10	0.000038	0.000047	107	109	0.93	1.5	0.0001	0.00017	<0.00010	<0.00010	815	<0.00050	<0.00050	0.2
2015	Q3	GH_FR1	<0.00010	<0.00010	<0.000050	<0.000050	0.01	0.011	<0.050	0.000019	0.000021	89	90	0.87	1.6	0.00012	0.00015	<0.00010	<0.00010	657	<0.00050	<0.00050	0.18
2015	Q3	GH_ERC	<0.00010	<0.00010	<0.000050	<0.000050	<0.010	<0.010	<0.050	0.0000059	0.000016	47	49	0.75	<1.0	0.00019	0.00037	<0.00010	<0.00010	284	<0.00050	<0.00050	0.16
2015	Q3	CM_MC2	<0.00010	<0.00010	<0.000050	<0.000050	0.027	0.029	<0.10	0.0000099	0.000018	102	104	0.86	2.1	0.00019	0.00023	0.00026	0.00034	802	<0.00050	<0.00050	0.12
2015	Q3	EV_MC2	<0.00010	<0.00010	<0.000050	<0.000050	0.016	0.018	<0.10	0.000049	0.000056	95	87	1.0	9.6	0.00013	0.00019	<0.00010	<0.00010	686	<0.00050	<0.00050	0.18
2015	Q3	EV_HC1	<0.00010	<0.00010	<0.000050	<0.000050	<0.010	0.011	<0.050	0.000017	0.000025	82	75	1.1	1.4	0.00015	0.00024	<0.00010	<0.00010	625	<0.00050	<0.00050	0.21
2015	Q3	LC_LCDSSLCC	<0.00010	<0.00010	<0.000050	<0.000050	0.012	0.013	<0.10	0.00025	0.00026	88	92	0.83	2.0	0.00011	0.0002	<0.00010	<0.00010	660	<0.00050	<0.00050	0.24
2015	Q4	GH_FR1	<0.00010	<0.00010	<0.000050	<0.000050	<0.010	0.011	<0.25	0.000015	0.000024	105	106	<0.50	1.7	0.00012	0.00013	<0.00010	<0.00010	760	<0.00050	<0.00050	0.16
2015	Q4	GH_ERC	<0.00010	<0.00010	<0.000050	<0.000050	<0.010	<0.010	<0.050	<0.0000050	0.0000073	56	58	<0.50	1.2	0.00022	0.00026	<0.00010	<0.00010	355	<0.00050	<0.00050	0.16
2015	Q4	CM_MC2	<0.00010	<0.00010	<0.000050	<0.000050	0.026	0.027	<0.25	0.0000075	0.0000093	118	115	0.56	3.2	0.00019	0.0002	<0.00010	<0.00010	876	<0.00050	<0.00050	0.11
2015	Q4	EV_MC2	<0.00010	<0.00010	<0.000050	<0.000050	0.016	0.016	<0.25	0.000037	0.000047	102	102	0.6	8.7	0.00012	0.00015	<0.00010	<0.00010	733	<0.00050	<0.00050	0.16
2015	Q4	EV_HC1	<0.00010	<0.00010	<0.000050	<0.000050	<0.010	0.01	<0.25	0.000013	0.000018	92	93	0.63	1.8	0.00013	0.00022	<0.00010	<0.00010	732	<0.00050	<0.00050	0.2
2015	Q4	LC_DCDS	<0.00050	<0.00050	<0.00025	<0.00025	<0.050	<0.050	<0.050	<0.000025	0.00006	37	36	2.3	<0.50	<0.00050	<0.00050	<0.00050	<0.00050	251	<0.0010	<0.0025	0.075
2015	Q4	LC_LC5	<0.00050	<0.00050	<0.00025	<0.00025	<0.050	<0.050	<0.050	<0.000025	0.00004	102	99	0.84	1.5	<0.00050	<0.00050	<0.00050	<0.00050	627	<0.0010	<0.0025	0.17
2015	Q4	LC_LCDSSLCC	<0.00050	<0.00050	<0.00025	<0.00025	<0.050	<0.050	<0.050	0.00024	0.00026	116	117	0.74	2.2	<0.00050	<0.00050	<0.00050	<0.00050	770	<0.0010	<0.0025	0.18
2016	Q1	GH_FR1	< 0.00010	< 0.00010	< 0.000050	< 0.000050	< 0.010	< 0.010	< 0.25	0.000014	0.000018	119	119	0.51	2.5	0.00012	0.00013	< 0.00010	< 0.00010	885	< 0.00050	< 0.00050	0.18
2016	Q1	GH_ERC	< 0.00010	< 0.00010	< 0.000050	< 0.000050	< 0.010	< 0.010	< 0.050	< 0.0000050	0.0000065	67	67	< 0.50	1.3	0.00024	< 0.00030	< 0.00010	< 0.00010	419	< 0.00050	< 0.00050	0.16
2016	Q1	CM_MC2	< 0.00010	< 0.00010	< 0.000050	< 0.000050	0.026	0.026	< 0.25	0.000016	0.000018	117	117	0.58	4.9	0.00018	< 0.00030	0.00072	0.00081	927	< 0.00050	< 0.00050	0.14
2016	Q1	EV_MC2	< 0.00010	< 0.00010	< 0.000050	< 0.000050	0.013	0.013	< 0.25	0.000035	0.000036	97	94	0.85	9.2	0.00013	0.00018	< 0.00010	< 0.00010	700	< 0.00050	< 0.00050	0.15
2016	Q1	EV_HC1	< 0.00010	< 0.00010	< 0.000050	< 0.000050	< 0.010	< 0.010	< 0.25	0.000017	0.000019	96	95	0.65	2.1	0.00016	< 0.00020	< 0.00010	< 0.00010	745	< 0.00050	< 0.00050	0.21

Year	Quarter	Sample ID	Hardness, Total or Dissolved CaCO3-N-mg/l	IRON-D-mg/l	IRON-T-mg/l	LEAD-D-mg/l	LEAD-T-mg/l	LITHIUM-D-mg/l	LITHIUM-T-mg/l	MAGNESIUM-D-mg/l	MAGNESIUM-T-mg/l	MAJOR ANION SUM-N-meq/l	MAJOR CATION SUM-N-meq/l	MANGANESE-D-mg/l	MANGANESE-T-mg/l	MERCURY-D-mg/l	MERCURY-T-mg/l	MOLYBDENUM-D-mg/l	MOLYBDENUM-T-mg/l	NICKEL-D-mg/l
Reference (2015 - 2021)																				
2015	Q1	Reference (FR_UFR1)	197	<0.010	<0.010	<0.000050	<0.000050	0.0019	0.0016	14	15	4.0	4.0	0.000054	0.00018	<0.000010	<0.000010	0.00053	0.00054	<0.00050
2015	Q1	Reference (FR_UFR1)	197	<0.010	<0.010	<0.000050	<0.000050	0.0019	0.0016	14	15	4.0	4.0	0.000054	0.00018	<0.000010	<0.000010	0.00053	0.00054	<0.00050
2015	Q1	Reference (FR_UFR1)	197	<0.010	<0.010	<0.000050	<0.000050	0.0015	0.0017	14	14	3.9	4.0	0.00017	0.00037	<0.000010	<0.000010	0.00056	0.00055	<0.00050
2015	Q2	Reference (FR_UFR1)	129	<0.010	0.052	<0.000050	<0.000050	<0.0010	0.0012	9.0	9.2	2.7	2.6	0.00064	0.0025	<0.0000050	<0.0000050	0.00052	0.00062	<0.00050
2015	Q2	Reference (GH_ER2)	160	<0.010	0.066	<0.000050	<0.000050	0.0017	0.0016	10	11	3.6	3.2	0.0033	0.0059	<0.0000050	<0.0000050	0.00092	0.00094	<0.00050
2015	Q3	Reference (FR_UFR1)	188	<0.010	<0.010	0.000055	<0.000050	0.002	0.002	13	13	3.9	3.8	0.00062	0.0015	<0.0000050	<0.0000050	0.00068	0.00068	<0.00050
2015	Q4	Reference (FR_UFR1)	190	<0.010	<0.010	<0.000050	<0.000050	0.0015	0.0015	14	14	3.9	3.9	0.0001	0.00031	<0.0000050	<0.0000050	0.00065	0.00059	<0.00050
2015	Q4	Reference (GH_ER2)	170	<0.010	<0.010	<0.000050	<0.000050	0.0016	0.0018	11	11	3.4	3.4	0.0021	0.0027	<0.0000050	<0.0000050	0.001	0.0010	<0.00050
2016	Q1	Reference (FR_UFR1)	202	< 0.010	< 0.010	< 0.000050	< 0.000050	0.0014	0.0015	15	15	3.9	4.1	0.0002	0.00034	< 0.0000050	< 0.00000050	0.00058	0.00056	< 0.00050
2016	Q2	Reference (FR_UFR1)	126	< 0.010	0.075	< 0.000050	0.00006	0.0011	0.0013	9.3	9.8	2.5	2.5	0.00045	0.0021	< 0.0000050	0.0000014	0.00061	0.00062	< 0.00050
2016	Q2	Reference (GH_ER2)	163	< 0.010	0.23	< 0.000050	0.00013	0.002	0.0021	11	11	3.2	3.3	0.0018	0.012	< 0.0000050	0.00000098	0.00091	0.00093	< 0.00050
2016	Q3	Reference (FR_UFR1)	177	< 0.010	0.013	< 0.000050	< 0.000050	0.0017	0.0018	13	14	3.9	3.6	0.00027	0.0011	< 0.0000050	< 0.00000050	0.00063	0.00063	< 0.00050
2016	Q4	Reference (FR_UFR1)	177	< 0.010	0.022	< 0.000050	< 0.000050	0.0015	0.0018	13	12	3.7	3.6	0.00027	0.00073	< 0.0000050	0.00000056	0.00057	0.00056	< 0.00050
2016	Q4	Reference (GH_ER2)	163	< 0.010	0.013	< 0.000050	< 0.000050	0.0019	0.0017	11	9.6	3.4	3.3	0.0012	0.0021	< 0.0000050	< 0.0000050	0.00097	0.001	< 0.00050
2017	Q1	Reference (FR_UFR1)	185	<0.01	<0.01	<0.00005	<0.00005	0.0013	0.0014	-	14	-	-	<0.0001	0.00027	<0.000005	<0.0000005	0.00062	0.00062	<0.0005
2017	Q2	Reference (FR_UFR1)	121	0.054	0.13	<0.00005	0.000092	0.0011	0.0012	-	8.7	-	-	0.0012	0.0035	<0.000005	0.0000031	0.00048	0.0005	0.00052
2017	Q2	Reference (GH_ER2)	177	<0.01	0.074	<0.00005	0.000061	0.0019	0.002	-	12	-	-	0.00095	0.0054	<0.000005	0.00000082	0.00094	0.00095	<0.0005
2017	Q2	Reference (CM_MC1)	134	<0.01	0.021	<0.00005	<0.00005	0.0041	0.0042	-	10	-	-	0.00015	0.00057	<0.000005	0.0000011	0.00074	0.0008	<0.0005
2017	Q3	Reference (FR_UFR1)	159	<0.01	0.011	<0.00005	<0.00005	0.0015	0.0015	-	13	-	-	0.00036	0.0011	<0.000005	<0.0000005	0.00064	0.00068	<0.0005
2017	Q3	Reference (GH_ER2)	137	<0.01	0.02	<0.00005	<0.00005	0.0017	0.0015	-	9.6	-	-	0.0021	0.0031	<0.000005	0.0000006	0.00096	0.00098	<0.0005
2017	Q3	Reference (CM_MC1)	138	<0.01	0.033	<0.00005	<0.00005	0.0044	0.0045	-	9.5	-	-	<0.0001	0.001	<0.000005	0.00000067	0.00088	0.00085	<0.0005
2017	Q4	Reference (FR_UFR1)	185	<0.01	<0.01	<0.00005	<0.00005	0.0019	0.0017	-	14	-	-	<0.0001	0.00056	<0.000005	<0.0000005	0.00055	0.00054	<0.0005
2017	Q4	Reference (GH_ER2)	161	<0.01	<0.01	<0.00005	<0.00005	0.0021	0.002	-	11	-	-	0.00061	0.0016	<0.000005	<0.0000005	0.0011	0.0011	<0.0005
2017	Q4	Reference (CM_MC1)	144	<0.01	<0.01	<0.00005	<0.00005	0.0045	0.0046	-	11	-	-	0.00012	0.00035	<0.000005	0.00000059	0.0009	0.00087	<0.0005
2018	Q1	Reference (FR_UFR1)	198	<0.01	<0.01	<0.00005	<0.00005	0.0015	0.0014	15	14	3.8	4.0	<0.0001	0.00024	<0.000005	<0.0000005	0.00058	0.00055	<0.0005
2018	Q1	Reference (GH_ER2)	170	<0.01	<0.01	<0.00005	<0.00005	0.0013	0.0017	11	11	3.6	3.4	0.0013	0.0015	<0.000005	<0.0000005	0.0009	0.0010	<0.0005
2018	Q1	Reference (CM_MC1)	153	<0.01	<0.01	<0.00005	<0.00005	0.0047	0.0048	12	11	3.8	3.2	<0.0001	0.00014	<0.000005	<0.0000005	0.00087	0.00096	<0.0005
2018	Q2	Reference (FR_UFR1)	123	0.014	0.13	<0.00005	0.00013	0.0011	0.0013	9.3	9.5	2.5	2.5	0.00039	0.0076	<0.000005	0.0000026	0.0006	0.00053	<0.0005
2018	Q2	Reference (GH_ER2)	164	<0.01	0.34	<0.00005	0.00017	0.002	0.0023	12	12	3.2	3.3	0.00023	0.012	<0.000005	0.000002	0.00095	0.00096	<0.0005
2018	Q2	Reference (CM_MC1)	125	0.024	0.11	<0.00005	0.000073	0.0037	0.0041	9.2	9.2	2.6	2.6	0.00035	0.0026	<0.000005	0.000002	0.00071	0.00072	<0.0005
2018	Q2	Reference (LC_SLC)	163	<0.01	0.012	<0.00005	<0.00005	0.003	0.0029	13	12	3.1	3.3	<0.0001	0.00073	<0.000005	0.00000064	0.00082	0.00079	<0.0005
2018	Q3	Reference (FR_UFR1)	183	<0.01	<0.01	<0.00005	<0.00005	0.0018	0.0018	14	13	3.8	3.7	0.00031	0.00067	<0.000005	<0.0000005	0.00064	0.00068	<0.0005
2018	Q3	Reference (GH_ER2)	148	<0.01	0.99	<0.00005	0.00084	0.0018	0.0024	10	11	3.0	3.0	<0.0001	0.06	<0.000005	0.00000076	0.0011	0.00087	<0.0005
2018	Q3	Reference (CM_MC1)	156	<0.01	0.011	<0.00005	<0.00005	0.0045	0.0048	12	10	3.2	3.3	0.00015	0.0006	<0.000005	<0.0000005	0.00094	0.0009	<0.0005
2018	Q3	Reference (LC_SLC)	211	<0.01	<0.01	<0.00005	<0.00005	0.0029	0.003	17	15	3.8	4.3	<0.0001	0.00017	<0.000005	<0.0000005	0.0013	0.0012	<0.0005
2018	Q4	Reference (FR_UFR1)	187	<0.01	<0.01	<0.00005	<0.00005	0.0016	0.0017	14	14	3.9	3.8	0.0001	0.00026	<0.000005	<0.0000005	0.00059	0.00061	<0.0005
2018	Q4	Reference (GH_ER2)	167	<0.01	0.037	<0.00005	<0.00005	0.0019	0.002	12	11	3.4	3.4	0.00039	0.0027	<0.000005	<0.0000005	0.001	0.001	<0.0005
2018	Q4	Reference (CM_MC1)	140	<0.01	<0.01	<0.00005	<0.00005	0.0046	0.0045	11	11	2.9	2.9	<0.0001	0.00027	<0.000005	0.00000063	0.00089	0.00093	<0.0005
2018	Q4	Reference (LC_SLC)	191	<0.01	<0.01	<0.00005	<0.00005	0.0033	0.0036	16	16	4.1	3.9	<0.0001	0.00012	<0.000005	<0.0000005	0.0012	0.0013	<0.0005
2019	Q1	Reference (FR_UFR1)	194	<0.01	<0.01	<0.00005	<0.00005	0.0015	0.0016	13.9	14.8	4.68	3.92	<0.0001	0.00027	<0.000005	<0.0000005	0.000536	0.000547	<0.0005
2019	Q1	Reference (GH_ER2)	172	<0.01	<0.01	<0.00005	<0.00005	0.0016	0.0016	11.5	10.8	3.52	3.48	0.00034	0.00065	<0.000005	<0.0000005	0.00109	0.001	<0.0005
2019	Q1	Reference (CM_MC1)	156	<0.01	<0.01	<0.00005	<0.00005	0.0048	0.0043	11.7	10.9	3.95	3.28	0.00014	0.00024	<0.000005	<0.0000005	0.000851	0.000821	<0.0005
2019	Q1	Reference (LC_SLC)	216	<0.01	<0.01	<0.00005	<0.00005	0.0044	0.0048	19	18.2	4.84	4.39	<0.0001	<0.0001	<0.000005	<0.0000005	0.00129	0.00138	<0.0005
2019	Q2	Reference (FR_UFR1)	133	<0.01	0.026	<0.00005	<0.00005	0.0012	0.0013	11	11	3.0	2.7	0.00013	0.0006	<0.000005	0.0000012	0.00051	0.00056	<0.0005
2019	Q2	Reference (GH_ER2)	168	<0.01	0.045	<0.00005	<0.00005	0.0017	0.0019	12	12	3.4	3.4	0.00013	0.0031	<0.000005	<0.0000005	0.001	0.00097	<0.0005
2019	Q2	Reference (CM_MC1)	133	<0.01	0.03	<0.00005	<0.00005	0.004	0.004	9.6	9.9	2.8	2.8	0.00011	0.0012	<0.000005	0.0000008	0.00084	0.00084	<0.0005
2019	Q2	Reference (LC_SLC)	167	<0.01	<0.01	<0.00005	<0.00005	0.0029	0.003	14	14	3.8	3.4	<0.0001	0.00013	<0.000005	<0.0000005	0.001	0.001	<0.0005
2019	Q3	Reference (FR_UFR1)	172	<0.01	<0.01	<0.00005	<0.00005	0.0015	0.0016	13	14	3.5	3.5	0.0003	0.00068	<0.000005	0.00000068	0.00064	0.00066	<0.0005
2019	Q3	Reference (GH_ER2)	154	<0.01	0.014	<0.00005	<0.00005	0.0017	0.0016	11	10.0	3.0	3.1	0.00059	0.0023	<0.000005	<0.0000005	0.00096	0.00095	<0.0005
2019	Q3	Reference (CM_MC1)	156	<0.01	<0.01	<0.00005	<0.00005	0.0048	0.0049	12	11	3.2	3.3	0.00021	0.00078	<0.000005	<0.0000005	0.001	0.00092	<0.0005
2019	Q3	Reference (LC_SLC)	171	<0.01	<0.01	<0.00005	<0.00005	0.0026	0.0029	14	14	3.7	3.5	<0.0001	0.00017	<0.000005	<0.0000005	0.0012	0.0012	<0.0005
2019	Q4	Reference (FR_UFR1)	178	<0.01	<0.01	<0.00005	<0.00005	0.0016	0.0017	13	14	3.8	3.6	<0.0001	0.00047	<0.000005	<0.0000005	0.00052	0.00056	<0.0005
2019	Q4	Reference (GH_ER2)	158	<0.01	0.016	<0.00005	<0.00005	0.0017	0.0018	12	12	3.4	3.2	0.00054	0.0018	<0.000005	<0.0000005	0.00098	0.00098	<0.0005
2019	Q4	Reference (CM_MC1)	142	<0.01	<0.01	<0.00005	<0.00005	0.0041	0.0044	11	10	3.1	3.0	0.0001	0.00023	<0.000005	<0.0000005	0.00083	0.00085	<0.0005
2019	Q4	Reference (LC_SLC)	203	<0.01	<0.01	<0.00005	<0.00005	0.0037	0.0035	16	17	4.2	4.1	<0.0001	0.00069	<0.000005	<0.0000005	0.0013	0.0012	<0.0005
2020	Q1	Reference (FR_UFR1)	179	<0.01	<0.01	<0.00005	<0.00005	0.0017	0.0017	14	14	4.0	3.6	<0.0001	0.0003	<0.000005	<0.0000005	0.00052	0.00055	<0.0005
2020	Q1	Reference (GH_ER2)	162	<0.01	0.021	<0.00005	<0.00005	0.0021	0.0018	11.9	11.7	3.64	3.28	0.00038	0.00166	<0.000005	<0.0000005	0.00101	0.00102	<0.0005
2020	Q1	Reference (CM_MC1)	146	<0.01	<0.01	<0.00005	<0.00005	0.0043	0.0047	11.4	11.4	3.38	3.09	<0.0001	0.00022	<0.000005	<0.0000005	0.000864	0.000883	<0.0005
2020	Q1	Reference (LC_SLC)	228	<0.01	0.016	<0.00005	<0.00005	0.0041	0.0044	19.1	17.3	4.59	4.62	<0.0001	0.00061	<0.000005	<0.0000005	0.00123	0.00121	<0.0005
2020	Q2	Reference (FR_UFR1)	130	<0.01	0.035	<0.00005	<0.00005	0.0011	0.0014	10.3	10	2.88	2.63	0.00023	0.00169	<0.000005	0.0000013	0.000527	0.000522	<0.0005
2020	Q2	Reference (GH_ER2)	155	<0.01	0.064	<0.00005	<0.00005	0.0019	0.0021	10.9	11.8	3.51	3.13	0.00083	0.00381	<0.000005	0.00000091	0.000935	0.000935	<0.0005
2020	Q2	Reference (CM_MC1)	123	<0.01	0.028	<0.00005	<0.00005	0.0038	0.0039	8.97	9.47	2.71	2.57	0.00027	0.00101	<0.000005	0.00000104	0.000607	0.000613	<0.0005
2020	Q2	Reference (LC_SLC)	157	<0.01	<0.01	<0.00005	<0.00005	0.0027	0.0029	12.3	12.3	3.3	3.18	<0.0001	0.00024	<0.000005	0.00000053	0.000753	0.000765	<0.0005
2020	Q3	Reference (FR_UFR1)	191	<0.01	<0.01	<0.00005	<0.00005	0.0019	0.0018	13.8	13.4	3.65	3.85	0.00028	0.00047	<0.000005	<0.0000005	0.00066	0.00068	<0.0005
2020	Q3	Reference (GH_ER2)	145	<0.01	0.034	<0.00005	<0.00005	0.0016	0.0018	10	10.8	2.96	2.93	0.00165	0.00386	<0.000005	<0.0000005	0.000943	0.00102	<0.0005
2020	Q3	Reference (CM_MC1)	162	<0.01	<0.01	<0.00005	<0.00005	0.0052	0.0053	11.9	12.4	3.17	3.39	0.00018	0.00037	<0.000005	<0.0000005	0.0009	0.000963	<0.0005
2020	Q3	Reference (LC_SLC)	184	<0.01	<0.01	<0.00005	0.000077	0.0031	0.0031	13.9	15	3.81	3.72	<0.0001	<0.0001	<0.000005	<0.0000005	0.0012	0.00122	<0.0005
2020	Q4	Reference (FR_UFR1)	183	<0.01	<0.01	<0.00005	<0.00005	0.0016	0.0017	13.3	14.1	4.01	3.69	0.00022	0.00035	<0.000005	<0.0000005	0.000639	0.000664	<0.0005
2020	Q4	Reference (GH_ER2)	163	<0.01	0.056	<0.00005	<0.00005	0.0017	0.0014	10.8	11.8	3.43	3.31	0.00156	0.00396	<0.000005	<0.0000005	0.000928	0.001	<0.0005
2020	Q4	Reference (CM_MC1)	145	<0.01	<0.01	<0.00005	<0.00005	0.0052	0.005	10.4	11.5	3.23	3.04	0.00015	0.0002	<0.000005	<0.0000005	0.000822	0.000923	<0.0005
2020	Q4	Reference (LC_SLC)	193	<0.01	<0.01	<0.00005	<0.00005	0.0034	0.0038	15.4	16.4	4.34	3.9	<0.0001	<0.0001	<0.000005	<0.0000005	0.00126	0.00132	<0.0005
2021	Q1	Reference (FR_UFR1)	197	<0.01	<0.01	<0.00005	<0.00005	0.0017	0.0016	15.4	15.2	3.8	3.98	0.00018	0.00031	<0.000005	<0.0000005	0.000606	0.000589	<0.0005
2021	Q1	Reference (GH_ER2)	170	<0.01	<0.01	<0.00005	<0.00005	0.0016	0.0018	12.2	13	3.61	3.44	0.0014	0.00166	<0.000005	<0.0000005	0.000944	0.00102	<0.0005
2021	Q1	Reference (CM_MC1)	156	<0.01	<0.01	<0.00005	<0.00005	0.0048	0.0048	12	12	3.43	3.31	<0.0001	<0.0001	<0.000005	<0.0000005	0.00087	0.000946	<0.0005
2021	Q1	Reference (LC_SLC)	235	<0.01	<0.01	<0.00005	<0.00005	0.0042	0.0043	19.9	19.5	4.5	4.75	<0.0001	<0.0001	<0.000005	<0.0000005	0.00128	0.00127	<0.0005
2021	Q2	Reference (FR_UFR1)	114	<0.01	0.159	<0.00005	0.000174	<0.001	0.0012	8.5	8.6	2.53	2.31	0.00032	0.0129	<0.000005	0.000003	0.000532	0.000489	<0.0005
2021	Q2	Reference (GH_ER2)	142	<0.01	1.5	<0.00005	0.00126	0.0015	0.0029	9.8	12.5	3.31	2.88	0.00157	0.0901	<0.000005	0.00000963	0.000872	0.000907	<0.0005
2021	Q2	Reference (CM_MC1)	96.3	0.019	0.375	<0.00005	0.00152	0.0027	0.0025	7.08	6.75	1.87	1.99	0.00096	0.0453	<0.000005	0.00000513	0.000488	0.000452	<0.0005
2021	Q2	Reference (LC_SLC)	107	<0.01	0.094	<0.00005	0.000079	0.0012	0.0015	7.59	8.49	2.57	2.17	0.00015	0.00341	<0.000005	0.00000191	0.000427	0.000498	<0.0005
2021	Q3	Reference (FR_UFR1)	177	<0.01	<0.01	<0.00005	<0.00005	0.0019	0.0019	12.9	13.3	3.75	3.59	0.0003	0.00054	<0.000005	<0.0000005	0.000682	0.000673	<0.0005
2021	Q3	Reference (GH_ER2)	143	<0.01	0.114	<0.00005	0.000117	0.0016	0.0018	9.4	9.3	2.95	2.89	0.00129	0.00865	<0.000005	0.00000156	0.00102	0.000946	<0.0005
2021	Q3	Reference (CM_MC1)	148	<0.01	<0.01	<0.00005	<0.00005	0.0053	0.0055	11.1	11.5	3.23	3.1	0.00017	0.00052	<0.000005	0.00000062	0.000932	0.000965	<0.0005
2021	Q3	Reference (LC_SLC)	171	<0.01	<0.01	<0.00005	<0.00005	0.0029	0.0031	14.1	15.2	3.76	3.47	<0.0001	<0.0001	<0.000005	<0.0000005	0.00119	0.00126	<0.0005
2021	Q4	Reference (FR_UFR1)	181	<0.01	<0.01	<0.00005	<0.00005	0.0017	0.0018	13.6	15.4	4.32	3.66	0.0003	0.00046	<0.000005	<0.0000005	0.000703	0.000679	<0.0005
2021	Q4	Reference (GH_ER2)	155	<0.01	0.018	<0.00005	<0.00005	0.0018	0.0018	10.8	11.2	3.56	3.14	0.00123	0.00212	<0.000005	<0.0000005	0.00108	0.00109	<0.0005
2021	Q4	Reference (CM_MC1)	159	<0.01	<0.01	<0.00005	<0.00005	0.0052	0.0048	11.4	11.1	3.47	3.33	0.00012	0.00018	<0.000005	<0.0000005	0.00089	0.000882	<0.0005
2021	Q4	Reference (LC_SLC)	197	<0.01	<0.01	<0.00005	<0.00005	0.0034	0.0038	16.8	15.3	4.42	3.98	<0.0001	<0.0001	<0.000005	<0.0000005	0.00129	0.0013	<0.0005
Tests categorized as no adverse response (2015 - 2021)																				
2015	Q1	GH_FR1	475	<0.010	<0.010	<0.000050	<0.000050	0.016	0.015	48	49	9.9	9.6	0.0017	0.0021	<0.000010	<0.000010	0.00095	0.00098	0.0022
2015	Q1	GH_ERC	191	<0.010	0.036	<0.000050	0.0002	0.0019	0.002	13	13	3.8	3.9	0.00035	0.0026	<0.000010	<0.000010	0.00092	0.00099	<0.00050
2015	Q1	CM_MC2	445	<0.010	0.031	<0.000050	<0.000050	0.011	0.011	44	46	9.7	9.4	0.0046	0.0064	<0.000010	<0.000010	0.001	0.0011	0.0095
2015	Q1	EV_MC2	381	<0.010	0.024	<0.000050	<0.000050	0.015	0.015	35	33	7.5	8.7	0.0024	0.0022	<0.000010	<0.000010	0.00079	0.00078	0.0007
2015	Q1	LC_LCDSSLCC	536	<0.010	<0.010	<0.000050	<0.000050	0.031	0.031	54	53	11	11	0.000074	0.00021	<0.000010	<0.000010	0.0017	0.0017	0.0036
2015	Q2	FR_FRCP1	302	<0.010	0.11	<0.000050	0.00014	0.019	0.018	29	29	6.1	6.1	0.0032	0.012	<0.0000050	<0.0000050	0.0013	0.0013	0.002
2015	Q2	GH_FR1	332	<0.010	0.07	<0.000050	0.000063	0.014	0.014	33	34	6.7	6.7	0.0011	0.0044	<0.0000050	<0.0000050	0.0011	0.0011	0.0019
2015	Q2	GH_ERC	179	<0.010	0.15	<0.000050	0.00011	0.0022	0.0023	12	12	3.8	3.6	0.00072	0.0081	<0.0000050	<0.0000050	0.00095	0.00097	<0.00050
2015	Q2	CM_MC2	248	<0.010	0.3	<0.000050	0.00017	0.0064	0.0067	23	23	5.4	5.2	0.0035	0.011	<0.0000050	0.0000084	0.00076	0.00081	0.0062
2015	Q2	EV_MC2	159	<0.010	0.39	<0.000050	0.00028	0.0054	0.0052	12	13	3.3	3.3	0.0003	0.01	<0.0000050	<0.0000050	0.00059	0.00054	0.00077
2015	Q2	EV_HC1	205	0.01	0.051	0.00005	0.000056	0.0044	0.0042	21	21	5.8	6.2	0.00053	0.0016	0.000005	0.000005	0.0005	0.00048	0.00075
2015	Q2	LC_DCDS	96	0.014	0.14	<0.000050	0.00013	0.0051	0.0051	8.3	8.4	2.1	2.0	0.0008	0.0025	<0.0000050	<0.0000050	0.00078	0.00083	0.00064
2015	Q3	FR_FRCP1	471	<0.010	0.033	<0.000050	<0.000050	0.03	0.031	50	51	9.5	9.5	0.0031	0.0069	<0.0000050	<0.0000050	0.0015	0.0015	0.0041
2015	Q3	GH_FR1	374	<0.010	0.016	<0.000050	<0.000050	0.015	0.015	37	37	7.6	7.6	0.00089	0.0023	<0.0000050	<0.0000050	0.00099	0.0010	0.0016
2015	Q3	GH_ERC	160	<0.010	0.088	<0.000050	0.00007	0.0017	0.002	10	11	3.3	3.2	0.00058	0.0078	<0.0000050	<0.0000050	0.00095	0.001	<0.00050
2015	Q3	CM_MC2	458	<0.010	0.022	<0.000050	<0.000050	0.013	0.014	49	51	9.4	9.6	0.0018	0.0032	<0.0000050	<0.0000050	0.001	0.0011	0.013
2015	Q3	EV_MC2	384	<0.010	0.018	<0.000050	<0.000050	0.022	0.021	36	35	8.1	7.9	0.00067	0.002	<0.0000050	<0.0000050	0.0022	0.0022	0.0047
2015	Q3	EV_HC1	373	<0.010	0.027	<0.000050	<0.000050	0.0069	0.0068	41	41	7.4	7.6	0.0028	0.0051	<0.0000050	<0.0000050	0.00092	0.00092	0.00079
2015	Q3	LC_LCDSSLCC	355	<0.010	<0.010	<0.000050	<0.000050	0.021	0.023	33	34	7.5	7.3	0.0002	0.00054	<0.0000050	<0.0000050	0.0014	0.0015	0.0047
2015	Q4	GH_FR1	436	<0.010	<0.010	<0.000050	<0.000050	0.017	0.017	42	43	8.5	8.8	0.0011	0.0016	<0.0000050	<0.0000050	0.0009	0.00099	0.0012
2015	Q4	GH_ERC	190	<0.010	<0.010	<0.000050	<0.000050	0.002	0.0021	12	13	3.9	3.9	0.00063	0.0013	<0.0000050	<0.0000050	0.00099	0.0011	<0.00050
2015	Q4	CM_MC2	505	<0.010	<0.010	<0.000050	<0.000050	0.011	0.012	51	51	10	11	0.00064	0.0012	<0.0000050	<0.0000050	0.00092	0.00096	0.0059
2015	Q4	EV_MC2	415	<0.010	0.014	<0.000050	<0.000050	0.023	0.022	39	39	8.3	8.5	0.0013	0.0018	< 0.00000050	< 0.00000050	0.002	0.0021	0.0039
2015	Q4	EV_HC1	431	<0.010	<0.010	<0.000050	<0.000050	0.0069	0.0067	49	50	8.6	8.7	0.0018	0.002	< 0.00000050	< 0.00000050	0.00097	0.00098	0.00066
2015	Q4	LC_DCDS	150	<0.050	<0.050	<0.00025	<0.00025	0.0074	0.0072	14	14	2.9	3.1	<0.00050	0.00077	<0.0000050	<0.0000050	0.0011	0.001	<0.0025
2015	Q4	LC_LC5	424	<0.050	<0.050	<0.00025	<0.00025	0.019	0.019	41	43	7.8	8.6	<0.00050	<0.00050	<0.0000050	<0.0000050	0.001	0.0011	<0.0025
2015	Q4	LC_LCDSSLCC	499	<0.050	<0.050	<0.00025	<0.00025	0.036	0.036	51	54	9.9	10	<0.00050	<0.00050	<0.0000050	<0.0000050	0.0017	0.0016	0.0065
2016	Q1	GH_FR1	507	< 0.010	< 0.010	< 0.000050	< 0.000050	0.015	0.014	51	52	9.9	10	0.001	0.0012	< 0.0000050	< 0.0000050	0.00084	0.00086	0.0014
2016	Q1	GH_ERC	231	< 0.010	< 0.010	< 0.000050	< 0.000050	0.0023	0.0025	15	16	4.4	4.7	0.00026	0.00034	< 0.0000050	< 0.0000050	0.00094	0.00092	< 0.00050
2016	Q1	CM_MC2	500	< 0.010	0.011	< 0.000050	< 0.000050	0.014	0.014	50	52	11	11	0.0045	0.0052	< 0.0000050	< 0.0000050	0.0010	0.0010	0.0094
2016	Q1	EV_MC2	395	< 0.010	0.038	< 0.000050	0.000053	0.018	0.018	37	37	7.8	8.1	0.0012	0.0021	< 0.00000050	< 0.00000050	0.0015	0.0015	0.0025
2016	Q1	EV_HC1	443	< 0.010	< 0.020	< 0.000050	< 0.000050	0.0066	0.0065	49	51	8.6	9.0	0.0013	0.0016	< 0.00000050	< 0.00000050	0.00092	0.00092	0.00062

Year	Quarter	Sample ID	Mean Cell Yield (x 104 cells/mL) (Mean)	ACIDITY TO pH 8.3 (As CaCO3)-N-mg/l	ALKALINITY, BICARBONATE (As CaCO3), lab measured.-N-mg/l	ALKALINITY, CARBONATE (As CaCO3), lab measured.-N-mg/l	ALKALINITY, HYDROXIDE (As CaCO3), lab measured.-N-mg/l	ALKALINITY, TOTAL (As CaCO3), lab measured.-N-mg/l	ALUMINUM-D-mg/l	ALUMINUM-T-mg/l	ANTIMONY-D-mg/l	ANTIMONY-T-mg/l	ARSENIC-D-mg/l	ARSENIC-T-mg/l	BARIUM-D-mg/l	BARIUM-T-mg/l
2016	Q1	LC_LCDSSLCC	129.5	< 1.0	193	< 1.0	< 1.0	193	< 0.0030	0.0074	0.0002	0.00025	< 0.00010	0.00013	0.086	0.089
2016	Q2	GH_FR1	100	< 1.0	160	< 1.0	< 1.0	160	< 0.0030	0.09	0.00017	0.00023	0.00011	0.00017	0.079	0.078
2016	Q2	GH_ERC	103.8	< 1.0	146	< 1.0	< 1.0	146	0.0045	0.31	< 0.00010	0.00011	< 0.00010	0.0003	0.051	0.053
2016	Q2	CM_MC2	94	1.1	152	< 1.0	< 1.0	152	0.0076	0.34	0.00014	0.00015	0.00017	0.00029	0.05	0.052
2016	Q2	EV_MC2	111.5	1.4	98	< 1.0	< 1.0	98	0.018	0.42	< 0.00010	0.0002	0.00017	0.00037	0.058	0.063
2016	Q2	EV_HC1	113.5	< 1.0	173	6.0	< 1.0	179	0.0046	0.15	< 0.00010	0.00013	0.00013	0.00024	0.038	0.04
2016	Q2	LC_DCDS	118.5	<1.0	89	<1.0	<1.0	89	0.023	0.19	0.00018	0.00027	0.00028	0.00035	0.084	0.086
2016	Q2	LC_LC5	85.2	<1.0	148	4.8	<1.0	153	<0.0030	0.12	0.00015	0.00024	0.00011	0.00018	0.069	0.071
2016	Q2	LC_LCDSSLCC	91	< 1.0	153	< 1.0	< 1.0	153	< 0.0030	0.029	0.00024	0.00033	0.00012	0.00015	0.037	0.038
2016	Q3	FR_FRCP1	124.5	< 1.0	193	4.8	< 1.0	198	< 0.0030	0.014	0.0002	0.00022	< 0.00010	0.00012	0.071	0.073
2016	Q3	GH_FR1	118	< 1.0	198	< 1.0	< 1.0	198	< 0.0030	0.0079	0.00013	0.00014	< 0.00010	0.00012	0.1	0.1
2016	Q3	GH_ERC	121.3	1.1	144	< 1.0	< 1.0	144	< 0.0030	0.021	< 0.00010	< 0.00010	< 0.00010	0.00011	0.049	0.05
2016	Q3	CM_MC2	107.5	< 1.0	193	8.8	< 1.0	201	< 0.0030	0.0053	0.00019	0.00025	0.00019	0.0002	0.077	0.075
2016	Q3	EV_MC2	120	1.6	204	< 1.0	< 1.0	204	< 0.0030	0.0054	0.00021	0.00022	0.00018	0.00018	0.1	0.1
2016	Q3	EV_HC1	120.5	< 1.0	192	< 1.0	< 1.0	192	0.014	0.073	< 0.00010	< 0.00010	0.00016	0.00021	0.065	0.066
2016	Q3	LC_LCDSSLCC	119.5	1.1	187	< 1.0	< 1.0	187	< 0.0030	0.0047	0.00021	0.00024	< 0.00010	0.00011	0.072	0.066
2016	Q4	FR_FRCP1	141	< 1.0	190	3.4	< 1.0	193	0.0046	0.015	0.00019	0.0002	< 0.00010	0.00018	0.072	0.067
2016	Q4	GH_FR1	158.5	<1	188	<1	<1	188	<0.003	0.012	0.00015	0.00034	<0.0001	0.00014	0.1	0.097
2016	Q4	GH_ERC	156.8	< 1.0	148	< 1.0	< 1.0	148	< 0.0030	0.019	< 0.00010	< 0.00010	< 0.00010	0.00012	0.055	0.051
2016	Q4	CM_MC2	156	< 1.0	165	< 1.0	< 1.0	165	0.0088	0.15	0.00014	0.00016	0.00017	0.00026	0.054	0.057
2016	Q4	EV_MC2	166.3	1.1	122	< 1.0	< 1.0	122	0.023	0.23	< 0.00010	0.00011	0.00019	0.00027	0.074	0.081
2016	Q4	EV_HC1	157.8	< 1.0	190	2.0	< 1.0	192	0.0054	0.076	< 0.00010	0.0001	0.00015	0.00019	0.06	0.06
2016	Q4	LC_DCDS	183.5	<1.0	131	<1.0	<1.0	131	0.027	0.17	0.00021	0.00036	0.00028	0.00042	0.13	0.14
2016	Q4	LC_LC5	186	<1.0	173	3.0	<1.0	176	<0.0030	0.0068	0.00012	0.00013	<0.00010	0.00011	0.089	0.089
2016	Q4	LC_LCDSSLCC	156	< 1.0	174	2.2	< 1.0	176	< 0.0030	0.0056	0.00019	0.00026	< 0.00010	0.0002	0.055	0.053
2017	Q1	FR_FRCP1	169.3	-	-	-	-	251	<0.001	0.005	0.00023	0.00066	<0.0001	0.00013	0.072	0.077
2017	Q1	GH_FR1	139	-	-	-	-	202	<0.003	0.0085	0.00012	0.00011	<0.0001	0.00011	0.12	0.12
2017	Q1	GH_ERC	175.3	-	-	-	-	156	<0.003	0.0065	<0.0001	<0.0001	<0.0001	<0.0001	0.062	0.064
2017	Q1	CM_MC2	171.8	-	-	-	-	211	0.0012	0.0081	0.00032	0.00066	0.00016	0.00021	0.072	0.075
2017	Q1	EV_MC2	216.3	-	-	-	-	176	<0.003	0.022	0.00023	0.00022	0.00012	0.00017	0.12	0.12
2017	Q1	EV_HC1	253.8	-	-	-	-	197	<0.003	0.0097	<0.0001	<0.0001	0.00014	0.00017	0.065	0.066
2017	Q1	LC_LCDSSLCC	211.8	-	-	-	-	196	<0.003	0.0086	0.00021	0.00024	<0.0001	0.0001	0.084	0.084
2017	Q2	FR_FRCP1	145	-	-	-	-	169	0.013	0.36	0.00021	0.00025	0.00013	0.00038	0.076	0.081
2017	Q2	GH_FR1	144	-	-	-	-	194	0.0069	0.71	0.00022	0.00027	0.00015	0.00038	0.081	0.095
2017	Q2	GH_ERC	141.3	-	-	-	-	157	<0.003	0.12	<0.0001	<0.0001	<0.0001	0.00017	0.057	0.063
2017	Q2	CM_MC2	129	-	-	-	-	197	0.0057	0.11	0.00028	0.00025	0.00016	0.00027	0.067	0.063
2017	Q2	CM_MC2	151.8	-	-	-	-	194	0.0047	0.095	0.00028	0.00035	0.00016	0.00027	0.067	0.08
2017	Q2	EV_MC2	139.5	-	-	-	-	143	0.018	0.11	0.0001	0.00012	0.00021	0.00029	0.091	0.091
2017	Q2	EV_HC1	144.3	-	-	-	-	201	0.0078	0.072	<0.0001	0.00011	0.00018	0.00028	0.05	0.051
2017	Q2	LC_DCDS	140.5	2.1	96	<1.0	<1.0	96	0.027	0.1	0.00023	0.00025	0.00035	0.00041	0.097	0.1
2017	Q2	LC_LC5	138.8	<1.0	174	9.2	<1.0	183	0.0065	0.069	0.00012	0.00014	<0.00010	0.00021	0.1	0.093
2017	Q2	LC_LCDSSLCC	134	-	-	-	-	199	0.0011	0.014	0.00028	0.00028	0.00012	0.00015	0.073	0.07
2017	Q3	FR_FRCP1	134.8	-	-	-	-	196	0.0011	0.0082	0.0002	0.00027	<0.0001	0.00012	0.069	0.069
2017	Q3	GH_FR1	155.5	-	-	-	-	191	0.0017	0.007	0.00016	0.00023	<0.0001	0.00012	0.1	0.1
2017	Q3	GH_ERC	156.5	-	-	-	-	140	0.0031	0.042	<0.0001	0.00016	0.00011	0.00015	0.047	0.048
2017	Q3	CM_MC2	131	-	-	-	-	180	0.0019	0.018	0.00031	0.00036	0.00018	0.00024	0.058	0.059
2017	Q3	EV_MC2	157	-	-	-	-	167	<0.003	0.0083	0.00018	0.0002	0.00017	0.00018	0.11	0.098
2017	Q3	EV_HC1	158.3	-	-	-	-	182	<0.003	0.0097	<0.0001	<0.0001	0.0002	0.0002	0.061	0.057
2017	Q3	LC_LCDSSLCC	146.8	-	-	-	-	192	0.0015	0.0031	0.00026	0.00024	<0.0001	0.00012	0.062	0.059
2017	Q4	FR_FRCP1	97.8	-	-	-	-	146	<0.003	<0.003	0.00024	0.00026	<0.0001	0.00012	0.07	0.073
2017	Q4	GH_FR1	116.3	-	-	-	-	160	<0.003	<0.003	0.00015	0.00015	<0.0001	<0.0001	0.11	0.11
2017	Q4	GH_ERC	128.8	-	-	-	-	145	<0.003	0.0045	<0.0001	<0.0001	<0.0001	<0.0001	0.056	0.054
2017	Q4	CM_MC2	105	-	-	-	-	196	<0.003	0.01	0.00027	0.0003	0.00017	0.00018	0.073	0.074
2017	Q4	EV_MC2	107.8	-	-	-	-	137	<0.003	0.011	<0.0001	0.00012	0.00017	0.00018	0.094	0.12
2017	Q4	EV_HC1	109.8	-	-	-	-	171	<0.003	0.004	<0.0001	<0.0001	0.00016	0.00018	0.063	0.063
2017	Q4	LC_DCDS	123	<1.0	142	<1.0	<1.0	142	0.013	0.024	0.00029	0.00032	0.0003	0.00033	0.18	0.18
2017	Q4	LC_LC5	112.8	<1.0	146	<1.0	<1.0	146	<0.0030	<0.0030	0.00012	0.00012	0.00015	0.00014	0.099	0.1
2017	Q4	LC_LCDSSLCC	103.5	-	-	-	-	156	<0.003	0.0038	0.00026	0.00029	0.00014	0.00018	0.074	0.075
2018	Q1	GH_FR1	137.5	<1	197	5.6	<1	203	<0.003	<0.003	0.00011	0.00012	<0.0001	0.00014	0.12	0.12
2018	Q1	GH_ERC	167.8	2.2	154	<1	<1	154	<0.003	<0.003	<0.0001	<0.0001	<0.0001	0.00012	0.054	0.058
2018	Q1	CM_MC2	145	<1	268	13	<1	282	<0.003	0.0037	0.00024	0.00023	0.00018	0.0002	0.08	0.07
2018	Q1	CM_MC3	145.8	<1	214	2.4	<1	216	<0.003	<0.003	0.0001	<0.0001	0.00017	0.00017	0.06	0.051
2018	Q1	EV_MC2	167.3	<1	204	17	<1	221	<0.003	0.004	0.00023	0.00026	<0.0002	0.00016	0.11	0.11
2018	Q1	EV_HC1	154.5	<1	177	21	<1	198	<0.003	<0.003	<0.0001	0.00015	0.00014	0.00016	0.075	0.071
2018	Q1	LC_LCDSSLCC	164.3	<1	193	1.2	<1	194	<0.003	<0.003	0.00023	0.00024	<0.0002	0.00012	0.088	0.083
2018	Q2	GH_FR1	121.5	<1	140	8.6	<1	149	0.0095	0.88	0.0003	0.00037	0.00018	0.00061	0.068	0.082
2018	Q2	GH_ERC	122.8	<1	133	8.6	<1	142	0.0044	0.59	<0.0001	0.0001	0.00012	0.00047	0.059	0.065
2018	Q2	CM_MC2	135.3	<1	156	13	<1	169	0.0051	0.22	0.00021	0.00023	0.00017	0.00029	0.064	0.062
2018	Q2	EV_MC2	155.5	<5.5	118	5.4	<1	123	0.016	0.5	0.00011	0.00016	0.00019	0.00047	0.077	0.087
2018	Q2	EV_HC1	122.3	<1	155	15	<1	170	0.0046	0.13	<0.0001	<0.0001	0.00017	0.00022	0.039	0.038
2018	Q2	LC_DCDS	148.3	<1.0	104	<1.0	<1.0	104	0.018	0.25	0.00051	0.00059	0.00038	0.00064	0.14	0.14
2018	Q2	LC_LC5	157.8	<1.0	150	8.6	<1.0	159	<0.0030	0.39	<0.00010	0.00018	0.00013	0.0004	0.08	0.081
2018	Q2	LC_LCDSSLCC	147.5	<1	155	9.2	<1	164	<0.003	0.039	0.00019	0.00025	0.00014	0.00023	0.047	0.042
2018	Q3	FR_FRCP1	113	<1	202	5.2	<1	207	<0.003	0.026	0.00024	0.00028	<0.0001	0.00011	0.077	0.065
2018	Q3	GH_FR1	108.8	<1	204	<1	<1	204	<0.003	0.0099	0.0002	0.0002	0.00012	0.00013	0.1	0.098
2018	Q3	GH_ERC	108.8	<1	142	<1	<1	142	<0.003	0.03	<0.0001	<0.0001	0.00012	0.00013	0.054	0.051
2018	Q3	CM_MC2	93	<1	187	<1	<1	187	<0.003	0.0052	0.00054	0.00054	0.00018	0.00019	0.066	0.066
2018	Q3	CM_MC3	95.8	<1	163	5.2	<1	168	<0.003	0.0065	0.00026	0.00027	0.00031	0.00028	0.06	0.058
2018	Q3	EV_MC2	106.5	<1	179	6.8	<1	186	<0.003	0.0043	0.00038	0.00039	0.00017	0.00017	0.11	0.1
2018	Q3	EV_HC1	98.5	<1	177	11	<1	187	<0.003	0.011	<0.0001	0.00011	0.0002	0.00022	0.065	0.058
2018	Q3	LC_LCDSSLCC	97	<1	190	9.0	<1	199	<0.003	0.0035	0.00024	0.00026	0.00011	0.00021	0.071	0.077
2018	Q4	FR_FRABCH	92	<1	247	<1	<1	247	<0.003	0.0052	<0.0001	0.00011	<0.0001	<0.0001	0.11	0.11
2018	Q4	GH_FR1	109	<1	197	10	<1	208	<0.003	0.0045	0.00014	0.00015	<0.0001	0.00013	0.11	0.11
2018	Q4	GH_ERC	118.8	<1	149	4.6	<1	154	<0.003	0.15	<0.0001	<0.0001	<0.0001	0.0002	0.056	0.057
2018	Q4	CM_MC2	94.8	<1	190	5.0	<1	195	<0.003	0.012	0.00047	0.0005	0.00024	0.00028	0.068	0.066
2018	Q4	EV_MC2	90.5	<1	156	5.8	<1	162	<0.003	0.0095	0.0002	0.00022	0.00017	0.00024	0.11	0.11
2018	Q4	EV_HC1	109.2	<1	176	9.0	<1	185	<0.003	0.022	<0.0001	<0.0001	0.00017	0.00022	0.068	0.066
2018	Q4	LC_DCDS	100.8	<1.0	156	8.0	<1.0	164	<0.0030	0.0064	0.00054	0.00055	0.00032	0.00033	0.25	0.27
2018	Q4	LC_LC5	101.8	<1.0	181	8.0	<1.0	189	<0.0030	0.0038	0.00011	0.00012	<0.00010	0.00013	0.099	0.1
2018	Q4	LC_LCDSSLCC	87.8	<1	192	6.2	<1	198	<0.003	0.0044	0.00026	0.00026	0.00011	0.00013	0.066	0.074
2019	Q1	FR_FRABCH	71.8	3.8	243	<1	<1	243	<0.003	<0.003	<0.0001	<0.0001	<0.0001	0.0001	0.108	0.113
2019	Q1	GH_FR1	71.5	2	216	<1	<1	216	<0.003	<0.003	0.00013	0.00012	<0.0001	0.00013	0.119	0.123
2019	Q1	GH_ERC	63.5	1.3	154	<1	<1	154	<0.003	<0.003	<0.0001	<0.0001	<0.0001	<0.0001	0.057	0.061
2019	Q1	CM_MC2	77.5	3.4	229	<1	<1	229	<0.003	0.0053	0.00022	0.00023	0.00021	0.00021	0.08	0.078
2019	Q1	EV_MC2	81.5	2.7	188	<1	<1	188	<0.003	<0.003	<0.0001	<0.0001	0.00015	0.00016	0.12	0.11
2019	Q1	EV_HC1	76.8	2.3	197	<1	<1	197	<0.003	0.0066	<0.0001	<0.0001	0.00016	0.00022	0.07	0.069
2019	Q1	LC_DCDS	82.8	1.3	201	<1	<1	201	<0.003	0.0085	0.00046	0.00049	0.00036	0.00035	0.23	0.22
2019	Q1	LC_LC3	79.5	4.0	227	<1	<1	227	<0.003	0.0041	0.00023	0.00026	<0.0001	<0.0001	0.059	0.059
2019	Q1	LC_LC5	76.8	<1	192	<1	<1	192	<0.003	0.004	<0.0001	<0.0001	0.0001	<0.0001	0.1	0.1
2019	Q1	LC_LCDSSLCC	81.5	1.8	198	<1	<1	198	<0.003	<0.003	0.00015	0.00017	0.0001	<0.0001	0.085	0.084
2019	Q2	FR_FRABCH	120.2	<1	223	<1	<1	223	<0.003	0.076	0.00012	0.00019	<0.0001	0.00014	0.094	0.093
2019	Q2	FR_FRCP1	107.5	<1	187	6.8	<1	194	<0.003	0.014	0.00034	0.00037	<0.0001	0.00013	0.069	0.069
2019	Q2	GH_FR1	120.5	<1	206	<1	<1	206	<0.003	0.011	0.0002	0.00019	0.00012	0.00015	0.1	0.1
2019	Q2	GH_ERC	120	<1	149	<1	<1	149	<0.003	0.033	<0.0001	<0.0001	<0.0001	0.00014	0.054	0.055
2019	Q2	CM_MC2	113.5	<1	159	5.2	<1	164	0.0037	0.072	0.00013	0.00013	0.00014	0.00017	0.055	0.056
2019	Q2	EV_MC2	105.2	<1	119	1.2	<1	120	0.0076	0.084	<0.0001	0.0001	0.00018	0.00018	0.083	0.084
2019	Q2	EV_HC1	134	<1	184	8.8	<1	193	<0.003	0.044	0.0001	0.0001	0.00016	0.00017	0.049	0.05
2019	Q2	LC_DCDS	112	<1	115	9.8	<1	125	<0.003	0.019	0.00048	0.00044	0.00032	0.00032	0.16	0.16
2019	Q2	LC_LC3	113.8	<1	198	<1	<1	198	<0.003	0.0033	0.00024	0.00027	<0.0001	0.00013	0.043	0.042
2019	Q2	LC_LC5	104.2	<1	188	<1	<1	188	<0.003	0.022	<0.0001	0.00013	0.0001	0.00012	0.091	0.09
2019	Q2	LC_LCDSSLCC	110.8	<1	179	<1	<1	179	<0.003	<0.003	0.00017	0.0002	<0.0001	0.00011	0.054	0.052
2019	Q3	GH_ERC	56.2	<1	146	<1	<1	146	<0.003	0.0092	<0.0001	<0.0001	0.0001	0.0001	0.049	0.047
2019	Q3	LC_DCDS	58.5	<1	127	6.0	<1	133	<0.003	0.0066	0.00048	0.00051	0.00033	0.00039	0.19	0.22
2019	Q4	FR_FRABCH	103.5	<1	240	<1	<1	240	<0.003	0.036	<0.0001	0.00013	<0.0001	0.00017	0.094	0.092
2019	Q4	FR_FRCP1	103.8	<1	233	4.0	<1	237	<0.003	0.0034	0.00029	0.00034	0.00011	0.00012	0.068	0.071
2019	Q4	GH_FR1	119.5	<1	200	3.0	<1	203	<0.003	0.0054	0.00011	0.00012	<0.0001	0.00011	0.1	0.11
2019	Q4	GH_ERC	124.8	<1	151	<1	<1	151	<0.003	0.0042	<0.0001	<0.0001	<0.0001	0.00011	0.061	0.064
2019	Q4	CM_MC2	111.5	<1	211	6.2	<1	217	<0.003	0.23	0.00019	0.00021	0.00017	0.00028	0.059	0.066
2019	Q4	EV_MC2	106.8	<1	181	3.8	<1	185	<0.003	0.0037	0.00011	0.0001	0.00016	0.00015	0.12	0.11
2019	Q4	EV_HC1	115.8	<1	204	<1	<1	204	<0.003	0.0064	<0.0001	<0.0001	0.00014	0.00015	0.064	0.056
2019	Q4	LC_DCDS	120	<1	149	<1	<1	149	<0.003	0.0036	0.00047	0.00053	0.00033	0.00032	0.23	0.26

Year	Quarter	Sample ID	BERYLLIUM-D-mg/l	BERYLLIUM-T-mg/l	BISMUTH-D-mg/l	BISMUTH-T-mg/l	BORON-D-mg/l	BORON-T-mg/l	BROMIDE-D-mg/l	CADMIUM-D-mg/l	CADMIUM-T-mg/l	CALCIUM-D-mg/l	CALCIUM-T-mg/l	CARBON, DISSOLVED ORGANIC-D-mg/l	CHLORIDE-D-mg/l	CHROMIUM-D-mg/l	CHROMIUM-T-mg/l	COBALT-D-mg/l	COBALT-T-mg/l	CONDUCTIVITY, LAB-N-us/cm	COPPER-D-mg/l	COPPER-T-mg/l	FLUORIDE-D-mg/l	Hardness, Total or Dissolved CaCO3-N-mg/l
2016	Q1	LC_LCDSSLCC	< 0.00010	< 0.00010	< 0.000050	< 0.000050	0.012	0.013	< 0.25	0.000083	0.000076	134	134	< 0.50	17	0.00014	< 0.00020	< 0.00010	< 0.00010	1010	< 0.00050	< 0.00050	0.24	572
2016	Q2	GH_FR1	< 0.00010	< 0.00010	< 0.000050	< 0.000050	< 0.010	< 0.010	< 0.050	0.000025	0.000035	74	71	2.0	0.99	< 0.00010	0.00029	< 0.00010	< 0.00010	573	< 0.00050	< 0.00050	0.18	312
2016	Q2	GH_ERC	< 0.00010	< 0.00010	< 0.000050	< 0.000050	< 0.010	< 0.010	< 0.050	0.000011	0.000035	53	53	1.3	0.79	0.00019	0.00085	< 0.00010	0.00015	342	< 0.00050	0.00065	0.16	185
2016	Q2	CM_MC2	< 0.00010	< 0.00010	< 0.000050	< 0.000050	0.016	0.017	< 0.050	0.000069	0.00011	69	67	1.9	1.5	0.00016	0.00058	0.00077	0.0013	549	< 0.00050	0.00079	0.1	283
2016	Q2	EV_MC2	< 0.00010	< 0.00010	< 0.000050	< 0.000050	< 0.010	< 0.010	< 0.050	0.000038	0.000078	38	37	2.6	1.2	0.00014	0.00076	< 0.00010	0.00027	266	< 0.00050	0.001	0.11	141
2016	Q2	EV_HC1	< 0.00010	< 0.00010	< 0.000050	< 0.000050	< 0.010	< 0.010	< 0.050	0.000027	0.000047	70	72	1.9	0.79	0.00011	0.00031	< 0.00010	< 0.00010	547	< 0.00050	< 0.00050	0.19	306
2016	Q2	LC_DCDS	<0.00010	<0.00010	<0.000050	<0.000050	<0.010	<0.010	<0.050	0.000037	0.000076	25	25	2.6	0.19	0.00011	0.00047	<0.00010	0.00012	192	<0.00050	0.00062	0.098	100
2016	Q2	LC_LC5	<0.00010	<0.00010	<0.000050	<0.000050	<0.010	<0.010	<0.050	0.000022	0.000063	69	71	1.6	1.5	0.00011	0.00038	<0.00010	0.00011	540	<0.00050	<0.00050	0.2	285
2016	Q2	LC_LCDSSLCC	< 0.00010	< 0.00010	< 0.000050	< 0.000050	< 0.010	0.011	< 0.050	0.0002	0.00022	71	72	1.6	2.8	0.00014	0.00021	< 0.00010	< 0.00010	557	< 0.00050	< 0.00050	0.22	293
2016	Q3	FR_FRCP1	< 0.000020	< 0.000020	< 0.000050	< 0.000050	< 0.010	0.011	< 0.25	0.000024	0.000042	101	103	0.99	1.5	< 0.00010	0.00012	< 0.00010	< 0.00010	874	< 0.00050	< 0.00050	0.22	455
2016	Q3	GH_FR1	< 0.000020	< 0.000020	< 0.000050	< 0.000050	< 0.010	< 0.010	< 0.25	0.000015	0.000016	89	89	0.8	1.5	< 0.00010	0.00017	< 0.00010	< 0.00010	732	< 0.00050	< 0.00050	0.2	379
2016	Q3	GH_ERC	< 0.000020	< 0.000020	< 0.000050	< 0.000050	< 0.010	< 0.010	< 0.050	< 0.0000050	0.0000053	46	45	0.58	0.37	0.0002	0.00027	< 0.00010	< 0.00010	317	< 0.00050	< 0.00050	0.18	161
2016	Q3	CM_MC2	< 0.000020	< 0.000020	< 0.000050	< 0.000050	0.028	0.029	< 0.25	0.0000075	0.0000086	101	105	0.99	3.4	0.00011	0.00018	0.00026	0.00034	901	< 0.00050	< 0.00050	0.12	465
2016	Q3	EV_MC2	< 0.000020	< 0.000020	< 0.000050	< 0.000050	0.017	0.018	< 0.25	0.000066	0.000069	106	111	0.83	13	0.00012	0.00015	< 0.00010	< 0.00010	793	< 0.00050	< 0.00050	0.17	435
2016	Q3	EV_HC1	< 0.000020	< 0.000020	< 0.000050	< 0.000050	< 0.010	< 0.010	< 0.050	0.000016	0.000027	78	81	0.95	1.1	0.00016	0.00025	< 0.00010	< 0.00010	652	< 0.00050	< 0.00050	0.23	368
2016	Q3	LC_LCDSSLCC	< 0.000020	< 0.000020	< 0.000050	< 0.000050	0.013	0.012	< 0.25	0.00017	0.00016	98	91	< 0.50	4.7	0.00012	0.00027	< 0.00010	< 0.00010	754	< 0.00050	< 0.00050	0.25	403
2016	Q4	FR_FRCP1	< 0.000020	< 0.000020	< 0.000050	< 0.000050	< 0.010	< 0.010	< 0.25	0.000045	0.000051	104	97	0.9	1.3	< 0.00010	0.00015	< 0.00010	< 0.00010	810	< 0.00050	< 0.00050	0.19	453
2016	Q4	GH_FR1	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.25	0.000017	0.000021	93	94	0.75	1.5	0.0001	0.00019	<0.0001	<0.0001	735	<0.0005	<0.0005	0.16	411
2016	Q4	GH_ERC	< 0.000020	< 0.000020	< 0.000050	< 0.000050	< 0.010	< 0.010	< 0.050	< 0.0000050	< 0.0000050	55	51	< 0.50	0.44	0.0002	0.00035	< 0.00010	< 0.00010	327	< 0.00050	0.00054	0.16	186
2016	Q4	CM_MC2	< 0.000020	< 0.000020	< 0.000050	< 0.000050	0.018	0.02	< 0.050	0.000013	0.000016	79	79	2.3	2.1	0.00017	0.00035	0.00065	0.0011	622	< 0.00050	< 0.00050	0.11	328
2016	Q4	EV_MC2	< 0.000020	< 0.000020	< 0.000050	< 0.000050	< 0.010	< 0.010	< 0.050	0.000025	0.000039	45	48	2.8	2.9	0.00012	0.00045	< 0.00010	0.00013	359	< 0.00050	0.00065	0.12	177
2016	Q4	EV_HC1	< 0.000020	< 0.000020	< 0.000050	< 0.000050	< 0.010	< 0.010	< 0.25	0.000019	0.000024	79	82	1.4	1.3	0.00014	0.00023	< 0.00010	< 0.00010	668	< 0.00050	< 0.00050	0.2	386
2016	Q4	LC_DCDS	<0.000020	0.000024	<0.000050	<0.000050	<0.010	<0.010	<0.050	0.000041	0.00013	35	36	2.1	1.4	<0.00010	0.00043	<0.00010	0.00021	268	<0.00050	0.0011	0.1	139
2016	Q4	LC_LC5	<0.000020	<0.000020	<0.000050	<0.000050	<0.010	<0.010	<0.25	0.000016	0.000038	88	85	0.58	2.5	<0.00010	0.00018	<0.00010	<0.00010	649	<0.00050	<0.00050	0.21	356
2016	Q4	LC_LCDSSLCC	< 0.000020	< 0.000020	< 0.000050	< 0.000050	< 0.010	0.01	< 0.25	0.00014	0.00015	94	83	0.91	6.8	0.0001	0.00019	< 0.00010	< 0.00010	700	< 0.00050	< 0.00050	0.21	384
2017	Q1	FR_FRCP1	<0.00002	<0.00002	<0.00005	<0.00005	0.01	0.011	<0.25	0.000052	0.000062	-	179	1.5	<2.5	<0.0001	0.00078	<0.0001	<0.0001	1430	<0.0002	<0.0005	0.13	841
2017	Q1	GH_FR1	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.25	0.000014	0.000018	-	115	0.57	1.8	<0.0001	0.00014	<0.0001	<0.0001	843	<0.0005	<0.0005	0.14	479
2017	Q1	GH_ERC	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	<0.000005	0.0000071	-	56	<0.5	0.38	0.00026	0.00027	<0.0001	<0.0001	354	<0.0005	<0.0005	0.14	190
2017	Q1	CM_MC2	<0.00002	<0.00002	<0.00005	<0.00005	0.029	0.031	<0.05	0.000038	0.000039	-	128	0.85	3.9	0.00012	0.00021	0.0022	0.0024	999	<0.0002	<0.0005	0.13	529
2017	Q1	EV_MC2	<0.00002	<0.00002	<0.00005	<0.00005	0.012	0.012	<0.05	0.000029	0.000035	-	84	0.8	7.1	0.00013	0.00023	<0.0001	<0.0001	615	<0.0005	<0.0005	0.15	334
2017	Q1	EV_HC1	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.000014	0.000021	-	89	0.72	1.3	0.00015	0.00023	<0.0001	<0.0001	704	<0.0005	<0.0005	0.22	411
2017	Q1	LC_LCDSSLCC	<0.00002	<0.00002	<0.00005	<0.00005	0.013	0.014	<0.25	0.0001	0.000094	-	125	<0.5	13	0.00012	0.00021	<0.0001	<0.0001	954	<0.0005	<0.0005	0.21	552
2017	Q2	FR_FRCP1	<0.00002	0.000031	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.000061	0.00013	-	86	2.1	0.72	0.00011	0.00082	<0.0001	0.00027	725	0.00034	0.0011	0.14	392
2017	Q2	GH_FR1	<0.00002	0.000038	<0.00005	<0.00005	<0.01	<0.01	<0.25	0.000035	0.000083	-	92	3.4	1.7	<0.0001	0.0012	<0.0001	0.00037	735	<0.0005	0.0013	0.13	404
2017	Q2	GH_ERC	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000089	0.000019	-	56	0.79	0.5	0.00023	0.0005	<0.0001	<0.0001	368	<0.0005	<0.0005	0.16	187
2017	Q2	CM_MC2	<0.00002	<0.00002	<0.00005	<0.00005	0.027	0.027	<0.05	0.0000045	0.000072	-	85	1.4	2.5	<0.0001	0.00028	0.005	0.0052	756	<0.0002	0.00068	0.1	383
2017	Q2	CM_MC2	<0.00002	<0.00002	<0.00005	<0.00005	0.032	0.039	<0.05	0.000043	0.00007	-	115	1.4	2.7	0.00013	0.00031	0.0044	0.0056	783	<0.0002	<0.0005	0.12	394
2017	Q2	EV_MC2	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.00003	0.000063	-	48	2.9	4.3	<0.0001	0.00025	0.00011	0.00025	402	0.00031	0.00074	0.099	199
2017	Q2	EV_HC1	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.000025	0.000043	-	71	2.6	0.79	<0.0001	0.00025	<0.0001	<0.0001	630	0.0002	0.00055	0.14	335
2017	Q2	LC_DCDS	<0.000020	<0.000020	<0.000050	<0.000050	<0.010	<0.010	<0.050	0.000049	0.000095	25	27	3.4	0.56	<0.00010	0.00024	<0.00010	0.00016	190	0.00027	0.00063	0.07	97
2017	Q2	LC_LC5	<0.000020	<0.000020	<0.000050	<0.000050	<0.010	<0.010	<0.050	0.000018	0.000047	90	86	1.9	2.7	<0.00010	0.00023	<0.00010	0.00011	698	<0.00020	<0.00050	0.15	375
2017	Q2	LC_LCDSSLCC	<0.00002	<0.00002	<0.00005	<0.00005	0.014	0.014	<0.05	0.00015	0.00017	-	108	1.2	8.0	<0.0001	0.00016	<0.0001	<0.0001	889	<0.0002	<0.0005	0.2	477
2017	Q3	FR_FRCP1	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	0.01	<0.05	0.000044	0.000051	-	100	1.6	0.87	<0.0001	0.00012	<0.0001	<0.0001	857	<0.0002	<0.0005	0.18	447
2017	Q3	GH_FR1	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.000019	0.000019	-	86	1.0	1.1	<0.0001	0.00016	<0.0001	<0.0001	742	<0.0002	<0.0005	0.15	391
2017	Q3	GH_ERC	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000073	0.000013	-	42	0.89	<0.5	0.00015	0.00029	<0.0001	<0.0001	295	<0.0002	<0.0005	0.14	149
2017	Q3	CM_MC2	<0.00002	<0.00002	<0.00005	<0.00005	0.031	0.031	<0.05	0.0000068	0.000017	-	96	0.97	1.0	0.00017	0.00026	0.0029	0.0035	840	<0.0002	<0.0005	0.11	426
2017	Q3	EV_MC2	<0.00002	<0.00002	<0.00005	<0.00005	0.012	0.012	<0.05	0.000031	0.000039	-	78	1.3	4.9	<0.0001	0.00015	<0.0001	<0.0001	531	<0.0005	<0.0005	0.16	350
2017	Q3	EV_HC1	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.000019	0.000022	-	83	0.97	0.81	0.00011	0.00022	<0.0001	<0.0001	610	<0.0005	<0.0005	0.21	416
2017	Q3	LC_LCDSSLCC	<0.00002	<0.00002	<0.00005	<0.00005	0.013	0.013	<0.05	0.00025	0.0002	-	92	1.8	5.5	<0.0001	0.00017	<0.0001	<0.0001	796	0.00021	<0.0005	0.2	397
2017	Q4	FR_FRCP1	<0.00002	<0.00002	<0.00005	<0.00005	0.011	0.011	<0.25	0.000012	0.000051	-	153	0.96	<2.5	<0.0001	<0.0001	<0.0001	<0.0001	1110	<0.0005	<0.0005	0.1	734
2017	Q4	GH_FR1	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.000015	0.000019	-	102	1.6	1.2	<0.0001	0.00015	<0.0001	<0.0001	749	<0.0005	<0.0005	0.13	476
2017	Q4	GH_ERC	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000058	0.0000075	-	48	1.1	<0.5	0.00022	0.00025	<0.0001	<0.0001	303	<0.0005	<0.0005	0.12	174
2017	Q4	CM_MC2	<0.00002	<0.00002	<0.00005	<0.00005	0.036	0.038	0.065	0.0000092	0.000011	-	124	0.97	5.9	<0.0001	0.00017	0.00058	0.00074	952	<0.0005	<0.0005	0.098	540
2017	Q4	EV_MC2	<0.00002	<0.00002	<0.00005	<0.00005	0.014	0.014	<0.05	<0.000005	0.000034	-	87	1.0	6.1	0.00011	0.00019	<0.0001	<0.0001	565	<0.0005	<0.0005	0.12	262
2017	Q4	EV_HC1	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000096	0.000019	-	82	1.0	0.8	<0.0001	0.00018	<0.0001	<0.0001	660	<0.0005	<0.0005	0.17	388
2017	Q4	LC_DCDS	<0.000020	<0.000020	<0.000050	<0.000050	<0.010	<0.010	<0.050	0.000032	0.000055	51	48	2.4	4.1	<0.00010	0.00018	0.00011	0.00013	373	<0.00050	<0.00050	0.073	202
2017	Q4	LC_LC5	<0.000020	<0.000020	<0.000050	<0.000050	<0.010	<0.010	<0.050	0.0000082	0.000025	92	93	1.0	2.9	<0.00010	<0.00030	<0.00010	<0.00010	652	<0.00050	<0.00050	0.16	388
2017	Q4	LC_LCDSSLCC	<0.00002	<0.00002	<0.00005	<0.00005	0.013	0.014	<0.05	0.00015	0.00016	-	111	0.97	8.0	<0.0001	0.00022	<0.0001	<0.0001	777	<0.0005	<0.0005	0.18	471
2018	Q1	GH_FR1	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.25	0.000017	0.000017	116	105	1.2	2.2	<0.0001	0.00011	<0.0001	<0.0001	909	0.00052	<0.0005	0.16	477
2018	Q1	GH_ERC	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	<0.000005	0.0000055	50	48	0.76	0.37	0.00022	0.00027	<0.0001	<0.0001	349	<0.0005	<0.0005	0.16	172
2018	Q1	CM_MC2	<0.00002	<0.00002	<0.00005	<0.00005	0.03	0.033	<0.05	0.000021	0.000021	124	132	1.2	3.2	<0.0001	0.0003	0.00085	0.00087	1060	<0.0005	<0.0005	0.096	559
2018	Q1	CM_MC3	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.000016	0.000015	70	70	0.63	1.5	0.00023	0.0003	<0.0001	<0.0001	524	<0.0005	<0.0005	0.17	261
2018	Q1	EV_MC2	<0.00004	<0.00002	<0.0001	<0.00005	<0.02	0.013	<0.05	0.000027	0.000033	90	90	0.96	4.9	<0.0002	<0.0001	<0.0002	<0.0001	706	<0.0005	<0.0005	0.11	387
2018	Q1	EV_HC1	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.000017	0.000018	93	89	0.82	0.97	0.00016	0.00012	<0.0001	<0.0001	777	<0.0005	<0.0005	0.18	438
2018	Q1	LC_LCDSSLCC	<0.00004	<0.00002	<0.0001	<0.00005	<0.02	0.015	<0.05	0.00011	0.000091	122	129	0.57	7.9	<0.0002	0.00013	<0.0002	<0.0001	1000	<0.0005	<0.0005	0.17	532
2018	Q2	GH_FR1	<0.00002	0.000055	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.000038	0.00014	71	69	4.0	1.5	<0.0001	0.0014	<0.0001	0.00077	599	0.00057	0.0023	0.15	322
2018	Q2	GH_ERC	<0.00002	0.000033	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.000012	0.000082	53	55	2.0	0.74	0.00018	0.0014	<0.0001	0.00029	357	<0.0005	0.0012	0.16	194
2018	Q2	CM_MC2	<0.00002	<0.00002	<0.00005	<0.00005	0.026	0.029	<0.05	0.000059	0.000082	93	85	1.6	4.9	<0.0001	0.00039	0.0033	0.0053	698	<0.0005	0.00067	0.14	385
2018	Q2	EV_MC2	<0.00002	0.000032	<0.00005	<0.00005	<0.0105	<0.011	<0.05	0.000033	0.000095	58	58	4.1	4.7	0.00011	0.00092	<0.0001	0.00041	397	<0.00051	0.0013	0.13	228
2018	Q2	EV_HC1	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.000018	0.00003	67	66	2.5	0.66	<0.0001	0.00025	<0.0001	<0.0001	510	<0.0005	<0.0005	0.19	292
2018	Q2	LC_DCDS	<0.000020	0.000024	<0.000050	<0.000050	<0.010	<0.010	<0.050	0.000074	0.0002	46	44	3.4	3.3	<0.00010	0.0011	0.0004	0.00092	364	<0.00050	0.0015	0.12	182
2018	Q2	LC_LC5	<0.000020	0.000029	<0.000050	<0.000050	<0.010	<0.010	<0.050	0.000027	0.0001	83	80	4.4	1.9	<0.00010	0.00076	<0.00010	0.00035	613	<0.00050	0.0011	0.2	346
2018	Q2	LC_LCDSSLCC	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	0.01	<0.05	0.0002	0.00022	98	87	1.5	3.1	<0.0001	0.00021	<0.0001	0.00018	715	<0.0005	0.00074	0.26	412
2018	Q3	FR_FRCP1	<0.00002	<0.00002	<0.00005	<0.00005	0.011	0.012	0.061	0.00005	0.000073	125	115	1.4	1.2	<0.0001	0.00013	<0.0001	<0.0001	942	<0.0005	<0.0005	0.21	589
2018	Q3	GH_FR1	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.000025	0.000021	101	96	1.2	1.5	0.0001	0.0002	<0.0001	<0.0001	806	<0.0005	<0.0005	0.19	467
2018	Q3	GH_ERC	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000086	0.000014	46	43	1.1	<0.5	0.00023	0.00033	<0.0001	<0.0001	298	<0.0005	<0.0005	0.19	165
2018	Q3	CM_MC2	<0.00002	<0.00002	<0.00005	<0.00005	0.053	0.058	<0.25	<0.000005	0.000016	144	135	1.4	3.4	0.00014	0.00022	0.0058	0.0075	1030	<0.0005	<0.0005	0.17	637
2018	Q3	CM_MC3	<0.00002	<0.00002	<0.00005	<0.00005	0.028	0.028	<0.05	0.000017	0.000019	91	83	1.3	1.6	0.00022	0.00024	0.0016	0.0019	660	<0.0005	<0.0005	0.22	366
2018	Q3	EV_MC2	<0.00002	<0.00002	<0.00005	<0.00005	0.017	0.019	0.058	0.000049	0.000063	103	97	1.2	5.5	0.00012	0.00031	0.00014	0.00019	663	<0.0005	0.00078	0.18	438
2018	Q3	EV_HC1	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.000015	0.000017	84	78	1.4	1.0	0.00013	0.00021	<0.0001	<0.0001	668	<0.0005	<0.0005	0.22	398
2018	Q3	LC_LCDSSLCC	<0.00002	<0.00002	<0.00005	<0.00005	0.013	0.015	<0.05	0.00027	0.00031	108	106	1.3	3.1	0.00016	<0.0003	<0.0001	<0.0001	799	<0.0005	<0.0005	0.25	465
2018	Q4	FR_FRABCH	<0.00002	<0.00002	<0.00005	<0.00005	0.012	0.013	<0.25	0.000033	0.000038	145	143	0.96	<2.5	0.00011	0.00012	<0.0001	<0.0001	1080	<0.0005	<0.0005	0.15	626
2018	Q4	GH_FR1	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.25	0.000015	0.000018	109	110	0.86	<2.5	0.0001	0.00016	<0.0001	<0.0001	876	<0.0005	<0.0005	0.17	490
2018	Q4	GH_ERC	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000051	0.000021	49	51	<0.5	<0.5	0.00022	0.00061	<0.0001	<0.0001	334	<0.0005	<0.0005	0.16	173
2018	Q4	CM_MC2	<0.00002	<0.00002	<0.00005	<0.00005	0.051	0.055	<0.25	0.000031	0.000037	127	128	1.2	4.0	0.00015	0.00018	0.0065	0.007	1000	<0.0005	<0.0005	0.15	542
2018	Q4	EV_MC2	<0.00002	<0.00002	<0.00005	<0.00005	0.014	0.015	0.36	0.00002	0.000028	73	76	1.7	3.6	0.00011	0.00022	<0.0001	<0.0001	585	<0.0005	<0.0005	0.17	315
2018	Q4	EV_HC1	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.25	0.000016	0.000022	82	85	1.4	1.4	0.00019	0.00018	<0.0001	<0.0001	708	<0.0005	<0.0005	0.21	413
2018	Q4	LC_DCDS	<0.000020	<0.000020	<0.000050	<0.000050	<0.010	<0.010	<0.050	0.000039	0.000089	74	76	2.0	9.0	<0.00010	<0.00010	0.00011	0.00021	603	<0.00050	<0.00050	0.1	308
2018	Q4	LC_LC5	<0.000020	<0.000020	<0.000050	<0.000050	<0.010	0.01	<0.050	0.00002	0.000037	91	91	<0.50	2.4	0.00011	0.00017	<0.00010	<0.00010	743	<0.00050	<0.00050	0.22	393
2018	Q4	LC_LCDSSLCC	<0.00002	<0.00002	<0.00005	<0.00005	0.015	0.016	<0.25	0.00017	0.00019	97	101	<0.5	4.8	0.00011	0.00014	<0.0001	<0.0001	811	<0.0005	<0.0005	0.24	433
2019	Q1	FR_FRABCH	<0.00002	<0.00002	<0.00005	<0.00005	0.01	0.011	<0.25	0.0000313	0.0000339	158	156	0.89	<2.5	0.00012	0.00026	0.00022	0.0002	1170	<0.0005	<0.0005	0.14	657
2019	Q1	GH_FR1	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.25	0.0000182	0.0000216	127	129	0.76	<2.5	0.00011	0.00013	<0.0001	<0.0001	977	<0.0005	<0.0005	0.16	548
2019	Q1	GH_ERC	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000077	0.0000065	51	52	<0.5	<0.5	0.00022	0.00028	<0.0001	<0.0001	337	<0.0005	<0.0005	0.15	179
2019	Q1	CM_MC2	<0.00002	<0.00002	<0.00005	<0.00005	0.028	0.028	<0.25	0.000017	0.00002	130	130	0.66	3.8	0.0002	0.00022	0.00052	0.00065	1060	<0.0005	<0.0005	0.12	579
2019	Q1	EV_MC2	<0.00002	<0.00002	<0.00005	<0.00005	0.011	0.011	<0.05	0.00002	0.000024	76	74	1.4	3.6	0.00013	0.00013	<0.0001	<0.0001	600	<0.0005	<0.0005	0.14	321
2019	Q1	EV_HC1	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.000017	0.000017	88	87	0.96	1.3	0.00017	0.00019	<0.0001	<0.0001	757	<0.0005	<0.0005	0.22	425
2019	Q1	LC_DCDS	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.000082	0.000089	74	76	1.5	7.8	<0.0001	<0.0001	<0.0001	0.00011	592	<0.0005	<0.0005	0.097	298
2019	Q1	LC_LC3	<0.00002	<0.00002	<0.00005	<0.00005	0.014	0.015	<0.25	0.000088	0.000093	154	168	0.85	42	0.00012	0.00015	0.0003	0.00033	1390	<0.0005	<0.0005	0.21	746
2019	Q1	LC_LC5	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.000011	0.000017	98	109	0.66	4.7	0.00013	0.00013	<0.0001	<0.0001	812	<0.0005	<0.0005	0.21	427
2019	Q1	LC_LCDSSLCC	<0.00002	<0.00002	<0.00005	<0.00005	0.011	0.012	<0.25	0.000081	0.000081	123	127	0.62	19	0.00012	0.00011	<0.0001	<0.0001	1010	<0.0005	<0.0005	0.21	543
2019	Q2	FR_FRABCH	<0.00002	<0.00002	<0.00005	<0.00005	0.01	0.015	<0.25	0.000038	0.000069	121	140	0.65	<2.5	0.00013	0.00033	0.00023	0.0003	1090	<0.0005	0.001	0.15	568
2019	Q2	FR_FRCP1	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.000043	0.000048	102	109	1.2	1.2	0.00012	0.00016	0.00017	0.00018	917	<0.0005	<0.0005	0.19	478
2019	Q2	GH_FR1	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.000021	0.000025	113	116	1.5	2.0	0.0001	0.00013	0.00011	0.00012	888	<0.0005	<0.0005	0.16	516
2019	Q2	GH_ERC	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.000008	0.000012	49	52	<0.5	0.63	0.00022	0.00032	<0.0001	<0.0001	334	<0.0005	<0.0005	0.16	179
2019	Q2	CM_MC2	<0.00002	<0.00002	<0.00005	<0.00005	0.019	0.019	<0.05	0.00002	0.000027	90	86	2.0	2.3	0.00015	0.00024	0.00056	0.00088	723	<0.0005	<0.0005	0.12	391
2019	Q2	EV_MC2	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.000016	0.000033	46	47	1.7	2.2	<0.0007	0.00025	<0.0001	<0.0001	359	<0.0005	<0.0005	0.12	179
2019	Q2	EV_HC1	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.000017	0.000024	80	84	0.87	1.1	<0.0006	0.00023	<0.0001	<0.0001	693	<0.0005	<0.0005	0.21	368
2019	Q2	LC_DCDS	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.000025	0.000078	58	55	2.7	4.6	<0.0005	0.00014	<0.0001	0.00016	453	<0.0005	<0.0005	0.11	228
2019	Q2	LC_LC3	<0.00002	<0.00002	<0.00005	<0.00005	0.013	0.015	<0.25	0.00016	0.0002	112	128	<0.5	13	0.00016	0.00013	<0.0001	0.00011	958	<0.0005	<0.0005	0.26	521
2019	Q2	LC_LC5	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.000016	0.00003	94	102	0.77	3.8	0.00015	0.00018	<0.0001	0.0001	770	<0.0005	<0.0005	0.24	416
2019	Q2	LC_LCDSSLCC	<0.00002	<0.00002	<0.00005	<0.00005	0.01	0.011	<0.05	0.000079	0.00009	92	100	0.61	9.6	0.00018	0.00029	<0.0001	<0.0001	803	<0.0005	<0.0005	0.25	405
2019	Q3	GH_ERC	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.00001	0.00001	45	45	0.61	<0.5	0.0002	0.00034	<0.0001	<0.0001	297	<0.0005	<0.0005	0.15	163
2019	Q3	LC_DCDS	<0.00002	<0.00002	<0.00005	<0.00005	0.01	0.011	<0.05	0.00005	0.000077	68	74	2.1	6.6	<0.0001	0.00012	0.00012	0.00016	558	<0.0005	0.00052	0.082	273
2019	Q4	FR_FRABCH	<0.00002	<0.00002	<0.00005	<0.00005	0.01	0.012	<0.25	<0.000005	0.000065	125	134	<0.5	<2.5	0.00012	0.00016	0.00014	0.00023	876	<0.0002	0.00052	0.18	548
2019	Q4	FR_FRCP1	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	0.011	<0.25	<0.000005	0.000069	139	165	0.94	<2.5	<0.0001	0.00012	<0.0001	0.00012	1080	<0.0002	<0.0005	0.24	709
2019	Q4	GH_FR1	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.000014	0.000028	106	107	0.55	1.7	0.00013	0.00013	<0.0001	<0.0001	743	<0.0002	0.0011	0.17	474
2019	Q4	GH_ERC	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000054	0.0000076	51	54	<0.5	<0.5	0.00025	0.00026	<0.0001	<0.0001	315	<0.0002	<0.0005	0.17	186
2019	Q4	CM_MC2	<0.00002	<0.00002	<0.00005	<0.00005	0.028	0.031	<0.05	0.000024	0.00004	127	131	0.78	3.3	0.00021	0.00052	0.0014	0.0027	868	<0.0002	<0.0005	0.14	578
2019	Q4	EV_MC2	<0.00002	<0.00002	<0.00005	<0.00005	0.01	0.012	0.061	0.00002	0.000025	74	75	0.75	4.4	0.00012	0.00014	<0.0001	<0.0001	519	<0.0002	<0.0005	0.15	317
2019	Q4	EV_HC1	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000095	0.000017	87	85	<0.5	1.4	0.00015	0.00016	<0.0001	<0.0001	652	<0.0002	<0.0005	0.22	423
2019	Q4	LC_DCDS	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.25	0.00011	0.00013	96	94	1.6	13	0.00023	<0.0001	0.00011	0.00011	665	<0.0002	<0.0005	0.12	386

Year	Quarter	Sample ID	IRON-D-mg/l	IRON-T-mg/l	LEAD-D-mg/l	LEAD-T-mg/l	LITHIUM-D-mg/l	LITHIUM-T-mg/l	MAGNESIUM-D-mg/l	MAGNESIUM-T-mg/l	MAJOR ANION SUM-N-meq/l	MAJOR CATION SUM-N-meq/l	MANGANESE-D-mg/l	MANGANESE-T-mg/l	MERCURY-D-mg/l	MERCURY-T-mg/l	MOLYBDENUM-D-mg/l	MOLYBDENUM-T-mg/l	NICKEL-D-mg/l
2016	Q1	LC_LCDSSLCC	< 0.010	< 0.010	< 0.000050	< 0.000050	0.037	0.038	58	60	12	12	0.0058	0.0064	< 0.0000050	< 0.00000050	0.0016	0.0017	0.0034
2016	Q2	GH_FR1	< 0.010	0.13	< 0.000050	0.000096	0.012	0.012	31	31	6.2	6.3	0.0015	0.0056	< 0.0000050	0.0000025	0.001	0.001	0.0019
2016	Q2	GH_ERC	< 0.010	0.38	< 0.000050	0.00022	0.0021	0.0025	13	13	3.7	3.8	0.0013	0.018	< 0.0000050	0.0000016	0.00091	0.00092	< 0.00050
2016	Q2	CM_MC2	< 0.010	0.39	< 0.000050	0.00021	0.0083	0.0085	27	26	6.0	5.9	0.0062	0.019	< 0.0000050	0.0000011	0.00076	0.00074	0.011
2016	Q2	EV_MC2	0.012	0.46	< 0.000050	0.00039	0.0052	0.0056	12	11	2.8	2.9	0.00014	0.013	0.0000015	0.0000018	0.00064	0.00069	0.0014
2016	Q2	EV_HC1	< 0.010	0.14	< 0.000050	0.000095	0.0064	0.0068	32	33	6.2	6.2	0.00048	0.0037	0.00000062	0.00000077	0.00074	0.00077	0.00097
2016	Q2	LC_DCDS	0.014	0.22	<0.000050	0.00016	0.0052	0.0051	8.9	8.8	2.0	2.1	0.0013	0.0045	<0.0000050	0.0000024	0.00087	0.00088	0.00079
2016	Q2	LC_LC5	<0.010	0.17	<0.000050	0.00012	0.015	0.015	27	28	5.7	5.8	0.00058	0.009	<0.0000050	0.000001	0.001	0.001	0.0016
2016	Q2	LC_LCDSSLCC	< 0.010	0.027	< 0.000050	< 0.000050	0.023	0.024	28	28	5.9	6.0	0.0016	0.0033	< 0.0000050	0.00000069	0.0014	0.0014	0.0045
2016	Q3	FR_FRCP1	< 0.010	0.032	< 0.000050	< 0.000050	0.032	0.032	49	48	10	9.2	0.0045	0.0074	< 0.0000050	< 0.00000050	0.0013	0.0013	0.0049
2016	Q3	GH_FR1	< 0.010	0.016	< 0.000050	< 0.000050	0.017	0.017	38	40	8.2	7.7	0.00092	0.002	< 0.0000050	< 0.00000050	0.0009	0.00097	0.0015
2016	Q3	GH_ERC	< 0.010	0.024	< 0.000050	< 0.000050	0.0024	0.0024	11	11	3.5	3.3	0.00045	0.0019	< 0.0000050	< 0.00000050	0.00091	0.00087	< 0.00050
2016	Q3	CM_MC2	< 0.010	< 0.010	< 0.000050	< 0.000050	0.016	0.017	52	53	10	9.8	0.00052	0.0013	< 0.0000050	< 0.00000050	0.0011	0.0012	0.012
2016	Q3	EV_MC2	< 0.010	0.01	< 0.000050	< 0.000050	0.031	0.033	41	42	9.4	9.0	0.0009	0.0014	< 0.00000050	0.00000085	0.0012	0.0012	0.0022
2016	Q3	EV_HC1	< 0.010	0.063	< 0.000050	0.000076	0.0084	0.0083	42	44	7.6	7.4	0.0054	0.0081	< 0.00000050	0.0000012	0.00092	0.00091	0.00074
2016	Q3	LC_LCDSSLCC	< 0.010	< 0.010	< 0.000050	< 0.000050	0.034	0.032	38	37	8.4	8.3	0.0009	0.0018	< 0.0000050	< 0.00000050	0.0016	0.0015	0.0044
2016	Q4	FR_FRCP1	< 0.010	0.027	< 0.000050	< 0.000050	0.029	0.03	47	45	9.7	9.2	0.0063	0.0083	< 0.0000050	< 0.0000005	0.0012	0.0012	0.0045
2016	Q4	GH_FR1	<0.01	0.022	<0.00005	<0.00005	0.017	0.017	43	44	8.5	8.3	0.00072	0.0017	<0.000005	<0.000005	0.001	0.0011	0.0019
2016	Q4	GH_ERC	< 0.010	0.028	< 0.000050	< 0.000050	0.0026	0.0022	12	12	3.7	3.8	0.00044	0.0027	< 0.0000050	< 0.0000050	0.0011	0.001	< 0.00050
2016	Q4	CM_MC2	< 0.010	0.15	< 0.000050	0.000098	0.01	0.01	32	33	7.2	6.9	0.0062	0.014	< 0.0000050	0.0000012	0.00097	0.00098	0.0073
2016	Q4	EV_MC2	0.023	0.16	< 0.000050	0.00012	0.0064	0.0068	16	17	3.9	3.7	0.001	0.0044	0.0000016	0.0000025	0.0006	0.00065	0.00078
2016	Q4	EV_HC1	< 0.010	0.058	< 0.000050	< 0.000050	0.0077	0.0081	46	46	8.0	7.8	0.0021	0.0033	< 0.0000005	0.00000085	0.00091	0.00093	0.00073
2016	Q4	LC_DCDS	0.014	0.25	<0.000050	0.00033	0.0084	0.0079	13	13	3.1	2.9	0.00047	0.0089	<0.0000050	0.0000057	0.0014	0.0014	0.00077
2016	Q4	LC_LC5	<0.010	<0.010	<0.000050	<0.000050	0.019	0.02	33	38	7.4	7.3	0.00028	0.00083	<0.0000050	<0.00000050	0.0011	0.0011	0.0013
2016	Q4	LC_LCDSSLCC	< 0.010	< 0.010	< 0.000050	< 0.000050	0.027	0.026	36	35	7.9	7.9	0.002	0.0032	< 0.0000050	< 0.0000005	0.0014	0.0015	0.004
2017	Q1	FR_FRCP1	<0.01	0.03	<0.00005	<0.00005	0.056	0.056	-	106	-	-	0.008	0.01	<0.000005	<0.0000005	0.0017	0.0017	0.0097
2017	Q1	GH_FR1	<0.01	0.011	<0.00005	<0.00005	0.016	0.016	-	49	-	-	0.0012	0.0015	<0.000005	<0.0000005	0.00081	0.00084	0.0014
2017	Q1	GH_ERC	<0.01	<0.01	<0.00005	<0.00005	0.0031	0.0035	-	14	-	-	0.00012	0.00032	<0.000005	<0.0000005	0.00099	0.00099	<0.0005
2017	Q1	CM_MC2	<0.01	0.013	<0.00005	<0.00005	0.018	0.017	-	55	-	-	0.011	0.013	<0.000005	<0.0000005	0.0014	0.0015	0.023
2017	Q1	EV_MC2	<0.01	0.029	<0.00005	<0.00005	0.018	0.017	-	32	-	-	0.00068	0.002	<0.0000005	<0.0000005	0.0015	0.0015	0.0021
2017	Q1	EV_HC1	<0.01	0.017	<0.00005	<0.00005	0.0064	0.0065	-	47	-	-	0.0024	0.0027	<0.0000005	<0.0000005	0.00091	0.00093	0.00074
2017	Q1	LC_LCDSSLCC	<0.01	0.025	<0.00005	<0.00005	0.04	0.039	-	58	-	-	0.0016	0.0022	<0.000005	<0.0000005	0.0022	0.0023	0.0039
2017	Q2	FR_FRCP1	0.018	0.49	<0.00005	0.00035	0.032	0.03	-	39	-	-	0.0057	0.022	<0.000005	0.0000038	0.0012	0.0015	0.0041
2017	Q2	GH_FR1	0.013	0.55	<0.00005	0.00043	0.015	0.015	-	44	-	-	0.0032	0.014	<0.000005	0.0000047	0.0012	0.0014	0.0031
2017	Q2	GH_ERC	<0.01	0.13	<0.00005	0.00008	0.0029	0.0032	-	15	-	-	0.00083	0.0062	<0.000005	0.00000073	0.00097	0.0011	<0.0005
2017	Q2	CM_MC2	<0.01	0.16	<0.00005	0.00012	0.015	0.015	-	36	-	-	0.026	0.031	<0.000005	0.0000011	0.0013	0.0013	0.024
2017	Q2	CM_MC2	<0.01	0.11	<0.00005	0.000077	0.017	0.02	-	47	-	-	0.024	0.034	<0.000005	0.0000013	0.0014	0.0017	0.022
2017	Q2	EV_MC2	0.021	0.15	<0.00005	0.00016	0.0082	0.0077	-	17	-	-	0.0019	0.0085	0.0000012	0.0000032	0.00074	0.00066	0.0014
2017	Q2	EV_HC1	<0.01	0.1	<0.00005	0.000076	0.0068	0.0068	-	38	-	-	0.0014	0.0034	0.00000061	0.0000013	0.00082	0.00086	0.001
2017	Q2	LC_DCDS	0.027	0.15	<0.000050	0.00014	0.005	0.0053	8.3	8.6	2.1	2.0	0.0078	0.012	<0.0000050	0.0000041	0.0011	0.0013	0.0014
2017	Q2	LC_LC5	<0.010	0.12	<0.000050	0.000098	0.021	0.02	36	36	8.0	7.6	0.0013	0.0093	<0.0000050	0.0000013	0.0011	0.001	0.0012
2017	Q2	LC_LCDSSLCC	<0.01	0.033	<0.00005	<0.00005	0.048	0.047	-	48	-	-	0.00081	0.0036	<0.000005	0.00000069	0.002	0.002	0.0052
2017	Q3	FR_FRCP1	<0.01	0.022	<0.00005	<0.00005	0.029	0.029	-	54	-	-	0.0054	0.0075	<0.000005	<0.0000005	0.0013	0.0013	0.0045
2017	Q3	GH_FR1	<0.01	0.013	<0.00005	<0.00005	0.019	0.018	-	43	-	-	0.0017	0.0023	<0.000005	0.0000005	0.00094	0.001	0.0025
2017	Q3	GH_ERC	<0.01	0.061	<0.00005	<0.00005	0.0025	0.0024	-	11	-	-	0.0011	0.004	<0.000005	0.0000007	0.00099	0.001	<0.0005
2017	Q3	CM_MC2	<0.01	0.032	<0.00005	<0.00005	0.017	0.016	-	47	-	-	0.0058	0.01	<0.000005	0.0000013	0.0015	0.0015	0.028
2017	Q3	EV_MC2	<0.01	0.012	<0.00005	<0.00005	0.016	0.015	-	31	-	-	0.0018	0.0022	<0.0000005	0.0000008	0.0012	0.0013	0.0019
2017	Q3	EV_HC1	<0.01	0.011	<0.00005	<0.00005	0.0071	0.0066	-	46	-	-	0.0054	0.0057	0.0000006	0.0000012	0.00085	0.00085	0.00078
2017	Q3	LC_LCDSSLCC	<0.01	<0.01	0.000097	<0.00005	0.036	0.036	-	37	-	-	0.00066	0.00087	<0.000005	0.0000005	0.0017	0.0016	0.0061
2017	Q4	FR_FRCP1	0.01	0.027	<0.00005	<0.00005	0.042	0.042	-	90	-	-	0.0073	0.011	<0.000005	<0.0000005	0.0013	0.0013	0.0082
2017	Q4	GH_FR1	<0.01	<0.01	<0.00005	<0.00005	0.018	0.018	-	51	-	-	0.0013	0.0014	<0.000005	<0.0000005	0.00089	0.00092	0.0017
2017	Q4	GH_ERC	<0.01	<0.01	<0.00005	<0.00005	0.0027	0.0025	-	12	-	-	0.00044	0.0011	<0.000005	<0.0000005	0.0011	0.0011	<0.0005
2017	Q4	CM_MC2	<0.01	0.013	<0.00005	<0.00005	0.022	0.023	-	58	-	-	0.002	0.0034	<0.000005	<0.0000005	0.0014	0.0014	0.016
2017	Q4	EV_MC2	<0.01	0.016	<0.00005	<0.00005	0.016	0.016	-	32	-	-	<0.0001	0.002	<0.000005	<0.0000005	0.00085	0.00092	<0.0005
2017	Q4	EV_HC1	<0.01	0.012	<0.00005	<0.00005	0.0065	0.0072	-	44	-	-	<0.0001	0.0057	<0.000005	<0.0000005	0.00089	0.00087	<0.0005
2017	Q4	LC_DCDS	<0.010	0.021	<0.000050	<0.000050	0.008	0.0089	18	18	4.2	4.1	0.00066	0.0029	<0.0000050	0.000001	0.0018	0.0018	0.0011
2017	Q4	LC_LC5	<0.010	<0.010	<0.000050	<0.000050	0.02	0.022	39	40	7.5	7.9	<0.00010	0.00041	<0.0000050	<0.00000050	0.0011	0.0011	0.00095
2017	Q4	LC_LCDSSLCC	<0.01	<0.01	<0.00005	<0.00005	0.037	0.04	-	49	-	-	0.0011	0.0022	<0.000005	<0.0000005	0.0016	0.0016	0.0053
2018	Q1	GH_FR1	<0.01	<0.01	<0.00005	<0.00005	0.016	0.016	45	49	10	9.7	0.00083	0.0012	<0.000025	<0.0000005	0.0011	0.0013	0.0012
2018	Q1	GH_ERC	<0.01	<0.01	<0.00005	<0.00005	0.0025	0.0032	12	13	3.8	3.5	0.00017	0.00027	<0.000000005	<0.0005	0.001	0.0011	<0.0005
2018	Q1	CM_MC2	<0.01	0.011	<0.00005	<0.00005	0.017	0.017	60	60	14	12	0.0046	0.0049	<0.000005	<0.0000005	0.0012	0.0013	0.014
2018	Q1	CM_MC3	<0.01	<0.01	<0.00005	<0.00005	0.0052	0.0052	21	21	6.7	5.5	0.0007	0.00073	<0.000005	<0.0000005	0.00076	0.00078	0.0013
2018	Q1	EV_MC2	<0.02	<0.01	<0.0001	<0.00005	0.019	0.02	37	40	8.4	7.8	<0.0008	0.0012	<0.000005	<0.0000005	0.0014	0.0014	0.0042
2018	Q1	EV_HC1	<0.01	<0.01	<0.00005	<0.00005	0.0066	0.0064	50	52	8.9	8.9	0.0022	0.0028	<0.000005	<0.0000005	0.00097	0.00099	0.00054
2018	Q1	LC_LCDSSLCC	<0.02	<0.01	<0.0001	<0.00005	0.043	0.052	55	57	11	11	0.00031	0.00015	<0.000005	<0.0000005	0.0019	0.0019	0.0043
2018	Q2	GH_FR1	0.019	1.1	<0.00005	0.00084	0.011	0.012	35	34	6.4	6.5	0.00065	0.029	<0.000005	0.0000085	0.0016	0.0017	0.0036
2018	Q2	GH_ERC	<0.01	0.74	<0.00005	0.00048	0.0031	0.0039	15	15	3.7	3.9	0.00015	0.028	<0.000000005	0.0034	0.00096	0.0011	<0.0005
2018	Q2	CM_MC2	<0.01	0.24	<0.00005	0.00016	0.016	0.016	37	35	7.6	8.3	0.016	0.035	<0.000005	0.0000013	0.0013	0.0014	0.021
2018	Q2	EV_MC2	0.019	0.6	<0.00005	0.00067	0.01	0.011	20	20	4.2	4.8	0.001	0.015	<0.000005	0.0053	0.00071	0.00073	0.0015
2018	Q2	EV_HC1	<0.01	0.13	<0.00005	0.000086	0.005	0.0054	30	27	5.7	5.9	0.00065	0.0043	<0.000005	0.0000015	0.00064	0.00067	0.00084
2018	Q2	LC_DCDS	<0.010	0.46	<0.000050	0.00054	0.0094	0.0096	16	15	3.7	3.7	0.014	0.031	<0.0000050	0.0000076	0.0036	0.0036	0.0035
2018	Q2	LC_LC5	<0.010	0.59	<0.000050	0.00043	0.017	0.018	34	32	6.6	7.0	0.00041	0.029	<0.0000050	0.0000038	0.0012	0.0012	0.0016
2018	Q2	LC_LCDSSLCC	<0.01	0.048	<0.00005	0.000077	0.034	0.033	41	37	7.7	8.5	0.0003	0.0035	<0.000005	0.0000013	0.002	0.0018	0.0054
2018	Q3	FR_FRCP1	<0.01	0.06	<0.00005	<0.00005	0.033	0.032	68	61	12	12	0.0047	0.01	<0.000005	<0.0000005	0.0014	0.0013	0.0066
2018	Q3	GH_FR1	<0.01	0.016	<0.00005	<0.00005	0.02	0.02	52	46	9.5	9.5	0.00044	0.0024	<0.000005	<0.0000005	0.0016	0.0016	0.0026
2018	Q3	GH_ERC	<0.01	0.052	<0.00005	<0.00005	0.0024	0.0023	12	10	3.4	3.3	0.00027	0.0033	<0.000000005	<0.0005	0.001	0.0011	<0.0005
2018	Q3	CM_MC2	<0.01	<0.01	<0.00005	<0.00005	0.029	0.031	67	60	13	14	0.0096	0.02	<0.000005	<0.0000005	0.0024	0.0024	0.055
2018	Q3	CM_MC3	<0.01	<0.01	<0.00005	<0.00005	0.015	0.014	34	31	7.8	7.8	0.003	0.0053	<0.000005	<0.0000005	0.0014	0.0014	0.018
2018	Q3	EV_MC2	<0.01	0.07	<0.00005	<0.00005	0.028	0.029	44	39	7.7	9.1	0.0014	0.0026	<0.000005	<0.0000005	0.0018	0.0019	0.0035
2018	Q3	EV_HC1	<0.01	0.022	<0.00005	<0.00005	0.0072	0.0079	46	42	8.0	8.0	0.0091	0.012	<0.000005	<0.0000005	0.00091	0.00098	<0.0005
2018	Q3	LC_LCDSSLCC	<0.01	<0.01	<0.00005	<0.00005	0.038	0.038	47	49	9.2	9.6	0.00021	<0.0005	<0.000005	<0.0005	0.0016	0.0016	0.0069
2018	Q4	FR_FRABCH	<0.01	0.023	<0.00005	<0.00005	0.036	0.036	64	66	13	13	0.0053	0.0063	<0.000005	<0.0000005	0.00069	0.00071	0.00053
2018	Q4	GH_FR1	<0.01	<0.01	<0.00005	<0.00005	0.019	0.019	53	54	11	9.9	0.001	0.0015	<0.000005	<0.0000005	0.0013	0.0014	0.0018
2018	Q4	GH_ERC	<0.01	0.2	<0.00005	0.00014	0.0027	0.003	12	13	3.7	3.5	0.00033	0.013	<0.000000005	<0.0005	0.0011	0.0011	<0.0005
2018	Q4	CM_MC2	<0.01	0.016	<0.00005	<0.00005	0.027	0.028	55	56	12	12	0.023	0.027	<0.000005	<0.0000005	0.0031	0.0032	0.044
2018	Q4	EV_MC2	<0.01	0.016	<0.00005	<0.00005	0.017	0.017	32	33	6.5	6.5	0.00083	0.0016	<0.000005	<0.0000005	0.0014	0.0014	0.0052
2018	Q4	EV_HC1	<0.01	0.031	<0.00005	<0.00005	0.007	0.0071	50	50	7.9	8.4	0.0019	0.0037	<0.000005	<0.0000005	0.00093	0.00095	0.00056
2018	Q4	LC_DCDS	<0.010	<0.010	<0.000050	<0.000050	0.012	0.013	30	30	6.8	6.3	0.00015	0.0058	<0.0000050	0.00000089	0.0038	0.0038	0.0048
2018	Q4	LC_LC5	<0.010	<0.010	<0.000050	<0.000050	0.02	0.022	40	42	8.3	8.0	0.00012	0.00036	<0.0000050	<0.00000050	0.0012	0.0012	0.0011
2018	Q4	LC_LCDSSLCC	<0.01	<0.01	<0.00005	<0.00005	0.037	0.038	46	47	9.5	9.0	<0.0001	0.0005	<0.000005	<0.0005	0.0018	0.0018	0.0051
2019	Q1	FR_FRABCH	<0.01	0.015	<0.00005	<0.00005	0.0301	0.0305	64	68.9	13.4	13.3	0.00431	0.00491	<0.000005	<0.0000005	0.000668	0.000569	<0.0005
2019	Q1	GH_FR1	<0.01	<0.01	<0.00005	<0.00005	0.017	0.0166	56.1	56.2	11.1	11.1	0.00064	0.00116	<0.000005	<0.0000005	0.00121	0.00117	0.00173
2019	Q1	GH_ERC	<0.01	<0.01	<0.00005	<0.00005	0.0029	0.0028	13	13	3.8	3.6	<0.0001	0.00013	<0.000005	<0.0000005	0.001	0.001	<0.0005
2019	Q1	CM_MC2	<0.01	<0.01	<0.00005	<0.00005	0.017	0.016	62	59	12	12	0.0032	0.0041	<0.000005	<0.0000005	0.0021	0.002	0.012
2019	Q1	EV_MC2	<0.01	<0.01	<0.00005	<0.00005	0.011	0.011	32	29	6.7	6.6	0.0012	0.0013	<0.000005	<0.0000005	0.00086	0.00088	0.00072
2019	Q1	EV_HC1	<0.01	0.012	<0.00005	<0.00005	0.0061	0.0063	50	48	8.5	8.6	0.0025	0.003	<0.000005	<0.0000005	0.00099	0.00097	0.00051
2019	Q1	LC_DCDS	<0.01	<0.01	<0.00005	<0.00005	0.011	0.012	28	26	7.1	6.1	0.00069	0.0018	<0.000005	0.00000076	0.0034	0.0033	0.0033
2019	Q1	LC_LC3	<0.01	0.31	<0.00005	<0.00005	0.047	0.051	88	82	17	16	0.062	0.068	<0.000005	<0.0000005	0.0075	0.0074	0.0057
2019	Q1	LC_LC5	<0.01	<0.01	<0.00005	<0.00005	0.018	0.017	44	45	9.1	8.7	0.00016	0.0007	<0.000005	<0.0000005	0.0012	0.044	0.00063
2019	Q1	LC_LCDSSLCC	<0.01	<0.01	<0.00005	<0.00005	0.035	0.036	57	55	12	11	0.0035	0.0039	<0.000005	<0.0000005	0.0033	0.0033	0.0029
2019	Q2	FR_FRABCH	<0.01	0.16	0.0004	0.0019	0.028	0.034	64	67	13	12	0.0039	0.013	<0.000005	<0.0000005	0.00071	0.00081	0.0013
2019	Q2	FR_FRCP1	<0.01	0.024	<0.00005	<0.00005	0.03	0.034	55	55	10	9.7	0.0049	0.0067	<0.000005	<0.0000005	0.0017	0.0019	0.0078
2019	Q2	GH_FR1	<0.01	0.021	<0.00005	<0.00005	0.019	0.019	57	57	10	11	0.00077	0.0021	<0.000005	<0.0000005	0.0018	0.0018	0.0023
2019	Q2	GH_ERC	<0.01	0.041	<0.00005	<0.00005	0.0024	0.0025	14	14	3.8	3.6	0.00015	0.0027	<0.000005	<0.0000005	0.001	0.001	<0.0005
2019	Q2	CM_MC2	<0.01	0.071	<0.00005	<0.00005	0.0099	0.0096	41	40	8.1	8.1	0.0034	0.0081	<0.000005	0.00000088	0.00098	0.00094	0.0079
2019	Q2	EV_MC2	<0.01	0.062	<0.00005	<0.00005	0.0061	0.0067	16	16	3.8	3.7	0.00026	0.0021	<0.000005	0.0000012	0.00068	0.00072	0.00096
2019	Q2	EV_HC1	<0.01	0.056	<0.00005	0.000055	0.0063	0.0072	41	45	7.8	7.5	0.00057	0.0031	<0.000005	<0.0000005	0.00092	0.00096	0.00077
2019	Q2	LC_DCDS	<0.01	0.017	<0.00005	<0.00005	0.01	0.0093	21	22	4.8	4.7	0.00012	0.0046	<0.000005	0.0000012	0.0034	0.0031	0.0037
2019	Q2	LC_LC3	<0.01	0.086	<0.00005	<0.00005	0.037	0.041	58	61	12	11	0.00049	0.02	<0.000005	<0.0000005	0.0032	0.0036	0.0058
2019	Q2	LC_LC5	<0.01	0.04	<0.00005	<0.00005	0.019	0.019	44	44	9.1	8.5	<0.0001	0.0026	<0.000005	<0.0000005	0.0012	0.046	0.00079
2019	Q2	LC_LCDSSLCC	<0.01	0.022	<0.00005	<0.00005	0.028	0.029	43	43	9.2	8.4	<0.0001	0.0041	<0.000005	<0.0000005	0.002	0.0022	0.0029
2019	Q3	GH_ERC	<0.01	0.014	<0.00005	<0.00005	0.0024	0.0023	12	11	3.4	3.3	0.00049	0.0021	<0.000005	<0.0000005	0.0011	0.0011	<0.0005
2019	Q3	LC_DCDS	<0.01	<0.01	<0.00005	<0.00005	0.016	0.015	25	30	5.8	5.6	0.00017	0.0013	<0.000005	0.00000089	0.0037	0.0036	0.0062
2019	Q4	FR_FRABCH	<0.01	0.12	<0.00005	0.00019	0.03	0.034	57	65	12	11	0.00015	0.018	<0.000005	0.0000024	0.00067	0.00063	0.00072
2019	Q4	FR_FRCP1	<0.01	0.023	<0.00005	<0.00005	0.042	0.047	88	95	16	14	0.0017	0.007	<0.000005	<0.0000005	0.0018	0.0019	0.0086
2019	Q4	GH_FR1	<0.01	0.012	<0.00005	<0.00005	0.019	0.019	51	53	9.8	9.6	0.0015	0.0017	<0.000005	<0.0000005	0.0009	0.00089	0.001
2019	Q4	GH_ERC	<0.01	<0.01	<0.00005	<0.00005	0.0031	0.0032	14	14	3.9	3.8	0.00029	0.00052	<0.000005	<0.0000005	0.001	0.0011	<0.0005
2019	Q4	CM_MC2	<0.01	0.2	<0.00005	0.00014	0.017	0.018	63	59	12	12	0.0065	0.021	<0.000005	0.00000081	0.001	0.0011	0.019
2019	Q4	EV_MC2	<0.01	<0.01	<0.00005	<0.00005	0.013	0.014	32	30	6.8	6.5	0.0012	0.0015	<0.000005	<0.0000005	0.00093	0.001	0.0016
2019	Q4	EV_HC1	<0.01	0.017	<0.00005	<0.00005	0.0066	0.0065	50	47	8.6	8.5	0.0057	0.0057	<0.000005	<0.0000005	0.00094	0.001	<0.0005
2019	Q4	LC_DCDS	<0.01	<0.01	<0.00005	<0.00005	0.017	0.016	36	36	8.2	7.9	0.00065	0.0012	<0.000005	0.00000067	0.004	0.0041	0.0058

Year	Quarter	Sample ID	Mean Cell Yield (x 104 cells/mL) (Mean)	ACIDITY TO pH 8.3 (As CaCO3)-N-mg/l	ALKALINITY, BICARBONATE (As CaCO3), lab measured.-N-mg/l	ALKALINITY, CARBONATE (As CaCO3), lab measured.-N-mg/l	ALKALINITY, HYDROXIDE (As CaCO3), lab measured.-N-mg/l	ALKALINITY, TOTAL (As CaCO3), lab measured.-N-mg/l	ALUMINUM-D-mg/l	ALUMINUM-T-mg/l	ANTIMONY-D-mg/l	ANTIMONY-T-mg/l	ARSENIC-D-mg/l	ARSENIC-T-mg/l	BARIUM-D-mg/l	BARIUM-T-mg/l	BERYLLIUM-D-mg/l
2019	Q4	LC_LC3	122.8	1.3	214	<1	<1	214	<0.003	<0.003	0.0003	0.00028	<0.0001	<0.0001	0.057	0.063	<0.00002
2019	Q4	LC_LC5	129.8	<1	208	4.8	<1	212	<0.003	0.0042	0.00011	0.00011	<0.0001	0.00011	0.094	0.087	<0.00002
2019	Q4	LC_LCDSSLCC	104	<1	192	<1	<1	192	<0.003	0.0067	0.00018	0.00019	<0.0001	0.00012	0.066	0.071	<0.00002
2020	Q1	FR_FRABCH	84	3.6	242	<1	<1	242	<0.003	0.0793	<0.0001	<0.0001	<0.0001	0.00012	0.103	0.104	<0.00002
2020	Q1	GH_FR1	86.5	<1	209	<1	<1	209	<0.003	<0.003	<0.0001	<0.0001	<0.0001	<0.0001	0.113	0.103	<0.00002
2020	Q1	GH_ERC	84.5	<1	154	<1	<1	154	0.0039	0.0074	<0.0001	<0.0001	<0.0001	<0.0001	0.0645	0.0593	<0.00002
2020	Q1	CM_MC2	74.5	<1	214	6.4	<1	220	<0.003	0.0099	0.00029	0.0003	0.00017	0.00024	0.0647	0.0634	<0.00002
2020	Q1	EV_MC2	73	<1	179	<1	<1	179	0.0031	0.0051	0.00013	0.00014	0.00017	0.00015	0.13	0.125	<0.00002
2020	Q1	EV_HC1	83.8	<1	198	<1	<1	198	<0.003	0.0044	<0.0001	<0.0001	0.00015	0.00016	0.0673	0.0677	<0.00002
2020	Q1	LC_DCDS	92.5	<1	152	<1	<1	152	<0.003	0.0047	0.00045	0.00047	0.00032	0.00035	0.268	0.264	<0.00002
2020	Q1	LC_LC3	74.8	1.5	226	<1	<1	226	<0.003	<0.003	0.00023	0.00024	<0.0001	<0.0001	0.0634	0.0604	<0.00002
2020	Q1	LC_LC5	82	<1	196	<1	<1	196	<0.003	0.0043	<0.0001	<0.0001	<0.0001	<0.0001	0.102	0.093	<0.00002
2020	Q1	LC_LCDSSLCC	73.5	<1	203	<1	<1	203	<0.003	<0.003	0.00016	0.00017	<0.0001	0.00012	0.0782	0.0786	<0.00002
2020	Q2	FR_FRABCH	128	2.4	183	9.8	<1	193	<0.003	0.0441	0.00022	0.00023	0.00011	0.00013	0.0733	0.063	<0.00002
2020	Q2	FR_FRCP1	122.8	<1	169	10.8	<1	180	<0.003	0.0494	0.00035	0.00033	0.00013	0.00017	0.0557	0.0529	<0.00002
2020	Q2	GH_FR1	98.2	<1	167	7.2	<1	175	0.0036	0.111	0.0002	0.00023	0.00016	0.0002	0.0728	0.0721	<0.00002
2020	Q2	GH_ERC	125	<1	157	<1	<1	157	<0.003	0.142	<0.0001	<0.0001	<0.0001	0.00022	0.0539	0.0582	<0.00002
2020	Q2	CM_MC2	122.8	<1	176	6.4	<1	182	0.0043	0.0639	0.00014	0.00015	0.00015	0.00021	0.0521	0.0578	<0.00002
2020	Q2	EV_MC2	124.5	<1	117	4.8	<1	121	0.0079	0.169	<0.0001	0.00011	0.00018	0.00029	0.0731	0.0758	<0.00002
2020	Q2	EV_HC1	115.5	<1	173	15	<1	188	<0.003	0.035	<0.0001	<0.0001	0.00016	0.00022	0.0396	0.0395	<0.00002
2020	Q2	LC_DCDS	134.2	<1	111	<1	<1	111	0.0047	0.14	0.00038	0.0004	0.00032	0.00044	0.118	0.124	<0.00002
2020	Q2	LC_LC3	120.2	2.5	182	<1	<1	182	<0.003	0.0038	0.00029	0.00031	0.00013	0.00014	0.0291	0.0281	<0.00002
2020	Q2	LC_LC5	124.2	<1	167	9.4	<1	177	<0.003	0.022	0.00014	0.00015	<0.0001	0.00015	0.0766	0.0744	<0.00002
2020	Q2	LC_LCDSSLCC	111.2	<1	168	6.8	<1	175	<0.003	0.0046	0.0002	0.00021	0.00014	0.00014	0.0404	0.0395	<0.00002
2020	Q3	FR_FRABCH	104.8	<1	<1	<1	225	225	<0.003	0.006	0.00014	0.00014	<0.0001	<0.0001	0.087	0.0909	<0.00002
2020	Q3	FR_FRCP1	116.5	<1	<1	<1	211	211	<0.003	0.0035	0.00027	0.00029	0.0001	<0.0001	0.0765	0.0796	<0.00002
2020	Q3	GH_FR1	101.8	<1	198	<1	<1	198	<0.003	0.0398	0.00012	0.00014	<0.0001	0.00028	0.0932	0.104	<0.00002
2020	Q3	GH_ERC	105.8	<1	141	<1	<1	141	<0.003	0.0168	<0.0001	<0.0001	<0.0001	0.00021	0.05	0.0529	<0.00002
2020	Q3	CM_MC2	98.8	<1	<1	<1	231	231	<0.003	0.0058	0.00036	0.0004	0.0002	0.00034	0.0599	0.0601	<0.00002
2020	Q3	EV_HC1	97.5	<1	<1	<1	187	187	<0.003	0.0096	<0.0001	0.0001	0.00019	0.00023	0.0546	0.0565	<0.00002
2020	Q3	LC_LC5	98	<1	179	6	<1	185	<0.003	0.0071	0.00014	0.00014	0.0001	0.00011	0.0967	0.0907	<0.00002
2020	Q3	LC_LCDSSLCC	105	<1	<1	<1	195	195	<0.003	<0.003	0.00024	0.00023	<0.0001	0.00012	0.0631	0.0627	<0.00002
2020	Q4	FR_FRABCH	124	<1	238	9.2	<1	248	<0.003	0.0032	0.0001	<0.0001	<0.0001	0.00017	0.102	0.0957	<0.00002
2020	Q4	FR_FRCP1	112	<1	229	12.6	<1	242	<0.003	0.0056	0.00026	0.00029	0.00013	0.00019	0.0774	0.0736	<0.00002
2020	Q4	GH_FR1	125	<1	204	6.6	<1	211	<0.003	0.346	0.00011	0.00014	<0.0001	0.00033	0.108	0.123	<0.00002
2020	Q4	GH_ERC	135	<1	152	<1	<1	152	0.0049	0.012	<0.0001	<0.0001	<0.0001	<0.0001	0.0558	0.063	<0.00002
2020	Q4	CM_MC2	123	<1	239	4.8	<1	244	<0.003	0.0077	0.00019	0.00018	0.00017	0.00024	0.071	0.0657	<0.00002
2020	Q4	EV_MC2	130	<1	172	8.2	<1	180	<0.003	0.0043	<0.0001	0.00014	0.00015	0.00031	0.115	0.113	<0.00002
2020	Q4	EV_HC1	115	<1	185	10.2	<1	195	<0.003	0.0051	<0.0001	<0.0001	0.00015	0.00023	0.0611	0.0583	<0.00002
2020	Q4	LC_DCDS	112	<1	145	<1	<1	145	<0.003	0.0045	0.00048	0.00051	0.00031	0.00035	0.256	0.265	<0.00002
2020	Q4	LC_LC3	114	<1	216	8.2	<1	224	<0.003	0.0042	0.0003	0.00032	<0.0001	0.00019	0.0563	0.0582	<0.00002
2020	Q4	LC_LC5	121	<1	188	9	<1	197	<0.003	<0.003	<0.0001	<0.0001	<0.0001	0.00016	0.0951	0.0963	<0.00002
2020	Q4	LC_LCDSSLCC	119	0.5	80.1	1.68	120.6	201.6	0.0015	0.0015	0.000216	0.000224	0.00006	0.00011	0.06602	0.06678	0.00001
2021	Q1	GH_FR1	103.2	2.6	214	<1	<1	214	<0.001	0.882	<0.0001	0.0002	<0.0001	0.00084	0.133	0.169	<0.00002
2021	Q1	GH_ERC	111.8	2.1	159	<1	<1	159	0.0011	<0.003	<0.0001	<0.0001	<0.0001	0.00011	0.0611	0.0613	<0.00002
2021	Q1	EV_HC1	91.2	<1	205	<1	<1	205	<0.003	0.0063	<0.0001	<0.0001	0.00015	0.00016	0.0713	0.0712	<0.00002
2021	Q1	LC_LCDSSLCC	86	<1	207	<1	<1	207	<0.003	<0.003	0.00019	0.00021	0.0001	0.00013	0.0908	0.0843	<0.00002
2021	Q2	FR_FRABCH	67.5	<2	159	<1	<1	159	0.0036	0.598	0.00014	0.00016	0.00013	0.00037	0.0501	0.06	<0.00002
2021	Q2	FR_FRCP1	68.8	<2	144	<1	<1	144	0.0034	0.346	0.00015	0.00018	0.00014	0.0003	0.0401	0.0516	<0.00002
2021	Q2	GH_ERC	66.2	<2	144	<1	<1	144	0.0113	1.31	<0.0001	0.00014	0.00013	0.00112	0.0431	0.0733	<0.00002
2021	Q2	CM_MC2	66.2	<2	135	<1	<1	135	0.0086	0.584	0.0001	0.00013	0.00014	0.00057	0.041	0.0489	<0.00002
2021	Q2	EV_MC2	70	<2	102	<1	<1	102	0.0135	5.82	<0.0001	0.00042	0.00022	0.00437	0.0525	0.284	<0.00002
2021	Q2	EV_HC1	60.2	<2	163	<1	<1	163	0.0047	0.506	<0.0001	0.0001	0.00016	0.00045	0.0354	0.0408	<0.00002
2021	Q2	LC_DCDS	69	<2	111	<1	<1	111	0.0133	0.471	0.00076	0.00081	0.0003	0.0005	0.153	0.174	<0.00002
2021	Q2	LC_LCDSSLCC	55	<2	150	<1	<1	150	0.0018	0.0353	0.00016	0.00018	0.00013	0.00014	0.0273	0.0299	<0.00002
2021	Q3	FR_FRABCH	83.8	<2	237	<1	<1	237	<0.001	0.004	0.00012	0.00014	<0.0001	0.00012	0.0946	0.0916	<0.00002
2021	Q3	FR_FRCP1	89.8	<2	205	14.4	<1	219	<0.001	0.0057	0.00028	0.0003	0.00011	0.00015	0.0764	0.0792	<0.00002
2021	Q3	GH_FR1	87	<2	193	11.2	<1	204	<0.001	0.0095	0.00012	0.00012	<0.0001	0.00013	0.106	0.106	<0.00002
2021	Q3	CM_MC2	89	<2	196	<1	<1	196	0.0014	0.0161	0.00022	0.00022	0.00018	0.00021	0.0649	0.0658	<0.00002
2021	Q3	EV_MC2	94.8	<2	165	4.8	<1	170	0.0012	0.0162	0.00011	0.00012	0.00018	0.00023	0.116	0.109	<0.00002
2021	Q3	LC_LC3	80.8	<2	209	10.6	<1	219	<0.001	<0.003	0.00031	0.00036	<0.0001	0.00014	0.0515	0.0554	<0.00002
2021	Q3	LC_LC5	91.2	<2	180	12	<1	192	0.0011	<0.003	0.00012	0.00014	0.0001	0.00012	0.099	0.0956	<0.00002
2021	Q3	LC_LCDSSLCC	85.8	<2	189	9.6	<1	199	0.001	<0.003	0.00022	0.00024	0.0001	0.00012	0.0582	0.062	<0.00002
2021	Q4	FR_FRABCH	73.2	2.4	252	<1	<1	252	0.0011	0.0102	0.00012	0.00016	<0.0001	<0.0001	0.103	0.109	<0.00002
2021	Q4	FR_FRCP1	73	<2	228	16	<1	244	<0.001	0.0046	0.00034	0.00038	0.00011	0.00013	0.083	0.0899	<0.00002
2021	Q4	GH_FR1	71.2	<2	234	5.4	<1	239	<0.001	0.0033	0.00011	0.00011	<0.0001	0.00012	0.121	0.132	<0.00002
2021	Q4	LC_DCDS	74.5	2	155	5	<1	160	0.0023	0.0076	0.00066	0.00066	0.0003	0.00031	0.237	0.237	<0.00002
2021	Q4	LC_LC3	75	<2	250	12.4	<1	263	<0.001	<0.003	0.0003	0.00032	<0.0001	0.0001	0.0592	0.0603	<0.00002
Tests categorized as possible or likely adverse response (2015 - 2020)																	
2015	Q1	FR_FRCP1	64	5.1	337	<1.0	<1.0	337	<0.0030	<0.0060	0.00048	0.00051	<0.00020	0.00022	0.036	0.037	<0.00020
2015	Q1	EV_HC1	27	1.0	131	4.3	1.0	135	0.003	0.009	0.0001	0.0001	0.00013	0.00014	0.041	0.042	0.0001
2015	Q2	LC_LC3	65	1.9	165	2.5	<1.0	168	<0.0030	0.011	0.00029	0.0003	0.00013	0.00015	0.035	0.035	<0.00010
2015	Q2	LC_LC5	72.8	<1.0	159	8.2	<1.0	167	0.0041	0.022	0.00012	0.00014	0.00011	0.00013	0.077	0.079	<0.00010
2015	Q2	LC_LCDSSLCC	69.2	<1.0	144	5.5	<1.0	150	<0.0030	0.016	0.00015	0.00017	0.00011	0.00014	0.041	0.042	<0.00010
2015	Q4	FR_FRCP1	96	<1.0	211	<1.0	<1.0	211	<0.0030	0.0035	0.00025	0.00026	<0.00010	<0.00010	0.08	0.078	<0.00010
2016	Q1	FR_FRCP1	93.5	2.2	254	< 1.0	< 1.0	254	< 0.0030	< 0.0030	0.00027	0.0003	< 0.00010	0.0001	0.075	0.075	< 0.00010
2016	Q2	FR_FRCP1	78.8	< 1.0	147	< 1.0	< 1.0	147	< 0.0030	0.11	0.00018	0.00025	< 0.00010	0.00016	0.065	0.068	< 0.00010
2018	Q1	FR_FRCP1	66.5	<1	223	<1	<1	223	<0.003	0.0033	0.00026	0.00026	<0.0001	<0.0001	0.089	0.074	<0.00002
2018	Q2	FR_FRCP1	94	<1	136	6.8	<1	143	0.0065	0.3	0.00022	0.00024	0.00011	0.00028	0.058	0.065	<0.00002
2018	Q4	FR_FRCP1	7	12	301	<1	<1	301	<0.003	0.017	0.0005	0.0005	<0.0002	<0.0002	0.015	0.018	<0.00004
2019	Q1	FR_FRCP1	9.5	13.8	403	<1	<1	403	<0.003	<0.006	0.00048	0.00045	<0.0002	<0.0002	0.0171	0.0193	<0.00004
2019	Q3	FR_FRABCH	27	1.6	216	5.4	<1	221	<0.003	0.0049	0.00016	0.00018	<0.0001	0.00011	0.082	0.081	<0.00002
2019	Q3	FR_FRCP1	34.5	<1	187	6.0	<1	193	<0.003	0.0047	0.00023	0.00024	0.00012	0.00011	0.064	0.065	<0.00002
2019	Q3	GH_FR1	26	<1	188	6.4	<1	195	<0.003	0.0041	0.00014	0.00015	0.00013	0.0001	0.089	0.086	<0.00002
2019	Q3	CM_MC2	22.8	<1	197	7.0	<1	204	<0.003	0.006	0.00021	0.00021	0.00019	0.00019	0.066	0.066	<0.00002
2019	Q3	EV_MC2	39.2	<1	160	7.6	<1	168	<0.003	0.0066	0.00011	0.00011	0.00019	0.00016	0.11	0.1	<0.00002
2019	Q3	EV_HC1	52.5	<1	184	9.6	<1	194	<0.003	0.0082	<0.0001	<0.0001	0.00018	0.00018	0.059	0.055	<0.00002
2019	Q3	LC_LC3	27	6.2	201	<1	<1	201	<0.003	<0.003	0.00027	0.00028	<0.0001	<0.0001	0.052	0.049	<0.00002
2019	Q3	LC_LC5	26.2	<1	178	4.2	<1	182	<0.003	0.0039	0.00012	0.00012	0.00011	0.0001	0.087	0.083	<0.00002
2019	Q3	LC_LCDSSLCC	29.8	1.5	184	<1	<1	184	<0.003	<0.003	0.00019	0.00019	0.00012	<0.0001	0.057	0.054	<0.00002
2020	Q1	FR_FRCP1	59.5	3	241	<1	<1	241	<0.003	0.0668	0.00027	0.00035	0.00011	0.00018	0.0796	0.093	<0.00002
2020	Q1	FR_FR4	66.2	<1	254	<1	<1	254	<0.003	<0.003	0.00026	0.00028	<0.0001	0.00012	0.079	0.0767	<0.00002
2020	Q3	EV_MC2	82	<1	<1	<1	176	176	<0.003	0.0054	<0.0001	0.00012	0.00018	0.00023	0.108	0.106	<0.00002
2020	Q3	LC_DCDS	85.2	<1	117	<1	<1	117	<0.003	0.0259	0.00055	0.00055	0.00029	0.00036	0.176	0.174	<0.00002
2020	Q3	LC_LC3	83.2	<1	<1	<1	219	219	<0.003	0.0033	0.00033	0.00034	<0.0001	0.00011	0.057	0.055	<0.00002
Tests categorized as possible or likely adverse response (2021)																	
2021	Q1	CM_MC2	76.5	2.9	230	<1	<1	230	<0.001	0.007	0.00014	0.00015	0.00016	0.00016	0.079	0.0731	<0.00002
2021	Q2	LC_LC3	47.2	<2	172	<1	<1	172	<0.001	0.0176	0.00035	0.00037	0.00014	0.00016	0.0244	0.0258	<0.00002
2021	Q4	CM_MC2	59	<2	253	8.6	<1	262	0.0012	0.0447	0.00019	0.00019	0.00016	0.00024	0.0829	0.0855	<0.00002

Year	Quarter	Sample ID	BERYLLIUM-T-mg/l	BISMUTH-D-mg/l	BISMUTH-T-mg/l	BORON-D-mg/l	BORON-T-mg/l	BROMIDE-D-mg/l	CADMIUM-D-mg/l	CADMIUM-T-mg/l	CALCIUM-D-mg/l	CALCIUM-T-mg/l	CARBON, DISSOLVED ORGANIC-D-mg/l	CHLORIDE-D-mg/l	CHROMIUM-D-mg/l	CHROMIUM-T-mg/l	COBALT-D-mg/l	COBALT-T-mg/l	CONDUCTIVITY, LAB-N-us/cm	COPPER-D-mg/l	COPPER-T-mg/l
2019	Q4	LC_LC3	<0.00002	<0.00005	<0.00005	0.016	0.016	<0.25	0.00017	0.00018	142	144	0.56	31	0.00014	0.00015	0.00019	0.00022	1010	0.0003	0.00066
2019	Q4	LC_LC5	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.000015	0.000029	104	94	<0.5	4.8	0.00012	0.00014	<0.0001	<0.0001	684	0.00028	<0.0005
2019	Q4	LC_LCDSSLCC	<0.00002	<0.00005	<0.00005	0.012	0.012	<0.05	0.00011	0.00016	106	110	<0.5	15	0.00016	0.00015	<0.0001	<0.0001	772	0.00068	0.00071
2020	Q1	FR_FRABCH	<0.00002	<0.00005	<0.00005	0.01	0.011	<0.25	0.0000305	0.0000652	133	138	<0.5	<2.5	0.00011	0.00027	0.00015	0.00023	1060	<0.0002	0.0009
2020	Q1	GH_FR1	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000487	0.0000199	104	106	<0.5	1.9	0.00012	0.00011	<0.0001	<0.0001	863	0.00029	<0.0005
2020	Q1	GH_ERC	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000071	0.0000075	50.8	51	0.58	<0.5	0.00027	0.00026	<0.0001	<0.0001	366	<0.0002	<0.0005
2020	Q1	CM_MC2	<0.00002	<0.00005	<0.00005	0.039	0.043	<0.25	0.0000274	0.0000295	140	144	0.66	3.5	0.00015	0.00018	0.00497	0.0053	1140	<0.0002	<0.0005
2020	Q1	EV_MC2	<0.00002	<0.00005	<0.00005	0.011	0.012	<0.05	0.000029	0.0000256	78.1	76.1	0.85	4.03	0.00014	0.00015	<0.0001	<0.0001	587	0.0002	<0.0005
2020	Q1	EV_HC1	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000167	0.0000187	87.2	82	0.9	1.41	0.00014	0.00017	<0.0001	<0.0001	727	0.00022	<0.0005
2020	Q1	LC_DCDS	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.000148	0.000139	104	93.2	1.9	13.2	<0.0001	<0.0001	<0.0001	<0.0001	758	0.00027	<0.0005
2020	Q1	LC_LC3	<0.00002	<0.00005	<0.00005	0.015	0.016	<0.25	0.000128	0.00012	165	151	0.9	44.3	0.00014	0.00015	0.00032	0.00032	1320	0.00036	0.00054
2020	Q1	LC_LC5	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.000143	0.0000727	100	93.5	0.78	5.27	0.00011	0.0002	<0.0001	<0.0001	765	<0.0002	<0.0005
2020	Q1	LC_LCDSSLCC	<0.00002	<0.00005	<0.00005	0.011	0.013	<0.05	0.0000814	0.0000805	130	126	0.67	21.9	0.00014	0.00016	<0.0001	<0.0001	994	0.00021	<0.0005
2020	Q2	FR_FRABCH	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000642	0.0000673	112	106	2.65	1.18	<0.0001	0.00013	0.00018	0.00019	768	0.00024	<0.0005
2020	Q2	FR_FRCP1	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.000104	0.000118	97.9	92.6	1.7	0.66	<0.0001	0.00014	0.00033	0.0004	701	0.00034	<0.0005
2020	Q2	GH_FR1	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000317	0.0000435	75	86.1	3.15	1.36	<0.0001	0.00026	<0.0001	0.00013	580	0.00035	<0.0005
2020	Q2	GH_ERC	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000079	0.0000311	48.9	54.8	1.54	0.65	0.0002	0.00049	<0.0001	<0.0001	305	<0.0002	<0.0005
2020	Q2	CM_MC2	<0.00002	<0.00005	<0.00005	0.019	0.021	<0.05	0.0000542	0.000069	85.3	93.8	1.4	2.72	0.00014	0.00035	0.0019	0.00231	642	<0.0002	<0.0005
2020	Q2	EV_MC2	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.000022	0.0000497	50	44	3.39	2.15	0.00012	0.00037	<0.0001	0.00017	283	0.00045	0.00056
2020	Q2	EV_HC1	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000199	0.0000243	80	74.4	2.31	1.34	0.00011	0.00017	<0.0001	<0.0001	529	0.00026	<0.0005
2020	Q2	LC_DCDS	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000854	0.000159	49.5	52.8	2.97	4.26	<0.0001	0.00034	0.00027	0.00045	379	0.00031	0.00062
2020	Q2	LC_LC3	<0.00002	<0.00005	<0.00005	0.012	0.013	<0.05	0.000306	0.000288	104	106	0.8	10.5	0.00011	0.00012	0.00014	0.00017	723	0.00031	<0.0005
2020	Q2	LC_LC5	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000264	0.0000431	84.5	84.4	1.72	2.58	0.00012	0.00012	<0.0001	<0.0001	575	<0.0002	<0.0005
2020	Q2	LC_LCDSSLCC	<0.00002	<0.00005	<0.00005	0.01	0.011	<0.05	0.00016	0.000163	88.8	86.4	1.2	6.31	0.00012	0.00016	<0.0001	<0.0001	584	0.00022	<0.0005
2020	Q3	FR_FRABCH	<0.00002	<0.00005	<0.00005	0.012	0.011	<0.25	0.0000416	0.0000407	129	124	<0.5	<2.5	<0.0001	0.0001	<0.0001	<0.0001	942	<0.0002	<0.0005
2020	Q3	FR_FRCP1	<0.00002	<0.00005	<0.00005	0.012	0.011	<0.25	0.000101	0.0001	130	119	<0.5	<2.5	0.0001	0.00011	<0.0001	<0.0001	947	0.00021	<0.0005
2020	Q3	GH_FR1	<0.00002	<0.00005	<0.00005	<0.01	0.01	<0.05	0.00002	0.0000413	97.9	101	<0.5	1.47	<0.0001	0.00024	<0.0001	<0.0001	732	0.0002	<0.0005
2020	Q3	GH_ERC	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000056	0.0000132	46.7	49.9	<0.5	<0.5	0.00021	0.00027	<0.0001	<0.0001	296	<0.0002	0.00076
2020	Q3	CM_MC2	<0.00002	<0.00005	<0.00005	0.058	0.062	<0.25	0.0000154	0.0000186	144	141	0.93	2.8	0.00014	0.00016	0.0034	0.0037	1080	<0.0002	<0.0005
2020	Q3	EV_HC1	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000183	0.0000169	80.7	79.7	0.53	0.93	0.00014	0.00018	<0.0001	<0.0001	626	<0.0002	<0.0005
2020	Q3	LC_LC5	<0.00002	<0.00005	<0.00005	0.011	0.01	<0.05	0.0000241	0.0000285	96.1	87.2	0.52	3.31	0.00013	0.00012	<0.0001	<0.0001	667	0.0002	<0.0005
2020	Q3	LC_LCDSSLCC	<0.00002	<0.00005	<0.00005	0.015	0.014	<0.05	0.000157	0.000178	107	101	0.97	10.5	<0.0001	0.00014	<0.0001	<0.0001	777	<0.0002	<0.0005
2020	Q4	FR_FRABCH	<0.00002	<0.00005	<0.00005	0.012	0.013	<0.25	0.0000329	0.000036	147	143	0.62	1.29	0.00013	0.00012	<0.0001	0.0001	979	<0.0002	0.0005
2020	Q4	FR_FRCP1	<0.00002	<0.00005	<0.00005	0.011	0.012	<0.25	0.000128	0.000122	163	153	0.99	1.39	<0.0001	0.00012	<0.0001	<0.0001	1080	<0.0002	<0.0005
2020	Q4	GH_FR1	0.000032	<0.00005	<0.00005	<0.01	0.01	<0.05	0.0000214	0.000105	114	118	0.7	1.69	0.00017	0.0008	<0.0001	0.0003	788	<0.0002	0.00105
2020	Q4	GH_ERC	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000082	0.0000109	49.5	50.1	<0.5	0.32	0.00022	0.00027	<0.0001	<0.0001	292	0.0004	<0.0005
2020	Q4	CM_MC2	<0.00002	<0.00005	<0.00005	0.061	0.065	<0.25	0.0000169	0.0000168	141	134	1.4	3.2	0.00013	0.00017	0.00223	0.0023	1040	0.00022	<0.0005
2020	Q4	EV_MC2	<0.00002	<0.00005	0.000067	0.011	0.013	<0.05	0.0000216	0.0000388	72.4	71.6	1.17	3.52	0.00014	0.00017	<0.0001	<0.0001	511	<0.0002	<0.0005
2020	Q4	EV_HC1	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000112	0.0000173	80.7	82.2	0.88	0.96	0.00017	0.00017	<0.0001	<0.0001	624	<0.0002	<0.0005
2020	Q4	LC_DCDS	<0.00002	<0.00005	<0.00005	<0.01	0.01	<0.25	0.000191	0.000197	127	123	1.46	17.8	<0.0001	<0.0001	0.00031	0.00034	897	<0.0002	<0.0005
2020	Q4	LC_LC3	<0.00002	<0.00005	<0.00005	0.016	0.018	<0.25	0.000219	0.000215	151	159	0.64	32	<0.0001	0.00014	0.0002	0.00022	1190	0.00027	<0.0005
2020	Q4	LC_LC5	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000149	0.0000215	98.2	99.3	1.04	4.12	0.00014	0.00015	<0.0001	<0.0001	749	<0.0002	<0.0005
2020	Q4	LC_LCDSSLCC	0.00001	0.000025	0.000025	0.0144	0.0152	0.025	0.0001404	0.0001594	111.12	108	0.394	12.22	0.000166	0.000128	0.00005	0.00005	801	0.0001	0.00025
2021	Q1	GH_FR1	0.000095	<0.00005	<0.00005	<0.01	0.011	<0.05	0.0000204	0.000369	119	144	<0.5	2	0.00012	0.0019	<0.0001	0.00096	828	<0.0002	0.00273
2021	Q1	GH_ERC	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000064	0.0000106	52.6	58.1	<0.5	0.4	0.00024	0.00026	<0.0001	<0.0001	326	<0.0002	<0.0005
2021	Q1	EV_HC1	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000137	0.0000166	92.4	96.2	<0.5	1.23	0.00023	0.00016	<0.0001	<0.0001	699	<0.0002	<0.0005
2021	Q1	LC_LCDSSLCC	<0.00002	<0.00005	<0.00005	0.013	0.014	<0.25	0.000079	0.0000947	144	149	<0.5	21.5	0.00011	0.00018	<0.0001	<0.0001	1020	<0.0002	<0.0005
2021	Q2	FR_FRABCH	0.000035	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000368	0.00016	71.6	73.5	2.27	0.63	0.00011	0.0011	<0.0001	0.00051	579	0.00032	0.00105
2021	Q2	FR_FRCP1	0.000031	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000348	0.0002	61.9	66.6	2.29	0.4	0.0001	0.00066	<0.0001	0.00068	483	0.00025	0.001
2021	Q2	GH_ERC	0.000122	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000087	0.00023	44	57.9	2.07	0.47	0.00016	0.003	<0.0001	0.00097	290	0.00023	0.00301
2021	Q2	CM_MC2	0.000056	<0.00005	<0.00005	0.023	0.024	<0.05	0.0000385	0.000125	60	58.5	2.92	0.54	0.00017	0.00085	0.00154	0.00295	442	0.00029	0.00124
2021	Q2	EV_MC2	0.00056	<0.00005	0.000108	<0.01	0.014	<0.05	0.000026	0.00168	30.4	59.9	4.4	0.86	0.00012	0.0093	<0.0001	0.0078	228	0.00046	0.0154
2021	Q2	EV_HC1	0.000044	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.000015	0.0000711	52.3	51.8	4.29	0.33	<0.0001	0.00075	<0.0001	0.0003	401	0.00033	0.00115
2021	Q2	LC_DCDS	0.00003	<0.00005	<0.00005	<0.01	0.011	<0.05	0.0000444	0.000266	56.3	56.5	3.21	3.87	<0.0001	0.00091	0.00039	0.00078	455	0.00036	0.0013
2021	Q2	LC_LCDSSLCC	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.00011	0.000156	55.7	61.1	2.65	2.68	<0.0001	0.00015	<0.0001	0.00015	466	0.00029	<0.0005
2021	Q3	FR_FRABCH	<0.00002	<0.00005	<0.00005	0.014	0.014	<0.25	0.0000437	0.0000414	139	140	2.42	2.03	<0.0001	0.00013	<0.0001	<0.0001	1050	0.00177	0.00166
2021	Q3	FR_FRCP1	<0.00002	<0.00005	<0.00005	0.014	0.014	<0.25	0.000126	0.000133	130	125	2.36	4.46	<0.0001	0.00012	0.00011	0.00011	1000	<0.0002	<0.0005
2021	Q3	GH_FR1	<0.00002	<0.00005	<0.00005	0.011	<0.01	<0.05	0.0000252	0.000022	105	92.2	2.34	1.75	0.00013	0.00015	<0.0001	<0.0001	793	0.00146	0.002
2021	Q3	CM_MC2	<0.00002	<0.00005	<0.00005	0.045	0.047	<0.05	0.0000154	0.0000206	111	110	1.13	1.4	0.00015	0.00026	0.00089	0.00098	918	<0.0002	<0.0005
2021	Q3	EV_MC2	<0.00002	<0.00005	<0.00005	0.014	0.014	<0.05	0.0000281	0.0000276	70.2	61.1	3.16	3.3	0.00012	0.00018	<0.0001	0.00011	509	0.00023	<0.0005
2021	Q3	LC_LC3	<0.00002	<0.00005	<0.00005	0.019	0.02	<0.25	0.00035	0.000344	116	124	0.7	70.5	0.0001	0.00013	<0.0001	0.00011	985	0.00047	0.00054
2021	Q3	LC_LC5	<0.00002	<0.00005	<0.00005	0.012	0.011	<0.05	0.0000306	0.0000382	93	93.6	3.49	3.84	0.00012	0.00013	<0.0001	<0.0001	726	<0.0002	<0.0005
2021	Q3	LC_LCDSSLCC	<0.00002	<0.00005	<0.00005	0.015	0.015	<0.05	0.000182	0.000181	94.8	98.3	0.64	10.2	0.00012	0.00013	<0.0001	<0.0001	786	0.00023	<0.0005
2021	Q4	FR_FRABCH	<0.00002	<0.00005	<0.00005	0.013	0.013	<0.25	0.0000413	0.0000486	148	154	0.74	1.58	0.00012	0.00013	<0.0001	<0.0001	1100	<0.0002	<0.0005
2021	Q4	FR_FRCP1	<0.00002	<0.00005	<0.00005	0.011	0.012	<0.25	0.000166	0.000168	147	156	0.83	2.18	<0.0001	<0.0001	0.00011	0.00012	1180	<0.0002	<0.0005
2021	Q4	GH_FR1	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000172	0.0000222	109	115	0.52	1.56	0.00016	0.00022	<0.0001	<0.0001	857	<0.0002	<0.0005
2021	Q4	LC_DCDS	<0.00002	<0.00005	<0.00005	0.01	0.011	<0.25	0.000279	0.000297	143	146	2.2	17.5	<0.0001	<0.0001	<0.0001	0.0001	1140	0.00024	<0.0005
2021	Q4	LC_LC3	<0.00002	<0.00005	<0.00005	0.02	0.022	<0.25	0.00024	0.000262	132	144	0.94	20.9	0.00013	0.00011	0.00016	0.00017	1100	0.0003	<0.0005
Tests categorized as possible or likely adverse response (2015 - 2020)																					
2015	Q1	FR_FRCP1	<0.00020	<0.0010	<0.0010	<0.020	<0.020	<1.0	<0.000020	0.000053	331	337	1.4	2.6	<0.00020	<0.00020	<0.00020	<0.00020	2680	<0.00050	<0.0010
2015	Q1	EV_HC1	0.0001	0.0005	0.0005	0.01	0.01	0.05	0.000017	0.000016	60	60	0.82	1.5	0.00014	0.00018	0.0001	0.0001	453	0.0005	0.0005
2015	Q2	LC_LC3	<0.00010	<0.000050	<0.000050	0.012	0.012	<0.10	0.00035	0.00038	93	93	0.74	1.9	0.00017	0.00019	0.0001	0.00011	760	<0.00050	<0.00050
2015	Q2	LC_LC5	<0.00010	<0.000050	<0.000050	<0.010	<0.010	<0.050	0.000035	0.000034	73	75	1.2	1.5	0.00016	0.00021	<0.00010	<0.00010	576	<0.00050	<0.00050
2015	Q2	LC_LCDSSLCC	<0.00010	<0.000050	<0.000050	<0.010	<0.010	<0.050	0.00014	0.00014	67	68	1.2	1.4	0.00014	0.00019	<0.00010	<0.00010	535	<0.00050	<0.00050
2015	Q4	FR_FRCP1	<0.00010	<0.000050	<0.000050	0.011	0.016	<0.25	0.00004	0.000055	131	130	0.65	2.2	<0.00010	0.00027	<0.00010	<0.00010	1030	<0.00050	<0.00050
2016	Q1	FR_FRCP1	< 0.00010	< 0.000050	< 0.000050	0.01	0.011	< 0.50	0.000036	0.000048	221	221	0.8	3.5	< 0.00010	< 0.00010	< 0.00010	< 0.00010	1720	< 0.00050	< 0.00050
2016	Q2	FR_FRCP1	< 0.00010	< 0.000050	< 0.000050	< 0.010	< 0.010	< 0.050	0.000031	0.000052	71	73	2.0	0.51	0.0001	0.00027	< 0.00010	0.00011	555	< 0.00050	0.00054
2018	Q1	FR_FRCP1	<0.00002	<0.00005	<0.00005	0.011	0.011	<0.05	0.00007	0.000072	196	195	1.0	2.3	<0.0001	<0.0001	0.00013	0.00013	1580	<0.0005	<0.0005
2018	Q2	FR_FRCP1	0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0001	0.00017	72	79	2.1	0.6	<0.0001	0.00054	<0.0001	0.00039	618	<0.0005	0.0011
2018	Q4	FR_FRCP1	<0.00004	<0.0001	<0.0001	<0.02	<0.02	<0.25	<0.00001	0.000018	409	422	2.3	6.5	<0.0002	<0.0002	<0.0002	<0.0002	3370	<0.0005	<0.001
2019	Q1	FR_FRCP1	<0.00004	<0.0001	<0.0001	<0.02	<0.02	<0.5	<0.00001	<0.00001	440	433	1.96	6.6	<0.0002	<0.0002	<0.0002	<0.0002	3460	<0.0005	<0.001
2019	Q3	FR_FRABCH	<0.00002	<0.00005	<0.00005	0.011	0.012	<0.05	0.000041	0.000036	108	116	0.84	1.1	0.00014	0.00023	0.00011	0.00011	855	<0.0005	0.00075
2019	Q3	FR_FRCP1	<0.00002	<0.00005	<0.00005	<0.01	0.011	<0.05	0.000042	0.000042	91	103	0.92	0.71	<0.0001	0.00017	<0.0001	<0.0001	708	<0.0005	<0.0005
2019	Q3	GH_FR1	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.000021	0.000023	90	89	0.97	1.1	0.00011	0.00042	<0.0001	<0.0001	705	<0.0005	<0.0005
2019	Q3	CM_MC2	<0.00002	<0.00005	<0.00005	0.028	0.027	<0.05	0.000013	0.000016	121	124	0.95	2.1	0.00016	0.00019	0.00053	0.00067	931	<0.0005	<0.0005
2019	Q3	EV_MC2	<0.00002	<0.00005	<0.00005	0.012	0.012	<0.05	0.000023	0.000027	68	63	1.4	2.7	0.00013	0.00018	<0.0001	<0.0001	509	<0.0005	<0.0005
2019	Q3	EV_HC1	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.000011	0.000018	77	73	1.1	0.98	0.00013	0.0002	<0.0001	<0.0001	662	<0.0005	<0.0005
2019	Q3	LC_LC3	<0.00002	<0.00005	<0.00005	0.016	0.015	<0.05	0.0003	0.00035	110	107	0.55	17	<0.0001	0.00017	0.00012	0.00013	901	<0.0005	<0.0005
2019	Q3	LC_LC5	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.000019	0.000035	81	81	0.92	2.6	0.00011	0.00021	<0.0001	<0.0001	635	<0.0005	<0.0005
2019	Q3	LC_LCDSSLCC	<0.00002	<0.00005	<0.00005	0.012	0.012	<0.05	0.00015	0.00019	88	87	0.69	8.5	0.00013	0.00018	<0.0001	<0.0001	703	<0.0005	<0.0005
2020	Q1	FR_FRCP1	<0.00002	<0.00005	<0.00005	0.011	0.012	<0.25	0.0000624	0.000139	159	174	2.38	2.5	0.00014	0.00083	0.00011	0.00021	1290	0.00143	0.00199
2020	Q1	FR_FR4	<0.00002	<0.00005	<0.00005	<0.01	0.011	<0.25	0.0000623	0.0000712	177	177	0.82	2.9	<0.0001	0.00014	0.00011	0.00011	1350	0.00021	<0.0005
2020	Q3	EV_MC2	<0.00002	<0.00005	<0.00005	0.014	0.015	<0.05	0.0000263	0.0000319	75.2	72.9	0.87	3.28	0.00012	0.00016	<0.0001	<0.0001	543	0.00026	<0.0005
2020	Q3	LC_DCDS	<0.00002	<0.00005	<0.00005	0.01	0.012	<0.25	0.0000851	0.000101	85.5	91.9	2.85	12.2	<0.0001	<0.0001	0.00027	0.00034	729	0.0003	<0.0005
2020	Q3	LC_LC3	<0.00002	<0.00005	<0.00005	0.018	0.019	<0.25	0.000313	0.000314	133	132	1.73	21.2	0.00012	0.00013	0.00015	0.00017	1020	0.00027	<0.0005
Tests categorized as possible or likely adverse response (2021)																					
2021	Q1	CM_MC2	<0.00002	<0.00005	<0.00005	0.03	0.034	<0.25	0.0000208	0.0000227	131	143	<0.5	2.28	0.00014	0.00016	0.00052	0.00059	1030	<0.0002	<0.0005
2021	Q2	LC_LC3	<0.00002	<0.00005	<0.00005	0.013	0.014	<0.05	0.000294	0.000342	78.9	82.6	1.02	5.34	<0.0001	0.00011	0.00016	0.00022	716	0.00045	0.00064
2021	Q4	CM_MC2	<0.00002	<0.00005	<0.00005	0.038	0.038	<0.25	0.0000196	0.0000244	155	145	2.46	1.64	0.00017	0.00015	0.00022	0.00048	1200	<0.0002	<0.0005

Year	Quarter	Sample ID	FLUORIDE-D-mg/l	Hardness, Total or Dissolved CaCO3-N-mg/l	IRON-D-mg/l	IRON-T-mg/l	LEAD-D-mg/l	LEAD-T-mg/l	LITHIUM-D-mg/l	LITHIUM-T-mg/l	MAGNESIUM-D-mg/l	MAGNESIUM-T-mg/l	MAJOR ANION SUM-N-meq/l	MAJOR CATION SUM-N-meq/l	MANGANESE-D-mg/l	MANGANESE-T-mg/l	MERCURY-D-mg/l	MERCURY-T-mg/l	MOLYBDENUM-D-mg/l	MOLYBDENUM-T-mg/l	NICKEL-D-mg/l
2019	Q4	LC_LC3	0.24	663	<0.01	0.11	<0.00005	<0.00005	0.049	0.05	75	74	15	14	0.044	0.048	<0.000005	<0.0000005	0.0057	0.0058	0.007
2019	Q4	LC_LC5	0.24	425	<0.01	0.011	<0.00005	<0.00005	0.021	0.02	40	45	9.0	8.7	0.00033	0.0022	<0.000005	<0.0000005	0.0013	0.039	0.0008
2019	Q4	LC_LCDSSLCC	0.24	482	<0.01	0.058	<0.00005	<0.00005	0.032	0.033	53	49	10	10	0.0046	0.012	<0.000005	<0.0000005	0.003	0.0028	0.0037
2020	Q1	FR_FRABCH	0.14	597	0.019	0.188	<0.00005	0.000181	0.0326	0.033	64.2	63.8	13.3	12.1	0.0127	0.0178	<0.000005	0.00000245	0.000612	0.000574	0.00053
2020	Q1	GH_FR1	0.141	470	<0.01	<0.01	<0.00005	<0.00005	0.0185	0.0181	50.9	51	10.3	9.54	0.00081	0.00083	<0.000005	<0.0000005	0.000875	0.000858	0.00094
2020	Q1	GH_ERC	0.137	187	<0.01	<0.01	<0.00005	<0.00005	0.0036	0.0033	14.6	14.5	4.15	3.8	0.00016	0.00037	<0.000005	<0.0000005	0.000933	0.000946	<0.0005
2020	Q1	CM_MC2	0.13	613	<0.01	0.014	<0.00005	<0.00005	0.0238	0.0265	64.1	65.4	14.6	13.1	0.0205	0.0223	<0.000005	<0.0000005	0.00157	0.0016	0.0428
2020	Q1	EV_MC2	0.123	326	0.011	0.016	<0.00005	<0.00005	0.0137	0.0163	31.7	29.9	6.84	6.72	0.00098	0.00144	<0.000005	<0.0000005	0.00105	0.00116	0.00205
2020	Q1	EV_HC1	0.179	422	<0.01	0.013	<0.00005	<0.00005	0.0062	0.0069	49.6	46.1	8.72	8.53	0.00437	0.00506	<0.000005	0.00000053	0.000905	0.000906	<0.0005
2020	Q1	LC_DCDS	0.083	420	<0.01	<0.01	<0.00005	<0.00005	0.0136	0.0152	39	35.1	8.12	8.55	0.00072	0.00118	<0.000005	0.00000082	0.0039	0.00388	0.00452
2020	Q1	LC_LC3	0.17	784	<0.01	0.204	<0.00005	<0.00005	0.0538	0.0505	90.3	81.1	17	16.4	0.0737	0.0784	<0.000005	<0.0000005	0.00721	0.00724	0.00793
2020	Q1	LC_LC5	0.167	435	<0.01	<0.01	<0.00005	<0.00005	0.0171	0.019	44.8	41.1	9.12	8.87	0.00012	0.00046	<0.000005	<0.0000005	0.00118	0.00115	0.00059
2020	Q1	LC_LCDSSLCC	0.172	571	<0.01	0.011	<0.00005	<0.00005	0.0344	0.0384	59.8	54.9	12	11.8	0.0036	0.00506	<0.000005	<0.0000005	0.00346	0.00361	0.00318
2020	Q2	FR_FRABCH	0.149	496	<0.01	0.071	<0.00005	0.000062	0.0284	0.0264	52.5	48.2	9.69	10	0.00633	0.00789	<0.000005	0.00000153	0.00153	0.00152	0.00579
2020	Q2	FR_FRCP1	0.161	436	<0.01	0.054	<0.00005	0.000058	0.0273	0.0249	46.5	44.3	8.84	8.82	0.00479	0.00841	<0.000005	0.00000089	0.00233	0.00231	0.0102
2020	Q2	GH_FR1	0.136	336	<0.01	0.115	<0.00005	0.000085	0.015	0.0156	36.2	39	7.3	6.83	0.00187	0.00516	<0.000005	0.00000174	0.00122	0.00125	0.00304
2020	Q2	GH_ERC	0.13	178	<0.01	0.175	<0.00005	0.000141	0.003	0.0033	13.5	14.3	3.98	3.62	0.00058	0.00969	<0.000005	0.00000079	0.000904	0.000916	<0.0005
2020	Q2	CM_MC2	0.109	364	<0.01	0.066	<0.00005	0.000058	0.0118	0.0128	36.8	41	8.23	7.7	0.0115	0.017	<0.000005	0.00000078	0.000792	0.000851	0.0137
2020	Q2	EV_MC2	0.127	196	<0.01	0.149	<0.00005	0.00013	0.006	0.0064	17.4	15.2	3.57	4.05	0.00114	0.00555	<0.000005	0.00000246	0.000627	0.000647	0.00142
2020	Q2	EV_HC1	0.062	380	<0.01	0.035	<0.00005	<0.00005	0.006	0.0066	43.7	37.8	6.88	7.67	0.00191	0.00287	<0.000005	0.00000097	0.000762	0.00082	0.0008
2020	Q2	LC_DCDS	0.101	202	<0.01	0.127	<0.00005	0.000128	0.0101	0.0112	19.1	20.5	4.56	4.14	0.00519	0.0126	<0.000005	0.00000222	0.00272	0.00267	0.00737
2020	Q2	LC_LC3	0.188	460	<0.01	0.025	<0.00005	<0.00005	0.036	0.0355	48.8	47.5	8.97	9.52	0.0141	0.015	<0.000005	<0.0000005	0.00244	0.00257	0.00744
2020	Q2	LC_LC5	0.163	362	<0.01	0.045	<0.00005	0.000053	0.0185	0.018	36.6	35.6	7.14	7.37	0.00114	0.006	<0.000005	0.00000082	0.00125	0.0012	0.00185
2020	Q2	LC_LCDSSLCC	0.193	375	<0.01	0.028	<0.00005	<0.00005	0.0283	0.0251	37.1	35.2	7.25	7.74	0.00418	0.00728	<0.000005	<0.0000005	0.00176	0.00175	0.00422
2020	Q3	FR_FRABCH	0.17	587	<0.01	0.016	<0.00005	<0.00005	0.0319	0.0311	64.7	59.1	11.4	11.9	0.00515	0.0051	<0.000005	0.00000059	0.00117	0.00112	0.00154
2020	Q3	FR_FRCP1	0.2	597	<0.01	0.014	<0.00005	<0.00005	0.0343	0.0329	66	64.9	11.6	12.1	0.00373	0.00433	<0.000005	<0.0000005	0.00264	0.00253	0.00569
2020	Q3	GH_FR1	0.171	428	<0.01	0.065	<0.00005	0.000078	0.0206	0.0204	44.6	48.6	8.66	8.68	0.00194	0.00474	<0.000005	0.00000206	0.00116	0.00113	0.00111
2020	Q3	GH_ERC	0.168	165	<0.01	0.023	<0.00005	<0.00005	0.0026	0.0026	11.7	12.3	3.36	3.33	0.00126	0.00307	<0.000005	<0.0000005	0.00104	0.00105	<0.0005
2020	Q3	CM_MC2	0.17	639	<0.01	0.015	<0.00005	<0.00005	0.0344	0.0346	67.6	70.6	13.4	14.2	0.00948	0.0122	<0.000005	<0.0000005	0.00155	0.00164	0.0438
2020	Q3	EV_HC1	0.212	379	<0.01	0.016	<0.00005	<0.00005	0.0065	0.0076	43	40	7.26	7.65	0.00528	0.00564	<0.000005	<0.0000005	0.000896	0.000967	0.00064
2020	Q3	LC_LC5	0.202	395	<0.01	<0.01	<0.00005	<0.00005	0.0237	0.0205	37.7	38.7	7.84	8.07	0.00037	0.00086	<0.000005	<0.0000005	0.00139	0.00129	0.00088
2020	Q3	LC_LCDSSLCC	0.224	433	<0.01	0.015	<0.00005	<0.00005	0.0355	0.0329	40.3	44.9	9.16	8.97	0.00442	0.00532	<0.000005	<0.0000005	0.00237	0.00228	0.00442
2020	Q4	FR_FRABCH	0.12	629	<0.01	0.01	<0.00005	<0.00005	0.0383	0.0382	63.7	61.2	13.8	12.7	0.00436	0.00441	<0.000005	<0.0000005	0.000968	0.000967	0.00091
2020	Q4	FR_FRCP1	0.14	742	0.017	0.026	<0.00005	<0.00005	0.0455	0.0447	81.6	85	15.7	15	0.00846	0.00907	<0.000005	<0.0000005	0.00342	0.00342	0.0098
2020	Q4	GH_FR1	0.15	504	<0.01	0.603	<0.00005	0.000462	0.0208	0.0196	53.5	57.2	11	10.2	0.00148	0.0102	<0.000005	0.00000348	0.00106	0.00115	0.00093
2020	Q4	GH_ERC	0.143	176	<0.01	0.016	<0.00005	<0.00005	0.0029	0.0027	12.7	14.2	3.75	3.57	0.00073	0.00151	<0.000005	<0.0000005	0.00101	0.00109	<0.0005
2020	Q4	CM_MC2	0.13	597	<0.01	0.03	<0.00005	<0.00005	0.0382	0.0361	59.2	62.5	14.4	13.4	0.00574	0.00625	<0.000005	<0.0000005	0.000964	0.0011	0.027
2020	Q4	EV_MC2	0.124	290	<0.01	<0.01	<0.00005	0.00005	0.0112	0.012	26.5	26.9	6.62	6.04	0.00135	0.00174	<0.000005	<0.0000005	0.000808	0.000888	0.00063
2020	Q4	EV_HC1	0.19	386	<0.01	<0.01	<0.00005	<0.00005	0.0066	0.0072	44.8	42.6	8.52	7.8	0.00256	0.00282	<0.000005	<0.0000005	0.000962	0.000983	0.00062
2020	Q4	LC_DCDS	<0.1	498	<0.01	<0.01	<0.00005	<0.00005	0.0295	0.0276	43.7	46.8	11.2	10.2	0.00185	0.00196	<0.000005	0.00000067	0.00394	0.00456	0.0146
2020	Q4	LC_LC3	0.14	668	<0.01	0.081	<0.00005	<0.00005	0.0538	0.0571	70.9	75.7	15.4	13.9	0.0368	0.0405	<0.000005	<0.0000005	0.00433	0.0045	0.00966
2020	Q4	LC_LC5	0.175	415	<0.01	<0.01	<0.00005	<0.00005	0.0218	0.0226	41.4	42.9	9.41	8.47	0.00032	0.0004	<0.000005	<0.0000005	0.0012	0.00125	0.00088
2020	Q4	LC_LCDSSLCC	0.2074	468.6	0.0003	0.0124	0.000025	0.000025	0.0368	0.0377	46.3	47.78	9.688	9.684	0.004162	0.005082	0.0000025	0.00000025	0.00249	0.002524	0.00452
2021	Q1	GH_FR1	0.12	524	<0.01	1.9	<0.00005	0.00139	0.0206	0.0221	55.2	56.5	10.4	10.6	0.00102	0.116	<0.000005	<0.000001	0.000771	0.000894	0.00069
2021	Q1	GH_ERC	0.14	194	<0.01	<0.01	<0.00005	<0.00005	0.0036	0.0038	15.1	15.6	4.05	3.94	0.00019	0.00028	<0.000005	<0.0000005	0.00102	0.00101	<0.0005
2021	Q1	EV_HC1	0.16	445	<0.01	<0.01	<0.00005	<0.00005	0.0067	0.0072	52.1	53.6	8.67	9	0.00302	0.0032	<0.000005	<0.0000005	0.000976	0.000942	0.00054
2021	Q1	LC_LCDSSLCC	0.19	640	<0.01	<0.01	<0.00005	<0.00005	0.0472	0.0492	67.9	67.9	12.8	13.3	0.00202	0.00275	<0.000005	<0.0000005	0.00266	0.00275	0.00354
2021	Q2	FR_FRABCH	0.14	307	<0.01	0.617	<0.00005	0.00052	0.017	0.0184	31.2	32.4	6.62	6.22	0.00536	0.0441	<0.000005	0.00000579	0.00105	0.000965	0.00182
2021	Q2	FR_FRCP1	0.15	262	<0.01	0.426	<0.00005	0.00048	0.0148	0.0161	26	26.9	5.48	5.3	0.00211	0.0594	<0.000005	0.00000362	0.00119	0.000919	0.00248
2021	Q2	GH_ERC	0.119	156	0.013	2.2	<0.00005	0.00169	0.002	0.0042	11.3	13.8	3.36	3.18	0.00251	0.117	<0.000005	0.00000881	0.00093	0.00097	<0.0005
2021	Q2	CM_MC2	0.072	249	<0.01	0.85	<0.00005	0.000752	0.0145	0.014	24	23.7	5.65	5.51	0.00914	0.0571	<0.000005	0.00000353	0.000708	0.000654	0.0102
2021	Q2	EV_MC2	0.074	113	0.013	11	<0.00005	0.0092	0.0041	0.0118	9.12	15.6	2.65	2.38	0.00271	0.39	<0.000005	0.000015	0.000486	0.000826	0.00096
2021	Q2	EV_HC1	0.117	219	<0.01	0.667	<0.00005	0.000474	0.0044	0.0045	21.4	20.8	4.76	4.43	0.00121	0.0169	<0.000005	0.00000428	0.000565	0.000601	0.00061
2021	Q2	LC_DCDS	0.078	225	0.012	0.402	<0.00005	0.000456	0.0124	0.0127	20.5	21.5	4.8	4.65	0.0632	0.078	<0.000005	0.0000057	0.0034	0.00303	0.0028
2021	Q2	LC_LCDSSLCC	0.2	232	<0.01	0.054	<0.00005	<0.00005	0.0166	0.0178	22.6	24.4	5.34	4.78	0.00156	0.0107	<0.000005	0.00000122	0.00126	0.00135	0.00292
2021	Q3	FR_FRABCH	0.17	610	<0.01	0.012	<0.00005	<0.00005	0.0438	0.0434	63.9	64.7	12.6	12.4	0.00454	0.00503	<0.000005	<0.0000005	0.00117	0.00122	0.00142
2021	Q3	FR_FRCP1	0.21	596	<0.01	0.022	<0.00005	<0.00005	0.05	0.0462	65.9	66	12.3	12	0.00481	0.00619	<0.000005	<0.0000005	0.00265	0.00258	0.00681
2021	Q3	GH_FR1	0.17	448	<0.01	0.015	<0.00005	<0.00005	0.0258	0.0242	45.2	44.9	9.09	9.1	0.00142	0.00195	<0.000005	<0.0000005	0.00115	0.00103	0.00103
2021	Q3	CM_MC2	0.13	503	<0.01	0.019	<0.00005	<0.00005	0.0238	0.0244	54.8	55.4	10.6	11	0.00332	0.00455	<0.000005	<0.0000005	0.0011	0.00116	0.0201
2021	Q3	EV_MC2	0.104	283	<0.01	0.024	<0.00005	<0.00005	0.0126	0.0122	26.1	24	5.76	5.88	0.00179	0.00296	<0.000005	<0.0000005	0.00147	0.00151	0.0018
2021	Q3	LC_LC3	0.2	516	<0.01	0.041	<0.00005	<0.00005	0.0562	0.0569	55	57.1	12.8	10.8	0.0144	0.0162	<0.000005	<0.0000005	0.00358	0.00366	0.00935
2021	Q3	LC_LC5	0.21	395	<0.01	<0.01	<0.00005	<0.00005	0.0267	0.0263	39.6	39.2	8.27	8.08	0.00029	0.00071	<0.000005	<0.0000005	0.00135	0.00142	0.00117
2021	Q3	LC_LCDSSLCC	0.23	404	<0.01	<0.01	<0.00005	<0.00005	0.0388	0.0391	40.6	42.5	8.98	8.39	0.00276	0.00382	<0.000005	<0.0000005	0.00233	0.00234	0.00485
2021	Q4	FR_FRABCH	0.109	659	<0.01	0.03	<0.00005	<0.00005	0.0465	0.0454	70.3	80.7	13.4	13.4	0.00462	0.00508	<0.000005	0.00000055	0.000997	0.00106	0.00146
2021	Q4	FR_FRCP1	0.19	701	0.019	0.029	<0.00005	<0.00005	0.056	0.0556	81.2	95.2	15.8	14.2	0.0078	0.00869	<0.000005	<0.0000005	0.00301	0.00317	0.0105
2021	Q4	GH_FR1	0.12	483	<0.01	0.011	<0.00005	<0.00005	0.0271	0.0268	51.2	54.4	10.3	9.8	0.00137	0.00156	<0.000005	<0.0000005	0.000994	0.00106	0.00085
2021	Q4	LC_DCDS	<0.1	590	<0.01	<0.01	<0.00005	<0.00005	0.0397	0.0407	56.6	56.2	11.9	12.2	0.00193	0.00238	<0.000005	0.00000065	0.00748	0.00794	0.0131
2021	Q4	LC_LC3	0.13	619	<0.01	0.082	<0.00005	<0.00005	0.0667	0.0725	70.3	65.3	13.4	13	0.0305	0.0338	<0.000005	<0.0000005	0.00473	0.00481	0.00971
Tests categorized as possible or likely adverse response (2015 - 2020)																					
2015	Q1	FR_FRCP1	0.45	1880	<0.020	<0.020	<0.00010	<0.00010	0.054	0.056	257	261	40	38	0.0019	0.0027	<0.000010	<0.000010	0.0028	0.0029	0.031
2015	Q1	EV_HC1	0.15	274	0.01	0.013	0.00005	0.00005	0.0047	0.0047	30	31	8.2	8.3	0.001	0.0015	0.00001	0.00001	0.00063	0.00065	0.0006
2015	Q2	LC_LC3	0.21	401	<0.010	<0.010	<0.000050	<0.000050	0.03	0.03	41	41	8.4	8.3	0.0001	0.0003	<0.0000050	<0.0000050	0.0017	0.0017	0.0088
2015	Q2	LC_LC5	0.19	300	0.013	0.031	<0.000050	<0.000050	0.014	0.014	29	30	6.4	6.1	0.0025	0.0026	<0.0000050	<0.0000050	0.0011	0.0011	0.0013
2015	Q2	LC_LCDSSLCC	0.22	269	<0.010	0.018	<0.000050	<0.000050	0.016	0.016	25	25	5.7	5.5	0.00016	0.00051	<0.0000050	<0.0000050	0.0011	0.0012	0.0036
2015	Q4	FR_FRCP1	0.17	597	<0.010	0.019	<0.000050	<0.000050	0.042	0.037	65	65	12	12	0.0076	0.0081	<0.0000050	<0.0000050	0.0015	0.0014	0.0068
2016	Q1	FR_FRCP1	< 0.20	1120	< 0.010	< 0.020	< 0.000050	< 0.000050	0.058	0.059	137	142	23	23	0.0068	0.0075	< 0.0000050	< 0.00000050	0.0017	0.0018	0.013
2016	Q2	FR_FRCP1	0.2	305	< 0.010	0.13	< 0.000050	0.000099	0.016	0.018	31	32	5.9	6.2	0.0028	0.0097	< 0.0000050	0.0000012	0.0012	0.0013	0.0021
2018	Q1	FR_FRCP1	0.12	984	<0.01	0.018	<0.00005	<0.00005	0.055	0.056	120	114	19	20	0.012	0.012	<0.000005	<0.0000005	0.0017	0.0017	0.0099
2018	Q2	FR_FRCP1	0.2	317	<0.01	0.38	<0.00005	0.00028	0.019	0.022	33	34	6.6	6.4	0.0015	0.023	<0.000005	0.000003	0.0014	0.0014	0.0053
2018	Q4	FR_FRCP1	0.11	2510	<0.02	0.029	<0.0001	<0.0001	0.087	0.087	362	369	49	51	0.0003	0.0022	<0.000005	<0.0000005	0.0024	0.0023	0.044
2019	Q1	FR_FRCP1	<0.2	2680	<0.02	<0.02	<0.0001	<0.0001	0.0744	0.0744	383	343	50.1	53.7	0.00053	0.00044	<0.000005	<0.0000005	0.0031	0.00287	0.0395
2019	Q3	FR_FRABCH	0.19	481	<0.01	0.013	<0.00005	0.000057	0.029	0.03	52	53	9.9	9.7	0.0035	0.0042	<0.000005	<0.0000005	0.0011	0.0011	0.0017
2019	Q3	FR_FRCP1	0.22	403	<0.01	0.012	<0.00005	<0.00005	0.024	0.026	43	43	8.1	8.2	0.0027	0.0046	<0.000005	<0.0000005	0.0014	0.0014	0.0034
2019	Q3	GH_FR1	0.16	406	<0.01	0.011	<0.00005	<0.00005	0.021	0.017	44	41	7.9	8.2	0.00068	0.0023	<0.000005	<0.0000005	0.0014	0.0013	0.0013
2019	Q3	CM_MC2	0.13	542	<0.01	<0.01	<0.00005	<0.00005	0.016	0.016	59	59	11	11	0.0017	0.0037	<0.000005	<0.0000005	0.0011	0.0011	0.018
2019	Q3	EV_MC2	0.12	281	<0.01	0.014	<0.00005	<0.00005	0.011	0.0089	27	25	5.6	5.8	0.00061	0.0021	<0.000005	<0.0000005	0.00096	0.00079	0.0011
2019	Q3	EV_HC1	0.17	377	<0.01	0.016	<0.00005	<0.00005	0.0072	0.006	45	41	7.5	7.6	0.0027	0.0051	<0.000005	<0.0000005	0.00098	0.00086	0.00064
2019	Q3	LC_LC3	0.23	497	<0.01	0.064	<0.00005	<0.00005	0.041	0.039	54	55	10	10	0.021	0.026	<0.000005	<0.0000005	0.0036	0.0037	0.0084
2019	Q3	LC_LC5	0.22	345	<0.01	0.01	<0.00005	<0.00005	0.019	0.019	35	35	7.3	7.0	0.00028	0.0013	<0.000005	<0.0000005	0.0012	0.03	0.0008
2019	Q3	LC_LCDSSLCC	0.26	375	<0.01	0.019	<0.00005	<0.00005	0.028	0.028	38	39	8.1	7.8	0.0031	0.0063	<0.000005	<0.0000005	0.0021	0.0021	0.0041
2020	Q1	FR_FRCP1	0.16	794	0.024	0.527	<0.00005	0.000326	0.056	0.0567	96.8	98.1	17.3	16.1	0.00919	0.0214	<0.000005	<0.0000005	0.00152	0.00165	0.0107
2020	Q1	FR_FR4	0.14	840	0.022	0.039	<0.00005	<0.00005	0.0527	0.0591	97.1	104	18.1	17	0.00973	0.011	<0.000005	<0.0000005	0.00157	0.00166	0.00956
2020	Q3	EV_MC2	0.156	312	<0.01	0.011	<0.00005	<0.00005	0.0112	0.0127	30.3	27.7	6.2	6.49	0.00175	0.0022	<0.000005	<0.0000005	0.00079	0.000892	0.00102
2020	Q3	LC_DCDS	0.11	362	<0.01	0.034	<0.00005	<0.00005	0.0219	0.0251	36	37.6	7.97	7.45	0.00161	0.0043	<0.000005	0.00000141	0.00404	0.00428	0.0118
2020	Q3	LC_LC3	0.21	580	<0.01	0.097	<0.00005	<0.00005	0.0552	0.0524	60.1	64.5	12.5	12.1	0.0251	0.0273	<0.000005	<0.0000005	0.00412	0.00399	0.00933
Tests categorized as possible or likely adverse response (2021)																					
2021	Q1	CM_MC2	<0.1	594	<0.01	<0.01	<0.00005	<0.00005	0.0199	0.0199	64.8	65.1	13	12.7	0.00376	0.00448	<0.000005	<0.0000005	0.000922	0.000933	0.0114
2021	Q2	LC_LC3	0.22	360	<0.01	0.032	<0.00005	<0.00005	0.0358	0.0372	39.7	42.8	8.17	7.46	0.00497	0.0077	<0.000005	0.00000084	0.00226	0.00244	0.00736
2021	Q4	CM_MC2	<0.1	707	<0.01	0.046	<0.00005	<0.00005	0.0228	0.0218	77.8	76.6	14.6	15	0.00225	0.00515	<0.000005	<0.0000005	0.000999	0.000989	0.0122

Notes:

"-D-" = dissolved concentration; "-T-" = total concentration; "-N-" = normal concentration; $CaCO_3$ = calcium carbonate; ∑TU = sum of toxic units; WQG = water quality guideline; mg/l = milligrams per litre; ug/l = micrograms per litre; % = percent.

Screening

Concentrations of parameters in 2021 tests categorized as possible or likely response are shaded if the concentration is greater than the maximum concentration measured in references or tests categorized as no adverse response.

Table D-2. *P. subcapitata* Cell Yield Paired with Water Quality

Year	Quarter	Sample ID	NICKEL-T-mg/l	NITRATE NITROGEN (NO3), AS N-N-mg/l	NITRITE NITROGEN (NO2), AS N-N-mg/l	NITROGEN, AMMONIA (AS N)-N-mg/l	ORTHO-PHOSPHATE-N-mg/l	OXIDATION-REDUCTION POTENTIAL, LAB-N-mv	pH, LAB-N-ph units	PHOSPHORUS-N-mg/l	POTASSIUM-D-mg/l	POTASSIUM-T-mg/l	SELENIUM-D-mg/l	SELENIUM-T-mg/l	SILICON-D-mg/l	SILICON-T-mg/l	SILVER-D-mg/l	SILVER-T-mg/l	SODIUM-D-mg/l	SODIUM-T-mg/l	STRONTIUM-D-mg/l	STRONTIUM-T-mg/l	SULFATE (AS SO4)-D-mg/l	THALLIUM-D-mg/l	THALLIUM-T-mg/l	TIN-D-mg/l	TIN-T-mg/l	TITANIUM-D-mg/l	TITANIUM-T-mg/l	TOTAL DISSOLVED SOLIDS (RESIDUE, FILTERABLE)-N-mg/l	TOTAL KJELDAHL NITROGEN-N-mg/l	TOTAL ORGANIC CARBON-T-mg/l	TOTAL SUSPENDED SOLIDS, LAB-N-mg/l	TURBIDITY, LAB-N-ntu	URANIUM-D-mg/l	URANIUM-T-mg/l	VANADIUM-D-mg/l	VANADIUM-T-mg/l	ZINC-D-mg/l	ZINC-T-mg/l	∑TU-WQGs	∑TU-WQGs/Benchmarks	PC1_allyrs	PC2_allyrs	PC1_2021	PC2_2021
Reference (2015 - 2021)																																														
2015	Q1	Reference (FR_UFR1)	<0.00050	0.13	<0.0010	<0.0050	0.0032	344	8.4	0.0042	0.39	0.4	0.00069	0.00073	1.6	1.6	<0.000010	<0.000010	0.71	0.77	0.088	0.091	47	<0.000010	<0.000010	<0.00010	<0.00010	<0.010	<0.010	229	<0.050	0.69	<1.0	0.13	0.00047	0.00047	<0.0010	<0.0010	<0.0030	<0.0030	2.76	5.58	-5.70544132	-0.74315055		
2015	Q1	Reference (FR_UFR1)	<0.00050	0.13	<0.0010	<0.0050	0.0032	344	8.4	0.0042	0.39	0.4	0.00069	0.00073	1.6	1.6	<0.000010	<0.000010	0.71	0.77	0.088	0.091	47	<0.000010	<0.000010	<0.00010	<0.00010	<0.010	<0.010	229	<0.050	0.69	<1.0	0.13	0.00047	0.00047	<0.0010	<0.0010	<0.0030	<0.0030	2.76	2.76	-5.70544132	-0.74315055		
2015	Q1	Reference (FR_UFR1)	<0.00050	0.13	<0.0010	<0.0050	0.0027	371	8.3	0.0035	0.39	0.42	0.00076	0.00073	1.6	1.7	<0.000010	<0.000010	0.71	0.72	0.089	0.092	46	<0.000010	<0.000010	<0.00010	<0.00010	<0.010	<0.010	222	<0.050	<0.50	<1.0	0.33	0.00047	0.00047	<0.0010	<0.0010	<0.0030	<0.0030	2.74	2.76	-5.6054188	-0.73667042		
2015	Q2	Reference (FR_UFR1)	<0.00050	0.066	<0.0010	<0.0050	0.0042	470	8.4	0.01	0.33	0.37	0.00048	0.00049	1.7	1.9	<0.000010	<0.000010	0.55	0.56	0.061	0.066	15	<0.000010	0.00001	<0.00010	<0.00010	<0.010	<0.010	147	0.1	2.1	2.4	1.5	0.00031	0.00033	<0.00050	<0.00050	<0.0030	<0.0030	2.69	4.33	-7.95850945	1.80945936		
2015	Q2	Reference (GH_ER2)	<0.00050	0.086	<0.0010	<0.0050	<0.0010	312	8.3	0.008	0.36	0.37	0.00079	0.00087	1.6	1.8	<0.000010	<0.000010	0.73	0.73	0.2	0.21	18	<0.000010	<0.000010	<0.00010	<0.00010	<0.010	<0.010	191	0.067	1.8	4.4	3.9	0.00079	0.00078	<0.00050	0.00051	<0.0030	<0.0030	2.51	2.52	-5.55880418	0.597996043		
2015	Q3	Reference (FR_UFR1)	<0.00050	0.019	<0.0010	<0.0050	0.0029	325	8.4	0.0054	0.53	0.52	0.00047	0.00043	2.1	2.1	<0.000010	<0.000010	0.7	0.69	0.093	0.093	32	<0.000010	<0.000010	<0.00010	<0.00010	<0.010	<0.010	211	0.08	1.0	1.1	0.2	0.00042	0.00042	<0.00050	<0.00050	<0.0030	<0.0030	2.15	5.11	-5.68997077	-1.23830228		
2015	Q4	Reference (FR_UFR1)	<0.00050	0.022	<0.0010	<0.0050	0.0017	346	8.4	0.0022	0.46	0.42	0.00069	0.00062	1.5	1.6	<0.000010	<0.000010	0.73	0.69	0.095	0.091	48	<0.000010	<0.000010	<0.00010	<0.00010	<0.010	<0.010	215	0.095	0.6	<1.0	0.26	0.00047	0.00044	<0.00050	<0.00050	<0.0030	<0.0030	2.41	10.02	-6.07742801	-1.84928001		
2015	Q4	Reference (GH_ER2)	<0.00050	0.078	<0.0010	<0.0050	0.0015	490	8.3	<0.0020	0.33	0.35	0.00072	0.00078	1.7	1.8	<0.000010	<0.000010	0.63	0.67	0.21	0.22	22	<0.000010	<0.000010	<0.00010	<0.00010	<0.010	<0.010	171	<0.050	<0.50	<1.0	0.26	0.00071	0.00072	<0.00050	<0.00050	<0.0030	<0.0030	2.40	2.41	-5.73063713	-1.90853954		
2016	Q1	Reference (FR_UFR1)	< 0.00050	0.17	< 0.0010	< 0.0050	0.0032	297	8.3	0.0036	0.38	0.37	0.0008	0.00078	1.8	1.8	< 0.000010	< 0.000010	0.68	0.68	0.089	0.09	50	< 0.000010	< 0.000010	< 0.00010	< 0.00010	0.011	0.011	244	< 0.050	< 0.50	< 1.0	0.17	0.0005	0.00049	< 0.00050	< 0.00050	< 0.0030	< 0.0030	1.85	4.42	-5.93119865	-2.22485838		
2016	Q2	Reference (FR_UFR1)	< 0.00050	0.034	< 0.0010	< 0.0050	0.0041	318	8.3	0.0078	0.3	0.34	0.00052	0.00055	1.9	2.1	< 0.000010	< 0.000010	0.6	0.63	0.063	0.065	13	< 0.000010	< 0.000010	< 0.00010	< 0.00010	< 0.010	< 0.010	135	0.086	2.8	1.9	1.6	0.00032	0.00033	< 0.00050	0.00051	< 0.0030	< 0.0030	2.27	4.38	-8.42522967	1.990444592		
2016	Q2	Reference (GH_ER2)	0.0005	0.12	< 0.0010	< 0.0050	0.0011	321	8.2	0.016	0.35	0.46	0.00083	0.00083	1.9	2.2	< 0.000010	< 0.000010	0.74	0.75	0.2	0.2	17	< 0.000010	< 0.000010	< 0.00010	< 0.00010	< 0.010	< 0.010	174	0.077	2.2	15	4.7	0.00076	0.00079	< 0.00050	0.001	< 0.0030	< 0.0030	2.57	2.58	-5.60250548	2.69782749		
2016	Q3	Reference (FR_UFR1)	< 0.00050	0.057	< 0.0010	< 0.0050	0.0031	375	8.2	0.0038	0.44	0.47	0.00056	0.00063	2.1	2.1	< 0.000010	< 0.000010	0.64	0.68	0.095	0.098	35	< 0.000010	< 0.000010	< 0.00010	< 0.00010	< 0.010	< 0.010	222	0.077	0.92	1.2	0.22	0.00042	0.00044	< 0.00050	< 0.00050	< 0.0030	< 0.0030	1.20	3.90	-6.11098335	-1.80783596		
2016	Q4	Reference (FR_UFR1)	< 0.00050	0.1	< 0.0010	< 0.0050	0.0023	343	8.3	0.0028	0.38	0.38	0.00069	0.00068	1.8	1.9	< 0.000010	< 0.000010	0.64	0.7	0.093	0.095	40	< 0.000010	< 0.000010	< 0.00010	< 0.00010	< 0.010	< 0.010	204	0.069	1.1	< 1.0	0.85	0.00044	0.00046	< 0.00050	< 0.00050	< 0.0030	< 0.0030	1.43	3.52	-6.60802218	-0.87354415		
2016	Q4	Reference (GH_ER2)	< 0.00050	0.071	< 0.0010	< 0.0050	< 0.0010	378	8.3	< 0.0020	0.34	0.36	0.00087	0.00083	1.7	1.7	< 0.000010	< 0.000010	0.65	0.61	0.24	0.24	23	< 0.000010	< 0.000010	< 0.00010	< 0.00010	< 0.010	< 0.010	167	< 0.050	0.62	< 1.0	0.38	0.00076	0.00079	< 0.00050	< 0.00050	< 0.0030	< 0.0030	1.70	1.71	-5.9768875	-2.31451354		
2017	Q1	Reference (FR_UFR1)	<0.0005	0.22	<0.001	<0.005	0.0049	-	8.3	0.0071	-	0.38	0.0012	0.0010	-	-	<0.00001	<0.00001	-	0.77	0.097	0.097	45	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	194	<0.05	1.0	<1	0.25	0.00046	0.00048	<0.0005	<0.0005	<0.001	<0.003	1.15	3.94	-6.73190535	-2.11574459		
2017	Q2	Reference (FR_UFR1)	0.00069	0.098	<0.001	0.011	0.0087	-	8.3	0.02	-	0.38	0.0007	0.0006	-	-	<0.00001	0.00002	-	0.62	0.064	0.062	22	<0.00001	<0.00001	0.00011	<0.0001	<0.01	<0.01	143	0.18	3.7	4.4	4.7	0.00035	0.00034	0.00053	0.001	0.0013	<0.003	3.67	1.20	-8.65017113	5.611188246		
2017	Q2	Reference (GH_ER2)	<0.0005	0.12	<0.001	<0.005	<0.001	-	8.4	0.0058	-	0.41	0.00086	0.00098	-	-	<0.00001	<0.00001	-	0.73	0.21	0.21	21	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	180	0.068	1.1	6.2	3.8	0.00079	0.00079	<0.0005	0.00061	<0.003	<0.003	1.51	1.52	-6.36627969	0.062680341		
2017	Q2	Reference (CM_MC1)	<0.0005	0.012	<0.001	<0.005	0.0029	-	8.2	0.0094	-	0.43	0.00029	0.00025	-	-	<0.00001	<0.00001	-	2.7	0.14	0.14	11	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	148	0.098	1.9	<1	0.41	0.00018	0.0002	<0.0005	<0.0005	<0.001	<0.003	1.18	4.47	-7.83224266	0.397382424		
2017	Q3	Reference (FR_UFR1)	<0.0005	0.011	<0.001	0.01	0.0027	-	8.4	0.0078	-	0.48	0.0006	0.00059	-	-	<0.00001	<0.00001	-	0.69	0.088	0.09	32	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	164	0.078	2.7	1.1	0.36	0.00037	0.00038	<0.0005	<0.0005	<0.001	<0.003	1.26	1.24	-7.48144851	-0.87844533		
2017	Q3	Reference (GH_ER2)	<0.0005	0.037	<0.001	0.0069	0.001	-	8.4	0.0059	-	0.38	0.00067	0.00064	-	-	<0.00001	<0.00001	-	0.6	0.19	0.19	15	<0.00001	<0.00001	0.00011	<0.0001	<0.01	<0.01	148	0.12	0.91	1.4	0.81	0.00053	0.00058	<0.0005	<0.0005	<0.001	<0.003	1.26	1.28	-7.15711928	-1.09017891		
2017	Q3	Reference (CM_MC1)	<0.0005	0.012	<0.001	0.0067	0.005	-	8.2	0.06	-	0.45	0.00019	0.00024	-	-	<0.00001	<0.00001	-	2.0	0.14	0.13	13	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	162	0.1	1.2	<1	0.37	0.0002	0.00019	<0.0005	<0.0005	<0.001	<0.003	1.22	4.47	-7.6822579	0.672392428		
2017	Q4	Reference (FR_UFR1)	<0.0005	0.0094	0.0011	<0.005	0.0016	-	8.4	0.0023	-	0.4	0.00058	0.00055	-	-	<0.00001	<0.00001	-	0.72	0.1	0.095	44	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	221	<0.05	1.0	1.2	0.45	0.00051	0.00045	<0.0005	<0.0005	<0.003	<0.003	1.08	1.09	-7.24165463	-1.98851864		
2017	Q4	Reference (GH_ER2)	<0.0005	0.037	<0.001	0.0089	<0.001	-	8.4	<0.002	-	0.38	0.00089	0.00087	-	-	<0.00001	<0.00001	-	0.7	0.21	0.21	18	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	174	<0.05	0.91	<1	0.38	0.00077	0.00072	<0.0005	<0.0005	<0.003	<0.003	1.23	1.24	-6.678773	-2.13540906		
2017	Q4	Reference (CM_MC1)	<0.0005	0.015	<0.001	<0.005	0.0035	-	8.3	0.0045	-	0.49	0.00019	0.00019	-	-	<0.00001	<0.00001	-	2.9	0.16	0.16	13	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	166	<0.2	1.4	2.4	1.3	0.00023	0.00023	<0.0005	<0.0005	<0.003	<0.003	1.07	4.18	-7.39957674	-0.14047362		
2018	Q1	Reference (FR_UFR1)	<0.0005	0.2	<0.001	0.0099	0.0029	436	8.4	0.0038	0.39	0.37	0.00091	0.00098	2.0	1.8	<0.00001	<0.00001	0.77	0.67	0.099	0.093	49	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	216	0.064	0.59	<1	0.14	0.00054	0.00049	<0.0005	<0.0005	<0.003	<0.003	1.13	1.09	-5.84942398	-2.83368422		
2018	Q1	Reference (GH_ER2)	<0.0005	0.1	<0.001	<0.005	<0.001	276	8.2	<0.002	0.29	0.3	0.00093	0.00092	1.7	1.9	<0.00001	<0.00001	0.72	0.72	0.2	0.22	23	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	186	<0.05	<0.5	<1	0.13	0.00077	0.00079	<0.0005	<0.0005	<0.003	<0.003	1.27	1.28	-5.84733043	-2.71927481		
2018	Q1	Reference (CM_MC1)	<0.0005	0.04	<0.001	<0.005	0.0036	331	8.3	0.0046	0.46	0.45	0.00027	0.00029	2.2	2.1	<0.00001	<0.00001	3.6	3.5	0.16	0.17	17	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	182	<0.2	0.81	<1	0.22	0.00024	0.00024	<0.0005	<0.0005	<0.003	<0.003	1.08	4.67	-5.53028026	-1.68728889		
2018	Q2	Reference (FR_UFR1)	0.00062	0.13	<0.001	0.0067	0.0079	293	8.3	0.027	0.39	0.42	0.0008	0.00072	1.9	2.1	<0.00001	<0.00001	0.57	0.56	0.072	0.066	16	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	114	0.13	3.0	7.4	3.8	0.00033	0.00035	<0.0005	0.00065	<0.001	<0.003	2.09	1.91	-7.88503686	3.369186468		
2018	Q2	Reference (GH_ER2)	0.00085	0.15	<0.001	0.01	0.0015	272	8.5	0.026	0.42	0.54	0.001	0.00091	1.8	2.5	<0.00001	<0.00001	0.71	0.76	0.2	0.2	19	<0.00001	0.00001	<0.0001	<0.0001	<0.01	<0.01	186	0.2	1.9	17	14	0.00072	0.00075	<0.0005	0.0013	<0.001	0.0036	2.49	1.35	-5.3204623	3.317478715		
2018	Q2	Reference (CM_MC1)	<0.0005	0.018	<0.001	<0.005	0.0069	264	8.3	0.016	0.48	0.5	0.00024	0.00028	2.1	2.3	<0.00001	<0.00001	2.4	2.4	0.13	0.12	10	<0.00001	0.000011	<0.0001	<0.0001	<0.01	<0.01	134	0.092	3.4	4.5	2.4	0.00018	0.0002	<0.0005	<0.0005	<0.001	<0.003	1.89	5.10	-7.145219	3.372698122		
2018	Q2	Reference (LC_SLC)	<0.0005	0.13	<0.001	0.01	0.001	293	8.4	0.005	0.36	0.35	0.00087	0.00078	2.0	2.1	<0.00001	<0.00001	0.88	0.81	0.13	0.12	25	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	176	0.13	2.1	1.6	0.63	0.001	0.0011	<0.0005	<0.0005	0.0015	<0.003	1.34	2.12	-5.81820036	-1.08460607		
2018	Q3	Reference (FR_UFR1)	<0.0005	0.024	<0.001	0.056	<0.001	321	8.4	0.0095	0.49	0.45	0.0006	0.00062	2.1	2.0	<0.00001	<0.00001	0.73	0.67	0.1	0.095	35	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	222	0.24	2.4	<1	0.22	0.00045	0.00043	<0.0005	<0.0005	<0.001	<0.003	1.20	1.30	-5.89117552	-1.54760604		
2018	Q3	Reference (GH_ER2)	0.002	0.023	<0.001	0.014	<0.001	300	8.2	0.0086	0.36	0.6	0.00069	0.00071	1.6	2.7	<0.00001	0.000014	0.68	0.64	0.21	0.21	16	<0.00001	0.000028	<0.0001	<0.0001	<0.01	<0.01	179	0.057	1.6	6.9	0.61	0.00064	0.00081	<0.0005	0.0031	<0.001	0.0073	4.89	1.43	-5.23148333	6.218977164		
2018	Q3	Reference (CM_MC1)	<0.0005	0.019	<0.001	0.024	0.0041	175	8.4	0.0091	0.51	0.5	0.00018	0.00022	2.2	2.4	<0.00001	<0.00001	2.8	2.6	0.15	0.14	13	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	174	0.052	1.5	<1	0.24	0.00023	0.00023	<0.0005	<0.0005	<0.001	0.0047	1.28	5.80	-5.96375944	-0.18171973		
2018	Q3	Reference (LC_SLC)	<0.0005	0.089	<0.001	0.026	<0.001	325	8.4	0.0043	0.44	0.36	0.0012	0.0013	2.0	2.1	<0.00001	<0.00001	0.9	0.8	0.16	0.14	48	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	233	<0.05	1.9	<1	0.13	0.0016	0.0016	<0.0005	<0.0005	0.0025	0.0036	1.43	1.20	-4.565378	-2.58324869		
2018	Q4	Reference (FR_UFR1)	<0.0005	0.032	<0.001	0.026	0.0023	453	8.4	<0.002	0.38	0.36	0.00073	0.00069	1.5	1.5	<0.00001	<0.00001	0.69	0.69	0.097	0.097	44	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	195	0.079	0.66	<1	0.19	0.00053	0.0005	<0.0005	<0.0005	<0.001	<0.003	1.22	1.21	-6.26370667	-2.74741623		
2018	Q4	Reference (GH_ER2)	<0.0005	0.054	<0.001	0.014	0.0022	453	8.3	<0.002	0.39	0.37	0.00091	0.00084	1.8	1.9	<0.00001	<0.00001	0.78	0.72	0.21	0.21	21	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	168	0.24	<0.5	<1	0.28	0.00077	0.00077	<0.0005	<0.0005	<0.001	<0.003	1.43	1.59	-5.7841934	-1.74477618		
2018	Q4	Reference (CM_MC1)	<0.0005	0.0088	<0.001	0.0081	0.0042	412	8.2	0.0037	0.43	0.42	0.00022	0.00023	2.3	2.1	<0.00001	<0.00001	3.2	3.2	0.13	0.13	14	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	127	0.091	2.2	<1	0.29	0.00025	0.00023	<0.0005	<0.0005	<0.001	<0.003	1.18	1.20	-6.72064239	-0.3395645		
2018	Q4	Reference (LC_SLC)	<0.0005	0.13	<0.001	0.023	0.0027	374	8.3	0.0026	0.34	0.39	0.0017	0.0015	1.9	2.0	<0.00001	<0.00001	0.88	0.89	0.16	0.16	57	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	214	<0.05	0.65	<1	0.27	0.0018	0.0019	<0.0005	<0.0005	0.0015	<0.003	1.58	1.43	-4.51673203	-3.02865368		
2019	Q1	Reference (FR_UFR1)	<0.0005	0.229	<0.001	<0.005	0.0058	429	8.3	0.0049	0.339	0.342	0.000939	0.000714	1.83	1.86	<0.00001	<0.00001	0.687	0.69	0.108	0.106	48.6	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	249	<0.05	0.63	<1	0.51	0.000487	0.000474	<0.0005	<0.0005	<0.001	0.0137	2.05	2.04	-5.65628737	-2.13305629		
2019	Q1	Reference (GH_ER2)	<0.0005	0.109	0.0015	<0.005	0.0023	410	8.2	0.0033	0.293	0.293	0.0011	0.001	1.64	1.63	<0.00001	<0.00001	0.674	0.637	0.224	0.215	24.1	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	181	<0.05	<0.5	<1	0.45	0.000782	0.000754	<0.0005	<0.0005	<0.001	<0.003	3.75	2.53	-6.03576237	-2.70061203		
2019	Q1	Reference (CM_MC1)	<0.0005	0.0591	0.0011	0.0069	0.0033	420	8.2	0.0032	0.487	0.432	0.000268	0.000307	2.23	2.03	<0.00001	<0.00001	3.53	3.28	0.161	0.147	16.9	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	209	<0.05	0.62	<1	0.26	0.000229	0.000225	<0.0005	<0.0005	<0.001	<0.003	2.38	2.39	-5.66472915	-1.81778884		
2019	Q1	Reference (LC_SLC)	<0.0005	0.146	<0.001	0.005	0.0038	428	8.2	0.0034	0.39	0.396	0.00184	0.00188	2.24	2.32	<0.00001	<0.00001	1.23	1.21	0.186	0.195	82	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	277	<0.05	0.71	<1	0.45	0.00173	0.00197	<0.0005	<0.0005	0.0016	<0.003	2.54	3.75	-3.5966347	-3.08307816		
2019	Q2	Reference (FR_UFR1)	<0.0005	<0.005	<0.001	0.016	0.0032	386	8.3	0.0064	0.32	0.32	0.00078	0.00071	1.8	2.0	<0.00001	<0.00001	0.66	0.66	0.065	0.072	23	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	164	0.058	1.8	<1	1.4	0.00038	0.00041	<0.0005	<0.0005	<0.001	<0.003	1.92	1.94	-8.02852515	0.131813676		
2019	Q2	Reference (GH_ER2)	<0.0005	0.073	<0.001	0.011	<0.001	452	8.2	0.006	0.32	0.33	0.0011	0.001	1.7	1.7	<0.00001	<0.00001	0.76	0.7	0.22	0.21	23	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	174	0.064	0.86	5.0	3.2	0.00072	0.00077	<0.0005	<0.0005	<0.001	<0.003	3.84	2.40	-6.00599832	-0.83553675		
2019	Q2	Reference (CM_MC1)	<0.0005	0.0086	<0.001	<0.005	0.0041	411	8.2	0.0045	0.37	0.41	0.00027	0.00025	2.1	2.2	<0.00001	<0.00001	2.7	2.8	0.13	0.13	13	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	167	<0.05	7.4	1.3	0.77	0.00022	0.00021	<0.0005	<0.0005	<0.001	<0.003	1.32	1.33	-6.8618486	1.038115377		
2019	Q2	Reference (LC_SLC)	<0.0005	0.059	<0.001	<0.005	0.0019	470	8.2	0.0022	0.34	0.34	0.0013	0.0013	1.8	1.9	<0.00001	<0.00001	0.8	0.8	0.14	0.15	46	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	197	<0.05	0.77	<1	0.68	0.0013	0.0013	<0.0005	<0.0005	0.0011	0.0065	2.39	3.85	-5.44511741	-2.6432112		
2019	Q3	Reference (FR_UFR1)	<0.0005	0.005	<0.001	0.021	<0.001	424	8.4	0.0026	0.41	0.4	0.0007	0.00063	1.9	2.2	<0.00001	<0.00001	0.71	0.69	0.095	0.1	28	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	190	0.057	1.2	1.1	0.55	0.00051	0.00047	<0.0005	<0.0005	<0.001	<0.003	1.83	1.84	-6.42116119	-1.83356559		
2019	Q3	Reference (GH_ER2)	0.00066	0.036	<0.001	0.029	<0.001	360	8.3	<0.002	0.34	0.34	0.00086	0.00081	1.8	1.8	<0.00001	<0.00001	0.61	0.64	0.21	0.21	16	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	154	0.079	0.79	1.1	0.51	0.00065	0.0007	<0.0005	<0.0005	<0.001	<0.003	2.31	2.64	-6.14721795	-1.64737131		
2019	Q3	Reference (CM_MC1)	<0.0005	0.012	<0.001	<0.005	0.0047	274	8.4	0.0048	0.54	0.47	0.00024	0.0002	2.3	2.5	<0.00001	<0.00001	3.1	3.0	0.15	0.16	13	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	135	<0.05	0.95	<1	0.25	0.00027	0.00024	<0.0005	<0.0005	<0.001	<0.003	1.80	1.82	-5.78307289	-0.79343076		
2019	Q3	Reference (LC_SLC)	<0.0005	0.12	<0.001	0.0053	0.0016	450	8.3	0.0037	0.34	0.33	0.0014	0.0013	1.9	2.0	<0.00001	<0.00001	0.72	0.72	0.13	0.14	41	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	205	<0.05	0.84	<1	0.24	0.0013	0.0013	<0.0005	<0.0005	0.0016	<0.003	2.63	2.32	-5.34023073	-2.70255231		
2019	Q4	Reference (FR_UFR1)	<0.0005	0.13	<0.001	0.019	0.0026	386	8.3	0.0031	0.34	0.34	0.001	0.00086	1.8	1.8	<0.00001	<0.00001	0.69	0.66	0.085	0.092	43	<0.00001	<0.00001	<0.0001	0.00014	<0.01	<0.01	188	0.064	0.67	1.4	0.17	0.0005	0.00049	<0.0005	<0.0005	<0.001	<0.003	1.84	1.86	-6.27076413	-2.30611059		
2019	Q4	Reference (GH_ER2)	<0.0005	0.075	<0.001	0.013	<0.001	456	8.3	<0.002	0.33	0.35	0.0011	0.00095	1.8	1.9	<0.00001	<0.00001	0.72	0.7	0.21	0.21	23	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	178	0.054	<0.5	1.4	0.64	0.00073	0.00073	<0.0005	<0.0005	<0.001	<0.003	2.29	1.85	-5.95218246	-2.28916907		
2019	Q4	Reference (CM_MC1)	<0.0005	0.019	<0.001	0.0053	0.0041	382	8.3	0.004	0.4	0.4	0.00026	0.00025	2.2	2.2	<0.00001	<0.00001	3.1	3.1	0.14	0.13	14	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	171	<0.05	0.76	<1	0.16	0.00023	0.00025	<0.0005	<0.0005	<0.001	<0.003	1.64	1.65	-6.69239529	-1.3817116		
2019	Q4	Reference (LC_SLC)	<0.0005	0.13	<0.001	0.015	0.0018	503	8.1	<0.002	0.37	0.35	0.0016	0.0016	2.2	2.0	<0.00001	<0.00001	0.95	0.94	0.16	0.16	61	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	230	0.054	1.0	<1	0.14	0.0017	0.0017	<0.0005	<0.0005	0.0018	<0.003	1.85	2.30	-4.36807295	-2.87263015		
2020	Q1	Reference (FR_UFR1)	<0.0005	0.2	<0.001	0.147	0.0047	490	8.1	0.0067	0.39	0.39	0.0009	0.0008	2.1	2.1	<0.00001	<0.00001	0.7	0.7	0.1	0.1	50	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	244	0.18	<0.5	<1	0.3	0.0005	0.0005	<0.0005	<0.0005	<0.001	<0.003	2.290447953	1.515058625	-5.81020975	-2.13465743		
2020	Q1	Reference (GH_ER2)	<0.0005	0.0896	<0.001	0.0146	<0.002	502	8.3	0.0019	0.35	0.327	0.00114	0.00111	1.85	1.87	<0.00001	<0.00001	0.753	0.757	0.215	0.21	25.2	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	200	0.051	0.63	1.3	0.29	0.000787	0.0008	<0.0005	<0.0005	<0.001	<0.003	1.793524741	3.929872183	-5.73896521	-2.43009039		
2020	Q1	Reference (CM_MC1)	<0.0005	0.0444	<0.001	<0.005	0.0073	440	8.2	0.0049	0.444	0.436	0.000279	0.000251	2.11	2.18	<0.00001	<0.00001	3.54	3.66	0.153	0.157	16.8	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	172	<0.05	0.85	<1	0.12	0.000241	0.000252	<0.0005	<0.0005	<0.001	<0.003	1.518163223	1.617535764	-6.04323763	-1.44311497		
2020	Q1	Reference (LC_SLC)	<0.0005	0.133	<0.001	<0.005	0.0062	485	8.2	0.0026	0.391	0.406	0.00179	0.00158	2.12	2.36	<0.00001	<0.00001	1.26	1.18	0.18	0.179	78.1	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	243	<0.05	0.83	3.7	0.17	0.00166	0.00165	<0.0005	<0.0005	0.002	<0.003	1.636960876	4.904785573	-3.84966004	-2.19160421		
2020	Q2	Reference (FR_UFR1)	<0.0005	0.0539	<0.001	<0.005	0.0053	340	8.4	0.0071	0.342	0.319	0.000659	0.000784	1.89	1.92	<0.00001	<0.00001	0.62	0.561	0.0675	0.0673	16.7	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	166	0.081	2.25	2.7	1.77	0.00037	0.000317	<0.0005	0.00053	<0.001	<0.003	1.3294982	1.316335456	-7.93272662	0.383818332		
2020	Q2	Reference (GH_ER2)	<0.0005	0.104	<0.001	0.07	0.005	480	8.3	0.0016	0.368	0.417	0.00119	0.00116	1.88	1.99	<0.00001	<0.00001	0.798	0.848	0.182	0.194	17.8	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	203	0.112	1.78	8	3.91	0.000823	0.000808	<0.0005	<0.0005	<0.001	<0.003	1.625337759	3.635860169	-5.51726709	0.054381799		
2020	Q2	Reference (CM_MC1)	<0.0005	0.0217	<0.001	0.0051	0.0057	329	8.3	0.0044	0.411	0.423	0.000288	0.000225	2.21	2.29	<0.00001	<0.00001	2.37	2.4	0.116	0.114	9.73	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	163	0.089	2.45	1.5	1.25	0.000192	0.000206	<0.0005	<0.0005	<0.001	<0.003	1.305001158	1.334962193	-7.30517652	0.745636891		
2020	Q2	Reference (LC_SLC)	<0.0005	0.0969	<0.001	0.019	<0.002	403	8.3	0.002	0.354	0.345	0.000792	0.000862	1.92	1.97	<0.00001	<0.00001	0.787	0.78	0.116	0.12	19.1	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	186	<0.05	2.02	<1	0.33	0.00111	0.000978	<0.0005	<0.0005	0.0024	<0.003	1.343174884	4.512323465	-5.96446945	-1.87730885		
2020	Q3	Reference (FR_UFR1)	<0.0005	0.0089	<0.001	0.0139	0.0027	407	8.4	0.0023	0.442	0.44	0.000656	0.000605	2.02	2.14	<0.00001	<0.00001	0.659	0.637	0.104	0.0989	34.4	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	234	<0.05	<0.5	<1	0.15	0.000443	0.000458	<0.0005	<0.0005	<0.001	<0.003	1.574371235	1.389625194	-6.07904895	-2.69228432		
2020	Q3	Reference (GH_ER2)	<0.0005	0.0432	<0.001	0.0076	0.0028	399	8.4	<0.001	0.343	0.373	0.000745	0.00071	1.8	1.84	<0.00001	<0.00001	0.573	0.669	0.201	0.213	15.2	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	175	<0.05	<0.5	2.8	0.59	0.000619	0.000688	<0.0005	0.00085	<0.001	<0.003	1.917865002	3.931080399	-6.31099118	-1.30777639		
2020	Q3	Reference (CM_MC1)	<0.0005	0.0146	<0.001	<0.005	0.0034	485	8.3	0.0035	0.546	0.551	0.000242	0.000259	2.31	2.52	<0.00001	<0.00001	3.12	3.18	0.169	0.175	14.2	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	172	0.065	1.02	<1	0.17	0.000228	0.000228	<0.0005	0.00067	<0.001	<0.003	1.379819348	1.906706057	-5.46431756	-0.78171141		
2020	Q3	Reference (LC_SLC)	<0.0005	0.0894	<0.001	<0.005	<0.002	446	8.4	0.0021	0.358	0.351	0.00125	0.00115	2.18	2.18	<0.00001	<0.00001	0.836	0.785	0.152	0.14	45.5	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	206	<0.05	<0.5	<1	<0.1	0.00126	0.00135	<0.0005	<0.0005	0.0023	<0.003	1.912615714	4.169394503	-5.0627576	-3.54562301		
2020	Q4	Reference (FR_UFR1)	<0.0005	0.0061	<0.001	<0.005	0.0027	501	8.3	0.0033	0.392	0.397	0.000713	0.000682	1.62	1.66	<0.00001	<0.00001	0.624	0.639	0.0982	0.102	48.9	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	216	<0.05	0.68	<1	<0.1	0.00047	0.000519	<0.0005	<0.0005	<0.001	<0.003	1.5349026	1.226609329	-6.48669532	-2.84153417		
2020	Q4	Reference (GH_ER2)	<0.0005	0.108	<0.001	0.0063	0.0132	367	8.3	<0.001	0.358	0.388	0.000804	0.00082	1.78	1.92	<0.00001	<0.00001	0.718	0.81	0.219	0.208	20.6	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	163	0.051	0.79	8.8	0.9	0.000672	0.000702	<0.0005	<0.0005	0.0044	<0.003	1.805627474	3.520418887	-5.93844734	-0.9814929		
2020	Q4	Reference (CM_MC1)	<0.0005	0.0103	<0.001	0.0074	0.0046	158	8.2	0.0042	0.48	0.452	0.000216	0.000232	2.12	2.21	<0.00001	<0.00001	2.91	3.15	0.157	0.151	15.5	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	179	0.082	2.08	<1	0.17	0.000242	0.000236	<0.0005	<0.0005	<0.001	<0.003	1.220559022	1.663487168	-5.96800055	-0.73993641		
2020	Q4	Reference (LC_SLC)	<0.0005	0.0844	<0.001	0.0116	<0.002	368	8.4	<0.001	0.381	0.395	0.00152	0.00154	1.89	2.07	<0.00001	<0.00001	0.897	0.971	0.162	0.163	65.8	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	232	<0.05	1.16	<1	<0.1	0.00147	0.00164	<0.0005	<0.0005	0.0017	<0.003	1.671651899	4.459677775	-4.41841515	-3.261537		
2021	Q1	Reference (FR_UFR1)	<0.0005	0.166	<0.001	0.0603	0.0056	385	8.2	0.0186	0.389	0.392	0.000921	0.000986	1.93	1.91	<0.00001	<0.00001	0.734	0.752	0.103	0.101	46.9	<0.00001	<0.00001	<0.0001	<0.0001	<0.0003	<0.0003	194	<0.05	<0.5	<1	0.14	0.000506	0.000536	<0.0005	<0.0005	0.0022	<0.003	2.811250418	2.749884492	-5.9506364	-2.16725923	-5.4309	-4.2033
2021	Q1	Reference (GH_ER2)	<0.0005	0.0997	<0.001	<0.005	0.0015	457	7.9	<0.002	0.334	0.334	0.00101	0.00101	1.85	1.85	<0.00001	<0.00001	0.713	0.74	0.206	0.225	22.7	<0.00001	<0.00001	<0.0001	<0.0001	<0.0003	<0.0003	145	0.094	<0.5	1.1	0.11	0.000761	0.000819	<0.0005	<0.0005	0.0014	<0.003	3.022453491	2.962532232	-5.63696749	-2.73751463	-5.0501	-4.8599
2021	Q1	Reference (CM_MC1)	<0.0005	0.052	<0.001	0.0068	0.0043	476	8.1	0.0022	0.464	0.445	0.000317	0.000294	2.09	2.2	<0.00001	<0.00001	3.82	3.47	0.167	0.18	17	<0.00001	<0.00001	<0.0001	<0.0001	<0.0003	<0.0003	151	<0.05	0.74	<1	0.11	0.000255	0.00026	<0.0005	<0.0005	<0.001	<0.003	1.823140713	1.770948359	-5.65743491	-1.8998366	-5.0495	-4.4136
2021	Q1	Reference (LC_SLC)	<0.0005	0.206	<0.001	<0.005	0.0022	455	8.2	<0.002	0.417	0.422	0.00182	0.00171	2.24	2.21	<0.00001	<0.00001	1.17	1.21	0.185	0.192	76.9	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	260	<0.05	<0.5	<1	<0.1	0.0017	0.00185	<0.0005	<0.0005	0.0017	0.0031	5.068049328	4.982800343	-3.61852201	-3.7996352	-2.6989	-4.6764
2021	Q2	Reference (FR_UFR1)	0.00062	0.0859	<0.001	0.0115	0.0037	304	7.9	0.0282	0.33	0.397	0.000515	0.000423	1.67	2.09	<0.00001	<0.00001	0.503	0.523	0.0634	0.0617	8.79	<0.00001	<0.00001	<0.0001	<0.0001	<0.0003	0.00325	127	0.155	2.99	18.1	7.27	0.000293	0.000304	<0.0005	0.0009	<0.001	<0.003	2.817528708	2.767198531	-8.57589784	4.277618568	-9.5688	-0.0193
2021	Q2	Reference (GH_ER2)	0.00354	0.13	<0.001	0.0109	0.0016	278	8.1	0.188	0.374	0.804	0.000849	0.000916	1.75	3.33	<0.00001	0.000032	0.723	0.785	0.195	0.222	14.7	<0.00001	0.000048	<0.0001	<0.0001	<0.0003	0.00909	168	0.437	3.96	159	79	0.000711	0.000922	<0.0005	0.00442	<0.001	0.0157	8.191998928	8.12982746	-4.00682849	11.65231555	-7.4457	6.5333
2021	Q2	Reference (CM_MC1)	0.00134	0.0244	<0.001	<0.005	0.0039	214	8.1	0.0832	0.385	0.488	0.000201	0.000229	2.04	2.76	<0.00001	<0.00001	1.27	1.24	0.0807	0.0844	4.92	<0.00001	0.000028	<0.0001	<0.0001	0.00035	0.00978	136	0.062	5.74	23.9	11.8	0.00013	0.000175	<0.0005	0.00117	0.0022	0.0064	4.427028355	4.370369467	-8.45771951	9.807024452	-11.1373	4.5567
2021	Q2	Reference (LC_SLC)	0.00058	0.107	<0.001	<0.005	0.0015	206	7.9	0.0052	0.266	0.319	0.000521	0.000565	1.49	1.76	<0.00001	<0.00001	0.446	0.478	0.063	0.0723	8.24	<0.00001	<0.00001	<0.0001	<0.0001	<0.0003	0.00284	132	0.135	3.03	5.5	3.34	0.000535	0.000583	<0.0005	0.00054	0.0034	0.0051	3.123737399	3.067582769	-8.27512089	2.215451256	-9.0634	-1.1415
2021	Q3	Reference (FR_UFR1)	<0.0005	0.0169	<0.001	0.0272	0.0032	406	8.3	0.0044	0.474	0.475	0.000566	0.000604	2.16	2.15	<0.00001	<0.00001	0.657	0.676	0.104	0.102	34.6	<0.00001	<0.00001	<0.0001	<0.0001	<0.0003	<0.0003	211	0.083	2.19	<1	0.28	0.000429	0.000458	<0.0005	<0.0005	<0.001	<0.003	2.60819986	2.530946491	-5.89734213	-1.49764511	-5.2731	-3.8535
2021	Q3	Reference (GH_ER2)	<0.0005	0.03	<0.001	<0.005	<0.001	451	8.3	0.0098	0.348	0.359	0.00064	0.000726	1.66	1.82	<0.00001	<0.00001	0.586	0.597	0.206	0.2	14.1	<0.00001	<0.00001	<0.0001	<0.0001	<0.0003	<0.0012	148	<0.05	1.35	6.9	0.8	0.000601	0.000632	<0.0005	0.00064	<0.001	<0.003	3.015573883	2.976599121	-6.51638521	0.461524246	-6.6168	-2.8050
2021	Q3	Reference (CM_MC1)	<0.0005	0.0149	<0.001	<0.005	0.0048	462	8.3	0.007	0.56	0.568	0.000196	0.000172	2.4	2.48	<0.00001	<0.00001	3.04	3.13	0.157	0.159	13	<0.00001	<0.00001	<0.0001	<0.0001	<0.0003	<0.0003	164	0.078	1.33	<1	0.5	0.000219	0.000223	<0.0005	<0.0005	<0.001	<0.003	2.092181885	2.047903947	-5.72175944	-0.63318918	-5.1746	-3.5834
2021	Q3	Reference (LC_SLC)	<0.0005	0.101	<0.001	0.0071	<0.001	455	8.3	0.0052	0.355	0.391	0.00117	0.00133	2.05	2.15	<0.00001	<0.00001	0.758	0.839	0.14	0.142	42.9	<0.00001	<0.00001	<0.0001	<0.0001	<0.0003	<0.0003	187	0.054	0.93	<1	0.17	0.00128	0.00137	<0.0005	<0.0005	0.0026	<0.003	4.107471775	3.993425014	-4.94776626	-2.83384605	-4.2523	-4.7685
2021	Q4	Reference (FR_UFR1)	<0.0005	0.0599	<0.001	<0.005	0.0023	472	8.1	0.0037	0.414	0.417	0.000953	0.00075	1.83	1.83	<0.00001	<0.00001	0.688	0.692	0.101	0.104	45.8	<0.00001	<0.00001	<0.0001	<0.0001	<0.0003	<0.0003	202	<0.05	<0.5	<1	<0.1	0.000502	0.000525	<0.0005	<0.0005	0.0012	<0.003	2.66327393	2.626232377	-5.83969165	-2.94547914	-4.9880	-4.8480
2021	Q4	Reference (GH_ER2)	<0.0005	0.0629	<0.001	0.0131	<0.001	454	8.1	0.19	0.354	0.362	0.000876	0.000869	1.78	1.95	<0.00001	<0.00001	0.7	0.7	0.219	0.223	18.7	<0.00001	<0.00001	<0.0001	<0.0001	<0.0003	<0.0003	169	<0.05	<0.5	6.4	0.43	0.000735	0.000727	<0.0005	<0.0005	<0.001	<0.003	3.151042783	3.095863638	-5.97480826	-1.1962571	-5.7128	-4.0433
2021	Q4	Reference (CM_MC1)	<0.0005	0.0176	<0.001	0.0051	0.003	472	8.3	0.0057	0.494	0.47	0.000218	0.000178	2.24	2.24	<0.00001	<0.00001	3.35	3.05	0.173	0.163	13.4	<0.00001	<0.00001	<0.0001	<0.0001	<0.0003	<0.0003	166	<0.05	1.05	<1	<0.1	0.000255	0.000227	<0.0005	<0.0005	<0.001	<0.003	1.783014119	1.739122458	-5.87373031	-1.78098959	-5.0904	-4.5261
2021	Q4	Reference (LC_SLC)	<0.0005	0.0992	<0.001	<0.005	<0.001	438	8.1	<0.002	0.392	0.379	0.00154	0.00147	2.07	2.16	<0.00001	<0.00001	0.937	0.912	0.155	0.166	54.6	<0.00001	<0.00001	<0.0001	<0.0001	<0.0003	<0.0003	228	<0.05	-	<1	<0.1	0.00172	0.0017	<0.0005	<0.0005	0.0032	0.0033	4.283640453	4.219351092	-4.23383861	-3.47784588	-3.6150	-4.9390
Tests categorized as no adverse response (2015 - 2																																														
2015	Q1	GH_FR1	0.0023	13	0.0039	<0.0050	<0.0010	305	8.3	0.0036	1.2	1.2	0.051	0.052	2.1	2.1	<0.000010	<0.000010	2.3	2.4	0.16	0.16	233	<0.000010	<0.000010	<0.00010	<0.00010	0.011	0.011	621	<0.050	1.1	<1.0	0.18	0.0022	0.0022	<0.0010	<0.0010	<0.0030	<0.0030	8.14	3.10	2.601	-0.924		
2015	Q1	GH_ERC	<0.00050	0.44	<0.0010	<0.0050	<0.0010	512	8.3	0.0043	0.36	0.37	0.0019	0.0019	1.8	1.9	<0.000010	<0.000010	0.94	0.95	0.2	0.21	30	<0.000010	<0.000010	<0.00010	<0.00010	<0.010	<0.010	203	<0.050	0.5	2.6	0.41	0.00081	0.00084	<0.0010	<0.0010	<0.0030	0.0041	3.10	2.75	-4.483	0.815		
2015	Q1	CM_MC2	0.0097	2.4	0.012	0.0055	0.001	491	8.4	0.005	1.4	1.4	0.0059	0.006	2.1	2.2	<0.000010	<0.000010	10	10	0.29	0.3	249	0.000014	<0.000010	<0.00010	<0.00010	<0.010	<0.010	551	<0.050	0.82	1.7	0.53	0.0022	0.0023	<0.0010	<0.0010	<0.0030	0.0032	6.71	6.06	4.321	1.473		
2015	Q1	EV_MC2	0.00052	3.2	0.0013	<0.0050	<0.0010	302	8.3	0.0047	1.2	1.2	0.024	0.022	2.5	2.5	<0.000010	<0.000010	24	5.7	0.19	0.2	147	<0.000010	<0.000010	0.00018	<0.00010	0.014	0.013	438	0.13	1.2	1.2	0.31	0.0013	0.0012	<0.0010	<0.0010	0.0041	<0.0030	4.32	3.82	2.024	1.120		
2015	Q1	LC_LCDSSLCC	0.0036	15	0.003	<0.0050	<0.0010	294	8.3	0.0029	1.2	1.2	0.072	0.071	2.1	2.1	<0.000010	<0.000010	5.9	5.9	0.23	0.23	283	<0.000010	<0.000010	<0.00010	<0.00010	0.014	0.013	690	<0.050	0.9	<1.0	0.29	0.0039	0.004	<0.0010	<0.0010	0.0038	0.0039	9.61	4.67	4.467	-1.135		
2015	Q2	FR_FRCP1	0.0024	7.4	0.0056	0.0095	0.0014	345	8.4	0.018	1.2	1.2	0.03	0.03	1.6	1.6	<0.000010	<0.000010	1.2	1.2	0.11	0.11	126	<0.000010	<0.000010	<0.00010	<0.00010	<0.010	<0.010	372	<0.050	2.2	7.7	2.0	0.0015	0.0016	<0.00050	0.00054	<0.0030	<0.0030	5.89	4.23	0.562	1.420		
2015	Q2	GH_FR1	0.002	7.5	0.0028	<0.0050	<0.0010	302	8.4	0.01	1.0	1.1	0.031	0.032	1.8	2.0	<0.000010	<0.000010	1.6	1.7	0.12	0.12	136	<0.000010	<0.000010	<0.00010	<0.00010	<0.010	<0.010	398	<0.050	1.6	3.6	2.2	0.0016	0.0016	<0.00050	<0.00050	<0.0030	<0.0030	5.56	2.88	0.463	0.087		
2015	Q2	GH_ERC	<0.00050	0.31	<0.0010	<0.0050	<0.0010	473	8.4	0.016	0.38	0.41	0.0017	0.0018	1.8	2.0	<0.000010	<0.000010	0.98	0.97	0.21	0.21	25	<0.000010	<0.000010	<0.00010	<0.00010	<0.010	<0.010	203	0.12	1.3	7.0	1.6	0.00083	0.00084	<0.00050	0.0007	<0.0030	<0.0030	2.87	2.71	-4.717	1.254		
2015	Q2	CM_MC2	0.0076	1.2	0.0029	<0.0050	<0.0010	359	8.4	0.017	0.9	0.98	0.0043	0.0043	1.8	2.4	<0.000010	<0.000010	4.4	4.5	0.16	0.17	110	0.000011	0.000018	<0.00010	<0.00010	<0.010	0.011	314	0.12	1.8	9.6	5.8	0.0011	0.0011	<0.00050	0.00088	0.0031	0.0059	5.62	2.67	-0.182	4.418		
2015	Q2	EV_MC2	0.0014	0.81	<0.0010	<0.0050	<0.0010	355	8.1	0.037	0.54	0.67	0.0052	0.005	1.7	2.3	<0.000010	0.000017	2.1	2.1	0.1	0.093	41	0.000011	0.000025	<0.00010	<0.00010	<0.010	<0.010	195	0.28	2.5	23	4.7	0.00051	0.00048	<0.00050	0.0016	<0.0030	0.0041	3.89	3.92	-3.918	6.356		
2015	Q2	EV_HC1	0.00083	0.57	0.001	0.0084	0.0031	413	7.5	0.0081	0.53	0.55	0.019	0.018	1.1	1.2	0.00001	0.00001	0.81	0.82	0.062	0.061	79	0.00001	0.00001	0.0001	0.0001	0.01	0.01	233	0.13	1.4	2.6	1.2	0.0012	0.0012	0.0005	0.0005	0.003	0.003	2.68	5.40	-4.366	0.882		
2015	Q2	LC_DCDS	0.001	0.24	<0.0010	<0.0050	0.031	367	8.3	0.048	0.81	0.87	0.0013	0.0014	2.4	2.8	<0.000010	<0.000010	0.59	0.58	0.032	0.033	8.7	<0.000010	0.000012	<0.00010	<0.00010	<0.010	<0.010	114	0.14	2.9	3.9	11	0.00018	0.0002	0.0013	0.0021	<0.0030	0.0034	4.24	3.80	-6.589	7.219		
2015	Q3	FR_FRCP1	0.0043	8.2	0.0049	<0.0050	<0.0010	345	8.4	0.0027	1.9	1.8	0.057	0.057	1.9	2.0	<0.000010	<0.000010	1.6	1.6	0.13	0.13	234	<0.000010	<0.000010	<0.00010	<0.00010	<0.010	<0.010	566	0.14	0.93	2.6	0.47	0.0027	0.0028	<0.00050	<0.00050	<0.0030	<0.0030	6.74	4.55	3.740	-0.888		
2015	Q3	GH_FR1	0.0017	9.1	0.0046	0.0071	<0.0010	323	8.3	0.0036	1.2	1.2	0.035	0.036	2.0	2.1	<0.000010	<0.000010	1.8	1.8	0.13	0.13	154	<0.000010	<0.000010	<0.00010	0.00015	<0.010	<0.010	473	<0.050	0.86	1.2	0.33	0.0018	0.0018	<0.00050	<0.00050	<0.0030	<0.0030	6.12	2.58	1.368	-1.050		
2015	Q3	GH_ERC	<0.00050	0.17	<0.0010	<0.0050	<0.0010	320	8.3	0.0077	0.38	0.42	0.0011	0.0012	1.7	1.9	<0.000010	<0.000010	0.7	0.74	0.19	0.2	20	<0.000010	<0.000010	<0.00010	0.00016	<0.010	<0.010	179	<0.050	0.79	5.1	1.3	0.00065	0.00071	<0.00050	0.00058	<0.0030	<0.0030	2.57	2.15	-5.561	0.697		
2015	Q3	CM_MC2	0.013	2.5	0.0088	<0.0050	<0.0010	349	8.4	0.003	1.5	1.5	0.0062	0.0064	2.0	2.1	<0.000010	<0.000010	8.7	8.7	0.27	0.29	249	0.000014	0.000019	<0.00010	<0.00010	<0.010	<0.010	626	0.1	0.75	1.2	0.61	0.0024	0.0025	<0.00050	<0.00050	<0.0030	<0.0030	6.55	3.04	3.981	-0.219		
2015	Q3	EV_MC2	0.0048	5.7	0.0027	0.01	0.0027	356	8.1	0.0052	1.5	1.5	0.023	0.023	2.5	2.3	<0.000010	<0.000010	4.7	4.6	0.21	0.21	169	0.000013	0.000014	<0.00010	<0.00010	<0.010	<0.010	477	0.16	0.83	1.2	0.34	0.0019	0.0019	<0.00050	<0.00050	<0.0030	0.0031	5.63	4.72	4.044	-0.085		
2015	Q3	EV_HC1	0.00079	0.87	0.0011	<0.0050	0.004	352	8.4	0.0082	0.99	0.99	0.029	0.028	2.1	2.0	<0.000010	<0.000010	1.5	1.5	0.11	0.11	165	<0.000010	<0.000010	<0.00010	<0.00010	<0.010	<0.010	479	0.073	1.6	2.3	0.77	0.0023	0.0023	<0.00050	<0.00050	<0.0030	<0.0030	3.20	5.85	-0.409	-0.098		
2015	Q3	LC_LCDSSLCC	0.005	7.2	<0.0020	<0.0050	0.0018	354	8.4	0.0029	1.0	1.1	0.037	0.04	2.2	2.3	<0.000010	<0.000010	3.8	3.9	0.16	0.17	157	<0.000010	<0.000010	<0.00010	<0.00010	<0.010	<0.010	447	0.12	0.64	1.4	0.35	0.0026	0.0028	<0.00050	<0.00050	0.0092	0.011	6.66	3.87	2.901	-1.299		
2015	Q4	GH_FR1	0.0012	10	<0.0050	<0.0050	<0.0010	288	8.4	<0.0020	1.2	1.2	0.04	0.039	2.1	2.2	<0.000010	<0.000010	2.1	2.2	0.14	0.15	189	<0.000010	<0.000010	<0.00010	<0.00010	<0.010	<0.010	520	0.091	0.57	<1.0	0.3	0.0019	0.0019	<0.00050	<0.00050	<0.0030	<0.0030	6.44	2.46	1.760	-2.689		
2015	Q4	GH_ERC	<0.00050	0.46	<0.0010	<0.0050	0.0018	491	8.3	<0.0020	0.39	0.39	0.0015	0.0016	1.9	1.9	<0.000010	<0.000010	0.89	0.94	0.22	0.23	37	<0.000010	<0.000010	<0.00010	<0.00010	<0.010	<0.010	214	<0.050	0.52	<1.0	0.26	0.00077	0.00081	<0.00050	<0.00050	<0.0030	<0.0030	2.47	2.41	-4.802	-2.194		
2015	Q4	CM_MC2	0.006	2.2	<0.0050	<0.0050	<0.0010	275	8.3	<0.0020	1.5	1.5	0.006	0.0058	2.2	2.1	<0.000010	<0.000010	10	11	0.3	0.3	277	0.000011	<0.000010	<0.00010	<0.00010	<0.010	<0.010	627	0.11	0.83	6.6	0.99	0.0022	0.0022	<0.00050	<0.00050	<0.0030	<0.0030	4.88	2.84	3.252	-1.531		
2015	Q4	EV_MC2	0.0041	5.9	<0.0050	<0.0050	0.0035	370	8.2	0.0036	1.3	1.3	0.024	0.025	2.5	2.6	<0.000010	<0.000010	4.9	4.8	0.23	0.23	183	<0.000010	<0.000010	<0.00010	<0.00010	<0.010	<0.010	492	0.14	0.7	1.0	0.36	0.0019	0.0019	<0.00050	<0.00050	<0.0030	<0.0030	5.08	4.03	4.112	-1.407		
2015	Q4	EV_HC1	0.00069	1.2	<0.0050	<0.0050	0.0058	360	8.4	0.0057	0.85	0.9	0.033	0.037	2.0	2.1	<0.000010	<0.000010	1.6	1.7	0.13	0.13	218	<0.000010	<0.000010	<0.00010	<0.00010	<0.010	<0.010	529	0.096	0.74	<1.0	0.29	0.0026	0.0027	<0.00050	<0.00050	<0.0030	<0.0030	3.10	4.25	0.574	-2.233		
2015	Q4	LC_DCDS	<0.0025	<0.0050	0.0012	0.0094	0.0012	367	8.0	0.017	1.1	1.2	0.0016	0.0016	1.4	1.6	<0.000050	<0.000050	0.69	0.73	0.047	0.049	13	<0.000050	<0.000050	<0.00050	<0.00050	<0.010	<0.010	140	<0.050	2.7	4.2	1.9	0.00031	0.00033	<0.0025	<0.0025	0.011	<0.015	7.33	3.78	-0.178	15.348		
2015	Q4	LC_LC5	<0.0025	9.8	<0.0010	<0.0050	0.001	376	7.9	0.063	1.1	1.2	0.038	0.038	2.2	2.2	<0.000050	<0.000050	2.7	3.1	0.17	0.17	178	<0.000050	<0.000050	<0.00050	<0.00050	<0.010	<0.010	440	<0.050	1.2	<1.0	0.35	0.0021	0.0021	<0.0025	<0.0025	<0.0050	<0.015	11.92	7.38	5.740	12.534		
2015	Q4	LC_LCDSSLCC	0.0071	13	0.003	<0.0050	<0.0010	364	8.3	<0.0050	1.3	1.4	0.052	0.054	2.2	2.3	<0.000050	<0.000050	5.8	6.2	0.21	0.22	237	<0.000050	<0.000050	<0.00050	<0.00050	<0.010	<0.010	565	<0.050	0.99	<1.0	0.29	0.0038	0.004	<0.0025	<0.0025	0.0081	<0.015	13.3	10.15	8.561	11.707		
2016	Q1	GH_FR1	0.0014	13	< 0.0050	< 0.0050	< 0.0010	304	8.3	< 0.0020	1.2	1.1	0.052	0.05	2.2	2.2	< 0.000010	< 0.000010	2.2	2.1	0.16	0.16	247	< 0.000010	< 0.000010	< 0.00010	< 0.00010	0.017	0.017	622	< 0.050	0.71	< 1.0	0.35	0.0022	0.0022	< 0.00050	< 0.00050	< 0.0030	< 0.0030	7.37	2.61	2.056	-2.973		
2016	Q1	GH_ERC	< 0.00050	0.76	< 0.0010	< 0.0050	< 0.0010	312	8.2	< 0.0020	0.38	0.39	0.0023	0.0023	1.8	1.9	< 0.000010	< 0.000010	1.0	1.0	0.24	0.24	61	< 0.000010	< 0.000010	< 0.00010	< 0.00010	0.012	0.012	256	< 0.050	< 0.50	< 1.0	0.24	0.00099	0.00095	< 0.00050	< 0.00050	< 0.0030	< 0.0030	2.65	1.85	-4.189	-2.624		
2016	Q1	CM_MC2	0.0098	2.9	0.012	< 0.0050	< 0.0010	500	8.3	< 0.0020	1.5	1.6	0.0054	0.0058	2.2	2.3	< 0.000010	< 0.000010	12	13	0.33	0.32	291	0.00001	0.000018	< 0.00010	< 0.00010	< 0.010	< 0.010	639	0.095	0.69	< 1.0	0.57	0.0026	0.0024	< 0.00050	< 0.00050	< 0.0030	< 0.0030	6.36	2.81	4.813	-0.752		
2016	Q1	EV_MC2	0.0026	5.1	< 0.0050	< 0.0050	< 0.0010	308	8.1	0.0023	1.2	1.1	0.022	0.021	2.3	2.4	< 0.000010	< 0.000010	5.1	4.9	0.2	0.21	174	< 0.000010	0.00001	< 0.00010	< 0.00010	0.015	0.016	482	0.11	0.77	< 1.0	0.77	0.0017	0.0017	< 0.00050	< 0.00050	< 0.0030	< 0.0030	4.49	3.63	3.051	-1.034		
2016	Q1	EV_HC1	< 0.0010	1.2	< 0.0050	< 0.0050	0.0041	294	8.3	0.0045	0.87	0.86	0.04	0.037	2.0	2.0	< 0.000010	< 0.000010	1.7	1.7	0.13	0.13	222	< 0.000010	< 0.000010	< 0.00010	< 0.00010	0.015	0.015	504	0.081	1.0	< 1.0	0.25	0.0027	0.0028	< 0.00050	< 0.00050	< 0.0030	< 0.0030	3.07	5.52	0.525	-1.989		

Year	Quarter	Sample ID	NICKEL-T-mg/l	NITRATE NITROGEN (NO3), AS N-N-mg/l	NITRITE NITROGEN (NO2), AS N-N-mg/l	NITROGEN, AMMONIA (AS N)-N-mg/l	ORTHO-PHOSPHATE-N-mg/l	OXIDATION-REDUCTION POTENTIAL, LAB-N-mv	pH, LAB-N-ph units	PHOSPHORUS-N-mg/l	POTASSIUM-D-mg/l	POTASSIUM-T-mg/l	SELENIUM-D-mg/l	SELENIUM-T-mg/l	SILICON-D-mg/l	SILICON-T-mg/l	SILVER-D-mg/l	SILVER-T-mg/l
2016	Q1	LC_LCDSSLCC	0.0034	11	0.0098	< 0.0050	0.0011	295	8.3	< 0.0020	1.4	1.4	0.036	0.035	2.2	2.3	< 0.000010	< 0.000010
2016	Q2	GH_FR1	0.0022	6.5	0.0025	< 0.0050	0.002	337	8.3	0.013	1.1	1.1	0.028	0.029	2.0	2.1	< 0.000010	< 0.000010
2016	Q2	GH_ERC	0.00067	0.41	< 0.0010	< 0.0050	< 0.0010	337	8.3	0.027	0.41	0.55	0.0023	0.002	1.9	2.4	< 0.000010	< 0.000010
2016	Q2	CM_MC2	0.011	2.0	0.0037	0.0074	0.0028	345	8.2	0.022	1.0	1.1	0.0062	0.0057	2.1	2.6	< 0.000010	< 0.000010
2016	Q2	EV_MC2	0.0022	0.78	< 0.0010	< 0.0050	0.013	312	8.1	0.039	0.55	0.64	0.0036	0.0033	2.0	2.8	< 0.000010	0.000017
2016	Q2	EV_HC1	0.0012	0.82	< 0.0010	< 0.0050	0.0054	323	8.3	0.01	0.78	0.87	0.031	0.031	1.9	2.2	< 0.000010	< 0.000010
2016	Q2	LC_DCDS	0.0011	0.4	<0.0010	<0.0050	0.032	369	8.2	0.048	0.86	0.91	0.0017	0.0017	2.5	2.8	<0.000010	0.00001
2016	Q2	LC_LC5	0.002	5.9	0.0012	<0.0050	<0.0010	378	8.3	0.016	0.89	0.98	0.022	0.022	2.0	2.2	<0.000010	<0.000010
2016	Q2	LC_LCDSSLCC	0.0048	6.3	< 0.0010	< 0.0050	< 0.0010	362	8.3	0.0027	0.94	0.99	0.018	0.019	2.0	2.1	< 0.000010	< 0.000010
2016	Q3	FR_FRCP1	0.0052	12	< 0.0050	< 0.0050	0.0011	365	8.4	0.0027	1.5	1.6	0.054	0.056	1.8	1.9	< 0.000010	< 0.000010
2016	Q3	GH_FR1	0.0015	9.6	0.0056	< 0.0050	< 0.0010	374	8.3	0.0061	1.2	1.2	0.034	0.037	2.1	2.2	< 0.000010	< 0.000010
2016	Q3	GH_ERC	< 0.00050	0.2	< 0.0010	< 0.0050	< 0.0010	370	8.2	0.0049	0.39	0.42	0.00098	0.0010	1.7	1.7	< 0.000010	< 0.000010
2016	Q3	CM_MC2	0.013	2.7	< 0.0050	< 0.0050	< 0.0010	385	8.4	< 0.0020	1.8	1.7	0.0059	0.006	1.8	1.8	< 0.000010	< 0.000010
2016	Q3	EV_MC2	0.0024	6.5	< 0.0050	0.0073	0.004	323	8.1	0.0052	1.5	1.6	0.026	0.026	2.8	2.8	< 0.000010	< 0.000010
2016	Q3	EV_HC1	0.0009	0.84	0.0016	0.0088	0.0064	312	8.3	0.012	0.9	0.98	0.031	0.032	2.1	2.3	< 0.000010	< 0.000010
2016	Q3	LC_LCDSSLCC	0.0046	8.6	< 0.0050	< 0.0050	0.0021	341	8.4	0.0027	1.1	1.4	0.027	0.027	2.2	2.1	< 0.000010	< 0.000010
2016	Q4	FR_FRCP1	0.0047	10	< 0.0050	< 0.0050	< 0.0010	344	8.4	< 0.0020	1.5	1.4	0.054	0.051	1.7	1.7	< 0.000010	< 0.000010
2016	Q4	GH_FR1	0.002	8.8	<0.005	<0.005	<0.001	360	8.3	0.0023	1.2	1.3	0.041	0.039	2.1	2.1	<0.00001	<0.00001
2016	Q4	GH_ERC	0.00086	0.28	< 0.0010	< 0.0050	< 0.0010	387	8.3	< 0.0020	0.39	0.41	0.0014	0.0014	1.8	1.8	< 0.000010	< 0.000010
2016	Q4	CM_MC2	0.0083	1.8	0.01	0.0076	0.0016	339	8.3	0.0063	1.2	1.3	0.0041	0.0044	2.0	2.4	< 0.000010	< 0.000010
2016	Q4	EV_MC2	0.0012	1.2	0.001	< 0.0050	0.0081	281	8.2	0.014	0.63	0.75	0.0054	0.006	2.1	2.6	< 0.000010	< 0.000010
2016	Q4	EV_HC1	0.00087	1.0	< 0.0050	< 0.0050	0.0061	337	8.4	0.0079	0.99	1.0	0.032	0.032	2.0	2.3	< 0.000010	< 0.000010
2016	Q4	LC_DCDS	0.0017	0.47	0.0077	0.02	0.021	328	8.2	0.05	1.2	1.3	0.0024	0.0023	2.5	2.7	<0.000010	0.000015
2016	Q4	LC_LC5	0.0015	7.9	<0.0050	<0.0050	<0.0010	357	8.4	<0.0020	1.1	1.1	0.029	0.029	2.0	2.1	<0.000010	<0.000010
2016	Q4	LC_LCDSSLCC	0.0038	7.3	< 0.0050	< 0.0050	0.0013	367	8.3	< 0.0020	1.1	1.1	0.024	0.023	2.0	2.0	< 0.000010	< 0.000010
2017	Q1	FR_FRCP1	0.01	20	0.02	0.0066	<0.001	-	8.3	0.0054	-	2.4	0.17	0.15	-	-	<0.00001	<0.00001
2017	Q1	GH_FR1	0.0013	13	<0.005	<0.005	0.0011	-	8.3	0.0039	-	1.2	0.057	0.051	-	-	<0.00001	<0.00001
2017	Q1	GH_ERC	<0.0005	0.45	<0.001	<0.005	0.001	-	8.2	<0.002	-	0.4	0.0018	0.0017	-	-	<0.00001	<0.00001
2017	Q1	CM_MC2	0.025	4.2	0.018	0.012	0.0022	-	8.3	0.0043	-	1.9	0.0079	0.0072	-	-	<0.00001	<0.00001
2017	Q1	EV_MC2	0.0025	3.5	<0.001	0.0075	0.0044	-	8.2	0.0056	-	1.2	0.016	0.016	-	-	<0.00001	<0.00001
2017	Q1	EV_HC1	0.00078	1.2	<0.001	0.0052	0.0068	-	8.3	0.0077	-	0.92	0.036	0.038	-	-	<0.00001	<0.00001
2017	Q1	LC_LCDSSLCC	0.0038	12	<0.005	<0.005	0.0024	-	8.3	0.0052	-	1.4	0.034	0.036	-	-	<0.00001	<0.00001
2017	Q2	FR_FRCP1	0.0056	12	0.0045	0.026	0.0028	-	8.4	0.042	-	1.5	0.058	0.051	-	-	<0.00001	0.000025
2017	Q2	GH_FR1	0.0048	6.7	<0.005	<0.005	0.0038	-	8.4	0.029	-	1.6	0.043	0.041	-	-	<0.00001	0.000021
2017	Q2	GH_ERC	<0.0005	0.5	<0.001	<0.005	<0.001	-	8.4	0.01	-	0.45	0.0024	0.0023	-	-	<0.00001	<0.00001
2017	Q2	CM_MC2	0.024	2.2	0.013	0.073	<0.001	-	8.2	0.018	-	1.4	0.0056	0.0048	-	-	<0.00001	<0.00001
2017	Q2	CM_MC2	0.027	2.3	0.013	0.052	<0.001	-	8.3	0.0098	-	1.9	0.0058	0.0061	-	-	<0.00001	<0.00001
2017	Q2	EV_MC2	0.0019	1.1	0.0011	0.024	0.0041	-	8.1	0.033	-	0.78	0.0072	0.0064	-	-	<0.00001	<0.00001
2017	Q2	EV_HC1	0.0013	0.85	<0.001	<0.005	0.0044	-	8.3	0.016	-	1.0	0.035	0.03	-	-	<0.00001	<0.00001
2017	Q2	LC_DCDS	0.0018	0.54	0.0014	0.027	0.032	375	8.1	0.06	0.99	1.1	0.0013	0.0013	2.5	2.7	<0.000010	<0.000010
2017	Q2	LC_LC5	0.0015	9.5	0.0047	<0.0050	0.0041	342	8.4	0.019	1.3	1.2	0.041	0.034	2.1	2.3	<0.000010	<0.000010
2017	Q2	LC_LCDSSLCC	0.0055	15	0.004	<0.005	0.0016	-	8.3	<0.002	-	1.6	0.046	0.041	-	-	<0.00001	<0.00001
2017	Q3	FR_FRCP1	0.005	8.9	0.0041	0.0084	0.002	-	8.3	0.0071	-	1.8	0.065	0.063	-	-	<0.00001	<0.00001
2017	Q3	GH_FR1	0.0028	9.5	0.0072	0.0074	<0.001	-	8.4	0.005	-	1.3	0.047	0.044	-	-	<0.00001	<0.00001
2017	Q3	GH_ERC	<0.0005	0.19	<0.001	0.0063	<0.001	-	8.4	0.0086	-	0.42	0.0013	0.0012	-	-	<0.00001	<0.00001
2017	Q3	CM_MC2	0.029	3.1	0.024	0.02	<0.001	-	8.5	0.009	-	1.7	0.0078	0.0075	-	-	<0.00001	<0.00001
2017	Q3	EV_MC2	0.0021	2.2	0.0032	0.0082	<0.001	-	8.4	0.0032	-	1.1	0.012	0.013	-	-	<0.00001	<0.00001
2017	Q3	EV_HC1	0.00093	0.79	<0.001	<0.005	0.0054	-	8.4	0.0072	-	0.87	0.033	0.035	-	-	<0.00001	<0.00001
2017	Q3	LC_LCDSSLCC	0.0059	10	0.0041	0.0067	0.0021	-	8.4	0.0052	-	1.2	0.041	0.036	-	-	<0.00001	<0.00001
2017	Q4	FR_FRCP1	0.0088	15	0.0082	0.0051	<0.001	-	8.2	<0.002	-	2.1	0.14	0.12	-	-	<0.00001	<0.00001
2017	Q4	GH_FR1	0.0018	11	0.0057	0.0067	<0.001	-	8.2	0.0026	-	1.2	0.067	0.057	-	-	<0.00001	<0.00001
2017	Q4	GH_ERC	<0.0005	0.25	0.0022	<0.005	<0.001	-	8.4	<0.002	-	0.39	0.0014	0.0012	-	-	<0.00001	<0.00001
2017	Q4	CM_MC2	0.017	3.7	0.0099	0.0075	<0.001	-	8.3	0.005	-	2.1	0.0092	0.0087	-	-	<0.00001	<0.00001
2017	Q4	EV_MC2	0.00091	2.7	0.0017	0.025	0.0014	-	8.3	0.0029	-	1.1	0.019	0.018	-	-	<0.00001	<0.00001
2017	Q4	EV_HC1	0.00078	0.86	<0.001	0.024	0.0048	-	8.5	0.0098	-	0.87	0.041	0.037	-	-	<0.00001	<0.00001
2017	Q4	LC_DCDS	0.0011	4.4	0.062	0.088	0.0063	250	8.3	0.011	1.6	1.6	0.0088	0.0083	2.4	2.4	<0.000010	<0.000010
2017	Q4	LC_LC5	0.0013	8.9	0.0041	<0.0050	<0.0010	291	8.2	<0.0020	1.1	1.2	0.044	0.039	2.1	2.1	<0.000010	<0.000010
2017	Q4	LC_LCDSSLCC	0.0057	9.6	0.0013	0.0066	<0.001	-	8.2	<0.002	-	1.5	0.042	0.037	-	-	<0.00001	<0.00001
2018	Q1	GH_FR1	0.0014	12	<0.005	<0.005	0.0013	272	8.3	0.0027	1.1	1.2	0.059	0.059	2.3	2.5	<0.00001	<0.00001
2018	Q1	GH_ERC	<0.0005	0.55	<0.001	<0.005	<0.001	280	8.1	<0.002	0.32	0.35	0.002	0.0019	0.0017	1.9	<0.00001	<0.00001
2018	Q1	CM_MC2	0.014	4.1	0.012	0.0093	0.0015	302	8.4	0.0035	1.7	1.7	0.0087	0.0091	2.4	2.3	<0.00001	<0.00001
2018	Q1	CM_MC3	0.0013	1.1	<0.001	<0.005	0.0015	327	8.3	0.0026	0.57	0.58	0.0031	0.0032	1.7	1.6	<0.00001	<0.00001
2018	Q1	EV_MC2	0.0042	3.2	0.0014	0.012	0.0016	317	8.4	0.0039	1.1	1.2	0.02	0.021	2.5	2.6	<0.00002	<0.00001
2018	Q1	EV_HC1	0.00054	1.2	<0.001	0.016	0.0068	332	8.5	0.0089	0.87	0.85	0.042	0.044	2.2	2.3	<0.00001	<0.00001
2018	Q1	LC_LCDSSLCC	0.0041	12	0.0013	0.0075	<0.001	429	8.3	0.0014	1.4	1.5	0.059	0.062	2.2	2.3	<0.00002	<0.00001
2018	Q2	GH_FR1	0.0065	4.8	0.0049	0.0085	0.0077	264	8.4	0.064	1.3	1.7	0.03	0.034	2.3	3.9	<0.00001	0.000037
2018	Q2	GH_ERC	0.0016	0.71	<0.001	0.0095	0.0016	282	8.4	0.055	0.5	0.77	0.0042	0.0046	0.002	3.2	<0.00001	0.000015
2018	Q2	CM_MC2	0.022	1.7	0.011	0.048	0.0015	246	8.5	0.018	1.5	1.4	0.0048	0.0052	2.2	2.6	<0.00001	<0.00001
2018	Q2	EV_MC2	0.0028	1.4	0.0013	0.0099	0.0092	270	8.3	0.053	0.93	1.0	0.0099	0.011	2.4	3.3	<0.00001	0.000021
2018	Q2	EV_HC1	0.0011	0.63	<0.001	0.012	0.0049	294	8.5	0.018	0.78	0.78	0.022	0.021	2.0	2.1	<0.00001	<0.00001
2018	Q2	LC_DCDS	0.0056	8.5	0.088	0.17	0.028	280	8.1	0.07	2.0	1.8	0.014	0.013	2.5	2.8	<0.000010	0.000021
2018	Q2	LC_LC5	0.003	6.9	0.0036	0.0084	0.0014	271	8.4	0.051	1.2	1.2	0.031	0.033	2.2	2.9	<0.000010	<0.000010
2018	Q2	LC_LCDSSLCC	0.0055	9.6	0.0011	0.0061	0.0014	321	8.4	0.0065	1.4	1.2	0.044	0.045	2.0	2.1	<0.00001	<0.00001
2018	Q3	FR_FRCP1	0.0067	11	0.0061	0.025	<0.001	325	8.4	0.0092	2.1	1.9	0.074	0.078	1.9	2.0	<0.00001	<0.00001
2018	Q3	GH_FR1	0.0027	9.0	0.009	0.037	<0.001	390	8.3	0.0046	1.4	1.4	0.051	0.054	2.1	2.3	<0.00001	<0.00001
2018	Q3	GH_ERC	0.00052	0.29	<0.001	0.012	<0.001	400	8.2	0.0058	0.4	0.39	0.0016	0.0015	0.0018	1.9	<0.00001	<0.00001
2018	Q3	CM_MC2	0.057	4.1	0.038	0.061	<0.001	152	8.2	0.0038	2.6	2.5	0.0077	0.0088	2.0	2.3	<0.00001	<0.00001
2018	Q3	CM_MC3	0.018	1.9	0.012	0.026	<0.001	154	8.4	0.0047	1.3	1.2	0.004	0.0046	1.7	1.9	<0.00001	<0.00001
2018	Q3	EV_MC2	0.0055	3.2	0.0052	0.02	0.0015	367	8.4	0.0051	1.7	1.6	0.022	0.025	2.5	2.7	<0.00001	<0.00001
2018	Q3	EV_HC1	0.00073	0.68	0.0025	0.018	<0.001	327	8.5	0.0052	0.97	0.92	0.033	0.037	2.1	2.3	<0.00001	<0.00001
2018	Q3	LC_LCDSSLCC	0.0078	9.6	0.0047	0.016	<0.001	323	8.4	0.004	1.4	1.4	0.052	0.051	2.3	2.6	<0.00001	<0.00001
2018	Q4	FR_FRABCH	0.00063	20	<0.005	0.015	0.0015	490	8.3	0.0021	1.9	1.8	0.095	0.091	2.3	2.4	<0.00001	<0.00001
2018	Q4	GH_FR1	0.002	11	<0.005	0.011	0.002	449	8.5	<0.002	1.4	1.3	0.063	0.06	2.2	2.3	<0.00001	<0.00001
2018	Q4	GH_ERC	<0.0005	0.35	<0.001	0.014	0.0014	454	8.4	<0.002	0.41	0.46	0.0017	0.0016	0.002	2.3	<0.00001	<0.00001
2018	Q4	CM_MC2	0.046	3.6	0.034	0.091	0.0029	411	8.4	0.0041	2.2	2.1	0.0067	0.0066	2.3	2.4	<0.00001	<0.00001
2018	Q4	EV_MC2	0.0057	1.9	0.0012	<0.005	0.002	307	8.4	0.0047	1.1	1.1	0.014	0.012	2.2	2.4	<0.00001	<0.00001
2018	Q4	EV_HC1	0.00066	0.84	<0.005	<0.005	0.0044	306	8.4	0.01	0.95	0.9	0.042	0.041	2.1	2.3	<0.00001	<0.00001
2018	Q4	LC_DCDS	0.0057	19	0.037	0.036	0.0014	331	8.4	0.017	2.3	2.4	0.03	0.027	1.6	1.9	<0.000010	<0.000010
2018	Q4	LC_LC5	0.0012	8.6	0.0031	0.016	0.0022	388	8.4	0.012	1.1	1.2	0.05	0.042	2.0	2.2	<0.000010	<0.000010
2018	Q4	LC_LCDSSLCC	0.0054	8.6	<0.005	0.023	0.0018	351	8.4	<0.002	1.6	1.8	0.054	0.044	2.0	2.3	<0.00001	<0.00001
2019	Q1	FR_FRABCH	<0.0005	21	0.008	0.0084	0.0025	410	8.2	0.0128	1.47	1.52	0.106	0.089	2.22	2.33	<0.00001	<0.00001
2019	Q1	GH_FR1	0.00174	11	0.0086	0.0067	0.0019	438	8.2	0.0025	1.12	1.17	0.074	0.06	2.33	2.41	<0.00001	<0.00001
2019	Q1	GH_ERC	<0.0005	0.54	0.0019	0.0099	0.0011	425	8.1	<0.002	0.32	0.33	0.002	0.0018	1.6	1.7	<0.00001	<0.00001
2019	Q1	CM_MC2	0.013	3.3	0.012	0.0087	0.0024	417	8.2	0.0047	1.8	1.7	0.0094	0.0078	2.5	2.4	<0.00001	<0.00001
2019	Q1	EV_MC2	0.00072	2.0	0.0017	0.023	0.0039	347	8.2	0.0056	0.91	0.83	0.02	0.016	2.5	2.3	<0.00001	<0.00001
2019	Q1	EV_HC1	0.00052	1.2	<0.001	0.014	0.0073	407	8.2	0.0082	0.83	0.84	0.048	0.04	2.1	2.2	<0.00001	<0.00001
2019	Q1	LC_DCDS	0.0034	16	0.0086	0.0099	0.031	370	8.2	0.026	2.2	2.1	0.022	0.019	2.7	2.8	<0.00001	<0.00001
2019	Q1	LC_LC3	0.0059	7.5	<0.005	0.0077	<0.001	382	8.2	0.0057	2.0	2	0.034	0.028	2.0	2.1	<0.00001	<0.00001
2019	Q1	LC_LC5	0.00067	9.5	0.0019	0.0077	<0.001	375	8.3	<0.002	0.99	1.0	0.05	0.044	2.3	2.4	<0.00001	<0.00001
2019	Q1	LC_LCDSSLCC	0.0028	8.1	0.0085	<0.005	0.002	392	8.2	<0.002	1.3	1.3	0.038	0.032	2.3	2.4	<0.00001	<0.00001
2019	Q2	FR_FRABCH	0.002	20	<0.005	0.008	<0.001	437	8.3	0.0039	1.9	2.0	0.095	0.087	1.8	2.0	<0.00001	<0.00001
2019	Q2	FR_FRCP1	0.0085	12	0.0086	0.036	<0.001	409	8.4	0.0024	1.7	1.7	0.068	0.063	1.4	1.5	<0.00001	<0.00001
2019	Q2	GH_FR1	0.0025	9.6	0.007	0.034	<0.001	421	8.3	0.003	1.3	1.3	0.072	0.059	2.0	2.1	<0.00001	<0.00001
2019	Q2	GH_ERC	<0.0005	0.56	0.0011	0.012	<0.001	499	8.2	0.0036	0.33	0.36	0.0029	0.0024	1.7	1.8	<0.00001	<0.00001
2019	Q2	CM_MC2	0.0084	2.0	0.0026	0.015	<0.001	406	8.4	0.004	1.1	1.2	0.0086	0.0071	1.9	2.0	<0.00001	<0.00001
2019	Q2	EV_MC2	0.00097	0.61	<0.001	<0.005	<0.001	416	8.3	0.0047	0.66	0.66	0.0058	0.0051	1.7	1.8	<0.00001	<0.00001
2019	Q2	EV_HC1	0.00082	0.86	<0.001	<0.005	0.0022	411	8.5	0.008	0.88	0.96	0.043	0.037	1.7	1.9	<0.00001	<0.00001
2019	Q2	LC_DCDS	0.0045	12	0.015	0.022	<0.001	413	8.7	0.012	1.7	1.7	0.02	0.02	0.99	1.8	<0.00001	<0.00001
2019	Q2	LC_LC3	0.0064	13	<0.005	<0.005	0.0011	454	8.2	0.0033	1.5	2	0.044	0.041	1.9	2.0	<0.00001	<0.00001
2019	Q2	LC_LC5	0.00094	9.7	0.0031	<0.005	<0.001	437	8.3	0.0037	1.1	1.1	0.047	0.046	1.7	1.9	<0.00001	<0.00001
2019	Q2	LC_LCDSSLCC	0.0031	8.5	0.001	0.02	0.001	490	8.3	0.0036	1.1	1.2	0.033	0.03	2.0	2.0	<0.00001	<0.00001
2019	Q3	GH_ERC	0.00066	0.22	<0.001	0.0092	<0.001	342	8.3	<0.002	0.38	0.38	0.0016	0.0014	1.9	1.9	<0.00001	<0.00001
2019	Q3	LC_DCDS	0.0074	16	0.058	0.038	<0.001	398	8.4	0.019	1.9	2.2	0.034	0.033	1.5	1.7	<0.00001	<0.00001
2019	Q4	FR_FRABCH	0.0012	19	<0.005	0.016	0.0014	316	8.3	0.065	1.6	1.7	0.082	0.077	2.6	2.4	<0.00001	<0.00001
2019	Q4	FR_FRCP1	0.0098	17	0.011	0.059	<0.001	388	8.3	0.0021	2.2	2.3	0.12	0.13	1.9	1.9	<0.00001	<0.00001
2019	Q4	GH_FR1	0.0012	10	0.0032	<0.005	<0.001	500	8.3	<0.002	1.2	1.3	0.055	0.053	2.4	2.5	<0.00001	<0.00001
2019	Q4	GH_ERC	<0.0005	0.73	<0.001	0.0055	<0.001	512	8.2	<0.002	0.41	0.44	0.0028	0.0024	2.0	2.1	<0.00001	<0.00001
2019	Q4	CM_MC2	0.021	2.9	0.0037	0.0072	<0.001	307	8.4	0.018	1.8	2.0	0.012	0.0093	2.2	2.9	<0.00001	<0.00001
2019	Q4	EV_MC2	0.0016	1.8	0.0014	0.01	0.0038	356	8.3	0.0035	0.97	0.94	0.015	0.014	2.3	2.4	<0.00001	<0.00001
2019	Q4	EV_HC1	0.00055	0.96	0.001	0.0066	0.0065	325	8.3	0.0058	0.83	0.82	0.041	0.04	2.1	2.1	<0.00001	<0.00001
2019	Q4	LC_DCDS	0.0059	27	0.019	0.097	0.026	315	8.2	0.026	2.2	2.4	0.053	0.048	2.5	2.7	<0.00001	<0.00001

Year	Quarter	Sample ID	SODIUM-D-mg/l	SODIUM-T-mg/l	STRONTIUM-D-mg/l	STRONTIUM-T-mg/l	SULFATE (AS SO4)-D-mg/l	THALLIUM-D-mg/l	THALLIUM-T-mg/l	TIN-D-mg/l	TIN-T-mg/l	TITANIUM-D-mg/l	TITANIUM-T-mg/l	TOTAL DISSOLVED SOLIDS (RESIDUE, FILTERABLE)-N-mg/l	TOTAL KJELDAHL NITROGEN-N-mg/l	TOTAL ORGANIC CARBON-T-mg/l	TOTAL SUSPENDED SOLIDS, LAB-N-mg/l	TURBIDITY, LAB-N-ntu	URANIUM-D-mg/l	URANIUM-T-mg/l	VANADIUM-D-mg/l	VANADIUM-T-mg/l
2016	Q1	LC_LCDSSLCC	6.7	6.9	0.23	0.24	303	< 0.000010	< 0.000010	< 0.00010	< 0.00010	0.017	0.018	713	0.07	< 0.50	< 1.0	0.35	0.0039	0.0039	< 0.00050	< 0.00050
2016	Q2	GH_FR1	1.4	1.4	0.11	0.1	121	< 0.000010	< 0.000010	< 0.00010	< 0.00010	< 0.010	< 0.010	366	0.2	2.0	7.1	3.0	0.0015	0.0015	< 0.00050	0.0006
2016	Q2	GH_ERC	0.95	0.94	0.21	0.2	33	< 0.000010	0.000014	< 0.00010	< 0.00010	< 0.010	< 0.010	191	0.19	2.2	23	5.7	0.00085	0.00085	< 0.00050	0.0014
2016	Q2	CM_MC2	5.6	5.5	0.18	0.18	131	0.00001	0.00002	< 0.00010	< 0.00010	< 0.010	0.012	401	0.2	2.2	15	6.5	0.0013	0.0012	< 0.00050	0.00085
2016	Q2	EV_MC2	1.8	1.7	0.088	0.092	36	< 0.000010	0.000023	< 0.00010	< 0.00010	< 0.010	0.015	165	0.2	3.3	25	11	0.00052	0.00058	< 0.00050	0.0019
2016	Q2	EV_HC1	1.3	1.3	0.096	0.099	120	< 0.000010	0.000014	< 0.00010	< 0.00010	0.013	0.015	378	0.19	2.5	5.9	3.1	0.002	0.0021	< 0.00050	0.00077
2016	Q2	LC_DCDS	0.45	0.46	0.033	0.033	8.0	<0.000010	0.000015	<0.00010	<0.00010	<0.010	0.01	114	0.13	3.1	6.5	9.3	0.00019	0.0002	0.0014	0.0024
2016	Q2	LC_LC5	1.9	2.0	0.11	0.12	105	<0.000010	<0.000010	<0.00010	<0.00010	0.013	0.014	359	0.22	2.2	16	4.2	0.0016	0.0016	<0.00050	0.00063
2016	Q2	LC_LCDSSLCC	3.4	3.6	0.13	0.13	110	0.00001	< 0.000010	< 0.00010	< 0.00010	0.011	0.012	352	0.18	1.8	< 1.0	0.94	0.0022	0.0023	< 0.00050	< 0.00050
2016	Q3	FR_FRCP1	1.5	1.6	0.14	0.14	249	< 0.000010	< 0.000010	< 0.00010	< 0.00010	< 0.010	< 0.010	611	0.17	1.3	1.4	0.36	0.003	0.003	< 0.00050	< 0.00050
2016	Q3	GH_FR1	1.8	1.9	0.13	0.14	168	< 0.000010	< 0.000010	< 0.00010	< 0.00010	< 0.010	< 0.010	477	0.15	1.3	< 1.0	0.43	0.002	0.002	< 0.00050	< 0.00050
2016	Q3	GH_ERC	0.72	0.7	0.21	0.2	26	< 0.000010	< 0.000010	< 0.00010	< 0.00010	< 0.010	< 0.010	195	0.055	0.65	< 1.0	1.1	0.0007	0.00067	< 0.00050	< 0.00050
2016	Q3	CM_MC2	11	11	0.32	0.34	277	0.000017	0.000014	< 0.00010	< 0.00010	< 0.010	< 0.010	644	0.13	1.2	1.5	0.37	0.0026	0.0027	< 0.00050	< 0.00050
2016	Q3	EV_MC2	6.5	6.6	0.23	0.24	214	0.000011	0.000012	< 0.00010	< 0.00010	< 0.010	< 0.010	570	0.14	0.96	< 1.0	0.3	0.0015	0.0015	< 0.00050	< 0.00050
2016	Q3	EV_HC1	1.5	1.6	0.12	0.12	176	< 0.000010	< 0.000010	< 0.00010	< 0.00010	< 0.010	< 0.010	496	0.096	1.5	2.7	2.6	0.0023	0.0023	< 0.00050	< 0.00050
2016	Q3	LC_LCDSSLCC	5.3	5.1	0.2	0.19	187	< 0.000010	< 0.000010	< 0.00010	< 0.00010	< 0.010	< 0.010	508	< 0.050	0.52	< 1.0	0.28	0.0029	0.0024	< 0.00050	< 0.00050
2016	Q4	FR_FRCP1	1.4	1.5	0.14	0.14	245	< 0.000010	< 0.000010	< 0.00010	< 0.00010	< 0.010	< 0.010	608	0.14	1.1	< 1.0	0.84	0.003	0.003	< 0.00050	< 0.00050
2016	Q4	GH_FR1	1.9	2.0	0.14	0.14	196	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	517	0.13	1.1	<2	0.49	0.0021	0.0022	<0.0005	<0.0005
2016	Q4	GH_ERC	0.8	0.85	0.25	0.24	32	< 0.000010	< 0.000010	< 0.00010	< 0.00010	< 0.010	< 0.010	203	< 0.050	0.8	3.4	1.2	0.00089	0.00084	< 0.00050	< 0.00050
2016	Q4	CM_MC2	6.4	6.7	0.22	0.22	178	0.00001	0.000017	< 0.00010	< 0.00010	< 0.010	< 0.010	451	0.15	2.4	9.1	3.8	0.0017	0.0017	< 0.00050	< 0.00050
2016	Q4	EV_MC2	2.5	2.7	0.11	0.12	63	< 0.000010	0.000015	< 0.00010	< 0.00010	< 0.010	< 0.010	228	0.2	3.4	6.8	5.5	0.00062	0.00066	< 0.00050	0.0011
2016	Q4	EV_HC1	1.9	1.9	0.13	0.13	193	< 0.000010	0.00001	< 0.00010	< 0.00010	< 0.010	< 0.010	480	0.1	1.7	1.8	2.3	0.0026	0.0026	< 0.00050	< 0.00050
2016	Q4	LC_DCDS	0.93	0.94	0.047	0.05	19	<0.000010	0.000027	<0.00010	<0.00010	<0.010	<0.010	171	0.25	3.3	10	22	0.00045	0.00048	0.0011	0.0022
2016	Q4	LC_LC5	2.5	2.8	0.16	0.15	154	<0.000010	<0.000010	<0.00010	<0.00010	<0.010	<0.010	441	<0.050	0.95	<1.0	0.46	0.002	0.0021	<0.00050	<0.00050
2016	Q4	LC_LCDSSLCC	4.2	4.2	0.18	0.17	176	0.00001	< 0.000010	< 0.00010	< 0.00010	< 0.010	< 0.010	487	0.13	0.91	< 1.0	0.39	0.0032	0.0031	< 0.00050	< 0.00050
2017	Q1	FR_FRCP1	-	2.3	0.19	0.2	531	0.000013	0.000012	<0.0001	<0.0001	<0.01	<0.01	1140	<0.05	1.5	1.2	0.44	0.0059	0.006	<0.0005	<0.0005
2017	Q1	GH_FR1	-	2.2	0.16	0.16	232	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	618	0.1	0.63	<1	0.47	0.0024	0.0023	<0.0005	<0.0005
2017	Q1	GH_ERC	-	1.0	0.21	0.22	38	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	223	<0.05	<0.5	<1	0.13	0.00085	0.00083	<0.0005	<0.0005
2017	Q1	CM_MC2	-	15	0.39	0.41	319	0.000014	0.000016	<0.0001	<0.0001	<0.01	<0.01	733	0.08	1.0	1.1	0.55	0.0031	0.0033	<0.0005	<0.0005
2017	Q1	EV_MC2	-	5.9	0.2	0.2	148	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	429	0.11	0.73	<1	0.7	0.0016	0.0016	<0.0005	<0.0005
2017	Q1	EV_HC1	-	1.7	0.13	0.13	204	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	492	0.081	0.89	<1	0.4	0.0027	0.0027	<0.0005	<0.0005
2017	Q1	LC_LCDSSLCC	-	7.4	0.23	0.22	295	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	707	0.12	0.71	1.4	0.36	0.0039	0.0041	<0.0005	<0.0005
2017	Q2	FR_FRCP1	-	1.3	0.13	0.13	205	0.000011	0.00003	<0.0001	<0.0001	<0.01	<0.01	496	0.67	3.2	17	23	0.0024	0.0025	<0.0005	0.0032
2017	Q2	GH_FR1	-	2.2	0.13	0.14	170	<0.00001	0.000025	<0.0001	<0.0001	<0.01	<0.015	497	0.39	5.9	15	25	0.0024	0.0024	<0.0005	0.0027
2017	Q2	GH_ERC	-	1.1	0.22	0.23	36	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	210	0.074	1.1	6.8	2.5	0.00094	0.00098	<0.0005	0.0007
2017	Q2	CM_MC2	-	11	0.35	0.33	236	0.000014	0.000022	<0.0001	<0.0001	<0.01	<0.01	541	0.3	2.3	9.0	6.9	0.0022	0.0021	<0.0005	0.00077
2017	Q2	CM_MC2	-	18	0.36	0.44	237	0.000015	0.00004	<0.0001	<0.0001	<0.01	<0.01	544	0.24	1.6	4.4	2.3	0.0022	0.0027	<0.0005	<0.0005
2017	Q2	EV_MC2	-	3.4	0.15	0.14	68	<0.00001	0.000011	<0.0001	<0.0001	<0.01	<0.01	222	0.31	3.3	20	11	0.00078	0.00073	<0.0005	0.00096
2017	Q2	EV_HC1	-	1.5	0.11	0.11	147	<0.00001	0.000017	<0.0001	<0.0001	<0.01	<0.01	398	0.22	3.1	4.2	3.4	0.0022	0.0023	<0.0005	0.00079
2017	Q2	LC_DCDS	0.58	0.59	0.035	0.038	6.8	<0.000010	0.000017	<0.00010	<0.00010	<0.010	<0.010	90	0.27	4.3	8.0	10	0.00023	0.00029	0.0014	0.0021
2017	Q2	LC_LC5	2.8	2.7	0.16	0.15	172	<0.000010	<0.000010	<0.00010	<0.00010	<0.010	<0.010	495	0.68	2.1	8.2	5.8	0.0017	0.0019	<0.00050	0.00056
2017	Q2	LC_LCDSSLCC	-	7.3	0.23	0.22	254	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	676	0.69	1.3	2.3	1.2	0.0033	0.0036	<0.0005	<0.0005
2017	Q3	FR_FRCP1	-	1.5	0.13	0.13	260	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	587	0.85	3.4	1.8	0.47	0.0027	0.0027	<0.0005	<0.0005
2017	Q3	GH_FR1	-	1.9	0.13	0.13	186	<0.00001	<0.00001	0.00011	<0.0001	<0.01	<0.01	502	0.62	0.99	1.2	0.54	0.0019	0.002	<0.0005	<0.0005
2017	Q3	GH_ERC	-	0.72	0.19	0.19	21	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	160	0.076	0.83	4.0	1.7	0.00058	0.00064	<0.0005	<0.0005
2017	Q3	CM_MC2	-	11	0.35	0.35	280	0.000017	0.000019	<0.0001	<0.0001	<0.01	<0.01	558	0.27	0.99	2.4	1.0	0.0023	0.0024	<0.0005	<0.0005
2017	Q3	EV_MC2	-	4.0	0.19	0.18	116	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	362	0.29	1.7	1.7	0.45	0.0012	0.0012	<0.0005	<0.0005
2017	Q3	EV_HC1	-	1.4	0.12	0.12	161	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	436	0.069	1.0	<1	0.31	0.0021	0.0021	<0.0005	<0.0005
2017	Q3	LC_LCDSSLCC	-	5.4	0.19	0.19	206	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	531	0.66	1.3	<1	0.43	0.0028	0.0028	<0.0005	<0.0005
2017	Q4	FR_FRCP1	-	2.0	0.17	0.17	510	0.000012	0.000012	<0.0001	<0.0001	<0.01	<0.01	980	0.57	0.84	<1	0.7	0.0055	0.0054	<0.0005	<0.0005
2017	Q4	GH_FR1	-	2.3	0.16	0.15	232	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	586	0.53	1.9	1.1	0.77	0.0027	0.0025	<0.0005	<0.0005
2017	Q4	GH_ERC	-	0.84	0.21	0.21	23	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	193	<0.05	0.96	<1	0.56	0.00087	0.00079	<0.0005	<0.0005
2017	Q4	CM_MC2	-	14	0.41	0.44	331	0.000016	0.000016	<0.0001	<0.0001	<0.01	<0.01	793	0.27	1.1	5.2	2.2	0.0034	0.0035	<0.0005	<0.0005
2017	Q4	EV_MC2	-	4.8	0.18	0.2	133	<0.00001	<0.00001	<0.0001	0.00014	<0.01	<0.01	420	<0.2	0.9	1.6	1.2	0.001	0.0012	<0.0005	<0.0005
2017	Q4	EV_HC1	-	1.5	0.13	0.13	189	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	474	<0.2	0.97	<1	0.31	0.0022	0.0025	<0.0005	<0.0005
2017	Q4	LC_DCDS	0.97	0.93	0.066	0.066	43	0.000012	0.000012	<0.00010	<0.00010	<0.010	<0.010	248	0.67	2.2	2.2	2.0	0.00077	0.00074	0.0012	0.0013
2017	Q4	LC_LC5	3.1	3.3	0.17	0.17	185	<0.000010	<0.000010	<0.00010	<0.00010	<0.010	<0.010	525	0.58	0.86	1.0	0.27	0.0024	0.0021	<0.00050	<0.00050
2017	Q4	LC_LCDSSLCC	-	6.4	0.21	0.21	245	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	651	0.51	0.94	<1	0.28	0.0038	0.0038	<0.0005	<0.0005
2018	Q1	GH_FR1	2.4	2.4	0.16	0.18	261	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	629	0.13	0.86	<1	0.24	0.0024	0.0024	<0.0005	<0.0005
2018	Q1	GH_ERC	0.94	0.98	0.2	0.21	33	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	203	0.11	0.56	4.8	1.1	0.00085	0.00085	<0.0005	<0.0005
2018	Q1	CM_MC2	15	15	0.41	0.42	362	0.000014	0.000013	<0.0001	<0.0001	<0.01	<0.01	772	0.31	1.0	<1	0.25	0.0038	0.0038	<0.0005	<0.0005
2018	Q1	CM_MC3	5.0	5.0	0.21	0.22	107	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	331	<0.2	0.74	<1	0.21	0.0013	0.0013	<0.0005	<0.0005
2018	Q1	EV_MC2	5.0	4.9	0.21	0.22	174	<0.00002	<0.00001	<0.0002	<0.0001	<0.01	<0.01	493	0.31	0.9	<1	0.25	0.002	0.0019	<0.001	<0.0005
2018	Q1	EV_HC1	1.8	1.8	0.14	0.14	229	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	568	<0.2	0.76	<1	0.26	0.0029	0.0028	<0.0005	<0.0005
2018	Q1	LC_LCDSSLCC	8.6	8.6	0.22	0.24	306	<0.00002	<0.00001	<0.0002	<0.0001	<0.01	<0.01	692	0.38	0.7	<1	0.16	0.0041	0.0039	<0.001	<0.0005
2018	Q2	GH_FR1	1.6	1.9	0.11	0.11	147	<0.00001	0.000039	<0.0001	<0.0001	<0.01	<0.01	417	0.69	6.7	52	47	0.0017	0.0018	<0.0005	0.0038
2018	Q2	GH_ERC	1.1	1.2	0.21	0.23	39	<0.00001	0.000024	<0.0001	<0.0001	<0.01	<0.01	202	0.27	2.7	43	10	0.00086	0.00086	<0.0005	0.0025
2018	Q2	CM_MC2	13	12	0.37	0.37	189	0.000015	0.000023	<0.0001	<0.0001	<0.01	<0.01	436	0.23	1.8	11	5.5	0.0019	0.002	<0.0005	0.00061
2018	Q2	EV_MC2	4.2	4.2	0.15	0.15	70	<0.00001	0.000027	<0.0001	<0.0001	<0.01	<0.01	262	0.28	4.1	37	15	0.00075	0.00077	<0.0005	0.0022
2018	Q2	EV_HC1	1.2	1.2	0.09	0.091	106	<0.00001	0.000011	<0.0001	<0.0001	<0.01	<0.01	333	0.16	2.8	8.0	4.3	0.0015	0.0017	<0.0005	0.00056
2018	Q2	LC_DCDS	1.3	1.2	0.073	0.071	43	0.000016	0.000035	<0.00010	<0.00010	<0.010	<0.010	229	0.71	6.7	25	38	0.00071	0.00074	0.0014	0.0033
2018	Q2	LC_LC5	2.4	2.2	0.14	0.13	140	<0.000010	0.000018	<0.00010	<0.00010	<0.010	<0.010	394	0.54	4.6	40	22	0.0018	0.0018	<0.00050	0.002
2018	Q2	LC_LCDSSLCC	5.5	4.8	0.19	0.17	175	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	433	0.15	1.7	4.8	6.6	0.0031	0.0029	<0.0005	0.00054
2018	Q3	FR_FRCP1	1.7	1.6	0.16	0.14	315	0.00001	0.000011	<0.0001	<0.0001	<0.01	<0.01	745	0.63	1.5	1.3	0.3	0.0038	0.0037	<0.0005	<0.0005
2018	Q3	GH_FR1	2.2	2.1	0.15	0.14	228	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	590	0.48	1.2	2.9	0.33	0.0027	0.0026	<0.0005	<0.0005
2018	Q3	GH_ERC	0.77	0.71	0.21	0.2	24	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	194	<0.05	1.1	1.7	0.4	0.00071	0.00072	<0.0005	<0.0005
2018	Q3	CM_MC2	20	20	0.64	0.61	447	0.00003	0.00003	<0.0001	<0.0001	<0.01	<0.01	830	0.27	1.9	<1	0.45	0.0044	0.0045	<0.0005	<0.0005
2018	Q3	CM_MC3	9.6	9.1	0.36	0.34	204	0.000025	0.000025	<0.0001	<0.0001	<0.01	<0.01	493	0.081	1.2	<1	0.44	0.0023	0.0023	<0.0005	<0.0005
2018	Q3	EV_MC2	6.5	6.4	0.26	0.25	171	0.000016	0.000015	<0.0001	<0.0001	<0.01	<0.01	460	0.43	1.2	1.1	0.3	0.0019	0.0018	<0.0005	<0.0005
2018	Q3	EV_HC1	1.5	1.6	0.13	0.12	198	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	472	0.11	1.2	1.7	0.58	0.0024	0.0024	<0.0005	<0.0005
2018	Q3	LC_LCDSSLCC	6.1	6.4	0.21	0.2	211	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	610	<0.05	1.2	1.4	0.17	0.0034	0.0035	<0.0005	<0.0005
2018	Q4	FR_FRABCH	2.7	2.6	0.18	0.18	324	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	788	0.2	0.83	<1	0.43	0.0035	0.0034	<0.0005	<0.0005
2018	Q4	GH_FR1	2.3	2.3	0.16	0.15	275	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	591	0.16	0.79	<1	0.39	0.0028	0.0027	<0.0005	<0.0005
2018	Q4	GH_ERC	0.89	0.89	0.21	0.21	27	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	179	<0.05	<0.5	<1	0.22	0.00082	0.00086	<0.0005	0.001
2018	Q4	CM_MC2	17	17	0.53	0.54	372	0.000024	0.000023	<0.0001	<0.0001	<0.01	<0.01	692	0.19	1.4	1.5	0.84	0.0043	0.0041	<0.0005	<0.0005
2018	Q4	EV_MC2	3.9	4.0	0.19	0.19	144	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	434	0.16	1.2	1.3	0.5	0.0018	0.0018	<0.0005	<0.0005
2018	Q4	EV_HC1	1.8	1.7	0.14	0.13	198	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	552	0.16	1.1	1.7	0.42	0.0025	0.0025	<0.0005	<0.0005
2018	Q4	LC_DCDS	1.8	1.9	0.11	0.12	94	0.000013	0.000014	<0.00010	<0.00010	<0.010	<0.010	388	0.46	2.6	3.7	1.8	0.0016	0.0016	0.00096	0.0013
2018	Q4	LC_LC5	3.3	3.6	0.17	0.18	184	<0.000010	<0.000010	<0.00010	<0.00010	<0.010	<0.010	495	0.14	<0.50	<1.0	0.3	0.0023	0.0023	<0.00050	<0.00050
2018	Q4	LC_LCDSSLCC	7.2	7.6	0.2	0.2	231	<0.00001	0.00001	<0.0001	<0.0001	<0.01	<0.01	544	<0.05	<0.5	<1	0.2	0.0035	0.0036	<0.0005	<0.0005
2019	Q1	FR_FRABCH	2.47	2.66	0.215	0.197	339	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	909	<0.05	0.63	1.2	0.42	0.00307	0.00305	<0.0005	<0.0005
2019	Q1	GH_FR1	2.44	2.38	0.181	0.188	287	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	728	0.089	0.77	<1	0.45	0.00276	0.00275	<0.0005	<0.0005
2019	Q1	GH_ERC	0.88	0.87	0.22	0.21	31	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	216	<0.05	<0.5	<1	0.21	0.00081	0.00082	<0.0005	<0.0005
2019	Q1	CM_MC2	14	13	0.42	0.4	343	0.000011	0.000011	<0.0001	<0.0001	<0.01	<0.01	809	0.33	0.86	<1	0.6	0.0033	0.0034	<0.0005	<0.0005
2019	Q1	EV_MC2	3.9	3.6	0.18	0.18	129	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	385	0.23	1.6	1.0	1.0	0.0013	0.0013	<0.0005	<0.0005
2019	Q1	EV_HC1	1.8	1.8	0.14	0.13	215	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	520	0.13	0.88	1.1	1.6	0.0026	0.0027	<0.0005	<0.0005
2019	Q1	LC_DCDS	1.6	1.5	0.1	0.1	82	0.000011	0.000012	<0.0001	<0.0001	<0.01	<0.01	384	0.55	1.7	2.0	1.5	0.0015	0.0017	0.0011	0.0012
2019	Q1	LC_LC3	14	13	0.25	0.26	490	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	1040	0.23	1.1	<1	1.1	0.0056	0.006	<0.0005	<0.0005
2019	Q1	LC_LC5	3.4	3.4	0.19	0.18	211	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	571	0.24	0.68	<1	0.34	0.0023	0.0023	<0.0005	<0.0005
2019	Q1	LC_LCDSSLCC	8.5	8.3	0.24	0.25	306	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	740	0.059	0.81	2.5	0.24	0.0037	0.004	<0.0005	<0.0005
2019	Q2	FR_FRABCH	2.7	3.3	0.15	0.17	360	<0.00001	<0.00001	<0.0001	0.00012	<0.01	<0.01	824	0.13	0.79	1.6	0.81	0.0029	0.0033	<0.0005	<0.0005
2019	Q2	FR_FRCP1	1.6	1.6	0.14	0.15	271	<0.00001	0.00001	<0.0001	<0.0001	<0.01	<0.01	661	0.36	1.6	<1	1.2	0.0032	0.0035	<0.0005	<0.0005
2019	Q2	GH_FR1	2.3	2.5	0.16	0.16	265	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	626	0.5	1.4	<1	0.82	0.0027	0.0028	<0.0005	<0.0005
2019	Q2	GH_ERC	0.94	1.0	0.21	0.22	35	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	193	0.059	<0.5	1.1	0.85	0.00082	0.00085	<0.0005	<0.0005
2019	Q2	CM_MC2	7.0	7.1	0.27	0.26	219	<0.00001	0.000011	<0.0001	<0.0001	<0.01	<0.01	504	0.3	1.9	2.8	1.6	0.0019	0.0019	<0.0005	<0.0005
2019	Q2	EV_MC2	2.6	2.6	0.12	0.12	61	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	213	0.36	2.3	4.0	2.2	0.00068	0.00065	<0.0005	0.00054
2019	Q2	EV_HC1	1.6	1.7	0.11	0.12	186	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	453	0.15	0.97	8.7	2.0	0.0026	0.0027	<0.0005	<0.0005
2019	Q2	LC_DCDS	1.4	1.4	0.083	0.079	65	<0.00001	0.000011	<0.0001	<0.0001	<0.01	<0.01	291	0.76	3.5	9.2	3.5	0.0012	0.0011	0.0012	0.0014
2019	Q2	LC_LC3	8.4	9	0.19	0.22	333	<0.00001	0.000011	<0.0001	<0.0001	<0.01	<0.01	693	<0.05	<0.5	<1	0.53	0.0036	0.0041	<0.0005	<0.0005
2019	Q2	LC_LC5	3.1	3.2	0.17	0.18	218	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	543	0.47	0.62	4.1	0.6	0.0021	0.0023	<0.0005	<0.0005
2019	Q2	LC_LCDSSLCC	6.1	6.1	0.18	0.2	226	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	552	<0.05	<0.5	1.2	0.39	0.0027	0.0031	<0.0005	<0.0005
2019	Q3	GH_ERC	0.75	0.74	0.2	0.21	22	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	170	<0.05	0.87	<1	0.65	0.0007	0.00075	<0.0005	<0.0005
2019	Q3	LC_DCDS	2.3	2.6	0.1	0.11	88	0.000015	0.000013	<0.0001	<0.0001	<0.01	<0.01	354	<0.25	2.4	1.7	0.98	0.0012	0.0012	0.0012	0.0016
2019	Q4	FR_FRABCH	2.3	2.3	0.14	0.16	298	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	756	<0.05	1.3	35	4.6	0.0028	0.003	<0.0005	<0.0005
2019	Q4	FR_FRCP1	2.0	2.0	0.16	0.19	483	0.000012	0.000012	<0.0001	<0.0001	<0.01	<0.01	1010	<0.05	1.1	1.9	0.25	0.005	0.0056	<0.0005	<0.0005
2019	Q4	GH_FR1	2.2	2.5	0.15	0.15	239	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	614	<0.05	0.56	1.3	0.3	0.0027	0.0025	<0.0005	<0.0005
2019	Q4	GH_ERC	1.1	1.1	0.21	0.22	39	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	223	0.18	<0.5	16	1.2	0.00085	0.00085	<0.0005	<0.0005
2019	Q4	CM_MC2	12	11	0.38	0.37	358	0.000011	0.000023	<0.0001	<0.0001	<0.01	<0.01	773	0.4	0.84	14	3.4	0.0031	0.0035	<0.0005	0.00067
2019	Q4	EV_MC2	4.0	4.0	0.18	0.19	134	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	388	0.4	0.81	1.0	0.34	0.0016	0.0014	<0.0005	<0.0005
2019	Q4	EV_HC1	1.6	1.6	0.13	0.13	213	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	503	0.34	<0.5	1.1	0.4	0.0027	0.0027	<0.0005	<0.0005
2019	Q4	LC_DCDS	2.8	2.6	0.13	0.14	141	<0.00001	0.000011	<0.0001	<0.0001	<0.01	<0.01	546	<0.05	1.6	<1	0.31	0.0019	0.002	0.001	0.0011

Year	Quarter	Sample ID	ZINC-D-mg/l	ZINC-T-mg/l	∑TU-WQGs	∑TU-WQGs/Benchmarks	PC1_allyrs	PC2_allyrs	PC1_2021	PC2_2021
2016	Q1	LC_LCDSSLCC	< 0.0030	0.0034	7.38	3.92	5.440	-2.704		
2016	Q2	GH_FR1	< 0.0030	< 0.0030	5.11	3.25	0.066	1.572		
2016	Q2	GH_ERC	< 0.0030	0.0035	3.25	2.29	-4.353	4.044		
2016	Q2	CM_MC2	0.0076	0.013	6.45	2.80	1.490	5.805		
2016	Q2	EV_MC2	< 0.0030	0.0047	4.30	4.37	-4.320	8.029		
2016	Q2	EV_HC1	< 0.0030	< 0.0030	2.90	6.06	-1.381	1.903		
2016	Q2	LC_DCDS	<0.0030	0.0037	3.70	3.63	-6.395	7.919		
2016	Q2	LC_LC5	<0.0030	0.004	5.09	3.80	-0.070	1.984		
2016	Q2	LC_LCDSSLCC	0.0089	0.01	5.62	4.48	1.752	0.173		
2016	Q3	FR_FRCP1	< 0.0030	< 0.0030	7.03	3.89	3.517	-2.182		
2016	Q3	GH_FR1	< 0.0030	< 0.0030	5.29	1.35	1.416	-2.382		
2016	Q3	GH_ERC	< 0.0030	< 0.0030	1.35	1.21	-5.777	-1.878		
2016	Q3	CM_MC2	< 0.0030	< 0.0030	5.43	2.36	4.595	-1.674		
2016	Q3	EV_MC2	< 0.0030	0.0031	4.43	3.26	4.057	-1.580		
2016	Q3	EV_HC1	< 0.0030	< 0.0030	2.52	4.67	-0.341	0.339		
2016	Q3	LC_LCDSSLCC	0.0089	0.0075	5.94	2.89	3.902	-2.572		
2016	Q4	FR_FRCP1	< 0.0030	< 0.0030	6.38	3.76	3.222	-1.859		
2016	Q4	GH_FR1	<0.003	<0.003	5.63	1.96	2.015	-1.905		
2016	Q4	GH_ERC	< 0.0030	< 0.0030	1.97	1.44	-5.069	-1.532		
2016	Q4	CM_MC2	< 0.0030	< 0.0030	4.72	2.36	1.815	2.608		
2016	Q4	EV_MC2	< 0.0030	< 0.0030	2.98	3.01	-3.241	4.453		
2016	Q4	EV_HC1	< 0.0030	< 0.0030	2.55	4.27	0.323	-0.491		
2016	Q4	LC_DCDS	<0.0030	0.005	3.56	3.38	-2.685	8.553		
2016	Q4	LC_LC5	<0.0030	<0.0030	5.43	3.64	1.263	-3.121		
2016	Q4	LC_LCDSSLCC	0.0061	0.0078	5.23	4.24	3.435	-1.909		
2017	Q1	FR_FRCP1	0.0023	<0.003	12.8	7.28	4.758	-1.409		
2017	Q1	GH_FR1	<0.003	<0.003	6.47	1.39	0.086	-2.857		
2017	Q1	GH_ERC	<0.003	<0.003	1.40	1.15	-5.899	-2.905		
2017	Q1	CM_MC2	0.0041	0.004	9.51	2.07	4.592	-0.004		
2017	Q1	EV_MC2	<0.003	<0.003	3.24	2.76	-0.302	-1.060		
2017	Q1	EV_HC1	<0.003	<0.003	2.32	8.33	-1.929	-1.771		
2017	Q1	LC_LCDSSLCC	0.0034	0.0042	7.13	2.99	3.044	-2.252		
2017	Q2	FR_FRCP1	0.002	0.0098	9.07	6.09	0.984	7.794		
2017	Q2	GH_FR1	<0.003	0.0072	7.47	1.85	0.993	7.560		
2017	Q2	GH_ERC	<0.003	<0.003	1.84	3.70	-5.325	0.432		
2017	Q2	CM_MC2	0.005	0.0071	9.32	9.56	3.284	4.520		
2017	Q2	CM_MC2	0.0041	0.0059	10.1	2.28	4.208	3.614		
2017	Q2	EV_MC2	0.0011	<0.003	2.84	2.86	-3.530	4.873		
2017	Q2	EV_HC1	<0.001	0.0044	2.41	8.76	-2.454	2.075		
2017	Q2	LC_DCDS	0.0017	0.0056	3.19	5.77	-5.014	8.526		
2017	Q2	LC_LC5	<0.0010	0.016	5.43	3.33	1.597	1.425		
2017	Q2	LC_LCDSSLCC	0.0084	0.012	8.25	3.91	3.272	-0.883		
2017	Q3	FR_FRCP1	<0.001	<0.003	5.91	3.58	1.123	-1.117		
2017	Q3	GH_FR1	<0.001	<0.003	5.56	1.44	-0.153	-1.889		
2017	Q3	GH_ERC	<0.001	<0.003	1.43	1.28	-6.541	-0.329		
2017	Q3	CM_MC2	<0.001	<0.003	10.9	1.93	2.996	1.224		
2017	Q3	EV_MC2	<0.003	<0.003	2.56	2.24	-0.625	-0.952		
2017	Q3	EV_HC1	<0.003	<0.003	2.09	10.02	-2.225	-1.282		
2017	Q3	LC_LCDSSLCC	0.014	0.0098	6.82	3.18	2.342	-1.157		
2017	Q4	FR_FRCP1	<0.003	<0.003	9.57	5.42	3.331	-1.790		
2017	Q4	GH_FR1	<0.003	<0.003	5.79	1.36	-0.011	-1.837		
2017	Q4	GH_ERC	<0.003	<0.003	1.35	1.08	-6.137	-2.129		
2017	Q4	CM_MC2	<0.003	<0.003	7.03	1.91	3.661	0.025		
2017	Q4	EV_MC2	<0.003	<0.003	2.50	2.25	-1.778	-0.873		
2017	Q4	EV_HC1	<0.003	<0.003	2.09	5.96	-2.383	-1.604		
2017	Q4	LC_DCDS	<0.0030	<0.0030	4.52	2.97	-0.158	3.564		
2017	Q4	LC_LC5	<0.0030	<0.0030	5.50	4.52	1.119	-2.432		
2017	Q4	LC_LCDSSLCC	0.0056	0.0076	6.63	4.01	2.452	-1.246		
2018	Q1	GH_FR1	<0.003	<0.003	6.10	1.51	2.494	-3.275		
2018	Q1	GH_ERC	<0.003	<0.003	1.47	1.13	-5.745	-1.327		
2018	Q1	CM_MC2	<0.003	<0.003	6.94	1.94	6.417	-1.142		
2018	Q1	CM_MC3	<0.003	<0.003	2.05	1.97	-1.627	-2.637		
2018	Q1	EV_MC2	<0.003	<0.003	3.41	2.87	3.815	-0.012		
2018	Q1	EV_HC1	<0.003	<0.003	2.23	6.04	0.492	-2.609		
2018	Q1	LC_LCDSSLCC	0.0035	0.0034	7.06	3.71	5.910	-1.081		
2018	Q2	GH_FR1	0.0013	0.012	8.73	4.36	2.124	11.036		
2018	Q2	GH_ERC	<0.001	0.0059	4.34	2.50	-3.905	7.475		
2018	Q2	CM_MC2	0.0075	0.012	8.89	2.03	5.423	4.550		
2018	Q2	EV_MC2	<0.0015	0.0056	4.75	4.70	-0.850	9.360		
2018	Q2	EV_HC1	<0.001	<0.003	2.11	8.62	-2.253	1.425		
2018	Q2	LC_DCDS	0.0013	0.0082	9.99	8.11	1.839	11.997		
2018	Q2	LC_LC5	<0.0010	0.0065	5.99	10.09	1.243	5.912		
2018	Q2	LC_LCDSSLCC	0.0074	0.009	6.62	5.00	3.383	0.711		
2018	Q3	FR_FRCP1	0.0013	<0.003	7.46	4.48	4.527	-1.319		
2018	Q3	GH_FR1	<0.001	<0.003	5.80	1.54	2.697	-1.687		
2018	Q3	GH_ERC	<0.001	<0.003	1.50	4.90	-6.139	-0.150		
2018	Q3	CM_MC2	<0.001	<0.003	18.2	6.75	9.345	0.798		
2018	Q3	CM_MC3	0.0023	<0.003	7.08	2.03	4.284	0.533		
2018	Q3	EV_MC2	0.0013	<0.003	4.16	3.58	4.513	-0.208		
2018	Q3	EV_HC1	<0.001	<0.003	2.18	17.3	0.059	-1.408		
2018	Q3	LC_LCDSSLCC	0.011	0.012	7.45	4.04	4.733	-0.908		
2018	Q4	FR_FRABCH	<0.001	<0.003	8.93	3.53	3.865	-3.102		
2018	Q4	GH_FR1	<0.001	<0.003	6.01	3.77	2.840	-3.187		
2018	Q4	GH_ERC	<0.001	<0.003	1.97	2.00	-5.497	0.430		
2018	Q4	CM_MC2	0.0044	0.0052	15.2	2.12	9.450	1.502		
2018	Q4	EV_MC2	<0.001	<0.003	3.34	3.09	1.880	-1.137		
2018	Q4	EV_HC1	<0.001	<0.003	2.30	14.4	0.416	-1.422		
2018	Q4	LC_DCDS	<0.0010	<0.0030	9.69	7.44	3.866	2.130		
2018	Q4	LC_LC5	<0.0010	<0.0030	5.96	4.51	1.395	-3.189		
2018	Q4	LC_LCDSSLCC	0.0059	0.0066	6.26	4.80	4.897	-2.340		
2019	Q1	FR_FRABCH	<0.001	<0.003	10.4	16.8	3.711	-2.669		
2019	Q1	GH_FR1	<0.001	<0.003	7.01	4.01	2.980	-3.276		
2019	Q1	GH_ERC	<0.001	<0.003	3.95	2.79	-5.175	-3.143		
2019	Q1	CM_MC2	0.0014	<0.003	7.18	2.47	6.212	-1.235		
2019	Q1	EV_MC2	<0.001	<0.003	2.74	4.73	0.041	-1.548		
2019	Q1	EV_HC1	<0.001	<0.003	3.04	6.23	-0.017	-1.624		
2019	Q1	LC_DCDS	0.0025	0.0031	8.19	6.45	3.171	2.036		
2019	Q1	LC_LC3	0.0026	0.0042	8.39	6.34	8.539	-1.574		
2019	Q1	LC_LC5	<0.001	<0.003	6.17	3.69	1.936	-3.844		
2019	Q1	LC_LCDSSLCC	0.0027	<0.003	6.75	4.58	5.400	-3.397		
2019	Q2	FR_FRABCH	0.0035	0.011	11.0	5.55	4.931	1.535		
2019	Q2	FR_FRCP1	<0.001	<0.003	8.75	4.03	4.163	-1.402		
2019	Q2	GH_FR1	<0.001	<0.003	6.16	3.55	3.173	-1.842		
2019	Q2	GH_ERC	<0.001	<0.003	4.02	2.81	-4.965	-1.800		
2019	Q2	CM_MC2	<0.001	<0.003	4.66	2.33	2.184	0.356		
2019	Q2	EV_MC2	<0.001	<0.003	2.31	5.61	-3.813	0.959		
2019	Q2	EV_HC1	<0.001	<0.003	2.97	4.13	-0.771	-0.982		
2019	Q2	LC_DCDS	<0.001	<0.003	6.81	6.29	1.081	2.866		
2019	Q2	LC_LC3	0.0048	0.0067	10.7	7.24	5.901	-2.426		
2019	Q2	LC_LC5	<0.001	<0.003	6.19	3.69	2.021	-2.447		
2019	Q2	LC_LCDSSLCC	0.0023	0.0032	6.51	4.39	2.798	-2.816		
2019	Q3	GH_ERC	<0.001	<0.003	2.62	2.35	-5.539	-2.112		
2019	Q3	LC_DCDS	<0.001	<0.003	9.30	7.86	3.398	2.210		
2019	Q4	FR_FRABCH	<0.001	<0.003	9.88	6.23	2.749	-0.031		
2019	Q4	FR_FRCP1	<0.001	0.0033	10.9	2.44	6.133	-2.772		
2019	Q4	GH_FR1	<0.001	<0.003	6.01	3.33	1.728	-3.110		
2019	Q4	GH_ERC	<0.001	<0.003	2.44	2.84	-4.632	-2.298		
2019	Q4	CM_MC2	0.0021	0.0042	8.94	2.39	5.801	2.417		
2019	Q4	EV_MC2	0.0011	<0.003	2.63	4.73	0.457	-2.349		
2019	Q4	EV_HC1	0.0012	<0.003	3.06	8.09	-0.158	-2.622		
2019	Q4	LC_DCDS	0.0043	0.0049	12.4	8.08	5.012	1.079		

Year	Quarter	Sample ID	NICKEL-T-mg/l	NITRATE NITROGEN (NO3), AS N-N-mg/l	NITRITE NITROGEN (NO2), AS N-N-mg/l	NITROGEN, AMMONIA (AS N)-N-mg/l	ORTHO-PHOSPHATE-N-mg/l	OXIDATION-REDUCTION POTENTIAL, LAB-N-mv	pH, LAB-N-ph units	PHOSPHORUS-N-mg/l	POTASSIUM-D-mg/l	POTASSIUM-T-mg/l	SELENIUM-D-mg/l	SELENIUM-T-mg/l	SILICON-D-mg/l	SILICON-T-mg/l
2019	Q4	LC_LC3	0.0074	12	<0.005	0.012	0.0018	441	8.2	0.005	1.8	2	0.047	0.04	2.1	2.2
2019	Q4	LC_LC5	0.0009	8.8	0.0019	0.023	0.0011	475	8.3	<0.002	1.1	1.1	0.041	0.039	2.3	2.3
2019	Q4	LC_LCDSSLCC	0.004	8.5	<0.001	0.014	0.0012	516	8.2	0.0034	1.2	1.3	0.038	0.034	2.2	2.3
2020	Q1	FR_FRABCH	0.00109	22	<0.005	0.0155	0.0023	440	8.2	0.036	1.73	1.72	0.0969	0.095	2.53	2.83
2020	Q1	GH_FR1	0.00088	12	0.0031	0.0063	<0.002	485	8.3	0.0022	1.28	1.17	0.0625	0.062	2.5	2.42
2020	Q1	GH_ERC	<0.0005	1.01	<0.001	0.0075	0.0013	470	8.2	<0.002	0.41	0.377	0.00391	0.0036	1.99	1.83
2020	Q1	CM_MC2	0.045	3.4	0.0145	0.0464	0.0024	434	8.3	0.0044	2.32	2.29	0.0082	0.0076	2.32	2.46
2020	Q1	EV_MC2	0.00209	2.27	0.002	0.0075	0.006	520	8.2	0.0042	0.973	1.05	0.0159	0.016	2.36	2.54
2020	Q1	EV_HC1	0.00056	1.04	<0.001	0.0087	0.0083	430	8.3	0.0079	0.862	0.906	0.0419	0.04	2.04	2.3
2020	Q1	LC_DCDS	0.00461	24	0.0119	0.0159	0.033	365	8.2	0.0344	2.27	2.32	0.0479	0.047	2.55	2.77
2020	Q1	LC_LC3	0.008	11	<0.005	<0.005	0.0066	438	7.9	0.001	1.93	1.92	0.0425	0.04	2.01	2.27
2020	Q1	LC_LC5	0.00068	9.3	0.0032	<0.005	<0.002	441	8.3	<0.001	1.03	1.04	0.0443	0.041	2.17	2.28
2020	Q1	LC_LCDSSLCC	0.00328	9	0.001	0.006	<0.002	406	8.3	0.0012	1.32	1.35	0.0412	0.04	2.2	2.43
2020	Q2	FR_FRABCH	0.0055	15	0.0081	0.0075	0.0011	425	8.4	0.0091	1.86	1.57	0.0687	0.061	1.85	1.74
2020	Q2	FR_FRCP1	0.01	13	0.0151	0.0082	0.0062	326	8.4	<0.001	1.9	1.69	0.0612	0.059	1.65	1.69
2020	Q2	GH_FR1	0.00368	7.2	0.0047	0.0135	0.0087	473	8.4	0.0022	1.23	1.31	0.046	0.047	2.28	2.7
2020	Q2	GH_ERC	0.00053	0.596	<0.001	0.0102	0.0014	417	8.3	0.0074	0.413	0.462	0.00417	0.0042	1.95	2.28
2020	Q2	CM_MC2	0.015	1.61	0.0026	0.0133	0.0021	299	8.4	<0.002	1.32	1.45	0.00854	0.0077	2.21	2.38
2020	Q2	EV_MC2	0.00171	0.701	<0.001	0.0066	0.0166	246	8.4	0.0089	0.662	0.743	0.0055	0.0053	2.16	2.62
2020	Q2	EV_HC1	0.00086	0.804	<0.001	0.0091	0.0071	309	8.5	0.0054	0.875	0.944	0.0343	0.033	1.74	1.97
2020	Q2	LC_DCDS	0.009	11	0.0063	0.0122	0.0463	416	8.3	0.0331	1.61	1.61	0.0203	0.022	2.29	2.77
2020	Q2	LC_LC3	0.0076	9.2	<0.001	0.0061	<0.002	309	8.3	0.0015	1.54	1.41	0.0378	0.037	2.01	1.98
2020	Q2	LC_LC5	0.00224	7.7	0.0034	0.0057	0.0056	306	8.4	0.0014	1.19	1.1	0.0354	0.035	1.83	1.9
2020	Q2	LC_LCDSSLCC	0.0044	6.6	<0.001	0.009	<0.002	315	8.4	0.0016	1.21	1.08	0.027	0.027	1.99	2
2020	Q3	FR_FRABCH	0.00152	19	0.0068	0.0071	<0.001	418	8.3	<0.002	1.86	1.8	0.08	0.08	2.14	2.21
2020	Q3	FR_FRCP1	0.00526	13	0.0109	0.0106	<0.002	432	8.4	<0.001	2.05	2.04	0.0879	0.085	1.98	2.07
2020	Q3	GH_FR1	0.00145	10	0.0085	0.0197	0.0374	426	8.5	<0.001	1.3	1.41	0.0509	0.049	2.31	2.4
2020	Q3	GH_ERC	<0.0005	0.36	<0.001	0.0092	<0.001	440	8.4	0.0021	0.401	0.524	0.00161	0.00159	1.94	1.97
2020	Q3	CM_MC2	0.045	3.2	0.0068	0.0169	<0.001	526	8.3	<0.002	2.43	2.39	0.00916	0.0088	1.99	2.17
2020	Q3	EV_HC1	0.00073	0.566	<0.001	0.0074	0.0044	361	8.4	0.0039	0.888	0.909	0.0324	0.033	2.04	2.28
2020	Q3	LC_LC5	0.00114	8.7	0.0058	0.0061	<0.002	476	8.4	<0.001	1.27	1.2	0.0373	0.038	2.36	2.39
2020	Q3	LC_LCDSSLCC	0.00428	7.8	0.0018	0.0337	<0.002	519	8.4	0.0015	1.25	1.26	0.0317	0.033	2.38	2.49
2020	Q4	FR_FRABCH	0.00099	22	0.0073	0.0151	<0.001	417	8.3	0.0021	1.99	1.99	0.101	0.093	2.12	2.25
2020	Q4	FR_FRCP1	0.0098	15	0.0083	<0.005	<0.002	501	8.4	<0.001	2.48	2.36	0.115	0.12	1.74	1.79
2020	Q4	GH_FR1	0.00226	13	0.0038	<0.005	<0.002	383	8.3	<0.001	1.46	1.62	0.0628	0.063	2.32	2.76
2020	Q4	GH_ERC	<0.0005	0.461	0.0011	<0.005	<0.001	406	8.3	<0.002	0.411	0.452	0.00186	0.00184	1.99	2.04
2020	Q4	CM_MC2	0.026	2.9	0.0103	0.0898	<0.001	179	8.3	0.002	2.09	1.96	0.00864	0.0092	2.2	2.27
2020	Q4	EV_MC2	0.00076	1.69	0.0014	0.0066	0.0026	497	8.3	<0.001	0.895	0.944	0.0135	0.013	2.02	2.15
2020	Q4	EV_HC1	0.00064	0.781	<0.001	<0.005	0.0043	423	8.4	0.0037	0.91	0.913	0.0387	0.037	1.93	2.08
2020	Q4	LC_DCDS	0.015	45	0.0099	0.0086	0.0208	449	8.2	0.0233	2.62	2.63	0.0681	0.075	2.37	2.34
2020	Q4	LC_LC3	0.01	12	<0.005	0.0085	0.0057	440	8.4	0.0011	1.93	1.96	0.0483	0.049	2.01	2.05
2020	Q4	LC_LC5	0.0009	11	0.0031	0.0125	<0.002	413	8.4	<0.001	1.22	1.21	0.0458	0.047	2.08	2.14
2020	Q4	LC_LCDSSLCC	0.00458	8.1	0.00212	0.01028	0.00168	437.8	8.4	0.0014	1.326	1.368	0.0342	0.036	2.306	2.486
2021	Q1	GH_FR1	0.0059	14	0.0025	0.0249	0.0016	311	7.9	0.105	1.26	1.48	0.0704	0.065	2.42	3.69
2021	Q1	GH_ERC	<0.0005	0.635	<0.001	0.242	0.0013	334	7.9	<0.002	0.399	0.392	0.00325	0.0029	1.83	1.8
2021	Q1	EV_HC1	0.00054	0.913	0.0044	0.0248	0.0069	466	8.2	0.0058	0.902	0.907	0.0397	0.043	1.99	2.29
2021	Q1	LC_LCDSSLCC	0.00319	11	<0.005	<0.005	0.0014	441	8.2	<0.002	1.53	1.59	0.0511	0.046	2.29	2.45
2021	Q2	FR_FRABCH	0.00405	9.7	<0.001	0.0184	<0.001	312	8.2	0.126	1.16	1.38	0.0362	0.036	1.69	2.98
2021	Q2	FR_FRCP1	0.0057	7.2	0.0059	0.0269	<0.001	411	8.1	0.0308	1.06	1.16	0.0274	0.026	1.56	2.3
2021	Q2	GH_ERC	0.00428	0.271	<0.001	0.0114	<0.001	263	8.2	0.225	0.419	0.929	0.00167	0.00178	1.85	3.97
2021	Q2	CM_MC2	0.013	1.07	0.0061	0.0352	<0.001	178	8.2	0.0717	0.999	1.17	0.0049	0.0046	1.97	2.79
2021	Q2	EV_MC2	0.026	0.301	0.001	0.0086	0.0113	219	7.8	0.242	0.546	1.99	0.0019	0.003	1.82	9.54
2021	Q2	EV_HC1	0.00183	0.385	<0.001	0.0123	0.0064	211	8.2	0.0334	0.666	0.853	0.0163	0.017	1.84	2.59
2021	Q2	LC_DCDS	0.0056	12	0.044	0.0469	0.0134	378	8.1	0.0539	1.97	2.05	0.0263	0.028	2.49	3.32
2021	Q2	LC_LCDSSLCC	0.00373	3.5	<0.001	0.0076	<0.001	428	8.1	<0.002	0.798	0.825	0.0227	0.022	1.66	1.85
2021	Q3	FR_FRABCH	0.00147	23	0.0092	0.0522	<0.001	411	8.3	<0.002	2.07	2.04	0.0918	0.092	2.1	2.19
2021	Q3	FR_FRCP1	0.007	14	0.0086	0.0075	0.0014	407	8.4	0.0029	2.3	2.23	0.0847	0.08	2.09	2.09
2021	Q3	GH_FR1	0.00109	13	0.006	0.0501	<0.001	412	8.4	0.0028	1.45	1.4	0.0568	0.054	2.19	2.32
2021	Q3	CM_MC2	0.021	1.5	0.0071	<0.005	<0.001	493	8.3	0.0091	1.97	2.02	0.00758	0.0067	2.02	2.14
2021	Q3	EV_MC2	0.00193	0.76	0.0021	0.0134	0.0023	490	8.3	0.0068	1.1	0.987	0.00663	0.0067	2.26	2.33
2021	Q3	LC_LC3	0.0096	9.9	<0.005	0.0071	<0.001	490	8.4	0.0048	1.82	1.88	0.0375	0.038	2.06	2.2
2021	Q3	LC_LC5	0.00122	10	0.0044	0.0057	<0.001	486	8.4	0.0091	1.34	1.29	0.0422	0.04	2.3	2.32
2021	Q3	LC_LCDSSLCC	0.00506	7.5	0.001	<0.005	<0.001	298	8.4	<0.002	1.31	1.39	0.0315	0.033	2.16	2.38
2021	Q4	FR_FRABCH	0.00168	23	<0.005	0.0073	0.0017	461	8.2	0.0055	2.21	2.22	0.108	0.1	2.39	2.51
2021	Q4	FR_FRCP1	0.012	23	0.023	<0.005	0.0014	457	8.4	0.0028	2.47	2.56	0.125	0.12	1.83	1.97
2021	Q4	GH_FR1	0.0009	13	0.0033	<0.005	<0.001	452	8.3	0.0148	1.42	1.58	0.0612	0.062	2.21	2.51
2021	Q4	LC_DCDS	0.013	47	0.0108	0.0076	0.0156	430	8.3	0.0169	3.14	3.09	0.0918	0.094	2.46	2.51
2021	Q4	LC_LC3	0.01	8.8	<0.005	<0.005	<0.001	462	8.3	0.005	2.14	2.11	0.0376	0.038	2.18	2.23
Tests categorized as possible or likely adverse res																
2015	Q1	FR_FRCP1	0.032	30	<0.020	<0.0050	<0.0010	354	8.3	0.0021	3.8	4.0	0.49	0.5	2.3	2.3
2015	Q1	EV_HC1	0.00064	0.8	0.001	0.005	0.0035	457	7.4	0.0047	0.61	0.62	0.022	0.022	1.3	1.3
2015	Q2	LC_LC3	0.0092	12	<0.0020	<0.0050	0.0025	492	8.3	0.0034	1.3	1.3	0.05	0.05	2.0	2.0
2015	Q2	LC_LC5	0.0017	6.7	0.0037	<0.0050	0.0012	491	8.5	0.0076	0.97	1.0	0.026	0.027	1.8	1.9
2015	Q2	LC_LCDSSLCC	0.0036	5.8	0.0014	<0.0050	0.0027	493	8.4	0.0056	0.82	0.82	0.025	0.025	1.8	1.9
2015	Q4	FR_FRCP1	0.0066	15	<0.0050	<0.0050	<0.0010	354	8.3	<0.0020	1.9	1.9	0.078	0.076	1.7	1.8
2016	Q1	FR_FRCP1	0.013	28	< 0.010	< 0.0050	< 0.0010	309	8.2	< 0.0020	2.5	2.5	0.21	0.21	2.1	2.1
2016	Q2	FR_FRCP1	0.003	7.4	0.0033	0.0086	0.0029	324	8.3	0.013	1.2	1.2	0.032	0.032	1.7	2.0
2018	Q1	FR_FRCP1	0.0096	20	0.0028	0.017	<0.001	426	8.2	0.0024	2.7	2.5	0.17	0.17	2.3	2.1
2018	Q2	FR_FRCP1	0.0067	8.1	0.0036	0.0085	0.0019	289	8.4	0.031	1.3	1.3	0.046	0.044	1.9	2.3
2018	Q4	FR_FRCP1	0.046	29	0.0052	0.025	<0.001	478	7.9	0.0058	5.0	4.9	0.64	0.63	2.8	2.8
2019	Q1	FR_FRCP1	0.034	29	0.013	0.0078	0.003	453	8	0.0028	4.88	4.2	0.647	0.53	2.72	2.58
2019	Q3	FR_FRABCH	0.0019	14	0.0045	0.011	<0.001	464	8.4	<0.002	1.8	1.8	0.069	0.057	2.0	2.3
2019	Q3	FR_FRCP1	0.0034	7.9	0.0064	0.041	<0.001	341	8.4	0.005	1.6	1.6	0.051	0.042	1.8	2.1
2019	Q3	GH_FR1	0.0017	8	0.0062	0.0078	<0.001	365	8.4	<0.002	1.3	1.3	0.048	0.043	2.2	2.2
2019	Q3	CM_MC2	0.017	2.4	0.0043	<0.005	<0.001	292	8.4	0.0022	1.9	1.7	0.0098	0.0084	2.0	2.2
2019	Q3	EV_MC2	0.0011	1.2	0.0024	0.013	0.0016	328	8.5	0.0026	0.92	0.82	0.013	0.011	2.3	2.2
2019	Q3	EV_HC1	0.00068	0.64	0.0013	0.0089	0.0034	377	8.4	0.0085	0.95	0.88	0.038	0.031	2.2	2.1
2019	Q3	LC_LC3	0.0085	9.1	<0.001	0.0087	0.0019	241	8.1	<0.002	1.6	2	0.034	0.028	2.1	2.3
2019	Q3	LC_LC5	0.00096	7.4	0.0043	0.0056	<0.001	411	8.3	0.0029	1.1	1.2	0.037	0.03	2.1	2.3
2019	Q3	LC_LCDSSLCC	0.0044	6.7	0.0011	0.0062	0.0014	267	8.2	<0.002	1.1	1.1	0.029	0.024	2.2	2.3
2020	Q1	FR_FRCP1	0.012	20	0.0058	0.0149	0.013	364	8.2	0.0015	2.68	2.73	0.144	0.15	2.14	2.37
2020	Q1	FR_FR4	0.0099	21	<0.005	0.0173	<0.002	399	8.2	<0.001	2.36	2.47	0.138	0.15	1.72	2.13
2020	Q3	EV_MC2	0.00107	1.45	0.003	0.0079	0.002	410	8.4	<0.001	0.945	0.974	0.0124	0.013	2.2	2.32
2020	Q3	LC_DCDS	0.013	28	0.109	0.0748	0.0122	433	8.3	0.0022	2.33	2.32	0.0532	0.054	1.24	1.34
2020	Q3	LC_LC3	0.0095	11	<0.005	0.0284	0.0027	481	8.4	0.0018	1.77	1.75	0.0384	0.039	2.3	2.33
Tests categorized as possible or likely adverse res																
2021	Q1	CM_MC2	0.012	2.66	<0.005	0.0052	0.0026	464	8.2	0.0022	1.72	1.56	0.00989	0.0096	2.23	2.41
2021	Q2	LC_LC3	0.008	7.4	<0.001	0.0119	0.0026	403	8.2	0.003	1.4	1.46	0.0506	0.049	1.76	1.86
2021	Q4	CM_MC2	0.013	2.42	<0.005	0.0063	<0.001	467	8.3	0.0045	2.23	2.16	0.0132	0.012	2.19	2.34

Year	Quarter	Sample ID	SILVER-D-mg/l	SILVER-T-mg/l	SODIUM-D-mg/l	SODIUM-T-mg/l	STRONTIUM-D-mg/l	STRONTIUM-T-mg/l	SULFATE (AS SO4)-D-mg/l	THALLIUM-D-mg/l	THALLIUM-T-mg/l	TIN-D-mg/l	TIN-T-mg/l	TITANIUM-D-mg/l	TITANIUM-T-mg/l
2019	Q4	LC_LC3	<0.00001	<0.00001	13	13	0.23	0.23	408	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01
2019	Q4	LC_LC5	<0.00001	<0.00001	3.6	3.5	0.18	0.17	193	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01
2019	Q4	LC_LCDSSLCC	<0.00001	<0.00001	8.0	7.7	0.21	0.21	257	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01
2020	Q1	FR_FRABCH	<0.00001	<0.00001	2.5	2.5	0.177	0.175	331	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01
2020	Q1	GH_FR1	<0.00001	<0.00001	2.4	2.39	0.157	0.155	251	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01
2020	Q1	GH_ERC	<0.00001	<0.00001	1.21	1.22	0.212	0.208	48	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01
2020	Q1	CM_MC2	<0.00001	<0.00001	18.1	18.6	0.532	0.544	473	0.00002	0.00002	<0.0001	<0.0001	<0.01	<0.01
2020	Q1	EV_MC2	<0.00001	<0.00001	4.33	4.18	0.218	0.231	143	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01
2020	Q1	EV_HC1	<0.00001	<0.00001	1.79	1.75	0.13	0.135	223	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01
2020	Q1	LC_DCDS	<0.00001	<0.00001	2.26	2.23	0.137	0.133	144	0.000011	0.000012	<0.0001	0.00017	<0.01	<0.01
2020	Q1	LC_LC3	<0.00001	<0.00001	15.6	15	0.244	0.242	504	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01
2020	Q1	LC_LC5	<0.00001	<0.00001	3.52	3.56	0.174	0.176	210	<0.00001	<0.00001	<0.0001	0.00018	<0.01	<0.01
2020	Q1	LC_LCDSSLCC	<0.00001	<0.00001	9.42	9.03	0.233	0.244	320	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01
2020	Q2	FR_FRABCH	<0.00001	<0.00001	1.88	1.59	0.135	0.134	228	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01
2020	Q2	FR_FRCP1	<0.00001	<0.00001	1.32	1.18	0.124	0.123	207	0.000014	0.000011	<0.0001	<0.0001	<0.01	<0.01
2020	Q2	GH_FR1	<0.00001	<0.00001	1.92	2.03	0.109	0.118	157	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01
2020	Q2	GH_ERC	<0.00001	<0.00001	1.24	1.27	0.191	0.207	36.9	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01
2020	Q2	CM_MC2	<0.00001	<0.00001	8.76	9.67	0.249	0.276	211	0.000012	0.000013	<0.0001	<0.0001	<0.01	<0.01
2020	Q2	EV_MC2	<0.00001	<0.00001	2.51	2.44	0.136	0.13	49.5	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01
2020	Q2	EV_HC1	<0.00001	<0.00001	1.4	1.42	0.116	0.115	145	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01
2020	Q2	LC_DCDS	<0.00001	<0.00001	1.31	1.35	0.0717	0.0755	67.6	<0.00001	0.000019	<0.0001	<0.0001	<0.01	<0.01
2020	Q2	LC_LC3	<0.00001	<0.00001	6.75	6.74	0.174	0.182	210	0.000012	0.00001	<0.0001	<0.0001	<0.01	<0.01
2020	Q2	LC_LC5	<0.00001	<0.00001	2.65	2.56	0.139	0.143	143	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01
2020	Q2	LC_LCDSSLCC	<0.00001	<0.00001	5.09	4.75	0.17	0.171	149	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01
2020	Q3	FR_FRABCH	<0.00001	<0.00001	2.31	2.05	0.159	0.15	266	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01
2020	Q3	FR_FRCP1	<0.00001	<0.00001	1.62	1.54	0.161	0.15	311	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01
2020	Q3	GH_FR1	<0.00001	<0.00001	2.03	2.38	0.137	0.149	189	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01
2020	Q3	GH_ERC	<0.00001	<0.00001	0.762	0.94	0.201	0.211	24.2	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01
2020	Q3	CM_MC2	<0.00001	<0.00001	31.1	31.3	0.584	0.607	408	0.000031	0.000028	<0.0001	<0.0001	<0.01	<0.01
2020	Q3	EV_HC1	<0.00001	<0.00001	1.45	1.53	0.12	0.122	166	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01
2020	Q3	LC_LC5	<0.00001	<0.00001	3.21	3.06	0.173	0.159	164	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01
2020	Q3	LC_LCDSSLCC	<0.00001	<0.00001	6.52	6.56	0.211	0.197	211	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01
2020	Q4	FR_FRABCH	<0.00001	<0.00001	2.5	2.59	0.194	0.181	347	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01
2020	Q4	FR_FRCP1	<0.00001	<0.00001	2.01	2.02	0.187	0.179	468	0.000012	0.000011	<0.0001	<0.0001	<0.01	<0.01
2020	Q4	GH_FR1	<0.00001	0.000014	2.29	2.52	0.161	0.161	276	<0.00001	0.000012	<0.0001	<0.0001	<0.01	<0.01
2020	Q4	GH_ERC	<0.00001	<0.00001	1	1.1	0.213	0.215	32.1	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01
2020	Q4	CM_MC2	<0.00001	<0.00001	32.4	33.9	0.554	0.569	444	0.000026	0.000024	<0.0001	<0.0001	<0.01	<0.01
2020	Q4	EV_MC2	<0.00001	0.00001	5.09	5.26	0.195	0.19	134	<0.00001	0.000106	<0.0001	<0.0001	<0.01	<0.01
2020	Q4	EV_HC1	<0.00001	<0.00001	1.52	1.59	0.134	0.134	218	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01
2020	Q4	LC_DCDS	<0.00001	<0.00001	4.94	5.23	0.182	0.184	219	0.000019	0.000016	<0.0001	<0.0001	<0.01	<0.01
2020	Q4	LC_LC3	<0.00001	<0.00001	11.2	11.7	0.247	0.251	439	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01
2020	Q4	LC_LC5	<0.00001	<0.00001	3.23	3.35	0.178	0.177	220	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01
2020	Q4	LC_LCDSSLCC	0.000005	0.000005	6.886	7.034	0.212	0.2104	226.8	0.000005	0.000005	0.00005	0.00005	0.005	0.005
2021	Q1	GH_FR1	<0.00001	0.000045	2.58	2.37	0.172	0.192	245	<0.00001	0.000045	<0.0001	<0.0001	<0.0003	0.00731
2021	Q1	GH_ERC	<0.00001	<0.00001	1.11	1.04	0.216	0.222	38.7	<0.00001	<0.00001	<0.0001	<0.0001	<0.0003	<0.0003
2021	Q1	EV_HC1	<0.00001	<0.00001	1.89	1.94	0.128	0.145	214	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01
2021	Q1	LC_LCDSSLCC	<0.00001	<0.00001	10.4	11	0.251	0.266	348	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01
2021	Q2	FR_FRABCH	<0.00001	0.000013	1.18	1.29	0.104	0.104	131	<0.00001	0.000021	<0.0001	<0.0001	<0.0003	0.0135
2021	Q2	FR_FRCP1	<0.00001	<0.00001	0.936	0.989	0.0968	0.0958	99.5	<0.00001	0.000015	<0.0001	<0.0001	<0.0003	<0.009
2021	Q2	GH_ERC	<0.00001	0.00005	0.858	0.899	0.206	0.219	21.2	<0.00001	0.000073	<0.0001	<0.0001	<0.0003	0.0102
2021	Q2	CM_MC2	<0.00001	<0.00001	11.9	11.7	0.239	0.238	137	0.000012	0.000036	<0.0001	<0.0001	<0.0003	0.00442
2021	Q2	EV_MC2	<0.00001	0.000294	2.1	2.08	0.0765	0.129	26.8	<0.00001	0.000316	<0.0001	<0.0001	<0.0003	0.0225
2021	Q2	EV_HC1	<0.00001	0.000015	1.06	1.03	0.0816	0.0861	70.1	<0.00001	0.000032	<0.0001	<0.0001	<0.0003	0.0033
2021	Q2	LC_DCDS	<0.00001	0.000016	2.14	2.13	0.0823	0.0857	78.5	0.000016	0.000036	<0.0001	<0.0001	<0.0003	0.0153
2021	Q2	LC_LCDSSLCC	<0.00001	<0.00001	2.84	2.95	0.108	0.12	96.1	<0.00001	<0.00001	<0.0001	<0.0001	<0.0003	<0.0009
2021	Q3	FR_FRABCH	<0.00001	<0.00001	2.71	2.74	0.173	0.172	297	<0.00001	<0.00001	<0.0001	<0.0001	<0.0003	<0.0003
2021	Q3	FR_FRCP1	<0.00001	<0.00001	2.01	1.98	0.168	0.164	328	<0.00001	0.000011	<0.0001	<0.0001	<0.0003	<0.0003
2021	Q3	GH_FR1	<0.00001	<0.00001	2.4	2.43	0.158	0.145	195	<0.00001	<0.00001	<0.0001	<0.0001	<0.0003	<0.0003
2021	Q3	CM_MC2	<0.00001	<0.00001	19.8	19.7	0.473	0.49	314	0.000016	0.000019	<0.0001	<0.0001	<0.0003	0.0005
2021	Q3	EV_MC2	<0.00001	<0.00001	4.66	4.41	0.193	0.182	106	<0.00001	<0.00001	<0.0001	<0.0001	<0.0003	0.00032
2021	Q3	LC_LC3	<0.00001	<0.00001	9.33	9.42	0.216	0.222	274	0.000013	0.000015	<0.0001	<0.0001	<0.0003	<0.0003
2021	Q3	LC_LC5	<0.00001	<0.00001	3.4	3.25	0.172	0.169	173	<0.00001	<0.00001	<0.0001	<0.0001	<0.0003	<0.0003
2021	Q3	LC_LCDSSLCC	<0.00001	<0.00001	6.54	6.76	0.197	0.197	200	<0.00001	<0.00001	<0.0001	<0.0001	<0.0003	<0.0003
2021	Q4	FR_FRABCH	<0.00001	<0.00001	3.16	3.41	0.186	0.191	321	<0.00001	<0.00001	<0.0001	<0.0001	<0.0003	<0.0003
2021	Q4	FR_FRCP1	<0.00001	<0.00001	2.45	2.49	0.186	0.196	445	0.000011	0.000012	<0.0001	<0.0001	<0.0003	<0.0003
2021	Q4	GH_FR1	<0.00001	<0.00001	2.57	2.78	0.162	0.173	216	<0.00001	<0.00001	<0.0001	<0.0001	<0.0003	<0.0003
2021	Q4	LC_DCDS	<0.00001	<0.00001	8.34	8.14	0.218	0.224	235	0.000021	0.00002	<0.0001	<0.0001	<0.0003	<0.0003
2021	Q4	LC_LC3	<0.00001	<0.00001	13.3	13.6	0.227	0.239	331	0.000011	<0.00001	<0.0001	<0.0001	<0.0003	<0.0003
Tests categorized as possible or likely adverse res															
2015	Q1	FR_FRCP1	<0.000020	<0.000020	2.0	2.1	0.22	0.23	1460	0.00003	0.000032	<0.00020	<0.00020	0.017	0.017
2015	Q1	EV_HC1	0.00001	0.00001	1.1	1.2	0.085	0.087	130	0.00001	0.00001	0.0001	0.0001	0.011	0.011
2015	Q2	LC_LC3	<0.000010	<0.000010	4.9	5.1	0.16	0.16	197	0.000013	0.000014	<0.00010	<0.00010	<0.010	<0.010
2015	Q2	LC_LC5	<0.000010	<0.000010	2.0	2.1	0.12	0.13	120	<0.000010	<0.000010	<0.00010	<0.00010	<0.010	<0.010
2015	Q2	LC_LCDSSLCC	<0.000010	<0.000010	2.9	2.9	0.13	0.13	107	<0.000010	<0.000010	<0.00010	<0.00010	<0.010	<0.010
2015	Q4	FR_FRCP1	<0.000010	<0.000010	2.1	2.0	0.16	0.16	327	<0.000010	<0.000010	<0.00010	<0.00010	<0.010	<0.010
2016	Q1	FR_FRCP1	< 0.000010	< 0.000010	2.2	2.2	0.2	0.2	765	0.000016	0.000015	< 0.00010	< 0.00010	0.021	0.021
2016	Q2	FR_FRCP1	< 0.000010	< 0.000010	1.0	1.1	0.097	0.1	116	< 0.000010	0.000013	< 0.00010	< 0.00010	< 0.010	< 0.010
2018	Q1	FR_FRCP1	<0.00001	<0.00001	2.6	2.3	0.22	0.21	613	0.000013	0.000012	<0.0001	<0.0001	<0.01	<0.01
2018	Q2	FR_FRCP1	<0.00001	0.000012	1.2	1.2	0.12	0.13	149	<0.00001	0.000019	<0.0001	<0.0001	<0.01	<0.01
2018	Q4	FR_FRCP1	<0.00002	<0.00002	2.2	2.2	0.23	0.24	1940	0.000045	0.000045	<0.0002	<0.0002	<0.01	<0.01
2019	Q1	FR_FRCP1	<0.00002	<0.00002	2.28	1.83	0.268	0.266	1,910	0.000041	0.000038	<0.0002	<0.0002	<0.01	<0.01
2019	Q3	FR_FRABCH	<0.00001	<0.00001	2.0	2.0	0.14	0.15	213	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01
2019	Q3	FR_FRCP1	<0.00001	<0.00001	1.4	1.3	0.13	0.14	176	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01
2019	Q3	GH_FR1	<0.00001	<0.00001	2.0	1.9	0.14	0.13	164	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01
2019	Q3	CM_MC2	<0.00001	<0.00001	11	11	0.38	0.4	313	0.000017	0.000015	<0.0001	<0.0001	<0.01	<0.01
2019	Q3	EV_MC2	<0.00001	<0.00001	3.2	3.0	0.17	0.16	98	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01
2019	Q3	EV_HC1	<0.00001	<0.00001	1.6	1.5	0.12	0.12	169	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01
2019	Q3	LC_LC3	<0.00001	<0.00001	8.4	9	0.19	0.2	254	0.000012	0.00001	<0.0001	<0.0001	<0.01	<0.01
2019	Q3	LC_LC5	<0.00001	<0.00001	2.5	2.6	0.14	0.15	145	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01
2019	Q3	LC_LCDSSLCC	<0.00001	<0.00001	5.4	5.5	0.18	0.18	175	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01
2020	Q1	FR_FRCP1	<0.00001	0.00001	2.88	2.89	0.191	0.206	526	0.000012	0.000017	<0.0001	0.00012	<0.01	<0.01
2020	Q1	FR_FR4	<0.00001	<0.00001	2.3	2.4	0.186	0.204	549	0.000012	0.000011	<0.0001	<0.0001	<0.01	<0.01
2020	Q3	EV_MC2	<0.00001	<0.00001	5.2	4.88	0.188	0.191	119	<0.00001	<0.00001	<0.0001	0.00021	<0.01	<0.01
2020	Q3	LC_DCDS	<0.00001	<0.00001	3.72	3.86	0.136	0.143	158	0.000021	0.000025	<0.0001	<0.0001	<0.01	<0.01
2020	Q3	LC_LC3	<0.00001	<0.00001	9.91	9.96	0.231	0.223	324	0.000012	0.000014	<0.0001	<0.0001	<0.01	<0.01
Tests categorized as possible or likely adverse res															
2021	Q1	CM_MC2	<0.00001	<0.00001	18	16.3	0.47	0.48	392	0.000011	0.000011	<0.0001	<0.0001	<0.0003	<0.0003
2021	Q2	LC_LC3	<0.00001	<0.00001	5.2	5.48	0.152	0.161	194	0.000012	0.000014	<0.0001	<0.0001	<0.0003	0.00056
2021	Q4	CM_MC2	<0.00001	<0.00001	18.5	16.9	0.525	0.493	437	0.000012	0.000012	<0.0001	<0.0001	<0.0003	<0.0012

Year	Quarter	Sample ID	TOTAL DISSOLVED SOLIDS (RESIDUE, FILTERABLE)-N-mg/l	TOTAL KJELDAHL NITROGEN-N-mg/l	TOTAL ORGANIC CARBON-T-mg/l	TOTAL SUSPENDED SOLIDS, LAB-N-mg/l	TURBIDITY, LAB-N-ntu	URANIUM-D-mg/l	URANIUM-T-mg/l	VANADIUM-D-mg/l	VANADIUM-T-mg/l	ZINC-D-mg/l	ZINC-T-mg/l	∑TU-WQGs	∑TU-WQGs/Benchmarks	PC1_allyrs	PC2_allyrs	PC1_2021	PC2_2021
2019	Q4	LC_LC3	896	<0.05	0.72	2.4	0.41	0.005	0.0051	<0.0005	<0.0005	0.0068	0.0067	9.54	6.38	8.125	-1.739		
2019	Q4	LC_LC5	538	<0.05	<0.5	2.1	0.33	0.0023	0.0023	<0.0005	<0.0005	0.0014	<0.003	6.14	3.85	2.248	-3.778		
2019	Q4	LC_LCDSSLCC	637	<0.05	<0.5	1.3	0.37	0.0035	0.0036	<0.0005	<0.0005	0.005	0.0065	9.23	7.01	4.588	-2.094		
2020	Q1	FR_FRABCH	857	<0.05	1.51	38.8	17.1	0.00312	0.00315	<0.0005	<0.0005	0.0013	0.0045	10.82685408	9.010044225	3.820	1.304		
2020	Q1	GH_FR1	676	0.495	0.52	<1	0.12	0.00246	0.00245	<0.0005	<0.0005	<0.001	<0.003	6.556879867	2.060833292	1.831	-3.772		
2020	Q1	GH_ERC	259	0.119	0.54	<1	<0.1	0.000864	0.000895	<0.0005	<0.0005	<0.001	<0.003	2.057141527	1.773447419	-4.530	-3.062		
2020	Q1	CM_MC2	895	0.229	0.74	<1	0.69	0.00417	0.00433	<0.0005	<0.0005	0.0031	0.0034	14.2436098	13.24105084	8.756	-0.020		
2020	Q1	EV_MC2	415	0.373	0.87	<1	0.24	0.00142	0.00151	<0.0005	<0.0005	<0.001	<0.003	2.873990477	2.590897061	0.965	-1.875		
2020	Q1	EV_HC1	525	0.253	0.88	<1	0.27	0.00263	0.00259	<0.0005	<0.0005	<0.001	<0.003	2.959321589	2.209977272	-0.038	-2.186		
2020	Q1	LC_DCDS	529	<0.05	1.92	<1	0.22	0.0022	0.00216	0.00108	0.00116	0.0041	0.0043	11.08216479	2.740700165	4.727	1.608		
2020	Q1	LC_LC3	993	0.474	0.94	<1	0.43	0.00513	0.0051	<0.0005	<0.0005	0.0047	0.006	9.271061299	4.820763108	8.759	-1.561		
2020	Q1	LC_LC5	557	0.356	0.66	<1	0.21	0.00222	0.00221	<0.0005	<0.0005	<0.001	<0.003	5.262613022	6.412903624	1.427	-3.248		
2020	Q1	LC_LCDSSLCC	728	<0.05	0.9	<1	<0.1	0.00362	0.0039	<0.0005	<0.0005	0.003	0.0032	6.303528516	2.837200123	4.951	-3.544		
2020	Q2	FR_FRABCH	650	<0.05	4.35	8.9	4.94	0.00298	0.00262	<0.0005	0.00058	0.0035	0.004	8.448879766	5.967790883	3.695	0.459		
2020	Q2	FR_FRCP1	596	<0.05	1.81	3.7	2.76	0.00291	0.00251	<0.0005	0.00065	0.006	0.0061	9.158833318	3.631301937	4.198	0.555		
2020	Q2	GH_FR1	477	0.394	3.33	8.7	3.77	0.00209	0.00218	<0.0005	0.00058	0.0019	0.0035	5.291697376	2.075187045	1.638	1.552		
2020	Q2	GH_ERC	228	0.168	1.58	7	3.82	0.000929	0.000991	<0.0005	0.00073	<0.001	<0.003	2.100036361	1.619425058	-4.246	1.207		
2020	Q2	CM_MC2	527	0.398	1.74	4.9	3.36	0.00208	0.00222	<0.0005	<0.0005	0.0058	0.0073	6.125927102	5.732180548	3.733	1.682		
2020	Q2	EV_MC2	198	0.135	3.46	8.7	5.64	0.000632	0.000714	<0.0005	0.00108	<0.001	<0.003	2.499809603	2.536594528	-3.317	3.439		
2020	Q2	EV_HC1	424	0.154	2.33	2	1.48	0.00221	0.00224	<0.0005	0.00055	<0.001	<0.003	5.914778636	1.321810306	-1.036	-0.350		
2020	Q2	LC_DCDS	301	0.612	3.29	14	2.12	0.000901	0.00104	0.00124	0.00207	0.0046	0.0097	7.627563553	5.777831638	1.643	6.799		
2020	Q2	LC_LC3	598	<0.25	0.78	2.4	0.45	0.00337	0.00304	<0.0005	<0.0005	0.0114	0.0111	7.623932256	5.093948591	5.269	-1.202		
2020	Q2	LC_LC5	482	<0.25	1.78	8.3	1.86	0.00205	0.00181	<0.0005	<0.0005	0.0015	<0.003	4.618953065	5.707491064	1.265	-0.993		
2020	Q2	LC_LCDSSLCC	475	<0.05	1.2	1.4	0.48	0.00268	0.00237	<0.0005	<0.0005	0.0063	0.0062	5.094567026	2.769004993	2.864	-1.670		
2020	Q3	FR_FRABCH	752	<0.25	<0.5	1.8	0.32	0.00306	0.0033	<0.0005	<0.0005	0.0024	<0.003	9.258306511	4.746644483	4.095	-3.393		
2020	Q3	FR_FRCP1	743	<0.25	<0.5	1.8	0.28	0.00349	0.0037	<0.0005	<0.0005	0.0047	0.0056	8.146498464	3.837941765	5.605	-3.034		
2020	Q3	GH_FR1	558	0.271	<0.5	31.9	2.75	0.00223	0.00227	<0.0005	0.00099	<0.001	<0.003	6.411812958	2.034888473	1.851	-0.275		
2020	Q3	GH_ERC	192	0.191	<0.5	5.2	1.04	0.000697	0.000724	<0.0005	0.00061	<0.001	0.005	2.048154367	1.911552272	-4.958	-1.038		
2020	Q3	CM_MC2	912	0.661	0.87	<1	0.42	0.00392	0.00384	<0.0005	0.00071	0.0011	0.0045	13.17875483	12.2349764	9.191	0.293		
2020	Q3	EV_HC1	439	0.266	0.74	<1	0.65	0.00216	0.00216	<0.0005	<0.0005	<0.001	<0.003	3.39665042	1.58060621	-0.557	-1.940		
2020	Q3	LC_LC5	468	<0.25	0.5	2.2	0.16	0.00204	0.00211	<0.0005	<0.0005	0.0014	<0.003	5.08070351	6.226739723	1.692	-3.526		
2020	Q3	LC_LCDSSLCC	571	<0.25	1.25	<1	0.17	0.00294	0.00311	<0.0005	<0.0005	0.0069	0.0074	5.795877105	2.902484116	4.719	-2.202		
2020	Q4	FR_FRABCH	833	<0.05	0.77	<1	0.14	0.00351	0.00354	<0.0005	<0.0005	0.001	<0.003	10.38470124	6.339903806	4.079	-3.678		
2020	Q4	FR_FRCP1	932	<0.25	1.02	1	0.47	0.00484	0.00492	<0.0005	<0.0005	0.0059	0.0065	10.23753397	5.388215931	7.224	-1.863		
2020	Q4	GH_FR1	635	<0.25	0.71	63.6	20.3	0.00256	0.00266	<0.0005	0.00161	0.0026	0.0076	8.886481187	2.727306799	2.880	3.347		
2020	Q4	GH_ERC	189	<0.05	0.61	<1	0.17	0.000757	0.000807	<0.0005	<0.0005	<0.001	<0.003	2.746347744	1.789995923	-4.934	-2.512		
2020	Q4	CM_MC2	855	0.331	1.2	<1	0.69	0.00337	0.00324	<0.0005	<0.0005	0.0023	0.0043	9.34927889	8.47797829	8.218	-0.045		
2020	Q4	EV_MC2	361	0.357	1.13	<1	0.32	0.00118	0.00122	<0.0005	<0.0005	<0.001	<0.003	2.468759602	2.2845145	0.328	-0.675		
2020	Q4	EV_HC1	485	0.238	0.84	<1	0.29	0.00235	0.00256	<0.0005	<0.0005	0.0014	<0.003	2.970842335	1.531565559	-0.296	-2.437		
2020	Q4	LC_DCDS	751	<0.05	1.58	<1	0.34	0.00262	0.00266	0.00107	0.0012	0.0082	0.0086	20.48654759	2.806567967	7.524	1.659		
2020	Q4	LC_LC3	919	<0.05	1.02	<1	0.33	0.00492	0.00552	<0.0005	<0.0005	0.0084	0.0086	10.0331927	8.763558653	8.526	-1.841		
2020	Q4	LC_LC5	561	<0.05	0.79	<1	0.19	0.00223	0.00232	<0.0005	<0.0005	0.0018	<0.003	5.772774175	7.030588413	1.577	-3.647		
2020	Q4	LC_LCDSSLCC	598.8	0.1712	0.45	0.5	0.176	0.003196	0.003308	0.00025	0.00025	0.00616	0.00634	5.525167473	2.950682144	3.553	-10.270		
2021	Q1	GH_FR1	552	1.48	0.66	19.9	3.66	0.00242	0.00264	<0.0005	0.00398	0.0022	0.0217	15.0657926	11.21826405	4.05	8.88	0.91	6.73
2021	Q1	GH_ERC	190	0.488	<0.5	<1	<0.1	0.000865	0.000922	<0.0005	<0.0005	<0.001	<0.003	3.297572083	3.165813652	-4.13	-2.95	-4.05	-4.36
2021	Q1	EV_HC1	499	0.351	<0.5	<1	0.28	0.00259	0.00276	<0.0005	<0.0005	<0.001	<0.003	4.214665606	3.894291305	0.30	-2.52	0.62	-2.53
2021	Q1	LC_LCDSSLCC	792	0.172	<0.5	<1	<0.1	0.00397	0.00438	<0.0005	<0.0005	0.0034	0.0031	9.34289815	6.143098487	6.20	-3.69	6.21	-1.42
2021	Q2	FR_FRABCH	370	0.889	2.79	138	27.3	0.0017	0.00174	<0.0005	0.00243	0.0031	0.0095	9.182249066	6.879966328	0.93	7.69	-1.72	5.47
2021	Q2	FR_FRCP1	322	0.541	2.78	59	15.1	0.00146	0.00143	<0.0005	0.00162	0.0026	0.0179	8.104715224	6.50722778	0.46	6.62	-2.11	4.46
2021	Q2	GH_ERC	184	0.525	3.94	165	75	0.000784	0.001	<0.0005	0.0057	0.001	0.0197	10.28259654	10.19555562	-3.10	13.37	-7.04	8.05
2021	Q2	CM_MC2	346	0.314	3.82	55.7	29	0.00118	0.00122	<0.0005	0.00146	0.0064	0.0122	8.20606612	7.864047378	1.86	9.02	-1.35	6.66
2021	Q2	EV_MC2	141	1.64	7.59	522	226	0.000351	0.00137	<0.0005	0.0247	0.0013	0.095	35.46916993	35.38896206	-1.04	23.47	-8.64	17.40
2021	Q2	EV_HC1	250	0.318	6.26	27.2	21.9	0.00106	0.00114	<0.0005	0.00174	<0.001	0.0052	4.405145029	4.277490094	-3.01	7.51	-5.20	4.10
2021	Q2	LC_DCDS	292	<0.05	7.7	40.3	24.9	0.00106	0.00111	0.00142	0.00343	0.024	0.0115	10.73411884	8.362087126	3.69	11.52	0.02	9.20
2021	Q2	LC_LCDSSLCC	288	0.629	2.5	3.8	1.82	0.00166	0.00177	<0.0005	<0.0005	0.0065	0.009	5.494097737	4.522385262	0.54	0.56	-0.64	0.04
2021	Q3	FR_FRABCH	820	0.467	2.14	<1	0.38	0.00365	0.00358	<0.0005	<0.0005	0.0024	<0.003	12.94991405	6.633310522	5.16	-1.79	4.98	-0.76
2021	Q3	FR_FRCP1	756	0.44	2.02	<1	0.37	0.00384	0.00388	<0.0005	<0.0005	0.0064	0.0059	10.6830874	6.583969038	6.71	-1.76	6.20	-0.27
2021	Q3	GH_FR1	565	0.1	2.02	<1	0.3	0.00237	0.00239	<0.0005	<0.0005	0.0011	<0.003	8.846069482	5.367662337	2.41	-1.55	2.44	-1.58
2021	Q3	CM_MC2	682	<0.05	1.12	1.3	0.62	0.00282	0.00297	<0.0005	<0.0005	<0.001	<0.003	8.727441618	8.213827914	5.69	-0.43	5.13	-0.11
2021	Q3	EV_MC2	323	0.057	2.56	<1	0.39	0.00125	0.00126	<0.0005	<0.0005	0.0035	<0.003	2.875445412	2.839617237	0.52	-0.64	0.37	-1.53
2021	Q3	LC_LC3	716	0.118	0.72	<1	0.32	0.00382	0.00404	<0.0005	<0.0005	0.0145	0.0164	11.24877121	7.769597732	8.21	-1.68	7.43	0.18
2021	Q3	LC_LC5	489	0.374	2.64	<1	0.2	0.00219	0.00223	<0.0005	<0.0005	0.0014	<0.003	7.234067803	4.627099796	2.31	-2.51	2.56	-2.43
2021	Q3	LC_LCDSSLCC	546	0.12	0.62	<1	0.24	0.00279	0.00298	<0.0005	<0.0005	0.0077	0.008	8.240459077	5.906114095	4.78	-3.01	4.50	-1.59
2021	Q4	FR_FRABCH	858	<0.05	0.92	2.2	0.38	0.00394	0.00417	<0.0005	<0.0005	0.0026	0.0083	12.04662148	5.729212532	5.23	-2.56	5.34	-1.30
2021	Q4	FR_FRCP1	903	0.35	0.89	<1	0.35	0.00505	0.00531	<0.0005	<0.0005	0.0086	0.01	15.74458454	9.123531528	8.34	-2.05	7.77	0.20
2021	Q4	GH_FR1	590	0.256	<0.5	<1	0.19	0.0027	0.00265	<0.0005	<0.0005	<0.001	<0.003	8.153229342	4.617484433	2.45	-3.38	2.94	-2.87
2021	Q4	LC_DCDS	838	0.507	2.17	<1	0.26	0.00321	0.00326	0.0012	0.00127	0.0103	0.0101	22.24549454	9.016991989	9.38	1.71	8.08	3.21
2021	Q4	LC_LC3	796	<0.05	-	1.8	0.3	0.00488	0.00482	<0.0005	<0.0005	0.0104	0.0113	9.912705824	6.953407037	8.77	-1.95	8.16	0.02
Tests categorized as possible or likely adverse res																			
2015	Q1	FR_FRCP1	2580	<0.050	1.5	<1.0	0.12	0.015	0.016	<0.0020	<0.0020	<0.0030	<0.0060	25.6	17.3	12.89140927	3.8948403		
2015	Q1	EV_HC1	325	0.05	0.84	1.0	0.24	0.0017	0.0017	0.001	0.001	0.003	0.003	3.32	3.23	-2.39364344	0.18850297		
2015	Q2	LC_LC3	519	<0.050	0.77	1.1	0.42	0.0033	0.0034	<0.00050	<0.00050	0.017	0.017	10.48	4.34	4.005135445	-0.54753595		
2015	Q2	LC_LC5	368	<0.050	1.4	5.1	1.1	0.0016	0.0016	<0.00050	<0.00050	0.0032	<0.0030	5.79	7.74	0.11220499	-0.31178708		
2015	Q2	LC_LCDSSLCC	337	<0.050	1.5	1.6	0.48	0.002	0.002	<0.00050	<0.00050	0.0061	0.0066	5.45	5.03	0.205552863	-0.56297959		
2015	Q4	FR_FRCP1	765	<0.050	0.81	<1.0	0.29	0.0038	0.0037	<0.00050	<0.00050	<0.0030	<0.0030	9.62	5.64	4.961576566	-2.12675621		
2016	Q1	FR_FRCP1	1520	< 0.050	0.95	< 1.0	0.28	0.0079	0.008	< 0.00050	< 0.00050	< 0.0030	< 0.0030	16.4	8.77	8.381958379	-2.80878044		
2016	Q2	FR_FRCP1	354	0.21	2.9	7.1	1.5	0.0016	0.0017	< 0.00050	0.00061	< 0.0030	0.0033	5.49	3.84	0.383169578	1.928422994		
2018	Q1	FR_FRCP1	1280	0.49	1.0	<1	0.31	0.0071	0.0067	<0.0005	<0.0005	<0.003	<0.003	11.8	6.33	7.358353554	-2.52326498		
2018	Q2	FR_FRCP1	421	0.47	3.4	22	14	0.0019	0.0021	<0.0005	0.0016	0.0046	0.011	7.15	5.35	2.006204218	5.541344116		
2018	Q4	FR_FRCP1	3260	0.87	2.5	33	21	0.023	0.023	<0.001	<0.001	<0.002	<0.006	27.3	19.1	13.0206503	5.046471113		
2019	Q1	FR_FRCP1	3470	<0.05	1.8	3	0.75	0.0201	0.019	<0.001	<0.001	<0.002	0.0079	25.0	3.96	13.16165401	2.719097634		
2019	Q3	FR_FRABCH	629	<0.25	0.84	<1	0.51	0.0031	0.0029	<0.0005	<0.0005	0.0017	0.0043	8.03	4.00	3.236049971	-2.17269283		
2019	Q3	FR_FRCP1	476	0.066	0.98	1.2	0.62	0.0027	0.0026	<0.0005	<0.0005	0.0011	<0.003	5.99	2.63	2.43880552	-2.09873713		
2019	Q3	GH_FR1	473	<0.25	1.2	2.1	1.2	0.0022	0.0023	<0.0005	<0.0005	<0.001	<0.003	5.65	3.61	1.457976414	-2.01963318		
2019	Q3	CM_MC2	674	0.37	1.0	<1	0.53	0.0032	0.0028	<0.0005	<0.0005	<0.001	<0.003	6.93	2.27	5.017426977	-1.2637629		
2019	Q3	EV_MC2	304	0.46	1.3	<1	0.68	0.0012	0.0011	<0.0005	<0.0005	0.0036	<0.003	2.40	4.31	-0.4131081	-1.35786952		
2019	Q3	EV_HC1	416	0.18	1.1	<1	0.84	0.0023	0.0022	<0.0005	<0.0005	<0.001	<0.003	2.48	6.23	-0.56686573	-1.57829381		
2019	Q3	LC_LC3	675	0.15	0.73	<1	0.35	0.0035	0.0035	<0.0005	<0.0005	0.013	0.015	9.06	6.85	6.479972535	-1.32856935		
2019	Q3	LC_LC5	445	0.082	1.3	1.8	0.56	0.0019	0.0018	<0.0005	<0.0005	<0.001	<0.003	4.92	3.14	1.30311257	-2.7060689		
2019	Q3	LC_LCDSSLCC	511	<0.25	0.77	<1	0.17	0.0026	0.0025	<0.0005	<0.0005	0.0059	0.0078	6.02	4.48	3.513253498	-2.13092968		
2020	Q1	FR_FRCP1	1130	0.136	2.39	4.7	1.57	0.00582	0.0062	<0.0005	<0.0005	0.0187	0.0296	14.29391958	6.769931898	8.038098908	3.64363303		
2020	Q1	FR_FR4	1110	<0.05	1.53	<1	0.16	0.00602	0.00635	<0.0005	<0.0005	0.0027	<0.003	12.35069936	3.392298786	7.078799238	-2.50370437		
2020	Q3	EV_MC2	374	0.356	1.13	1.4	0.36	0.00116	0.0012	<0.0005	<0.0005	<0.001	<0.003	2.33068342	2.160207974	0.494862373	-1.52178621		
2020	Q3	LC_DCDS	523	<0.25	3.6	5.2	2.82	0.00191	0.00203	0.00116	0.00134	0.0033	0.0043	14.47276682	3.28975298	6.22112759	3.386545998		
2020	Q3	LC_LC3	765	<0.05	1.67	<1	0.29	0.00428	0.00443	<0.0005	<0.0005	0.0125	0.0135	8.852270181	7.462486277	8.067080551	-1.09845811		
Tests categorized as possible or likely adverse res																			
2021	Q1	CM_MC2	817	0.389	<0.5	<1	0.26	0.00307	0.00302	<0.0005	<0.0005	0.0017	<0.003	7.33220255	6.477149668	5.923335799	-2.57902004	5.9653	-1.2925
2021	Q2	LC_LC3	457	<0.05	1.2	<1	1.4	0.00301	0.00323	<0.0005	<0.0005	0.0145	0.0152	9.235932289	6.757618324	4.741716785	-0.17185477	3.4521	0.6494
2021	Q4	CM_MC2	921	0.245	1.58	6.4	0.51	0.004	0.00361	<0.0005	<0.0005	<0.001	<0.003	7.222942594	6.423306306	6.739605136	-0.77318656	6.5381	-0.1840

Notes:

"-D-" = dissolved concentration; "-T-" = total concentrat

Screening

Concentrations of parameters in 2021 tests categorize

Year	Quarter	Sample ID	Mean Survival (Control Normalized)	Mean Dry Weight (Control Normalized)	ACIDITY TO pH 8.3 (As CaCO3)-N-mg/l	ALKALINITY BICARBONATE (As CaCO3) lab measured.-N-mg/l	ALKALINITY CARBONATE (As CaCO3) lab measured.-N-mg/l	ALKALINITY HYDROXIDE (As CaCO3) lab measured.-N-mg/l	ALKALINITY TOTAL (As CaCO3) lab measured.-N-mg/l	ALUMINUM-D-mg/l	ALUMINUM-T-mg/l	ANTIMONY-D-mg/l	ANTIMONY-T-mg/l	ARSENIC-D-mg/l
Reference (2015 - 2021)														
2015	Q1	Reference (FR_UFR1)	72	82	1.0	135	4.3	1.0	139	0.0033	0.024	0.0001	0.0001	0.0001
2015	Q2	Reference (FR_UFR1)	104	92	1.0	114	2.8	1.0	116	0.0048	0.049	0.0001	0.0001	0.00011
2015	Q3	Reference (FR_UFR1)	96	70	1.0	153	6.8	1.0	160	0.003	0.0086	0.0001	0.00011	0.00011
2015	Q4	Reference (FR_UFR1)	94	104	1.0	140	5.2	1.0	146	0.003	0.0056	0.0001	0.0001	0.0001
2016	Q1	Reference (FR_UFR1)	100	95	<1	139	3.0	<1	141	0.0039	0.0055	<0.0001	<0.0001	<0.0001
2016	Q2	Reference (FR_UFR1)	98	105	<1	114	<1	<1	114	0.0059	0.054	<0.0001	<0.0001	0.00011
2016	Q3	Reference (FR_UFR1)	102	110	<1	154	4.0	<1	158	<0.003	0.0071	<0.0001	<0.0001	<0.0001
2016	Q4	Reference (FR_UFR1)	96	113	<1	140	1.9	<1	141	0.0082	0.042	<0.0001	<0.0001	<0.0001
2017	Q1	Reference (FR_UFR1)	100	85	-	-	-	-	141	0.001	0.005	<0.0001	0.00014	<0.0001
2017	Q2	Reference (FR_UFR1)	100	101	-	-	-	-	119	0.032	0.09	<0.0001	0.00011	0.00014
2017	Q2	Reference (GH_ER2)	109	92	-	-	-	-	151	0.0032	0.14	<0.0001	<0.0001	0.00011
2017	Q3	Reference (FR_UFR1)	88	101	-	-	-	-	147	0.0026	0.0058	<0.0001	0.0001	<0.0001
2017	Q3	Reference (GH_ER2)	83	94	-	-	-	-	136	0.0029	0.014	<0.0001	0.00012	0.00011
2017	Q3	Reference (CM_MC1)	80	65	-	-	-	-	142	0.0029	0.013	<0.0001	0.00011	0.00021
2017	Q4	Reference (FR_UFR1)	102	89	-	-	-	-	144	<0.003	0.0033	<0.0001	<0.0001	<0.0001
2017	Q4	Reference (GH_ER2)	98	75	-	-	-	-	147	<0.003	0.0067	<0.0001	<0.0001	<0.0001
2017	Q4	Reference (CM_MC1)	98	71	-	-	-	-	136	<0.003	0.0054	<0.0001	<0.0001	0.00015
2018	Q1	Reference (FR_UFR1)	98	79	1.3	137	6.3	<1	143	0.0071	0.013	<0.000125	<0.0001	0.00013
2018	Q1	Reference (GH_ER2)	96	79	1.2	151	4.7	<1	155	<0.003	<0.003	<0.0001	0.00011	<0.0001
2018	Q1	Reference (CM_MC1)	100	71	1.2	156	4.4	<1	160	<0.003	0.0039	<0.0001	<0.0001	0.00016
2018	Q2	Reference (FR_UFR1)	102	121	1.0	99	1.5	<1	99	0.012	0.21	<0.0001	<0.0001	0.00013
2018	Q2	Reference (GH_ER2)	104	118	<1	133	6.2	<1	139	0.0053	0.87	<0.0001	0.00014	0.00015
2018	Q2	Reference (CM_MC1)	102	126	1.7	96	2.3	<1	98	0.029	0.37	<0.000125	<0.0001	0.00023
2018	Q2	Reference (LC_SLC)	104	126	1.2	114	3.5	<1	117	0.0043	0.07	<0.0001	<0.0001	0.00012
2018	Q3	Reference (FR_UFR1)	107	180	<1	147	5.9	<1	153	<0.003	0.0046	<0.0001	<0.0001	0.0001
2018	Q3	Reference (GH_ER2)	107	143	<1	133	3.2	<1	135	<0.003	0.24	<0.0001	<0.0001	0.00011
2018	Q3	Reference (CM_MC1)	95	137	<1	145	1.5	<1	146	0.003	0.016	<0.0001	<0.0001	0.00018
2018	Q3	Reference (LC_SLC)	70	117	<1	137	4.1	<1	141	<0.003	0.0053	<0.0001	<0.0001	0.00011
2018	Q4	Reference (FR_UFR1)	94	56	1.1	149	1.5	<1	150	<0.003	0.0035	<0.0001	<0.0001	<0.0001
2018	Q4	Reference (GH_ER2)	96	71	<1	149	1.0	<1	149	<0.003	0.0078	<0.0001	<0.0001	<0.0001
2018	Q4	Reference (CM_MC1)	94	135	1.2	145	<1	<1	145	<0.003	0.0031	<0.0001	<0.0001	0.00015
2018	Q4	Reference (LC_SLC)	98	68	<1	145	<1	<1	145	<0.003	<0.003	<0.0001	<0.0001	0.00011
2019	Q1	Reference (FR_UFR1)	78	64	0.875	155.75	<1.0	<1.0	155.75	0.028625	0.165575	<0.0001	<0.0001	0.0000725
2019	Q1	Reference (GH_ER2)	67	64	<1.0	149.75	<1.0	<1.0	149.75	<0.003	0.0074	<0.0001	<0.0001	<0.0001
2019	Q1	Reference (CM_MC1)	98	100	1.675	161.25	<1.0	<1.0	161.25	<0.003	0.002575	<0.0001	<0.0001	0.0001375
2019	Q3	Reference (FR_UFR1)	96	78	<1.0	143.25	3.75	<1.0	147	0.001925	0.005725	<0.0001	<0.0001	0.00008
2019	Q3	Reference (GH_ER2)	93	87	2.55	136	1.6	<1.0	137.5	<0.003	0.0115	<0.0001	<0.0001	0.0000925
2019	Q3	Reference (CM_MC1)	90	107	<1.0	143.25	3.35	<1.0	146.75	<0.003	0.00795	<0.0001	<0.0001	0.0002075
2019	Q3	Reference (LC_SLC)	102	109	0.75	139.5	0.675	<1.0	139.75	<0.003	0.002375	<0.0001	<0.0001	0.0001125
2019	Q4	Reference (FR_UFR1)	98	144	<1.0	143	<1.0	<1.0	143	<0.003	0.06685	<0.0001	<0.0001	0.000065
2019	Q4	Reference (GH_ER2)	100	59	0.775	146	0.775	<1.0	146.25	0.0024	0.013225	<0.0001	<0.0001	<0.0001
2019	Q4	Reference (CM_MC1)	96	95	<1.0	144.5	1.225	<1.0	145.25	<0.003	0.006975	<0.0001	<0.0001	0.0001875
2019	Q4	Reference (LC_SLC)	88	82	<1.0	143.25	<1.0	<1.0	143.25	<0.003	0.0087	<0.0001	<0.0001	0.0000825
2020	Q2	Reference (FR_UFR1)	98	110	<1.00	87.1	2.30	30.4	119	0.00335	0.0567	<0.000100	<0.000100	0.0000875
2020	Q2	Reference (GH_ER2)	104	97	<1.00	109	2.10	37.4	147	<0.0030	0.167	<0.000100	<0.000100	0.00010
2020	Q2	Reference (CM_MC1)	107	98	<1.00	115	0.925	<1.00	115	0.00778	0.172	<0.000100	<0.000100	0.000193
2020	Q2	Reference (LC_SLC)	102	63	<1.00	134	3.80	<1.00	138	<0.0030	0.0249	<0.000100	<0.000100	0.00013
2020	Q4	Reference (FR_UFR1)	53	19	<1.00	143	3.45	<1.00	147	<0.0030	0.0163	<0.000100	<0.000100	0.0000625
2020	Q4	Reference (GH_ER2)	80	19	<1.00	146	4.45	<1.00	150	<0.0030	0.0282	<0.000100	<0.000100	<0.000100
2020	Q4	Reference (CM_MC1)	82	22	<1.00	142	<1.00	<1.00	142	0.00198	0.0132	<0.000100	<0.000100	0.00018
2020	Q4	Reference (LC_SLC)	92	20	<1.00	140	2.50	<1.00	142	<0.0030	0.0028	<0.000100	<0.000100	0.0000775
2021	Q2	Reference (FR_UFR1)	102	-	<2	115	<1	<1	115	0.003575	0.116125	<0.0001	<0.0001	0.000115
2021	Q2	Reference (FR_UFR1)	96	118	<2	126.5	3.5	<1	130	0.00105	0.04745	<0.0001	<0.0001	0.0000475
2021	Q2	Reference (GH_ER2)	98	-	<2	141.25	<1	<1	141.25	0.002575	0.5835	<0.0001	0.0001075	0.000125
2021	Q2	Reference (CM_MC1)	106	-	<2	95.4	<1	<1	95.4	0.01245	0.315875	<0.0001	<0.0001	0.0002075
2021	Q2	Reference (LC_SLC)	106	-	<2	118.25	<1	<1	118.25	0.0033	0.0573	<0.0001	<0.0001	0.0001275
2021	Q3	Reference (FR_UFR1)	98	71	<2	145	2.2	<1	147.5	0.000825	0.030925	<0.0001	<0.0001	0.0000025
2021	Q3	Reference (GH_ER2)	102	62	<2	129.5	2.15	<1	131.25	0.001125	0.055325	<0.0001	<0.0001	0.0001025
2021	Q3	Reference (CM_MC1)	102	90	<2	146.75	1.65	<1	147.75	0.002075	0.013125	<0.0001	<0.0001	0.000195
2021	Q3	Reference (LC_SLC)	98	64	<2	132.25	2.1	<1	133.5	0.0013	0.01645	<0.0001	<0.0001	0.000115
2021	Q4	Reference (FR_UFR1)	107	114	<2	150.75	2.65	<1	154	0.000375	0.002175	<0.0001	<0.0001	<0.0001
2021	Q4	Reference (GH_ER2)	104	130	<2	146.25	1.8	<1	154.5	0.0025	0.066825	<0.0001	<0.0001	0.000105
2021	Q4	Reference (CM_MC1)	98	128	<2	154	1.1	<1	154	0.0029	0.011625	<0.0001	<0.0001	0.00016
2021	Q4	Reference (LC_SLC)	104	114	<2	146.25	4.5	<1	150.25	0.001125	0.003175	<0.0001	0.000105	0.000105

Year	Quarter	Sample ID	ARSENIC-T-mg/l	BARIUM-D-mg/l	BARIUM-T-mg/l	BERYLLIUM-D-mg/l	BERYLLIUM-T-mg/l	BISMUTH-D-mg/l	BISMUTH-T-mg/l	BORON-D-mg/l	BORON-T-mg/l	BROMIDE-D-mg/l	CADMIUM-D-mg/l	CADMIUM-T-mg/l	CALCIUM-D-mg/l	CALCIUM-T-mg/l	CARBON DISSOLVED ORGANIC-D-mg/l	CHLORIDE-D-mg/l	CHROMIUM-D-mg/l	CHROMIUM-T-mg/l
Reference (2015 - 2021)																				
2015	Q1	Reference (FR_UFR1)	0.00012	0.07	0.072	0.0001	0.0001	0.00032	0.00032	0.01	0.01	0.05	0.0000097	0.000011	51	52	1.3	1.0	0.00013	0.00019
2015	Q2	Reference (FR_UFR1)	0.00013	0.043	0.043	0.0001	0.0001	0.00005	0.00005	0.01	0.01	0.05	0.0000057	0.0000086	37	37	1.8	1.0	0.00011	0.00026
2015	Q3	Reference (FR_UFR1)	0.00016	0.081	0.082	0.0001	0.0001	0.00005	0.00005	0.01	0.01	0.05	0.0000081	0.000012	57	58	1.0	1.0	0.0001	0.00014
2015	Q4	Reference (FR_UFR1)	0.00011	0.073	0.074	0.0001	0.0001	0.00005	0.00005	0.01	0.01	0.05	0.0000065	0.0000085	55	56	0.55	1.0	0.00012	0.00018
2016	Q1	Reference (FR_UFR1)	<0.0001	0.076	0.075	<0.0001	<0.0001	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000055	0.0000082	55	57	0.52	0.92	0.00011	0.00018
2016	Q2	Reference (FR_UFR1)	0.00012	0.042	0.043	<0.00004	<0.00004	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.000006	0.000012	37	38	1.7	0.1	0.00013	0.0002
2016	Q3	Reference (FR_UFR1)	0.00011	0.075	0.077	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000078	0.0000098	51	52	0.84	0.13	0.0001	0.00017
2016	Q4	Reference (FR_UFR1)	0.00012	0.064	0.063	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000064	0.0000092	47	47	1.2	0.19	0.00011	0.0002
2017	Q1	Reference (FR_UFR1)	0.00011	0.076	0.081	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000085	0.000011	-	49	0.72	<0.5	0.0001	0.00013
2017	Q2	Reference (FR_UFR1)	0.00016	0.049	0.047	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.000012	0.000018	-	33	3.0	<0.5	0.00013	0.00046
2017	Q2	Reference (GH_ER2)	0.00019	0.048	0.048	<0.00002	0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000081	0.000025	-	49	1.2	0.42	0.0002	0.00055
2017	Q3	Reference (FR_UFR1)	0.00013	0.074	0.073	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000082	0.000012	-	50	1.1	0.21	0.00011	0.00021
2017	Q3	Reference (GH_ER2)	0.00012	0.047	0.046	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000073	0.0000088	-	45	0.78	0.32	0.00022	0.00024
2017	Q3	Reference (CM_MC1)	0.00023	0.052	0.05	<0.00002	<0.00002	<0.00005	<0.00005	0.016	0.015	<0.05	0.0000093	0.000012	-	39	1.3	<0.5	0.00013	0.00025
2017	Q4	Reference (FR_UFR1)	0.00011	0.073	0.074	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	0.052	0.0000068	0.00001	-	51	0.73	<0.5	0.0001	0.00014
2017	Q4	Reference (GH_ER2)	0.00012	0.048	0.048	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000053	0.000008	-	43	0.67	<0.5	0.00025	0.00029
2017	Q4	Reference (CM_MC1)	0.00019	0.051	0.051	<0.00002	<0.00002	<0.00005	<0.00005	0.013	0.014	<0.05	0.0000073	0.0000088	-	42	1.3	0.51	0.00017	0.00019
2018	Q1	Reference (FR_UFR1)	0.00012	0.079	0.071	<0.00003	<0.00002	<0.0000625	<0.00005	<0.0125	<0.01	<0.05	0.0000083	0.00001	54	52	0.78	<0.5	<0.000125	0.00014
2018	Q1	Reference (GH_ER2)	0.00023	0.051	0.05	<0.00002	<0.00002	<0.0000625	<0.00005	<0.01	<0.01	<0.05	0.0000058	0.000011	49	50	0.58	0.27	0.00021	0.00027
2018	Q1	Reference (CM_MC1)	0.00016	0.055	0.052	<0.00002	<0.00002	<0.00005	<0.00005	0.013	0.014	<0.05	0.0000071	0.0000079	43	42	0.89	0.56	0.00015	0.0002
2018	Q2	Reference (FR_UFR1)	0.00023	0.039	0.041	<0.00002	0.000022	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000096	0.000034	31	31	2.6	<0.5	0.00011	0.00048
2018	Q2	Reference (GH_ER2)	0.00075	0.043	0.057	<0.00002	0.000072	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000089	0.00015	43	51	1.9	0.51	0.00016	0.0022
2018	Q2	Reference (CM_MC1)	0.00037	0.033	0.033	<0.000025	0.000024	<0.0000625	<0.00005	0.013	0.011	<0.05	0.000011	0.000033	28	28	3.7	<0.5	0.00017	0.00057
2018	Q2	Reference (LC_SLC)	0.00019	0.029	0.029	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.0625	0.0000065	0.000025	38	36	2.5	<0.5	0.00012	0.0003
2018	Q3	Reference (FR_UFR1)	0.00012	0.076	0.07	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000075	0.000011	50	48	1.1	0.31	0.00011	0.00011
2018	Q3	Reference (GH_ER2)	0.00029	0.043	0.045	<0.00002	0.000032	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000064	0.000047	44	44	0.97	0.4	0.0002	0.00073
2018	Q3	Reference (CM_MC1)	0.00021	0.059	0.054	<0.00002	<0.00002	<0.00005	<0.00005	0.016	0.017	<0.05	0.000011	0.000011	42	41	1.2	0.43	0.00018	0.00024
2018	Q3	Reference (LC_SLC)	0.00012	0.044	0.042	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.000011	0.000015	52	49	0.98	0.44	0.00013	0.00024
2018	Q4	Reference (FR_UFR1)	0.00011	0.077	0.072	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000085	0.000012	53	52	0.59	<0.5	0.00012	0.00038
2018	Q4	Reference (GH_ER2)	0.0002	0.048	0.046	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000065	0.0000082	48	45	0.56	<0.5	0.00025	0.00036
2018	Q4	Reference (CM_MC1)	0.00016	0.055	0.055	<0.00002	<0.00002	<0.00005	<0.00005	0.014	0.014	<0.05	0.0000072	0.0000087	43	41	0.72	0.58	0.00019	0.00019
2018	Q4	Reference (LC_SLC)	0.00012	0.05	0.048	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000094	0.00001	58	55	<0.5	0.64	0.00014	0.00029
2019	Q1	Reference (FR_UFR1)	0.0001125	0.072675	0.071775	<0.00002	0.00001325	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.00001095	0.00001895	50.65	50.3	1.105	<0.5	0.00014	0.0004175
2019	Q1	Reference (GH_ER2)	0.000105	0.0486	0.047225	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	5.075E-06	6.875E-06	47.85	48.975	0.495	<0.5	0.00024	0.000295
2019	Q1	Reference (CM_MC1)	0.0001675	0.055325	0.055075	<0.00002	<0.00002	<0.00005	<0.00005	0.01275	0.01325	<0.05	0.0000084	8.125E-06	42.75	42.775	0.41	0.68	0.000165	0.0002375
2019	Q3	Reference (FR_UFR1)	0.00009	0.0665	0.063675	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	7.625E-06	1.0525E-05	48.95	50.175	0.94	<0.5	0.0001275	0.0001325
2019	Q3	Reference (GH_ER2)	0.0001225	0.042475	0.04045	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	5.975E-06	1.2575E-05	43.275	43.15	0.615	<0.5	0.000195	0.000255
2019	Q3	Reference (CM_MC1)	0.00021	0.0526	0.0535	<0.00002	<0.00002	<0.00005	<0.00005	0.01575	0.01625	<0.05	1.1275E-05	1.3375E-05	41.125	41.95	0.885	<0.5	0.000195	0.0002275
2019	Q3	Reference (LC_SLC)	0.0001075	0.040375	0.0397	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.00001205	1.7075E-05	46.825	48.25	0.67	<0.5	0.0001525	0.0002075
2019	Q4	Reference (FR_UFR1)	0.0001275	0.06935	0.066575	<0.00002	0.00001375	<0.00005	<0.00005	<0.01	0.00875	<0.05	1.3525E-05	3.6375E-05	50.375	51.675	0.715	<0.5	0.0001125	0.0002525
2019	Q4	Reference (GH_ER2)	0.000115	0.04575	0.045225	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	6.975E-06	0.0000085	45.125	49.325	0.32	<0.5	0.00026	0.00028
2019	Q4	Reference (CM_MC1)	0.0001875	0.0459	0.04775	<0.00002	<0.00002	<0.00005	<0.00005	0.01325	0.01325	<0.05	0.0000089	1.0675E-05	41.15	40.225	0.9475	<0.5	0.0002125	0.0002375
2019	Q4	Reference (LC_SLC)	0.0001025	0.04225	0.041525	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	1.0325E-05	1.4425E-05	52.7	54.8	0.6925	0.4075	0.0001475	0.000185
2020	Q2	Reference (FR_UFR1)	0.000158	0.0409	0.0395	<0.000020	<0.000020	<0.000050	<0.000050	<0.0100	<0.0100	0.050	0.0000059	0.0000151	33.4	34.9	2.49	0.50	0.0000675	0.000203
2020	Q2	Reference (GH_ER2)	0.000238	0.0418	0.0457	<0.000020	0.000014	<0.000050	<0.000050	<0.0100	<0.0100	<0.050	0.0000074	0.0000319	43.7	46.6	1.75	<0.50	0.00019	0.00053
2020	Q2	Reference (CM_MC1)	0.000278	0.0353	0.0374	<0.000020	<0.000020	<0.000050	<0.000050	0.0103	0.0115	<0.050	0.0000101	0.0000214	31.9	33.1	2.96	<0.50	0.00015	0.000383
2020	Q2	Reference (LC_SLC)	0.000153	0.0328	0.0319	<0.000020	<0.000020	<0.000050	<0.000050	<0.0100	<0.0100	<0.050	0.0000138	0.0000181	42.2	42.1	2.18	<0.50	0.000143	0.000213
2020	Q4	Reference (FR_UFR1)	0.000095	0.0696	0.0689	<0.000020	<0.000020	<0.000050	<0.000050	<0.0100	<0.0100	<0.050	0.00000668	0.00000833	51.3	51.4	0.713	0.165	0.000080	0.000145
2020	Q4	Reference (GH_ER2)	0.000105	0.0467	0.0487	<0.000020	<0.000020	<0.000050	<0.000050	<0.0100	<0.0100	<0.050	0.0000048	0.0000101	47.1	47.8	0.353	0.293	0.000228	0.000308
2020	Q4	Reference (CM_MC1)	0.00020	0.0486	0.0477	<0.000020	<0.000020	<0.000050	<0.000050	0.0145	0.0155	<0.050	0.0000101	0.00000908	40.5	40.5	1.77	0.543	0.000173	0.00021
2020	Q4	Reference (LC_SLC)	0.00012	0.0433	0.0441	<0.000020	<0.000020	<0.000050	<0.000050	<0.0100	<0.0100	<0.050	0.0000112	0.0000133	52.0	52.9	0.79	0.465	0.000148	0.000173
2021	Q2	Reference (FR_UFR1)	0.0001625	0.0363	0.036925	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000072	0.0000182	31.65	32.05	3.17	0.1125	0.0001175	0.0002825
2021	Q2	Reference (FR_UFR1)	0.0001325	0.056325	0.056925	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	9.125E-06	0.00001465	41.6	40.35	1.3725	0.0425	0.0001775	0.00016
2021	Q2	Reference (GH_ER2)	0.0005275	0.03685	0.049825	<0.00002	0.00004625	<0.00005	<0.00005	<0.01	<0.01	<0.05	7.525E-06	0.00010975	40.6	48.125	2.095	0.455	0.0001875	0.001405
2021	Q2	Reference (CM_MC1)	0.000365	0.027725	0.0329	<0.00002	0.0000285	<0.00005	<0.00005	0.01	0.0105	<0.05	0.00001105	0.0000448	26.025	25.725	4.0825	0.155	0.00024	0.0006025
2021	Q2	Reference (LC_SLC)	0.000165	0.02465	0.026225	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.00001295	2.6175E-05	33.225	34.525	2.6925	0.1275	0.00014	0.00025
2021	Q3	Reference (FR_UFR1)	0.0000825	0.066225	0.067475	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	8.875E-06	2.1925E-05	47.625	48.275	2.7225	0.145	0.0000575	0.0001125
2021	Q3	Reference (GH_ER2)	0.0001625	0.0428	0.04435	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	5.875E-06	1.6175E-05	41.625	42.075	2.73	0.2475	0.0002025	0.0003
2021	Q3	Reference (CM_MC1)	0.0002175	0.0507	0.05135	<0.00002	<0.00002	<0.00005	<0.00005	0.01675	0.01675	<0.05	1.0575E-05	0.00001065	40.675	39.35	1.6175	0.3575	0.0001625	0.0002
2021	Q3	Reference (LC_SLC)	0.00013	0.0382	0.0398	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	1.2475E-05	1.3325E-05	46.925	46.625	2.07	0.2525	0.0001375	0.000175
2021	Q4	Reference (FR_UFR1)	0.0000075	0.069875	0.072575	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.000004	9.175E-06	51.95	52.8	0.6025	0.1425	0.000005	0.0000725
2021	Q4	Reference (GH_ER2)	0.0001675	0.048225	0.049675	<0.00002	0.00002325	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.00000705	2.1625E-05	46.325	47.85	0.9275	0.2925	0.0002575	0.00043
2021	Q4	Reference (CM_MC1)	0.000185	0.049275	0.04875	<0.00002	<0.00002	<0.00005	<0.00005	0.01425	0.0145	<0.05	0.0000087	1.1075E-05	42.375	40.275	1.4825	0.43	0.0002375	0.0002425
2021	Q4	Reference (LC_SLC)	0.0001125	0.04325	0.05725	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000114	1.7025E-05	52.875	64.35	0.9525	0.415	0.0002225	0.0001675

Year	Quarter	Sample ID	COBALT-D-mg/l	COBALT-T-mg/l	CONDUCTIVITY LAB-N-us/cm	COPPER-D-mg/l	COPPER-T-mg/l	FLUORIDE-D-mg/l	Hardness Total or Dissolved CaCO3-N-mg/l	IRON-D-mg/l	IRON-T-mg/l	LEAD-D-mg/l	LEAD-T-mg/l	LITHIUM-D-mg/l	LITHIUM-T-mg/l	MAGNESIUM-D-mg/l
Reference (2015 - 2021)																
2015	Q1	Reference (FR_UFR1)	0.0001	0.0001	328	0.0005	0.0005	0.14	180	0.01	0.017	0.00005	0.00005	0.0013	0.0013	13
2015	Q2	Reference (FR_UFR1)	0.0001	0.0001	234	0.0005	0.0005	0.15	131	0.01	0.036	0.00005	0.00005	0.0011	0.0012	9.2
2015	Q3	Reference (FR_UFR1)	0.0001	0.0001	348	0.0005	0.0005	0.15	199	0.01	0.011	0.00005	0.00005	0.0018	0.0021	14
2015	Q4	Reference (FR_UFR1)	0.0001	0.0001	356	0.0005	0.0005	0.15	193	0.01	0.01	0.00005	0.00005	0.0014	0.0013	14
2016	Q1	Reference (FR_UFR1)	<0.0001	<0.0001	356	<0.0005	<0.0005	0.15	195	<0.01	<0.01	<0.00005	<0.00005	0.0016	0.0017	14
2016	Q2	Reference (FR_UFR1)	<0.0001	<0.0001	243	<0.0005	<0.0005	0.16	133	<0.01	0.043	<0.00005	0.000053	0.0012	0.0013	9.6
2016	Q3	Reference (FR_UFR1)	<0.0001	<0.0001	341	<0.0005	<0.0005	0.17	181	<0.01	0.011	<0.00005	<0.00005	0.0018	0.0016	13
2016	Q4	Reference (FR_UFR1)	<0.0001	<0.0001	319	<0.0005	<0.0005	0.16	171	<0.01	0.019	<0.00005	<0.00005	0.0013	0.0016	13
2017	Q1	Reference (FR_UFR1)	<0.0001	<0.0001	338	<0.0002	<0.0005	0.14	182	<0.01	<0.01	<0.00005	<0.00005	0.0016	0.0015	-
2017	Q2	Reference (FR_UFR1)	<0.0001	<0.0001	247	0.00031	0.00055	0.11	126	0.023	0.082	<0.00005	0.000065	0.0011	0.0012	-
2017	Q2	Reference (GH_ER2)	<0.0001	0.00011	307	<0.0005	0.00051	0.15	175	<0.01	0.15	<0.00005	0.00011	0.0017	0.0019	-
2017	Q3	Reference (FR_UFR1)	<0.0001	<0.0001	333	<0.000425	<0.0005	0.15	178	<0.01	0.01	<0.00005	<0.00005	0.0018	0.0017	-
2017	Q3	Reference (GH_ER2)	<0.0001	<0.0001	282	<0.000425	<0.0005	0.16	155	<0.01	0.02	<0.00005	<0.00005	0.0016	0.0018	-
2017	Q3	Reference (CM_MC1)	<0.0001	<0.0001	269	<0.000425	<0.0005	0.055	146	<0.01	0.016	<0.00005	<0.00005	0.0048	0.0045	-
2017	Q4	Reference (FR_UFR1)	<0.0001	<0.0001	333	<0.0005	<0.0005	0.11	183	<0.01	<0.01	<0.00005	<0.00005	0.0017	0.0017	-
2017	Q4	Reference (GH_ER2)	<0.0001	<0.0001	280	<0.0005	<0.0005	0.13	156	<0.01	0.011	<0.00005	<0.00005	0.0018	0.0017	-
2017	Q4	Reference (CM_MC1)	<0.0001	<0.0001	273	<0.0005	<0.0005	0.052	143	<0.01	<0.01	<0.00005	<0.00005	0.0046	0.0048	-
2018	Q1	Reference (FR_UFR1)	<0.000125	<0.0001	357	0.00053	<0.0005	0.12	192	<0.0125	0.02	<0.0000625	<0.00005	0.0016	0.0015	14
2018	Q1	Reference (GH_ER2)	<0.0001	<0.0001	329	<0.0005	<0.0005	0.16	170	<0.01	<0.01	<0.00005	<0.00005	0.0015	0.0016	12
2018	Q1	Reference (CM_MC1)	<0.0001	<0.0001	307	<0.0005	<0.0005	0.057	153	<0.01	<0.01	<0.00005	<0.00005	0.0045	0.0048	11
2018	Q2	Reference (FR_UFR1)	<0.0001	0.00015	207	<0.0005	0.0013	0.12	112	0.011	0.25	<0.00005	0.00018	0.0011	0.0014	8.6
2018	Q2	Reference (GH_ER2)	<0.0001	0.00053	279	<0.0005	0.0017	0.15	150	<0.01	1.3	<0.00005	0.00085	0.0016	0.0026	10
2018	Q2	Reference (CM_MC1)	<0.000125	0.00015	193	<0.0005	0.00083	0.059	101	0.025	0.34	<0.0000625	0.00025	0.0027	0.0031	7.6
2018	Q2	Reference (LC_SLC)	<0.0001	<0.0001	243	<0.0005	<0.0005	0.21	134	<0.01	0.07	<0.00005	0.000066	0.0017	0.0019	9.5
2018	Q3	Reference (FR_UFR1)	<0.0001	<0.0001	324	<0.0005	<0.0005	0.17	184	<0.01	<0.01	<0.00005	<0.00005	0.0018	0.0018	14
2018	Q3	Reference (GH_ER2)	<0.0001	0.0002	262	<0.0005	0.00069	0.17	151	<0.01	0.35	<0.00005	0.00029	0.0018	0.002	10
2018	Q3	Reference (CM_MC1)	<0.0001	<0.0001	277	<0.0005	0.00051	0.079	154	<0.01	0.013	<0.00005	<0.00005	0.0049	0.0051	12
2018	Q3	Reference (LC_SLC)	<0.0001	<0.0001	347	<0.0005	<0.0005	0.34	197	<0.01	0.01	<0.00005	<0.00005	0.0032	0.0033	16
2018	Q4	Reference (FR_UFR1)	<0.0001	<0.0001	349	<0.0005	<0.0005	0.14	194	<0.01	0.011	<0.00005	<0.00005	0.0016	0.0017	15
2018	Q4	Reference (GH_ER2)	<0.0001	<0.0001	304	<0.0005	0.0005	0.16	169	<0.01	0.013	<0.00005	<0.00005	0.0017	0.0018	12
2018	Q4	Reference (CM_MC1)	<0.0001	<0.0001	287	<0.0005	<0.0005	0.072	153	<0.01	<0.01	<0.00005	<0.00005	0.0044	0.0043	11
2018	Q4	Reference (LC_SLC)	<0.0001	<0.0001	399	<0.0005	<0.0005	0.37	224	<0.01	<0.01	<0.00005	<0.00005	0.0042	0.004	19
2019	Q1	Reference (FR_UFR1)	<0.0001	0.000085	363.5	<0.0005	0.00039	0.109	184.25	0.0195	0.07875	<0.00005	0.0000745	0.0016	0.00175	14.125
2019	Q1	Reference (GH_ER2)	<0.0001	<0.0001	304.75	<0.0005	<0.0005	0.13725	168.5	<0.01	0.0065	<0.00005	<0.00005	0.001675	0.00175	11.925
2019	Q1	Reference (CM_MC1)	<0.0001	<0.0001	304.5	<0.0005	<0.0005	0.061	154	<0.01	<0.01	<0.00005	<0.00005	0.0044	0.00445	11.45
2019	Q3	Reference (FR_UFR1)	<0.0001	<0.0001	317.75	<0.0005	<0.0005	0.15575	179.5	<0.01	<0.01	<0.00005	<0.00005	0.001675	0.001675	13.925
2019	Q3	Reference (GH_ER2)	<0.0001	<0.0001	277	<0.0005	<0.0005	0.16025	152	<0.01	0.0255	<0.00005	<0.00005	0.001675	0.00165	10.7
2019	Q3	Reference (CM_MC1)	<0.0001	<0.0001	285	<0.0005	<0.0005	0.07725	150.25	<0.01	<0.01	<0.00005	<0.00005	0.0048	0.0048	11.55
2019	Q3	Reference (LC_SLC)	<0.0001	<0.0001	338.25	<0.0005	<0.0005	0.3125	178	<0.01	<0.01	<0.00005	<0.00005	0.002775	0.00295	14.825
2019	Q4	Reference (FR_UFR1)	<0.0001	0.0000825	325	0.0001975	0.00049	0.1375	185.5	<0.01	0.084	<0.00005	0.0001185	0.00155	0.001725	14.475
2019	Q4	Reference (GH_ER2)	<0.0001	<0.0001	292	0.00035	<0.0005	0.135	160.25	<0.01	0.01825	<0.00005	<0.00005	0.001725	0.001875	11.6
2019	Q4	Reference (CM_MC1)	<0.0001	<0.0001	263.25	0.0003275	<0.0005	0.063	148.75	<0.01	<0.01	<0.00005	<0.00005	0.004425	0.00445	11.175
2019	Q4	Reference (LC_SLC)	<0.0001	<0.0001	359	0.000265	<0.0005	0.31825	196.75	<0.01	0.01025	<0.00005	<0.00005	0.0036	0.003875	15.875
2020	Q2	Reference (FR_UFR1)	<0.000100	<0.000100	221	0.000233	<0.00050	0.0943	122	<0.0100	0.0485	<0.000050	0.0000433	0.000975	0.0013	9.46
2020	Q2	Reference (GH_ER2)	<0.000100	0.000105	279	0.000125	0.000398	0.13	155	<0.0100	0.198	<0.000050	0.000143	0.00173	0.0021	11.1
2020	Q2	Reference (CM_MC1)	<0.000100	0.0000775	193	0.00027	0.000445	0.0575	114	0.00725	0.137	<0.000050	0.000118	0.00315	0.00345	8.32
2020	Q2	Reference (LC_SLC)	<0.000100	<0.000100	246	0.00015	<0.00050	0.197	152	<0.0100	0.0263	<0.000050	0.0000345	0.0021	0.00228	11.4
2020	Q4	Reference (FR_UFR1)	<0.000100	<0.000100	318	<0.00020	<0.00050	0.134	184	<0.0100	0.0105	<0.000050	<0.000050	0.00153	0.0017	13.6
2020	Q4	Reference (GH_ER2)	<0.000100	<0.000100	282	0.000125	<0.00050	0.143	163	<0.0100	0.0405	<0.000050	<0.000050	0.00173	0.00188	11.0
2020	Q4	Reference (CM_MC1)	<0.000100	<0.000100	260	0.000165	<0.00050	0.072	146	<0.0100	0.012	<0.000050	<0.000050	0.0047	0.00453	10.8
2020	Q4	Reference (LC_SLC)	<0.000100	<0.000100	348	<0.00020	<0.00050	0.343	195	<0.0100	<0.0100	<0.000050	<0.000050	0.0034	0.00363	15.7
2021	Q2	Reference (FR_UFR1)	<0.0001	0.000105	217.75	0.0002625	0.000505	0.09975	115.5	<0.01	0.1005	<0.00005	0.00009625	0.0011	0.001375	8.92
2021	Q2	Reference (FR_UFR1)	<0.0001	<0.0001	279.75	<0.0002	<0.0005	0.101	150.5	<0.01	0.027	<0.00005	0.00001075	0.001475	0.00155	11.325
2021	Q2	Reference (GH_ER2)	<0.0001	0.0003925	268.5	0.000225	0.001295	0.1335	141.5	<0.01	0.84825	<0.00005	0.00062825	0.0014	0.002175	9.7425
2021	Q2	Reference (CM_MC1)	<0.0001	0.0001975	171.5	0.0003525	0.0007925	0.0505	95.375	0.014	0.28075	<0.00005	0.0004815	0.002375	0.00245	7.3825
2021	Q2	Reference (LC_SLC)	<0.0001	<0.0001	226.75	0.000205	<0.0005	0.18	118.5	<0.01	0.04775	<0.00005	0.00005725	0.00135	0.001475	8.65
2021	Q3	Reference (FR_UFR1)	<0.0001	0.0000425	318.5	0.000055	<0.0005	0.155	171.5	<0.01	0.0295	<0.00005	0.000016	0.001725	0.00185	12.825
2021	Q3	Reference (GH_ER2)	<0.0001	<0.0001	260.25	<0.0002	<0.0005	0.14	144.5	<0.01	0.08075	<0.00005	0.00008475	0.001625	0.001775	9.85
2021	Q3	Reference (CM_MC1)	<0.0001	<0.0001	270.75	0.000215	<0.0005	0.0675	145.75	<0.01	0.01425	<0.00005	0.0000545	0.005125	0.0051	10.725
2021	Q3	Reference (LC_SLC)	<0.0001	<0.0001	309.5	<0.0002	<0.0005	0.2925	171.75	<0.01	0.02125	<0.00005	<0.00005	0.00275	0.0028	13.3
2021	Q4	Reference (FR_UFR1)	<0.0001	<0.0001	344.5	0.0000575	<0.0005	0.127	185.75	<0.01	<0.01	<0.00005	<0.00005	0.00175	0.001675	13.65
2021	Q4	Reference (GH_ER2)	<0.0001	0.00015	295	<0.0002	0.0005475	0.1325	162	<0.01	0.1225	<0.00005	0.000146	0.001875	0.001925	11.25
2021	Q4	Reference (CM_MC1)	<0.0001	<0.0001	269.5	0.00024	<0.0005	0.05875	152.25	<0.01	0.01525	<0.00005	<0.00005	0.0047	0.004575	11.185
2021	Q4	Reference (LC_SLC)	<0.0001	<0.0001	371.75	<0.0002	<0.0005	0.34	198.25	<0.01	<0.01	<0.00005	<0.00005	0.003425	0.009525	16.1

Tests categorized as no adverse response (2015 - 2021)

2015	Q1	FR_FRCP1	0.93	94	1.0	217	9.1	1.0	226	0.003	0.024	0.00036	0.00037	0.0001	0.00013	0.087	0.089	0.0001	0.0001	0.00032	0.00032	0.013	0.013	0.27	0.000037	0.000074	144	148	1.2	2.4	0.00011	0.00017	0.00012	0.00014	1113	0.0005	0.0005	0.18	679	0.01	0.035	0.00005	0.000053	0.043	0.043	77
2015	Q1	GH_FR1	0.93	98	1.0	197	7.5	1.0	204	0.003	0.069	0.0002	0.00021	0.0001	0.00015	0.11	0.11	0.0001	0.0001	0.00032	0.00032	0.01	0.01	0.1	0.000021	0.000027	112	113	1.5	2.7	0.00011	0.00022	0.00011	0.00017	823	0.0005	0.00051	0.15	479	0.01	0.065	0.00005	0.000063	0.014	0.014	48
2015	Q1	CM_MC2	0.93	94	1.0	172	4.1	1.0	176	0.0063	0.2	0.00013	0.00015	0.00016	0.00026	0.059	0.061	0.0001	0.0001	0.00032	0.00032	0.019	0.021	0.06	0.00002	0.000034	80	82	1.6	2.4	0.00015	0.00046	0.00047	0.00072	599	0.0005	0.00062	0.11	333	0.01	0.21	0.00005	0.00014	0.0081	0.0084	32
2015	Q2	GH_FR1	1.1	100	1.0	153	4.9	1.0	158	0.003	0.054	0.00015	0.00016	0.0001	0.00016	0.083	0.084	0.0001	0.0001	0.00005	0.00005	0.01	0.01	0.075	0.00002	0.000028	80	80	1.4	1.6	0.00013	0.00024	0.0001	0.0001	581	0.0005	0.0005	0.17	329	0.01	0.077	0.00005	0.000071	0.015	0.015	31
2015	Q2	CM_MC2	1.1	100	1.1	132	3.7	1.0	136	0.012	0.66	0.00011	0.00013	0.00016	0.00049	0.042	0.048	0.0001	0.00011	0.00005	0.00005	0.014	0.017	0.05	0.000035	0.000088	59	60	1.5	1.4	0.00023	0.001	0.0003	0.00083	457	0.0005	0.0013	0.099	240	0.015	0.85	0.00005	0.00058	0.0062	0.0069	23
2015	Q3	FR_FRCP1	0.84	88	1.0	196	11	1.0	207	0.003	0.0082	0.00026	0.00029	0.0001	0.00017	0.078	0.079	0.0001	0.0001	0.00005	0.00005	0.013	0.014	0.25	0.000043	0.000052	122	123	0.92	1.6	0.0001	0.00014	0.0001	0.0001	925	0.0005	0.0005	0.2	541	0.01	0.019	0.00005	0.00005	0.035	0.036	58
2015	Q3	GH_FR1	0.84	69	1.0	177	8.5	1.0	185	0.003	0.032	0.00017	0.00021	0.00011	0.00016	0.099	0.1	0.0001	0.0001	0.00005	0.00005	0.01	0.011	0.067	0.000018	0.000023	92	92	0.89	1.5	0.00011	0.0002	0.0001	0.0001	686	0.0005	0.0005	0.18	385	0.01	0.052	0.00005	0.000062	0.015	0.015	38
2015	Q4	FR_FRCP1	0.77	102	1.0	211	2.7	1.0	213	0.0032	0.0046	0.00025	0.00028	0.0001	0.00011	0.08	0.08	0.0001	0.0001	0.00005	0.00005	0.011	0.012	0.25	0.000043	0.000058	140	141	0.78	2.4	0.00012	0.00016	0.0001	0.0001	1100	0.0005	0.0005	0.18	650	0.01	0.021	0.00005	0.00005	0.04	0.041	73
2015	Q4	GH_FR1	0.77	96	1.0	187	5.8	1.0	193	0.003	0.0037	0.00012	0.00015	0.0001	0.00012	0.11	0.11	0.0001	0.0001	0.00005	0.00005	0.01	0.012	0.25	0.000017	0.000019	106	107	0.66	2.0	0.00012	0.00017	0.0001	0.0001	783	0.0005	0.0005	0.16	445	0.01	0.011	0.00005	0.00005	0.016	0.016	44
2015	Q4	CM_MC2	0.77	102	1.0	189	6.3	1.0	195	0.0031	0.05	0.00015	0.00017	0.00017	0.00023	0.074	0.074	0.0001	0.0001	0.00005	0.00005	0.024	0.027	0.25	0.000012	0.000019	108	107	1.2	3.4	0.00016	0.00026	0.00051	0.0006	821	0.0005	0.00059	0.11	456	0.01	0.053	0.00005	0.000063	0.012	0.012	46
2016	Q1	GH_FR1	0.86	94	1.0	198	<1	<1	198	<0.003	0.0098	0.00014	0.00016	<0.0001	0.00013	0.12	0.12	<0.0001	<0.0001	<0.00005	<0.00005	<0.01	<0.01	<0.25	0.000016	0.000017	119	120	0.65	2.6	0.00012	0.00015	<0.0001	<0.0001	891	<0.0005	<0.0005	0.17	505	<0.01	0.013	<0.00005	<0.00005	0.015	0.015	50
2016	Q3	FR_FRCP1	0.79	100	1.2	199	3.9	<1	202	<0.003	0.014	0.00022	0.00024	<0.0001	0.00011	0.077	0.076	<0.00002	<0.00002	<0.00005	<0.00005	0.011	0.011	<0.25	0.000021	0.000049	106	114	0.96	1.6	<0.0001	0.00013	0.0001	0.00011	907	<0.0005	<0.0005	0.21	501	<0.01	0.029	<0.00005	<0.00005	0.037	0.037	57
2016	Q3	GH_FR1	0.79	98	<1	195	3.7	<1	198	<0.003	0.007	0.00013	0.00015	0.0001	0.00013	0.11	0.11	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	0.01	<0.25	0.000015	0.000019	93	95	0.82	1.6	0.00011	0.00018	<0.0001	<0.0001	740	<0.0005	<0.0005	0.19	399	<0.01	0.015	<0.00005	<0.00005	0.018	0.019	40
2016	Q3	CM_MC2	0.79	100	1.0	200	4.8	<1	204	<0.003	0.0075	0.0002	0.00023	0.00019	0.0002	0.077	0.076	<0.00002	<0.00002	<0.00005	<0.00005	0.028	0.03	<0.25	0.0000066	0.0000092	114	116	1.0	3.4	0.00014	0.00017	0.00034	0.00043	915	<0.0005	<0.0005	0.12	504	<0.01	0.012	<0.00005	<0.00005	0.017	0.018	54
2016	Q4	FR_FRCP1	0.63	96	<1	194	4.6	<1	198	0.0038	0.024	0.00019	0.0002	<0.0001	0.00014	0.075	0.074	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.25	0.000042	0.000051	108	106	1.0	1.4	<0.0001	0.00015	<0.0001	<0.0001	850	<0.0005	<0.0005	0.21	478	<0.01	0.034	<0.00005	<0.00005	0.032	0.033	50
2016	Q4	GH_FR1	0.63	88	1.2	191	2.0	<1	192	<0.003	0.01	0.00016	0.00024	0.00011	0.00014	0.1	0.1	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.25	0.000016	0.00002	98	100	0.84	1.6	0.00012	0.00016	<0.0001	<0.0001	758	<0.0005	<0.0005	0.17	431	<0.01	0.018	<0.00005	<0.00005	0.017	0.018	45
2016	Q4	CM_MC2	0.63	100	<1	178	1.9	<1	179	0.0055	0.088	0.00014	0.00016	0.00017	0.00023	0.054	0.056	<0.00002	<0.00002	<0.00005	<0.00005	0.019	0.021	<0.1	0.000027	0.000035	84	85	1.6	2.0	0.00016	0.00033	0.00076	0.00099	669	<0.0005	<0.0005	0.11	358	<0.01	0.077	<0.00005	0.000066	0.011	0.011	36
2017	Q1	GH_FR1	0.86	104	-	-	-	-	204	<0.003	0.0066	0.00011	0.00013	<0.0001	0.00011	0.12	0.12	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.25	0.000015	0.000018	-	117	0.86	1.9	0.0001	0.00013	<0.0001	<0.0001	869	<0.0005	<0.0005	0.14	499	<0.01	0.011	<0.00005	<0.00005	0.017	0.017	-
2017	Q2	FR_FRCP1	0.9	100	-	-	-	-	181	0.0069	0.19	0.00021	0.00024	0.00012	0.00025	0.07	0.071	<0.00002	0.000023	<0.00005	<0.00005	<0.01	0.01	<0.05	0.000064	0.00011	-	87	2.2	0.67	0.0001	0.00059	<0.0001	0.00019	724	0.00028	0.00076	0.15	390	0.012	0.25	<0.00005	0.00019	0.03	0.029	-
2017	Q2	GH_FR1	0.9	100	-	-	-	-	179	0.0049	0.33	0.00019	0.00022	0.00013	0.00029	0.081	0.086	<0.00002	0.000026	<0.00005	<0.00005	<0.01	<0.01	<0.15	0.00003	0.000065	-	80	2.6	1.5	<0.0001	0.00072	<0.0001	0.00025	630	<0.0005	0.00089	0.15	366	0.011	0.34	<0.00005	0.00026	0.015	0.014	-
2017	Q3	FR_FRCP1	0.71	83	-	-	-	-	204	0.0025	0.0062	0.00024	0.00027	<0.0001	0.00012	0.074	0.072	<0.00002	<0.00002	<0.00005	<0.00005	0.011	0.011	<0.2	0.000022	0.00005	-	127	1.2	1.4	0.00011	0.00017	<0.0001	<0.0001	993	<0.000425	<0.0005	0.19	584	<0.01	0.021	<0.00005	<0.00005	0.037	0.034	-
2017	Q3	GH_FR1	0.71	78	-	-	-	-	191	0.0027	0.0068	0.00016	0.00019	<0.0001	0.00012	0.11	0.1	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.15	0.00002	0.000019	-	98	0.95	1.4	0.00011	0.00015	<0.0001	<0.0001	767	<0.000425	<0.0005	0.17	434	<0.01	0.012	<0.00005	<0.00005	0.019	0.019	-
2017	Q4	FR_FRCP1	0.63	96	-	-	-	-	179	<0.003	0.019	0.00024	0.00027	<0.0001	0.00014	0.072	0.075	<0.00002	<0.00002	<0.00005	<0.00005	0.011	0.011	0.3	0.000012	0.000056	-	150	1.0	<2.5	<0.0001	0.00015	<0.0001	0.00011	1153	<0.0005	<0.0005	0.11	734	0.01	0.055	<0.00005	0.000059	0.041	0.041	-
2017	Q4	GH_FR1	0.63	102	-	-	-	-	177	<0.003	0.0051	0.00018	0.0002	0.0001	0.00013	0.11	0.11	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	0.05	0.000017	0.000019	-	107	1.2	1.3	0.00012	0.00015	<0.0001	<0.0001	830	<0.0005	<0.0005	0.13	505	<0.01	0.012	<0.00005	<0.00005	0.017	0.017	-
2018	Q1	GH_FR1	0.34	96	1.0	201	7.0	<1	208	0.007	0.0069	0.00019	0.0002	0.00011	0.00015	0.13	0.12	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.25	0.00002	0.000022	121	120	0.98	2.5	<0.0001	0.00027	<0.0001	<0.0001	938	0.00051	<0.0005	0.16	526	<0.01	0.015	<0.00005	<0.00005	0.017	0.017	54
2018	Q1	CM_MC3	0.34	98	1.3	186	3.2	<1	188	<0.003	0.0034	0.0001	0.00014	0.00016	0.00017	0.055	0.052	<0.00002	<0.00002	<0.00005	<0.00005	0.01	0.01	<0.05	0.000015	0.000015	70	70	0.7	1.9	0.00018	0.00027	<0.0001	<0.0001	512	<0.0005	<0.0005	0.19	260	<0.01	0.01	<0.00005	<0.00005	0.0051	0.0053	21
2018	Q2	FR_FRCP1	0.34	104	<1	142	3.6	<1	145	0.0049	0.52	0.00018	0.00022	0.00012	0.00042	0.05	0.064	<0.00002	0.000045	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.000064	0.00018	66	73	2.0	0.54	0.00011	0.00093	<0.0001	0.0005	531	<0.0005	0.0014	0.18	287	<0.01	0.82	<0.00005	0.00059	0.018	0.019	29
2018	Q2	GH_FR1	0.34	98	<1	142	6.7	<1	149	0.006	0.53	0.00023	0.00029	0.00016	0.00046	0.064	0.075	<0.00002	0.000041	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.000032	0.00013	64	65	3.2	1.0	<0.0001	0.00094	<0.0001	0.00049	522	0.00056	0.0015	0.17	279	0.013	0.74	<0.00005	0.00059	0.012	0.012	29
2018	Q2	CM_MC3	0.34	102	1.2	119	7.2	<1	125	0.0093	0.74	0.00011	0.00013	0.00027	0.00057	0.038	0.04	<0.000025	0.000058	<0.00005	<0.00005	0.011	0.012	<0.05	0.000041	0.000074	51	49	1.7	1.0	0.00014	0.00095	0.00066	0.0014	364	0.00098	0.0026	0.16	194	0.011	0.74	<0.00005	0.00048	0.0049	0.0056	16
2018	Q2	LC_LCDSSLCC	0.34	96	1.1	143	5.5	<1	148	<0.003	0.043	0.00018	0.00023	0.00012	0.0002	0.035	0.035	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	0.01	<0.0625	0.00019	0.00024	73	66	2.0	2.2	0.00012	0.0003	<0.0001	0.00014	541	<0.0005	0.00059	0.23	300	<0.01	0.054	<0.00005	0.000064	0.026	0.025	29
2018	Q3	FR_FRCP1	0.3	111	<1	207	4.0	<1	210	<0.003	0.014	0.00029	0.00032	0.00011	0.00014	0.088	0.08	<0.00002	<0.00002	<0.00005	<0.00005	0.012	0.012	0.2	0.000037	0.000056	125	121	1.3	1.7	<0.0001	0.00014	0.00011	0.00012	964	<0.0005	<0.0005	0.21	601	<0.01	0.036	<0.00005	<0.00005	0.034	0.033	71
2018	Q3	GH_FR1	0.3	109	<1	190	3.8	<1	194	<0.003	0.018	0.00016	0.00017	0.00012	0.00013	0.11	0.1	<0.00002	<0.00002	<0.00005	<0.00005	0.01	<0.01	<0.1	0.000023	0.000026	101	97	1.0	1.5	0.0001	0.00017	<0.0001	<0.0001	768	<0.0005	<0.0005	0.18	464	<0.01	0.029	0.00011	0.00018	0.02	0.02	51
2018	Q3	LC_LCDSSLCC	0.3	109	<1	191	9.6	<1	201	<0.003	0.0034	0.00023	0.00025	0.00011	0.00015	0.072	0.073	<0.00002	<0.00002	<0.00005	<0.00005	0.013	0.014	<0.15	0.00026	0.00029	101	103	1.0	3.4	0.00012	0.00018	<0.0001	<0.0001	811	<0.0005	<0.0005	0.25	444	<0.01	<0.01	<0.00005	<0.00005	0.036	0.038	47
2018	Q4	GH_FR1	0.34	91	1.6	211	1.9	<1	212	<0.003	0.0039	0.00012	0.00013	0.0001	0.00012	0.12	0.11	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.2	0.000019	0.00002	119	118	0.67	2.3	0.00016	0.00028	<0.0001	<0.0001	909	<0.0005	0.00051	0.17	542	<0.01	0.011	<0.00005	<0.00005	0.017	0.017	60
2018	Q4	GH_ERC	0.34	85	1.3	154	<1	<1	154	<0.003	<0.003	<0.0001	<0.0001	<0.0001	0.00013	0.059	0.058	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.000006	0.0000079	52	51	0.53	<0.5	0.00024	0.00026	<0.0001	<0.0001	330	<0.0005	0.0005	0.16	184	<0.01	<0.01	<0.00005	<0.00005	0.003	0.003	13
2018	Q4	CM_MC3	0.34	81	1.6	168	1.3	<1	168	<0.003	0.0063	0.00013	0.00013	0.00018	0.0002	0.06	0.06	<0.00002	<0.00002	<0.00005	<0.00005	0.014	0.014	<0.05	0.000014	0.000015	76	76	0.73	1.9	0.00023	0.00025	0.0001	0.00013	556	<0.0005	<0.0005	0.21	295	<0.01	0.013	<0.00005	<0.00005	0.0068	0.0068	25
2018	Q4	EV_MC2	0.34	98	1.3	192	2.4	<1	193	<0.003	<0.003	0.00018	0.00018	0.00015	0.00018	0.12	0.11	<0.00002	<0.00002	<0.00005	<0.00005	0.014	0.015	0.6	0.000023	0.000028	91	88	0.73	5.2	0.00015	0.00015	<0.0001	<0.0001	698	<0.0005	<0.0005	0.15	400	<0.01	<0.01	<0.00005	<0.00005	0.021	0.021	42
2018	Q4	EV_HC1	0.34	94	1.1	197	2.1	<1	199	<0.003	0.0052	<0.0001	<0.0001	0.00015	0.00018	0.07	0.068	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.000017	0.000019	91	88	0.65	1.3	0.00017	0.00021	<0.0001	<0.0001	745	<0.0005	<0.0005	0.22	431	<0.01	0.015	<0.00005	<0.00005	0.0067	0.0067	50
2019	Q1	FR_FRABCH	0.11	87	3.2	241.25	<1.0	<1.0	241.25	<0.003	0.002825	<0.0001	<0.0001	<0.0001	0.0000625	0.10725	0.1065	<0.00002	<0.00002	<0.00005	<0.00005	0.00925	0.01125	<0.1	3.3125E-05	0.0000359	147.5	150.25	0.6	1.4525	0.0001075	0.0001875	0.000245	0.000235	1170	<0.0005	<0.0005	0.08275	650	<0.01	0.01625	<0.00005	<0.00005	0.03135	0.032625	68.55
2019	Q1	FR_FRCP1	0.11	78	10.275	364	<1.0	<1.0	364	<0.003	0.019975	0.00042	0.00043	0.000115	0.0001475	0.034725	0.035525	<0.000015	<0.000015	<0.00038	<0.000038	0.00875	0.01025	<0.13	0.0000144	0.0000269	349.5	352	1.56	5.5225	<0.000075	0.0002875	0.0001	0.0001125	2863	<0.0005	<0.00038	0.0775	2107.25	<0.0075	0.03275	<0.00038	0.00005875	0.0682	0.071775	299.225
2019	Q1	GH_FR1	0.11	91	1.9	211.75	<1.0	<1.0	211.75	0.0022	0.0127	0.0001325	0.00014	0.000065	0.0001225	0.118	0.11675	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.075	1.8825E-05	0.00002335	119	122.25	0.8075	1.6675	0.0000825	0.000125	0.000075	0.000085	947.25	<0.0005	<0.0005	0.13575	536	<0.01	0.0105	<0.00005	<0.00005	0.016825	0.017225	57.925
2019	Q1	CM_MC2	0.11	107	2.1	223.25	1.525	<1.0	224.5	<0.003	0.006875	0.000285	0.000295	0.000205	0.000235	0.078975	0.082425	<0.00002	<0.00002	<0.00005	<0.00005	0.029	0.031	<0.1	0.0000246	2.6325E-05	141	145.25	0.4975	6.1175	0.000145	0.0001875	0.0009	0.0010325	1120	<0.0005	<0.0005	0.08825	615.75	<0.01	<0.01	<0.00005	<0.00005	0.01805	0.01895	64.125
2019	Q1	RG_MIDAG	0.11	87	2.6	186.5	<1.0	<1.0	186.5	<0.003	0.0253	0.000135	0.0001525	0.000205	0.00023	0.08485	0.084125	<0.00002	<0.00002	<0.00005	<0.00005	0.01575	0.01725	<0.05	1.8325E-05	0.000023	96.45	95.95	0.5225	3.1075	0.0001775	0.0002125	<0.0001	0.0002025	655	<0.0005	<0.0005	0.142	393.75	<0.01	0.02925	<0.00005	0.00003975	0.00975	0.00995	37.1
2019	Q3	FR_FRABCH	0.46	102	1.425	225.5	2.875	<1	228	<0.003	0.004425	0.00015	0.0001775	<0.0001	0.00009	0.091425	0.088225	<0.00002	<0.00002	<0.00005	<0.00005	0.01175	0.0125	<0.075	0.0000329	0.0000358	118.5	121.75	0.5525	1.18	0.00012	0.0001725	0.0001325	0.0001375	909	<0.0005	0.0005425	0.185	527	<0.01	0.0145	<0.00005	0.0000395	0.0318	0.033125	56.25
2019	Q3	FR_FRCP1	0.46	96	0.7	192.5	4.125	<1.0	196.5	<0.003	0.005325	0.000255	0.000285	0.00011	0.000115	0.0776	0.074875	<0.00002	<0.00002	<0.00005	<0.00005	0.0095	0.01125	<0.05	0.0000412	0.00004595	101.575	105.225	0.865	0.8475	0.000065	0.0001325	<0.0001	<0.0001	774	<0.0005	<0.0005	0.21	448	<0.01	0.0165	<0.00005	<0.00005	0.027925	0.02845	47.325
2019	Q3	GH_FR1	0.46	100	<1.0	190.75	6.3	<1.0	197.25	<0.003	0.006175	0.000135	0.0001475	0.00012	0.0000925	0.0939	0.089675	<0.00002	<0.00002	<0.00005	<0.00005	0.00675	0.00625	<0.05	0.0000173	2.2475E-05	92.95	92.325	0.98	1.28	0.0000975	0.0002475	0.0000625	<0.0001	736	<0.0005	<0.0005	0.17425	416.75	<0.01	0.019	<0.00005	<0.00005	0.019775	0.0186	44.825
2019	Q3	GH_ERC	0.46	94	<1.0	146	1.45	<1.0	147.5	<0.003	0.007075	<0.0001	<0.0001	0.000075	0.0000975	0.0507	0.04865	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	6.025E-06	0.00001035	45.725	46.875	0.5275	<0.5	0.00021	0.0002625	<0.0001	<0.0001	304	<0.0005	<0.0005	0.1635	164.25	<0.01	0.012	<0.00005	<0.00005	0.0026	0.002575	12.175
2019	Q3	RG_MIDAG	0.46	98	<1.0	153.25	3.075	<1.0	156.25	<0.003	0.0142	0.0001075	0.000135	0.00032	0.0003375	0.056425	0.05845	<0.00002	<0.00002	<0.00005	<0.00005	0.0125	0.01275	<0.05	0.00001395	1.8275E-05	71.025	71.075	0.665	1.005	0.00019	0.000245	0.000065	0.000165	528.75	<0.0005	<0.0005	0.20625	281.5	<0.01	0.01525	<0.00005	<0.00005	0.007375	0.007175	25.35
2019	Q3	EV_MC2	0.46	104	<1.0	164.75	4.5	<1.0	169.5	<0.003	0.019025	0.0001075	0.000115	0.0001925	0.0001975	0.106975	0.10665	<0.00002	<0.00002	<0.00005	<0.00005	0.01025	0.0115	0.03425	1.9275E-05	3.3825E-05	67.425	68.8	1.0375	2.6525	0.00014	0.000215	<0.0001	0.00007	515.5	<0.0005	<0.0005	0.16	282.75	<0.01	0.0265	<0.00005	0.00003375	0.010625	0.00995	27.825
2019	Q4	FR_FRABCH	0.39	88	0.925	236.5	1.175	<1	237.25	<0.003	0.015525	<0.0001	0.0001125	<0.0001	0.00008	0.09715	0.094375	<0.00002	<0.00002	<0.00005	<0.00005	0.0095	0.01175	<0.1	2.1875E-05	4.0925E-05	132	136.75	0.495	1.2575	0.0001175	0.000135	0.00015	0.0001775	967.75	0.000265	0.0005125	0.11325	586.5	0.018	0.04375	<0.00005	0.000065	0.03	0.0332	62.275
2019	Q4	GH_FR1	0.39	96	<1.0	200.75	2	<1.0	202.5	0.003	0.0034	0.0001125	0.0001175	<0.0001	0.00012	0.10425	0.10375	<0.00002	<0.00002	<0.00005	<0.00005	0.00625	<0.01	<0.05	1.5425E-05	2.1125E-05	103.7	110	0.7125	1.6375	0.00014	0.000145	<0.0001	0.0001	789.25	0.0001875	0.000465	0.13175	465.25	0.01	0.00675	<0.00005	0.00005	0.0183	0.01865	50.125
2019	Q4	RG_MIDAG	0.39	98	<1.0	178.25	1.95	<1.0	180	<0.003	0.02985	0.0001125	0.00012	0.000215	0.0002375	0.06795	0.068925	<0.00002	<0.00002	<0.00005	<0.00005	0.01325	0.013	<0.05	1.6575E-05	2.1625E-05	89.875	93.5	0.525	2.0325	0.0001925	0.0002475	0.00015	0.00025	648	0.00031	<0.0005	0.18425	370.75	<0.01	0.035	<0.00005	0.000033	0.008275	0.00875	35.5
2019	Q4	EV_MC2	0.39	98	0.875	171.75	1.325	<1.0	173	<0.003	0.005075	0.0000775	0.00009	0.00016	0.0001575	0.11125	0.1075	<0.00002	<0.00002	<0.00005	<0.00005	0.009	0.01	0.04175	2.2475E-05	2.5075E-05	72.45	71.725	0.6725	3.6575	0.000175	0.0001575	<0.0001	<0.0001	524.25	0.0001575	<0.0005	0.137	299.25	<0.01	0.00925	<0.00005	0.0000385	0.012125	0.011975	28.725
2020	Q2	FR_FRABCH	0.62	93	0.975	132	5.73	46.6	184	<0.0030	0.105	0.00020	0.000213	0.0000975	0.000198	0.0683	0.0657	<0.000020	<0.000020	<0.000050	<0.000050	<0.0100	<0.0100	<0.050	0.0000533	0.0000757	101	102	2.02	0.938	<0.000100	0.00026	0.000105	0.000195	731	0.000205	0.000388	0.122	438	0.0085	0.15	<0.000050	0.000123	0.0262	0.0253	45.3
2020	Q2	FR_FRCP1	0.62	91	<1.00	121	6.73	45.1	172	0.0035	0.0583	0.000273	0.000273	0.000105	0.000195	0.0545	0.0531	<0.000020	<0.000020	<0.000050	<0.000050	<0.0100	<0.0100	<0.050	0.0000759	0.00010	89.8	91.8	1.84	0.458	0.000065	0.000205	0.000158	0.00025	670	0.000285	<0.00050	0.144	392	<0.0100	0.0738	<0.000050	0.000068	0.0249	0.0238	40.8
2020	Q2	GH_FR1	0.62	100	<1.00	119	5.83	42.4	167	0.00203	0.0737	0.00018	0.000193	0.000138	0.000195	0.0718	0.0729	<0.000020	<0.000020	<0.000050	<0.000050	<0.0100	<0.0100	<0.050	0.0000324	0.0000428	77.1	80.5	2.36	1.22	0.000095	0.000225	<0.000100	0.000070	596	0.000248	<0.00050	0.143	341	0.0065	0.0853	<0.000050	0.0000658	0.0154	0.0156	36.1
2020	Q2	GH_ERC	0.62	93	<1	110	2.60	37.9	150	<0.0030	0.239	<0.000100	<0.000100	0.0000875	0.000285	0.0497	0.0541	<0.000020	0.0000135	<0.000050	<0.000050	<0.0100	<0.0100	<0.050	0.00000828	0.0000402	49.2	51.8	1.51	0.45	0.000193	0.000663	<0.000100	0.000123	98.4	0.000135	0.000418	0.129	177	<0.0100	0.298	<0.000050	0.000199	0.00268	0.00308	13.2
2020	Q2	EV_MC2	0.62	100	1.18	83.9	2.55	24.8	110	0.0101	0.452	0.0000875	0.00013	0.000193	0.000375	0.0657	0.0758	<0.000020	0.000023	<0.000050	<0.000050	<0.0100	<0.0100	<0.050	0.0000224	0.0000932	41.9	39.7	2.92	1.48	0.000125	0.000753	<0.000100	0.000385	274	0.000368	0.00086	0.0935	164	0.00675	0.40	<0.000050	0.00031	0.00618	0.00665	14.4
2020	Q2	LC_LC5	0.62	102	<1.00	163	9.00	<1.00	173	<0.0030	0.112	0.00014	0.000153	0.000085	0.00022	0.0719	0.0747	<0.000020	0.0000135	<0.000050	<0.000050	<0.0100	<0.0100	<0.050	0.0000281	0.0000631	78.7	81.3	1.69	2.21	0.00010	0.000333	<0.000100	0.000145	544	0.00024	0.000415	0.165	333	<0.0100	0.187	<0.000050	0.000152	0.0166	0.0168	33.2
2020	Q2	LC_LCDSSLCC	0.62	107	<1.00	162	6.30	<1.00	168	0.022	0.0212	0.000205	0.000193	0.000133	0.00015	0.0381	0.0388	<0.000020	<0.000020	<0.000050	<0.000050	0.00825	0.00825	<0.050	0.000167	0.000168	82.8	80.3	1.37	5.50	0.000195	0.000195	0.000095	0.0000775	541	0.000655	<0.00050	0.196	338	0.0123	0.0485	0.0000808	0.000033	0.0234	0.0233	31.7
2020	Q4	FR_FRABCH	0.345	96	<1.00	221	2.68	<1.00	224	<0.0030	0.0102	0.000090	0.000108	<0.000100	0.000115	0.102	0.102	<0.000020	<0.000020	<0.000050	<0.000050	0.0115	0.0125	<0.25	0.0000358	0.0000392	148	148	0.61	1.78	0.00010	0.000135	<0.000100	0.000115	999	<0.00020	0.000313	0.125	645	0.00675	0.022	<0.000050	<0.000050	0.0367	0.0372	66.6
2020	Q4	GH_FR1	0.345	73	<1.00	203	3.50	<1.00	206	<0.0030	0.0894	0.000090	0.000113	0.0000625	0.00012	0.11	0.118	<0.000020	0.0000155	<0.000050	<0.000050	<0.0100	0.00625	<0.050	0.0000196	0.0000408	113	117	0.45	1.75	0.000143	0.00029	<0.000100	0.000113	811	<0.00020	0.00045	0.148	495	<0.0100	0.156	<0.000050	0.000134	0.0217	0.0216	51.7
2020	Q4	GH_ERC	0.345	86	<1	150	4.95	<1.00	154	0.00283	0.0182	<0.000100	<0.000100	<0.000100	0.0000825	0.0569	0.0583	<0.000020	<0.000020	<0.000050	<0.000050	<0.0100	<0.0100	<0.050	0.00000675	0.0000077	50.2	51.4	0.44	0.338	0.000235	0.000275	<0.000100	<0.000100	95.1	0.000183	<0.00050	0.146	177	<0.0100	0.018	<0.000050	<0.000050	0.00313	0.00315	12.5
2020	Q4	EV_MC2	0.345	86	<1.00	172	5.50	<1.00	177	<0.0030	0.0205	<0.000100	0.000085	0.000153	0.00021	0.108	0.109	<0.000020	<0.000020	<0.000050	0.0000355	0.0113	0.0118	<0.050	0.0000236	0.000032	72.3	71.6	1.51	4.03	0.000128	0.00018	<0.000100	<0.000100	522	0.00014	<0.00050	0.138	293	<0.0100	0.0188	<0.000050	0.0000313	0.0119	0.0112	27.3
2020	Q4	EV_HC1	0.345	90	<1.00	185	8.95	<1.00	194	<0.0030	0.0326	<0.000100	0.000065	0.000158	0.000205	0.0599	0.0606	<0.000020	<0.000020	<0.000050	<0.000050	<0.0100	<0.0100	<0.050	0.0000129	0.0000181	81.6	83.7	1.01	1.08	0.000158	0.000218	<0.000100	<0.000100	652	<0.00020	<0.00050	0.209	394	<0.0100	0.0313	<0.000050	0.0000423	0.00648	0.00648	46.2
2020	Q4	LC_LC3	0.345	96	1.15	218	5.25	<1.00	223	<0.0030	0.00393	0.000318	0.00033	<0.000100	0.000123	0.0596	0.0611	<0.000020	<0.000020	<0.000050	<0.000050	0.0163	0.017	<0.25	0.000214	0.000217	153	156	0.52	34.0	0.000095	0.00013	0.000213	0.000248	1150	0.00020	<0.00050	0.203	687	<0.0100	0.0945	<0.000050	<0.000050	0.0546	0.057	74.5
2020	Q4	LC_LC5	0.345	90	<1.00	188	6.48	<1.00	194	<0.0030	0.00603	0.0000675	0.000090	<0.000100	0.000123	0.0979	0.101	<0.000020	<0.000020	<0.000050	<0.000050	<0.0100	<0.0100	<0.050	0.0000165	0.0000391	103	102	0.82	4.61	0.00013	0.000143	<0.000100	<0.000100	744	<0.00020	<0.00050	0.209	438	<0.0100	0.0065	<0.000050	<0.000050	0.0219	0.0225	44.2
2020	Q4	LC_LCDSSLCC	0.345	88	<1.00	191	7.6	<1.00	199	<0.0030	<0.0030	0.000198	0.00021	0.000065	0.000108	0.0705	0.0719	<0.000020	<0.000020	<0.000050	<0.000050	0.0125	0.013	<0.050	0.000112	0.000121	117	120	0.483	17.6	0.000133	0.000148	<0.00010	<0.00010	863	<0.00020	<0.00050	0.236	504	<0.010	0.0073	<0.000050	<0.000050	0.0355	0.0386	51.5
2021	Q2	FR_FRABCH	-	102	<2	178.25	1.1	<1	178.5	0.0028	0.258675	0.00017	0.00018	0.000115	0.000245	0.05395	0.057725	<0.00002	0.00002375	<0.00005	<0.00005	0.01025	0.01025	<0.05	4.4975E-05	0.00009695	84.975	85.725	1.9675	0.785	0.0001025	0.0005075	<0.0001	0.0002575	685	0.0002925	0.000655	0.1475	370.25	<0.01	0.30975	<0.00005	0.00024525	0.027625	0.029	38.4
2021	Q2	FR_FRCP1	-	104	<2	166.5	<1	<1	166.5	0.00235	0.163	0.0002	0.0002075	0.000115	0.0002075	0.044075	0.04825	<0.00002	0.00002275	<0.00005	<0.00005	0.0105	0.01025	<0.05	5.5425E-05	0.0001146	74.725	74.9	1.8625	0.49	0.0001	0.0003625	0.000105	0.000305	598	0.0002325	0.00064	0.1625	322.5	<0.01	0.20725	<0.00005	0.00019725	0.027675	0.0285	32.95
2021	Q2	GH_FR1	-	102	2	163.75	1	1	163.75	0.0013	0.1758	0.00014	0.00015	0.0001125	0.00022	0.0619	0.066325	0.00002	0.000021	0.00005	0.00005	0.01	0.01	0.05	2.4375E-05	0.0000721	69.625	69.175	2.13	0.9025	0.000105	0.000375	0.0001	0.00018	562	0.00023	0.0006425	0.1575	295.75	0.01	0.23175	0.00005	0.00021225	0.016725	0.016425	29.55
2021	Q2	GH_ERC	-	100	<2	140.5	<1	<1	140.5	0.004575	0.84425	<0.0001	0.000115	0.0001225	0.000705	0.04155	0.0568	<0.00002	0.0000615	<0.00005	<0.00005	<0.01	<0.01	<0.05	8.675E-06	0.00012908	42.75	51.275	1.73	0.4775	0.000195	0.00195	<0.0001	0.00053	286.75	0.00022	0.0016425	0.13675	151.5	0.01075	1.2835	<0.00005	0.00088425	0.001875	0.00305	10.9
2021	Q2	RG_MIDAG	-	106	<2	130.25	<1	<1	130.25	0.004525	0.395	<0.0001	0.000105	0.00025	0.0004575	0.033	0.03395	<0.00002	0.00003	<0.00005	<0.00005	0.011	0.0125	<0.05	3.0475E-05	0.00005755	48.075	49.9	1.5975	0.69	0.0002	0.0008875	0.0005075	0.0009325	359.75	0.00026	0.000745	0.1425	186.5	<0.01	0.4125	<0.00005	0.0002585	0.0061	0.0063	16.15
2021	Q2	EV_MC2	-	102	<2	110.5	<1	<1	110.5	0.010725	1.63925	<0.0001	0.0001825	0.0001975	0.00132	0.0532	0.116475	<0.00002	0.000156	<0.00005	0.0000645	<0.01	0.011	<0.05	0.0000258	0.00046973	37.55	47.95	3.065	2.585	0.000135	0.0026575	0.000105	0.00217	301.25	0.0003225	0.004455	0.09475	143.5	0.01075	2.96475	<0.00005	0.0024995	0.005	0.00845	12.13
2021	Q2	EV_HC1	-	106	<2	160.25	2.7	<1	162.5	0.003225	0.2046	<0.0001	0.0001	0.00016	0.000255	0.0374	0.039025	<0.00002	0.000026	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.00001575	0.00003625	56.3	55.9	2.725	0.415	0.0001075	0.0003525	<0.0001	0.00015	436	0.0002425	0.000675	0.14675	240.75	<0.01	0.23575	<0.00005	0.0001785	0.004475	0.004625	24.3
2021	Q2	LC_DCDS	-	98	<2	119.25	<1	<1	119.25	0.009	0.17335	0.000645	0.0006625	0.00031	0.0004025	0.1565	0.16925	<0.00002	0.0000225	<0.00005	<0.00005	<0.01	0.01025	<0.05	7.4725E-05	0.00015275	56.15	57.675	2.8325	4.2925	<0.0001	0.0003525	0.0002425	0.0003575	463.5	0.000325	0.00071	0.06775	227	0.0105	0.1435	<0.00005	0.000162	0.01335	0.013625	21.125
2021	Q2	LC_LC3	-	104	2.1	173	1	1	173	0.001375	0.008425	0.0003125	0.0003175	0.00013	0.00014	0.025875	0.0265	0.00002	0.00002	0.00005	0.00005	0.012	0.01275	0.05	0.0003535	0.0003625	77.15	77.75	1.05	5.645	0.0001225	0.00013	0.000125	0.00015	663.5	0.000485	0.0005475	0.2075	346.25	0.01	0.019	0.00005	0.00005	0.0326	0.03335	37.325
2021	Q2	LC_LC5	-	106	<2	155	2.3	<1	156.75	0.00175	0.233975	0.0001325	0.00015	0.0001125	0.0002775	0.057675	0.068675	<0.00002	0.000029	<0.00005	<0.00005	<0.01	<0.01	0.07225	2.9775E-05	0.00010423	64.2	67.075	1.7975	1.585	0.0001125	0.000505	<0.0001	0.0002525	523	0.0002175	0.00077	0.175	272.5	<0.01	0.37625	<0.00005	0.000297	0.01695	0.017075	27.25
2021	Q2	LC_LCDSSLCC	-	104	<2	148.75	1.25	<1	149.25	0.002025	0.02415	0.000165	0.000175	0.0001225	0.0001375	0.029775	0.0312	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0001565	0.00017275	57.65	59.475	1.985	2.9725	0.00013	0.0001625	<0.0001	0.0001125	469.25	0.000315	<0.0005	0.195	242.25	<0.01	0.033	<0.00005	<0.00005	0.01745	0.0178	23.85
2021	Q3	GH_ERC	0.86	102	<2	135.75	2.65	<1	138	0.0026	0.0394	<0.0001	<0.0001	0.000105	0.0001625	0.048125	0.049225	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000074	1.7825E-05	44.475	43.4	2.63	0.275	0.0002	0.000275	<0.0001	0.000105	280.5	<0.0002	<0.0005	0.137	156.25	<0.01	0.05325	<0.00005	0.00010125	0.002325	0.0024	10.925
2021	Q3	RG_MIDAG	0.86	98	2.225	151.25	3.85	1	154.5	0.001575	0.013925	0.000125	0.000125	0.0002875	0.0003425	0.05295	0.0534	0.00002	0.00002	0.00005	0.00005	0.0195	0.021	0.05	1.5925E-05	0.0000197	67.85	71.75	0.9275	0.7275	0.000195	0.0002175	0.000125	0.0001775	519	0.0002	0.0005	0.17	271.5	<0.01	0.01675	<0.00005	0.00005	0.010475	0.0106	24.775
2021	Q3	EV_MC2	0.86	98	<2	165.75	5.45	<1	171	0.00155	0.0602	0.0001075	0.0001175	0.0001875	0.0002575	0.100725	0.09895	<0.00002	<0.00002	<0.00005	<0.00005	0.01275	0.014	0.053	0.0000233	3.4875E-05	64.15	65.3	1.8275	3.185	0.0001775	0.0002425	0.0001	0.000145	490.75	0.0002175	0.000515	0.136	261.5	<0.01	0.06525	0.0000515	0.000101	0.0121	0.011975	24.6
2021	Q3	EV_HC1	0.86	102	<2	183.5	6.25	<1	189.75	0.0035	0.191	<0.0001	0.00011	0.000185	0.000315	0.059775	0.0598	<0.00002	0.00002775	<0.00005	<0.00005	<0.01	<0.01	0.0505	0.00001395	0.0000317	73.7	75.25	2.65	0.86	0.00014	0.00041	<0.0001	0.000195	627.5	0.00036	0.0007675	0.205	354.25	<0.01	0.24475	<0.00005	0.00022275	0.007025	0.007025	41.275
2021	Q3	LC_DCDS	0.86	104	<2	142	1.6	<1	142.75	0.003925	0.012075	0.0006925	0.00077	0.0003	0.000345	0.2095	0.21725	<0.00002	<0.00002	<0.00005	<0.00005	0.0105	0.01175	<0.2	0.00019385	0.000219	116.75	121	2.6425	14.2	<0.0001	0.0001025	0.0001025	0.00012	914	0.0002625	<0.0005	0.095	472.5	<0.01	0.01325	<0.00005	<0.00005	0.03165	0.0327	43.95
2021	Q3	LC_LC3	0.86	100	2	206.75	3.4	1	209.25	0.001	0.006775	0.0003225	0.000335	0.000105	0.000125	0.0497	0.04935	0.00002	0.00002	0.00005	0.00005	0.019	0.01975	0.15	0.000355	0.00034125	119.5	115.5	1.9175	29.725	0.000105	0.0001225	0.0001125	0.0001225	918	0.00038	0.00051	0.2	527.75	0.01	0.0395	0.00005	0.00005	0.055425	0.055975	55.7
2021	Q3	LC_LCDSSLCC	0.86	98	<2	181.75	5.7	<1	187	0.00105	0.005125	0.000215	0.000225	0.0001075	0.0001275	0.055	0.05565	<0.00002	<0.00002	<0.00005	<0.00005	0.01425	0.0145	<0.05	0.00017075	0.000191	92.475	91.25	2.2125	9.035	0.000115	0.000145	<0.0001	<0.0001	716.5	0.000235	<0.0005	0.2225	390.75	<0.01	0.0155	<0.00005	<0.00005	0.03645	0.0377	38.825
2021	Q4	FR_FRABCH	0.43	104	0.5	262	<1	<1	262	0.000775	0.012825	0.0001325	0.0001575	<0.0001	0.00004	0.099425	0.10295	<0.00002	<0.00002	<0.00005	<0.00005	0.01225	0.01275	<0.25	4.0875E-05	4.7375E-05	152.25	155.25	1.23	1.9375	0.0001225	0.0001525	<0.0001	0.00005	1152.5	<0.0002	0.0002025	0.07975	666	0.008	0.03475	0.000025	0.0000115	0.04575	0.047725	69.425
2021	Q4	FR_FRCP1	0.43	107	<2	245.75	11.15	<1	256.75	<0.001	0.004075	0.0004825	0.0004975	0.0001175	0.0001375	0.08735	0.09065	<0.00002	<0.00002	<0.00005	<0.00005	0.01375	0.0145	<0.25	0.000145	0.0001475	153.75	160.25	1.485	1.9675	<0.0001	0.000165	0.0002125	0.000225	1240	<0.0002	<0.0005	0.1875	729.75	0.017	0.02925	<0.00005	<0.00005	0.06345	0.066875	83.975
2021	Q4	GH_FR1	0.43	100	2	210.75	5.9	1	227	0.001025	0.0108	0.000115	0.000125	0.0001	0.0001125	0.11575	0.1205	0.00002	0.00002	0.00005	0.00005	0.01	0.01	0.1	1.8675E-05	2.2725E-05	113.25	114.5	0.805	1.7925	0.00013	0.0001725	0.0001	0.0001	885.75	0.0002	0.0005	0.1245	507.5	0.01	0.0275	0.00005	0.00005	0.026775	0.0272	54.55
2021	Q4	CM_MC2	0.43	107	<2	236.75	5.2	<1	241.75	0.0023	0.031225	0.0001575	0.0001675	0.0001675	0.0001975	0.0748	0.07525	<0.00002	<0.00002	<0.00005	<0.00005	0.033	0.03475	<0.25	1.6825E-05	0.00001965	132.25	130.25	1.4975	2.0075	0.0001575	0.0001725	0.000265	0.0004025	1040.5	0.000205	<0.0005	0.1125	592.25	<0.01	0.035	<0.00005	<0.00005	0.0198	0.0196	63.65
2021	Q4	RG_MIDAG	0.43	109	<2	184	1.85	<1	185	0.001125	0.007275	0.0001025	0.0001175	0.0002075	0.0002375	0.076775	0.072275	<0.00002	<0.00002	<0.00005	<0.00005	0.0165	0.017	<0.05	0.0000206	2.1225E-05	86	84.075	1.0625	1.1275	0.0002925	0.0002125	<0.0001	0.0001075	633.5	<0.0002	<0.0005	0.1575	342.75	<0.01	0.01225	<0.00005	<0.00005	0.00975	0.010375	31.125
2021	Q4	EV_MC2	0.43	104	2.575	146	36.25	<1	181.5	0.002825	0.020175	0.0001	0.000105	0.0001525	0.0001725	0.100725	0.101275	<0.00002	<0.00002	<0.00005	<0.00005	0.0125	0.013	0.0685	2.8725E-05	0.00003135	75.975	77	1.4525	5.1925	0.0001225	0.0001425	<0.0001	<0.0001	553	0.0002625	<0.0005	0.12	307.5	0.0105	0.0215	<0.00005	<0.00005	0.015475	0.01485	28.575
2021	Q4	EV_HC1	0.43	102	<2	192	6.05	<1	198.25	0.001425	0.012175	<0.0001	0.0001	0.00016	0.00017	0.06255	0.06305	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	1.3825E-05	1.6575E-05	84.725	84.975	1.06	0.955	0.000175	0.0002025	<0.0001	<0.0001	692.25	<0.0002	0.001285	0.175	405	<0.01	0.022	<0.00005	0.00007075	0.007225	0.007275	47
2021	Q4	LC_LC3	0.43	102	2.175	232.5	8	1	240	0.0012	0.00525	0.0003025	0.00032	0.0001025	0.00013	0.058325	0.059525	0.00002	0.00002	0.00005	0.00005	0.02	0.021	0.25	0.00023625	0.00026025	137.25	139	1.4325	25.825	0.000165	0.0001425	0.0001475	0.00019	1140	0.000765	0.00058	0.21	621.25	0.01	0.1055	0.00005	0.00005	0.0661	0.071375	67.625
2021	Q4	LC_LC5	0.43	104	<2	191.25	10.65	<1	201.75	0.001225	0.0165	0.0001125	0.0001275	<0.0001	0.0001125	0.097275	0.100875	<0.00002	<0.00002	<0.00005	<0.00005	0.01	0.01025	<0.05	0.00002	0.00004345	100.55	102.85	1.375	4.925	0.0002175	0.00015	<0.0001	<0.0001	813.25	0.0002375	<0.0005	0.2	437.25	<0.01	0.03575	<0.00005	0.0000535	0.02655	0.02835	45.2
2021	Q4	LC_LCDSSLCC	0.43	107	<2	204.75	10.05	<1	214.5	0.001525	0.00305	0.00022	0.0002325	<0.0001	0.0001175	0.065075	0.0675	<0.00002	<0.00002	<0.00005	<0.00005	0.01475	0.01525	<0.2	0.00013675	0.00014225	112.25	114	1.045	15.8	0.0001875	0.00013	<0.0001	<0.0001	910.75	0.0002175	<0.0005	0.23	483	<0.01	0.01125	<0.00005	<0.00005	0.0449	0.049275	49.2

Tests categorized as possible or likely adverse response for dry weight (2015 to 2020)																																						
2015	Q2	FR_FRCP1	100	72	1.0	137	5.0	1.0	142	0.003	0.045	0.00021	0.00022	0.0001	0.00013	0.06	0.061	0.0001	0.0001	0.00005	0.00005	0.01	0.01	0.05	0.000025	0.000039	73	73	1.4	1.1	0.00011	0.00019	0.0001	0.00011	568	0.0005	0.0005	0.2	308	0.01	0.064	0.00005	0.000082	0.018	0.019	30
2016	Q1	FR_FRCP1	100	58	1.4	235	1.9	<1	236	0.0032	0.0038	0.00026	0.00029	<0.0001	0.00011	0.083	0.084	<0.0001	<0.0001	<0.00005	<0.00005	0.011	0.012	<0.3125	0.000025	0.000055	183	187	0.76	3.0	0.0001	0.0011	<0.0001	<0.0001	1450	<0.0005	0.00052	0.18	889	<0.01	0.022	<0.00005	<0.00005	0.059	0.06	104
2016	Q2	FR_FRCP1	98	51	<1	151	3.5	<1	154	<0.003	0.07	0.00017	0.00022	<0.0001	0.00014	0.058	0.059	<0.00004	<0.00004	<0.00005	0.000051	<0.01	<0.01	<0.05	0.000027	0.000045	74	75	1.5	0.51	0.00011	0.00024	<0.0001	0.0001	569	<0.0005	0.00051	0.21	311	<0.01	0.09	<0.00005	0.000078	0.018	0.019	30
2016	Q2	GH_FR1	98	60	<1	163	4.2	<1	166	<0.003	0.058	0.00015	0.00018	0.0001	0.00014	0.08	0.08	<0.00004	<0.00004	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.000022	0.000032	80	79	1.4	0.96	0.00011	0.00022	<0.0001	<0.0001	598	<0.0005	<0.0005	0.18	332	<0.01	0.086	<0.00005	0.000072	0.014	0.014	32
2016	Q2	CM_MC2	94	30	1.0	143	3.5	<1	146	0.0068	0.37	0.00015	0.00017	0.00017	0.0003	0.045	0.045	<0.00004	0.000044	<0.00005	<0.00005	0.017	0.017	<0.05	0.000064	0.0001	69	68	1.5	1.2	0.00017	0.0006	0.0021	0.0029	537	<0.0005	0.0007	0.1	282	<0.01	0.4	<0.00005	0.00024	0.009	0.0093	26
2017	Q1	FR_FRCP1	100	56	-	-	-	-	259	<0.001	0.0035	0.00027	0.0004	<0.0001	0.00013	0.076	0.073	<0.00002	<0.00002	<0.00005	<0.00005	0.01	0.011	<0.25	0.000043	0.000057	-	197	1.2	2.8	<0.0001	0.00027	<0.0001	<0.0001	1585	<0.0002	<0.0005	0.14	1008	<0.01	0.023	<0.00005	<0.00005	0.062	0.06	-
2017	Q4	CM_MC2	90	43	-	-	-	-	200	<0.003	0.0079	0.00025	0.00028	0.00017	0.00019	0.08	0.076	<0.00002	<0.00002	<0.00005	<0.00005	0.032	0.035	0.062	0.000012	0.000014	-	120	1.1	4.5	0.00012	0.00018	0.00098	0.0011	900	<0.0005	<0.0005	0.088	526	<0.01	0.012	<0.00005	<0.00005	0.018	0.019	-
2018	Q1	FR_FRCP1	86	38	2.9	227	1.4	<1	227	0.0034	0.0063	0.00025	0.00026	<0.000125	0.00015	0.085	0.08	<0.00003	<0.000025	<0.0000625	<0.0000625	0.013	0.014	<0.05	0.000025	0.000087	178	193	1.3	2.5	<0.000125	0.00029	0.00015	0.00015	1465	0.0005	<0.000625	0.14	868	<0.0125	0.033	<0.0000625	<0.0000625	0.054	0.057	103
2018	Q4	FR_FRABCH	94	50	1.6	238	1.9	<1	239	<0.003	0.0038	<0.0001	<0.0001	<0.0001	<0.0001	0.12	0.11	<0.00002	<0.00002	<0.00005	<0.00005	0.012	0.012	<0.2	0.000041	0.000042	149	145	0.58	2.3	0.00012	0.00027	0.00014	0.00015	1100	<0.0005	0.00051	0.15	667	<0.01	0.021	<0.00005	<0.00005	0.033	0.033	72
2018	Q4	LC_LCDSSLCC	74	35	1.0	194	1.4	<1	195	<0.003	<0.003	0.00017	0.00019	<0.0001	0.00011	0.086	0.081	<0.00002	<0.00002	<0.00005	<0.00005	0.013	0.012	<0.25	0.000094	0.000094	126	121	<0.5	15	0.00012	0.00025	<0.0001	<0.0001	944	<0.0005	<0.0005	0.24	556	<0.01	0.012	<0.00005	<0.00005	0.034	0.035	59
2019	Q3	CM_MC2	90	59	<1.0	202.5	7.4	<1.0	210	<0.003	0.0133	0.000205	0.00021	0.0001825	0.0002	0.068275	0.06935	<0.00002	<0.00002	<0.00005	<0.00005	0.0285	0.029	<0.05	1.1525E-05	0.000022	121.75	124.25	0.8125	2.2375	0.000155	0.0001875	0.00056	0.0010075	953.75	<0.0005	<0.0005	0.124	548.5	<0.01	0.01875	<0.00005	0.00003825	0.01635	0.016575	59.475
2019	Q3	EV_HC1	88	67	<1.0	186.5	5.6	<1.0	192.25	<0.003	0.0153	<0.0001	0.0000625	0.000175	0.0001875	0.0603	0.058925	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	1.1725E-05	1.9325E-05	78.65	78.475	0.865	1.1175	0.0001575	0.0001925	<0.0001	<0.0001	662.25	<0.0005	<0.0005	0.2205	384.5	<0.01	0.027	<0.00005	<0.00005	0.00705	0.006625	45.675
2019	Q3	LC_DCDS	94	65	<1.0	128.5	4.7	<1.0	133.5	<0.003	0.021575	0.000485	0.0005175	0.0003025	0.0003425	0.20125	0.21275	<0.00002	<0.00002	<0.00005	<0.00005	0.0625	0.0095	<0.05	2.9025E-05	0.00005825	71.725	72.875	2.1325	7.47	<0.0001	0.00015	0.0001175	0.0001525	581.75	<0.0005	0.0003175	0.0975	295.75	<0.01	0.02625	<0.00005	0.00003275	0.0158	0.015375	28.3
2019	Q3	LC_LCDSSLCC	90	50	0.75	185.75	1.75	<1.0	187.25	<0.003	0.004325	0.00019	0.000195	0.0000825	0.0000775	0.06035	0.05867	<0.00002	<0.00002	<0.00005	<0.00005	0.0125	0.013	<0.05	0.00015	0.0001705	91.1	93.175	0.5975	8.9425	0.0001275	0.0002	<0.0001	<0.0001	727.25	<0.0005	<0.0005	0.2375	391.75	<0.01	0.01925	<0.00005	<0.00005	0.02815	0.02785	39.875
2019	Q4	FR_FRCP1	96	36	1.65	242.75	1.375	<1.0	243.75	<0.003	0.0065	0.00033	0.0003525	0.0000825	0.0001175	0.07185	0.07295	<0.00002	<0.00002	<0.00005	<0.00005	0.00925	0.0115	<0.1	0.00003205	0.0000734	159	172.5	0.87	1.4625	0.0000675	0.000125	0.0001	0.0001375	1258	0.00018	<0.0005	0.18375	814.75	<0.01	0.0305	<0.00005	<0.00005	0.045975	0.04825	101.4
2019	Q4	GH_ERC	88	74	0.9	151.25	<1.0	<1.0	151.25	<0.003	0.004025	<0.0001	<0.0001	0.000075	0.0001175	0.06115	0.062525	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	7.025E-06	8.925E-06	50.175	54.9	<0.5	<0.5	0.000225	0.0002625	<0.0001	<0.0001	335.5	0.00023	<0.0005	0.14325	182.25	<0.01	<0.01	<0.00005	<0.00005	0.003	0.003175	13.825
2019	Q4	EV_HC1	85	72	0.925	200.75	1.275	<1.0	201.75	<0.003	0.02065	<0.0001	0.0000825	0.0001625	0.000165	0.063875	0.0611	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.00001415	1.9475E-05	87.45	87.875	0.59	1.3875	0.0001575	0.000195	<0.0001	<0.0001	700.75	0.00013	<0.0005	0.20375	416.25	<0.01	0.03475	<0.00005	0.00005625	0.00685	0.00685	48.025
2020	Q2	RG_MIDAG	98	61	0.75	121	4.15	32.6	157	0.0028	0.119	0.0000675	0.000103	0.00024	0.000305	0.0444	0.0439	<0.000020	<0.000020	<0.000050	<0.000050	0.012	0.0123	<0.050	0.000328	0.0000468	61.9	61.8	1.43	1.83	0.000198	0.000308	0.00053	0.000965	414	0.000178	0.000318	0.131	240	<0.0100	0.114	<0.000050	0.0000995	0.00715	0.00698	20.9
2020	Q2	LC_DCDS	87	50	<1.00	111	<1.00	<1.00	111	0.0101	0.0582	0.000383	0.00038	0.000295	0.000385	0.122	0.125	<0.000020	<0.000020	<0.000050	<0.000050	<0.0100	<0.0100	<0.050	0.0000933	0.000118	54.5	53.5	2.51	4.53	0.000070	0.000183	0.000228	0.000303	390	0.000378	0.000418	0.094	219	0.0095	0.0638	0.0000398	0.0000508	0.0114	0.0117	20.2
Tests categorized as possible or likely adverse response for survival (2015 to 2020)																																						
2019	Q3	LC_LC5	81	76	<1.0	182.5	4.55	<1.0	187	<0.003	0.013075	0.0001175	0.00013	0.000065	0.0000825	0.088525	0.0884	<0.00002	<0.00002	<0.00005	<0.00005	0.00675	0.008	<0.05	1.6575E-05	0.00003085	82.05	85.8	0.705	2.77	0.0001175	0.000215	<0.0001	<0.0001	659.75	<0.0005	<0.0005	0.20925	353.75	<0.01	0.0205	<0.00005	0.000045	0.0197	0.01985	36.125
2019	Q4	LC_LC3	67	154	1.875	222	<1.0	<1.0	222	<0.003	0.00315	0.0003275	0.0003375	0.0001025	0.000125	0.06785	0.06695	<0.00002	<0.00002	<0.00005	<0.00005	0.015	0.0165	<0.1	0.00024375	0.00024675	143.25	150.5	0.46	13.8425	0.00013	0.000145	0.000085	0.0000925	1093	0.00051	0.0003525	0.1745	659.25	<0.01	0.03825	<0.00005	<0.00005	0.04955	0.053025	73.3
2019	Q4	LC_LC5	75	67	<1.0	193.5	1.95	<1.0	195	<0.003	0.0072	0.000065	0.00011	<0.0001	0.000065	0.0937	0.08965	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	0.00625	<0.05	1.6075E-05	0.0000213	95.85	97.225	0.6225	3.8125	0.00013	0.0001575	<0.0001	<0.0001	711.75	0.00024	<0.0005	0.16725	407	<0.01	0.0065	<0.00005	<0.00005	0.019475	0.020175	40.8
2019	Q4	LC_LCDSSLCC	73	85	<1.0	196.25	<1.0	<1.0	196.25	<0.003	0.003425	0.000195	0.000205	0.0000625	0.00024	0.073725	0.0721	<0.00002	<0.00002	<0.00005	<0.00005	0.01175	0.0125	<0.05	0.00010213	0.00012125	112.25	115.75	0.4025	9.31	0.000145	0.0002025	<0.0001	<0.0001	846.25	0.00042	0.000445	0.191	489.25	<0.01	0.02375	<0.00005	<0.00005	0.033475	0.035325	50.85
2020	Q2	EV_HC1	80	74	<1.00	130	8.23	44.1	182	<0.0030	0.107	0.000065	<0.000100	0.00016	0.000215	0.039	0.0405	<0.000020	<0.000020	<0.000050	<0.000050	<0.0100	<0.0100	<0.050	0.0000179	0.0000314	70.8	68.2	2.43	0.89	0.0000975	0.000238	<0.000100	<0.000100	517	0.000235	<0.00050	0.119	323	<0.0100	0.0833	<0.000050	0.0000625	0.00588	0.00593	35.3
2020	Q2	LC_LC3	76	76	1.40	177	7.38	<1.00	184	0.0104	0.0064	0.000298	0.000298	0.000138	0.00015	0.031	0.0296	0.0000198	<0.000020	<0.000050	<0.000050	0.0128	0.0133	<0.050	0.00039	0.000333	104	102	0.918	9.71	0.00015	0.000143	0.000233	0.000155	721	0.0010	0.000605	0.194	458	0.0135	0.038	0.000145	0.0000423	0.0351	0.0348	47.8
2020	Q4	FR_FRCP1	57	15	<1.00	225	9.35	<1.00	234	<0.0030	0.0115	0.000283	0.000315	0.000118	0.000138	0.0794	0.076	<0.000020	<0.000020	<0.000050	<0.000050	0.0115	0.0123	<0.25	0.000114	0.00011	157	151	1.03	2.48	<0.000100	0.000175	0.000135	0.000145	1093	0.000153	<0.00050	0.16	734	0.016	0.0335	<0.000050	<0.000050	0.0437	0.0443	83.4
2020	Q4	RG_MIDAG	63	16	<1.00	181	2.83	<1.00	183	0.00205	0.0262	0.000113	0.000128	0.00023	0.000293	0.0722	0.0732	<0.000020	<0.000020	<0.000050	<0.000050	0.0238	0.0255	<0.050	0.0000177	0.0000211	90.0	89.5	1.29	1.64	0.000188	0.00024	0.000283	0.000385	617	0.00013	<0.00050	0.172	362	<0.0100	0.0323	<0.000050	0.0000365	0.015	0.0152	33.1
2020	Q4	LC_DCDS	61	20	<1.00	146	<1.00	<1.00	146	<0.0030	0.00593	0.000468	0.000503	0.000308	0.000353	0.277	0.264	<0.000020	<0.000020	<0.000050	<0.000050	<0.0100	0.0075	<0.25	0.000191	0.000193	128	128	1.58	17.4	<0.000100	<0.000100	0.00022	0.000243	917	0.000138	<0.00050	<0.100	511	<0.0100	0.0065	<0.000050	<0.000050	0.0261	0.026	46.6
Tests categorized as possible or likely adverse response for dry weight and survival (2015 to 2020)																																						
2015	Q3	CM_MC2	67	35	1.1	201	8.6	1.0	210	0.003	0.01	0.0002	0.00021	0.00019	0.00023	0.077	0.078	0.0001	0.0001	0.00005	0.00005	0.027	0.027	0.21	0.0000091	0.000017	119	121	0.99	2.8	0.00014	0.00017	0.00018	0.00021	939	0.0005	0.0005	0.12	534	0.01	0.012	0.00005	0.00005	0.014	0.015	57
2016	Q1	CM_MC2	80	58	<1	203	5.6	<1	209	<0.003	0.02	0.00021	0.00022	0.00016	0.00019	0.077	0.076	<0.0001	<0.0001	<0.00005	<0.00005	0.025	0.027	<0.25	0.000017	0.000016	116	118	0.7	5.0	0.00016	0.00026	0.00091	0.00098	916	0.00052	<0.0005	0.13	493	<0.01	0.018	<0.00005	<0.00005	0.013	0.014	49
2017	Q1	CM_MC2	67	23	-	-	-	-	208	0.0026	0.016	0.00033	0.00045	0.00015	0.0002	0.07	0.071	<0.00002	<0.00002	<0.00005	<0.00005	0.032	0.033	<0.2	0.000039	0.000044	-	132	0.68	3.7	0.00013	0.00022	0.0041	0.0042	1016	<0.000425	<0.0005	0.13	553	<0.01	0.02	<0.00005	<0.00005	0.02	0.021	-
2017	Q2	CM_MC2	58	16	-	-	-	-	178	0.0048	0.2	0.00024	0.00026	0.00017	0.0003	0.058	0.06	<0.00002	0.000023	<0.00005	<0.00005	0.025	0.027	<0.05	0.000068	0.0001	-	88	1.8	1.8	0.00013	0.00052	0.0032	0.004	696	0.00022	0.00068	0.1	348	<0.01	0.24	<0.00005	0.00017	0.014	0.014	-
2017	Q3	CM_MC2	0	0	-	-	-	-	188	0.003	0.034	0.00031	0.00036	0.0002	0.00025	0.064	0.065	<0.00002	<0.00002	<0.00005	<0.00005	0.032	0.032	<0.05	0.0000055	0.000021	-	110	1.2	1.4	0.00015	0.00025	0.0016	0.003	873	<0.000425	0.00053	0.11	487	<0.01	0.052	<0.00005	0.00007	0.018	0.017	-
2018	Q1	CM_MC2	36	15	1.3	229	7.5	<1	236	<0.003	0.013	0.00024	0.00027	0.00017	0.00019	0.078	0.075	<0.00002	<0.00002	<0.00005	<0.00005	0.032	0.036	<0.05	0.00002	0.000023	133	137	1.1	5.9	0.00011	0.00023	0.001	0.0012	1081	<0.0005	<0.0005	0.11	586	<0.01	0.019	<0.00005	<0.00005	0.017	0.019	61
2018	Q2	CM_MC2	55	97	1.1	138	9.0	<1	147	0.01	1.2	0.00017	0.00019	0.00017	0.00068	0.057	0.062	<0.000025	0.000069	<0.000025	<0.00005	0.019	0.02	<0.05	0.000064	0.00014	69	66	2.0	2.8	0.00014	0.0015	0.0014	0.0033	539	<0.0005	0.0017	0.11	287	0.013	1.4	<0.0000625	0.00088	0.0095	0.011	28
2018	Q3	CM_MC2	30	10	<1	194	<1	<1	194	<0.004	0.006	0.00052	0.00053	0.00022	0.00022	0.069	0.067	<0.00002	<0.00002	<0.00005	<0.00005	0.025	0.052	0.058	0.00009	0.000014	137	140	1.1	3.2	0.00013	0.00016	0.0057	0.0064	1060	<0.0005	<0.0005	0.17	607	<0.01	<0.01	<0.00005	<0.00005	0.029	0.031	64
2018	Q3	CM_MC2	77	23	<1	168	6.5	<1	174	<0.003	0.0048	0.00024	0.00025	0.00027	0.00028	0.064	0.061	<0.00002	<0.00002	<0.00005	<0.00005	0.028	0.028	<0.1	0.00001	0.000018	90	89	0.98	1.6	0.00019	0.0023	0.0015	0.0016	696	<0.0005	<0.0005	0.22	366	<0.01	<0.01	<0.00005	<0.00005	0.014	0.014	34
2018	Q4	FR_FRCP1	17	18	9.7	397	<1	<1	397	<0.003	0.0053	0.00049	0.0005	0.00017	0.00021	0.019	0.019	<0.000025	<0.000035	<0.000625	<0.0000875	0.014	0.018	<0.375	0.0000086	0.000014	416	421	1.4	6.7	<0.000125	0.00038	<0.000125	<0.000175	3348	0.00051	<0.000875	0.17	2580	<0.0125	<0.0175	<0.0000625	<0.0000875	0.076	0.079	374
2018	Q4	CM_MC2	70	21	1.4	210	1.7	<1	211	<0.003	0.0059	0.00024	0.00027	0.00021	0.00024	0.077	0.075	<0.00002	<0.00002	<0.00005	<0.00005	0.029	0.028	<0.2	0.000019	0.000021	122	121	0.77	3.7	0.00021	0.00019	0.00055	0.0064	968	<0.0005	<0.0005	0.14	545	<0.01	<0.01	<0.00005	<0.00005	0.015	0.015	58
2019	Q3	LC_LC3	75	65	4.075	212.25	<1.0	<1.0	212.25	<0.003	0.003325	0.0002775	0.0002975	<0.0001	0.00008	0.051975	0.05195	<0.00002	<0.00002	<0.00005	<0.00005	0.01675	0.01625	<0.075	0.00031025	0.00035325	115.75	117.25	0.42	16.85	0.00008	0.000215	0.0000875	0.0001525	953.25	<0.0005	<0.0005	0.2085	524.75	<0.01	0.073	<0.00005	<0.00005	0.040425	0.0404	57.225
2019	Q4	CM_MC2	79	54	<1.0	217.5	3.825	<1.0	221.25	<0.003	0.07625	0.0002	0.0002025	0.000185	0.00022	0.061925	0.064675	<0.00002	<0.00002	<0.00005	<0.00005	0.02825	0.02825	<0.1	2.4025E-05	3.0725E-05	135.75	131.5	0.7825	3.2125	0.0001725	0.0003325	0.00146	0.002165	968.5	0.000265	<0.0005	0.11	597.75	<0.01	0.07375	<0.00005	0.00006325	0.0175	0.017725	62.9
2019	Q4	LC_DCDS	35	51	<1.0	149.75	1	1	149.75	<0.003	0.003425	0.000485	0.00051	0.000325	0.000345	0.2545	0.256	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.25	0.000122	0.0001255	100.175	100.425	1.79	12.475	0.00095	0.000065	0.0000925	0.0001125	729.25	0.0003025	<0.0005	0.085	402.75	<0.01	<0.01	<0.00005	<0.00005	0.015825	0.0159	37
2020	Q2	CM_MC2	30	15	<1.00	167	1.98	<1.00	169	0.0047	0.492	0.00015	0.000158	0.00015	0.000333	0.0465	0.0509	<0.000020	0.0000253	<0.000050	<0.000050	0.0215	0.0238	<0.050	0.000071	0.0000997	78.3	84.2	1.94	1.74	0.000168	0.00076	0.00206	0.00266	550	0.000155	0.000593	0.108	331	<0.0100	0.463	<0.000050	0.000242	0.0123	0.0135	33.0
2020	Q4	CM_MC2	24	12	<1.00	238	3.40	<1.00	241	<0.0030	0.0112	0.000183	0.000185	0.000168	0.000195	0.0687	0.0664	<0.000020	<0.000020	<0.000050	<0.000050	0.0595	0.0613	0.10	0.0000168	0.0000211	136	133	1.11	3.29	0.00013	0.00016	0.00273	0.00287	1036	0.00013	<0.00050	0.15	591	<0.0100	0.0405	0.0000395	<0.000050	0.0393	0.0377	61.0
Tests categorized as possible or likely adverse response for dry weight (2021)																																						
2021	Q4	LC_DCDS	83	91	2	165	2	<1	166.25	0.00235	0.0083	0.000635	0.00065	0.0002875	0.0003075	0.232	0.23	<0.00002	<0.00002	<0.00005	<0.00005	0.01	0.0105	<0.25	0.00025425	0.00028575	143.5	143.75	2.2825	20.475	<0.0001	<0.0001	<0.0001	0.0001025	1112.5	0.0002425	<0.0005	0.103	579.5	<0.01	0.0115	<0.00005	<0.00005	0.038625	0.039625	53.775
Tests categorized as possible or likely adverse response for survival (2021)																																						
2021	Q2	CM_MC2	74	-	<2	143.25	<1	<1	143.25	0.00585	0.48575	0.0001175	0.0001375	0.0001475	0.0003975	0.037925	0.043075	<0.00002	0.0000355	<0.00005	<0.00005	0.01975	0.0225	<0.05	6.3725E-05	0.00011175	61.775	62.125	2.1625	0.6575	0.00017	0.0010125	0.001735	0.00241	511.5	0.0002325	0.0008525	0.092	264.25	<0.01	0.59675	<0.00005	0.00004175	0.011825	0.01185	26.675
Tests categorized as possible or likely adverse response for dry weight and survival (2021)																																						
2021	Q3	CM_MC2	40	37	<2	224.75	1.95	<1	226	0.001375	0.029225	0.0002275	0.00023	0.0001725	0.0002125	0.066425	0.0669	<0.00002	<0.00002	<0.00005	<0.00005	0.05275	0.0535	<0.2	1.7975E-05	0.00002235	125.25	122	1.22	2.4325	0.0001275	0.000205	0.000755	0.001035	1004	0.0002175	<0.0005	0.1375	558	<0.01	0.03475	<0.00005	0.00005675	0.027725	0.0279	59.6

Notes:
"-D-" = dissolved concentration; "-T-" = total concentration; "-N-" = normal concentration; $CaCO_3$ = calcium carbonate; ∑TU = sum of toxic units; WQG = water quality guideline; mg/l = milligrams per litre; ug/l = micrograms per litre; % = percent.

Screening
Concentrations of parameters in 2021 tests categorized as possible or likely response are shaded if the concentration is greater than the maximum concentration measured in references or tests categorized as no adverse response.

Year	Quarter	Sample ID	MAGNESIUM-T-mg/l	MAJOR ANION SUM-N-meq/l	MAJOR CATION SUM-N-meq/l	MANGANESE-D-mg/l	MANGANESE-T-mg/l	MERCURY-D-mg/l	MERCURY-T-mg/l	MOLYBDENUM-D-mg/l	MOLYBDENUM-T-mg/l	NICKEL-D-mg/l	NICKEL-T-mg/l	NITRATE NITROGEN (NO3) AS N-N-mg/l
Reference (2015 - 2021)														
2015	Q1	Reference (FR_UFR1)	13	3.6	3.6	0.00062	0.001	0.000009	0.000009	0.00057	0.00057	0.0005	0.0005	0.12
2015	Q2	Reference (FR_UFR1)	9.2	2.6	2.7	0.00069	0.0022	0.000005	0.000005	0.00056	0.0006	0.0005	0.0005	0.03
2015	Q3	Reference (FR_UFR1)	14	3.9	4.0	0.00068	0.0013	0.000005	0.000005	0.00064	0.00065	0.0005	0.0005	0.048
2015	Q4	Reference (FR_UFR1)	14	3.9	3.9	0.00016	0.00031	0.000005	0.000005	0.00061	0.00059	0.0005	0.0005	0.074
2016	Q1	Reference (FR_UFR1)	14	3.9	3.9	0.0002	0.00036	<0.000005	<0.0000005	0.00057	0.00059	<0.0005	<0.0005	0.16
2016	Q2	Reference (FR_UFR1)	10.0	2.6	2.7	0.00032	0.0016	<0.000005	0.00000095	0.00063	0.00065	<0.0005	<0.0005	0.018
2016	Q3	Reference (FR_UFR1)	14	4.0	3.6	0.00019	0.00071	<0.000005	<0.0000005	0.00063	0.00064	<0.0005	<0.0005	0.043
2016	Q4	Reference (FR_UFR1)	12	3.6	3.5	0.00017	0.00056	<0.000005	0.00000058	0.00057	0.00058	<0.0005	<0.0005	0.097
2017	Q1	Reference (FR_UFR1)	15	-	-	<0.0001	0.00027	<0.000005	<0.0000005	0.0006	0.00059	<0.0005	<0.0005	0.21
2017	Q2	Reference (FR_UFR1)	9.4	-	-	0.00063	0.0026	<0.000005	0.0000022	0.00049	0.00052	0.00051	0.00055	0.079
2017	Q2	Reference (GH_ER2)	12	-	-	0.00078	0.0088	<0.000005	0.0000011	0.00092	0.00093	<0.0005	0.00059	0.12
2017	Q3	Reference (FR_UFR1)	13	-	-	0.00021	0.00075	<0.000005	<0.0000005	0.00063	0.00067	<0.0005	<0.0005	0.012
2017	Q3	Reference (GH_ER2)	10	-	-	0.0021	0.0037	<0.000005	0.00000053	0.00099	0.001	<0.0005	<0.0005	0.04
2017	Q3	Reference (CM_MC1)	11	-	-	0.00011	0.00054	<0.000005	0.00000055	0.00089	0.0009	<0.0005	<0.0005	0.015
2017	Q4	Reference (FR_UFR1)	14	-	-	0.00013	0.0005	<0.000005	<0.0000005	0.00057	0.00058	<0.0005	<0.0005	0.024
2017	Q4	Reference (GH_ER2)	11	-	-	0.00045	0.0016	<0.000005	<0.0000005	0.001	0.001	<0.0005	<0.0005	0.047
2017	Q4	Reference (CM_MC1)	11	-	-	0.00013	0.00024	<0.000005	0.00000054	0.00085	0.00087	<0.0005	<0.0005	0.015
2018	Q1	Reference (FR_UFR1)	14	3.9	3.9	0.00016	0.00053	<0.000005	0.00000052	0.00057	0.00062	<0.000625	<0.0005	0.19
2018	Q1	Reference (GH_ER2)	12	3.6	3.4	0.0014	0.0015	<0.000005	<0.0000005	0.00094	0.001	<0.0005	0.00064	0.1
2018	Q1	Reference (CM_MC1)	11	3.6	3.2	<0.0001	0.00017	<0.000005	<0.0000005	0.00088	0.00093	<0.0005	<0.0005	0.041
2018	Q2	Reference (FR_UFR1)	8.6	2.2	2.3	0.00057	0.011	<0.000005	0.0000025	0.00055	0.00055	<0.0005	0.00074	0.089
2018	Q2	Reference (GH_ER2)	12	3.1	3.0	0.00069	0.067	<0.000005	0.0000043	0.00091	0.00097	<0.0005	0.0026	0.13
2018	Q2	Reference (CM_MC1)	7.6	2.1	2.1	0.00098	0.0087	0.0000052	0.0000027	0.00057	0.00064	<0.000625	0.00079	0.0093
2018	Q2	Reference (LC_SLC)	9.6	2.6	2.7	0.00016	0.0026	<0.000005	0.0000012	0.00057	0.00058	<0.0005	0.00057	0.11
2018	Q3	Reference (FR_UFR1)	13	3.8	3.7	0.00025	0.00061	<0.000005	<0.0000005	0.00064	0.00065	<0.0005	<0.0005	0.01
2018	Q3	Reference (GH_ER2)	10	3.1	3.0	0.00052	0.022	<0.000005	0.00000079	0.001	0.00095	<0.0005	0.00094	0.036
2018	Q3	Reference (CM_MC1)	11	3.2	3.2	0.00019	0.0007	<0.000005	<0.0000005	0.00095	0.00091	<0.0005	0.00055	0.017
2018	Q3	Reference (LC_SLC)	15	3.9	4.0	<0.0001	0.00034	<0.000005	<0.0000005	0.0013	0.0012	<0.0005	0.00055	0.086
2018	Q4	Reference (FR_UFR1)	14	4.0	3.9	<0.0001	0.00037	<0.000005	<0.0000005	0.0006	0.00057	<0.0005	0.0005	0.21
2018	Q4	Reference (GH_ER2)	12	3.5	3.4	0.00035	0.0014	<0.000005	<0.0000005	0.0011	0.0011	<0.0005	<0.0005	0.095
2018	Q4	Reference (CM_MC1)	11	3.3	3.2	0.00034	0.00042	<0.000005	<0.0000005	0.00087	0.00089	<0.0005	<0.0005	0.046
2018	Q4	Reference (LC_SLC)	19	4.5	4.5	<0.0001	0.0001	<0.000005	<0.0000005	0.0014	0.0013	<0.0005	<0.0005	0.14
2019	Q1	Reference (FR_UFR1)	13.475	4.1425	3.73	0.0001625	0.001905	<0.000005	1.2025E-06	0.00051225	0.00049325	<0.0005	0.00049	0.23575
2019	Q1	Reference (GH_ER2)	11.85	3.515	3.41	0.0004075	0.00088	<0.000005	0.00000032	0.001065	0.001055	<0.0005	<0.0005	0.108
2019	Q1	Reference (CM_MC1)	11.525	3.6025	3.2325	0.0001475	0.0002175	<0.000005	<0.0000005	0.00087525	0.00087475	<0.0005	<0.0005	0.057925
2019	Q3	Reference (FR_UFR1)	13.625	3.595	3.63	0.0002325	0.0006025	<0.000005	3.575E-07	0.000638	0.0006765	<0.0005	<0.0005	0.012175
2019	Q3	Reference (GH_ER2)	10.015	3.1125	3.075	0.000625	0.0035075	<0.000005	<0.0000005	0.000948	0.00096075	<0.0005	0.0003525	0.031525
2019	Q3	Reference (CM_MC1)	11.6	3.215	3.155	0.000185	0.0005325	<0.000005	3.15E-07	0.00097	0.0009255	<0.0005	<0.0005	0.01485
2019	Q3	Reference (LC_SLC)	14.95	3.7875	3.6	<0.0001	0.0001575	<0.000005	<0.0000005	0.001195	0.0012075	<0.0005	<0.0005	0.100875
2019	Q4	Reference (FR_UFR1)	14.1	3.785	3.7475	0.0000675	0.0052325	<0.000005	7.025E-07	0.000563	0.00055825	<0.0005	0.000405	0.16125
2019	Q4	Reference (GH_ER2)	11.75	3.4075	3.2475	0.0006875	0.001555	<0.000005	<0.0000005	0.0009985	0.0010445	<0.0005	<0.0005	0.081825
2019	Q4	Reference (CM_MC1)	11	3.1975	3.1175	0.000075	0.0002025	<0.000005	<0.0000005	0.000852	0.00087675	<0.0005	<0.0005	0.025975
2019	Q4	Reference (LC_SLC)	16.925	4.21	3.99	<0.0001	0.0006325	<0.000005	<0.0000005	0.00129	0.001555	<0.0005	<0.0005	0.1385
2020	Q2	Reference (FR_UFR1)	9.96	2.66	2.48	0.000218	0.0023	<0.0000050	0.00000153	0.000576	0.000547	<0.00050	<0.00050	0.0246
2020	Q2	Reference (GH_ER2)	11.3	3.29	3.14	0.000823	0.0108	<0.0000050	0.00000173	0.0011	0.00089	<0.00050	0.000528	0.107
2020	Q2	Reference (CM_MC1)	8.89	2.46	2.37	0.000298	0.00395	<0.0000050	0.00000189	0.000547	0.000592	<0.00050	0.000483	0.0121
2020	Q2	Reference (LC_SLC)	11.3	3.12	3.11	0.0000675	0.00102	<0.0000050	0.000000898	0.000695	0.000682	<0.00050	0.000325	0.097
2020	Q4	Reference (FR_UFR1)	13.9	3.94	3.72	0.000223	0.000525	<0.0000050	0.000000353	0.000595	0.000621	<0.00050	<0.00050	0.0261
2020	Q4	Reference (GH_ER2)	11.2	3.45	3.30	0.00143	0.00342	<0.0000050	<0.00000050	0.000964	0.00102	<0.00050	<0.00050	0.076
2020	Q4	Reference (CM_MC1)	11.1	3.15	3.06	0.00017	0.000453	<0.0000050	0.00000041	0.000823	0.000886	<0.00050	<0.00050	0.015
2020	Q4	Reference (LC_SLC)	16.9	4.16	3.94	<0.000100	0.000128	<0.0000050	<0.00000050	0.00122	0.0013	<0.00050	<0.00050	0.102
2021	Q2	Reference (FR_UFR1)	8.8975	2.515	2.3475	0.000265	0.006055	<0.000005	0.0000018	0.000559	0.000556	<0.0005	0.00053	0.04315
2021	Q2	Reference (FR_UFR1)	11.15	3.08	3.045	0.0002975	0.00195	<0.000005	0.00000028	0.00068	0.00067925	<0.0005	<0.0005	0.0089
2021	Q2	Reference (GH_ER2)	10.925	3.125	2.865	0.001085	0.0475	<0.000005	0.0000037	0.00109125	0.00092525	<0.0005	0.0018175	0.10435
2021	Q2	Reference (CM_MC1)	7.2825	2.0325	1.97	0.0004525	0.01576	<0.000005	0.0000029	0.0005315	0.00055	<0.0005	0.00075	0.01395
2021	Q2	Reference (LC_SLC)	8.9325	2.6	2.4	0.000115	0.0017825	<0.000005	0.0000014	0.00053475	0.0005505	<0.0005	0.00052	0.090825
2021	Q3	Reference (FR_UFR1)	12.9	3.72	3.4725	0.00053	0.0049675	<0.000005	0.00000041	0.00066075	0.00068725	<0.0005	0.0002075	0.0253
2021	Q3	Reference (GH_ER2)	9.55	2.965	2.9225	0.00206	0.0068925	<0.000005	0.00000096	0.0010175	0.00098375	<0.0005	<0.0005	0.0407
2021	Q3	Reference (CM_MC1)	11.025	3.2425	3.06	0.0002475	0.0011575	<0.000005	0.00000078	0.000933	0.00092775	<0.0005	<0.0005	0.01785
2021	Q3	Reference (LC_SLC)	13.65	3.54	3.475	0.0001175	0.000625	<0.000005	0.00000068	0.001125	0.0011575	<0.0005	<0.0005	0.1315
2021	Q4	Reference (FR_UFR1)	14.575	4.0725	3.7525	0.00021	0.00043	<0.000005	<0.0000005	0.00060975	0.0006455	<0.0005	<0.0005	0.0279
2021	Q4	Reference (GH_ER2)	11.55	3.5375	3.275	0.001465	0.0105825	<0.000005	<0.0000005	0.0010095	0.00098925	<0.0005	0.0006225	0.06745
2021	Q4	Reference (CM_MC1)	11.0075	3.375	3.185	0.0001675	0.000305	<0.000005	0.00000061	0.0008175	0.00085625	<0.0005	<0.0005	0.015675
2021	Q4	Reference (LC_SLC)	23.875	4.2975	4.0125	<0.0001	0.0002275	<0.000005	<0.0000005	0.0012675	0.00129	<0.0005	0.000645	0.10855

Year	Quarter	Sample ID	NITRITE NITROGEN (NO2) AS N-N-mg/l	NITROGEN AMMONIA (AS N)-N-mg/l	ORTHO-PHOSPHATE-N-mg/l	OXIDATION-REDUCTION POTENTIAL LAB-N-mv	pH LAB-N-ph units	PHOSPHORUS-N-mg/l	POTASSIUM-D-mg/l	POTASSIUM-T-mg/l	SELENIUM-D-mg/l	SELENIUM-T-mg/l	SILICON-D-mg/l	SILICON-T-mg/l	SILVER-D-mg/l	SILVER-T-mg/l	SODIUM-D-mg/l	SODIUM-T-mg/l	STRONTIUM-D-mg/l	STRONTIUM-T-mg/l
2015	Q1	Reference (FR_UFR1)	0.001	0.005	0.003	336	8.3	0.005	0.4	0.42	0.00072	0.00077	1.7	1.8	0.00001	0.00001	0.71	0.71	0.084	0.085
2015	Q2	Reference (FR_UFR1)	0.001	0.005	0.003	383	8.3	0.007	0.34	0.36	0.00045	0.0005	1.7	1.8	0.00001	0.00001	0.57	0.58	0.063	0.066
2015	Q3	Reference (FR_UFR1)	0.001	0.005	0.0036	362	8.4	0.0033	0.52	0.54	0.00049	0.00049	2.1	2.2	0.00001	0.00001	0.72	0.74	0.095	0.097
2015	Q4	Reference (FR_UFR1)	0.001	0.005	0.0015	377	8.4	0.0024	0.39	0.39	0.00065	0.00067	1.5	1.6	0.00001	0.00001	0.68	0.68	0.092	0.091
2016	Q1	Reference (FR_UFR1)	<0.001	<0.005	0.0031	293	8.3	0.0041	0.4	0.39	0.00083	0.00081	1.8	1.8	<0.00001	<0.00001	0.71	0.71	0.089	0.092
2016	Q2	Reference (FR_UFR1)	<0.001	<0.005	0.0025	292	8.3	0.0047	0.32	0.34	0.00051	0.00055	1.8	1.9	<0.00001	<0.00001	0.62	0.63	0.065	0.067
2016	Q3	Reference (FR_UFR1)	<0.001	<0.005	0.0027	344	8.3	0.0051	0.46	0.46	0.0006	0.00064	2.1	2.1	<0.00001	<0.00001	0.68	0.74	0.098	0.1
2016	Q4	Reference (FR_UFR1)	<0.001	<0.005	0.0024	322	8.3	0.0045	0.36	0.37	0.00066	0.00066	1.7	1.9	<0.00001	<0.00001	0.68	0.68	0.089	0.089
2017	Q1	Reference (FR_UFR1)	0.0012	<0.005	0.007	-	8.2	0.012	-	0.43	0.001	0.00094	-	-	<0.00001	<0.00001	-	0.84	0.094	0.092
2017	Q2	Reference (FR_UFR1)	0.0022	0.007	0.0074	-	8.3	0.018	-	0.36	0.00068	0.00068	-	-	<0.00001	0.000013	-	0.6	0.066	0.064
2017	Q2	Reference (GH_ER2)	<0.001	<0.005	0.0011	-	8.3	0.009	-	0.43	0.00089	0.00088	-	-	<0.00001	<0.00001	-	0.79	0.21	0.21
2017	Q3	Reference (FR_UFR1)	<0.001	0.0063	0.0025	-	8.4	0.0042	-	0.46	0.00055	0.00059	-	-	<0.00001	<0.00001	-	0.69	0.096	0.096
2017	Q3	Reference (GH_ER2)	<0.001	0.0055	0.0011	-	8.2	0.004	-	0.38	0.00065	0.00064	-	-	<0.00001	<0.00001	-	0.6	0.21	0.21
2017	Q3	Reference (CM_MC1)	<0.001	0.0063	0.0049	-	8.3	0.021	-	0.49	0.00018	0.00023	-	-	<0.00001	<0.00001	-	2.4	0.15	0.15
2017	Q4	Reference (FR_UFR1)	0.001	0.0052	0.0014	-	8.4	0.0028	-	0.4	0.00059	0.00061	-	-	<0.00001	<0.00001	-	0.7	0.098	0.099
2017	Q4	Reference (GH_ER2)	<0.001	0.0074	<0.001	-	8.4	0.0015	-	0.37	0.00083	0.00081	-	-	<0.00001	<0.00001	-	0.7	0.2	0.2
2017	Q4	Reference (CM_MC1)	0.001	0.0075	0.0035	-	8.2	0.0028	-	0.51	0.0002	0.00021	-	-	<0.00001	<0.00001	-	3.0	0.16	0.16
2018	Q1	Reference (FR_UFR1)	<0.001	0.0077	0.003	355	8.3	0.0045	0.39	0.37	0.0009	0.00089	1.9	1.9	<0.0000125	<0.00001	0.77	0.79	0.096	0.091
2018	Q1	Reference (GH_ER2)	<0.001	<0.005	0.0011	260	8.3	0.002	0.31	0.31	0.001	0.0011	1.8	1.9	<0.00001	<0.00001	0.76	0.74	0.2	0.22
2018	Q1	Reference (CM_MC1)	<0.001	0.0089	0.0027	402	8.3	0.004	0.45	0.45	0.00028	0.00028	2.1	2.2	<0.00001	<0.00001	3.5	3.4	0.16	0.17
2018	Q2	Reference (FR_UFR1)	<0.001	0.0079	0.007	289	8.3	0.031	0.34	0.44	0.00059	0.00053	1.9	2.2	<0.00001	0.000016	0.53	0.53	0.063	0.06
2018	Q2	Reference (GH_ER2)	<0.001	0.0093	0.0029	277	8.4	0.14	0.4	0.78	0.00078	0.00082	1.9	3.3	<0.00001	0.000027	0.7	0.72	0.19	0.2
2018	Q2	Reference (CM_MC1)	<0.001	0.0082	0.0044	281	8.2	0.02	0.39	0.5	0.0002	0.00022	2.2	2.7	<0.0000125	<0.00001	1.6	1.5	0.095	0.093
2018	Q2	Reference (LC_SLC)	<0.001	0.0086	0.0023	269	8.3	0.016	0.3	0.33	0.00058	0.00056	1.7	1.9	<0.0000125	<0.00001	0.58	0.57	0.083	0.081
2018	Q3	Reference (FR_UFR1)	<0.001	0.027	0.002	355	8.4	0.0045	0.47	0.44	0.00057	0.00059	2.0	2.0	<0.00001	<0.0000125	0.74	0.67	0.1	0.096
2018	Q3	Reference (GH_ER2)	0.0025	0.018	0.0022	341	8.3	0.01	0.35	0.43	0.00067	0.00066	1.6	2.0	<0.00001	0.000011	0.66	0.61	0.21	0.2
2018	Q3	Reference (CM_MC1)	<0.001	0.016	0.0044	340	8.3	0.0056	0.57	0.5	0.00018	0.0002	2.3	2.4	<0.00001	<0.00001	3.1	2.9	0.16	0.15
2018	Q3	Reference (LC_SLC)	<0.001	0.029	0.0017	368	8.4	0.0029	0.38	0.35	0.0013	0.0014	2.0	2.1	<0.00001	<0.00001	0.89	0.85	0.15	0.15
2018	Q4	Reference (FR_UFR1)	<0.001	0.027	0.0053	411	8.3	0.0058	0.39	0.38	0.00093	0.00084	1.9	2.0	<0.00001	<0.00001	0.8	0.74	0.11	0.097
2018	Q4	Reference (GH_ER2)	<0.001	0.032	0.0017	408	8.3	0.0063	0.33	0.33	0.0011	0.0011	1.8	1.8	<0.00001	<0.00001	0.75	0.72	0.22	0.22
2018	Q4	Reference (CM_MC1)	<0.001	0.0074	0.0035	423	8.2	0.0044	0.45	0.44	0.00025	0.00029	2.1	2.2	<0.00001	<0.00001	3.4	3.4	0.15	0.15
2018	Q4	Reference (LC_SLC)	<0.001	0.016	0.0025	438	8.2	0.003	0.4	0.38	0.0019	0.0017	2.3	2.3	<0.00001	<0.00001	1.2	1.2	0.19	0.18
2019	Q1	Reference (FR_UFR1)	0.0012	0.020375	0.00715	419.5	8.2	0.0131	0.37525	0.4015	0.0009745	0.00082375	1.9075	2.1	0.00000775	0.00001575	0.72325	0.696	0.09595	0.09705
2019	Q1	Reference (GH_ER2)	0.00075	0.0035	0.0011	451.5	8.2	0.004875	0.329	0.335	0.0011475	0.0010975	1.665	1.715	<0.00001	<0.00001	0.7445	0.722	0.21025	0.2135
2019	Q1	Reference (CM_MC1)	0.00065	0.009375	0.003175	411.75	8.175	0.0037	0.4515	0.436	0.000278	0.000299	2.07	2.1025	<0.00001	<0.00001	3.3725	3.3675	0.16125	0.15775
2019	Q3	Reference (FR_UFR1)	<0.001	0.00945	0.00135	408.75	8.375	0.00195	0.43975	0.39775	0.0007145	0.00063725	1.9775	2.03	<0.00001	<0.00001	0.7305	0.69	0.098275	0.099575
2019	Q3	Reference (GH_ER2)	<0.001	0.013575	<0.001	450.5	8.325	0.00195	0.3525	0.33225	0.00079175	0.00077325	1.7525	1.7425	<0.00001	<0.00001	0.64825	0.611	0.2105	0.21425
2019	Q3	Reference (CM_MC1)	<0.001	0.003225	0.00425	330.5	8.35	0.003725	0.51475	0.504	0.000212	0.00018775	2.3775	2.3975	<0.00001	<0.00001	3.09	3.1075	0.14625	0.15125
2019	Q3	Reference (LC_SLC)	0.00075	0.00515	0.0016	380	8.3	0.001675	0.35875	0.3505	0.0015075	0.0013	2.0175	2.0925	<0.00001	<0.00001	0.79075	0.7965	0.139	0.14275
2019	Q4	Reference (FR_UFR1)	0.00065	0.02365	0.0028	399.5	8.25	0.0147	0.3685	0.4055	0.00090975	0.0009045	1.8625	1.9975	<0.00001	<0.00001	0.69575	0.70475	0.093025	0.096425
2019	Q4	Reference (GH_ER2)	0.000675	0.012575	0.000775	418	8.25	0.0019	0.338	0.35925	0.00102175	0.0009865	1.795	1.88	<0.00001	<0.00001	0.706	0.73975	0.206	0.21825
2019	Q4	Reference (CM_MC1)	0.000675	0.005825	0.00425	406	8.275	0.003975	0.4095	0.42275	0.00025275	0.0002615	2.085	2.2275	<0.00001	<0.00001	3.095	3.115	0.1415	0.139
2019	Q4	Reference (LC_SLC)	<0.001	0.0078	0.00195	467.75	8.175	0.00195	0.36825	0.3815	0.0015475	0.0015525	2.1075	2.145	<0.00001	<0.00001	1.0005	1.02825	0.16375	0.168
2020	Q2	Reference (FR_UFR1)	0.0010	0.00413	0.00345	388	8.38	0.0102	0.32	0.336	0.000557	0.000615	1.84	1.94	<0.0000100	<0.0000100	0.587	0.582	0.0675	0.0718
2020	Q2	Reference (GH_ER2)	<0.00100	0.0254	0.0221	387	8.38	0.00115	0.369	0.442	0.000918	0.000912	1.79	2.13	<0.0000100	0.0000065	0.751	0.791	0.192	0.199
2020	Q2	Reference (CM_MC1)	<0.00100	0.0151	0.00983	439	8.20	0.00405	0.38	0.456	0.000232	0.00022	2.08	2.50	<0.0000100	<0.0000100	1.79	1.90	0.106	0.11
2020	Q2	Reference (LC_SLC)	<0.00100	0.00908	0.00363	450	8.33	0.00195	0.338	0.321	0.000689	0.000763	1.85	1.95	<0.0000100	<0.0000100	0.711	0.71	0.102	0.101
2020	Q4	Reference (FR_UFR1)	0.00090	0.0123	0.00268	300	8.30	0.0042	0.388	0.385	0.000769	0.000714	1.60	1.71	<0.0000100	<0.0000100	0.657	0.658	0.0963	0.0987
2020	Q4	Reference (GH_ER2)	<0.00100	0.0265	0.00653	335	8.33	0.00123	0.352	0.359	0.000833	0.000864	1.77	1.86	<0.0000100	<0.0000100	0.698	0.708	0.211	0.214
2020	Q4	Reference (CM_MC1)	<0.00100	0.00483	0.0037	255	8.20	0.0030	0.454	0.438	0.000211	0.000241	2.11	2.26	<0.0000100	<0.0000100	3.07	3.10	0.153	0.154
2020	Q4	Reference (LC_SLC)	<0.00100	0.0121	<0.0020	317	8.30	0.00155	0.372	0.388	0.0015	0.00152	1.93	2.07	<0.0000100	<0.0000100	0.921	0.979	0.16	0.166
2021	Q2	Reference (FR_UFR1)	<0.001	0.0067	0.0032	403.25	8.05	0.011625	0.3505	0.3715	0.0005075	0.00049225	1.81	2.0275	<0.00001	<0.00001	0.58525	0.5645	0.066375	0.065925
2021	Q2	Reference (FR_UFR1)	0.000225	0.02935	0.002425	458.75	8.35	0.004275	0.4185	0.43275	0.000577	0.000537	2.0225	2.105	<0.00001	<0.00001	0.60125	0.60475	0.086325	0.0853
2021	Q2	Reference (GH_ER2)	0.001175	0.011125	0.001525	373.75	8.15	0.078625	0.3525	0.60925	0.000779	0.00075925	1.78	2.7925	<0.00001	0.0000175	0.67325	0.69575	0.19275	0.20725
2021	Q2	Reference (CM_MC1)	<0.001	0.007	0.00345	326.75	7.825	0.027175	0.35225	0.44225	0.00021125	0.00021925	2.065	2.635	<0.00001	<0.00001	1.265	1.265	0.081725	0.080275
2021	Q2	Reference (LC_SLC)	0.001125	0.01025	0.00165	382.75	8.125	0.003	0.27725	0.301	0.00054225	0.00058975	1.6325	1.75	<0.00001	<0.00001	0.50125	0.5195	0.070175	0.070925
2021	Q3	Reference (FR_UFR1)	<0.001	0.0057	0.00285	406.25	8.325	0.01685	0.451	0.4595	0.00066975	0.000642	2.0375	2.1875	<0.00001	<0.00001	0.647	0.656	0.0985	0.09875
2021	Q3	Reference (GH_ER2)	<0.001	0.0067	<0.001	353.25	8.275	0.019425	0.37025	0.377	0.000671	0.000697	1.7275	1.875	<0.00001	<0.00001	0.6065	0.585	0.20675	0.2005
2021	Q3	Reference (CM_MC1)	<0.001	<0.005	0.0046	423.75	8.2	0.006425	0.5285	0.5315	0.0002025	0.00020325	2.265	2.3625	<0.00001	<0.00001	3.03	2.9875	0.15225	0.14675
2021	Q3	Reference (LC_SLC)	0.001125	0.006175	0.0017	358	8.225	0.00435	0.365	0.3755	0.0013425	0.0013225	1.9725	2.1225	<0.00001	<0.00001	0.6945	0.713	0.13225	0.132
2021	Q4	Reference (FR_UFR1)	<0.001	0.002325	0.002275	461.75	8.275	0.001825	0.3855	0.38475	0.00082225	0.000772	1.6725	1.7625	<0.00001	<0.00001	0.659	0.68075	0.0969	0.1045
2021	Q4	Reference (GH_ER2)	<0.001	0.007325	0.00125	455.25	8.2	0.05665	0.34625	0.3815	0.0009055	0.00085625	1.8075	2.01	<0.00001	<0.00001	0.68025	0.704	0.21525	0.219
2021	Q4	Reference (CM_MC1)	<0.001	0.00635	0.00405	445	8.25	0.005475	0.45675	0.43575	0.00022325	0.00019625	2.15	2.2	<0.00001	<0.00001	3.19	3.0325	0.14925	0.15125
2021	Q4	Reference (LC_SLC)	<0.001	0.01035	0.00165	449.75	8.275	0.00275	0.377	0.6065	0.0014975	0.0121275	2.0575	2.1875	<0.00001	<0.00001	0.93425	1.71375	0.158	0.167

Year	Quarter	Sample ID	SULFATE (AS SO4)-D-mg/l	THALLIUM-D-mg/l	THALLIUM-T-mg/l	TIN-D-mg/l	TIN-T-mg/l	TITANIUM-D-mg/l	TITANIUM-T-mg/l	TOTAL DISSOLVED SOLIDS (RESIDUE FILTERABLE)-N-mg/l	TOTAL KJELDAHL NITROGEN-N-mg/l	TOTAL ORGANIC CARBON-T-mg/l	TOTAL SUSPENDED SOLIDS LAB-N-mg/l	TURBIDITY LAB-N-ntu	URANIUM-D-mg/l	URANIUM-T-mg/l
2015	Q1	Reference (FR_UFR1)	38	0.00001	0.00001	0.0001	0.0001	0.01	0.01	203	0.075	1.1	1.1	0.69	0.00044	0.00044
2015	Q2	Reference (FR_UFR1)	14	0.00001	0.00001	0.0001	0.0001	0.01	0.01	141	0.094	2.0	2.0	1.4	0.00031	0.00031
2015	Q3	Reference (FR_UFR1)	36	0.00001	0.000016	0.0001	0.0001	0.01	0.01	221	0.06	0.84	1.0	0.24	0.00043	0.00044
2015	Q4	Reference (FR_UFR1)	47	0.00001	0.00001	0.0001	0.0001	0.01	0.01	217	0.065	0.6	1.0	0.22	0.00045	0.00045
2016	Q1	Reference (FR_UFR1)	49	<0.00001	<0.00001	<0.0001	<0.0001	0.01	0.01	237	0.055	0.53	<1	0.2	0.00045	0.0005
2016	Q2	Reference (FR_UFR1)	15	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	147	0.077	2.0	1.5	0.82	0.00032	0.00033
2016	Q3	Reference (FR_UFR1)	38	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	218	0.07	0.97	1.7	0.27	0.00045	0.00045
2016	Q4	Reference (FR_UFR1)	38	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	197	0.065	1.3	<1	0.69	0.00043	0.00045
2017	Q1	Reference (FR_UFR1)	46	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	195	0.074	0.77	<1	0.27	0.00046	0.00046
2017	Q2	Reference (FR_UFR1)	18	<0.00001	0.000011	0.0001	<0.0001	<0.01	<0.01	146	0.12	3.3	3.0	2.6	0.00031	0.00034
2017	Q2	Reference (GH_ER2)	18	<0.00001	0.00001	<0.0001	<0.0001	<0.01	<0.01	182	0.1	1.8	11	5.2	0.00079	0.00082
2017	Q3	Reference (FR_UFR1)	36	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	201	0.063	1.5	1.1	0.24	0.00043	0.00041
2017	Q3	Reference (GH_ER2)	16	<0.00001	<0.00001	0.0001	<0.0001	<0.01	<0.01	162	0.067	0.79	1.3	0.62	0.00063	0.00063
2017	Q3	Reference (CM_MC1)	13	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	162	0.064	1.1	<1	0.37	0.00022	0.00022
2017	Q4	Reference (FR_UFR1)	46	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	235	0.071	0.78	1.1	0.36	0.00052	0.00051
2017	Q4	Reference (GH_ER2)	19	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	194	0.19	0.69	1.6	0.7	0.00078	0.00076
2017	Q4	Reference (CM_MC1)	14	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	173	0.12	1.2	1.4	0.52	0.00022	0.00023
2018	Q1	Reference (FR_UFR1)	48	<0.0000125	<0.00001	<0.000125	<0.0001	<0.01	<0.01	206	0.068	0.88	<1	0.31	0.00052	0.00049
2018	Q1	Reference (GH_ER2)	23	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	193	<0.05	0.51	<1	0.12	0.00068	0.00075
2018	Q1	Reference (CM_MC1)	18	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	174	<0.2	0.96	<1	0.16	0.00025	0.00025
2018	Q2	Reference (FR_UFR1)	11	<0.00001	0.000012	<0.0001	<0.0001	<0.01	<0.01	116	0.1	2.9	13	5.5	0.00029	0.00031
2018	Q2	Reference (GH_ER2)	15	<0.00001	0.000043	<0.0001	<0.0001	<0.01	<0.01	169	0.26	4.2	75	54	0.0007	0.00085
2018	Q2	Reference (CM_MC1)	6.7	<0.0000125	0.000025	<0.000125	<0.0001	<0.01	<0.01	113	0.12	3.9	12	6.3	0.00014	0.00015
2018	Q2	Reference (LC_SLC)	14	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	146	0.12	2.9	5.6	2.2	0.00072	0.00074
2018	Q3	Reference (FR_UFR1)	36	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	221	0.11	1.3	<1	0.75	0.00049	0.00045
2018	Q3	Reference (GH_ER2)	17	<0.00001	0.000015	<0.0001	<0.0001	<0.01	<0.01	169	0.074	1.1	4.3	0.73	0.00068	0.0007
2018	Q3	Reference (CM_MC1)	13	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	175	0.056	1.2	1.2	0.6	0.00025	0.00024
2018	Q3	Reference (LC_SLC)	51	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	227	0.068	1.2	1.1	0.25	0.0016	0.0016
2018	Q4	Reference (FR_UFR1)	48	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	228	0.057	0.73	<1	0.51	0.00053	0.0005
2018	Q4	Reference (GH_ER2)	23	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	174	0.18	0.61	1.0	0.38	0.00081	0.00083
2018	Q4	Reference (CM_MC1)	16	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	172	<0.05	0.79	<1	0.28	0.00024	0.00025
2018	Q4	Reference (LC_SLC)	74	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	264	0.11	0.56	<1	0.39	0.0017	0.0017
2019	Q1	Reference (FR_UFR1)	48.2	<0.00001	0.00000875	<0.0001	<0.0001	<0.01	0.008	223.5	0.11175	1.3025	2.775	2.5025	0.0004895	0.00047325
2019	Q1	Reference (GH_ER2)	24.375	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	184.75	0.13125	0.33	1.2	0.505	0.00080825	0.00077675
2019	Q1	Reference (CM_MC1)	17.125	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	181.25	<0.05	0.415	<1	0.2575	0.0002305	0.0002365
2019	Q3	Reference (FR_UFR1)	31.1	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	236.25	0.13775	0.98	1	0.3275	0.0004915	0.000469
2019	Q3	Reference (GH_ER2)	17.125	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	164.5	0.0675	0.63	1.3	0.5525	0.0006805	0.00068
2019	Q3	Reference (CM_MC1)	13.6	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	156.75	0.06025	0.895	0.85	0.25	0.0002435	0.00023825
2019	Q3	Reference (LC_SLC)	46.425	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	213.75	0.0575	0.6875	<1	0.2225	0.001555	0.001485
2019	Q4	Reference (FR_UFR1)	43.675	<0.00001	0.00000675	<0.0001	0.0000725	<0.01	<0.01	191.25	0.377	1.3925	8.15	0.8475	0.0005115	0.00050325
2019	Q4	Reference (GH_ER2)	22.8	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	172	0.0445	0.3575	1.6	0.7675	0.000743	0.000764
2019	Q4	Reference (CM_MC1)	13.925	<0.00001	<0.00001	0.00007	<0.0001	<0.01	<0.01	163.5	<0.05	0.8775	<1	0.245	0.000227	0.0002515
2019	Q4	Reference (LC_SLC)	63.125	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	232.75	0.04075	0.8425	<1	0.2725	0.0017	0.0017275
2020	Q2	Reference (FR_UFR1)	13.6	<0.0000100	<0.0000100	<0.000100	<0.000100	<0.0100	<0.0100	144	0.163	2.56	4.80	1.88	0.000352	0.000336
2020	Q2	Reference (GH_ER2)	16.0	<0.0000100	0.0000080	<0.000100	<0.000100	<0.0100	<0.0100	197	0.114	2.18	17.5	8.57	0.000748	0.000762
2020	Q2	Reference (CM_MC1)	7.39	<0.0000100	0.0000128	<0.000100	<0.000100	<0.0100	<0.0100	151	0.080	3.13	4.05	2.92	0.000165	0.000184
2020	Q2	Reference (LC_SLC)	16.8	<0.0000100	<0.0000100	<0.000100	<0.000100	<0.0100	<0.0100	165	0.0753	2.26	2.38	1.31	0.000944	0.000879
2020	Q4	Reference (FR_UFR1)	47.8	<0.0000100	<0.0000100	<0.000100	<0.000100	<0.0100	<0.0100	207	<0.050	0.748	<1.00	0.208	0.000484	0.000498
2020	Q4	Reference (GH_ER2)	20.0	<0.0000100	<0.0000100	<0.000100	<0.000100	<0.0100	<0.0100	184	0.0513	0.385	4.25	0.783	0.00072	0.00074
2020	Q4	Reference (CM_MC1)	14.1	<0.0000100	<0.0000100	<0.000100	<0.000100	<0.0100	<0.0100	174	0.090	1.71	<1.00	0.22	0.000233	0.000228
2020	Q4	Reference (LC_SLC)	61.6	<0.0000100	<0.0000100	<0.000100	<0.000100	<0.0100	<0.0100	231	0.080	0.878	<1.00	<0.100	0.00155	0.00164
2021	Q2	Reference (FR_UFR1)	10.005	<0.00001	<0.00001	<0.0001	<0.0001	<0.0003	0.002455	127.5	0.07825	2.6325	8.375	3.4	0.000313	0.00031925
2021	Q2	Reference (FR_UFR1)	22.825	<0.00001	<0.00001	<0.0001	<0.0001	<0.0003	0.00025	151.75	0.13275	1.3825	0.4	0.395	0.0003765	0.000379
2021	Q2	Reference (GH_ER2)	13.25	<0.00001	0.00002775	<0.0001	<0.0001	<0.0003	0.0058275	161	0.2185	2.5175	73.35	34.675	0.00066125	0.0008005
2021	Q2	Reference (CM_MC1)	5.5825	<0.00001	0.0000195	<0.0001	<0.0001	0.0003125	0.00667	119.75	0.202	4.47	10.25	6.165	0.0001295	0.00015
2021	Q2	Reference (LC_SLC)	10.4925	<0.00001	<0.00001	<0.0001	<0.0001	<0.0003	0.00133	131.5	0.0785	2.805	3.075	1.6475	0.00061325	0.00065875
2021	Q3	Reference (FR_UFR1)	36.45	<0.00001	<0.00001	<0.0001	<0.0001	<0.0003	0.000185	198.75	0.11325	2.4975	5.375	2.555	0.0004325	0.00044925
2021	Q3	Reference (GH_ER2)	15.6	<0.00001	<0.00001	<0.0001	<0.0001	<0.0003	0.0008275	156	0.06875	2.915	3.525	2.29	0.0006305	0.0006275
2021	Q3	Reference (CM_MC1)	13.15	<0.00001	<0.00001	<0.0001	<0.0001	<0.0003	<0.000375	170.25	0.058	1.6275	5	0.6725	0.00022875	0.000223
2021	Q3	Reference (LC_SLC)	40.325	<0.00001	<0.00001	<0.0001	<0.0001	<0.0003	0.0004325	190.25	0.10325	2.35	1.175	0.72	0.0014225	0.0014375
2021	Q4	Reference (FR_UFR1)	47.275	<0.00001	<0.00001	<0.0001	0.00002	<0.0003	<0.0003	208.5	0.02325	0.745	0.45	0.0675	0.000487	0.000524
2021	Q4	Reference (GH_ER2)	20.775	<0.00001	0.00001	<0.0001	<0.0001	<0.0003	0.0006075	179.5	<0.05	0.8275	4.3	0.49	0.00072475	0.00079025
2021	Q4	Reference (CM_MC1)	13.55	<0.00001	<0.00001	<0.0001	<0.0001	0.0003325	0.0003975	158.5	0.06125	1.4525	<1	0.23	0.000229	0.00022825
2021	Q4	Reference (LC_SLC)	60.425	<0.00001	<0.00001	<0.0001	<0.0001	<0.0003	<0.0003	228	0.0595	0.82	1.475	<0.1	0.00171	0.001965

Tests categorized as no adverse response (2015 -																																														
2015	Q1	FR_FRCP1	78	14	14	0.0069	0.01	0.000009	0.000009	0.002	0.002	0.0073	0.0077	15	0.014	0.019	0.001	305	8.4	0.004	2.1	2.2	0.11	0.11	1.9	2.0	0.00001	0.00001	2.4	2.5	0.17	0.17	407	0.000013	0.000013	0.0001	0.0001	0.013	0.014	866	0.05	1.3	1.9	1.3	0.0041	0.0042
2015	Q1	GH_FR1	49	9.7	9.7	0.0023	0.0043	0.000009	0.000009	0.0012	0.0012	0.0037	0.0039	11	0.0038	0.005	0.0014	343	8.3	0.0061	1.3	1.3	0.05	0.049	2.3	2.4	0.00001	0.00001	2.3	2.4	0.15	0.15	230	0.00001	0.00001	0.0001	0.0001	0.012	0.014	574	0.12	1.9	2.5	3.6	0.0022	0.0023
2015	Q1	CM_MC2	33	7.0	7.0	0.0038	0.011	0.000009	0.000009	0.00092	0.00096	0.0061	0.0067	1.6	0.01	0.0079	0.0015	359	8.3	0.014	1.1	1.2	0.0043	0.0043	2.0	2.5	0.00001	0.00001	6.9	6.9	0.22	0.23	159	0.00001	0.000017	0.0001	0.0001	0.01	0.014	408	0.12	1.9	10	6.1	0.0015	0.0015
2015	Q2	GH_FR1	32	6.4	6.7	0.00099	0.0047	0.000005	0.000005	0.00099	0.00099	0.0016	0.0018	7.8	0.003	0.0054	0.001	444	8.4	0.009	1.0	1.1	0.03	0.03	1.7	1.8	0.00001	0.00001	1.6	1.6	0.11	0.11	129	0.00001	0.00001	0.0001	0.0001	0.01	0.01	386	0.073	1.6	4.4	1.8	0.0015	0.0015
2015	Q2	CM_MC2	23	5.0	5.0	0.0027	0.028	0.000005	0.000007	0.00077	0.00097	0.006	0.0081	1.1	0.0029	0.0068	0.0017	363	8.4	0.062	0.83	1.1	0.0039	0.0039	1.9	3.1	0.00001	0.000013	3.8	3.9	0.15	0.16	103	0.00001	0.000034	0.0001	0.0001	0.01	0.018	308	0.18	2.2	32	16	0.0011	0.0011
2015	Q3	FR_FRCP1	59	11	11	0.0052	0.0071	0.000005	0.000005	0.0015	0.0015	0.0056	0.0058	10	0.0071	0.0064	0.001	364	8.4	0.0022	1.9	1.9	0.072	0.073	2.0	2.1	0.00001	0.00001	1.7	1.8	0.15	0.15	291	0.000011	0.00001	0.0001	0.0001	0.01	0.01	703	0.13	0.96	1.0	0.23	0.0032	0.0033
2015	Q3	GH_FR1	38	7.8	7.8	0.002	0.0057	0.000005	0.000005	0.00099	0.001	0.0015	0.0016	9.6	0.006	0.0062	0.001	393	8.3	0.0031	1.2	1.2	0.037	0.037	2.0	2.1	0.00001	0.00001	1.8	1.9	0.13	0.13	160	0.00001	0.00001	0.0001	0.00012	0.01	0.01	508	0.12	0.89	8.3	1.9	0.0018	0.0019
2015	Q4	FR_FRCP1	74	13	13	0.0076	0.0089	0.000005	0.000005	0.0015	0.0015	0.007	0.0072	16	0.0053	0.005	0.001	379	8.3	0.002	1.9	2.0	0.091	0.091	1.8	1.8	0.00001	0.00001	2.0	2.1	0.17	0.17	364	0.00001	0.00001	0.0001	0.0001	0.011	0.011	836	0.1	0.88	1.1	0.37	0.0042	0.0043
2015	Q4	GH_FR1	45	8.9	9.0	0.0012	0.0016	0.000005	0.000005	0.00094	0.00098	0.0015	0.0015	10	0.005	0.005	0.0011	354	8.4	0.0022	1.2	1.2	0.042	0.042	2.2	2.2	0.00001	0.00001	2.0	2.1	0.15	0.15	202	0.00001	0.00001	0.0001	0.0001	0.01	0.011	545	0.11	0.7	1.0	0.27	0.002	0.0021
2015	Q4	CM_MC2	46	9.4	9.6	0.0039	0.0065	0.000005	0.0000051	0.0011	0.0011	0.0087	0.009	2.4	0.034	0.016	0.0012	373	8.4	0.0081	1.4	1.4	0.0052	0.0052	2.1	2.2	0.00001	0.00001	9.5	9.5	0.29	0.29	252	0.000011	0.000012	0.0001	0.0001	0.011	0.012	571	0.14	1.4	4.1	2.0	0.0024	0.0023
2016	Q1	GH_FR1	52	10	10	0.0012	0.0016	<0.000005	<0.000001625	0.00089	0.00089	0.0016	0.0016	13	0.0052	<0.005	<0.001	325	8.2	0.0032	1.2	1.2	0.051	0.05	2.1	2.2	<0.00001	<0.00001	2.4	2.4	0.16	0.16	251	<0.00001	<0.00001	<0.0001	<0.0001	0.013	0.013	618	0.084	0.88	<1	0.56	0.0022	0.0022
2016	Q3	FR_FRCP1	56	11	10	0.0043	0.0075	<0.000005	<0.0000005	0.0013	0.0013	0.0054	0.0057	13	0.0068	0.0057	0.0014	332	8.3	0.0046	1.8	1.7	0.066	0.066	1.9	2.0	<0.00001	<0.00001	1.8	1.8	0.15	0.16	280	<0.00001	0.00001	<0.0001	<0.0001	<0.01	<0.01	692	0.14	1.1	1.7	0.74	0.0034	0.0035
2016	Q3	GH_FR1	42	8.7	8.1	0.0009	0.0018	<0.000005	<0.000001062	0.00094	0.00098	0.0015	0.0016	10	0.0057	<0.005	0.001	331	8.3	0.0043	1.3	1.2	0.039	0.04	2.1	2.3	<0.00001	<0.00001	1.9	2.0	0.14	0.14	188	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	514	0.13	1.1	<1	0.36	0.0021	0.0021
2016	Q3	CM_MC2	55	11	11	0.00064	0.0015	<0.000005	<0.0000005	0.0012	0.0012	0.014	0.015	3.1	0.0062	<0.005	0.001	333	8.3	0.0022	1.8	1.8	0.0067	0.0069	1.9	2.1	<0.00001	<0.00001	11	12	0.36	0.36	310	0.000016	0.000015	<0.0001	<0.0001	<0.01	<0.01	704	0.14	1.2	1.1	0.43	0.0029	0.0029
2016	Q4	FR_FRCP1	50	10	9.7	0.0068	0.0087	<0.000005	<0.0000005	0.0013	0.0013	0.0049	0.0052	12	<0.005	<0.005	<0.001	330	8.3	0.0031	1.6	1.6	0.059	0.058	1.7	1.8	<0.00001	<0.00001	1.5	1.6	0.15	0.15	253	0.000011	<0.00001	<0.0001	<0.0001	<0.01	<0.01	626	0.073	1.4	1.4	1.2	0.0031	0.0032
2016	Q4	GH_FR1	46	9.0	8.7	0.00096	0.0017	<0.000005	<0.000001625	0.0011	0.0011	0.0024	0.0025	9.5	<0.005	0.0054	0.0011	353	8.3	0.011	1.3	1.3	0.043	0.042	2.1	2.2	<0.00001	<0.00001	2.0	2.1	0.14	0.15	212	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	553	0.21	1.8	2.2	0.79	0.0023	0.0023
2016	Q4	CM_MC2	37	7.9	7.5	0.0073	0.011	<0.000005	0.00000078	0.00089	0.00093	0.0098	0.011	2.2	0.008	0.0057	0.0013	296	8.3	0.0053	1.3	1.3	0.0057	0.0058	2.1	2.4	<0.00001	<0.00001	7.5	7.7	0.23	0.24	195	0.000011	0.000015	<0.0001	<0.0001	<0.01	<0.01	482	0.13	1.9	4.2	2.2	0.0018	0.0019
2017	Q1	GH_FR1	49	-	-	0.0012	0.0015	<0.000005	<0.0000005	0.00081	0.00086	0.0014	0.0014	13	<0.005	0.0057	0.0016	-	8.3	0.003	-	1.2	0.053	0.053	-	-	<0.00001	<0.00001	-	2.3	0.17	0.17	239	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	623	0.092	0.78	<1	0.38	0.0024	0.0024
2017	Q2	FR_FRCP1	40	-	-	0.0044	0.014	<0.000005	0.0000021	0.0013	0.0014	0.0042	0.005	11	0.0045	0.015	0.0022	-	8.3	0.024	-	1.5	0.056	0.049	-	-	<0.00001	0.000014	-	1.4	0.13	0.13	190	0.00001	0.000018	<0.0001	<0.0001	<0.01	<0.01	495	0.5	2.8	8.9	9.4	0.0022	0.0023
2017	Q2	GH_FR1	37	-	-	0.0018	0.011	<0.000005	0.0000053	0.0011	0.0012	0.0024	0.0034	6.7	0.0037	<0.005	0.0034	-	8.3	0.018	-	1.3	0.035	0.033	-	-	<0.00001	0.000015	-	1.9	0.12	0.12	143	<0.00001	0.000016	<0.0001	<0.0001	<0.01	<0.01125	423	0.31	4.3	12	14	0.0019	0.0019
2017	Q3	FR_FRCP1	68	-	-	0.0051	0.0088	<0.000005	<0.0000005	0.0013	0.0014	0.0065	0.0067	11	0.0059	0.0059	0.0013	-	8.3	0.0041	-	2.0	0.086	0.086	-	-	<0.00001	<0.00001	-	1.6	0.15	0.15	341	0.000011	0.000011	<0.0001	<0.0001	<0.01	<0.01	792	0.42	1.8	1.5	0.57	0.0039	0.0038
2017	Q3	GH_FR1	45	-	-	0.001	0.0022	<0.000005	0.0000005	0.00097	0.001	0.0025	0.0027	10	0.0069	0.0056	<0.001	-	8.3	0.0029	-	1.3	0.051	0.048	-	-	<0.00001	<0.00001	-	1.9	0.14	0.14	206	<0.00001	<0.00001	0.0001	<0.0001	<0.01	<0.01	568	0.37	1.2	1.6	0.38	0.0023	0.0023
2017	Q4	FR_FRCP1	91	-	-	0.0072	0.013	<0.000005	<0.0000005	0.0013	0.0014	0.0085	0.0093	15	0.0072	0.0067	<0.001	-	8.2	0.0025	-	2.1	0.14	0.13	-	-	<0.00001	<0.00001	-	2.0	0.17	0.17	513	0.000012	0.000013	<0.0001	<0.0001	<0.01	<0.01	1053	0.45	1.0	1.3	0.69	0.0058	0.0058
2017	Q4	GH_FR1	60	-	-	0.0011	0.0019	<0.000005	<0.0000005	0.0011	0.0011	0.0029	0.0031	10	0.0055	0.0073	<0.001	-	8.4	0.0017	-	1.4	0.067	0.065	-	-	<0.00001	<0.00001	-	2.3	0.16	0.16	274	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	685	0.43	1.5	1.3	0.8	0.003	0.003
2018	Q1	GH_FR1	54	11	11	0.00083	0.0017	<0.00001	<0.0000005	0.0017	0.0019	0.0016	0.0016	12	<0.005	0.0056	0.0015	257	8.4	0.0055	1.3	1.2	0.067	0.063	2.4	2.5	<0.00001	<0.00001	2.7	2.5	0.17	0.19	285	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	680	0.24	1.0	2.0	0.46	0.0024	0.0026
2018	Q1	CM_MC3	21	6.1	5.4	0.00059	0.00095	<0.000005	<0.0000005	0.00073	0.00076	0.0013	0.0014	1.1	<0.001	0.0066	0.0011	355	8.3	0.0023	0.56	0.57	0.0033	0.0033	1.6	1.6	<0.00001	<0.00001	4.9	5.0	0.21	0.22	105	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	322	<0.2	0.71	<1	0.21	0.0013	0.0013
2018	Q2	FR_FRCP1	30	5.9	5.8	0.0014	0.045	<0.000005	0.0000039	0.0012	0.0011	0.0031	0.0054	7.9	0.0028	0.0086	0.0019	273	8.3	0.066	1.2	1.3	0.037	0.035	1.8	2.5	<0.00001	0.000018	1.1	1.1	0.1	0.1	114	<0.00001	0.000027	<0.0001	<0.0001	<0.01	<0.01	352	0.45	3.6	49	18	0.0018	0.0019
2018	Q2	GH_FR1	29	5.8	5.7	0.0008	0.03	<0.000005	0.0000053	0.0013	0.0013	0.0026	0.005	5.0	0.0032	0.009	0.0061	292	8.4	0.062	1.1	1.3	0.027	0.028	2.2	3.1	<0.00001	0.000021	1.4	1.5	0.1	0.1	115	<0.00001	0.000026	<0.0001	<0.0001	<0.01	<0.01	348	0.52	5.0	45	46	0.0015	0.0016
2018	Q2	CM_MC3	16	3.9	4.1	0.0083	0.026	<0.000005	0.0000019	0.00067	0.00075	0.0056	0.0071	0.78	0.0029	0.016	0.0028	286	8.3	0.046	0.62	0.88	0.0025	0.0026	1.7	2.8	<0.00001	<0.00001	3.5	3.3	0.16	0.16	64	0.000021	0.000048	<0.0001	<0.0001	<0.01	0.011	220	0.27	2.3	23	16	0.00072	0.00087
2018	Q2	LC_LCDSSLCC	28	5.9	6.2	0.0003	0.0032	<0.000005	0.0000012	0.0014	0.0014	0.0046	0.0051	6.6	0.0011	0.0073	0.0017	319	8.3	0.008	1.0	0.98	0.028	0.027	1.8	2.0	<0.00001	<0.00001	4.0	3.8	0.14	0.13	115	0.00001	0.000011	<0.0001	<0.0001	<0.01	<0.01	356	0.47	1.9	5.6	3.3	0.0022	0.0022
2018	Q3	FR_FRCP1	68	12	12	0.0057	0.008	<0.000005	<0.0000005	0.0016	0.0015	0.0074	0.0075	11	0.0096	0.025	0.0013	387	8.3	0.0039	2.1	2.0	0.086	0.086	2.0	2.0	<0.00001	<0.00001	1.7	1.6	0.16	0.15	342	0.000011	0.000012	<0.0001	<0.0001	<0.01	<0.01	785	0.45	1.4	1.1	1.2	0.0043	0.0041
2018	Q3	GH_FR1	47	9.2	9.4	0.0012	0.0029	<0.000005	<0.0000005	0.0013	0.0013	0.0019	0.0021	9.9	0.0083	0.028	0.0014	378	8.3	0.0046	1.5	1.3	0.051	0.05	2.2	2.3	<0.00001	<0.00001	2.3	2.1	0.15	0.14	218	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	572	0.41	1.2	2.7	0.36	0.0026	0.0025
2018	Q3	LC_LCDSSLCC	46	9.6	9.2	0.00017	0.0004	<0.000005	<0.0000005	0.0015	0.0015	0.0069	0.0072	11	0.0039	0.015	0.0017	374	8.4	0.0029	1.4	1.4	0.055	0.052	2.3	2.4	<0.00001	<0.00001	6.0	6.0	0.2	0.2	229	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	590	0.23	1.2	1.1	0.33	0.0035	0.0036
2018	Q4	GH_FR1	57	11	11	0.00092	0.0013	<0.000005	<0.0000005	0.0013	0.0013	0.0018	0.0017	11	0.0055	0.057	0.0015	431	8.3	0.004	1.3	1.2	0.071	0.065	2.4	2.5	<0.00001	<0.00001	2.6	2.5	0.18	0.17	272	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	686	0.27	0.83	<1	0.4	0.0028	0.0028
2018	Q4	GH_ERC	13	3.8	3.7	0.00015	0.00023	<0.000005	<0.0000005	0.0011	0.0011	<0.0005	<0.0005	0.49	<0.001	0.067	0.0013	433	8.2	0.002	0.37	0.37	0.0022	0.002	1.8	1.8	<0.00001	<0.00001	0.98	0.92	0.21	0.21	31	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	201	0.2	0.57	<1	0.22	0.00087	0.00084
2018	Q4	CM_MC3	26	6.3	6.1	0.00062	0.001	<0.000005	<0.0000005	0.0011	0.0011	0.0024	0.0025	1.2	0.0017	0.0078	0.0022	423	8.2	0.0036	0.71	0.71	0.0041	0.004	1.7	1.7	<0.00001	<0.00001	5.3	5.4	0.25	0.25	135	0.00001	0.00001	<0.0001	<0.0001	<0.01	<0.01	397	0.12	0.73	<1	0.38	0.0016	0.0016
2018	Q4	EV_MC2	38	8.0	8.2	0.0013	0.0013	<0.000005	<0.0000005	0.0012	0.0012	0.0037	0.0035	2.8	0.0018	0.054	0.0021	415	8.3	0.0037	1.3	1.2	0.023	0.022	2.5	2.5	<0.00001	<0.00001	4.7	4.4	0.22	0.21	183	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	490	1.2	0.81	1.1	0.66	0.0021	0.0021
2018	Q4	EV_HC1	48	8.8	8.7	0.0036	0.0041	<0.000005	<0.0000005	0.00096	0.00097	0.00052	0.0006	1.1	0.001	0.077	0.0081	380	8.3	0.0095	0.87	0.87	0.045	0.041	2.3	2.3	<0.00001	<0.00001	1.8	1.8	0.14	0.14	225	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	539	0.32	0.68	1.1	0.58	0.0029	0.0028
2019	Q1	FR_FRABCH	66.025	13.725	13.15	0.004815	0.0054275	<0.000005	<0.0000005	0.0005965	0.0006015	0.00041	0.0004825	22	0.0068	0.0801	0.0017	428.5	8.125	0.005825	1.605	1.585	0.1155	0.093	2.3025	2.3325	<0.00001	<0.00001	2.63	2.575	0.19225	0.192	354	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	883.5	0.09275	0.5775	0.85	0.32	0.00307	0.0031375
2019	Q1	FR_FRCP1	275.45	41.75	42.25	0.0038	0.0052925	<0.000005	0.00000057	0.0027075	0.002665	0.02979	0.028	27	0.012825	0.012875	0.001825	439.5	8.125	0.005425	4.1	3.995	0.54725	0.45	2.505	2.61	<0.0000075	<0.0000075	2.225	2.0925	0.23575	0.2355	1,580	0.00002825	0.0000315	<0.000075	<0.000075	<0.01	<0.005	2832	0.15525	1.49	5.1	2.925	0.0162325	0.01603
2019	Q1	GH_FR1	57.875	10.975	10.85	0.0010275	0.0015725	<0.000005	3.175E-07	0.00141	0.0013875	0.0016475	0.001785	11	0.005125	0.0119	0.002225	440.75	8.175	0.003975	1.2525	1.255	0.074675	0.064	2.3475	2.4925	<0.00001	<0.00001	2.4925	2.59	0.17125	0.1755	285	<0.00001	0.00000675	<0.0001	<0.0001	<0.01	<0.01	720	0.15125	0.8225	1.575	0.8875	0.002835	0.002805
2019	Q1	CM_MC2	67.15	13.375	13	0.0056275	0.006665	<0.000005	<0.0000005	0.0027025	0.0027125	0.0146	0.015	3.9	0.012075	0.0161	0.00205	406.25	8.225	0.004875	1.8575	1.875	0.00907	0.0087	2.415	2.495	<0.00001	<0.00001	15.375	15.6	0.4615	0.46475	404	0.00001175	0.000013	<0.0001	<0.0001	<0.01	<0.01	847	0.257	0.5375	0.85	0.61	0.00368	0.0039175
2019	Q1	RG_MIDAG	36.35	8.3525	8.26	0.0002	0.0019425	<0.000005	0.00000034	0.0012975	0.00132	0.0026125	0.0028375	1.92	0.001725	0.010275	0.003425	400.5	8.125	0.00665	0.9815	0.94225	0.0058275	0.0053	1.9025	2.005	<0.00001	<0.00001	8.36	8.115	0.32075	0.3155	211	<0.00001	0.0000075	<0.0001	<0.0001	<0.01	<0.01	522.25	0.20775	0.4975	2	0.7025	0.0021225	0.0021475
2019	Q3	FR_FRABCH	55.925	10.5675	10.685	0.003655	0.00452	<0.000005	6.75E-07	0.00097125	0.001021	0.00131	0.0014125	16	0.006275	0.011175	0.000675	465.5	8.3	0.00135	1.91	1.7925	0.07635	0.064	2.1825	2.2375	<0.00001	<0.00001	2.115	2.1025	0.15075	0.15525	234	<0.00001	<0.00001	<0.0001	0.00019	<0.01	<0.01	663	0.1135	0.5375	1.65	0.425	0.0031325	0.0030775
2019	Q3	FR_FRCP1	47.05	8.9825	9.0625	0.00293	0.0045975	<0.000005	<0.0000005	0.0014675	0.00154	0.0036775	0.0037225	9	0.013375	0.043425	0.00085	405.75	8.35	0.00265	1.8275	1.69	0.0581	0.051	1.955	2.005	<0.00001	<0.00001	1.4825	1.4125	0.14075	0.14675	210.25	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	560.75	0.35775	0.895	1.025	0.385	0.00292	0.0028675
2019	Q3	GH_FR1	44.15	8.435	8.45	0.0012	0.0025825	<0.000005	<0.0000005	0.00108175	0.001071	0.001075	0.0013175	8.8	0.0061	0.01425	<0.001	412.5	8.375	0.0019	1.355	1.3175	0.04875	0.043	2.2225	2.24	<0.00001	<0.00001	2.05	2.02	0.1395	0.13725	183.5	<0.00001	<0.00001	<0.0001	0.0000675	<0.01	<0.01	524.25	<0.1	1.145	2.825	0.7725	0.00232	0.0023025
2019	Q3	GH_ERC	11.725	3.4625	3.33	0.000625	0.0016525	<0.000005	<0.0000005	0.0010425	0.0010725	<0.0005	0.0003525	0.28125	0.00095	0.004175	<0.001	340.75	8.3	0.00215	0.40175	0.38775	0.001645	0.0015425	1.9125	1.89	<0.00001	<0.00001	0.8025	0.78	0.20825	0.2105	23.6	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	183.25	0.1335	1.47	0.925	0.6275	0.0007485	0.00075825
2019	Q3	RG_MIDAG	25.25	5.895	5.84	0.000805	0.00238	<0.000005	<0.0000005	0.00085125	0.00082025	0.0034525	0.003755	0.889	0.0015	0.00975	0.001325	364.75	8.375	0.00215	0.831	0.81775	0.003925	0.0039	1.785	1.825	<0.00001	<0.00001	4.2925	4.3675	0.22425	0.223	128.2	0.000023	0.000025	<0.0001	<0.0001	<0.01	<0.01	351.25	0.26775	1.395	1.25	0.615	0.0014	0.0013625
2019	Q3	EV_MC2	26.225	5.745	5.8225	0.0006825	0.0028725	<0.000005	0.00000033	0.00090525	0.00086475	0.000995	0.001195	1.3525	0.0018	0.013175	0.00195	423	8.375	0.00485	0.91	0.87575	0.0134775	0.012	2.35	2.3125	<0.00001	<0.00001	3.365	3.11	0.16375	0.1625	104.875	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	333.5	0.62775	0.995	2.45	0.7825	0.0011975	0.001155
2019	Q4	FR_FRABCH	64.95	12.225	11.85	0.003285	0.0082675	<0.000005	7.95E-07	0.000711	0.00071125	0.000715	0.0008675	19	0.00275	0.01675	0.001075	401.5	8.3	0.02135	1.7275	1.7	0.0871	0.082	2.425	2.4725	<0.00001	<0.00001	2.3325	2.4025	0.16275	0.1645	293.75	<0.00001	<0.00001	<0.0001	0.000075	<0.01	<0.01	765	<0.05	0.8725	9.375	1.3375	0.0030725	0.0031325
2019	Q4	GH_FR1	51.65	9.6	9.4175	0.001245	0.0014925	<0.000005	0.0000005	0.0009185	0.00091375	0.000935	0.001075	10	0.002575	0.00745	0.000975	410.5	8.3	0.002	1.2325	1.29	0.05675	0.054	2.3425	2.44	<0.00001	<0.00001	2.23	2.29	0.15225	0.15575	229.25	<0.00001	<0.00001	<0.000065	0.0000875	<0.01	<0.01	598.25	<0.05	0.73	0.7	0.425	0.00252	0.0024625
2019	Q4	RG_MIDAG	34.35	7.795	7.72	0.0008725	0.002495	<0.000005	0.00000033	0.00085125	0.000867	0.0046525	0.0051(Mn)	1.5175	0.000675	0.0081	0.0024	417.75	8.3	0.00315	0.92225	0.93675	0.005925	0.0055(Mn)	1.7425	1.895	<0.00001	<0.00001	6.585	6.4175	0.27475	0.26625	193.25	0.00001175	0.000015	<0.0001	0.00014	<0.01	<0.01	459.75	0.2995	0.6025	<1	0.36	0.001815	0.00192
2019	Q4	EV_MC2	27.975	6.2075	6.17	0.001115	0.0013725	<0.000005	<0.0000005	0.00088075	0.0008935	0.0010975	0.0011	1.675	0.00465	0.010425	0.0029	423	8.225	0.00295	0.89275	0.88575	0.013725	0.013	2.3475	2.4225	<0.00001	<0.00001	3.835	3.8075	0.1765	0.17975	121.25	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	365.25	0.33	0.695	0.925	0.34	0.0013575	0.00134
2020	Q2	FR_FRABCH	45.9	9.00	8.85	0.00453	0.0105	<0.0000050	0.00000133	0.00142	0.00147	0.00381	0.00432	14.0	0.00643	0.0075	0.00080	391	8.43	0.0127	1.64	1.59	0.0667	0.061	1.77	1.90	<0.0000100	<0.0000100	1.61	1.55	0.126	0.133	206	<0.0000100	0.0000070	<0.000100	<0.000100	<0.0100	<0.0100	566	0.11	2.52	8.93	3.86	0.0027	0.00259
2020	Q2	FR_FRCP1	41.5	8.13	7.93	0.00288	0.00794	<0.0000050	0.00000108	0.00187	0.00188	0.0061	0.0065	13.0	0.0106	0.00583	0.00748	409	8.45	<0.00100	1.66	1.60	0.0597	0.057	1.62	1.78	<0.0000100	<0.0000100	1.25	1.24	0.12	0.125	181	0.00000875	0.0000080	<0.000100	<0.000100	<0.0100	<0.0100	533	0.0858	1.91	7.23	3.08	0.00264	0.00249
2020	Q2	GH_FR1	36.2	7.07	6.92	0.00172	0.00463	<0.0000050	0.00000126	0.00119	0.00117	0.00244	0.00282	7.80	0.00453	0.0077	0.00705	392	8.45	0.0011	1.21	1.25	0.0413	0.041	1.98	2.23	<0.0000100	<0.0000100	1.71	1.77	0.116	0.117	151	<0.0000100	<0.0000100	<0.000100	<0.000100	<0.0100	<0.0100	446	0.158	2.60	5.18	2.91	0.00195	0.00197
2020	Q2	GH_ERC	13.5	3.66	3.60	0.000708	0.014	<0.0000050	0.00000136	0.000914	0.000931	<0.00050	0.000698	0.48	<0.00100	0.00818	0.0216	311	8.38	0.00118	0.415	0.512	0.00281	0.0029	1.84	2.32	<0.0000100	0.0000070	1.07	1.10	0.202	0.21	29.5	<0.0000100	0.00000875	<0.000100	<0.000100	<0.0100	<0.0100	204	0.15	1.95	20.0	10.5	0.000844	0.000892
2020	Q2	EV_MC2	13.5	3.24	3.40	0.00116	0.0145	<0.0000050	0.00000423	0.000639	0.000627	0.0016	0.00262	0.70	0.000775	0.00938	0.0518	340	8.28	0.00948	0.635	0.783	0.00567	0.0052	2.12	2.98	<0.0000100	0.0000125	2.42	2.32	0.12	0.114	45.2	<0.0000100	0.0000183	<0.000100	<0.000100	<0.0100	0.0105	187	0.341	3.72	29.0	14.6	0.000595	0.000627
2020	Q2	LC_LC5	33.2	6.91	6.77	0.00104	0.0142	<0.0000050	0.00000114	0.00125	0.00116	0.00167	0.00227	7.50	0.00243	0.00408	0.0156	364	8.45	0.000725	1.11	1.10	0.0312	0.033	1.76	2.11	<0.0000100	<0.0000100	2.30	2.30	0.129	0.133	137	<0.0000100	0.0000080	<0.000100	<0.000100	<0.0100	<0.0100	416	0.198	5001	12.9	3.45	0.0019	0.00184
2020	Q2	LC_LCDSSLCC	31.8	6.78	6.95	0.00527	0.00931	<0.0000050	0.00000056	0.00159	0.00154	0.00412	0.00406	5.60	0.00135	0.00413	<0.0020	329	8.38	0.000925	1.03	0.969	0.0235	0.023	1.95	2.06	<0.0000100	<0.0000100	4.34	4.17	0.149	0.153	138	<0.0000100	<0.0000100	0.0000725	<0.000100	<0.0100	<0.0100	400	0.064	1.56	1.70	0.643	0.00238	0.0023
2020	Q4	FR_FRABCH	66.1	13.4	13.0	0.0046	0.00513	<0.0000050	<0.00000050	0.000868	0.000904	0.000955	0.00104	22.0	0.0069	0.00963	0.00125	311	8.20	0.00285	2.00	1.97	0.10	0.093	2.23	2.34	<0.0000100	<0.0000100	2.54	2.56	0.184	0.183	348	<0.0000100	<0.0000100	<0.000100	<0.000100	<0.0100	<0.0100	841	<0.050	0.785	1.95	0.485	0.00349	0.00348
2020	Q4	GH_FR1	52.3	10.6	10.0	0.00139	0.0038	<0.0000050	0.00000106	0.000945	0.000986	0.0010	0.00119	13.0	0.00383	<0.0050	0.00133	325	8.30	<0.00100	1.42	1.42	0.0644	0.062	2.31	2.42	<0.0000100	0.00000725	2.39	2.36	0.159	0.161	262	<0.0000100	0.00000675	<0.000100	<0.000100	<0.0100	<0.0100	634	0.050	0.44	16.5	5.31	0.00258	0.00259
2020	Q4	GH_ERC	13.0	3.78	3.59	0.00065	0.00182	<0.0000050	0.000000498	0.00105	0.00111	<0.00050	<0.00050	0.457	0.000925	0.0342	0.0019	308	8.35	0.00133	0.42	0.421	0.00199	0.0019	1.94	1.98	<0.0000100	<0.0000100	0.994	1.00	0.209	0.215	31.0	<0.0000100	<0.0000100	<0.000100	<0.000100	<0.0100	<0.0100	197	0.127	1.03	2.53	1.42	0.000777	0.000808
2020	Q4	EV_MC2	27.2	6.42	6.12	0.00125	0.00211	<0.0000050	0.000000385	0.000742	0.000797	0.000623	0.000758	1.71	0.00148	0.00625	0.0035	315	8.30	0.0018	0.91	0.909	0.0139	0.013	2.18	2.23	<0.0000100	0.00000625	5.44	5.40	0.184	0.188	127	<0.0000100	0.0000303	<0.000100	<0.000100	<0.0100	<0.0100	360	0.284	1.66	1.05	0.525	0.00111	0.00114
2020	Q4	EV_HC1	45.4	8.32	7.96	0.00257	0.00359	<0.0000050	0.000000348	0.000924	0.000978	0.000493	0.000655	0.805	0.0017	0.0045	0.00713	290	8.38	0.0048	0.901	0.906	0.040	0.039	1.99	2.09	<0.0000100	<0.0000100	1.62	1.62	0.131	0.134	210	<0.0000100	<0.0000100	<0.000100	<0.000100	<0.0100	<0.0100	477	0.245	1.32	4.38	0.595	0.00244	0.00253
2020	Q4	LC_LC3	78.4	15.2	14.3	0.0416	0.0462	<0.0000050	<0.00000050	0.00425	0.00451	0.00952	0.010	12.0	<0.0050	0.0111	0.00475	375	8.30	0.00118	1.98	2.01	0.0502	0.048	2.07	2.18	<0.0000100	<0.0000100	11.6	12.1	0.243	0.256	427	<0.0000100	<0.0000100	<0.000100	<0.000100	<0.0100	<0.0100	925	0.035	0.628	<1.00	0.33	0.00511	0.00534
2020	Q4	LC_LC5	45.5	9.14	8.94	0.000375	0.000725	<0.0000050	<0.00000050	0.0012	0.00125	0.000833	0.00090	10.0	0.00203	0.00955	0.00843	301	8.35	0.00070	1.23	1.22	0.0496	0.047	2.17	2.30	<0.0000100	<0.0000100	3.34	3.52	0.181	0.185	211	<0.0000100	<0.0000100	<0.000100	<0.000100	<0.0100	<0.0100	565	<0.050	0.81	2.23	0.308	0.00232	0.0024
2020	Q4	LC_LCDSSLCC	54.2	10.8	10.40	0.00413	0.00516	<0.0000050	<0.00000050	0.0025	0.00264	0.00415	0.00438	8.60	0.00085	0.01268	<0.0020	396	8.35	0.00073	1.37	1.39	0.0406	0.039	2.14	2.27	<0.000010	<0.000010	7.49	7.89	0.223	0.232	274	<0.000010	<0.000010	<0.00010	<0.00010	<0.010	<0.010	678	<0.050	0.578	<1.00	0.103	0.00353	0.00367
2021	Q2	FR_FRABCH	38.775	7.87	7.5075	0.0035975	0.0202575	<0.000005	0.0000025	0.0011875	0.00116625	0.0022275	0.003125	13.425	0.002425	0.0086	0.00165	406.5	8.225	0.0437	1.46	1.535	0.05175	0.05075	1.7725	2.2825	<0.00001	0.00001075	1.7125	1.685	0.114	0.11475	159.25	<0.00001	0.00001325	<0.0001	<0.0001	<0.0003	0.005085	465.25	0.364	2.5425	44.55	11.15	0.002345	0.0023425
2021	Q2	FR_FRCP1	33.35	6.7975	6.5375	0.0023875	0.02237	<0.000005	0.000002	0.0013375	0.00126475	0.0031925	0.0042575	11	0.004275	0.014875	0.001775	438	8.175	0.0152	1.405	1.4475	0.04245	0.04175	1.64	1.9925	<0.00001	<0.00001	1.4415	1.46725	0.10495	0.1038	127.875	<0.00001	0.00001125	<0.0001	<0.0001	<0.0003	0.00367	406	0.3015	2.2475	20.725	6.485	0.0021325	0.0021475
2021	Q2	GH_FR1	29.825	6.3375	6	0.0020225	0.015235	0.000005	0.0000018	0.0011375	0.00103825	0.0013775	0.00218	8	0.001875	0.012225	0.001425	381.25	8.225	0.012325	1.0785	1.16	0.034775	0.03225	1.855	2.265	0.00001	0.00001	1.5475	1.5425	0.1059	0.107	118.25	0.00001	0.0000105	0.0001	0.0001	0.0003	0.00322	362.5	0.28	2.96	25.25	9.98	0.001655	0.0017225
2021	Q2	GH_ERC	12.2	3.24	3.0775	0.001285	0.062825	<0.000005	0.0000046	0.00094	0.0009705	<0.0005	0.0024075	0.3505	0.0011	0.0066	0.0015	376.25	8.15	0.1088	0.3715	0.731	0.001445	0.00152	1.8125	3.2875	<0.00001	0.0000255	0.799	0.81875	0.196	0.20375	18.575	<0.00001	0.000039	<0.0001	<0.0001	<0.0003	0.0079625	173.75	0.21775	2.3125	87.225	41.025	0.00072375	0.000871
2021	Q2	RG_MIDAG	15.975	4.0475	3.9425	0.0030925	0.01486	<0.000005	0.0000015	0.0005775	0.00061375	0.0045675	0.00587	0.47975	0.001675	0.011975	0.00235	407	8.175	0.024375	0.62225	0.742	0.002865	0.0027	1.625	2.18	<0.00001	<0.00001	4.56	4.51	0.15125	0.15225	66.5	0.0000175	0.000037	<0.0001	<0.0001	<0.0003	0.00685	227	0.26025	2.06	13.175	9.04	0.00078525	0.0008395
2021	Q2	EV_MC2	14.75	3.325	2.99	0.0018675	0.10684	<0.000005	0.000006	0.000571	0.00064125	0.001205	0.0079575	0.609	0.00105	0.0087	0.009975	366	8.025	0.083375	0.55775	1.0185	0.0032125	0.004825	1.91	4.215	<0.00001	0.00008175	2.3125	2.665	0.0955	0.1151	47.725	<0.00001	0.0000895	<0.0001	<0.0001	<0.0003	0.00762	186.75	0.49025	4.1275	147.8	64.8325	0.0004815	0.00077275
2021	Q2	EV_HC1	23.6	4.995	4.8725	0.001075	0.0068775	<0.000005	0.0000021	0.0006645	0.0006545	0.0006125	0.000985	0.4045	<0.001	0.010025	0.006225	372.75	8.3	0.0154	0.66075	0.73125	0.01935	0.0195	1.9275	2.2675	<0.00001	0.00001125	1.11	1.14875	0.094525	0.0932	81.55	<0.00001	0.0000155	<0.0001	<0.0001	<0.0003	0.0021125	266.75	0.165	3.5225	9.6	8.14	0.00131	0.0013
2021	Q2	LC_DCDS	21.225	4.9975	4.695	0.026155	0.031305	<0.000005	0.0000029	0.0038625	0.00385	0.0035025	0.0044275	12.5	0.046375	0.04195	0.0185	434.25	7.95	0.03105	1.79	1.7975	0.026325	0.0275	2.495	2.8325	<0.00001	0.0000115	2.435	2.4225	0.08645	0.086825	77.025	0.00001375	0.0000205	<0.0001	<0.0001	<0.0003	0.005535	304.75	0.05225	4.0725	13.325	9.0225	0.0009655	0.00099325
2021	Q2	LC_LC3	37.45	7.595	7.18	0.0047325	0.0057275	0.000005	0.00000071	0.0019375	0.00202	0.007685	0.007925	6.575	0.001	0.006725	0.0017	422.75	8.225	0.00225	1.36	1.3725	0.035975	0.03625	1.79	1.8425	0.00001	0.00001	5.185	5.295	0.1485	0.148	168	0.00001175	0.0000125	0.0001	0.0001	0.0003	0.000365	441	0.0925	1.075	2.1	0.555	0.0027025	0.002885
2021	Q2	LC_LC5	27.3	5.9025	5.5525	0.00094	0.0271425	<0.000005	0.0000026	0.0010555	0.0011055	0.001375	0.002465	6.825	0.004575	0.0096	0.001225	440.25	8.3	0.0407	0.983	1.06725	0.02745	0.02825	1.8225	2.2675	<0.00001	0.0000115	1.92	1.9675	0.11325	0.11525	107.125	<0.00001	0.00001475	<0.0001	<0.0001	<0.0003	0.003335	348.5	0.46225	1.955	31.05	5.98	0.001555	0.001685
2021	Q2	LC_LCDSSLCC	23.725	5.29	4.99	0.0015675	0.005485	<0.000005	0.00000098	0.0012175	0.001285	0.0035225	0.0038975	3.5	<0.001	0.006425	0.0012	437	8.225	0.002075	0.85025	0.84725	0.0192	0.0195	1.7425	1.8425	<0.00001	<0.00001	3.0125	3.0675	0.11575	0.11725	94.175	<0.00001	<0.00001	<0.0001	<0.0001	<0.0003	0.0005675	301.25	0.26175	1.9975	2.575	1.1225	0.0016775	0.0017925
2021	Q3	GH_ERC	10.9	3.2225	3.1625	0.0012625	0.0093475	<0.000005	0.00000084	0.00103125	0.0009845	<0.0005	0.0005225	0.20325	0.001	0.009675	0.001025	444.5	8.275	0.01005	0.40475	0.3985	0.00156	0.0014975	1.8175	1.9225	<0.00001	<0.00001	0.7645	0.7375	0.2015	0.1975	20.975	<0.00001	<0.00001	<0.0001	<0.0001	<0.0003	<0.0006	171.75	0.06625	2.7325	7.225	3.5025	0.0006795	0.000706
2021	Q3	RG_MIDAG	25.275	5.96	5.7675	0.0017725	0.00292	<0.000005	0.00000066	0.000824	0.00081525	0.0041	0.0044725	0.6185	0.0018	0.0123	0.001375	362.25	8.25	0.004225	0.8955	0.8985	0.0033125	0.00335	1.64	1.78	<0.00001	0.00001	7.3825	7.525	0.259	0.25375	134.3	0.00002525	0.00002525	<0.0001	0.0001	<0.0003	0.00031	350.5	0.14775	0.9425	1.05	0.5625	0.00136	0.0013725
2021	Q3	EV_MC2	24.25	5.64	5.43	0.00186	0.00473	<0.000005	0.00000095	0.0015325	0.001495	0.001645	0.002	0.748	0.0025	0.014675	0.0017	422.5	8.325	0.0093	0.98875	1.00325	0.0068175	0.007025	2.11	2.3525	<0.00001	<0.00001	4.095	4.1575	0.17975	0.17375	99.575	<0.00001	0.000011	<0.0001	<0.0001	<0.0003	0.000975	264	0.2015	1.625	3.075	3.15	0.001205	0.001205
2021	Q3	EV_HC1	40.425	7.5225	7.165	0.0042525	0.010115	<0.000005	0.000002	0.00091	0.00091775	0.000575	0.0010375	0.53	0.001525	0.020625	0.004	438.25	8.35	0.026075	0.955	0.9915	0.029925	0.03125	2.0525	2.46	<0.00001	0.000013	1.49	1.5	0.1245	0.121	175.75	<0.00001	0.000016	<0.0001	<0.0001	<0.0003	0.0015975	431.5	0.17575	3.5275	9.325	11.22	0.0022075	0.0021725
2021	Q3	LC_DCDS	46.975	10.2525	9.765	0.00269	0.00371	<0.000005	0.000001	0.0069275	0.00752	0.0099925	0.011025	39.5	0.0438	0.012375	0.01675	439.25	8.225	0.02475	2.7125	2.9375	0.0749	0.0795	2.0775	2.2875	<0.00001	<0.00001	6.305	6.865	0.18175	0.199	201.75	0.00002	0.0000205	<0.0001	<0.0001	<0.0003	0.00037	702.5	0.6845	2.605	3.625	1.5325	0.0022925	0.0024375
2021	Q3	LC_LC3	54.75	11.245	11.025	0.01605	0.017	0.000005	0.00000055	0.0033725	0.0034075	0.0095175	0.0096	9.325	0.0031	0.0063	0.001325	404.25	8.175	0.00365	1.87	1.82	0.037025	0.0365	2.1125	2.295	0.00001	0.00001	9.52	9.3625	0.21325	0.206	265.75	0.0000135	0.00001425	0.0001	0.0001	0.0003	0.000375	674.75	0.26475	1.9325	1.35	0.57	0.0037775	0.00377
2021	Q3	LC_LCDSSLCC	39.275	8.2875	8.115	0.003075	0.0044275	<0.000005	0.00000052	0.0021375	0.002165	0.004795	0.0050325	6.65	0.001075	0.00885	<0.001	370	8.3	0.002325	1.3	1.325	0.0289	0.029	2.175	2.345	<0.00001	<0.00001	6.295	6.3875	0.18825	0.18625	183	<0.00001	<0.00001	<0.0001	<0.0001	<0.0003	<0.0003	507.5	0.2175	2.1025	<1	0.3875	0.00274	0.0027325
2021	Q4	FR_FRABCH	76.875	13.9	13.475	0.005035	0.00585	<0.000005	0.00000024	0.0010525	0.00108825	0.0014825	0.0016725	23.25	0.002075	0.002075	0.0015	445.5	8.175	0.0038	2.0575	2.2075	0.1032	0.099	2.3	2.5025	<0.00001	<0.00001	2.9925	3.33	0.18475	0.197	333.5	<0.00001	<0.00001	<0.0001	<0.0001	<0.0003	0.000135	868	0.1475	1.2575	1.275	0.2175	0.00371	0.00411
2021	Q4	FR_FRCP1	90.975	15.9	14.775	0.009155	0.0101475	<0.000005	<0.0000005	0.0035075	0.003705	0.011325	0.01225	21	0.03435	0.0826	0.001275	443.25	8.375	0.00225	2.8525	2.93	0.1145	0.1125	1.8675	2.04	<0.00001	<0.00001	2.64	2.745	0.21	0.22325	443.5	0.0000165	0.0000175	<0.0001	<0.0001	<0.0003	<0.0003	961.75	0.38325	1.4775	<1	0.3025	0.0051225	0.00549
2021	Q4	GH_FR1	55.35	10.8	10.2975	0.0014	0.0027775	0.000005	0.0000005	0.0010435	0.00108	0.0009375	0.00105	14	0.00525	0.006375	0.0014	456.75	8.325	0.005375	1.4525	1.5375	0.04987	0.0489825	2.3075	2.4725	0.00001	0.00001	2.57	2.71	0.16675	0.17	250.5	0.00001	0.00001	0.0001	0.0001	0.0003	0.0003	649.5	0.3865	0.76	1.825	0.3	0.0027975	0.002925
2021	Q4	CM_MC2	64.8	13.2	12.5575	0.0025575	0.0042775	<0.000005	<0.0000005	0.0009085	0.00093975	0.009565	0.01015	2.2425	0.007025	0.0112	0.001975	452	8.3	0.003175	1.84	1.7975	0.0101575	0.009725	2.095	2.2775	<0.00001	<0.00001	15.825	15.625	0.43875	0.43825	391.25	0.0000105	0.0000105	<0.0001	<0.0001	<0.0003	<0.0015	768.5	0.28025	1.1925	2.725	0.685	0.0030775	0.0031275
2021	Q4	RG_MIDAG	31.05	7.465	7.2125	0.0008775	0.00165	<0.000005	<0.0000005	0.00078125	0.000778	0.002055	0.002345	0.8265	0.00115	0.012225	0.00265	457.75	8.225	0.061625	0.94175	0.94175	0.004665	0.004675	1.865	1.885	<0.00001	<0.00001	7.7575	7.6525	0.28175	0.284	176.25	0.000012	0.000013	<0.0001	<0.0001	<0.0003	0.000345	429.5	0.169	1.07	<1	0.2075	0.0016	0.00168
2021	Q4	EV_MC2	29.225	6.555	6.3775	0.0014775	0.0022525	<0.000005	0.00000071	0.001406	0.0014525	0.0016325	0.00164	1.236	0.001425	0.007025	0.0035	461.75	8.225	0.005375	1.08025	1.048	0.011805	0.0096	2.39	2.3975	<0.00001	<0.00001	4.8075	4.64	0.189	0.188	129.05	<0.00001	<0.00001	<0.0001	<0.0001	<0.0003	0.0005925	372	0.18225	2.155	2.55	0.53	0.00131075	0.00134125
2021	Q4	EV_HC1	49.275	8.47	8.19	0.0028025	0.003495	<0.000005	0.00000052	0.0009375	0.000973	0.0006025	0.000645	0.70075	0.001075	0.00585	0.005	459.25	8.325	0.00695	0.9425	0.954	0.04165	0.03775	2.09	2.145	<0.00001	<0.00001	1.645	1.6625	0.1315	0.133	212.5	<0.00001	<0.00001	<0.0001	<0.0001	<0.0003	<0.000375	486.25	0.1505	1.0775	1	0.4275	0.002625	0.0027075
2021	Q4	LC_LC3	68.95	13.925	13.025	0.02845	0.0357	0.000005	0.00000058	0.004565	0.00473	0.009455	0.010075	10.25	0.005	0.005125	0.001725	441.5	8.225	0.004125	2.055	2.105	0.040475	0.04025	2.1275	2.2275	0.00001	0.00001	13.125	13.725	0.23025	0.238	367.75	0.0000105	0.0000115	0.0001	0.0001	0.0003	0.0003	819	0.30225	1.53333333	1.55	0.295	0.004825	0.004925
2021	Q4	LC_LC5	44.075	9.3825	8.945	0.0003475	0.0029275	<0.000005	<0.0000005	0.0013575	0.00135	0.0010325	0.0012325	11	0.003075	0.005725	0.00125	444	8.425	0.00665	1.285	1.3075	0.04475	0.0465	2.13	2.3425	<0.00001	<0.00001	4.0275	4.0525	0.179	0.186	211.75	<0.00001	<0.00001	<0.0001	<0.0001	<0.0003	<0.00045	572.75	0.2625	1.33	1.375	0.1975	0.0025975	0.0025675
2021	Q4	LC_LCDSSLCC	50.925	10.95	10.0625	0.00369	0.00461	<0.000005	<0.0000005	0.002785	0.0028525	0.004745	0.004975	7.975	<0.004	<0.005	0.001325	434.25	8.4	0.0021	1.47	1.5225	0.035	0.0355	2.1375	2.2825	<0.00001	<0.00001	9.02	9.4425	0.215	0.2175	270.5	<0.00001	<0.00001	0.0001075	<0.0001	<0.0003	<0.0003	647.5	0.27675	1.32666667	1.425	0.1525	0.0035825	0.0037175

Tests categorized as possible or likely adverse re																																							
2015	Q2	FR_FRCP1	30	5.9	6.2	0.0027	0.0079	0.000005	0.000005	0.0012	0.0012	0.0018	0.0021	8.1	0.0046	0.011	0.0012	397	8.4	0.01	1.2	1.2	0.03	0.03	1.5	1.6	0.00001	0.00001	1.2	1.2	0.10	0.1	119	0.00001	0.00001	0.0001	0.0001	0.01	0.01	374	0.05	1.7	5.4	1.4	0.0016	0.0016
2016	Q1	FR_FRCP1	108	18	18	0.0073	0.0092	<0.000005	<0.0000005	0.0017	0.0017	0.0092	0.0098	26	0.0066	<0.005	<0.001	306	8.3	0.0025	2.4	2.4	0.15	0.15	1.9	2.0	<0.00001	<0.00001	2.4	2.5	0.2	0.2	561	0.000013	0.000015	<0.0001	<0.0001	0.015	0.015	1205	0.12	0.87	1.0	0.31	0.0062	0.0063
2016	Q2	FR_FRCP1	31	6.2	6.3	0.0022	0.0076	<0.000005	0.00000091	0.0011	0.0011	0.0019	0.0024	8.4	0.0027	0.0059	0.0017	331	8.3	0.0094	1.1	1.1	0.03	0.031	1.6	1.7	<0.00001	<0.00001	1.0	1.1	0.099	0.1	119	<0.00001	0.00001	<0.0001	<0.0001	0.011	0.011	377	0.16	2.0	6.0	0.98	0.0017	0.0017
2016	Q2	GH_FR1	33	6.6	6.7	0.00088	0.0043	<0.000005	0.0000011	0.00099	0.00099	0.0016	0.0017	7.6	0.0027	0.005	0.0013	318	8.4	0.0096	1.0	1.1	0.029	0.03	1.8	1.9	<0.00001	<0.00001	1.5	1.5	0.11	0.11	128	<0.00001	<0.00001	<0.0001	<0.0001	0.011	0.011	394	0.17	1.8	4.4	1.4	0.0016	0.0016
2016	Q2	CM_MC2	26	5.9	5.9	0.011	0.025	<0.000005	0.000001	0.00087	0.00088	0.015	0.017	2.0	0.0088	0.024	0.0023	307	8.3	0.02	1.0	1.1	0.0046	0.0045	2.0	2.6	<0.00001	<0.00001	6.2	6.0	0.2	0.19	134	0.000012	0.000022	<0.0001	<0.0001	0.012	0.017	366	0.2	1.8	14	6.6	0.0014	0.0014
2017	Q1	FR_FRCP1	122	-	-	0.0064	0.0076	<0.000005	<0.0000005	0.0018	0.0018	0.013	0.012	23	0.011	0.0062	0.0052	-	8.2	0.014	-	2.6	0.2	0.19	-	-	<0.00001	<0.00001	-	2.3	0.2	0.2	680	0.000015	0.000016	<0.0001	<0.0001	<0.01	<0.01	1330	0.22	1.3	1.1	0.35	0.0073	0.0073
2017	Q4	CM_MC2	57	-	-	0.004	0.005	<0.000005	<0.0000005	0.0013	0.0013	0.015	0.016	3.7	0.012	0.017	<0.001	-	8.3	0.003	-	1.9	0.0084	0.0078	-	-	<0.00001	<0.00001	-	13	0.41	0.41	325	0.000014	0.000015	<0.0001	<0.0001	<0.01	<0.01	744	0.44	1.0	3.2	1.4	0.003	0.0031
2018	Q1	FR_FRCP1	104	18	18	0.01	0.016	<0.000005	<0.0000005	0.0017	0.0018	0.0084	0.0089	20	0.0045	0.010	<0.001	358	8.2	0.0026	2.5	2.4	0.16	0.15	2.2	2.2	<0.000125	<0.000125	2.6	2.6	0.2	0.21	552	0.000015	0.000014	<0.000125	<0.000125	<0.01	<0.01	1164	0.29	1.3	1.1	0.84	0.0063	0.0062
2018	Q4	FR_FRABCH	67	13	14	0.0051	0.0052	<0.000005	<0.0000005	0.00067	0.0063	0.00054	0.00059	20	0.0057	0.024	0.0016	400	8.3	0.0027	1.8	1.7	0.1	0.092	2.5	2.6	<0.00001	<0.00001	2.8	2.6	0.2	0.19	330	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	851	0.17	0.58	<1	0.44	0.0033	0.0031
2018	Q4	LC_LCDSSLCC	55	11	12	0.0021	0.0028	<0.000005	<0.0000005	0.0025	0.0025	0.0033	0.0032	8.2	0.0051	0.022	0.0014	423	8.3	0.0029	1.4	1.3	0.038	0.036	2.3	2.4	<0.00001	<0.00001	8.9	8.3	0.24	0.23	293	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	702	0.077	0.6	<1	0.59	0.0037	0.0038
2019	Q3	CM_MC2	60.675	11.475	11.475	0.0019375	0.0067725	<0.000005	<0.0000005	0.0011025	0.001085	0.017925	0.019	2.585	0.0057	0.006075	0.00065	332.5	8.4	0.00185	1.905	1.8625	0.0094275	0.0084	2.03	2.08	<0.00001	<0.00001	11.125	11.175	0.37575	0.38975	336.25	0.000016	0.000016	<0.0001	<0.0001	<0.01	<0.01	709	0.4245	0.815	1.125	0.5425	0.0029825	0.0029
2019	Q3	EV_HC1	43.075	7.6425	7.78	0.00333	0.0063325	<0.000005	<0.0000005	0.00096275	0.000908	0.000535	0.000695	0.62725	0.001175	0.00615	0.0018	418.5	8.375	0.010025	0.9835	0.91925	0.037825	0.032	2.2025	2.125	<0.00001	<0.00001	1.665	1.54	0.11875	0.1215	178.5	<0.00001	<0.00001	<0.0001	0.000065	<0.01	<0.01	457.75	0.33325	0.89	0.925	0.9575	0.0023075	0.0021975
2019	Q3	LC_DCDS	29.5	6.14	6.0775	0.0002625	0.001895	<0.000005	0.00000143	0.00365	0.00381	0.0063025	0.007	17	0.058275	0.053375	0.0007	390.25	8.375	0.047175	2.12	2.13	0.03795	0.035	1.5925	1.67	<0.00001	<0.00001	2.5225	2.585	0.10775	0.1115	97.55	0.0000145	0.00001425	<0.0001	<0.0001	<0.01	<0.01	382.75	0.68375	3.515	1.7	0.965	0.0013975	0.00135
2019	Q3	LC_LCDSSLCC	40.925	8.245	8.105	0.00199	0.006755	<0.000005	<0.0000005	0.00223	0.0022225	0.0040925	0.004315	6.4	0.001125	0.0079	0.00115	261	8.275	0.005025	1.18	1.185	0.02855	0.026	2.315	2.3725	<0.00001	<0.00001	5.7675	5.9275	0.18825	0.18425	181.5	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	514.75	0.11175	0.6875	0.75	0.22	0.00284	0.00276
2019	Q4	FR_FRCP1	100.05	16.8	16.45	0.004755	0.0080275	<0.000005	<0.0000005	0.00197	0.0019525	0.010245	0.011	17	0.011625	0.03215	<0.001	412.25	8.275	0.001575	2.4125	2.4125	0.15665	0.14	1.995	2.0275	<0.00001	<0.00001	2.2175	2.3675	0.1805	0.1855	512	0.0000135	0.0000145	<0.0001	<0.0001	<0.01	<0.01	1095	<0.05	1.1575	1.25	0.405	0.005895	0.0060075
2019	Q4	GH_ERC	13.95	3.895	3.6975	0.0003025	0.000565	<0.000005	<0.0000005	0.0011385	0.0010725	<0.0005	<0.0005	0.72175	0.000975	0.01095	0.0011	448.5	8.2	<0.002	0.4095	0.42175	0.0027775	0.0025	1.965	2.015	<0.00001	<0.00001	1.04975	1.0565	0.21575	0.21925	39	<0.00001	<0.00001	<0.0001	0.0000825	<0.01	<0.01	205.75	0.21675	0.32	5.375	0.45	0.0008415	0.000849
2019	Q4	EV_HC1	47.925	8.5975	8.4125	0.0048425	0.005725	<0.000005	0.00000042	0.00096	0.00102575	0.00045	0.0005125	0.9895	0.000625	0.0119	0.006725	390	8.25	0.007425	0.8675	0.8865	0.043525	0.042	2.1375	2.1825	<0.00001	0.00000775	1.685	1.715	0.1315	0.13675	213.75	<0.00001	0.00000825	0.00008	<0.0001	<0.01	<0.01	517.25	0.26875	0.7175	1.95	0.7775	0.0027475	0.0028325
2020	Q2	RG_MIDAG	21.4	5.34	5.07	0.00355	0.0097	<0.000050	0.00000102	0.000655	0.000667	0.00587	0.0066	0.81	0.0015	0.0305	0.00895	402	8.38	0.00233	0.771	0.814	0.00386	0.0037	1.79	2.06	<0.0000100	<0.0000100	5.64	5.72	0.19	0.199	100.0	0.0000173	0.0000258	<0.000100	<0.000100	<0.0100	<0.0100	311	0.224	1.60	6.73	3.99	0.00109	0.00113
2020	Q2	LC_DCDS	20.0	4.60	4.49	0.00437	0.0068	<0.0000050	0.00000188	0.00273	0.00274	0.0080	0.0086	12.0	0.0076	0.00655	0.031	399	8.25	0.0305	1.62	1.60	0.0236	0.024	2.36	2.58	<0.0000100	<0.0000100	1.48	1.48	0.0771	0.0775	68.9	0.00000625	0.0000145	<0.000100	<0.000100	<0.0100	<0.0100	290	0.222	2.61	4.78	2.22	0.000984	0.00101
Tests categorized as possible or likely adverse re																																							
2019	Q3	LC_LC5	37.5	7.4825	7.215	0.00019	0.0027475	<0.000005	<0.0000005	0.00117	0.032525	0.0008625	0.00099	7.6	0.003875	0.006075	0.000625	337.75	8.375	0.001475	1.165	1.1825	0.03675	0.033	2.24	2.33	<0.00001	<0.00001	2.7	2.7625	0.1505	0.1515	149.75	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	462.25	0.14025	0.825	1.2	0.4175	0.00202	0.0019775
2019	Q4	LC_LC3	75.175	14.125	13.625	0.0113315	0.01286	<0.000005	<0.0000005	0.0029625	0.003005	0.00921	0.0094	16	0.002225	0.0317	0.002375	423.25	8.2	0.00365	1.79	1.83	0.09615	0.087	2.22	2.295	<0.00001	<0.00001	8.945	8.9875	0.2345	0.241	391.75	0.00001	0.00001175	<0.0001	<0.0001	<0.01	<0.01	886	<0.05	0.7125	0.975	0.43	0.0056925	0.00586
2019	Q4	LC_LC5	43.875	8.59	8.3075	0.0003025	0.001095	<0.000005	<0.0000005	0.001155	0.04115	0.0007525	0.0008875	8.9	0.001275	0.01065	0.00065	439.25	8.3	0.0018	1.075	1.095	0.043875	0.041	2.185	2.3075	<0.00001	<0.00001	3.38	3.3975	0.175	0.17825	189	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	516.75	<0.025	0.6175	1.325	0.35	0.002265	0.0022975
2019	Q4	LC_LCDSSLCC	51.15	10.3875	10.09	0.00138	0.00428	<0.000005	<0.0000005	0.0020425	0.0020575	0.004005	0.0042625	10	0.001875	0.01375	0.0012	471.25	8.275	0.00215	1.2625	1.28	0.0592	0.055	2.275	2.4	<0.00001	<0.00001	6.505	6.565	0.215	0.22125	262.5	<0.00001	<0.00001	0.00007	<0.0001	<0.01	<0.01	655	0.04275	0.385	0.7	0.32	0.0038325	0.0039925
2020	Q2	EV_HC1	33.4	6.36	6.52	0.00142	0.00373	<0.0000050	0.00000125	0.000718	0.000728	0.000748	0.000975	0.669	<0.00100	0.0122	0.0105	329	8.45	0.00538	0.829	0.856	0.0319	0.030	1.85	2.05	<0.0000100	<0.0000100	1.39	1.36	0.107	0.103	127	<0.0000100	0.0000085	<0.000100	<0.000100	<0.0100	<0.0100	368	0.246	2.35	4.63	3.62	0.00191	0.00186
2020	Q2	LC_LC3	46.8	9.23	9.51	0.0139	0.0137	<0.0000050	0.00000413	0.00255	0.00246	0.00774	0.0076	8.90	0.00105	0.0207	0.0133	376	8.40	0.00165	1.50	1.41	0.037	0.037	1.94	1.98	<0.0000100	<0.0000100	6.52	6.42	0.176	0.172	222	0.0000135	0.0000118	<0.000100	<0.000100	<0.0100	<0.0100	566	0.135	1.22	1.33	0.428	0.00356	0.00338
2020	Q4	FR_FRCP1	81.5	15.4	14.9	0.00941	0.0101	<0.0000050	0.00000368	0.00299	0.00296	0.0097	0.0098	16.0	0.0132	0.0158	<0.0020	292	8.33	<0.00100	2.57	2.42	0.114	0.11	1.85	1.93	<0.0000100	<0.0000100	2.12	2.03	0.192	0.186	456	0.0000125	0.0000103	<0.000100	<0.000100	<0.0100	<0.0100	943	0.050	1.21	4.90	1.80	0.00492	0.00482
2020	Q4	RG_MIDAG	34.0	7.68	7.98	0.00134	0.00277	<0.0000050	0.00000423	0.000861	0.000911	0.00544	0.0059	1.16	0.00183	0.0070	0.00373	334	8.25	0.00205	1.09	1.08	0.00492	0.0046	1.75	1.81	<0.0000100	<0.0000100	16.8	17.5	0.327	0.341	187	0.0000168	0.0000178	<0.000100	<0.000100	<0.0100	<0.0100	466	0.184	1.26	10.0	1.06	0.00178	0.00186
2020	Q4	LC_DCDS	47.2	10.9	10.5	0.00221	0.00244	<0.0000050	0.00000065	0.00404	0.00433	0.0122	0.013	44	0.00535	0.00738	0.0292	405	8.18	0.0255	2.69	2.68	0.0717	0.075	2.47	2.54	<0.0000100	<0.0000100	5.07	4.98	0.182	0.189	209	0.0000163	0.0000016	<0.000100	<0.000100	<0.0100	<0.0100	743	0.050	1.59	0.775	0.323	0.00255	0.00264
Tests categorized as possible or likely adverse re																																							
2015	Q3	CM_MC2	58	11	11	0.00076	0.0017	0.000005	0.000005	0.0011	0.0011	0.012	0.013	3.2	0.0068	0.0062	0.001	404	8.3	0.0029	1.7	1.8	0.0079	0.0081	1.9	1.9	0.00001	0.00001	10	10	0.31	0.32	325	0.000019	0.000018	0.0001	0.0001	0.01	0.01	725	0.14	1.1	1.3	0.48	0.0029	0.003
2016	Q1	CM_MC2	50	11	10	0.006	0.0071	<0.000005	<0.00000275	0.0011	0.0011	0.01	0.01	3.0	0.026	0.01	0.0012	347	8.3	0.0023	1.6	1.6	0.0055	0.0055	2.2	2.3	<0.00001	<0.00001	13	13	0.33	0.33	291	0.000011	0.000016	<0.0001	<0.0001	0.011	0.011	642	0.12	0.8	1.1	0.74	0.0026	0.0026
2017	Q1	CM_MC2	56	-	-	0.018	0.02	<0.000005	<0.0000005	0.0016	0.0016	0.032	0.033	4.6	0.021	0.038	0.0023	-	8.3	0.0036	-	2.0	0.0074	0.0069	-	-	<0.00001	<0.00001	-	16	0.44	0.45	356	0.000018	0.000021	<0.0001	<0.0001	<0.01	<0.01	750	0.13	0.78	1.1	0.63	0.0037	0.0037
2017	Q2	CM_MC2	36	-	-	0.017	0.028	<0.000005	0.0000014	0.0011	0.0013	0.018	0.02	2.3	0.0095	0.047	0.0016	-	8.2	0.029	-	1.5	0.0069	0.0062	-	-	<0.00001	<0.00001	-	11	0.3	0.31	204	0.000014	0.000028	<0.0001	0.00013	<0.01	<0.01	479	0.21	2.3	11	9.3	0.0019	0.002
2017	Q3	CM_MC2	53	-	-	0.0021	0.012	<0.000005	0.00000073	0.0015	0.0015	0.026	0.027	3.3	0.019	0.015	0.0012	-	8.4	0.013	-	1.8	0.0084	0.0081	-	-	<0.00001	<0.00001	-	12	0.38	0.38	305	0.00002	0.000021	<0.0001	<0.0001	<0.01	<0.01	627	0.24	1.2	3.2	1.2	0.0029	0.0029
2018	Q1	CM_MC2	61	13	12	0.0056	0.0078	<0.000005	<0.0000005	0.0013	0.0014	0.015	0.015	4.3	0.017	0.015	0.0012	344	8.3	0.0033	1.8	1.8	0.0093	0.009	2.3	2.4	<0.00001	<0.00001	16	16	0.44	0.45	380	0.000014	0.000012	<0.0001	<0.0001	<0.01	<0.01	794	0.27	0.99	1.2	0.71	0.0039	0.0039
2018	Q3	CM_MC2	27	5.9	6.1	0.0095	0.055	<0.000005	0.0000025	0.00093	0.0011	0.012	0.015	1.4	0.0055	0.027	0.0027	271	8.4	0.063	1.1	1.5	0.0049	0.005	2.2	3.9	<0.0000125	0.000011	7.8	7.1	0.24	0.23	136	0.000014	0.000044	<0.000125	<0.0001	<0.01	0.016	335	0.24	3.0	30	30	0.0014	0.0014
2018	Q3	CM_MC2	65	13	13	0.012	0.016	<0.000005	<0.0000005	0.0025	0.0025	0.053	0.053	4.3	0.034	0.047	0.0012	293	8.2	0.0035	2.6	2.4	0.0087	0.0087	2.0	2.2	0.000011	<0.00001	19	19	0.6	0.6	437	0.000029	0.000027	<0.0001	<0.0001	<0.01	<0.01	859	0.25	1.2	1.2	0.55	0.0045	0.0045
2018	Q3	LC_LC3	33	8.1	7.8	0.032	0.042	<0.000005	<0.0000005	0.0014	0.014	0.017	0.017	2.1	0.0091	0.021	0.002	328	8.4	0.0044	1.3	1.2	0.0043	0.0044	1.7	1.8	<0.00001	<0.00001	9.5	9.1	0.35	0.34	210	0.000024	0.000023	<0.0001	<0.0001	<0.01	<0.01	491	0.14	1.0	<1	0.33	0.0024	0.0022
2018	Q4	FR_FRCP1	363	51	52	0.00019	0.00049	<0.000005	<0.0000005	0.0029	0.0029	0.04	0.039	29	0.013	0.027	0.0019	413	8.0	0.0034	5.1	4.8	0.68	0.62	2.8	3.0	<0.0000125	<0.0000175	2.3	2.1	0.25	0.24	1940	0.000041	0.000041	<0.000125	<0.000175	<0.01	<0.01	3508	0.22	1.5	2.2	0.55	0.021	0.021
2018	Q4	CM_MC2	57	12	11	0.0031	0.0041	<0.000005	<0.0000005	0.0021	0.0022	0.012	0.012	3.1	0.012	0.012	0.0019	395	8.2	0.0029	1.6	1.6	0.0088	0.0082	2.3	2.4	<0.00001	<0.00001	12	12	0.4	0.41	335	0.000011	0.000011	<0.0001	<0.0001	<0.01	<0.01	722	0.25	0.86	<1	0.58	0.0032	0.0033
2019	Q3	LC_LC3	59.275	11.05	10.875	0.0126775	0.027425	<0.000005	<0.0000005	0.0037225	0.0036775	0.0086325	0.0091	9.1	<0.0015	0.007875	0.001675	278.25	8.15	0.00225	1.6225	1.64	0.0378	0.038	2.2325	2.3475	<0.00001	<0.00001	8.54	8.835	0.20375	0.20325	273.5	0.00001225	0.00001275	<0.0001	0.0000875	<0.01	<0.01	709	0.1	0.5475	1.1	0.3975	0.003935	0.0039375
2019	Q4	CM_MC2	62.6	12.4	12.5	0.0065325	0.013685	<0.000005	0.00000047	0.0010875	0.0011275	0.020375	0.022	3.005	0.0028	0.00935	0.00075	352.25	8.35	0.0073	1.8575	1.95	0.0102325	0.0095	2.115	2.48	<0.00001	<0.00001	12.275	12.225	0.399	0.39025	369	0.000014	0.00001775	0.000205	0.0000925	<0.01	<0.01	774.5	0.345	0.8225	5.4	2.0675	0.00321	0.0034075
2019	Q4	LC_DCDS	37.275	8.285	8.23	0.000745	0.001095	<0.000005	0.00000065	0.0040375	0.004175	0.0057975	0.0059	28	0.0129	0.0456	0.0277	344.25	8.225	0.028	2.3375	2.38	0.051425	0.05	2.5675	2.7325	<0.00001	<0.00001	2.68	2.6825	0.135	0.14225	142.25	0.00000875	0.00001025	0.000075	0.0000675	<0.01	<0.01	553.5	<0.025	1.855	0.875	0.4975	0.0019575	0.002095
2020	Q2	CM_MC2	35.3	7.37	7.05	0.011	0.0254	<0.0000050	0.00000143	0.000848	0.000895	0.0148	0.016	1.55	0.00228	0.0221	0.0148	363	8.33	0.00163	1.24	1.46	0.00738	0.0070	2.02	2.89	<0.0000100	<0.0000100	9.18	9.70	0.257	0.266	184	0.0000145	0.0000223	<0.000100	<0.000100	<0.0100	0.0135	475	0.426	2.10	14.3	10.5	0.00178	0.00187
2020	Q4	CM_MC2	62.6	13.7	13.5	0.0074	0.00871	<0.0000050	0.00000328	0.00102	0.00109	0.0261	0.026	2.69	0.0106	0.0952	0.00178	210	8.30	0.000825	2.03	2.02	0.00882	0.0087	2.21	2.35	<0.0000100	<0.0000100	37.3	38.0	0.614	0.621	413	0.0000225	0.0000235	<0.000100	<0.000100	<0.0100	<0.0100	836	0.267	1.28	1.00	0.965	0.00331	0.00335
Tests categorized as possible or likely adverse re																																							
2021	Q4	LC_DCDS	55.15	12.525	12	0.001935	0.0028825	<0.000005	0.00000093	0.0074	0.007725	0.012675	0.013	49	0.011625	0.006175	0.019375	426.5	8.275	0.020025	2.99	3.0325	0.090975	0.08825	2.455	2.505	<0.00001	<0.00001	7.965	8.1525	0.2115	0.22025	247.5	0.000019	0.000019	<0.0001	<0.0001	<0.0003	<0.0003	741.75	0.2345	2.29	1.35	0.2825	0.003085	0.0033075
Tests categorized as possible or likely adverse re																																							
2021	Q2	CM_MC2	26.625	5.9375	5.685	0.009775	0.034075	<0.000005	0.0000019	0.0007585	0.00078575	0.0122125	0.014125	0.96075	0.00395	0.02145	0.001625	362.333333	8.125	0.032225	1.02875	1.185	0.0056675	0.00545	1.885	2.63	<0.00001	<0.00001	8.8	8.7125	0.232	0.23175	143.25	0.000011	0.000026	<0.0001	<0.0001	<0.0003	0.007545	333.333333	0.3335	2.66	31.1666667	15.94	0.00137	0.00142
Tests categorized as possible or likely adverse re																																							
2021	Q3	CM_MC2	61.025	12.75	12.2	0.0034025	0.0067675	<0.000005	0.00000077	0.001105	0.001105	0.0204	0.0215	1.9625	0.013375	0.024075	0.001	378.5	8.275	0.00515	2.105	2.1975	0.009055	0.0085	1.9725	2.135	<0.00001	<0.00001	22.275	22.825	0.535	0.5225	385.5	0.00001925	0.0000185	<0.0001	<0.0001	<0.0003	0.0007525	779	0.18675	1.215	19.9	1.7125	0.003285	0.0032475

Notes:
"-D-" = dissolved concentration; "-T-" = total concentra

Screening
Concentrations of parameters in 2021 tests categorize

Year	Quarter	Sample ID	VANADIUM-D-mg/l	VANADIUM-T-mg/l	ZINC-D-mg/l	ZINC-T-mg/l	∑TU-WQGs	∑TU-WQGs/Benchmarks	PC1_allyrs_surv	PC2_allyrs_surv	PC3_allyrs_surv	PC4_allyrs_surv	PC1_2021_surv	PC2_2021_surv	PC3_2021_surv	PC1_allyrs_dw	PC2_allyrs_dw	PC3_allyrs_dw	PC4_allyrs_dw	PC1_2021_dw	PC2_2021_dw	PC3_2021_dw
Reference (2015 - 2021)																						
2015	Q1	Reference (FR_UFR1)	0.0008	0.0008	0.003	0.0032	2.68	2.69	-5.45	-2.46	1.08	-1.22				-5.4370623	-2.8623295	0.37876023	-1.3086891			
2015	Q2	Reference (FR_UFR1)	0.0005	0.0005	0.003	0.003	2.35	2.36	-7.57	-2.81	-0.32	-1.19				-7.4786639	-3.2190538	-1.0730278	-1.8336203			
2015	Q3	Reference (FR_UFR1)	0.0005	0.00053	0.003	0.003	2.20	2.20	-4.39	-2.91	2.05	-1.86				-4.3939704	-3.2903107	1.49505873	-1.5752326			
2015	Q4	Reference (FR_UFR1)	0.0005	0.0005	0.003	0.003	2.26	2.25	-5.03	-3.66	3.16	-1.14				-5.0538996	-4.1554426	2.24689804	-0.5364003			
2016	Q1	Reference (FR_UFR1)	<0.0005	<0.0005	<0.003	<0.003	1.85	1.84	-4.78	-3.79	3.46	-1.36				-4.7657231	-4.3443847	2.89316529	-0.450883			
2016	Q2	Reference (FR_UFR1)	<0.0005	0.0005	<0.003	<0.003	1.45	1.46	-7.64	-3.30	0.33	-1.21				-7.5423361	-3.7584826	-0.3086259	-1.5166517			
2016	Q3	Reference (FR_UFR1)	<0.0005	<0.0005	<0.003	<0.003	1.17	1.17	-4.91	-3.76	2.45	-1.82				-4.8585822	-4.2191435	1.96777693	-1.2992661			
2016	Q4	Reference (FR_UFR1)	<0.0005	0.0005	<0.003	<0.00375	1.37	1.38	-5.88	-3.51	1.60	-1.30				-5.8126014	-3.9625004	0.99747296	-1.105292			
2017	Q1	Reference (FR_UFR1)	<0.0005	<0.0005	<0.001	0.0037	1.18	1.18	-6.34	-4.65	2.95	5.16				-6.1476236	-5.2636305	0.37156132	5.3733709			
2017	Q2	Reference (FR_UFR1)	0.00051	0.00066	0.0011	<0.003	2.39	2.41	-8.81	-2.53	-1.82	5.12				-8.6183987	-2.8863291	-4.6315635	3.36171788			
2017	Q2	Reference (GH_ER2)	<0.0005	0.0009	<0.003	<0.003	1.82	1.83	-6.15	-2.78	-1.76	5.98				-5.9879822	-2.8357141	-5.0877777	4.10826201			
2017	Q3	Reference (FR_UFR1)	<0.0005	<0.0005	<0.0025	<0.003	1.21	1.22	-6.67	-4.41	2.54	5.31				-6.5456615	-4.9248104	-0.476742	5.13712413			
2017	Q3	Reference (GH_ER2)	<0.0005	<0.0005	<0.0025	<0.003	1.24	1.25	-6.31	-4.20	1.87	5.56				-6.1447958	-4.6690922	-1.0632043	5.22410011			
2017	Q3	Reference (CM_MC1)	<0.0005	<0.0005	<0.0025	<0.003	1.16	1.18	-7.31	-3.88	1.37	5.45				-7.1331904	-4.4197274	-1.517911	4.91260496			
2017	Q4	Reference (FR_UFR1)	<0.0005	<0.0005	<0.003	<0.003	1.12	1.12	-6.35	-4.64	3.45	5.43				-6.2566055	-5.1816299	0.32400667	5.55344716			
2017	Q4	Reference (GH_ER2)	<0.0005	<0.0005	<0.003	<0.003	1.28	1.29	-5.95	-4.22	2.64	5.72				-5.8842712	-4.6476449	-0.613753	5.51187772			
2017	Q4	Reference (CM_MC1)	<0.0005	<0.0005	<0.003	<0.003	1.08	1.10	-7.08	-4.11	2.13	5.50				-6.9064095	-4.682679	-0.7103885	5.29174563			
2018	Q1	Reference (FR_UFR1)	<0.0006225	0.0005	<0.003	<0.003	1.26	1.26	-4.82	-3.21	2.50	-1.64				-4.8084937	-3.6737394	1.95880675	-1.130816			
2018	Q1	Reference (GH_ER2)	<0.0005	<0.0005	<0.003	<0.003	1.33	1.34	-4.31	-3.79	2.82	-1.12				-4.2606863	-4.2426746	2.1992627	-0.4621495			
2018	Q1	Reference (CM_MC1)	<0.0005	<0.0005	<0.003	<0.003	1.10	1.11	-4.71	-3.49	2.50	-1.61				-4.6539219	-3.9809415	2.08933492	-1.0273251			
2018	Q2	Reference (FR_UFR1)	<0.0005	0.00099	<0.001	0.0031	2.79	2.81	-8.37	-1.66	-4.24	-1.17				-8.1683945	-1.8179365	-4.8023736	-3.1867625			
2018	Q2	Reference (GH_ER2)	<0.0005	0.0043	<0.001	0.011	6.59	6.61	-5.37	0.86	-8.47	-0.81				-5.247528	1.32391047	-9.4110965	-4.6365993			
2018	Q2	Reference (CM_MC1)	<0.0006225	0.00092	<0.00125	0.0033	2.97	3.00	-8.59	-0.82	-5.26	-1.54				-8.3460796	-0.9745166	-5.5045212	-3.8336755			
2018	Q2	Reference (LC_SLC)	<0.0005	0.00054	0.0018	0.0038	1.58	1.59	-7.02	-2.53	-1.74	-1.17				-6.8982561	-2.7466909	-2.3972938	-2.2947421			
2018	Q3	Reference (FR_UFR1)	<0.0005	<0.0005	<0.001	<0.003	1.13	1.14	-4.78	-3.63	2.42	-1.76				-4.7603748	-4.037564	1.73975102	-1.3669238			
2018	Q3	Reference (GH_ER2)	<0.0005	0.0013	<0.001	0.0041	2.54	2.55	-5.41	-1.93	-2.42	-0.68				-5.3131122	-1.9682975	-3.3642182	-2.1429861			
2018	Q3	Reference (CM_MC1)	<0.0005	<0.0005	0.001	0.0034	1.19	1.21	-5.16	-3.06	1.28	-1.70				-5.085854	-3.4872877	0.95084183	-1.5335058			
2018	Q3	Reference (LC_SLC)	<0.0005	<0.0005	0.0022	0.0033	1.55	1.55	-3.30	-3.30	2.54	-1.68				-3.3813611	-3.5982458	1.97626653	-1.1868952			
2018	Q4	Reference (FR_UFR1)	<0.0005	<0.0005	<0.001	<0.003	1.47	1.47	-4.70	-3.84	2.53	-1.61				-4.6400353	-4.3249225	2.16228525	-0.9384965			
2018	Q4	Reference (GH_ER2)	<0.0005	<0.0005	<0.001	0.0039	1.46	1.47	-4.42	-3.65	1.91	-0.89				-4.3491417	-4.0593269	1.33464215	-0.4847538			
2018	Q4	Reference (CM_MC1)	<0.0005	<0.0005	<0.001	<0.003	1.09	1.11	-5.01	-3.74	2.44	-1.55				-4.8894588	-4.2975971	2.32312538	-0.7915834			
2018	Q4	Reference (LC_SLC)	<0.0005	<0.0005	0.0016	<0.003	1.64	1.62	-2.42	-3.62	3.17	-1.82				-2.4469446	-3.9906185	3.04962143	-0.8074516			
2019	Q1	Reference (FR_UFR1)	0.000325	0.0008	0.000775	0.0053	2.77	2.78	-5.39	-2.44	-0.73	-1.39				-5.2700693	-2.7018682	-1.1213245	-1.9409662			
2019	Q1	Reference (GH_ER2)	<0.0005	<0.0005	<0.0005	<0.003	2.85	2.86	-4.56	-4.26	3.00	-0.81				-4.4706444	-4.7639088	2.41100205	0.03780441			
2019	Q1	Reference (CM_MC1)	<0.0005	<0.0005	<0.001	<0.003	2.71	2.73	-4.77	-4.05	3.01	-1.75				-4.6499514	-4.6335851	2.97076178	-0.7457508			
2019	Q3	Reference (FR_UFR1)	<0.0005	<0.0005	0.0008	0.001875	1.72	1.73	-4.78	-4.05	3.04	-1.74				-4.7505728	-4.5029679	2.43334728	-1.0524822			
2019	Q3	Reference (GH_ER2)	<0.0005	<0.0005	<0.001	<0.003	2.41	2.42	-4.98	-3.82	1.87	-1.17				-4.8858973	-4.2005318	1.35045413	-0.7931756			
2019	Q3	Reference (CM_MC1)	<0.0005	<0.0005	<0.001	<0.003	1.87	1.89	-5.09	-3.28	2.24	-1.92				-5.0625008	-3.749062	1.82777991	-1.4719785			
2019	Q3	Reference (LC_SLC)	<0.0005	<0.0005	0.001875	0.002575	2.64	2.66	-3.83	-3.89	3.39	-1.39				-3.8580841	-4.3198925	2.98713411	-0.3998539			
2019	Q4	Reference (FR_UFR1)	<0.0005	0.0004825	0.000825	0.00355	1.67	1.68	-5.04	-2.99	-0.78	-1.36				-4.877287	-3.1735904	-1.1559636	-1.9018044			
2019	Q4	Reference (GH_ER2)	<0.0005	<0.0005	0.00065	0.0021	2.93	2.95	-4.65	-4.11	2.75	-0.95				-4.588407	-4.5597261	2.13749502	-0.2242981			
2019	Q4	Reference (CM_MC1)	<0.0005	<0.0005	<0.001	<0.003	1.69	1.70	-5.71	-3.64	2.24	-1.78				-5.6236839	-4.1761709	2.00942112	-1.1927855			
2019	Q4	Reference (LC_SLC)	<0.0005	<0.0005	0.001875	<0.003	1.94	1.94	-3.10	-3.55	2.81	-1.68				-3.0742246	-3.9218855	2.76953619	-0.7312463			
2020	Q2	Reference (FR_UFR1)	<0.00050	0.000413	0.00075	<0.0030	1.16	1.16	-11.54	16.95	4.14	-0.09				-12.917916	15.0368487	4.12806208	1.32154681			
2020	Q2	Reference (GH_ER2)	<0.00050	0.000953	<0.00100	0.00243	1.83	1.83	-8.16	15.81	3.14	0.68				-9.5061878	14.5668731	1.91749319	1.27940599			
2020	Q2	Reference (CM_MC1)	<0.00050	0.000603	0.000625	<0.0030	1.61	1.63	-10.26	13.00	1.94	-0.76				-11.269394	11.6091268	1.89118725	-0.1560797			
2020	Q2	Reference (LC_SLC)	<0.00050	0.00032	0.00268	0.00283	1.17	1.17	-9.76	16.97	6.74	-0.42				-11.236784	15.0717402	6.616471	1.94809915			
2020	Q4	Reference (FR_UFR1)	<0.00050	<0.00050	<0.00100	<0.0030	1.04	1.03														
2020	Q4	Reference (GH_ER2)	<0.00050	<0.00050	0.00185	<0.0030	1.64	1.63														
2020	Q4	Reference (CM_MC1)	<0.00050	<0.00050	<0.00100	<0.0030	0.951	0.955														
2020	Q4	Reference (LC_SLC)	<0.00050	<0.00050	0.00183	0.00188	1.35	1.33														
2021	Q2	Reference (FR_UFR1)	<0.0005	0.00068	0.00165	0.0032	2.42863358	2.38445368	-8.14	-3.12	-3.14	-1.71	-10.29	-1.31	0.54							
2021	Q2	Reference (FR_UFR1)	<0.0005	0.000235	0.000875	<0.003	2.0701746	2.01086103	-5.90	-4.58	1.53	-2.37	-7.05	-6.08	0.06	-5.6859629	-5.0685224	1.58057412	-1.9720711	-10.089727	-1.4762118	0.95537581
2021	Q2	Reference (GH_ER2)	<0.0005	0.0027025	0.001325	0.008425	5.42937324	5.3761222	-5.45	-0.41	-7.94	-0.92	-8.43	5.73	-0.08							
2021	Q2	Reference (CM_MC1)	<0.0005	0.0009525	0.004225	0.0048	3.55832358	3.49784612	-9.14	-1.59	-6.73	-1.59	-12.23	3.67	-2.20							
2021	Q2	Reference (LC_SLC)	<0.0005	0.00051	0.0031	0.00415	3.06872413	2.99769163	-7.57	-3.40	-1.66	-1.49	-9.48	-2.66	1.23							
2021	Q3	Reference (FR_UFR1)	<0.0005	0.00021	0.0003	<0.003	2.32755778	2.25364814	-5.03	-4.19	0.48	-2.51	-6.49	-5.68	1.85	-4.7938038	-4.4497975	0.58806001	-2.4240813	-9.1851392	-0.7295771	1.97611686
2021	Q3	Reference (GH_ER2)	<0.0005	0.0005625	0.0015	<0.003	2.64953421	2.60607272	-5.47	-3.14	-2.01	-1.10	-7.45	-2.42	-0.13	-5.2196503	-3.2712485	-2.4509284	-2.1389913	-8.6499471	3.99889699	-0.4856669
2021	Q3	Reference (CM_MC1)	<0.0005	<0.0005	0.001075	<0.003	1.99765659	1.94270047	-5.20	-3.33	-0.13	-2.16	-6.61	-3.76	-4.07	-4.9654038	-3.6870176	0.07835052	-2.2699202	-8.5850653	0.50942306	-3.9929238
2021	Q3	Reference (LC_SLC)	<0.0005	<0.0005	0.003025	0.003	3.95730965	3.85256703	-4.02	-3.57	0.36	-1.87	-5.59	-4.08	0.06	-3.8524658	-3.8212163	0.45023939	-1.8337876	-7.679592	0.66823889	-0.3092998
2021	Q4	Reference (FR_UFR1)	<0.0005	<0.0005	0.000125	0.0011	2.14769288	2.11947243	-4.50	-6.13	4.97	-2.26	-5.76	-10.18	1.19	-4.3112937	-6.7805778	5.1048445	-0.4530535	-9.9341808	-5.3976522	2.80991838
2021	Q4	Reference (GH_ER2)	<0.0005	0.000715	<0.001	0.006	3.16548545	3.10938886	-4.59	-3.13	-1.59	-1.38	-6.29	-2.46	-0.87	-4.3375306	-3.2943878	-1.7718784	-2.1486745	-7.6296242	3.25701831	-0.6530148
2021	Q4	Reference (CM_MC1)	<0.0005	<0.0005	<0.001	<0.003	2.00932683	1.96167991	-5.38	-3.76	0.98	-2.10	-6.94	-4.86	-4.97	-5.1693599	-4.2244989	1.1363736	-1.8079923	-9.3156065	-0.482934	-4.4285342
2021	Q4	Reference (LC_SLC)	<0.0005	<0.0005	0.002175	0.003075	4.71721988	4.65138517	-1.75	-3.85	2.44	-2.06	-2.86	-5.76	-0.64	-1.6955261	-4.1159584	2.55864169	-1.2665543	-5.9713295	-2.3552056	0.06923853

Tests categorized as no adverse response (2015 -																				
2015	Q1	FR_FRCP1	0.0008	0.0008	0.003	0.0031	10.8	6.71	5.72	1.69	0.28	-0.11				5.27566386	2.13776971	-0.2106618	-0.281021			
2015	Q1	GH_FR1	0.0008	0.00083	0.003	0.003	7.70	4.84	2.77	0.73	-0.76	-0.90				2.50727334	1.0499228	-1.1583584	-1.4835791			
2015	Q1	CM_MC2	0.0008	0.00092	0.003	0.0036	5.72	5.33	0.50	1.73	-3.11	-0.34				0.27292416	2.0658454	-3.7599141	-1.9196509			
2015	Q2	GH_FR1	0.0005	0.00056	0.003	0.003	5.64	3.83	0.45	-0.64	-0.80	-0.42				0.27625507	-0.4187396	-1.5345415	-1.1465622			
2015	Q2	CM_MC2	0.0005	0.0016	0.0035	0.0091	6.99	6.80	-1.77	2.09	-6.65	-0.36				-1.8892381	2.57679084	-7.3206551	-3.3266287			
2015	Q3	FR_FRCP1	0.0005	0.0005	0.003	0.003	8.04	5.21	4.60	0.33	1.32	-0.37				4.24081155	0.61696701	0.89216233	-0.1568296			
2015	Q3	GH_FR1	0.0005	0.00051	0.003	0.003	6.43	4.03	1.83	-0.50	-0.08	-0.74				1.61833217	-0.2520614	-0.66076	-1.137725			
2015	Q4	FR_FRCP1	0.0005	0.0005	0.003	0.003	10.3	5.93	5.38	0.29	1.52	0.20				5.01739561	0.59908729	1.12837573	0.61941192			
2015	Q4	GH_FR1	0.0005	0.0005	0.003	0.003	6.54	3.81	2.69	-1.05	2.56	-0.97				2.43070247	-0.9999645	2.17130989	-0.2877857			
2015	Q4	CM_MC2	0.0005	0.00053	0.003	0.003	6.51	5.83	3.01	1.32	-0.54	-0.20				2.67077861	1.61966225	-1.1930031	-0.7777006			
2016	Q1	GH_FR1	<0.0005	<0.0005	<0.003	<0.003	7.21	3.69	3.03	-1.12	2.38	-0.61				2.82277705	-1.0658269	2.17711138	0.20901898			
2016	Q3	FR_FRCP1	<0.0005	<0.0005	<0.003	<0.003	7.65	4.18	4.36	-0.23	1.05	-0.17				4.07532785	0.06408864	0.73248047	0.07802173			
2016	Q3	GH_FR1	<0.0005	0.00051	<0.003	<0.003	5.69	3.06	2.51	-1.29	1.99	-0.77				2.30080923	-1.208191	1.61040161	-0.2550407			
2016	Q3	CM_MC2	<0.0005	<0.0005	<0.003	<0.003	6.15	5.24	4.03	0.14	2.44	0.01				3.65607443	0.26736654	1.82855766	0.6383274			
2016	Q4	FR_FRCP1	<0.0005	<0.0005	<0.003	<0.0045	7.19	4.00	3.79	-0.19	0.77	0.11				3.49808653	0.12178722	0.20731214	0.14436869			
2016	Q4	GH_FR1	<0.0005	<0.0005	<0.003	<0.003	5.66	3.18	2.68	-0.87	0.88	-0.49				2.49785136	-0.7073078	0.5888975	-0.3103597			
2016	Q4	CM_MC2	<0.0005	<0.0005	0.0032	0.004	5.30	4.74	1.74	0.81	-1.42	-0.01				1.51079585	1.09069816	-1.890517	-0.7816442			
2017	Q1	GH_FR1	<0.0005	<0.0005	<0.003	<0.003	6.44	2.98	0.65	-2.50	3.12	7.57				0.57362199	-2.5693403	-0.1464786	7.74204863			
2017	Q2	FR_FRCP1	<0.0005	0.0016	0.0028	0.0066	7.75	4.91	-0.35	0.37	-4.33	7.94				-0.3902839	0.83757559	-7.5825723	5.26879227			
2017	Q2	GH_FR1	<0.0005	0.0016	<0.003	0.0049	6.11	4.47	-1.43	0.39	-4.63	7.75				-1.4396281	0.84308092	-8.0607502	4.87004843			
2017	Q3	FR_FRCP1	<0.0005	<0.0005	<0.0025	<0.003	7.34	4.38	2.09	-1.10	1.08	8.28				1.94966108	-0.9040693	-2.1820859	7.71895429			
2017	Q3	GH_FR1	<0.0005	<0.0005	<0.0025	<0.003	5.95	3.23	0.45	-2.19	2.25	7.66				0.36567386	-2.2011308	-1.039059	7.46964836			
2017	Q4	FR_FRCP1	<0.0005	0.00052	<0.003	0.0032	9.80	5.64	2.94	-0.73	0.81	8.72				2.81523968	-0.494845	-2.3744131	8.15617375			
2017	Q4	GH_FR1	<0.0005	<0.0005	<0.003	<0.003	6.07	3.34	0.87	-2.11	2.00	7.92				0.78216914	-2.062954	-1.3775821	7.62028161			
2018	Q1	GH_FR1	<0.0005	<0.0005	<0.003	<0.003	6.49	4.02	4.05	-0.55	1.76	-0.91				3.76487325	-0.3236345	1.34483198	-0.5219373			
2018	Q1	CM_MC3	<0.0005	<0.0005	<0.003	<0.003	2.03	1.93	-0.53	-2.61	2.39	-0.44				-0.6112792	-2.7670945	1.78763091	0.13704423			
2018	Q2	FR_FRCP1	<0.0005	0.0023	0.0025	0.011	7.81	6.11	-0.14	1.80	-7.40	0.03				-0.2067902	2.47907486	-7.9499164	-3.0832567			
2018	Q2	GH_FR1	<0.0005	0.0024	0.0013	0.0092	6.76	6.28	-0.44	2.19	-7.61	-0.64				-0.5442947	2.88774757	-8.1737313	-3.9363367			
2018	Q2	CM_MC3	<0.0005	0.0018	0.0039	0.011	5.96	6.01	-2.78	1.71	-6.68	-0.13				-2.8501312	2.11225277	-7.4710569	-3.2005469			
2018	Q2	LC_LCDSSLCC	<0.0005	0.00054	0.0087	0.01	5.31	4.71	1.29	0.28	-2.29	-0.16				1.09509176	0.66600101	-2.7144771	-1.3249511			
2018	Q3	FR_FRCP1	<0.0005	<0.0005	0.0013	0.003	7.87	4.88	5.27	0.32	0.53	-0.04				4.95672165	0.70241625	0.19805025	0.01092821			
2018	Q3	GH_FR1	<0.0005	<0.0005	0.0011	<0.003	5.87	3.94	3.33	-0.71	0.60	-0.71				3.10339591	-0.4379831	0.17469025	-0.734419			
2018	Q3	LC_LCDSSLCC	<0.0005	<0.0005	0.011	0.013	7.67	5.82	4.82	0.23	1.56	-0.78				4.44380279	0.53057137	1.3122326	-0.4598382			
2018	Q4	GH_FR1	<0.0005	<0.0005	0.0011	<0.003	6.18	3.91	4.23	-1.23	2.13	-1.25				4.01294285	-1.0854221	2.21481422	-0.4511724			
2018	Q4	GH_ERC	<0.0005	<0.0005	<0.001	<0.003	1.49	1.50	-3.32	-3.92	3.06	-1.09				-3.2741118	-4.3610287	2.70253955	-0.1511168			
2018	Q4	CM_MC3	<0.0005	<0.0005	<0.001	<0.003	2.46	2.30	0.33	-2.13	1.96	-0.39				0.25272163	-2.2421399	1.64276941	0.19991088			
2018	Q4	EV_MC2	<0.0005	<0.0005	<0.001	<0.003	3.30	2.80	3.66	-0.70	1.87	-0.79				3.45845164	-0.5885489	1.77065972	-0.1849224			
2018	Q4	EV_HC1	<0.0005	<0.0005	<0.001	<0.003	2.40	2.16	1.80	-1.79	1.19	-1.39				1.696683	-1.7296885	1.21494449	-1.0042947			
2019	Q1	FR_FRABCH	<0.0005	<0.0005	<0.001	<0.003	11.1	5.19	4.98	-1.45	1.96	-1.29				4.87941286	-1.3040344	2.58170594	-0.2317974			
2019	Q1	FR_FRCP1	<0.00038	<0.00038	0.000925	0.003475	22.0	14.4	10.33	1.72	-0.72	-1.37				9.944502	2.50839718	0.43391672	-1.0128328			
2019	Q1	GH_FR1	<0.0005	<0.0005	<0.001	<0.003	7.00	4.00	4.03	-1.58	1.90	-1.20				3.89823697	-1.4307161	2.16646182	-0.3531882			
2019	Q1	CM_MC2	<0.0005	<0.0005	0.001675	<0.003	8.22	7.09	6.30	0.74	1.61	-0.21				5.98233024	0.97645323	1.71690929	0.47707082			
2019	Q1	RG_MIDAG	<0.0005	<0.0005	<0.001	<0.003	4.13	3.61	2.25	-1.51	1.28	-0.62				2.19584422	-1.4713349	1.32591257	-0.0868118			
2019	Q3	FR_FRABCH	<0.0005	<0.0005	0.0008	0.0022	8.95	4.65	4.36	-1.26	2.42	-0.97				4.1123434	-1.0831038	2.3828836	-0.1175298			
2019	Q3	FR_FRCP1	<0.0005	<0.0005	0.001025	0.0019	6.98	4.63	3.88	-0.96	1.67	-0.17				3.59976192	-0.7477201	1.20082999	0.2129678			
2019	Q3	GH_FR1	<0.0005	<0.0005	0.000925	<0.003	5.81	3.54	2.64	-1.65	1.52	-1.13				2.4216683	-1.4538678	1.13109587	-0.8347375			
2019	Q3	GH_ERC	<0.0005	<0.0005	<0.001	<0.003	2.91	2.92	-4.08	-3.65	2.29	-0.92				-4.036949	-4.0114028	1.6292145	-0.4209132			
2019	Q3	RG_MIDAG	<0.0005	<0.0005	0.0007	<0.003	3.54	3.33	-0.07	-1.58	1.07	-0.27				-0.2094148	-1.5847239	0.3556854	-0.2578746			
2019	Q3	EV_MC2	<0.0005	<0.0005	0.001275	<0.003	2.85	2.70	0.67	-1.71	0.70	-1.00				0.57886731	-1.6258812	0.22864438	-1.0658055			
2019	Q4	FR_FRABCH	<0.0005	<0.0005	0.000675	<0.003	9.41	4.28	3.92	-0.86	0.66	-1.13				3.72570572	-0.54752	0.63435141	-0.8954439			
2019	Q4	GH_FR1	<0.0005	<0.0005	0.001	0.003	5.72	3.06	2.92	-2.13	2.86	-1.37				2.7610024	-2.0938224	2.92006388	-0.3050262			
2019	Q4	RG_MIDAG	<0.0005	<0.0005	0.001125	<0.003	3.93	3.53	2.44	-0.94	1.29	0.16				2.22977899	-0.8607618	0.86797305	0.45096854			
2019	Q4	EV_MC2	<0.0005	<0.0005	0.00105	<0.003	2.55	2.35	1.10	-2.11	2.09	-1.02				1.05456247	-2.2011655	2.13506596	-0.24639			
2020	Q2	FR_FRABCH	<0.00050	0.000778	0.00273	0.00445	7.82	4.26	-1.34	14.38	2.81	-0.43				-2.597681	13.7141465	2.0712526	0.24618376			
2020	Q2	FR_FRCP1	<0.00050	0.000583	0.00448	0.00505	8.05	4.91	-1.49	14.28	2.55	-0.07				-2.7894984	13.5458613	1.88727458	0.53607734			
2020	Q2	GH_FR1	<0.00050	0.00057	0.00263	0.0020	5.00	3.18	-2.74	14.99	4.58	-0.87				-4.094641	14.0048994	4.29935937	0.63884666			
2020	Q2	GH_ERC	<0.00050	0.00124	0.00085	0.00258	2.24	2.23	-7.80	15.54	2.90	0.17				-9.1186543	14.3577044	1.80657278	0.71995976			
2020	Q2	EV_MC2	<0.00050	0.00213	<0.00100	0.0043	3.73	3.74	-6.66	12.74	-1.72	-0.55				-7.5385492	12.0641862	-2.3439102	-1.6131015			
2020	Q2	LC_LC5	<0.00050	0.000645	0.00198	0.00368	4.89	3.16	-2.73	13.77	2.96	-0.45				-3.965664	13.0804819	2.01617779	0.13088005			
2020	Q2	LC_LCDSSLCC	<0.00050	0.000315	0.0311	0.00725	5.48	4.32	-1.04	11.21	4.14	-0.93				-2.1250277	10.492405	4.29910827	0.57918227			
2020	Q4	FR_FRABCH	<0.00050	<0.00050	0.000925	<0.0030	9.99	4.07														
2020	Q4	GH_FR1	<0.00050	0.00059	0.00103	0.00493	7.07	3.57														
2020	Q4	GH_ERC	<0.00050	<0.00050	0.0010	<0.0030	1.85	1.82														
2020	Q4	EV_MC2	<0.00050	0.000318	<0.00100	<0.0030	2.05	1.87														
2020	Q4	EV_HC1	<0.00050	0.000333	0.000725	<0.0030	5.71	5.54														
2020	Q4	LC_LC3	<0.00050	<0.00050	0.00893	0.00945	9.97	6.97														
2020	Q4	LC_LC5	<0.00050	<0.00050	0.00163	<0.0030	5.13	2.52														
2020	Q4	LC_LCDSSLCC	<0.00050	<0.00050	0.00498	0.0047	5.99	3.78														
2021	Q2	FR_FRABCH	<0.0005	0.0012	0.003775	0.0057	9.28739387	5.87254832	1.70	0.66	-5.83	-0.25	0.17	3.93	2.51							
2021	Q2	FR_FRCP1	<0.0005	0.000935	0.0028	0.007875	8.52354195	5.83106383	1.23	0.33	-4.94	-0.04	-0.07	2.87	2.92							
2021	Q2	GH_FR1	0.0005	0.000875	0.001425	0.00465	6.6296008	4.76506803	0.44	-0.37	-4.76	-0.60	-1.30	2.02	2.32							
2021	Q2	GH_ERC	<0.0005	0.003725	0.00145	0.01035	7.01820026	6.92619593	-4.86	0.26	-8.74	-0.96	-8.07	7.64	-0.31							
2021	Q2	RG_MIDAG	<0.0005	0.0011025	0.002775	0.01135	5.38735368	5.20477596	-2.91	0.31	-5.88	-0.22	-4.78	4.64	-1.64							
2021	Q2	EV_MC2	<0.0005	0.0070275	0.0011	0.02755	11.4171888	11.3730793	-4.03	2.53	-11.75	-0.72	-8.36	14.85	-1.74							
2021	Q2	EV_HC1	<0.0005	0.000835	<0.001	0.00355	3.49188614	3.35309352	-2.59	-0.96	-4.32	-1.47	-4.53	1.31	1.33							
2021	Q2	LC_DCDS	0.0014625	0.00221	0.008775	0.006475	8.96019315	6.40157787	1.10	1.99	-6.17	-0.24	-0.03	7.08	-1.96							
2021	Q2	LC_LC3	0.0005	0.0005	0.016	0.016425	8.80863395	6.43013047	3.57	-0.36	-0.70	-0.22	3.22	-0.38	-0.18							
2021	Q2	LC_LC5	<0.0005	0.001035	0.00255	0.0061	7.02227073	5.48100467	0.36	0.22	-5.45	-0.51	-1.32	3.21	2.16							
2021	Q2	LC_LCDSSLCC	<0.0005	<0.0005	0.0079	0.009325	5.62825643	4.53019556	0.68	-1.08	-1.68	-0.41	-0.43	-0.75	1.09							
2021	Q3	GH_ERC	<0.0005	0.00054	0.001625	0.0035	2.72040473	2.64623369	-4.57	-2.78	-2.00	-1.21	-6.33	-2.35	0.04	-4.348387	-2.8421489	-2.3644664	-2.214214	-7.6028933	3.48547712	-0.4348155
2021	Q3	RG_MIDAG	<0.0005	0.0005275	0.001225	0.003	4.4584594	4.25770546	0.47	-1.74	0.22	-0.53	-0.46	-2.07	-3.73	0.46202712	-1.7452726	0.11440731	-0.5448602	-2.2711689	0.08421386	-2.8070686
2021	Q3	EV_MC2	<0.0005	0.00066	0.00235	<0.003	3.33796224	3.32443543	0.82	-1.05	-1.96	-1.02	-0.47	-0.64	-1.32	0.84881054	-0.7896654	-2.1495712	-1.9642548	-1.512617	2.27595572	-1.3397112
2021	Q3	EV_HC1	<0.0005	0.0010325	0.001275	0.004225	4.54396069	4.34198642	0.27	-0.19	-4.56	-1.49	-1.37	2.24	1.30	0.27114144	0.30351945	-4.731249	-3.451995	-0.6013285	8.12016422	0.87303439
2021	Q3	LC_DCDS	0.0012225	0.0014675	0.008175	0.008225	19.0884802	8.21060126	6.60	1.96	-2.28	0.52	6.82	3.56	-2.83	6.44913413	2.45697618	-1.9897392	-0.1544162	6.7011842	0.55532396	-6.430015
2021	Q3	LC_LC3	0.0005	0.0005	0.0152	0.015425	10.1407163	6.80635732	6.84	0.95	-1.07	-0.35	6.95	0.82	-1.71	6.65604945	1.47353329	-0.5262542	-0.5339673	5.57836271	-1.3586802	-1.8155478
2021	Q3	LC_LCDSSLCC	<0.0005	<0.0005	0.007975	0.01525	7.50310387	5.42986222	4.58	-0.47	-0.32	-0.98	4.03	-1.03	-0.90	4.45274817	-0.107872	0.06159235	-1.0366721	2.20723092	-1.40431	-0.903925
2021	Q4	FR_FRABCH	<0.0005	<0.0005	0.0018	0.001575	11.5542207	5.1677825	5.88	-1.66	2.11	-0.79	5.90	-4.35	-0.74	5.75413135	-1.4009159	2.41195015	0.21735114	2.72360127	-6.5513108	0.32944663
2021	Q4	FR_FRCP1	<0.0005	<0.0005	0.0079	0.0108	16.3360164	10.295675	8.39	1.35	0.15	-0.07	9.63	0.31	0.51	8.02123014	1.91775327	0.26492484	0.01756209	7.98594691	-1.8408553	1.37528823
2021	Q4	GH_FR1	0.0005	0.0005	0.00105	0.003	8.52555603	4.68040959	4.30	-1.75	1.13	-1.49	3.79	-3.35	0.10	4.2003773	-1.494777	1.30443944	-1.0702051	1.28799378	-2.9900211	1.19467224
2021	Q4	CM_MC2	<0.0005	<0.0005	0.0013	<0.003	6.50133973	5.7667276	5.09	0.42	0.41	-0.70	5.58	-0.86	-4.25	4.85176139	0.75300362	0.39338458	-0.5855669	4.00393473	-0.780178	-2.1005452
2021	Q4	RG_MIDAG	<0.0005	<0.0005	0.00105	<0.003	3.99568565	3.71048029	1.39	-2.18	0.46	-0.96	0.56	-3.07	-3.16	1.43273878	-2.1737906	0.54253828	-0.7816904	-1.8094752	-1.7949825	-2.4074968
2021	Q4	EV_MC2	<0.0005	<0.0005	0.0012	0.003375	2.86637853	2.86866643	1.96	-1.40	-0.16	-1.82	0.77	-2.15	-2.14	1.97536705	-1.2442855	0.01323074	-2.0001732	-1.048246	-0.405738	-2.0521074
2021	Q4	EV_HC1	<0.0005	<0.0005	0.001175	0.003475	3.83708083	3.57694619	1.39	-2.07	0.46	-1.79	0.45	-3.01	0.19	1.35338092	-1.9661667	0.62630154	-1.6641882	-1.6606726	-0.7111498	1.10379037
2021	Q4	LC_LC3	0.0005	0.0005	0.0105	0.045925	11.7522536	8.40440113	8.21	1.52	-0.96	-0.33	8.70	1.32	-2.13	7.94073799	2.13737726	-0.5864612	-0.5848884	7.4458649	-1.2532927	-1.6473102
2021	Q4	LC_LC5	<0.0005	<0.0005	0.0015	0.00315	7.75468957	4.82248971	3.91	-1.59	0.78	-1.46	3.11	-2.94	-0.02	3.7871669	-1.279158	0.69721504	-1.3510975	0.84041083	-1.743029	0.81391752
2021	Q4	LC_LCDSSLCC	<0.0005	<0.0005	0.00625	0.005375	8.48087205	6.00138515	6.33	-0.12	1.14	-0.88	6.66	-2.09	-1.73	6.06137948	0.2867215	1.27349269	-0.5049807	4.03525396	-2.9733771	-0.5934238

Tests categorized as possible or likely adverse re																						
2015	Q2	FR_FRCP1	0.0005	0.00051	0.003	0.003	5.83	4.00	0.33	-0.51	-1.00	0.07				0.12262572	-0.2780763	-1.8767324	-0.7793192			
2016	Q1	FR_FRCP1	<0.0005	<0.0005	<0.003	<0.003	15.2	8.19	7.01	0.65	1.42	0.12				6.59118641	1.06493127	1.21567476	0.65388337			
2016	Q2	FR_FRCP1	<0.0005	0.00053	<0.003	0.0031	5.11	3.20	0.32	-0.71	-1.20	0.06				0.16353445	-0.4683463	-1.9244343	-0.7598659			
2016	Q2	GH_FR1	<0.0005	0.00053	<0.003	<0.003	4.71	2.91	0.58	-0.91	-0.71	-0.42				0.43274467	-0.6889957	-1.3850048	-1.0602959			
2016	Q2	CM_MC2	<0.0005	0.00088	0.0059	0.011	7.85	7.44	0.19	2.09	-4.73	0.12				-0.0088929	2.50930889	-5.234848	-1.9820733			
2017	Q1	FR_FRCP1	<0.0005	<0.0005	0.0019	<0.003	13.9	7.59	4.40	-0.42	1.11	8.89				4.23934897	-0.1330907	-1.9470278	8.53262436			
2017	Q4	CM_MC2	<0.0005	<0.0005	<0.003	<0.003	6.82	5.75	1.71	-0.41	1.38	8.87				1.53697177	-0.32939	-2.1632206	8.33787928			
2018	Q1	FR_FRCP1	<0.0006625	<0.000625	<0.003	0.0045	11.7	6.21	7.11	0.82	-0.05	-0.25				6.82905334	1.30818074	0.24577353	-0.0544528			
2018	Q4	FR_FRABCH	<0.0005	<0.0005	0.0022	0.0035	9.11	3.72	5.23	-0.88	1.92	-1.28				5.01619167	-0.6289225	2.12607749	-0.4867142			
2018	Q4	LC_LCDSSLCC	<0.0005	<0.0005	0.0033	0.0036	5.77	4.13	5.79	-0.34	2.21	-0.67				5.46826622	-0.0728264	2.20115448	0.13495534			
2019	Q3	CM_MC2	<0.0005	<0.0005	<0.001	<0.003	7.69	6.92	4.53	0.26	1.72	0.02				4.16496391	0.49365993	1.08496871	0.34182821			
2019	Q3	EV_HC1	<0.0005	<0.0005	<0.001	<0.003	2.74	2.60	0.98	-1.83	0.72	-1.27				0.84964958	-1.7092533	0.33038474	-1.3010849			
2019	Q3	LC_DCDS	0.001145	0.0014325	<0.001	<0.003	9.71	7.84	2.75	0.20	-1.30	1.11				2.58401721	0.47668346	-2.1838593	0.213842			
2019	Q3	LC_LCDSSLCC	<0.0005	<0.0005	0.005525	0.007025	6.21	4.71	4.06	-0.78	1.58	-0.55				3.8254728	-0.5877933	1.51968357	-0.0383631			
2019	Q4	FR_FRCP1	<0.0005	<0.0005	0.0016	0.00495	11.6	6.94	6.84	0.24	1.48	-0.39				6.49485424	0.6418169	1.7247798	0.33848876			
2019	Q4	GH_ERC	<0.0005	<0.0005	0.000725	<0.003	2.58	2.58	-3.13	-3.72	2.68	-1.07				-3.0836424	-4.0831179	2.34284334	-0.2457041			
2019	Q4	EV_HC1	<0.0005	<0.0005	0.001	<0.003	2.45	2.23	1.28	-1.75	0.75	-1.24				1.19794415	-1.6550357	0.80982711	-0.9564552			
2020	Q2	RG_MIDAG	<0.00050	0.00050	0.00325	0.00495	3.50	3.43	-3.93	11.36	2.41	-0.56				-4.9420129	10.6059249	1.76763525	-0.0309417			
2020	Q2	LC_DCDS	0.0012	0.00168	0.0138	0.0070	7.67	5.01	-2.10	10.82	0.51	0.04				-2.9463362	10.2244676	0.37350509	0.13264358			
Tests categorized as possible or likely adverse re																						
2019	Q3	LC_LC5	<0.0005	<0.0005	0.000775	<0.003	5.15	3.30	2.93	-1.95	2.36	-1.10				2.70094464	-1.8017482	1.97375803	-0.4976196			
2019	Q4	LC_LC3	<0.0005	<0.0005	0.0087	0.008725	12.2	8.02	7.54	0.62	1.04	-0.37				7.22830613	1.04446113	1.46866325	0.25095699			
2019	Q4	LC_LC5	<0.0005	<0.0005	0.0009	<0.003	5.37	3.09	3.34	-2.38	3.35	-1.32				3.13308769	-2.3145856	3.28828632	-0.1507775			
2019	Q4	LC_LCDSSLCC	<0.0005	<0.0005	0.004175	0.0049	7.81	5.18	5.08	-0.81	2.05	-0.73				4.82205547	-0.5751538	2.13977883	0.07457288			
2020	Q2	EV_HC1	<0.00050	0.000608	0.000625	<0.0030	13.8	13.7	-5.30	18.16	3.67	-0.42				-6.8343801	16.8966454	3.49538523	0.73016221			
2020	Q2	LC_LC3	<0.00050	<0.00050	0.102	0.0198	9.17	7.48	2.59	10.23	1.57	-0.29				1.60108626	10.0177063	1.69846863	0.21209317			
2020	Q4	FR_FRCP1	<0.00050	<0.00050	0.00523	0.0060	10.3	6.14														
2020	Q4	RG_MIDAG	<0.00050	<0.00050	0.00123	<0.0030	3.32	3.07														
2020	Q4	LC_DCDS	0.00105	0.00132	0.00753	0.00778	19.4	7.93														
Tests categorized as possible or likely adverse re																						
2015	Q3	CM_MC2	0.0005	0.0005	0.003	0.003	6.86	5.92	3.87	0.51	1.67	-0.19				3.51355711	0.67858886	1.07502945	0.11081577			
2016	Q1	CM_MC2	<0.0005	<0.0005	<0.003	<0.003	6.49	5.64	4.04	1.01	1.38	-0.18				3.65796464	1.1877026	0.88474426	0.05678167			
2017	Q1	CM_MC2	<0.0005	<0.0005	0.0043	0.0049	12.0	10.7	2.67	0.70	1.31	9.12				2.41255492	0.80277425	-2.0807342	8.63189064			
2017	Q2	CM_MC2	<0.0005	0.00081	0.0063	0.0096	8.84	8.29	-0.22	1.56	-4.12	8.57				-0.3067905	1.92835443	-7.4019905	6.02536444			
2017	Q3	CM_MC2	<0.0005	<0.0005	<0.0025	0.0039	10.3	9.35	0.86	0.26	-0.14	8.81				0.64669647	0.41855121	-3.8061357	7.60926791			
2018	Q1	CM_MC2	<0.0005	<0.0005	<0.003	0.003	7.30	6.36	5.72	1.03	1.03	-0.17				5.35566182	1.34976001	0.68647508	0.02221022			
2018	Q2	CM_MC2	<0.000625	0.0025	0.0046	0.016	9.73	9.61	0.31	3.69	-7.91	-0.35				0.12086883	4.38499226	-8.4813638	-3.7880659			
2018	Q3	CM_MC2	0.00051	<0.0005	0.001	<0.003	17.0	16.0	6.46	2.13	1.42	1.01				6.01290645	2.35274426	1.13192614	1.53502281			
2018	Q3	MC3	<0.0005	<0.0005	0.0014	<0.003	6.72	6.35	2.77	0.38	1.58	0.38				2.42809174	0.44791115	0.84389009	0.59196428			
2018	Q4	FR_FRCP1	<0.0006625	<0.000875	<0.00125	<0.00525	25.9	17.7	10.77	2.41	0.41	-2.05				10.2766701	3.06093309	2.07308823	-1.0909477			
2018	Q4	CM_MC2	<0.0005	<0.0005	0.0011	<0.003	5.95	5.26	5.10	0.48	1.72	-0.27				4.79506769	0.66560464	1.65133621	0.36049728			
2019	Q3	LC_LC3	<0.0005	<0.0005	0.012075	0.0147	10.2	7.97	6.55	0.44	0.41	-0.47				6.33178215	0.82964101	1.09406923	0.00468708			
2019	Q4	CM_MC2	<0.0005	0.000355	0.00215	0.0027	8.74	7.86	4.77	1.39	-0.48	-0.02				4.41014423	1.81555652	-0.9517674	-0.0305974			
2019	Q4	LC_DCDS	0.001055	0.00123	0.00425	0.004525	12.7	8.01	4.42	0.64	0.49	-0.38				4.23565368	0.80505818	0.72716219	-0.0904769			
2020	Q2	CM_MC2	<0.00050	0.00116	0.00748	0.0103	7.26	6.91	-1.02	11.93	-0.95	-0.46				-1.9808492	11.6830376	-1.2214543	-0.9944248			
2020	Q4	CM_MC2	<0.00050	<0.00050	0.0019	0.00275	9.16	8.35														
Tests categorized as possible or likely adverse re																						
2021	Q4	LC_DCDS	0.00116	0.0013	0.00965	0.010075	22.9427485	9.23069923	7.77	1.70	-1.05	-0.11	8.16	2.43	-3.64	7.5616892	2.19751405	-0.5814713	-0.2943239	7.50975143	-1.2292086	-6.5646896
Tests categorized as possible or likely adverse re																						
2021	Q2	CM_MC2	<0.0005	0.0012375	0.006975	0.010675	8.03299506	7.64967182	-0.04	2.03	-7.15	0.02	-1.52	7.26	-2.78							
Tests categorized as possible or likely adverse re																						
2021	Q3	CM_MC2	<0.0005	<0.0005	0.001225	<0.003	9.30577262	8.64492195	5.43	1.12	-0.58	-0.07	6.04	0.92	-5.56	5.1598854	1.54641523	-0.6792688	-0.2974036	5.16311876	0.98177338	-3.1919626

Notes:
"-D-" = dissolved concentration; "-T-" = total concentra

Screening
Concentrations of parameters in 2021 tests categorize

Year	Quarter	Sample ID	Mean Survival (Control Normalized)	Mean Viability (Control Normalized)	Mean Length (Control Normalized)	Mean Wet Weight (Control Normalized)	ACIDITY TO pH 8.3 (As CaCO3)-N-mg/l	ALKALINITY BICARBONATE (As CaCO3) lab measured.-N-mg/l	ALKALINITY CARBONATE (As CaCO3) lab measured.-N-mg/l	ALKALINITY HYDROXIDE (As CaCO3) lab measured.-N-mg/l	ALKALINITY TOTAL (As CaCO3) lab measured.-N-mg/l	ALUMINUM-D-mg/l	ALUMINUM-T-mg/l	ANTIMONY-D-mg/l	ANTIMONY-T-mg/l	ARSENIC-D-mg/l	ARSENIC-T-mg/l	BARIUM-D-mg/l	BARIUM-T-mg/l	BERYLLIUM-D-mg/l	BERYLLIUM-T-mg/l	BISMUTH-D-mg/l	BISMUTH-T-mg/l	BORON-D-mg/l	BORON-T-mg/l	BROMIDE-D-mg/l	CADMIUM-D-mg/l	CADMIUM-T-mg/l	CALCIUM-D-mg/l	CALCIUM-T-mg/l	CARBON DISSOLVED ORGANIC-D-mg/l	CHLORIDE-D-mg/l	CHROMIUM-D-mg/l	CHROMIUM-T-mg/l	COBALT-D-mg/l	COBALT-T-mg/l	CONDUCTIVITY LAB-N-us/cm	COPPER-D-mg/l	COPPER-T-mg/l	FLUORIDE-D-mg/l	Hardness Total or Dissolved CaCO3-N-mg/l	IRON-D-mg/l
Reference (2015 - 2021)																																										
2015	Q2	Reference (FR_UFR1)	91	89	98	100	1	114.0	3.6	1	118.000	0.008	0.0590	0.0001	0.0001	0.0001	0.00	0.043	0.0430	0.0001	0.0001	0.00005	0.00	0.01	0.01	0.050000	0.000007	0	38	38.0	1.9	1.0000	0.00012	0.00026	0.0001	0	239.0000	0.0005	0.0	0	132.00	0.01
2015	Q4	Reference (FR_UFR1)	90	90	100	102	1	140.0	5.2	1	146.000	0.003	0.0056	0.0001	0.0001	0.0001	0.00	0.073	0.0740	0.0001	0.0001	0.00005	0.00	0.01	0.01	0.050000	0.000007	0	55	56.0	0.6	1.0000	0.00012	0.00018	0.0001	0	356.0000	0.0005	0.0	0	193.00	0.01
2015	Q2	Reference (GH_ER2)	61	62	102	106	1	146.0	4.2	1	150.000	0.003	0.0820	0.0001	0.0001	0.00011	0.00	0.044	0.0460	0.0001	0.0001	0.00005	0.00	0.01	0.01	0.050000	0.000006	0	48	49.0	1.1	1.2000	0.0002	0.00075	0.0001	0	297.0000	0.0005	0.0	0	162.00	0.01
2015	Q4	Reference (GH_ER2)	94	94	97	99	1	146.0	1.7	1	147.000	0.003	0.0140	0.0001	0.0001	0.0001	0.00	0.047	0.0480	0.0001	0.0001	0.00005	0.00	0.01	0.01	0.050000	0.000005	0	51	52.0	0.7	1.1000	0.00022	0.0003	0.0001	0	314.0000	0.0005	0.0	0	173.00	0.01
2016	Q2	Reference (FR_UFR1)	84	81	103	103	<1	114.0	<1	<1	114.000	0.006	0.0540	<0.0001	<0.0001	0.00011	0.00	0.042	0.0430	<0.00004	<0.00004	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.000006	0	37	38.0	1.7	0.1000	0.00013	0.0002	<0.0001	<0.0001	243.0000	<0.0005	<0.0005	0	133.00	<0.01
2016	Q4	Reference (FR_UFR1)	91	91	101	103	<1	140.0	1.9	<1	141.000	0.008	0.0420	<0.0001	<0.0001	<0.0001	0.00	0.064	0.0630	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.000006	0	47	47.0	1.2	0.1900	0.00011	0.0002	<0.0001	<0.0001	319.0000	<0.0005	<0.0005	0	171.00	<0.01
2016	Q2	Reference (GH_ER2)	103	101	104	103	<1	140.0	2.0	<1	141.000	0.003	0.1400	<0.0001	<0.0001	0.0001	0.00	0.041	0.0420	<0.00004	<0.00004	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.000006	0	47	48.0	1.1	0.5700	0.00019	0.00049	<0.0001	0	287.0000	<0.0005	<0.0005	0	162.00	<0.01
2016	Q4	Reference (GH_ER2)	96	97	101	103	<1	145.0	1.3	<1	146.000	<0.003	0.0076	<0.0001	<0.0001	0.0001	0.00	0.045	0.0450	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.000006	0	47	48.0	0.6	0.3700	0.00024	0.00026	<0.0001	<0.0001	297.0000	<0.0005	<0.0005	0	163.00	<0.01
2017	Q4	Reference (CM_MC1)	35	36	98	103	-	-	-	-	136.000	<0.003	0.0067	<0.0001	<0.0001	0.00015	0.00	0.051	0.0510	<0.00002	<0.00002	<0.00005	<0.00005	0.013	0.014	<0.09	0.000008	0	-	41.0	1.2	1.1000	0.00018	0.00019	<0.0001	<0.0001	275.0000	<0.0005	<0.0005	0	144.00	<0.01
2017	Q2	Reference (FR_UFR1)	79	87	110	111	-	-	-	-	113.000	0.006	0.1600	<0.0001	0.00011	0.00012	0.00	0.039	0.0400	<0.00002	0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.000009	0	-	31.0	2.5	<0.5	0.0001	0.00058	<0.0001	0	218.0000	0.00025	0.0	0	112.00	<0.01
2017	Q4	Reference (FR_UFR1)	70	74	100	99	-	-	-	-	144.000	<0.003	0.0033	<0.0001	<0.0001	<0.0001	0.00	0.074	0.0730	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	0.052000	0.000007	0	-	51.0	0.7	<0.5	0.0001	0.00018	<0.0001	<0.0001	334.0000	<0.0005	<0.0005	0	184.00	<0.01
2017	Q2	Reference (GH_ER2)	100	106	103	108	-	-	-	-	143.000	0.005	0.7100	<0.0001	0.00011	0.00013	0.001	0.043	0.0530	<0.00002	0.00006	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.000008	0	-	53.0	1.8	0.4500	0.00017	0.0019	<0.0001	0	276.0000	<0.00044	0.0	0	155.00	<0.01
2017	Q4	Reference (GH_ER2)	57	59	99	98	-	-	-	-	147.000	<0.003	0.0068	<0.0001	<0.0001	<0.0001	0.00	0.048	0.0470	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.000005	0	-	43.0	0.6	<0.5	0.00025	0.00028	<0.0001	<0.0001	280.0000	<0.0005	<0.0005	0	155.00	<0.01
2018	Q2	Reference (CM_MC1)	104	107	105	105	2	92.0	<1	<1	92.000	0.025	0.3300	<0.00012	<0.0001	0.00023	0.00	0.028	0.0290	<0.000024	0.00002	<0.00006	<0.00005	<0.012	0.01	<0.05	0.000012	0	25	25.0	3.3	<0.5	0.00022	0.00057	<0.00012	0	176.0000	<0.0005	0.0	0	93.00	0.02
2018	Q4	Reference (CM_MC1)	87	91	104	103	1	135.0	2.8	<1	137.000	0.003	0.0080	<0.0001	<0.0001	0.00017	0.00	0.047	0.0460	<0.00002	<0.00002	<0.00005	<0.00005	0.013	0.014	<0.05	0.000008	0	39	39.0	1.6	0.5000	0.00018	0.00021	<0.0001	<0.0001	278.0000	<0.0005	<0.0005	0	142.00	<0.01
2018	Q2	Reference (FR_UFR1)	96	99	101	100	1	102.0	<1	<1	102.000	0.007	0.1600	<0.0001	<0.0001	0.00013	0.00	0.039	0.0380	<0.00002	0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.000008	0	30	30.0	2.2	<0.5	0.00011	0.00041	<0.0001	0	206.0000	<0.0005	0.0	0	112.00	<0.01
2018	Q4	Reference (FR_UFR1)	94	95	102	102	<1	146.0	5.7	<1	151.000	<0.003	0.0031	<0.0001	<0.0001	<0.0001	0.00	0.071	0.0680	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.000007	0	52	50.0	0.7	<0.5	0.0001	0.00018	<0.0001	<0.0001	343.0000	<0.0005	<0.0005	0	187.00	<0.01
2018	Q2	Reference (GH_ER2)	97	101	105	105	<1	134.0	3.4	<1	137.000	0.005	0.7100	<0.0001	0.00013	0.00015	0.001	0.041	0.0540	<0.00002	0.00006	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.000009	0	41	49.0	1.8	0.5100	0.00015	0.0019	<0.0001	0	265.0000	<0.0005	0.0	0	142.00	<0.01
2018	Q4	Reference (GH_ER2)	95	100	102	102	<1	146.0	1.6	<1	147.000	<0.003	0.0100	<0.0001	<0.0001	<0.0001	0.00	0.048	0.0450	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.000006	0	47	47.0	0.5	<0.5	0.00024	0.00028	<0.0001	<0.0001	297.0000	<0.0005	<0.0005	0	167.00	<0.01
2018	Q2	Reference (LC_SLC)	101	103	105	108	1	108.0	1.8	<1	109.000	0.004	0.0590	<0.0001	<0.0001	0.00011	0.00	0.025	0.0260	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.06	0.000008	0	35	33.0	2.1	<0.5	0.00011	0.00028	<0.0001	<0.0001	220.0000	<0.0005	<0.0005	0	123.00	<0.01
2018	Q4	Reference (LC_SLC)	97	101	103	102	<1	143.0	3.0	<1	145.000	<0.003	0.0071	<0.0001	<0.0001	0.0001	0.00	0.043	0.0430	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.000011	0	53	52.0	0.7	0.5000	0.00013	0.0002	<0.0001	<0.0001	368.0000	<0.0005	<0.0005	0	201.00	<0.01
2019	Q2	Reference (CM_MC1)	92	90	102	109	2	100.3	0.9	<1.0	100.820	0.021	0.1890	<0.0001	<0.0001	0.00024	0.00	0.031	0.03252	<0.00002	<0.00002	<0.00005	<0.00005	0.007	0.007	<0.05	0.000013	0	28	28.8	3.5	<0.5	0.0002	0.00043	<0.0001	0	205.6000	<0.0005	0.0	0	102.56	0.015
2019	Q4	Reference (CM_MC1)	96	89	99	100	1	144.4	1.1	<1.0	145.000	<0.003	0.00588	<0.0001	<0.0001	0.00018	0.00	0.046	0.04762	<0.00002	<0.00002	<0.00005	<0.00005	0.013	0.013	<0.05	0.000009	0	41	40.5	0.9	<0.5	0.00022	0.00024	<0.0001	<0.0001	266.2000	0.00028	<0.0005	0	147.80	<0.01
2019	Q2	Reference (FR_UFR1)	106	107	101	101	2	118.0	0.8	<1.0	118.400	0.005	0.05208	<0.0001	<0.0001	0.00009	0.00	0.042	0.0424	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.000005	0	35	35.3	1.4	<0.5	0.00011	0.00029	<0.0001	<0.0001	234.6000	<0.0005	<0.0005	0	128.00	<0.01
2019	Q4	Reference (FR_UFR1)	101	98	98	100	<1.0	145.6	<1.0	<1.0	145.600	<0.003	0.05424	<0.0001	<0.0001	0.00006	0.00	0.069	0.06694	<0.00002	0.00001	<0.00005	<0.00005	<0.01	0.008	<0.05	0.000013	0	51	51.5	1.0	<0.5	0.00011	0.00023	<0.0001	0	328.6000	0.00018	0.0	0	186.20	<0.01
2019	Q2	Reference (GH_ER2)	94	93	104	110	1	135.6	1.4	<1.0	136.600	0.002	0.21276	<0.0001	<0.0001	0.00011	0.00	0.041	0.04308	<0.00002	0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.000007	0	45	46.4	0.9	0.4760	0.00023	0.00067	<0.0001	0	290.8000	<0.0005	0.0	0	155.80	<0.01
2019	Q4	Reference (GH_ER2)	101	98	92	94	1	147.6	2.0	<1.0	149.200	0.002	0.01172	<0.0001	<0.0001	<0.0001	0.00	0.046	0.04544	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.000007	0	46	49.4	0.3	<0.5	0.00026	0.00027	<0.0001	<0.0001	298.0000	0.0003	<0.0005	0	162.40	<0.01
2019	Q2	Reference (LC_SLC)	94	99	98	100	1	120.0	1.5	<1.0	121.400	0.002	0.0176	<0.0001	<0.0001	0.00012	0.00	0.028	0.02708	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.000011	0	38	38.0	1.8	<0.5	0.00015	0.00019	<0.0001	<0.0001	265.8000	<0.0005	<0.0005	0	137.20	<0.01
2019	Q4	Reference (LC_SLC)	97	92	99	104	<1.0	145.6	<1.0	<1.0	145.600	<0.003	0.00726	<0.0001	<0.0001	0.00008	0.00	0.042	0.04204	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.000011	0	54	54.9	0.6	0.3760	0.00015	0.00018	<0.0001	<0.0001	365.0000	0.00027	<0.0005	0	199.40	<0.01
2020	Q2	Reference (CM_MC1)	102	102	96	105	<1.00	109.0	0.8	<1.00	109.000	0.009	0.2870	<0.000100	<0.000100	0.0002	0.00	0.034	0.0362	<0.000020	0.00002	<0.000050	<0.000050	0.009	0.01	<0.050	0.00001	0	30	31.1	3.3	<0.50	0.00015	0.00051	<0.000100	0	186.0000	0.00028	0.0	0	107.00	0.008
2020	Q4	Reference (CM_MC1)	102	102	101	99	<1.00	141.0	<1.00	<1.00	141.000	0.002	0.0124	<0.000100	<0.000100	0.00018	0.00	0.048	0.0472	<0.000020	<0.000020	<0.000050	<0.000050	0.014	0.015	<0.050	0.00001	0	40	40.2	1.6	0.5320	0.00017	0.00021	<0.000100	<0.000100	257.0000	0.00017	<0.00050	0	144.00	<0.0100
2020	Q2	Reference (FR_UFR1)	110	113	103	103	<1.00	91.1	2.4	24	117.000	0.003	0.1642	<0.000100	0.00006	0.00009	0.00	0.039	0.0400	<0.000020	0.00002	<0.000050	<0.000050	<0.0100	<0.0100	0.045000	0.000006	0	33	34.7	2.6	0.4500	0.00006	0.00036	<0.000100	0	217.0000	0.00024	0.0	0	119.00	<0.0100
2020	Q4	Reference (FR_UFR1)	104	104	97	94	<1.00	142.0	3.9	<1.00	145.000	0.002	0.0155	<0.000100	<0.000100	0.00007	0.00	0.069	0.0688	<0.000020	<0.000020	<0.000050	<0.000050	<0.0100	<0.0100	<0.050	0.000008	0	51	50.5	0.7	0.1700	0.00009	0.00014	<0.000100	<0.000100	318.0000	<0.00020	<0.00050	0	181.00	<0.0100
2020	Q2	Reference (GH_ER2)	90	90	99	109	<1.00	118.0	2.4	30	149.000	0.003	0.5460	<0.000100	0.00008	0.00011	0.001	0.041	0.0546	<0.000020	0.00005	<0.000050	<0.000050	<0.0100	<0.0100	<0.050	0.000008	0	44	53.4	1.8	<0.50	0.00019	0.0014	<0.000100	0	273.0000	0.00015	0.0	0	154.00	0.006
2020	Q4	Reference (GH_ER2)	96	95	100	100	<1.00	145.0	4.2	<1.00	149.000	<0.0030	0.0243	<0.000100	<0.000100	0.00006	0.00	0.046	0.0488	<0.000020	<0.000020	<0.000050	<0.000050	<0.0100	<0.0100	<0.050	0.000005	0	47	47.7	0.3	0.3040	0.00023	0.0003	<0.000100	<0.000100	283.0000	0.00012	<0.00050	0	163.00	<0.0100
2020	Q2	Reference (LC_SLC)	99	100	95	105	<1.00	131.0	3.1	<1.00	134.000	0.002	0.0383	<0.000100	<0.000100	0.00013	0.00	0.031	0.0306	<0.000020	<0.000020	<0.000050	<0.000050	<0.0100	<0.0100	<0.050	0.000013	0	40	40.5	2.3	<0.50	0.00014	0.00024	<0.000100	<0.000100	239.0000	0.00017	<0.00050	0	145.00	<0.0100
2020	Q4	Reference (LC_SLC)	102	102	100	93	<1.00	139.0	2.7	<1.00	142.000	<0.0030	0.00254	<0.000100	<0.000100	0.00008	0.00	0.043	0.0434	<0.000020	<0.000020	<0.000050	<0.000050	<0.0100	<0.0100	0.045000	0.000011	0	51	52.6	0.8	0.4800	0.00015	0.00017	<0.000100	<0.000100	348.0000	<0.00020	<0.00050	0	192.00	<0.0100
2021	Q2	Reference (CM_MC1)	100	104	104	112	<2	96.3	<1	<1	96.320	0.011	0.2761	<0.0001	<0.0001	0.00021	0.00	0.027	0.03178	<0.00002	0.00003	<0.00005	<0.00005	0.01	0.01	<0.05	0.000011	0	26	25.7	3.6	0.1460	0.00024	0.00057	<0.0001	0	172.6000	0.00033	0.0	0	94.68	0.013
2021	Q4	Reference (CM_MC1)	108	107	101	100	2	146.0	1.1	1	151.200	0.003	0.01488	0.0001	0.0001	0.00017	0.00	0.048	0.04694	0.00002	0.00002	0.00005	0.00	0.014	0.014	0.050000	0.000009	0	41	39.1	1.7	0.4300	0.00024	0.00026	0.0001	0	267.6000	0.00025	0.0	0	147.60	0.01
2021	Q2	Reference (FR_UFR1)	103	110	105	106	<2	114.4	1.4	<1	115.000	0.003	0.10314	<0.0001	<0.0001	0.00012	0.00	0.036	0.0366	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.000007	0	32	32.1	2.9	0.1100	0.00013	0.00027	<0.0001	0	219.2000	0.00025	0.0	0	116.40	<0.01
2021	Q4	Reference (FR_UFR1)	103	101	99	99	<2	145.4	1.9	<1	153.400	0.00	0.00394	<0.0001	<0.0001	<0.0001	0.00	0.07	0.07118	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.000005	0	51	52.2	0.4	0.1540	0.00003	0.00008	<0.0001	<0.0001	341.2000	0.00009	<0.0005	0	185.60	<0.01
2021	Q2	Reference (GH_ER2)	100	97	103	119	<2	138.8	<1	<1	138.800	0.003	0.6334	<0.0001	0.00011	0.00013	0.001	0.036	0.0500	<0.00002	0.00005	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.000007	0	40	47.4	2.0	0.4140	0.00019	0.00152	<0.0001	0	264.8000	0.00022	0.0	0	140.60	<0.01
2021	Q4	Reference (GH_ER2)	107	106	104	103	<2	143.8	1.6	<1	156.400	0.002	0.05542	<0.0001	<0.0001	0.0001	0.00	0.048	0.04884	<0.00002	0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.000007	0	46	47.5	0.8	0.3080	0.00026	0.0004	<0.0001	0	296.8000	<0.0002	0.0	0	162.80	<0.01
2021	Q2	Reference (LC_SLC)	95	100	102	115	<2	115.0	<1	<1	115.000	0.003	0.05192	<0.0001	<0.0001	0.00013	0.00	0.024	0.02568	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.000013	0	33	34.0	2.5	0.1220	0.00016	0.00025	<0.0001	<0.0001	223.2000	0.0002	<0.0005	0	117.60	<0.01
2021	Q4	Reference (LC_SLC)	103	96	96	96	<2	141.4	3.8	<1	150.000	0.001	0.00314	<0.0001	0.0001	0.00011	0.00	0.043	0.05428	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.000012	0	52	61.9	1.0	0.4240	0.00021	0.00017	<0.0001	<0.0001	374.4000	<0.0002	<0.0005	0	197.00	<0.01
Tests categorized as no adverse response (2015 - 2021)																																										
2015	Q2	CM_MC2	80	82	103	101	1	132.0	3.7	1	138.000	0.012	0.5800	0.00019	0.00016	0.00023	0.00	0.043	0.0490	0.00018	0.00014	0.00054	0.001	0.021	0.018	0.050000	0.000038	0	60	60.0	1.3	1.4000	0.00028	0.00091	0.00034	0	466.0000	0.0005	0.0	0	245.00	0.022
2015	Q2	EV_HC1	75	75	100	98	1	107.0	6.4	1	113.000	0.003	0.0550	0.0001	0.0001	0.00013	0.00	0.027	0.0280	0.0001	0.0001	0.00005	0.00	0.01	0.01	0.057000	0.000014	0	47	47.0	1.1	1.3000	0.00014	0.00023	0.0001	0	364.0000	0.0005	0.0	0	206.00	0.01
2015	Q4	EV_HC1	82	81	98	100	1	188.0	8.3	1	197.000	0.003	0.0230	0.0001	0.00011	0.00015	0.00	0.063	0.0640	0.0001	0.0001	0.00005	0.00	0.01	0.01	0.200000	0.000015	0	93	93.0	1.3	1.9000	0.00014	0.00028	0.0001	0	750.0000	0.0005	0.0	0	434.00	0.01
2015	Q2	EV_MC2	103	102	104	104	1	100.0	3.5	1	104.000	0.007	0.6600	0.00014	0.00017	0.00018	0.001	0.064	0.0760	0.0001	0.00012	0.00005	0.00	0.01	0.01	0.050000	0.000024	0	45	46.0	2.0	3.2000	0.00018	0.0012	0.0001	0	321.0000	0.00061	0.0	0	170.00	0.01
2015	Q4	EV_MC2	87	86	98	98	2	166.0	1.6	1	167.000	0.007	0.0810	0.00026	0.00029	0.00016	0.00	0.11	0.1100	0.0001	0.0001	0.00005	0.00	0.013	0.013	0.100000	0.000029	0	81	81.0	1.5	5.6000	0.00014	0.00027	0.0001	0	588.0000	0.0005	0.0	0	320.00	0.013
2015	Q2	FR_FRCP1	83	83	105	110	1	139.0	5.9	1	145.000	0.003	0.0470	0.00022	0.00022	0.0001	0.00	0.063	0.0640	0.0001	0.0001	0.00005	0.00	0.01	0.01	0.050000	0.000028	0	75	75.0	1.5	1.1000	0.0001	0.00018	0.0001	0	580.0000	0.0005	0.0	0	315.00	0.01
2015	Q2	GH_ERC	69	68	101	106	1	148.0	4.5	1	153.000	0.003	0.2100	0.0001	0.0001	0.0001	0.00	0.049	0.0510	0.0001	0.0001	0.00005	0.00	0.01	0.01	0.050000	0.000007	0	52	53.0	1.1	1.3000	0.00024	0.00069	0.0001	0	323.0000	0.0005	0.0	0	177.00	0.01
2015	Q4	GH_ERC	77	74	97	95	1	151.0	1.7	1	152.000	0.003	0.0089	0.0001	0.0001	0.0001	0.00	0.06	0.0600	0.0001	0.0001	0.00005	0.00	0.01	0.01	0.050000	0.000006	0	57	58.0	0.6	1.2000	0.00023	0.0003	0.0001	0	357.0000	0.0005	0.0	0	195.00	0.01
2015	Q2	GH_FR1	89	92	102	98	1	150.0	5.7	1	156.000	0.003	0.0510	0.00016	0.00017	0.0001	0.00	0.085	0.0860	0.0001	0.0001	0.00005	0.00	0.01	0.01	0.070000	0.000021	0	81	81.0	1.4	1.6000	0.00012	0.00024	0.0001	0	595.0000	0.0005	0.0	0	335.00	0.01
2015	Q2	LC_LCDSSLCC	102	101	101	101	1	116.0	4.7	1	121.000	0.003	0.0410	0.00014	0.00016	0.00012	0.00	0.035	0.0350	0.0001	0.0001	0.00005	0.00	0.01	0.01	0.060000	0.00011	0	57	58.0	1.2	1.5000	0.00012	0.00032	0.0001	0	436.0000	0.0005	0.0	0	232.00	0.01
2015	Q4	LC_LCDSSLCC	88	87	98	103	1	199.0	1.0	1	199.000	0.003	0.0052	0.00028	0.00032	0.0001	0.00	0.083	0.0870	0.0001	0.0001	0.00005	0.00	0.015	0.016	0.250000	0.00020	0	119	125.0	0.7	3.8000	0.00014	0.00017	0.0001	0	901.0000	0.0005	0.0	0	497.00	0.01
2016	Q2	EV_HC1	86	81	102	111	<1	167.0	9.1	<1	176.000	0.003	0.0740	<0.0001	0.00011	0.00015	0.00	0.041	0.0420	<0.00004	<0.00004	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.00002	0	70	71.0	1.3	0.7400	0.00012	0.00024	<0.0001	<0.0001	545.0000	<0.0005	<0.0005	0	311.00	<0.01
2016	Q4	EV_MC2	87	88	102	110	1	132.0	<1	<1	132.000	0.012	0.1000	0.00012	0.00013	0.00018	0.00	0.079	0.0830	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	0.01	<0.05	0.000025	0	54	55.0	2.1	3.5000	0.00012	0.00029	<0.0001	0	410.0000	<0.0005	0.0	0	211.00	0.014
2016	Q2	FR_FRCP1	81	79	99	102	<1	151.0	3.5	<1	154.000	<0.003	0.0700	0.00017	0.00022	<0.0001	0.00	0.058	0.0590	<0.00004	<0.00004	<0.00005	0.00	<0.01	<0.01	<0.05	0.000027	0	74	75.0	1.5	0.5100	0.00011	0.00024	<0.0001	0	569.0000	<0.0005	0.0	0	311.00	<0.01
2016	Q2	GH_ERC	81	77	102	108	1	144.0	1.7	<1	145.000	0.005	0.2300	<0.0001	0.0001	0.0001	0.00	0.048	0.0500	<0.00004	<0.00004	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.000008	0	52	53.0	1.1	0.6700	0.00022	0.00067	<0.0001	0	327.0000	<0.0005	0.0	0	180.00	<0.01
2016	Q4	GH_ERC	98	102	97	103	1	151.0	1.1	<1	151.000	<0.003	0.0130	<0.0001	<0.0001	<0.0001	0.00	0.055	0.0540	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.000006	0	51	52.0	0.5	0.4500	0.00023	0.0003	<0.0001	<0.0001	324.0000	<0.0005	0.0	0	178.00	<0.01
2017	Q2	CM_MC2	97	93	106	117	-	-	-	-	142.000	0.007	0.6000	0.00018	0.00023	0.00018	0.00	0.043	0.0480	<0.00002	0.00004	<0.00005	<0.00005	0.016	0.017	<0.05	0.000092	0	-	62.0	2.1	0.7200	0.00015	0.00096	0.0018	0	517.0000	0.00023	0.0	0	252.00	0.01
2017	Q2	EV_HC1	103	104	106	115	-	-	-	-	166.000	0.006	0.3800	0.00011	0.00011	0.00017	0.00	0.04	0.0430	<0.00002	0.00003	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.000025	0	-	59.0	2.4	0.5000	0.00012	0.00061	<0.0001	0	458.0000	<0.0005	0.0	0	260.00	<0.01
2017	Q2	EV_MC2	102	108	110	119	-	-	-	-	105.000	0.022	1.0000	0.0001	0.00018	0.00021	0.001	0.059	0.0770	<0.00002	0.00007	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.000029	0	-	38.0	2.9	2.0000	0.00013	0.0016	<0.0001	0	277.0000	<0.0005	0.0	0	142.00	0.024
2017	Q2	FR_FRCP1	81	87	108	113	-	-	-	-	164.000	0.003	0.2400	0.00018	0.00019	0.00011	0.00	0.054	0.0570	<0.00002	0.00003	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.00005	0	-	68.0	2.0	0.5000	<0.0001	0.00059	<0.0001	0	540.0000	0.00025	0.0	0	279.00	<0.01
2017	Q2	GH_FR1	91	100	117	127	-	-	-	-	159.000	0.004	0.3500	0.00016	0.00019	0.00013	0.00	0.07	0.0770	<0.00002	0.00003	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.000025	0	-	68.0	2.1	0.8400	0.0001	0.00078	<0.0001	0	506.0000	<0.00044	0.0	0	281.00	<0.01
2017	Q2	LC_LCDSSLCC	99	93	107	126	-	-	-	-	151.000	0.002	0.0270	0.00021	0.00021	0.00013	0.00	0.035	0.0340	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.00022	0	-	59.0	1.8	2.0000	0.00011	0.00023	0.0001	0	489.0000	0.00033	0.0	0	248.00	<0.01
2018	Q2	CM_MC2	94	94	106	113	1	137.0	5.0	<1	141.000	0.009	1.1000	0.00016	0.00018	0.00017	0.001	0.05	0.0550	<0.000024	0.00007	<0.00006	<0.00005	0.016	0.017	<0.05	0.000077	0	61	58.0	2.0	1.7000	0.00016	0.0014	0.0013	0	486.0000	<0.0005	0.0	0	252.00	0.012
2018	Q4	CM_MC2	84	87	103	109	1	202.0	6.5	<1	209.000	<0.003	0.0130	0.00039	0.00041	0.00018	0.00	0.071	0.0720	<0.00002	<0.00002	<0.00005	<0.00005	0.048	0.049	<0.21	0.000023	0	127	126.0	1.0	3.9000	0.00015	0.00018	0.0051	0	993.0000	<0.0005	<0.0005	0	556.00	<0.01
2018	Q2	EV_HC1	94	96	107	113	<1	159.0	9.0	<1	168.000	0.018	0.2300	<0.0001	0.0001	0.00016	0.00	0.041	0.0410	<0.00002	0.00003	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.000021	0	61	60.0	2.3	0.5700	0.00012	0.00043	<0.0001	0	485.0000	<0.0005	0.0	0	270.00	0.018

Year	Quarter	Sample ID	Mean Survival (Control Normalized)	Mean Viability (Control Normalized)	Mean Length (Control Normalized)	Mean Wet Weight (Control Normalized)	ACIDITY TO pH 8.3 (As CaCO3)-N-mg/l	ALKALINITY BICARBONATE (As CaCO3) lab measured.-N-mg/l	ALKALINITY CARBONATE (As CaCO3) lab measured.-N-mg/l	ALKALINITY HYDROXIDE (As CaCO3) lab measured.-N-mg/l	ALKALINITY TOTAL (As CaCO3) lab measured.-N-mg/l	ALUMINUM-D-mg/l	ALUMINUM-T-mg/l	ANTIMONY-D-mg/l	ANTIMONY-T-mg/l	ARSENIC-D-mg/l	ARSENIC-T-mg/l	BARIUM-D-mg/l	BARIUM-T-mg/l	BERYLLIUM-D-mg/l	BERYLLIUM-T-mg/l	BISMUTH-D-mg/l	BISMUTH-T-mg/l	BORON-D-mg/l	BORON-T-mg/l	BROMIDE-D-mg/l	CADMIUM-D-mg/l	CADMIUM-T-mg/l	CALCIUM-D-mg/l	CALCIUM-T-mg/l	CARBON DISSOLVED ORGANIC-D-mg/l	CHLORIDE-D-mg/l	CHROMIUM-D-mg/l	CHROMIUM-T-mg/l	COBALT-D-mg/l	COBALT-T-mg/l	CONDUCTIVITY LAB-N-us/cm	COPPER-D-mg/l	COPPER-T-mg/l	FLUORIDE-D-mg/l	Hardness Total or Dissolved CaCO3-N-mg/l	IRON-D-mg/l
2018	Q4	EV_HC1	84	88	103	103	1	173.0	7.4	<1	180.000	<0.003	0.0230	<0.0001	<0.0001	0.00016	0.00	0.067	0.0680	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.17	0.000015	0	86	87.0	1.0	1.4000	0.00016	0.00023	<0.0001	<0.0001	727.0000	<0.0005	<0.0005	0	422.00	<0.01
2018	Q2	EV_MC2	106	109	105	111	2	97.0	<1	<1	97.000	0.085	0.8500	0.0001	0.00015	0.00024	0.001	0.057	0.0710	0.00002	0.00006	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.000042	0	34	35.0	3.0	1.5000	0.00022	0.0014	0.00014	0	262.0000	0.00053	0.0	0	134.00	0.073
2018	Q4	EV_MC2	91	96	105	106	1	173.0	4.6	<1	178.000	<0.003	0.0100	0.00017	0.00019	0.00015	0.00	0.11	0.1100	<0.00002	<0.00002	<0.00005	<0.00005	0.014	0.014	0.200000	0.000025	0	79	82.0	1.2	5.7000	0.00012	0.00018	<0.0001	<0.0001	625.0000	<0.0005	<0.0005	0	331.00	<0.01
2018	Q2	FR_FRCP1	92	93	103	108	<1	154.0	4.9	<1	158.000	0.004	0.3700	0.00019	0.00022	0.00011	0.00	0.048	0.0570	<0.00002	0.00004	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.000055	0	67	70.0	1.7	0.5100	0.00011	0.0007	<0.0001	0	527.0000	<0.0005	0.0	0	288.00	<0.01
2018	Q2	GH_ERC	98	102	105	107	<1	136.0	5.9	<1	141.000	0.005	1.2000	<0.0001	0.00016	0.00014	0.001	0.048	0.0670	<0.00002	0.0001	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.000011	0	45	56.0	1.8	0.5500	0.00018	0.0027	<0.0001	0	292.0000	<0.0005	0.0	0	159.00	<0.01
2018	Q4	GH_ERC	97	99	100	96	<1	150.0	4.0	<1	154.000	<0.003	0.0400	<0.0001	<0.0001	<0.0001	0.00	0.059	0.0560	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.000007	0	50	49.0	<0.5	<0.5	0.00023	0.00034	<0.0001	<0.0001	322.0000	<0.0005	<0.0005	0	179.00	<0.01
2018	Q2	GH_FR1	95	95	106	115	1	154.0	6.1	<1	160.000	0.004	0.2400	0.00019	0.00023	0.00014	0.00	0.065	0.0680	<0.00002	0.00004	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.00003	0	66	66.0	2.3	0.8600	0.0001	0.00085	<0.0001	0	521.0000	0.00053	0.0	0	285.00	0.01
2018	Q2	LC_LCDSSLCC	102	103	104	109	1	153.0	3.0	<1	156.000	<0.003	0.0310	0.00019	0.00022	0.00012	0.00	0.033	0.0340	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.06	0.00022	0	66	60.0	1.7	1.8000	0.00011	0.00025	<0.0001	0	490.0000	<0.0005	0.0	0	270.00	<0.01
2018	Q4	LC_LCDSSLCC	100	103	105	110	<1	192.0	8.4	<1	200.000	<0.003	0.0033	0.00025	0.00026	0.0001	0.00	0.072	0.0700	<0.00002	<0.00002	<0.00005	<0.00005	0.016	0.017	<0.17	0.00016	0	108	106.0	0.7	7.0000	0.00011	0.00015	<0.0001	<0.0001	842.0000	<0.0005	<0.0005	0	470.00	<0.01
2019	Q2	CM_MC2	86	85	103	111	1	136.6	2.8	<1.0	139.200	0.007	0.30366	0.0001	0.00013	0.00016	0.00	0.042	0.04422	<0.00002	0.00002	<0.00005	<0.00005	0.012	0.015	<0.05	0.000055	0	61	63.3	2.1	1.2340	0.00017	0.00062	0.00065	0	535.2000	<0.0005	0.0	0	268.60	<0.01
2019	Q2	EV_HC1	95	91	101	112	1	164.0	4.2	<1.0	168.200	0.002	0.04084	0.00006	0.00006	0.00016	0.00	0.041	0.04186	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.000014	0	61	63.6	1.6	0.5680	0.00015	0.00021	<0.0001	<0.0001	521.6000	<0.0005	<0.0005	0	272.40	<0.01
2019	Q4	EV_HC1	89	86	100	105	1	200.4	4.5	<1.0	204.600	<0.003	0.01772	<0.0001	0.00008	0.00016	0.00	0.064	0.06176	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.000014	0	88	87.8	0.5	1.4520	0.00016	0.00019	<0.0001	<0.0001	713.8000	0.00012	<0.0005	0	420.40	<0.01
2019	Q2	EV_MC2	91	94	105	109	2	101.2	0.6	<1.0	101.440	0.017	0.24278	<0.0001	0.00007	0.0002	0.00	0.06	0.06668	<0.00002	0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.000021	0	36	36.9	2.4	1.3680	0.00019	0.00049	<0.0001	0	276.4000	0.00031	0.0	0	139.80	0.011
2019	Q4	FR_FRABCH	84	81	99	100	1	237.6	1.0	<1.0	238.200	<0.003	0.01272	<0.0001	0.0001	<0.0001	0.00	0.097	0.09518	<0.00002	<0.00002	<0.00005	<0.00005	0.01	0.012	<0.11	0.000023	0	134	137.2	1.0	1.2560	0.0001	0.00014	0.00015	0	982.2000	0.00023	0.0	0	589.40	0.015
2019	Q2	FR_FRCP1	88	87	104	119	1	159.0	2.7	<1.0	161.600	0.002	0.0769	0.00019	0.00021	0.00007	0.00	0.052	0.05316	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.000031	0	76	78.1	1.1	0.5260	0.0001	0.00024	0.00007	0	623.8000	<0.0005	0.0	0	334.20	<0.01
2019	Q4	FR_FRCP1	90	86	92	96	2	241.8	1.2	<1.0	242.600	<0.003	0.00608	0.00033	0.00035	0.00009	0.00	0.073	0.07464	<0.00002	<0.00002	<0.00005	<0.00005	0.01	0.012	<0.11	0.000036	0	163	170.6	1.0	1.4200	0.00006	0.00012	0.00011	0	1268.0000	0.0002	<0.0005	0	813.60	<0.01
2019	Q2	GH_ERC	94	96	103	111	1	140.2	1.8	<1.0	141.600	0.002	0.35252	<0.0001	0.00007	0.0001	0.00	0.048	0.05238	<0.00002	0.00003	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.000016	0	48	50.9	0.6	0.6140	0.00023	0.00099	<0.0001	0	322.4000	<0.0005	0.0	0	172.40	<0.01
2019	Q4	GH_ERC	100	96	99	104	1	152.8	2.1	<1.0	154.600	<0.003	0.00386	<0.0001	<0.0001	0.00007	0.00	0.062	0.0631	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.000008	0	52	55.5	<0.5	<0.5	0.00024	0.00026	<0.0001	<0.0001	344.6000	0.00042	<0.0005	0	187.20	0.007
2019	Q2	LC_DCDS	95	98	105	112	<1.0	115.8	2.6	<1.0	118.200	0.004	0.0290	0.0004	0.00039	0.00029	0.00	0.15	0.1476	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.000041	0	48	47.1	2.3	3.1780	0.00011	0.00012	0.00007	0	384.4000	<0.0005	<0.0005	0	191.40	<0.01
2019	Q2	LC_LC3	92	95	104	118	1	171.0	2.0	<1.0	173.000	<0.003	0.0092	0.00029	0.00031	0.0001	0.00	0.032	0.03202	<0.00002	<0.00002	<0.00005	<0.00005	0.012	0.013	<0.045	0.000273	0	91	94.7	0.4	7.7860	0.00015	0.00016	0.00009	0	781.6000	<0.0005	0.0	0	411.80	<0.01
2019	Q4	LC_LC3	90	83	100	104	2	220.4	<1.0	<1.0	222.800	0.002	0.00282	0.00032	0.00033	0.00009	0.00	0.066	0.06594	<0.00002	<0.00002	<0.00005	<0.00005	0.015	0.017	<0.11	0.00023	0	147	153.2	0.5	18.1340	0.00013	0.00014	0.00012	0	1128.0000	0.00052	0.0	0	673.00	0.03
2019	Q2	LC_LC5	91	89	102	113	<1.0	160.8	3.7	<1.0	164.200	0.002	0.06526	0.00011	0.00026	0.00009	0.00	0.072	0.07298	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.000023	0	75	79.2	1.0	2.1260	0.00013	0.00026	<0.0001	0	609.6000	<0.0005	0.0	0	320.40	<0.01
2019	Q2	LC_LCDSSLCC	101	101	104	115	1	147.6	2.2	<1.0	149.600	<0.003	0.01244	0.00017	0.00019	0.0001	0.00	0.039	0.03728	<0.00002	<0.00002	<0.00005	<0.00005	0.006	0.006	<0.05	0.000116	0	70	71.3	1.0	4.5840	0.00015	0.0002	<0.0001	0	579.4000	<0.0005	<0.0005	0	297.40	<0.01
2019	Q4	LC_LCDSSLCC	90	86	103	107	<0.5	195.4	2.7	<1.0	197.800	<0.003	0.00304	0.00019	0.00021	0.00006	0.00	0.074	0.07314	<0.00002	<0.00002	<0.00005	<0.00005	0.012	0.013	<0.065	0.000106	0	114	117.8	0.4	11.2680	0.00014	0.0002	<0.0001	<0.0001	869.0000	0.0004	0.0	0	495.00	<0.01
2020	Q2	CM_MC2	102	103	102	107	<1.00	159.0	1.7	<1.00	160.000	0.005	0.6630	0.00014	0.00016	0.00015	0.00	0.045	0.0505	<0.000020	0.00004	<0.000050	<0.000050	0.02	0.023	<0.050	0.000078	0	74	78.4	2.0	1.5000	0.00016	0.00096	0.00189	0	533.0000	0.00018	0.0	0	311.00	<0.0100
2020	Q4	CM_MC2	87	86	101	110	<1.00	234.0	3.8	<1.00	238.000	<0.0030	0.0454	0.00018	0.00018	0.00016	0.00	0.068	0.0670	<0.000020	<0.000020	<0.000050	<0.000050	0.059	0.061	0.105000	0.000017	0	134	132.0	1.1	3.2400	0.00011	0.0002	0.00273	0	1021.0000	0.00012	<0.00050	0	577.00	<0.0100
2020	Q2	EV_HC1	105	104	97	103	<1.00	104.0	6.7	67	177.000	<0.0030	0.1410	0.00006	<0.000100	0.00016	0.00	0.038	0.0398	<0.000020	<0.000020	<0.000050	<0.000050	<0.0100	<0.0100	<0.050	0.000017	0	68	64.9	2.3	0.7620	0.00011	0.00028	<0.000100	0	491.0000	0.00023	0.0	0	303.00	<0.0100
2020	Q4	EV_HC1	84	81	100	100	<1.00	184.0	9.5	<1.00	193.000	<0.0030	0.0317	<0.000100	0.00006	0.00015	0.00	0.06	0.0599	<0.000020	<0.000020	<0.000050	<0.000050	<0.0100	<0.0100	<0.050	0.000013	0	83	83.9	0.9	1.0600	0.00016	0.00021	<0.000100	<0.000100	659.0000	<0.00020	<0.00050	0	398.00	<0.0100
2020	Q2	EV_MC2	97	99	98	108	1	86.0	2.1	20	107.000	0.01	0.6750	0.00008	0.00015	0.0002	0.001	0.063	0.0785	<0.000020	0.00004	<0.000050	<0.000050	<0.0100	<0.0100	<0.050	0.000024	0	40	39.5	2.8	1.4300	0.00013	0.0011	<0.000100	0	267.0000	0.00037	0.0	0	157.00	0.006
2020	Q4	EV_MC2	99	100	103	104	<1.00	169.0	4.5	<1.00	173.000	0.003	0.0167	<0.000100	0.00008	0.00015	0.00	0.102	0.1060	<0.000020	<0.000020	<0.000050	0.00	0.01	0.012	<0.050	0.000023	0	69	70.0	1.4	3.8600	0.00013	0.00018	<0.000100	<0.000100	512.0000	0.00013	<0.00050	0	279.00	<0.0100
2020	Q2	FR_FRABCH	96	94	95	102	1	138.0	6.6	37	182.000	<0.0030	0.3280	0.00019	0.00023	0.0001	0.00	0.064	0.0678	<0.000020	0.00003	<0.000050	<0.000050	<0.0100	<0.0100	<0.050	0.00005	0	95	99.0	2.0	0.8620	<0.000100	0.00063	0.00009	0	695.0000	0.00022	0.0	0	411.00	0.008
2020	Q2	FR_FRCP1	94	90	93	98	<1.00	128.0	7.4	36	171.000	0.004	0.1815	0.00025	0.00027	0.00011	0.00	0.051	0.0531	<0.000020	0.00002	<0.000050	<0.000050	<0.0100	<0.0100	<0.050	0.000075	0	85	87.9	1.9	0.4160	0.00006	0.00039	0.00016	0	638.0000	0.00029	0.0	0	370.00	<0.0100
2020	Q2	GH_ERC	95	98	102	106	<1	120.0	2.9	30	153.000	0.004	0.7490	<0.000100	0.00009	0.0001	0.001	0.049	0.0635	<0.000020	0.00006	<0.000050	<0.000050	<0.0100	<0.0100	<0.050	0.00001	0	49	57.0	1.6	0.4100	0.00019	0.0018	<0.000100	0	96.8000	0.00016	0.0	0	175.00	0.007
2020	Q4	GH_ERC	97	96	99	100	<1	149.0	4.9	<1.00	154.000	0.003	0.0154	<0.000100	<0.000100	<0.000100	0.00	0.056	0.0587	<0.000020	<0.000020	<0.000050	<0.000050	<0.0100	<0.0100	<0.050	0.000007	0	50	50.9	0.4	0.3540	0.00023	0.00027	<0.000100	<0.000100	95.3000	0.00017	<0.00050	0	177.00	<0.0100
2020	Q2	GH_FR1	93	94	93	102	<1.00	127.0	5.6	34	166.000	0.002	0.1675	0.00017	0.00019	0.00014	0.00	0.069	0.0714	<0.000020	0.00002	<0.000050	<0.000050	<0.0100	<0.0100	<0.050	0.00003	0	74	77.8	2.3	1.0800	0.00009	0.00037	<0.000100	0	568.0000	0.00025	0.0	0	325.00	0.006
2020	Q2	LC_DCDS	104	98	99	109	<1.00	109.0	<1.00	<1.00	109.000	0.012	0.1732	0.00037	0.00039	0.00029	0.00	0.117	0.1250	<0.000020	0.00002	<0.000050	<0.000050	<0.0100	<0.0100	<0.050	0.000088	0	52	51.5	2.6	4.2700	0.00007	0.00041	0.00022	0	377.0000	0.00037	0.0	0	208.00	0.01
2020	Q4	LC_DCDS	88	89	102	101	<1.00	145.0	<1.00	<1.00	145.000	<0.0030	0.0065	0.00047	0.0005	0.0003	0.00	0.27	0.2600	<0.000020	<0.000020	<0.000050	<0.000050	<0.0100	0.007	<0.25	0.00019	0	127	127.0	1.4	17.0000	<0.000100	<0.000100	0.0002	0	909.0000	0.00013	<0.00050	0	508.00	<0.0100
2020	Q2	LC_LC5	97	90	96	114	<1.00	161.0	8.3	<1.00	170.000	0.002	0.2630	0.00013	0.00016	0.0001	0.00	0.067	0.0741	<0.000020	0.00003	<0.000050	<0.000050	<0.0100	<0.0100	<0.050	0.000027	0	74	78.4	1.7	1.9900	0.0001	0.0006	<0.000100	0	520.0000	0.00025	0.0	0	311.00	<0.0100
2020	Q4	LC_LC5	86	86	101	104	<1.00	187.0	6.5	<1.00	194.000	<0.0030	0.00572	0.00007	0.00009	<0.000100	0.00	0.096	0.1010	<0.000020	<0.000020	<0.000050	<0.000050	<0.0100	<0.0100	<0.050	0.000016	0	102	102.0	0.9	4.5700	0.00012	0.00014	<0.000100	<0.000100	748.0000	<0.00020	<0.00050	0	431.00	<0.0100
2020	Q2	LC_LCDSSLCC	112	109	101	103	<1.00	157.0	6.0	<1.00	163.000	0.018	0.0378	0.00019	0.00019	0.00013	0.00	0.036	0.0370	<0.000020	<0.000020	<0.000050	<0.000050	0.008	0.008	<0.050	0.000159	0	76	74.1	1.5	4.8100	0.00018	0.00022	0.00009	0	510.0000	0.0006	0.0	0	311.00	0.001
2021	Q2	CM_MC2	97	105	105	122	<2	141.0	<1	<1	141.000	0.006	0.4580	0.00011	0.00013	0.00015	0.00	0.037	0.04156	<0.00002	0.00003	<0.00005	<0.00005	0.02	0.022	<0.05	0.000059	0	60	59.5	1.9	0.6240	0.00018	0.00094	0.00168	0	498.8000	0.00023	0.0	0	255.00	<0.01
2021	Q4	CM_MC2	98	100	107	112	<2	224.2	4.4	<1	235.800	0.002	0.03102	0.00015	0.00016	0.00016	0.00	0.072	0.07222	<0.00002	<0.00002	<0.00005	<0.00005	0.031	0.033	<0.21	0.000017	0	126	123.9	1.5	2.0220	0.00016	0.00018	0.00031	0	1003.0000	0.0002	<0.0005	0	562.40	<0.01
2021	Q2	EV_HC1	101	105	103	121	<2	161.2	4.0	<1	164.800	0.003	0.1682	<0.0001	0.0001	0.00016	0.00	0.039	0.0396	<0.00002	0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.000015	0	57	57.5	2.5	0.4340	0.00012	0.00034	<0.0001	0	451.8000	0.00023	0.0	0	247.60	<0.01
2021	Q4	EV_HC1	99	92	102	109	<2	190.4	5.0	<1	203.600	0.001	0.01344	<0.0001	0.0001	0.00016	0.00	0.063	0.06232	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.000014	0	86	85.0	1.0	0.9920	0.00018	0.0002	<0.0001	<0.0001	698.8000	<0.0002	0.0	0	414.20	<0.01
2021	Q2	EV_MC2	100	98	105	122	<2	112.0	1.0	1	112.000	0.01	1.3634	0.0001	0.00017	0.0002	0.001	0.053	0.10414	0.00002	0.00013	0.00005	0.00	0.01	0.011	<0.05	0.000025	0	38	46.8	2.9	2.8920	0.00014	0.00223	0.0001	0	311.2000	0.00031	0.0	0	146.40	0.011
2021	Q4	EV_MC2	95	92	99	102	2	142.6	29.2	<1	176.600	0.003	0.02394	0.0001	0.0001	0.00016	0.00	0.099	0.09778	<0.00002	<0.00002	<0.00005	<0.00005	0.012	0.012	0.064800	0.000029	0	74	74.2	1.4	4.7140	0.00013	0.00015	<0.0001	<0.0001	524.4000	0.00027	<0.0005	0	301.20	0.01
2021	Q2	FR_FR2	95	102	105	118	<2	131.4	1.7	1	132.200	0.003	0.15718	0.00014	0.00015	0.00011	0.00	0.037	0.03864	<0.00002	0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.000035	0	54	53.8	1.9	0.3360	0.00011	0.00039	0.00012	0	417.2000	0.00027	0.0	0	220.20	<0.01
2021	Q4	FR_FR2	92	92	106	105	<2	206.6	2.7	1	226.200	0.001	0.00488	0.00046	0.00049	0.00012	0.00	0.096	0.09632	<0.00002	<0.00002	<0.00005	<0.00005	0.014	0.014	<0.21	0.000038	0	127	126.6	0.8	1.5680	0.00019	0.00015	0.00029	0	971.6000	<0.0002	0.0	0	559.60	0.025
2021	Q2	FR_FR4	93	95	104	118	<2	144.0	2.0	<1	145.200	0.003	0.30052	0.00016	0.00019	0.00012	0.00	0.038	0.04344	<0.00002	0.00002	<0.00005	<0.00005	<0.01	0.01	<0.05	0.000054	0	62	63.1	1.9	0.4040	0.00019	0.00057	0.00011	0	496.8000	0.00031	0.0	0	262.60	<0.01
2021	Q4	FR_FR4	92	90	105	109	<2	234.6	11.5	<1	264.400	0.001	0.02236	0.0005	0.0005	0.00012	0.00	0.09	0.08898	<0.00002	<0.00002	<0.00005	<0.00005	0.014	0.014	<0.25	0.00015	0	161	157.4	1.1	6.2280	<0.00012	0.00014	0.00025	0	1262.0000	0.00021	<0.0005	0	767.20	0.019
2021	Q2	FR_FRABCH	96	99	104	121	<2	174.2	2.6	<1	176.200	0.003	0.22372	0.00016	0.00018	0.00011	0.00	0.052	0.0550	<0.00002	0.00002	<0.00005	<0.00005	0.01	0.01	<0.05	0.000042	0	83	83.5	1.9	0.7540	0.0001	0.00045	<0.0001	0	667.4000	0.00029	0.0	0	358.80	<0.01
2021	Q4	FR_FRABCH	101	98	106	109	0	256.2	<1	<1	266.600	0.00	0.01224	0.00014	0.00016	0.00006	0.000006.	0.098	0.10336	<0.00002	<0.00002	<0.00005	<0.00005	0.012	0.013	<0.25	0.000039	0	152	155.0	0.9	2.6240	0.00012	0.00015	<0.0001	0	1162.0000	0.00012	0.0	0	668.20	0.004
2021	Q2	FR_FRCP1	99	104	102	117	<2	163.2	2.4	<1	164.800	0.002	0.1421	0.0002	0.00021	0.00011	0.00	0.043	0.0478	<0.00002	0.00002	<0.00005	<0.00005	0.01	0.01	<0.05	0.000051	0	73	72.6	1.8	0.4760	0.0001	0.00034	0.0001	0	583.2000	0.00023	0.0	0	312.80	<0.01
2021	Q2	FR_FRRD	92	95	104	115	2	178.8	3.3	<1	181.800	0.002	0.26048	0.00016	0.00019	0.0001	0.00	0.055	0.05778	<0.00002	0.00002	<0.00005	<0.00005	0.01	0.011	<0.05	0.000047	0	92	93.8	1.8	0.9080	0.00011	0.00051	0.0001	0	736.8000	0.00021	0.0	0	404.40	<0.01
2021	Q4	FR_FRRD	101	100	102	99	4	288.6	1.8	<1	313.200	0.001	0.00406	0.00011	0.00011	<0.0001	0.00	0.105	0.10376	<0.00002	<0.00002	<0.00005	<0.00005	0.017	0.017	<0.25	0.000047	0	164	165.4	0.9	1.7860	0.00019	0.00016	<0.0001	<0.0001	1250.2000	<0.0002	<0.0005	0	725.20	<0.01
2021	Q2	FR_MULTIPLATE	90	92	104	129	<2	125.2	1.3	<1	125.600	0.003	0.11136	0.00013	0.00014	0.00012	0.00	0.035	0.0369	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.000031	0	51	51.2	2.0	0.2180	0.00011	0.00029	0.0001	0	392.2000	0.00026	0.0	0	205.20	<0.01
2021	Q4	FR_MULTIPLATE	98	95	104	110	<2	183.4	1.9	<1	201.000	0.00	0.01292	0.00042	0.00044	0.00003	0.00	0.091	0.09196	<0.00002	<0.00002	<0.00005	<0.00005	0.002	0.002	<0.17	0.000041	0	126	124.8	0.9	0.9520	0.00001	0.00014	0.00015	0	953.2000	0.0001	<0.0005	0	537.00	<0.01
2021	Q2	GH_ERC	98	104	105	128	<2	139.0	<1	<1	139.000	0.004	0.8754	<0.0001	0.00012	0.00012	0.001	0.041	0.05644	<0.00002	0.00006	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.000009	0	43	51.4	1.8	0.4420	0.0002	0.00204	<0.0001	0	282.0000	0.00022	0.0	0	151.00	0.011
2021	Q4	GH_ERC	103	99	106	114	<2	147.2	2.1	<1	160.600	0.001	0.00878	<0.0001	<0.0001	0.0001	0.00	0.057	0.05778	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.000007	0	49	49.6	0.6	0.3360	0.00027	0.0003	<0.0001	<0.0001	315.2000	<0.0002	<0.0005	0	175.20	<0.01
2021	Q2	GH_FR1	89	93	104	120	2	162.2	1.8	1	163.200	0.004	0.16084	0.00014	0.00015	0.00011	0.00	0.061	0.06518	0.00002	0.00002	0.00005	0.00	0.01	0.01	0.050000	0.000024	0	69	68.1	2.0	0.8820	0.00011	0.00035	0.0001	0	553.4000	0.00022	0.0	0	293.60	0.01
2021	Q4	GH_FR1	91	90	107	119	2	207.8	4.9	1	229.400	0.001	0.00924	0.00012	0.00013	0.0001	0.00	0.119	0.1210	0.00002	0.00002	0.00005	0.00	0.01	0.01	0.090000	0.000019	0	115	114.4	0.7	1.9440	0.00013	0.00017	0.0001	0	890.8000	0.0002	0.0	0	514.60	0.01
2021	Q2	LC_DCDS	102	109	107	132	<2	121.2	<1	<1	121.200	0.008	0.14494	0.0006	0.00065	0.00029	0.00	0.164	0.1708	<0.00002	0.00002	<0.00005	<0.00005	<0.01	0.01	<0.05	0.000077	0	56	59.9	2.7	4.7000	<0.0001	0.00034	0.00021	0	474.4000	0.00031	0.0	0	223.60	0.01
2021	Q4	LC_DCDS	104	103	105	107	2	158.0	1.8	<1	164.800	0.002	0.00784	0.00063	0.00064	0.00029	0.00	0.228	0.2290	<0.00002	<0.00002	<0.00005	<0.00005	0.01	0.01	<0.25	0.000254	0	141	142.0	2.2	20.2800	<0.0001	<0.0001	<0.0001	0	1106.0000	0.00023	<0.0005	0	571.20	<0.01
2021	Q2	LC_LC3	98	101	106	122	2	174.6	1.0	1	174.600	0.001	0.0074	0.0003	0.00032	0.00013	0.00	0.027	0.02804	0.00002	0.00002	0.00005	0.00	0.012	0.013	0.050000	0.000371	0	79	80.4	1.1	6.0300	0.00012	0.00013	0.00012	0	673.0000	0.00048	0.0	0	351.40	0.01
2021	Q4	LC_LC3	113	110	106	104	3	226.8	6.6	1	241.800	0.001	0.0048	0.00031	0.00032	0.0001	0.00	0.059	0.05902	0.00002	0.00002	0.00005	0.00	0.02	0.021	0.250000	0.000234	0	137	138.6	1.3	26.2800	0.00015	0.00014	0.00015	0	1146.0000	0.00066	0.0	0	623.20	0.01
2021	Q2	LC_LC5	84	90	106	126	<2	154.2	3.3	<1	157.000	0.002	0.20958	0.00013	0.00015	0.00011	0.00	0.058	0.06812	<0.00002	0.00003	<0.00005	<0.00005	<0.01	<0.01	0.067800	0.00003	0	65	67.8	1.7	1.5600	0.00012	0.00047	<0.0001	0	523.6000	0.00021	0.0	0	274.20	<0.01
2021	Q4	LC_LC5	101	95	102	100	<2	188.2	10.5	<1	205.600	0.001	0.0138	0.00011	0.00013	0.0001	0.00	0.099	0.1017	<0.00002	<0.00002	<0.00005	<0.00005	0.01	0.01	<0.05	0.000019	0	101	103.5	1.3	5.0320	0.0002	0.00015	<0.0001	<0.0001	821.6000	0.00023	<0.0005	0	439.80	<0.01
2021	Q2	LC_LCDSSLCC	100	106	106	135	<2	147.2	2.0	<1	148.600	0.002	0.02226	0.00016	0.00017	0.00012	0.00	0.03	0.03186	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.000162	0	58	60.4	1.9	3.0460	0.00013	0.00017	<0.0001	0	471.2000	0.0003	<0.0005	0	244.40	<0.01
2021	Q4	LC_LCDSSLCC	101	100	108	107	2	201.8	8.2	<1	217.800	0.001	0.00304	0.00022	0.00023	0.00016	0.00	0.066	0.06706	<0.00002	<0.00002	<0.00005	<0.00005	0.015	0.015	<0.21	0.000137	0	112	114.0	1.0	15.9800	0.00017	0.00013	<0.0001	<0.0001	918.0000	0.00021	<0.0005	0	486.00	<0.01

Year	Quarter	Sample ID	Mean Survival (Control Normalized)	Mean Viability (Control Normalized)	Mean Length (Control Normalized)	Mean Wet Weight (Control Normalized)	ACIDITY TO pH 8.3 (As CaCO3)-N-mg/l	ALKALINITY BICARBONATE (As CaCO3) lab measured.-N-mg/l	ALKALINITY CARBONATE (As CaCO3) lab measured.-N-mg/l	ALKALINITY HYDROXIDE (As CaCO3) lab measured.-N-mg/l	ALKALINITY TOTAL (As CaCO3) lab measured.-N-mg/l	ALUMINUM-D-mg/l	ALUMINUM-T-mg/l	ANTIMONY-D-mg/l	ANTIMONY-T-mg/l	ARSENIC-D-mg/l	ARSENIC-T-mg/l	BARIUM-D-mg/l	BARIUM-T-mg/l	BERYLLIUM-D-mg/l	BERYLLIUM-T-mg/l	BISMUTH-D-mg/l	BISMUTH-T-mg/l	BORON-D-mg/l	BORON-T-mg/l	BROMIDE-D-mg/l	CADMIUM-D-mg/l	CADMIUM-T-mg/l	CALCIUM-D-mg/l	CALCIUM-T-mg/l	CARBON DISSOLVED ORGANIC-D-mg/l	CHLORIDE-D-mg/l	CHROMIUM-D-mg/l	CHROMIUM-T-mg/l	COBALT-D-mg/l	COBALT-T-mg/l	CONDUCTIVITY LAB-N-us/cm	COPPER-D-mg/l	COPPER-T-mg/l	FLUORIDE-D-mg/l	Hardness Total or Dissolved CaCO3-N-mg/l	IRON-D-mg/l
Tests categorized as possible or likely adverse response for viability (2015 to 2020) - Non- UFR Stations																																											
2016	Q4	CM_MC2	87	84	102	110	<1	178.0	1.9	<1	179.000	0.006	0.0880	0.00014	0.00016	0.00017	0.00	0.054	0.0560	<0.00002	<0.00002	<0.00005	<0.00005	0.019	0.021	<0.1	0.000027	0	84	85.0	1.6	2.0000	0.00016	0.00033	0.00076	0	669.0000	<0.0005	<0.0005	0	358.00	<0.01
2019	Q4	LC_LC5	82	72	100	101	<1.0	193.6	1.7	<1.0	194.800	<0.003	0.00826	0.00006	0.00011	<0.0001	0.00	0.093	0.09112	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	0.006	<0.05	0.000016	0	97	98.2	0.6	3.9220	0.00013	0.00015	<0.0001	<0.0001	724.2000	0.00028	<0.0005	0	411.00	<0.01
2020	Q2	LC_LC3	96	91	99	116	1	174.0	7.3	<1.00	181.000	0.012	0.00906	0.0003	0.00031	0.00014	0.00	0.03	0.0284	0.00002	<0.000020	<0.000050	<0.000050	0.012	0.013	<0.050	0.00037	0	96	94.0	0.9	8.4900	0.00017	0.00015	0.00022	0	685.0000	0.0010	0.0	0	423.00	0.015
Tests categorized as possible or likely adverse response for survival (2015 to 2020) - Non- UFR Stations																																										
2018	Q4	FR_FRABCH	77	80	99	99	2	246.0	2.2	<1	247.000	<0.003	0.0039	<0.0001	0.00011	<0.0001	0.00	0.11	0.1100	<0.00002	<0.00002	<0.00005	<0.00005	0.012	0.012	<0.25	0.000033	0	142	139.0	0.7	<2.5	0.00011	0.00014	0.0001	0	1066.0000	<0.0005	<0.0005	0	626.00	<0.01
2020	Q4	LC_LC3	90	91	101	106	1	214.0	5.8	<1.00	220.000	<0.0030	0.00376	0.00032	0.00033	<0.000100	0.00	0.059	0.0605	<0.000020	<0.000020	<0.000050	<0.000050	0.016	0.017	<0.25	0.000211	0	150	154.0	0.5	33.6000	0.0001	0.00013	0.00021	0	1152.0000	0.0002	<0.00050	0	676.00	<0.0100
Tests categorized as possible or likely adverse response for survival and viability (2015 to 2020) - Non-UFR Stations																																										
2015	Q4	FR_FRCP1	73	72	96	100	1	211.0	2.7	1	213.000	0.003	0.0046	0.00025	0.00028	0.0001	0.00	0.08	0.0800	0.0001	0.0001	0.00005	0.00	0.011	0.012	0.250000	0.000043	0	140	141.0	0.8	2.4000	0.00012	0.00016	0.0001	0	1100.0000	0.0005	0.0	0	650.00	0.01
2015	Q4	CM_MC2	82	81	100	103	1	189.0	6.3	1	195.000	0.003	0.0500	0.00015	0.00017	0.00017	0.00	0.074	0.0740	0.0001	0.0001	0.00005	0.00	0.024	0.027	0.250000	0.000012	0	108	107.0	1.2	3.4000	0.00016	0.00026	0.00051	0	821.0000	0.0005	0.0	0	456.00	0.01
2016	Q4	FR_FRCP1	54	55	98	100	<1	194.0	4.6	<1	198.000	0.004	0.0240	0.00019	0.0002	<0.0001	0.00	0.075	0.0740	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.25	0.000042	0	108	106.0	1.0	1.4000	<0.0001	0.00015	<0.0001	<0.0001	850.0000	<0.0005	<0.0005	0	478.00	<0.01
2016	Q2	GH_FR1	76	77	104	101	<1	163.0	4.2	<1	166.000	<0.003	0.0580	0.00015	0.00018	0.0001	0.00	0.08	0.0800	<0.00004	<0.00004	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.000022	0	80	79.0	1.4	0.9600	0.00011	0.00022	<0.0001	<0.0001	598.0000	<0.0005	<0.0005	0	332.00	<0.01
2016	Q4	GH_FR1	44	46	98	105	1	191.0	2.0	<1	192.000	<0.003	0.0100	0.00016	0.00024	0.00011	0.00	0.10	0.1000	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.25	0.000016	0	98	100.0	0.8	1.6000	0.00012	0.00016	<0.0001	<0.0001	758.0000	<0.0005	<0.0005	0	431.00	<0.01
2016	Q2	CM_MC2	73	73	102	101	1	143.0	3.5	<1	146.000	0.007	0.3700	0.00015	0.00017	0.00017	0.00	0.045	0.0450	<0.00004	0.00004	<0.00005	<0.00005	0.017	0.017	<0.05	0.000064	0	69	68.0	1.5	1.2000	0.00017	0.0006	0.0021	0	537.0000	<0.0005	0.0	0	282.00	<0.01
2016	Q4	EV_HC1	60	59	97	104	<1	189.0	5.3	<1	195.000	0.004	0.0370	<0.0001	0.0001	0.00015	0.00	0.057	0.0560	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.2	0.000016	0	82	82.0	1.2	1.2000	0.00015	0.00018	<0.0001	<0.0001	661.0000	<0.0005	<0.0005	0	381.00	<0.01
2016	Q2	EV_MC2	68	66	105	113	1	100.0	<1	<1	100.000	0.014	0.4100	0.00012	0.00016	0.00018	0.00	0.057	0.0620	<0.00004	0.00005	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.000028	0	40	40.0	2.3	1.7000	0.00013	0.00073	<0.0001	0	286.0000	0.00051	0.0	0	152.00	0.012
2016	Q2	LC_LCDSSLCC	84	80	104	103	<1	155.0	2.7	<1	157.000	0.003	0.0170	0.00023	0.00026	0.00012	0.00	0.039	0.0400	<0.00004	<0.00004	<0.00005	<0.00005	0.01	0.011	<0.1	0.00020	0	75	75.0	1.3	3.2000	0.00015	0.00019	0.00009	0	562.0000	0.00044	0.0	0	304.00	<0.01
2016	Q4	LC_LCDSSLCC	69	70	104	116	1	181.0	2.7	<1	184.000	<0.003	0.0300	0.00022	0.00027	<0.0001	0.00	0.061	0.0620	<0.00002	<0.00002	<0.00005	<0.00005	0.01	0.011	<0.25	0.00015	0	95	95.0	0.8	6.5000	0.00012	0.00021	<0.0001	<0.0001	742.0000	<0.0005	<0.0005	0	395.00	<0.01
2017	Q4	FR_FRCP1	27	29	96	105	-	-	-	-	190.000	<0.003	0.0160	0.00024	0.00026	<0.0001	0.00	0.074	0.0750	<0.00002	<0.00002	<0.00005	<0.00005	0.011	0.011	0.290000	0.000012	0	-	151.0	1.0	<2.5	<0.0001	0.00018	<0.0001	0	1174.0000	<0.0005	<0.0005	0	745.00	0.01
2017	Q4	GH_FR1	23	23	92	108	-	-	-	-	181.000	<0.003	0.0055	0.00017	0.00019	0.0001	0.00	0.11	0.1100	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	0.050000	0.000017	0	-	106.0	1.1	1.3000	0.00012	0.00015	<0.0001	<0.0001	826.0000	<0.0005	<0.0005	0	497.00	<0.01
2017	Q4	CM_MC2	23	23	113	128	-	-	-	-	202.000	<0.003	0.0081	0.00025	0.00028	0.00017	0.00	0.079	0.0770	<0.00002	<0.00002	<0.00005	<0.00005	0.033	0.035	0.099000	0.000012	0	-	121.0	1.1	4.4000	0.00012	0.00019	0.0011	0	919.0000	<0.0005	<0.0005	0	532.00	<0.01
2017	Q4	EV_HC1	34	34	90	92	-	-	-	-	185.000	<0.003	0.0055	<0.0001	0.00011	0.00015	0.00	0.065	0.0620	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.09	0.000016	0	-	84.0	1.1	1.1000	0.00013	0.00019	<0.0001	<0.0001	698.0000	<0.0005	<0.0005	0	399.00	<0.01
2017	Q4	EV_MC2	24	23	91	102	-	-	-	-	175.000	<0.003	0.0086	<0.0001	0.00012	0.00015	0.00	0.11	0.1100	<0.00002	<0.00002	<0.00005	<0.00005	0.012	0.013	<0.09	0.000026	0	-	81.0	0.9	7.1000	0.00011	0.00015	<0.0001	<0.0001	588.0000	<0.0005	<0.0005	0	314.00	<0.01
2017	Q2	GH_ERC	63	69	115	123	-	-	-	-	149.000	0.005	0.8700	<0.0001	0.00013	0.00012	0.001	0.049	0.0620	<0.00002	0.00007	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.000011	0	-	56.0	1.8	0.5500	0.00021	0.0023	<0.0001	0	302.0000	<0.00044	0.0	0	168.00	<0.01
2017	Q4	GH_ERC	23	22	91	96	-	-	-	-	148.000	<0.003	0.0044	<0.0001	<0.0001	<0.0001	0.00	0.057	0.0550	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.000006	0	-	47.0	0.7	<0.5	0.00022	0.00029	<0.0001	<0.0001	300.0000	<0.0005	<0.0005	0	167.00	<0.01
2017	Q4	LC_LCDSSLCC	41	41	108	119	-	-	-	-	186.000	<0.003	0.0043	0.00026	0.00028	0.00011	0.00	0.079	0.0770	<0.00002	<0.00002	<0.00005	<0.00005	0.013	0.014	0.053000	0.00016	0	-	114.0	0.9	6.7000	0.00011	0.00019	<0.0001	<0.0001	853.0000	<0.0005	<0.0005	0	494.00	<0.01
2018	Q4	GH_FR1	66	68	96	97	<1	197.0	8.9	<1	206.000	<0.003	0.0043	0.00013	0.00014	<0.0001	0.00	0.12	0.1100	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.25	0.000017	0	113	110.0	0.7	<2.5	0.00011	0.00015	<0.0001	<0.0001	869.0000	<0.0005	<0.0005	0	513.00	<0.01
2019	Q2	FR_FRABCH	73	75	96	96	1	182.2	2.3	<1.0	184.200	<0.003	0.10488	0.00013	0.00016	0.00006	0.00	0.069	0.07022	<0.00002	<0.00002	<0.00005	<0.00005	0.006	0.007	<0.045	0.000031	0	97	100.4	1.1	0.8800	0.0001	0.0003	0.00012	0	802.6000	<0.0005	0.0	0	429.80	<0.01
2019	Q2	GH_FR1	69	71	102	106	<1.0	168.2	3.1	<1.0	171.000	<0.003	0.10376	0.00016	0.00017	0.00011	0.00	0.079	0.0779	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.000018	0	86	85.3	1.1	1.2260	0.00013	0.00037	0.00006	0	681.8000	<0.0005	0.0	0	378.40	<0.01
2019	Q4	GH_FR1	69	65	99	109	<1.0	202.6	1.7	<1.0	204.000	0.002	0.01922	0.00011	0.00012	<0.0001	0.00	0.105	0.1048	<0.00002	<0.00002	<0.00005	<0.00005	0.006	<0.01	<0.05	0.000016	0	105	111.8	0.7	1.6980	0.00014	0.00016	<0.0001	0	806.4000	0.0002	0.0	0	468.20	0.007
2019	Q4	CM_MC2	81	75	99	105	1	216.6	3.2	<1.0	219.600	<0.003	0.06298	0.0002	0.00021	0.00018	0.00	0.063	0.0642	<0.00002	<0.00002	<0.00005	<0.00005	0.028	0.028	<0.085	0.000023	0	134	131.8	0.8	3.1320	0.00019	0.0003	0.00148	0	973.8000	0.00023	<0.0005	0	594.00	<0.01
2019	Q4	EV_MC2	80	75	100	101	1	173.0	3.9	<1.0	177.000	<0.003	0.00486	0.00008	0.00009	0.00016	0.00	0.111	0.1088	<0.00002	<0.00002	<0.00005	<0.00005	0.009	0.01	0.038400	0.000022	0	74	72.3	0.6	3.6940	0.00017	0.00015	<0.0001	<0.0001	537.4000	0.00015	<0.0005	0	303.40	0.006
2019	Q4	LC_DCDS	73	66	100	105	<1.0	151.4	1.0	1	151.400	<0.003	0.00414	0.00049	0.00051	0.00033	0.00	0.255	0.2566	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.1	0.000123	0	100	100.9	1.7	12.4400	0.00009	0.00006	0.00008	0	739.4000	0.00034	0.0	0	402.00	<0.01
2020	Q4	FR_FRCP1	57	57	96	97	<1.00	224.0	11.2	<1.00	235.000	<0.0030	0.0112	0.00035	0.00038	0.00012	0.00	0.08	0.0780	<0.000020	<0.000020	<0.000050	<0.000050	0.012	0.012	<0.25	0.000112	0	155	151.0	1.0	2.4100	<0.000100	0.00015	0.00022	0	1106.0000	0.00014	<0.00050	0	721.00	0.016
2020	Q4	GH_FR1	78	78	99	102	<1.00	202.0	5.4	<1.00	208.000	<0.0030	0.0718	0.0001	0.00011	0.00006	0.00	0.111	0.1190	<0.000020	0.00001	<0.000050	<0.000050	0.006	0.006	<0.050	0.00002	0	114	115.0	0.4	1.7900	0.00012	0.00026	<0.000100	0	818.0000	<0.00020	0.0	0	494.00	<0.0100
2020	Q4	LC_LCDSSLCC	89	87	102	111	<1.00	191.0	8.3	<1.00	199.000	<0.0030	<0.0030	0.0002	0.00021	0.00006	0.00	0.07	0.0714	<0.000020	<0.000020	<0.000050	<0.000050	0.013	0.013	<0.050	0.000111	0	116	119.0	0.4	17.5000	0.00013	0.00014	<0.000100	<0.000100	872.0000	<0.00020	<0.00050	0	498.00	<0.01000
Tests categorized as possible or likely adverse response for length (2015 to 2020)																																										
2015	Q4	GH_FR1	80	79	94	98	1	187.0	5.8	1	193.000	0.003	0.0037	0.00012	0.00015	0.0001	0.00	0.11	0.1100	0.0001	0.0001	0.00005	0.00	0.01	0.012	0.250000	0.000017	0	106	107.0	0.7	2.0000	0.00012	0.00017	0.0001	0	783.0000	0.0005	0.0	0	445.00	0.01
Tests categorized as possible or likely adverse response for survival, viability, and length (2015 to 2020)																																										
2020	Q4	FR_FRABCH	75	72	92	95	<1.00	223.0	2.2	<1.00	225.000	<0.0030	0.0108	0.0001	0.00012	<0.000100	0.00	0.10	0.1030	<0.000020	<0.000020	<0.000050	<0.000050	0.012	0.012	<0.25	0.000036	0	146	146.0	0.6	1.8200	0.0001	0.00013	0.00006	0	1011.0000	<0.00020	0.0	0	634.00	0.006
Tests categorized as possible or likely adverse response for survival, viability, length, and weight (2015 to 2020)																																										
2018	Q4	FR_FRCP1	23	19	83	87	13	336.0	<1	<1	336.000	<0.003	0.0064	0.00049	0.0005	<0.0002	0.00	0.015	0.0180	<0.00004	<0.000028	<0.0001	<0.00007	<0.02	0.014	<0.25	<0.00001	0	401	414.0	1.7	6.4000	<0.0002	0.00015	<0.0002	<0.00014	3314.0000	<0.0005	<0.0007	0	2492.00	<0.02
Tests categorized as possible or likely adverse response for survival (2021)																																										
2021	Q4	FR_FRCP1	83	83	105	110	<2	240.2	9.1	<1	258.600	<0.001	0.0054	0.00049	0.0005	0.00012	0.00	0.089	0.08896	<0.00002	<0.00002	<0.00005	<0.00005	0.013	0.014	<0.25	0.000145	0	156	160.4	1.3	2.0680	<0.0001	0.00015	0.00022	0	1244.0000	0.0002	<0.0005	0	748.40	0.017

Notes:
"-D-" = dissolved concentration; "-T-" = total concentration; "-N-" = normal concentration; $CaCO_3$ = calcium carbonate; ∑TU = sum of toxic units; WQG = water quality guideline; mg/l = milligrams per litre; ug/l = micrograms per litre; % = percent.

Screening
Concentrations of parameters in 2021 tests categorized as possible or likely response are shaded if the concentration is greater than the maximum concentration measured in references or tests categorized as no adverse response.

Year	Quarter	Sample ID	IRON-T-mg/l	LEAD-D-mg/l	LEAD-T-mg/l	LITHIUM-D-mg/l	LITHIUM-T-mg/l	MAGNESIUM-D-mg/l	MAGNESIUM-T-mg/l	MAJOR ANION SUM-N-meq/l	MAJOR CATION SUM-N-meq/l	MANGANESE-D-mg/l	MANGANESE-T-mg/l	MERCURY-D-mg/l	MERCURY-T-mg/l	MOLYBDENUM-D-mg/l	MOLYBDENUM-T-mg/l	NICKEL-D-mg/l	NICKEL-T-mg/l	NITRATE NITROGEN (NO3) AS N-N-mg/l	NITRITE NITROGEN (NO2) AS N-N-mg/l	NITROGEN AMMONIA (AS N)-N-mg/l	ORTHO-PHOSPHATE-N-mg/l	OXIDATION-REDUCTION POTENTIAL LAB-N-mv	pH LAB-N-ph units	PHOSPHORUS-N-mg/l	POTASSIUM-D-mg/l	POTASSIUM-T-mg/l	SELENIUM-D-mg/l	SELENIUM-T-mg/l	SILICON-D-mg/l	SILICON-T-mg/l	SILVER-D-mg/l	SILVER-T-mg/l	SODIUM-D-mg/l	SODIUM-T-mg/l	STRONTIUM-D-mg/l	STRONTIUM-T-mg/l	SULFATE (AS SO4)-D-mg/l	THALLIUM-D-mg/l	THALLIUM-T-mg/l	TIN-D-mg/l
Reference (2015 - 2021)																																										
2015	Q2	Reference (FR_UFR1)	0.04000	0.00005	0.0001	0.0012	0	9	9.4	2.7	2.7000	0.0007	0.002200	0.000005	0.00001	0.00055	0.00059	0.0005	0.0	0.038	0.001	0.005	0	361.0	8.300	0.01	0.34	0.3600	0.00046	0.0	1.7	1.80000	0.00001	0.0	0.58	0.58	0.064	0	14.00000	0.00001	0.00001	0.0001
2015	Q4	Reference (FR_UFR1)	0.01000	0.00005	0.0001	0.0014	0	14	14.0	3.9	3.9000	0.0002	0.000310	0.000005	0.00001	0.00061	0.00059	0.0005	0.0	0.074	0.001	0.005	0	377.0	8.400	0.0	0.39	0.3900	0.00065	0.0	1.5	1.60000	0.00001	0.0	0.68	0.68	0.092	0	47.00000	0.00001	0.00001	0.0001
2015	Q2	Reference (GH_ER2)	0.09300	0.00005	0.0001	0.0016	0	11	11.0	3.4	3.3000	0.0029	0.007400	0.0000055	0.00001	0.00095	0.00096	0.0005	0.0	0.082	0.001	0.0068	0	330.0	8.300	0.01	0.35	0.3700	0.00075	0.0	1.7	1.90000	0.00001	0.0	0.74	0.74	0.20	0	17.00000	0.00001	0.00001	0.0001
2015	Q4	Reference (GH_ER2)	0.02200	0.00005	0.0001	0.0016	0	11	11.0	3.4	3.5000	0.0023	0.003500	0.000005	0.00001	0.0010	0.0010	0.0005	0.0	0.081	0.001	0.005	0	386.0	8.300	0.0	0.35	0.3600	0.00079	0.0	1.7	1.80000	0.00001	0.0	0.65	0.67	0.21	0	22.00000	0.00001	0.00001	0.0001
2016	Q2	Reference (FR_UFR1)	0.04300	<0.00005	0.0001	0.0012	0	10	10.0	2.6	2.7000	0.0003	0.001600	<0.000005	0.0000	0.00063	0.00065	<0.0005	<0.0005	0.018	<0.001	<0.005	0	292.0	8.300	0.0	0.32	0.3400	0.00051	0.0	1.8	1.90000	<0.00001	<0.00001	0.62	0.63	0.065	0	15.00000	<0.00001	<0.00001	<0.0001
2016	Q4	Reference (FR_UFR1)	0.01900	<0.00005	<0.00005	0.0013	0	13	12.0	3.6	3.5000	0.0002	0.000560	<0.000005	0.0000	0.00057	0.00058	<0.0005	<0.0005	0.097	<0.001	<0.005	0	322.0	8.300	0.0	0.36	0.3700	0.00066	0.0	1.7	1.90000	<0.00001	<0.00001	0.68	0.68	0.089	0	38.00000	<0.00001	<0.00001	<0.0001
2016	Q2	Reference (GH_ER2)	0.17000	<0.00005	0.0001	0.0016	0	10	11.0	3.2	3.3000	0.0014	0.013000	<0.000005	0.0000	0.00095	0.00095	<0.0005	0.0	0.089	<0.001	<0.005	0	339.0	8.300	0.01	0.34	0.4100	0.00075	0.0	1.7	2.00000	<0.00001	<0.00001	0.72	0.72	0.20	0	17.00000	<0.00001	<0.00001	<0.0001
2016	Q4	Reference (GH_ER2)	0.01200	<0.00005	<0.00005	0.0019	0	11	11.0	3.4	3.3000	0.0011	0.001900	<0.000005	<0.000001625	0.00098	0.0010	<0.0005	<0.0005	0.075	<0.001	0.0056	0	352.0	8.300	0.0	0.35	0.3700	0.00085	0.0	1.7	1.80000	<0.00001	<0.00001	0.69	0.69	0.23	0	23.00000	<0.00001	<0.00001	<0.0001
2017	Q4	Reference (CM_MC1)	<0.01	<0.00005	<0.00005	0.0046	0	-	11.0	-	-	0.0001	0.000260	<0.000005	0.0000	0.00085	0.00088	<0.0005	<0.0005	0.068	0.0018	0.007	0	-	8.200	0.0	-	0.5000	0.0002	0.0	-	-	<0.00001	<0.00001	-	3.00	0.16	0	28.00000	<0.00001	<0.00001	<0.0001
2017	Q2	Reference (FR_UFR1)	0.20000	<0.00005	0.0001	0.001	0	-	8.6	-	-	0.0005	0.008700	<0.000005	0.0000	0.0005	0.00054	<0.0005	0.0	0.070	0.0019	0.0056	0	-	8.300	0.02	-	0.4200	0.00056	0.0	-	-	<0.00001	<0.00001	-	0.53	0.061	0	10.00000	<0.00001	0.00001	<0.0001
2017	Q4	Reference (FR_UFR1)	<0.01	<0.00005	<0.00005	0.0017	0	-	14.0	-	-	0.0001	0.000470	<0.000005	<0.0000005	0.00057	0.00059	<0.0005	<0.0005	0.031	0.001	0.0052	0	-	8.400	0.0	-	0.3900	0.00059	0.0	-	-	<0.00001	<0.00001	-	0.69	0.099	0	46.00000	<0.00001	<0.00001	<0.0001
2017	Q2	Reference (GH_ER2)	1.10000	<0.00005	0.0007	0.0013	0	-	12.0	-	-	0.0014	0.069000	<0.000005	0.0000	0.00085	0.00097	<0.0005	0.0	0.110	<0.001	0.005	0	-	8.400	0.1	-	0.6700	0.00072	0.0	-	-	<0.00001	0.0	-	0.69	0.19	0	14.00000	<0.00001	0.00004	<0.0001
2017	Q4	Reference (GH_ER2)	0.01100	<0.00005	<0.00005	0.0019	0	-	11.0	-	-	0.0004	0.001500	<0.000005	<0.0000005	0.0011	0.0010	<0.0005	<0.0005	0.050	<0.001	0.0069	<0.001	-	8.400	0.0	-	0.3600	0.00084	0.0	-	-	<0.00001	<0.00001	-	0.70	0.21	0	19.00000	<0.00001	<0.00001	<0.0001
2018	Q2	Reference (CM_MC1)	0.31000	<0.00006	0.0003	0.0021	0	7	7.1	1.9	1.9000	0.001	0.009200	0.0000052	0.0000	0.00051	0.00057	<0.0006	0.0	0.007	<0.001	0.008	0	281.0	8.000	0.02	0.34	0.4400	0.00018	0.0	2.1	2.60000	<0.000012	<0.00001	1.2	1.20	0.078	0	5.10000	<0.000012	0.00002	<0.00012
2018	Q4	Reference (CM_MC1)	<0.01	<0.00005	<0.00005	0.0043	0	11	11.0	3.0	3.0000	0.0001	0.000290	<0.000005	0.0000	0.00086	0.00088	<0.0005	<0.0005	0.017	<0.001	0.015	0	411.0	8.300	0.0	0.42	0.4200	0.00023	0.0	2.1	2.10000	<0.00001	<0.00001	3.1	3.10	0.14	0	14.00000	<0.00001	<0.00001	<0.0001
2018	Q2	Reference (FR_UFR1)	0.19000	<0.00005	0.0001	0.0011	0	9	8.4	2.3	2.3000	0.0006	0.008300	<0.000005	0.0000	0.00059	0.00056	<0.0005	0.0	0.052	<0.001	0.0082	0	301.0	8.200	0.02	0.34	0.4100	0.00049	0.0	1.8	2.10000	<0.00001	0.0	0.53	0.52	0.063	0	9.90000	<0.00001	0.00001	<0.0001
2018	Q4	Reference (FR_UFR1)	<0.01	<0.00005	<0.00005	0.0015	0	14	14.0	3.9	3.8000	0.0001	0.000320	<0.000005	<0.0000005	0.00058	0.00058	<0.0005	<0.0005	0.078	<0.001	0.047	0	386.0	8.400	0.0	0.37	0.3500	0.00076	0.0	1.5	1.60000	<0.00001	<0.00001	0.69	0.70	0.097	0	44.00000	<0.00001	<0.00001	<0.0001
2018	Q2	Reference (GH_ER2)	1.00000	<0.00005	0.0008	0.0014	0	10	11.0	3.0	2.9000	0.0008	0.065000	<0.000005	0.0000	0.00089	0.00089	<0.0005	0.0	0.100	0.0011	0.009	0	271.0	8.300	0.13	0.38	0.6800	0.00068	0.0	1.8	2.90000	<0.00001	0.0	0.65	0.66	0.19	0	13.00000	<0.00001	0.00004	<0.0001
2018	Q4	Reference (GH_ER2)	0.01500	<0.00005	<0.00005	0.0018	0	12	11.0	3.4	3.4000	0.0004	0.001300	<0.000005	<0.0000005	0.0010	0.0010	<0.0005	<0.0005	0.081	<0.001	0.015	0	349.0	8.300	0.0	0.35	0.3400	0.00092	0.0	1.8	1.80000	<0.00001	<0.00001	0.73	0.71	0.22	0	22.00000	<0.00001	<0.00001	<0.0001
2018	Q2	Reference (LC_SLC)	0.05900	<0.00005	0.0001	0.0013	0	8	8.5	2.4	2.5000	0.0002	0.002100	<0.000005	0.0000	0.00052	0.00053	<0.0005	0.0	0.091	<0.001	0.013	0	241.0	8.100	0.01	0.27	0.2900	0.00051	0.0	1.5	1.60000	<0.000012	<0.00001	0.46	0.46	0.068	0	11.00000	<0.00001	<0.00001	<0.0001
2018	Q4	Reference (LC_SLC)	0.01300	<0.00005	<0.00005	0.0035	0	17	17.0	4.2	4.1000	0.0001	0.000330	<0.000005	<0.0000005	0.0013	0.0013	0.00052	<0.0005	0.130	<0.001	0.012	0	376.0	8.300	0.01	0.36	0.3700	0.0016	0.0	2.0	2.10000	<0.00001	<0.00001	0.96	0.98	0.17	0	61.00000	<0.00001	<0.00001	<0.0001
2019	Q2	Reference (CM_MC1)	0.17240	<0.00005	0.0001	0.0025	0	8	8.0	2.2	2.1320	0.0005	0.005254	<0.000005	0.0000	0.00061	0.00064	<0.0005	0.0	0.0102	<0.001	0.014	0	377.2	8.140	0.01	0.34	0.4084	0.00021	0.0	2.1	2.41800	<0.00001	<0.00001	1.59	1.622	0.089	0	7.54000	<0.00001	0.00002	<0.0001
2019	Q4	Reference (CM_MC1)	<0.01	<0.00005	<0.00005	0.0044	0	11	11.2	3.2	3.0980	0.0001	0.000186	<0.000005	<0.0000005	0.00086	0.00088	<0.0005	<0.0005	0.0287	0.0006	0.0057	0	378.4	8.240	0.0	0.41	0.4206	0.00026	0.0	2.1	2.25000	<0.00001	<0.00001	3.09	3.156	0.142	0	14.02000	<0.00001	<0.00001	0.00007
2019	Q2	Reference (FR_UFR1)	0.04700	<0.00005	0.000	0.0012	0	10	10.2	2.7	2.5900	0.0003	0.002764	<0.000005	0.0000	0.00058	0.00057	<0.0005	0.0	0.0356	<0.001	0.0299	0	393.8	8.060	0.01	0.32	0.3284	0.00058	0.0	1.8	1.87200	<0.00001	<0.00001	0.59	0.596	0.067	0	15.15400	<0.00001	<0.00001	<0.0001
2019	Q4	Reference (FR_UFR1)	0.06820	<0.00005	0.0001	0.0016	0	14	14.3	3.8	3.7620	0.0001	0.004240	<0.000005	0.0000	0.00056	0.00056	<0.0005	0.0	0.1674	0.0006	0.0213	0	412.2	8.260	0.01	0.37	0.3982	0.0009	0.0	1.9	1.99600	<0.00001	<0.00001	0.7	0.708	0.093	0	43.60000	<0.00001	0.00001	<0.0001
2019	Q2	Reference (GH_ER2)	0.28800	<0.00005	0.0002	0.0015	0	11	10.9	3.1	3.1560	0.0002	0.015648	<0.000005	0.0000	0.00098	0.00091	<0.0005	0.0	0.0924	<0.001	0.0141	<0.001	400.0	8.240	0.04	0.33	0.4192	0.00091	0.0	1.7	2.04600	<0.00001	0.0	0.73	0.729	0.216	0	18.60000	<0.00001	0.00001	<0.0001
2019	Q4	Reference (GH_ER2)	0.01560	<0.00005	<0.00005	0.0018	0	12	11.6	3.5	3.2880	0.0006	0.001434	<0.000005	<0.0000005	0.0010	0.00107	<0.0005	<0.0005	0.0838	0.0006	0.0111	0	385.8	8.280	0.0	0.33	0.3560	0.00102	0.0	1.8	1.89000	<0.00001	<0.00001	0.71	0.733	0.208	0	22.82000	<0.00001	<0.00001	<0.0001
2019	Q2	Reference (LC_SLC)	0.01520	<0.00005	<0.00005	0.0017	0	10	10.3	2.9	2.7340	0.0001	0.000756	<0.000005	0.0000	0.00067	0.00068	<0.0005	<0.0005	0.1017	<0.001	0.0077	0	433.2	8.260	0.0	0.29	0.2840	0.00079	0.0	1.6	1.68800	<0.00001	<0.00001	0.57	0.554	0.091	0	20.15800	<0.00001	<0.00001	<0.0001
2019	Q4	Reference (LC_SLC)	0.00920	<0.00005	<0.00005	0.0037	0	16	17.2	4.3	4.0420	<0.0001	0.000516	<0.000005	<0.0000005	0.00128	0.00153	<0.0005	<0.0005	0.1396	<0.001	0.0079	0	462.4	8.200	0.0	0.37	0.3800	0.00158	0.0	2.1	2.17800	<0.00001	<0.00001	1.01	1.039	0.164	0	63.42000	<0.00001	<0.00001	<0.0001
2020	Q2	Reference (CM_MC1)	0.27800	<0.000050	0.0002	0.0029	0	8	8.5	2.3	2.2200	0.0003	0.008340	<0.0000050	0.0000	0.00053	0.00059	<0.00050	0.0	0.0116	<0.00100	0.0126	0	409.0	8.180	0.0	0.37	0.4830	0.00022	0.0	2.1	2.59000	<0.0000100	<0.0000100	1.62	1.71	0.099	0	6.76000	<0.0000100	0.00002	<0.000100
2020	Q4	Reference (CM_MC1)	0.01060	<0.000050	<0.000050	0.0046	0	11	10.9	3.1	3.0200	0.0001	0.000402	<0.0000050	0.0000	0.00082	0.00088	<0.00050	<0.00050	0.0149	<0.00100	0.0051	0	265.0	8.200	0.0	0.44	0.4300	0.00022	0.0	2.1	2.23000	<0.0000100	<0.0000100	3.02	3.04	0.152	0	13.90000	<0.0000100	<0.0000100	<0.000100
2020	Q2	Reference (FR_UFR1)	0.19780	<0.000050	0.0001	0.001	0	9	9.6	2.6	2.4200	0.0002	0.008820	<0.0000050	0.0000	0.00056	0.00056	<0.00050	0.0	0.0323	0.0009	0.0038	0	394.0	8.380	0.02	0.32	0.3850	0.00053	0.0	1.9	2.07000	<0.0000100	0.0	0.56	0.56	0.066	0	12.20000	<0.0000100	0.00001	<0.000100
2020	Q4	Reference (FR_UFR1)	0.00940	<0.000050	<0.000050	0.0015	0	13	13.8	3.9	3.6600	0.0002	0.000476	<0.0000050	0.0000	0.0006	0.00062	<0.00050	<0.00050	0.0254	0.0008	0.012	0	277.0	8.300	0.0	0.38	0.3800	0.00076	0.0	1.6	1.67000	<0.0000100	<0.0000100	0.65	0.651	0.095	0	47.20000	<0.0000100	<0.0000100	<0.000100
2020	Q2	Reference (GH_ER2)	0.81800	<0.000050	0.0006	0.0016	0	11	11.9	3.3	3.1200	0.0012	0.066300	<0.0000050	0.00001	0.00104	0.0009	<0.00050	0.0	0.104	<0.00100	0.0231	0	346.0	8.360	0.0	0.38	0.6000	0.00088	0.0	1.8	2.69000	<0.0000100	0.0	0.73	0.766	0.19	0	14.80000	<0.0000100	0.00003	<0.000100
2020	Q4	Reference (GH_ER2)	0.03440	<0.000050	<0.000050	0.0017	0	11	11.1	3.4	3.3000	0.0013	0.003040	<0.0000050	<0.00000050	0.00098	0.00101	<0.00050	<0.00050	0.0749	<0.00100	0.0224	0	348.0	8.320	0.0	0.36	0.3560	0.00084	0.0	1.8	1.85000	<0.0000100	<0.0000100	0.7	0.706	0.213	0	20.00000	<0.0000100	<0.0000100	<0.000100
2020	Q2	Reference (LC_SLC)	0.03740	<0.000050	0.000	0.0019	0	11	10.8	3.0	2.9500	0.0001	0.001840	<0.0000050	0.0000	0.00063	0.00063	<0.00050	0.0	0.0939	<0.00100	0.0078	0	414.0	8.320	0.0	0.32	0.3190	0.00063	0.0	1.8	1.93000	<0.0000100	<0.0000100	0.65	0.654	0.092	0	14.90000	<0.0000100	<0.0000100	<0.000100
2020	Q4	Reference (LC_SLC)	<0.0100	<0.000050	<0.000050	0.0034	0	15	16.6	4.1	3.8800	<0.000100	0.000112	<0.0000050	<0.00000050	0.00122	0.0013	<0.00050	<0.00050	0.116	0.0009	0.0184	<0.0020	304.0	8.300	0.0	0.37	0.3810	0.00148	0.0	2.0	2.07000	<0.0000100	<0.0000100	0.9	0.952	0.158	0	60.80000	<0.0000100	<0.0000100	<0.000100
2021	Q2	Reference (CM_MC1)	0.24700	<0.00005	0.0004	0.0023	0	7	7.3	2.1	1.9560	0.0004	0.013168	<0.000005	0.0000	0.00052	0.00055	<0.0005	0.0	0.0123	<0.001	0.0066	0	324.4	7.880	0.02	0.35	0.4274	0.0002	0.0	2.0	2.56400	<0.00001	<0.00001	1.25	1.234	0.08	0	5.66600	<0.00001	0.00002	<0.0001
2021	Q4	Reference (CM_MC1)	0.01620	0.00005	0.0001	0.0045	0	11	10.8	3.3	3.0880	0.0002	0.000358	0.000005	0.0000	0.00081	0.00084	0.0005	0.0	0.016	0.001	0.0061	0	444.4	8.240	0.01	0.44	0.4270	0.00023	0.0	2.1	2.17200	0.00001	0.0	3.05	2.912	0.143	0	13.14000	0.00001	0.00001	0.0001
2021	Q2	Reference (FR_UFR1)	0.09200	<0.00005	0.0001	0.0011	0	9	9.0	2.5	2.3660	0.0003	0.005568	<0.000005	0.0000	0.00056	0.00057	<0.0005	0.0	0.0417	<0.001	0.0066	0	401.8	8.100	0.01	0.35	0.3720	0.00049	0.0	1.8	1.99200	<0.00001	<0.00001	0.58	0.564	0.067	0	10.50400	<0.00001	<0.00001	<0.0001
2021	Q4	Reference (FR_UFR1)	<0.01	<0.00005	<0.00005	0.0017	0	14	14.4	4.1	3.7480	0.0002	0.000458	<0.000005	<0.0000005	0.00061	0.00063	<0.0005	<0.0005	0.0257	<0.001	0.0009	0	458.0	8.280	0.0	0.39	0.3834	0.00082	0.0	1.6	1.72000	<0.00001	<0.00001	0.66	0.671	0.098	0	47.26000	<0.00001	<0.00001	<0.0001
2021	Q2	Reference (GH_ER2)	0.93860	<0.00005	0.0007	0.0014	0	10	10.9	3.1	2.8460	0.001	0.052120	<0.000005	0.0000	0.00105	0.00094	<0.0005	0.0	0.0993	0.0011	0.0103	0	385.4	8.180	0.09	0.35	0.6270	0.00076	0.0	1.7	2.82200	<0.00001	0.0	0.64	0.661	0.192	0	13.18000	<0.00001	0.00003	<0.0001
2021	Q4	Reference (GH_ER2)	0.10180	<0.00005	0.0001	0.0018	0	11	11.6	3.6	3.2920	0.0014	0.008816	<0.000005	<0.0000005	0.00102	0.0010	<0.0005	0.0	0.0679	<0.001	0.0069	0	455.2	8.200	0.05	0.35	0.3756	0.00091	0.0	1.8	1.96400	<0.00001	<0.00001	0.69	0.70	0.216	0	20.98000	<0.00001	0.00001	<0.0001
2021	Q2	Reference (LC_SLC)	0.04420	<0.00005	0.0001	0.0013	0	8	8.7	2.5	2.3800	0.0001	0.001654	<0.000005	0.0000	0.00053	0.00055	<0.0005	0.0	0.0919	0.0011	0.0133	0	399.0	8.160	0.0	0.28	0.2956	0.00053	0.0	1.6	1.71200	<0.00001	<0.00001	0.48	0.493	0.069	0	10.51400	<0.00001	<0.00001	<0.0001
2021	Q4	Reference (LC_SLC)	<0.01	<0.00005	<0.00005	0.0034	0	16	22.4	4.3	3.9900	<0.0001	0.000202	<0.000005	<0.0000005	0.00127	0.00129	<0.0005	0.0	0.1084	<0.001	0.0094	0	448.6	8.280	0.0	0.38	0.5618	0.00153	0.0	2.1	2.18200	<0.00001	<0.00001	0.95	1.556	0.159	0	60.78000	<0.00001	<0.00001	<0.0001
Tests categorized as no adverse response (2015 -																																										
2015	Q2	CM_MC2	0.74000	0.00009	0.0005	0.0063	0	23	24.0	5.1	5.0000	0.0029	0.025000	0.000006	0.00001	0.00078	0.00095	0.0062	0.01	1.100	0.0047	0.0064	0	357.0	8.300	0.05	0.85	1.0000	0.0040	0.0	1.9	2.80000	0.000018	0.0	4.1	4.10	0.16	0	107.00000	0.000018	0.00004	0.0001
2015	Q2	EV_HC1	0.05800	0.00005	0.0001	0.0042	0	22	22.0	6.1	6.2000	0.0006	0.002100	0.000005	0.00001	0.00051	0.00052	0.00073	0.0	0.560	0.0011	0.0064	0	423.0	7.700	0.01	0.54	0.5600	0.0190	0.0	1.2	1.30000	0.00001	0.0	0.84	0.86	0.064	0	82.00000	0.00001	0.00001	0.0001
2015	Q4	EV_HC1	0.02800	0.00005	0.0001	0.0071	0	49	49.0	8.6	8.8000	0.0019	0.002400	<0.0000005	<0.0000005	0.0010	0.0010	0.00076	0.0	1.200	0.004	0.005	0	373.0	8.400	0.01	0.95	0.9700	0.0360	0.0	2.1	2.20000	0.00001	0.0	1.9	1.90	0.13	0	217.00000	0.00001	0.00001	0.0001
2015	Q2	EV_MC2	0.82000	0.00005	0.0007	0.0066	0	14	14.0	3.3	3.5000	0.0007	0.024000	0.000005	0.00001	0.00078	0.00087	0.0012	0.0	1.100	0.0013	0.006	0	380.0	8.300	0.08	0.63	0.8200	0.0064	0.0	1.7	2.80000	0.00001	0.0	2.3	2.20	0.10	0	49.00000	0.000011	0.00004	0.0001
2015	Q4	EV_MC2	0.08300	0.00005	0.0001	0.016	0	29	29.0	6.5	6.6000	0.0013	0.003000	<0.0000005	<0.0000005	0.0016	0.0016	0.0029	0.0	3.800	0.0023	0.0054	0	376.0	8.200	0.01	1.1	1.1000	0.0160	0.0	2.4	2.50000	0.00001	0.0	3.9	3.90	0.19	0	129.00000	0.00001	0.00001	0.0001
2015	Q2	FR_FRCP1	0.06600	0.00005	0.0001	0.020	0	31	31.0	6.1	6.4000	0.0031	0.008300	0.000005	0.00001	0.0013	0.0013	0.0021	0.0	7.900	0.0052	0.012	0	372.0	8.400	0.01	1.2	1.2000	0.0330	0.0	1.5	1.60000	0.00001	0.0	1.2	1.20	0.10	0	125.00000	0.00001	0.00001	0.0001
2015	Q2	GH_ERC	0.26000	0.000051	0.0002	0.0021	0	12	12.0	3.6	3.6000	0.0005	0.014000	0.000005	0.00001	0.00096	0.00094	0.0005	0.0	0.260	0.001	0.0052	0	433.0	8.400	0.03	0.37	0.4400	0.0015	0.0	1.7	2.10000	0.00001	0.0	0.95	0.94	0.20	0	23.00000	0.00001	0.00001	0.0001
2015	Q4	GH_ERC	0.01500	0.00005	0.0001	0.0019	0	13	13.0	3.9	3.9000	0.0006	0.001400	0.000005	0.00001	0.0010	0.0010	0.0005	0.0	0.490	0.001	0.005	0	391.0	8.300	0.0	0.4	0.4000	0.0016	0.0	1.9	1.90000	0.00001	0.0	0.92	0.93	0.22	0	39.00000	0.00001	0.00001	0.0001
2015	Q2	GH_FR1	0.07100	0.00005	0.0001	0.015	0	32	32.0	6.5	6.8000	0.001	0.004500	0.000005	0.00001	0.0010	0.0010	0.0018	0.0	7.800	0.0034	0.0053	0	433.0	8.400	0.01	1.0	1.1000	0.0310	0.0	1.8	1.90000	0.00001	0.0	1.6	1.60	0.11	0	134.00000	0.00001	0.00001	0.0001
2015	Q2	LC_LCDSSLCC	0.04800	0.00005	0.0001	0.014	0	22	22.0	5.7	5.8000	0.0002	0.002300	0.000005	0.00001	0.00095	0.00096	0.0029	0.0	4.800	0.0015	0.005	0	414.0	8.000	0.01	0.66	0.6800	0.0220	0.0	1.5	1.60000	0.00001	0.0	2.4	2.40	0.11	0	90.00000	0.000011	0.00001	0.0001
2015	Q4	LC_LCDSSLCC	0.01000	0.00005	0.0001	0.036	0	49	52.0	10.0	10.0000	0.0004	0.000500	0.000005	0.00001	0.0018	0.0019	0.0066	0.01	15.000	0.005	0.005	0	341.0	8.300	0.0	1.4	1.5000	0.0500	0.1	2.2	2.30000	0.00001	0.0	7.0	7.20	0.22	0	248.00000	0.00001	0.00001	0.0001
2016	Q2	EV_HC1	0.07200	<0.00005	0.0001	0.006	0	33	33.0	6.1	6.3000	0.0005	0.002700	0.0000005	0.0000	0.00076	0.00078	0.00086	0.0	0.760	<0.001	<0.005	0	330.0	8.400	0.01	0.8	0.8500	0.0300	0.0	1.8	2.00000	<0.00001	<0.00001	1.2	1.30	0.096	0	120.00000	<0.00001	0.00001	<0.0001
2016	Q4	EV_MC2	0.08100	<0.00005	0.0001	0.0092	0	18	19.0	4.5	4.4000	0.0006	0.002600	0.000001	0.0000	0.00079	0.00083	0.0013	0.0	1.800	0.0011	<0.005	0	288.0	8.200	0.01	0.7	0.7900	0.0077	0.0	2.1	2.30000	<0.00001	<0.00001	2.8	3.00	0.13	0	79.00000	<0.00001	0.00001	<0.0001
2016	Q2	FR_FRCP1	0.09000	<0.00005	0.0001	0.018	0	30	31.0	6.2	6.3000	0.0022	0.007600	<0.000005	0.0000	0.0011	0.0011	0.0019	0.0	8.400	0.0027	0.0059	0	331.0	8.300	0.01	1.1	1.1000	0.0300	0.0	1.6	1.70000	<0.00001	<0.00001	1.0	1.10	0.099	0	119.00000	<0.00001	0.00001	<0.0001
2016	Q2	GH_ERC	0.28000	<0.00005	0.0002	0.0021	0	12	12.0	3.5	3.6000	0.001	0.017000	<0.000005	0.0000	0.00096	0.00094	<0.0005	0.0	0.310	<0.001	<0.005	0	356.0	8.300	0.02	0.37	0.4700	0.0016	0.0	1.8	2.20000	<0.00001	<0.00001	0.9	0.89	0.21	0	29.00000	<0.00001	0.00001	<0.0001
2016	Q4	GH_ERC	0.01800	<0.00005	<0.00005	0.0026	0	12	12.0	3.7	3.6000	0.0004	0.001600	<0.000005	<0.000001625	0.0010	0.0010	<0.0005	0.0	0.290	<0.001	<0.005	0	372.0	8.200	0.0	0.39	0.4100	0.0014	0.0	1.8	1.90000	<0.00001	<0.00001	0.84	0.88	0.23	0	32.00000	<0.00001	<0.00001	<0.0001
2017	Q2	CM_MC2	0.83000	<0.00005	0.0005	0.009	0	-	26.0	-	-	0.011	0.039000	<0.000005	0.0000	0.00088	0.0010	0.0130	0.02	2.000	0.0064	0.030	0	-	8.300	0.07	-	1.3000	0.0063	0.0	-	-	<0.00001	0.0	-	6.20	0.20	0	135.00000	0.000013	0.00004	<0.0001
2017	Q2	EV_HC1	0.40000	<0.00005	0.0002	0.0046	0	-	26.0	-	-	0.0013	0.008900	0.0000008	0.0000	0.00062	0.00066	0.00076	0.0	0.560	<0.001	<0.005	0	-	8.300	0.02	-	0.8500	0.0220	0.0	-	-	<0.00001	0.0	-	1.10	0.087	0	85.00000	<0.00001	0.00002	<0.0001
2017	Q2	EV_MC2	1.20000	<0.00005	0.0008	0.005	0	-	13.0	-	-	0.0018	0.033000	0.0000016	0.00001	0.00061	0.00067	0.0013	0.0	0.760	0.0011	0.0058	0	-	8.100	0.11	-	0.9200	0.0042	0.0	-	-	<0.00001	0.0	-	2.00	0.09	0	40.00000	<0.00001	0.00004	<0.0001
2017	Q2	FR_FRCP1	0.39000	<0.00005	0.0003	0.019	0	-	28.0	-	-	0.0023	0.023000	<0.000005	0.0000	0.0011	0.0012	0.0025	0.0	8.700	0.0031	0.0076	0	-	8.300	0.05	-	1.3000	0.0350	0.0	-	-	<0.00001	0.0	-	1.10	0.096	0	111.00000	0.00001	0.00002	<0.0001
2017	Q2	GH_FR1	0.51000	<0.00005	0.0004	0.013	0	-	28.0	-	-	0.0013	0.022000	<0.000005	<0.000008	0.0010	0.0011	0.0018	0.0	5.800	0.0024	0.0063	0	-	8.400	0.04	-	1.1000	0.0260	0.0	-	-	<0.00001	0.0	-	1.40	0.10	0	99.00000	<0.00001	0.00002	<0.0001
2017	Q2	LC_LCDSSLCC	0.04300	<0.00005	0.0001	0.021	0	-	24.0	-	-	0.0005	0.003400	<0.000005	0.0000	0.0012	0.0012	0.0048	0.0	5.600	0.0011	0.0056	0	-	8.300	0.01	-	0.9400	0.0220	0.0	-	-	<0.00001	<0.00001	-	3.00	0.12	0	98.00000	<0.00001	0.00001	<0.0001
2018	Q2	CM_MC2	1.30000	<0.00006	0.0008	0.0081	0	25	24.0	5.4	5.3000	0.010	0.050000	<0.000005	0.0000	0.00084	0.00093	0.0110	0.01	1.300	0.0036	0.024	0	273.0	8.300	0.06	0.95	1.3000	0.0046	0.0	2.0	3.50000	<0.000012	0.0	6.5	5.90	0.19	0	118.00000	0.000013	0.00004	<0.00012
2018	Q4	CM_MC2	0.01600	<0.00005	0.0001	0.024	0	58	57.0	12.0	12.0000	0.018	0.021000	<0.000005	<0.0000005	0.0025	0.0025	0.0380	0.04	3.300	0.025	0.075	0	363.0	8.400	0.0	2.1	2.0000	0.0071	0.0	2.2	2.30000	<0.00001	<0.00001	17.0	16.00	0.55	1	350.00000	0.00002	0.00002	<0.0001
2018	Q2	EV_HC1	0.27000	0.000051	0.0002	0.0049	0	29	26.0	5.5	5.5000	0.0015	0.007800	<0.000005	0.0000	0.00068	0.00075	0.00075	0.0	0.590	<0.001	0.017	0	279.0	8.400	0.02	0.76	0.8000	0.0240	0.0	1.8	2.20000	<0.00001	0.0	1.2	1.10	0.091	0	101.00000	0.00001	0.00002	<0.0001

Year	Quarter	Sample ID	IRON-T-mg/l	LEAD-D-mg/l	LEAD-T-mg/l	LITHIUM-D-mg/l	LITHIUM-T-mg/l	MAGNESIUM-D-mg/l	MAGNESIUM-T-mg/l	MAJOR ANION SUM-N-meq/l	MAJOR CATION SUM-N-meq/l	MANGANESE-D-mg/l	MANGANESE-T-mg/l
2018	Q4	EV_HC1	0.03400	<0.00005	0.0001	0.0067	0	50	50.0	8.2	8.5000	0.0022	0.003400
2018	Q2	EV_MC2	1.10000	0.000098	0.0008	0.0047	0	12	11.0	2.8	2.8000	0.0042	0.035000
2018	Q4	EV_MC2	0.01800	<0.00005	0.0001	0.018	0	33	33.0	7.1	6.8000	0.0009	0.001500
2018	Q2	FR_FRCP1	0.60000	<0.00005	0.0004	0.019	0	29	28.0	5.9	5.8000	0.0015	0.033000
2018	Q2	GH_ERC	1.80000	<0.00005	0.0013	0.0025	0	11	13.0	3.3	3.2000	0.0007	0.098000
2018	Q4	GH_ERC	0.05300	<0.00005	0.0001	0.0026	0	13	12.0	3.7	3.6000	0.0003	0.004300
2018	Q2	GH_FR1	0.37000	<0.00005	0.0003	0.013	0	29	28.0	5.9	5.8000	0.0007	0.018000
2018	Q2	LC_LCDSSLCC	0.03900	<0.00005	0.0001	0.024	0	26	25.0	5.6	5.6000	0.0003	0.002200
2018	Q4	LC_LCDSSLCC	<0.01	<0.00005	<0.00005	0.042	0	49	49.0	9.8	9.8000	0.0004	0.000860
2019	Q2	CM_MC2	0.40360	<0.00005	0.0003	0.0068	0	28	28.4	5.8	5.5860	0.0042	0.021502
2019	Q2	EV_HC1	0.04200	<0.00005	0.000	0.0047	0	29	30.3	5.8	5.5180	0.0008	0.002604
2019	Q4	EV_HC1	0.03060	<0.00005	0.000	0.0068	0	48	49.0	8.7	8.4960	0.0046	0.005354
2019	Q2	EV_MC2	0.25680	<0.00005	0.0002	0.0044	0	12	12.2	2.9	2.8880	0.0008	0.009626
2019	Q4	FR_FRABCH	0.03800	<0.00005	0.0001	0.0301	0	62	65.5	12.2	11.9000	0.0036	0.007686
2019	Q2	FR_FRCP1	0.12380	<0.00005	0.0001	0.0195	0	35	35.6	7.0	6.7580	0.0026	0.011838
2019	Q4	FR_FRCP1	0.02960	<0.00005	<0.00005	0.0479	0	99	99.7	16.6	16.4200	0.0056	0.008396
2019	Q2	GH_ERC	0.51520	<0.00005	0.0003	0.0022	0	13	13.0	3.5	3.4960	0.0002	0.027524
2019	Q4	GH_ERC	<0.01	0.000031	<0.00005	0.0032	0	14	13.9	4.0	3.7960	0.0003	0.000454
2019	Q2	LC_DCDS	0.03560	<0.00005	0.000	0.0099	0	17	18.0	4.0	3.9180	0.0005	0.004464
2019	Q2	LC_LC3	0.04320	<0.00005	0.000	0.0311	0	45	45.4	8.8	8.5440	0.0034	0.010394
2019	Q4	LC_LC3	0.03340	<0.00005	<0.00005	0.0504	0	74	77.7	14.3	13.9400	0.0221	0.023508
2019	Q2	LC_LC5	0.12920	<0.00005	0.0001	0.015	0	33	32.6	6.7	6.5280	0.0002	0.010098
2019	Q2	LC_LCDSSLCC	0.03280	<0.00005	0.000	0.0185	0	30	29.6	6.2	6.0900	0.0004	0.004644
2019	Q4	LC_LCDSSLCC	0.02160	<0.00005	<0.00005	0.0338	0	51	52.9	10.5	10.2120	0.0021	0.004786
2020	Q2	CM_MC2	0.73400	<0.000050	0.0004	0.0116	0	31	33.2	6.9	6.6200	0.0101	0.033400
2020	Q4	CM_MC2	0.06960	0.000037	0.000	0.0383	0	59	60.8	13.5	13.1000	0.0078	0.012600
2020	Q2	EV_HC1	0.12620	<0.000050	0.0001	0.0054	0	32	30.7	6.0	6.1300	0.0014	0.004640
2020	Q4	EV_HC1	0.03120	<0.000050	0.000	0.0066	0	47	45.5	8.3	8.0500	0.0026	0.003550
2020	Q2	EV_MC2	0.78800	<0.000050	0.0006	0.0058	0	14	13.0	3.1	3.2600	0.0014	0.026200
2020	Q4	EV_MC2	0.01600	<0.000050	0.000	0.0115	0	26	26.4	6.2	5.8200	0.0013	0.001890
2020	Q2	FR_FRABCH	0.58600	<0.000050	0.0004	0.0253	0	42	42.8	8.5	8.3100	0.0046	0.028600
2020	Q2	FR_FRCP1	0.27100	<0.000050	0.0002	0.0245	0	38	38.8	7.7	7.4800	0.0026	0.016490
2020	Q2	GH_ERC	1.20000	<0.000050	0.0008	0.0027	0	13	14.0	3.7	3.5400	0.0011	0.070400
2020	Q4	GH_ERC	0.01540	<0.000050	<0.000050	0.0031	0	12	12.8	3.8	3.5800	0.0006	0.001590
2020	Q2	GH_FR1	0.23860	<0.000050	0.0002	0.0149	0	34	33.9	6.7	6.5900	0.0019	0.011570
2020	Q2	LC_DCDS	0.24440	0.000037	0.0003	0.011	0	19	19.1	4.4	4.2600	0.0042	0.009660
2020	Q4	LC_DCDS	0.00620	<0.000050	<0.000050	0.025	0	46	47.0	11.0	10.0000	0.002	0.002300
2020	Q2	LC_LC5	0.47600	<0.000050	0.0004	0.0157	0	31	31.4	6.6	6.3200	0.0011	0.033900
2020	Q4	LC_LC5	0.00620	<0.000050	<0.000050	0.0219	0	43	45.2	9.2	8.7900	0.0003	0.000698
2020	Q2	LC_LCDSSLCC	0.06660	0.00007	0.000	0.0213	0	29	29.5	6.4	6.4000	0.0045	0.009160
2021	Q2	CM_MC2	0.55780	<0.00005	0.0004	0.0113	0	26	25.6	5.8	5.4760	0.0094	0.031060
2021	Q4	CM_MC2	0.03560	<0.00005	<0.00005	0.0187	0	60	61.8	12.6	11.9240	0.0029	0.004612
2021	Q2	EV_HC1	0.19640	<0.00005	0.0002	0.0046	0	26	25.0	5.2	5.0120	0.0014	0.006206
2021	Q4	EV_HC1	0.02240	<0.00005	0.0001	0.0072	0	49	49.7	8.6	8.3780	0.0028	0.003378
2021	Q2	EV_MC2	2.43480	<0.00005	0.002	0.0055	0	13	14.7	3.4	3.0500	0.0018	0.087512
2021	Q4	EV_MC2	0.02400	<0.00005	<0.00005	0.0149	0	28	28.3	6.2	6.2520	0.0014	0.002154
2021	Q2	FR_FR2	0.17720	<0.00005	0.0001	0.0142	0	21	20.8	4.6	4.4660	0.004	0.015030
2021	Q4	FR_FR2	0.04400	<0.00005	<0.00005	0.0627	0	59	59.9	11.7	11.3400	0.0174	0.018280
2021	Q2	FR_FR4	0.38540	<0.00005	0.0003	0.0191	0	26	26.9	5.6	5.3280	0.0027	0.024752
2021	Q4	FR_FR4	0.08280	<0.00005	0.0001	0.0666	0	89	87.4	16.0	15.5200	0.0116	0.020340
2021	Q2	FR_FRABCH	0.27040	<0.00005	0.0002	0.0271	0	37	37.5	7.7	7.2780	0.0033	0.017844
2021	Q4	FR_FRABCH	0.03300	0.00003	0.000	0.0462	0	70	76.4	14.2	13.5200	0.005	0.005800
2021	Q2	FR_FRCP1	0.18380	<0.00005	0.0002	0.027	0	32	32.6	6.6	6.3420	0.0024	0.019500
2021	Q2	FR_FRRD	0.31660	<0.00005	0.0002	0.0315	0	43	41.9	8.6	8.2060	0.0017	0.017804
2021	Q4	FR_FRRD	0.01160	<0.00005	<0.00005	0.0644	0	76	78.1	15.5	14.7400	0.0005	0.000776
2021	Q2	FR_MULTIPLATE	0.12140	<0.00005	0.0001	0.0129	0	19	18.9	4.4	4.1520	0.001	0.007774
2021	Q4	FR_MULTIPLATE	0.01680	<0.00005	0.000	0.0559	0	54	54.5	11.4	10.8800	0.0024	0.003464
2021	Q2	GH_ERC	1.32680	<0.00005	0.0009	0.0018	0	11	12.1	3.2	3.0640	0.0013	0.067260
2021	Q4	GH_ERC	0.01600	<0.00005	<0.00005	0.003	0	13	12.9	3.8	3.5500	0.0004	0.001156
2021	Q2	GH_FR1	0.21420	0.00005	0.0002	0.0169	0	29	29.5	6.3	5.9560	0.0019	0.013962
2021	Q4	GH_FR1	0.02400	0.00005	0.0001	0.0268	0	55	55.2	10.9	10.4380	0.0014	0.002498
2021	Q2	LC_DCDS	0.12000	<0.00005	0.0001	0.0141	0	21	22.1	5.2	4.6280	0.0216	0.026348
2021	Q4	LC_DCDS	0.01120	<0.00005	<0.00005	0.0382	0	53	54.5	12.3	11.8200	0.0018	0.002658
2021	Q2	LC_LC3	0.01960	0.00005	0.0001	0.0337	0	38	38.1	7.8	7.2880	0.0053	0.006526
2021	Q4	LC_LC3	0.09480	0.00005	0.0001	0.0668	0	68	69.2	14.0	13.0800	0.0291	0.034420
2021	Q2	LC_LC5	0.33580	<0.00005	0.0003	0.0174	0	27	27.4	5.9	5.5900	0.0009	0.024034
2021	Q4	LC_LC5	0.03060	<0.00005	0.0001	0.0267	0	46	44.7	9.5	9.0000	0.0003	0.002390
2021	Q2	LC_LCDSSLCC	0.03040	<0.00005	<0.00005	0.0178	0	24	23.9	5.3	5.0380	0.0017	0.005086
2021	Q4	LC_LCDSSLCC	0.01100	<0.00005	<0.00005	0.0457	0	50	51.5	11.1	10.1300	0.0038	0.004496

Year	Quarter	Sample ID	MERCURY-D-mg/l	MERCURY-T-mg/l	MOLYBDENUM-D-mg/l	MOLYBDENUM-T-mg/l	NICKEL-D-mg/l	NICKEL-T-mg/l	NITRATE NITROGEN (NO3) AS N-N-mg/l	NITRITE NITROGEN (NO2) AS N-N-mg/l	NITROGEN AMMONIA (AS N)-N-mg/l	ORTHO-PHOSPHATE-N-mg/l	OXIDATION-REDUCTION POTENTIAL LAB-N-mv	pH LAB-N-ph units	PHOSPHORUS-N-mg/l	POTASSIUM-D-mg/l	POTASSIUM-T-mg/l	SELENIUM-D-mg/l
2018	Q4	EV_HC1	<0.000005	0.0000	0.00093	0.00095	0.00054	0.0	0.980	0.0034	0.015	0	312.0	8.400	0.01	0.9	0.9000	0.0440
2018	Q2	EV_MC2	<0.000005	0.00001	0.00057	0.00066	0.0015	0.0	0.690	0.0011	0.011	0	291.0	8.100	0.1	0.58	0.8300	0.0040
2018	Q4	EV_MC2	<0.000005	<0.0000005	0.0013	0.0012	0.0036	0.0	2.700	0.0011	0.014	0	292.0	8.300	0.0	1.1	1.1000	0.0170
2018	Q2	FR_FRCP1	<0.000005	0.0000	0.0011	0.0011	0.0024	0.0	8.100	0.0021	0.010	0	309.0	8.300	0.05	1.2	1.3000	0.0350
2018	Q2	GH_ERC	<0.000005	0.00001	0.0010	0.0011	<0.0005	0.0	0.410	0.0011	0.0093	0	273.0	8.400	0.2	0.45	0.9000	0.0019
2018	Q4	GH_ERC	<0.000005	0.0000	0.0011	0.0011	<0.0005	<0.0005	0.370	<0.001	0.017	0	400.0	8.300	0.0	0.4	0.4000	0.0017
2018	Q2	GH_FR1	<0.000005	0.0000	0.0012	0.0012	0.0022	0.0	5.600	0.0029	0.0088	0	300.0	8.400	0.04	1.1	1.1000	0.0290
2018	Q2	LC_LCDSSLCC	<0.000005	0.0000	0.0012	0.0012	0.0047	0.01	5.600	0.001	0.0074	0	274.0	8.200	0.01	0.96	0.9400	0.0230
2018	Q4	LC_LCDSSLCC	<0.000005	<0.0000005	0.0020	0.0020	0.0047	0.01	8.000	0.0034	0.015	0	420.0	8.400	0.0	1.6	1.6000	0.0420
2019	Q2	CM_MC2	<0.000005	0.0000	0.00078	0.00083	0.00802	0.01	1.3178	0.0016	0.0344	0	390.4	8.280	0.02	0.93	1.0586	0.00609
2019	Q2	EV_HC1	<0.000005	0.0000	0.00073	0.00075	0.00063	0.0	0.5414	<0.001	0.0187	0	391.6	8.380	0.01	0.68	0.7078	0.02468
2019	Q4	EV_HC1	<0.000005	0.0000	0.00095	0.00101	0.00047	0.0	1.0036	0.0006	0.0116	0	364.0	8.300	0.01	0.88	0.8876	0.04378
2019	Q2	EV_MC2	<0.000005	0.0000	0.00054	0.00056	0.00099	0.0	0.479	<0.001	0.0086	0	408.8	8.180	0.03	0.54	0.5834	0.00394
2019	Q4	FR_FRABCH	<0.000005	0.0000	0.0007	0.00071	0.00068	0.0	19.000	0.0027	0.0157	0	410.0	8.280	0.02	1.71	1.6980	0.08858
2019	Q2	FR_FRCP1	<0.000005	0.0000	0.00116	0.00119	0.0034	0.0	7.700	0.003	0.0179	<0.0005	400.0	8.300	0.01	1.17	1.1996	0.03836
2019	Q4	FR_FRCP1	<0.000005	<0.0000005	0.0020	0.00201	0.01002	0.01	18.000	0.0132	0.0515	0	419.0	8.260	0.0	2.47	2.4780	0.15432
2019	Q2	GH_ERC	<0.000005	0.0000	0.00102	0.00099	<0.0005	0.0	0.4574	0.0006	0.0098	0	422.8	8.260	0.06	0.36	0.5032	0.00223
2019	Q4	GH_ERC	<0.000005	<0.0000005	0.00114	0.00107	<0.0005	<0.0005	0.7586	0.0009	0.0099	0	432.8	8.240	<0.002	0.41	0.4226	0.00289
2019	Q2	LC_DCDS	<0.000005	0.0000	0.00276	0.00257	0.00396	0.0	8.100	0.010	0.0127	0	396.6	8.340	0.02	1.47	1.4440	0.01492
2019	Q2	LC_LC3	<0.000005	0.0000	0.00254	0.00266	0.00683	0.01	9.600	<0.0009	0.0154	0	409.8	8.080	0.0	1.44	1.3840	0.03634
2019	Q4	LC_LC3	<0.000005	<0.0000005	0.00368	0.00379	0.00886	0.01	15.000	0.0023	0.0267	0	420.4	8.240	0.0	1.81	1.8600	0.0859
2019	Q2	LC_LC5	<0.000005	0.0000	0.00109	0.02956	0.00099	0.0	6.300	0.0018	0.0116	0	411.0	8.080	0.02	0.99	0.9822	0.03124
2019	Q2	LC_LCDSSLCC	<0.000005	0.0000	0.00156	0.00157	0.00314	0.0	5.200	0.0006	0.0076	0	434.6	8.020	0.0	0.93	0.8962	0.02194
2019	Q4	LC_LCDSSLCC	<0.000005	<0.0000005	0.00228	0.00233	0.00391	0.0	10.000	0.002	0.0122	0	465.2	8.300	0.0	1.27	1.3000	0.0556
2020	Q2	CM_MC2	<0.0000050	0.0000	0.00083	0.00088	0.0140	0.02	1.470	0.002	0.023	0	347.0	8.300	0.0	1.19	1.4700	0.00705
2020	Q4	CM_MC2	<0.0000050	0.0000	0.00102	0.00107	0.0253	0.03	2.630	0.0111	0.0924	0	226.0	8.300	0.0	1.96	1.9900	0.00884
2020	Q2	EV_HC1	<0.0000050	0.0000	0.00068	0.0007	0.00071	0.0	0.603	<0.00100	0.0109	0	344.0	8.440	0.01	0.77	0.8140	0.0285
2020	Q4	EV_HC1	<0.0000050	0.0000	0.00091	0.00097	0.00051	0.0	0.821	0.0015	0.0051	0	301.0	8.380	0.0	0.89	0.8940	0.0403
2020	Q2	EV_MC2	<0.0000050	0.00001	0.00061	0.00064	0.00152	0.0	0.658	0.0009	0.0158	0	329.0	8.260	0.01	0.61	0.8480	0.00525
2020	Q4	EV_MC2	<0.0000050	0.0000	0.00071	0.00079	0.00064	0.0	1.650	0.0014	0.0062	0	337.0	8.300	0.0	0.85	0.8810	0.0129
2020	Q2	FR_FRABCH	<0.0000050	0.0000	0.00139	0.00146	0.00349	0.0	13.000	0.0061	0.0128	0	356.0	8.440	0.04	1.56	1.6000	0.0626
2020	Q2	FR_FRCP1	<0.0000050	0.0000	0.00178	0.00179	0.00562	0.01	12.000	0.0092	0.007	0	419.0	8.460	0.0	1.57	1.5600	0.0562
2020	Q2	GH_ERC	<0.0000050	0.0000	0.00092	0.00099	<0.00050	0.0	0.460	<0.00100	0.010	0	305.0	8.360	0.0	0.44	0.7290	0.00261
2020	Q4	GH_ERC	<0.0000050	0.0000	0.00106	0.0011	<0.00050	<0.00050	0.451	0.0008	0.0279	0	309.0	8.340	0.0	0.41	0.4170	0.00201
2020	Q2	GH_FR1	<0.0000050	0.0000	0.00115	0.00117	0.0022	0.0	7.500	0.0044	0.0091	0	384.0	8.440	0.0	1.17	1.2300	0.0383
2020	Q2	LC_DCDS	<0.0000050	0.0000	0.0026	0.00262	0.00733	0.01	11.000	0.0078	0.0076	0	402.0	8.220	0.03	1.57	1.5900	0.0221
2020	Q4	LC_DCDS	<0.0000050	0.0000	0.0041	0.0043	0.0120	0.01	43.000	0.0048	0.011	0	374.0	8.200	0.03	2.6	2.6000	0.0720
2020	Q2	LC_LC5	<0.0000050	0.0000	0.00119	0.00114	0.00157	0.0	7.000	0.0022	0.0049	0	377.0	8.440	0.0	1.06	1.1400	0.0290
2020	Q4	LC_LC5	<0.0000050	<0.00000050	0.00122	0.00125	0.00082	0.0	10.000	0.0022	0.0153	0	283.0	8.340	0.0	1.2	1.2100	0.0497
2020	Q2	LC_LCDSSLCC	<0.0000050	0.0000	0.00148	0.00145	0.00395	0.0	5.000	0.0012	0.0067	0	348.0	8.380	0.0	0.97	0.9350	0.0221
2021	Q2	CM_MC2	<0.000005	0.0000	0.00074	0.00078	0.01193	0.01	0.8902	0.0038	0.0196	0	339.5	8.120	0.03	0.99	1.1400	0.0053
2021	Q4	CM_MC2	<0.000005	<0.0000005	0.00089	0.00092	0.00922	0.01	2.116	0.0064	0.010	0	452.4	8.300	0.0	1.74	1.7120	0.00969
2021	Q2	EV_HC1	<0.000005	0.0000	0.00067	0.00067	0.00062	0.0	0.421	<0.001	0.0115	0	380.0	8.320	0.01	0.68	0.7332	0.02068
2021	Q4	EV_HC1	<0.000005	0.0000	0.00094	0.00097	0.00061	0.0	0.7218	0.0011	0.0059	0	458.2	8.300	0.01	0.96	0.9586	0.04174
2021	Q2	EV_MC2	<0.000005	0.00001	0.00058	0.00064	0.0012	0.01	0.6476	0.001	0.011	0	372.2	8.060	0.07	0.57	0.9532	0.00362
2021	Q4	EV_MC2	<0.000005	0.0000	0.00133	0.00137	0.00154	0.0	1.1146	0.0013	0.0067	0	459.6	8.200	0.01	1.06	1.0214	0.01138
2021	Q2	FR_FR2	<0.000005	0.0000	0.00089	0.0009	0.00248	0.0	5.000	0.0041	0.0213	0	414.8	8.280	0.02	0.94	0.9638	0.01708
2021	Q4	FR_FR2	<0.000005	<0.0000005	0.00231	0.00239	0.00671	0.01	18.800	0.0302	0.0836	0	459.8	8.240	0.0	2.64	2.6440	0.05922
2021	Q2	FR_FR4	<0.000005	0.0000	0.00114	0.00118	0.00299	0.0	7.040	0.004	0.0136	0	447.4	8.260	0.03	1.15	1.2536	0.02794
2021	Q4	FR_FR4	<0.000005	<0.0000005	0.00357	0.00367	0.01214	0.01	20.600	0.0277	0.0757	0	461.2	8.360	0.0	2.92	2.8340	0.1212
2021	Q2	FR_FRABCH	<0.000005	0.0000	0.00117	0.00116	0.00209	0.0	12.940	0.0024	0.0082	0	408.0	8.260	0.04	1.43	1.4840	0.0492
2021	Q4	FR_FRABCH	<0.000005	0.0000	0.0011	0.00113	0.00162	0.0	23.400	0.0043	0.0069	0	445.4	8.160	0.0	2.07	2.2140	0.10216
2021	Q2	FR_FRCP1	<0.000005	0.0000	0.00133	0.00126	0.00297	0.0	10.400	0.0041	0.0142	0	439.2	8.220	0.01	1.38	1.4200	0.0403
2021	Q2	FR_FRRD	<0.000005	0.0000	0.00115	0.0012	0.00217	0.0	16.200	0.0032	0.0095	0	464.8	8.260	0.02	1.58	1.6960	0.06136
2021	Q4	FR_FRRD	<0.000005	<0.0000005	0.00082	0.00081	0.00061	0.0	29.200	<0.005	0.0726	0	462.0	8.180	0.0	2.77	2.7300	0.1172
2021	Q2	FR_MULTIPLATE	<0.000005	0.0000	0.00086	0.00088	0.00241	0.0	5.140	0.0034	0.015	0	452.2	8.240	0.01	0.81	0.8280	0.01696
2021	Q4	FR_MULTIPLATE	<0.000005	<0.0000005	0.00198	0.0020	0.00733	0.01	21.400	0.020	0.1756	0	458.2	8.280	0.0	2.05	2.0340	0.06818
2021	Q2	GH_ERC	<0.000005	0.0000	0.00093	0.00098	<0.0005	0.0	0.3128	0.0011	0.0068	0	381.0	8.180	0.12	0.37	0.7452	0.00137
2021	Q4	GH_ERC	0.000005	0.0000	0.00108	0.00114	<0.0005	<0.0005	0.301	<0.001	0.0053	0	457.2	8.220	0.0	0.42	0.4338	0.00209
2021	Q2	GH_FR1	0.000005	0.0000	0.00111	0.00104	0.00129	0.0	7.880	0.0022	0.0141	0	385.8	8.240	0.01	1.07	1.1480	0.03374
2021	Q4	GH_FR1	0.000005	0.0000	0.00107	0.00109	0.00096	0.0	14.200	0.0053	0.0068	0	452.8	8.300	0.0	1.49	1.5280	0.05334
2021	Q2	LC_DCDS	<0.000005	0.0000	0.00377	0.00412	0.00353	0.0	13.400	0.049	0.0346	0	439.0	8.000	0.03	1.74	1.8260	0.02556
2021	Q4	LC_DCDS	<0.000005	0.0000	0.00678	0.00706	0.01258	0.01	48.000	0.0112	0.0076	0	432.4	8.280	0.02	2.96	3.0040	0.0899
2021	Q2	LC_LC3	0.000005	0.0000	0.00193	0.00207	0.00788	0.01	6.900	0.001	0.007	0	419.8	8.240	0.0	1.36	1.4000	0.03544
2021	Q4	LC_LC3	0.000005	0.0000	0.00465	0.00477	0.00944	0.01	10.200	0.005	0.0051	0	441.0	8.200	0.0	2.07	2.1080	0.04164
2021	Q2	LC_LC5	<0.000005	0.0000	0.00106	0.00113	0.00137	0.0	6.880	0.0043	0.0088	0	442.8	8.320	0.04	1.0	1.0818	0.02736
2021	Q4	LC_LC5	<0.000005	<0.0000005	0.00138	0.00138	0.00104	0.0	11.200	0.003	0.0056	0	445.2	8.400	0.01	1.29	1.3180	0.04652
2021	Q2	LC_LCDSSLCC	<0.000005	0.0000	0.00121	0.0013	0.00361	0.0	3.640	<0.001	0.0069	0	442.6	8.260	0.0	0.85	0.8576	0.01912
2021	Q4	LC_LCDSSLCC	<0.000005	<0.0000005	0.00284	0.00288	0.00476	0.0	8.060	<0.0042	<0.005	0	438.4	8.380	0.0	1.49	1.5260	0.0370

Year	Quarter	Sample ID	SELENIUM-T-mg/l	SILICON-D-mg/l	SILICON-T-mg/l	SILVER-D-mg/l	SILVER-T-mg/l	SODIUM-D-mg/l	SODIUM-T-mg/l	STRONTIUM-D-mg/l	STRONTIUM-T-mg/l	SULFATE (AS SO4)-D-mg/l	THALLIUM-D-mg/l	THALLIUM-T-mg/l	TIN-D-mg/l
2018	Q4	EV_HC1	0.0	2.1	2.30000	<0.00001	<0.00001	1.7	1.70	0.13	0	216.00000	<0.00001	<0.00001	<0.0001
2018	Q2	EV_MC2	0.0	2.0	3.10000	<0.000012	0.0	1.8	1.70	0.083	0	38.00000	0.000011	0.00004	<0.0001
2018	Q4	EV_MC2	0.0	2.3	2.40000	<0.00001	<0.00001	4.4	4.60	0.20	0	155.00000	<0.00001	<0.00001	<0.0001
2018	Q2	FR_FRCP1	0.0	1.6	2.20000	<0.00001	0.0	1.1	1.10	0.098	0	104.00000	<0.00001	0.00002	<0.0001
2018	Q2	GH_ERC	0.0	1.9	3.70000	<0.00001	0.0	0.82	0.84	0.19	0	23.00000	<0.00001	0.00006	<0.0001
2018	Q4	GH_ERC	0.0	1.9	2.00000	<0.00001	<0.00001	0.92	0.88	0.21	0	28.00000	<0.00001	<0.00001	<0.0001
2018	Q2	GH_FR1	0.0	2.0	2.40000	<0.00001	0.0	1.4	1.40	0.10	0	110.00000	<0.00001	0.00002	<0.0001
2018	Q2	LC_LCDSSLCC	0.0	1.7	1.90000	<0.00001	<0.00001	3.7	3.60	0.13	0	99.00000	0.000011	0.00001	<0.0001
2018	Q4	LC_LCDSSLCC	0.0	2.1	2.20000	<0.00001	<0.00001	9.3	9.50	0.21	0	242.00000	<0.00001	0.00001	<0.0001
2019	Q2	CM_MC2	0.0	1.9	2.36600	<0.00001	<0.00001	4.57	4.66	0.187	0	137.92000	0.000007	0.00002	<0.0001
2019	Q2	EV_HC1	0.0	1.7	1.86000	<0.00001	0.0	1.21	1.22	0.094	0	113.18000	<0.00001	<0.00001	<0.0001
2019	Q4	EV_HC1	0.0	2.1	2.19600	<0.00001	0.0	1.7	1.73	0.132	0	215.80000	<0.00001	0.00001	0.00007
2019	Q2	EV_MC2	0.0	1.9	2.20800	<0.00001	0.0	1.83	1.762	0.09	0	40.38000	<0.00001	0.00002	<0.0001
2019	Q4	FR_FRABCH	0.1	2.4	2.49400	<0.00001	<0.00001	2.34	2.442	0.163	0	291.80000	<0.00001	<0.00001	<0.0001
2019	Q2	FR_FRCP1	0.0	1.5	1.64000	<0.00001	<0.00001	1.12	1.13	0.108	0	152.24000	<0.00001	0.00001	<0.0001
2019	Q4	FR_FRCP1	0.1	2.0	2.05400	<0.00001	<0.00001	2.2	2.344	0.182	0	501.00000	0.000014	0.00001	<0.0001
2019	Q2	GH_ERC	0.0	1.8	2.30000	<0.00001	0.0	0.89	0.934	0.215	0	28.40000	<0.00001	0.00002	<0.0001
2019	Q4	GH_ERC	0.0	2.0	2.02600	<0.00001	<0.00001	1.07	1.073	0.218	0	39.54000	<0.00001	<0.00001	0.00006
2019	Q2	LC_DCDS	0.0	1.8	2.06400	<0.00001	<0.00001	1.23	1.182	0.069	0	46.00000	0.000006	0.00001	<0.0001
2019	Q2	LC_LC3	0.0	1.9	1.91600	<0.00001	<0.00001	5.96	6.088	0.158	0	215.80000	0.00001	0.00001	<0.0001
2019	Q4	LC_LC3	0.1	2.2	2.29200	<0.00001	<0.00001	9.88	9.99	0.237	0	398.80000	0.000009	0.00001	<0.0001
2019	Q2	LC_LC5	0.0	1.8	1.98400	<0.00001	0.0	2.25	2.28	0.134	0	139.74000	<0.00001	0.00001	<0.0001
2019	Q2	LC_LCDSSLCC	0.0	1.8	1.87200	<0.00001	<0.00001	3.76	3.786	0.136	0	131.70000	<0.00001	<0.00001	<0.0001
2019	Q4	LC_LCDSSLCC	0.1	2.3	2.40800	<0.00001	<0.00001	6.85	6.966	0.217	0	266.00000	<0.00001	<0.00001	0.00007
2020	Q2	CM_MC2	0.0	2.0	3.03000	<0.0000100	0.0	8.52	8.91	0.24	0	171.00000	0.000014	0.00003	<0.000100
2020	Q4	CM_MC2	0.0	2.2	2.40000	<0.0000100	<0.0000100	35.8	36.50	0.609	1	406.00000	0.000022	0.00002	<0.000100
2020	Q2	EV_HC1	0.0	1.8	2.07000	<0.0000100	<0.0000100	1.3	1.26	0.102	0	114.00000	<0.0000100	0.00001	<0.000100
2020	Q4	EV_HC1	0.0	2.0	2.08000	<0.0000100	<0.0000100	1.63	1.63	0.128	0	210.00000	<0.0000100	<0.0000100	<0.000100
2020	Q2	EV_MC2	0.0	2.1	3.20000	<0.0000100	0.0	2.3	2.20	0.113	0	42.70000	<0.0000100	0.00003	<0.000100
2020	Q4	EV_MC2	0.0	2.1	2.19000	<0.0000100	0.0	5.17	5.35	0.173	0	122.00000	<0.0000100	0.00003	<0.000100
2020	Q2	FR_FRABCH	0.1	1.8	2.22000	<0.0000100	0.0	1.54	1.47	0.119	0	186.00000	<0.0000100	0.00002	<0.000100
2020	Q2	FR_FRCP1	0.1	1.6	1.94000	<0.0000100	0.0	1.22	1.19	0.113	0	163.00000	0.000008	0.00001	<0.000100
2020	Q2	GH_ERC	0.0	1.9	3.06000	<0.0000100	0.0	1.03	1.06	0.198	0	27.30000	<0.0000100	0.00004	<0.000100
2020	Q4	GH_ERC	0.0	1.9	1.96000	<0.0000100	<0.0000100	0.98	0.993	0.212	0	30.70000	<0.0000100	<0.0000100	<0.000100
2020	Q2	GH_FR1	0.0	2.0	2.32000	<0.0000100	0.0	1.61	1.65	0.111	0	138.00000	<0.0000100	0.00001	<0.000100
2020	Q2	LC_DCDS	0.0	2.4	2.67000	<0.0000100	0.0	1.42	1.41	0.074	0	64.70000	0.000007	0.00002	<0.000100
2020	Q4	LC_DCDS	0.1	2.5	2.60000	<0.0000100	<0.0000100	4.9	4.80	0.18	0	210.00000	0.000016	0.00002	<0.000100
2020	Q2	LC_LC5	0.0	1.8	2.36000	<0.0000100	0.0	2.13	2.14	0.121	0	125.00000	<0.0000100	0.00001	<0.000100
2020	Q4	LC_LC5	0.0	2.2	2.27000	<0.0000100	<0.0000100	3.3	3.48	0.178	0	212.00000	<0.0000100	<0.0000100	<0.000100
2020	Q2	LC_LCDSSLCC	0.0	1.9	2.03000	<0.0000100	<0.0000100	3.9	3.76	0.137	0	124.00000	<0.0000100	<0.0000100	0.00007
2021	Q2	CM_MC2	0.0	1.9	2.56400	<0.00001	<0.00001	8.26	8.258	0.223	0	137.80000	0.000011	0.00002	<0.0001
2021	Q4	CM_MC2	0.0	2.1	2.23000	<0.00001	<0.00001	15.02	14.90	0.416	0	368.40000	0.00001	0.00001	<0.0001
2021	Q2	EV_HC1	0.0	1.9	2.19000	<0.00001	0.0	1.14	1.153	0.094	0	89.64000	<0.00001	0.00001	<0.0001
2021	Q4	EV_HC1	0.0	2.1	2.13400	<0.00001	<0.00001	1.7	1.686	0.134	0	213.80000	<0.00001	<0.00001	<0.0001
2021	Q2	EV_MC2	0.0	1.9	3.83400	<0.00001	0.0	2.41	2.676	0.097	0	50.82000	<0.00001	0.00007	<0.0001
2021	Q4	EV_MC2	0.0	2.4	2.37800	<0.00001	<0.00001	4.77	4.578	0.185	0	119.50000	<0.00001	<0.00001	<0.0001
2021	Q2	FR_FR2	0.0	1.6	1.94000	<0.00001	0.0	0.89	0.854	0.088	0	77.14000	<0.00001	0.00001	<0.0001
2021	Q4	FR_FR2	0.1	1.8	1.93200	<0.00001	<0.00001	2.66	2.69	0.216	0	281.00000	0.000013	0.00001	<0.0001
2021	Q2	FR_FR4	0.0	1.6	2.14400	<0.00001	0.0	1.1	1.093	0.091	0	104.36000	<0.00001	0.00002	<0.0001
2021	Q4	FR_FR4	0.1	1.9	1.95800	<0.00001	<0.00001	2.76	2.714	0.224	0	436.80000	0.000016	0.00002	<0.0001
2021	Q2	FR_FRABCH	0.0	1.7	2.16400	<0.00001	0.0	1.67	1.646	0.11	0	153.80000	<0.00001	0.00001	<0.0001
2021	Q4	FR_FRABCH	0.1	2.3	2.46800	<0.00001	<0.00001	2.98	3.272	0.189	0	340.60000	<0.00001	<0.00001	<0.0001
2021	Q2	FR_FRCP1	0.0	1.6	1.92800	<0.00001	<0.00001	1.43	1.436	0.102	0	123.50000	<0.00001	0.00001	<0.0001
2021	Q2	FR_FRRD	0.1	1.7	2.25800	<0.00001	0.0	1.9	1.858	0.117	0	179.80000	<0.00001	0.00001	<0.0001
2021	Q4	FR_FRRD	0.1	2.4	2.47600	<0.00001	<0.00001	3.9	3.958	0.191	0	341.60000	<0.00001	<0.00001	<0.0001
2021	Q2	FR_MULTIPLATE	0.0	1.6	1.81200	<0.00001	<0.00001	0.78	0.753	0.085	0	70.46000	<0.00001	0.00001	<0.0001
2021	Q4	FR_MULTIPLATE	0.1	1.7	1.87000	<0.00001	<0.00001	2.19	2.236	0.189	0	280.40000	0.000003	0.0000	<0.0001
2021	Q2	GH_ERC	0.0	1.8	3.28600	<0.00001	0.0	0.76	0.777	0.196	0	18.20000	<0.00001	0.00004	<0.0001
2021	Q4	GH_ERC	0.0	2.0	2.03800	<0.00001	<0.00001	0.9	0.935	0.208	0	26.98000	<0.00001	<0.00001	<0.0001
2021	Q2	GH_FR1	0.0	1.8	2.19400	0.00001	0.0	1.52	1.516	0.105	0	116.20000	0.00001	0.00001	0.0001
2021	Q4	GH_FR1	0.1	2.3	2.43000	0.00001	0.0	2.63	2.716	0.17	0	249.80000	0.00001	0.00001	0.0001
2021	Q2	LC_DCDS	0.0	2.5	2.78200	<0.00001	0.0	2.52	2.622	0.086	0	81.82000	0.000013	0.00002	<0.0001
2021	Q4	LC_DCDS	0.1	2.5	2.51600	<0.00001	<0.00001	7.83	7.998	0.21	0	243.20000	0.000019	0.00002	<0.0001
2021	Q2	LC_LC3	0.0	1.8	1.87800	0.00001	0.0	5.31	5.466	0.152	0	172.60000	0.000011	0.00001	0.0001
2021	Q4	LC_LC3	0.0	2.2	2.21800	0.00001	0.0	13.44	13.74	0.234	0	370.20000	0.000011	0.00001	0.0001
2021	Q2	LC_LC5	0.0	1.8	2.23400	<0.00001	0.0	1.94	1.988	0.114	0	107.70000	<0.00001	0.00001	<0.0001
2021	Q4	LC_LC5	0.0	2.1	2.31400	<0.00001	<0.00001	4.11	4.064	0.18	0	215.00000	<0.00001	<0.00001	<0.0001
2021	Q2	LC_LCDSSLCC	0.0	1.7	1.84000	<0.00001	<0.00001	3.09	3.128	0.118	0	96.14000	<0.00001	<0.00001	<0.0001
2021	Q4	LC_LCDSSLCC	0.0	2.2	2.29600	<0.00001	<0.00001	9.26	9.454	0.22	0	275.60000	<0.00001	<0.00001	0.00011

Year	Quarter	Sample ID	IRON-T-mg/l	LEAD-D-mg/l	LEAD-T-mg/l	LITHIUM-D-mg/l	LITHIUM-T-mg/l	MAGNESIUM-D-mg/l	MAGNESIUM-T-mg/l	MAJOR ANION SUM-N-meq/l	MAJOR CATION SUM-N-meq/l	MANGANESE-D-mg/l	MANGANESE-T-mg/l	MERCURY-D-mg/l	MERCURY-T-mg/l	MOLYBDENUM-D-mg/l	MOLYBDENUM-T-mg/l	NICKEL-D-mg/l	NICKEL-T-mg/l	NITRATE NITROGEN (NO3) AS N-N-mg/l	NITRITE NITROGEN (NO2) AS N-N-mg/l	NITROGEN AMMONIA (AS N)-N-mg/l	ORTHO-PHOSPHATE-N-mg/l	OXIDATION-REDUCTION POTENTIAL LAB-N-mv	pH LAB-N-ph units	PHOSPHORUS-N-mg/l	POTASSIUM-D-mg/l	POTASSIUM-T-mg/l	SELENIUM-D-mg/l	SELENIUM-T-mg/l	SILICON-D-mg/l	SILICON-T-mg/l	SILVER-D-mg/l	SILVER-T-mg/l	SODIUM-D-mg/l	SODIUM-T-mg/l	STRONTIUM-D-mg/l	STRONTIUM-T-mg/l	SULFATE (AS SO4)-D-mg/l	THALLIUM-D-mg/l	THALLIUM-T-mg/l	TIN-D-mg/l
Tests categorized as possible or likely adverse re																																											
2016	Q4	CM_MC2	0.07700	<0.00005	0.0001	0.011	0	36	37.0	7.9	7.5000	0.0073	0.011000	<0.000005	0.0000	0.00089	0.00093	0.0098	0.01	2.200	0.008	0.0057	0	296.0	8.300	0.01	1.3	1.3000	0.0057	0.0	2.1	2.40000	<0.00001	<0.00001	7.5	7.70	0.23	0	195.00000	0.000011	0.00002	<0.0001
2019	Q4	LC_LC5	0.00900	<0.00005	<0.00005	0.0194	0	41	44.2	8.6	8.3880	0.0003	0.001164	<0.000005	<0.0000005	0.00118	0.04102	0.00074	0.0	8.900	0.0014	0.0123	0	442.0	8.300	0.0	1.07	1.0940	0.04396	0.0	2.2	2.31200	<0.00001	<0.00001	3.38	3.414	0.176	0	189.00000	<0.00001	<0.00001	<0.0001
2020	Q2	LC_LC3	0.03660	0.000127	0.000	0.033	0	44	43.8	8.7	8.7800	0.0123	0.011900	<0.0000050	0.0000	0.00236	0.00231	0.00755	0.01	8.100	0.0009	0.0171	0	395.0	8.400	0.0	1.43	1.3800	0.0357	0.0	1.9	1.93000	<0.0000100	<0.0000100	5.93	5.85	0.163	0	203.00000	0.000013	0.00001	<0.000100
Tests categorized as possible or likely adverse re																																											
2018	Q4	FR_FRABCH	0.01700	<0.00005	<0.00005	0.034	0	66	67.0	13.0	13.0000	0.0045	0.005100	<0.000005	<0.0000005	0.0007	0.0007	0.00052	0.0	19.000	0.0053	0.017	0	426.0	8.300	0.0	1.8	1.8000	0.0930	0.1	2.3	2.40000	<0.00001	<0.00001	2.6	2.60	0.18	0	314.00000	<0.00001	<0.00001	<0.0001
2020	Q4	LC_LC3	0.09500	<0.000050	<0.000050	0.0548	0	73	77.5	15.1	14.1000	0.0418	0.046500	<0.000050	<0.0000050	0.0042	0.00442	0.00932	0.01	12.000	<0.0050	0.012	0	347.0	8.300	0.0	1.94	1.9800	0.0503	0.0	2.1	2.20000	<0.0000100	<0.0000100	11.4	11.80	0.24	0	424.00000	<0.0000100	0.00001	<0.000100
Tests categorized as possible or likely adverse re																																											
2015	Q4	FR_FRCP1	0.02100	0.00005	0.0001	0.040	0	73	74.0	13.0	13.0000	0.0076	0.008900	0.000005	0.00001	0.0015	0.0015	0.0070	0.01	16.000	0.0053	0.005	0	379.0	8.300	0.0	1.9	2.0000	0.0910	0.1	1.8	1.80000	0.00001	0.0	2.0	2.10	0.17	0	364.00000	0.00001	0.00001	0.0001
2015	Q4	CM_MC2	0.05300	0.00005	0.0001	0.012	0	46	46.0	9.4	9.6000	0.0039	0.006500	0.000005	0.00001	0.0011	0.0011	0.0087	0.01	2.400	0.034	0.016	0	373.0	8.400	0.01	1.4	1.4000	0.0052	0.0	2.1	2.20000	0.00001	0.0	9.5	9.50	0.29	0	252.00000	0.000011	0.00001	0.0001
2016	Q4	FR_FRCP1	0.03400	<0.00005	<0.00005	0.032	0	50	50.0	10.0	9.7000	0.0068	0.008700	<0.000005	<0.0000005	0.0013	0.0013	0.0049	0.01	12.000	<0.005	<0.005	<0.001	330.0	8.300	0.0	1.6	1.6000	0.0590	0.1	1.7	1.80000	<0.00001	<0.00001	1.5	1.60	0.15	0	253.00000	0.000011	<0.00001	<0.0001
2016	Q2	GH_FR1	0.08600	<0.00005	0.0001	0.014	0	32	33.0	6.6	6.7000	0.0009	0.004300	<0.000005	0.0000	0.00099	0.00099	0.0016	0.0	7.600	0.0027	0.005	0	318.0	8.400	0.01	1.0	1.1000	0.0290	0.0	1.8	1.90000	<0.00001	<0.00001	1.5	1.50	0.11	0	128.00000	<0.00001	<0.00001	<0.0001
2016	Q4	GH_FR1	0.01800	<0.00005	<0.00005	0.017	0	45	46.0	9.0	8.7000	0.001	0.001700	<0.000005	<0.000001625	0.0011	0.0011	0.0024	0.0	9.500	<0.005	0.0054	0	353.0	8.300	0.01	1.3	1.3000	0.0430	0.0	2.1	2.20000	<0.00001	<0.00001	2.0	2.10	0.14	0	212.00000	<0.00001	<0.00001	<0.0001
2016	Q2	CM_MC2	0.40000	<0.00005	0.0002	0.009	0	26	26.0	5.9	5.9000	0.011	0.025000	<0.000005	0.0000	0.00087	0.00088	0.0150	0.02	2.000	0.0088	0.024	0	307.0	8.300	0.02	1.0	1.1000	0.0046	0.0	2.0	2.60000	<0.00001	<0.00001	6.2	6.00	0.20	0	134.00000	0.000012	0.00002	<0.0001
2016	Q4	EV_HC1	0.03600	<0.00005	<0.00005	0.0075	0	43	43.0	7.8	7.7000	0.0015	0.002500	<0.000005	0.0000	0.00091	0.00093	0.00075	0.0	1.000	<0.004	<0.005	0	318.0	8.400	0.01	0.91	0.9300	0.0330	0.0	2.0	2.20000	<0.00001	<0.00001	1.7	1.70	0.13	0	182.00000	<0.00001	0.00001	<0.0001
2016	Q2	EV_MC2	0.43000	<0.00005	0.0003	0.0057	0	13	12.0	3.0	3.1000	0.0004	0.012000	0.0000013	0.0000	0.00073	0.00074	0.0017	0.0	1.000	0.0012	<0.005	0	339.0	8.200	0.04	0.56	0.6800	0.0042	0.0	1.9	2.60000	<0.00001	0.0	1.8	1.80	0.091	0	44.00000	<0.00001	0.00002	<0.0001
2016	Q2	LC_LCDSSLCC	0.02000	<0.000045	<0.000045	0.025	0	29	29.0	6.2	6.3000	0.0025	0.003700	<0.000005	0.0000	0.0014	0.0014	0.0046	0.0	6.300	0.002	<0.005	0	347.0	8.300	0.0	0.97	1.0000	0.0210	0.0	1.9	1.90000	<0.00001	<0.00001	3.7	3.90	0.13	0	120.00000	0.00001	0.00001	<0.0000875
2016	Q4	LC_LCDSSLCC	0.02900	<0.00005	0.0001	0.033	0	38	39.0	8.6	8.2000	0.0018	0.003300	<0.000005	0.0000	0.0016	0.0016	0.0044	0.0	9.900	<0.005	<0.005	0	330.0	8.300	0.0	1.2	1.2000	0.0280	0.0	2.0	2.20000	<0.00001	<0.00001	5.2	5.30	0.19	0	194.00000	0.00001	0.00001	<0.0001
2017	Q4	FR_FRCP1	0.04900	<0.00005	0.0001	0.041	0	-	94.0	-	-	0.0075	0.013000	<0.000005	<0.0000005	0.0013	0.0014	0.0086	0.01	15.000	0.0067	0.0063	<0.001	-	8.200	0.0	-	2.2000	0.1400	0.1	-	-	<0.00001	<0.00001	-	2.00	0.18	0	515.00000	0.000011	0.00001	<0.0001
2017	Q4	GH_FR1	0.01300	<0.00005	<0.00005	0.017	0	-	57.0	-	-	0.0013	0.002000	<0.000005	0.0000	0.0011	0.0011	0.0026	0.0	10.000	0.0056	0.0068	<0.001	-	8.400	0.0	-	1.3000	0.0650	0.1	-	-	<0.00001	<0.00001	-	2.20	0.16	0	267.00000	<0.00001	<0.00001	<0.0001
2017	Q4	CM_MC2	0.01200	<0.00005	<0.00005	0.018	0	-	59.0	-	-	0.0043	0.005400	<0.000005	<0.0000005	0.0013	0.0014	0.0160	0.02	3.900	0.014	0.020	<0.001	-	8.300	0.0	-	1.9000	0.0084	0.0	-	-	<0.00001	<0.00001	-	14.00	0.41	0	334.00000	0.000014	0.00002	<0.0001
2017	Q4	EV_HC1	0.01100	<0.00005	<0.00005	0.007	0	-	47.0	-	-	0.0025	0.004400	0.0000015	0.0000	0.00089	0.00089	0.00058	0.0	0.940	0.002	0.0088	0	-	8.400	0.01	-	0.8800	0.0400	0.0	-	-	<0.00001	0.0	-	1.60	0.13	0	203.00000	<0.00001	<0.00001	<0.0001
2017	Q4	EV_MC2	0.01600	<0.00005	<0.00005	0.015	0	-	31.0	-	-	0.0007	0.001700	0.0000031	0.0000	0.00078	0.0008	0.00052	0.0	2.800	0.0019	0.0091	0	-	8.200	0.0	-	1.0000	0.0180	0.0	-	-	<0.00001	<0.00001	-	5.00	0.20	0	136.00000	<0.00001	<0.00001	<0.0001
2017	Q2	GH_ERC	1.30000	<0.00005	0.0049	0.0024	0	-	14.0	-	-	0.0011	0.081000	<0.000005	0.00001	0.00094	0.0011	<0.0005	0.0	0.380	<0.001	0.0052	0	-	8.400	0.13	-	0.7900	0.0018	0.0	-	-	<0.00001	0.0	-	0.90	0.19	0	23.00000	<0.00001	0.00004	<0.0001
2017	Q4	GH_ERC	<0.01	<0.00005	0.0001	0.0027	0	-	12.0	-	-	0.0003	0.000970	<0.000005	<0.0000005	0.0010	0.0011	<0.0005	<0.0005	0.250	0.0013	0.0085	<0.001	-	8.400	0.0	-	0.4000	0.0012	0.0	-	-	<0.00001	<0.00001	-	0.85	0.21	0	24.00000	<0.00001	<0.00001	<0.0001
2017	Q4	LC_LCDSSLCC	<0.01	<0.00005	<0.00005	0.041	0	-	51.0	-	-	0.0006	0.001300	<0.000005	0.0000	0.0016	0.0017	0.0056	0.01	11.000	0.0015	0.008	0	-	8.300	0.0	-	1.5000	0.0540	0.1	-	-	<0.00001	<0.00001	-	6.70	0.21	0	257.00000	0.00001	<0.00001	<0.0001
2018	Q4	GH_FR1	0.01100	<0.00005	<0.00005	0.019	0	56	56.0	10.0	10.0000	0.0009	0.001400	<0.000005	<0.0000005	0.0012	0.0012	0.0017	0.0	10.000	0.005	0.012	0	376.0	8.400	<0.002	1.4	1.3000	0.0640	0.1	2.2	2.30000	<0.00001	<0.00001	2.4	2.40	0.16	0	259.00000	<0.00001	<0.00001	<0.0001
2019	Q2	FR_FRABCH	0.17600	0.000094	0.0005	0.0228	0	46	45.8	8.9	8.6900	0.0024	0.012782	<0.000005	0.0000	0.00088	0.00088	0.00153	0.0	12.000	0.0018	0.0121	<0.001	409.2	8.280	0.02	1.38	1.4340	0.05662	0.1	1.7	1.89400	<0.00001	<0.00001	1.69	1.804	0.124	0	209.80000	<0.00001	0.00001	<0.0001
2019	Q2	GH_FR1	0.16100	<0.00005	0.0001	0.0154	0	40	39.7	7.5	7.6740	0.0006	0.009116	<0.000005	0.0000	0.00137	0.00128	0.00154	0.0	6.900	0.0035	0.0168	<0.001	431.2	8.360	0.01	1.1	1.1110	0.04054	0.0	1.9	2.04800	<0.00001	<0.00001	1.71	1.778	0.131	0	171.88000	<0.00001	0.00001	<0.0001
2019	Q4	GH_FR1	0.03380	<0.00005	0.000	0.0183	0	50	51.5	9.7	9.4800	0.0012	0.002004	<0.000005	0.0000	0.00091	0.00091	0.00096	0.0	10.000	0.0026	0.0072	0	397.4	8.300	0.0	1.23	1.2860	0.05724	0.1	2.4	2.49600	<0.00001	<0.00001	2.25	2.29	0.154	0	230.80000	<0.00001	<0.00001	0.00006
2019	Q4	CM_MC2	0.06140	<0.00005	0.0001	0.0173	0	63	62.8	12.3	12.4200	0.0066	0.012556	<0.000005	0.0000	0.0011	0.00113	0.02072	0.02	2.984	0.0027	0.0111	0	338.6	8.320	0.01	1.83	1.9120	0.01012	0.0	2.1	2.49200	<0.00001	<0.00001	12.24	12.26	0.396	0	366.00000	0.000014	0.00002	0.00017
2019	Q4	EV_MC2	0.00940	<0.00005	0.000	0.0125	0	29	29.0	6.3	6.2520	0.0011	0.001330	<0.000005	<0.0000005	0.0009	0.00091	0.0011	0.0	1.756	0.0038	0.0107	0	427.6	8.260	0.0	0.9	0.8982	0.01438	0.0	2.4	2.45400	<0.00001	<0.00001	3.83	3.852	0.178	0	123.40000	<0.00001	<0.00001	<0.0001
2019	Q4	LC_DCDS	<0.01	<0.00005	0.000	0.0157	0	37	37.7	8.3	8.2100	0.0008	0.001234	<0.000005	0.0000	0.00049	0.00422	0.00568	0.01	28.000	0.0129	0.0421	0	350.0	8.240	0.04	2.34	2.3800	0.05196	0.1	2.6	2.77400	<0.00001	<0.00001	2.65	2.668	0.136	0	140.80000	0.000009	0.00001	0.00007
2020	Q4	FR_FRCP1	0.03280	<0.000050	<0.000050	0.0439	0	81	81.0	15.4	14.6000	0.0099	0.010700	<0.0000050	0.0000	0.00331	0.00332	0.0108	0.01	16.000	0.0148	0.100	<0.0020	273.0	8.340	<0.00100	2.61	2.5100	0.1150	0.1	1.9	1.93000	<0.0000100	<0.0000100	2.08	2.02	0.19	0	452.00000	0.000015	0.00001	<0.000100
2020	Q4	GH_FR1	0.12600	<0.000050	0.0001	0.0219	0	51	51.5	10.5	10.0000	0.0013	0.003330	<0.0000050	0.0000	0.00097	0.0010	0.00101	0.0	13.000	0.0037	0.0076	0	356.0	8.320	0.0	1.41	1.4100	0.0646	0.1	2.3	2.39000	<0.0000100	0.0	2.33	2.35	0.161	0	258.00000	<0.0000100	0.00001	<0.000100
2020	Q4	LC_LCDSSLCC	0.00820	<0.000050	<0.000050	0.0358	0	51	53.8	10.7	10.3000	0.0043	0.005390	<0.0000050	<0.0000050	0.00249	0.0026	0.00408	0.0	8.600	0.0009	0.0125	<0.0020	365.0	8.360	0.0	1.34	1.3700	0.0408	0.0	2.2	2.27000	<0.0000100	<0.0000100	7.42	7.79	0.22	0	272.00000	<0.0000100	<0.0000100	<0.000100
Tests categorized as possible or likely adverse re																																											
2015	Q4	GH_FR1	0.01100	0.00005	0.0001	0.016	0	44	45.0	8.9	9.0000	0.0012	0.001600	0.000005	0.00001	0.00094	0.00098	0.0015	0.0	10.000	0.005	0.005	0	354.0	8.400	0.0	1.2	1.2000	0.0420	0.0	2.2	2.20000	0.00001	0.0	2.0	2.10	0.15	0	202.00000	0.00001	0.00001	0.0001
Tests categorized as possible or likely adverse re																																											
2020	Q4	FR_FRABCH	0.02520	<0.000050	<0.000050	0.0369	0	65	66.7	13.4	12.8000	0.0045	0.005360	<0.0000050	<0.00000050	0.00094	0.00098	0.00117	0.0	22.000	0.006	0.022	0	297.0	8.200	0.0	1.97	1.9800	0.1020	0.1	2.2	2.33000	<0.0000100	<0.0000100	2.5	2.55	0.181	0	348.00000	<0.0000100	<0.0000100	<0.000100
Tests categorized as possible or likely adverse re																																											
2018	Q4	FR_FRCP1	0.01600	<0.0001	<0.00007	0.079	0	362	369.0	49.0	50.0000	0.0002	0.000660	<0.000005	<0.0000005	0.0026	0.0025	0.0420	0.04	29.000	0.0056	0.042	0	389.0	7.900	0.0	4.9	4.9000	0.6000	0.6	2.7	2.80000	<0.00002	<0.000014	2.1	2.20	0.22	0	1906.00000	0.000043	0.00004	<0.0002
Tests categorized as possible or likely adverse re																																											
2021	Q4	FR_FRCP1	0.03300	<0.00005	<0.00005	0.0644	0	87	90.2	16.0	15.1600	0.0096	0.010718	<0.000005	<0.0000005	0.00354	0.00371	0.01166	0.01	21.600	0.0346	0.0871	0	442.2	8.360	0.0	2.9	2.9020	0.1156	0.1	1.9	2.00600	<0.00001	<0.00001	2.72	2.742	0.215	0	446.40000	0.000017	0.00002	<0.0001

Notes:
"-D-" = dissolved concentration; "-T-" = total concentrat

Screening
Concentrations of parameters in 2021 tests categorize

Year	Quarter	Sample ID	TIN-T-mg/l	TITANIUM-D-mg/l	TITANIUM-T-mg/l	TOTAL DISSOLVED SOLIDS (RESIDUE FILTERABLE)-N-mg/l	TOTAL KJELDAHL NITROGEN-N-mg/l	TOTAL ORGANIC CARBON-T-mg/l	TOTAL SUSPENDED SOLIDS LAB-N-mg/l	TURBIDITY LAB-N-ntu	URANIUM-D-mg/l	URANIUM-T-mg/l	VANADIUM-D-mg/l	VANADIUM-T-mg/l	ZINC-D-mg/l	ZINC-T-mg/l	∑TU-WQGs	∑TU-WQGs/Benchmarks	PC1_allyrs	PC2_allyrs	PC3_allyrs	PC1_2021	PC2_2021	PC3_2021	PC1_allyrs_UFR	PC2_allyrs_UFR	PC3_allyrs_UFR	PC4_allyrs_UFR	PC1_2021_UFR	PC2_2021_UFR	PC3_2021_UFR
Reference (2015 - 2021)																															
2015	Q2	Reference (FR_UFR1)	0.00	0.01	0	143.00	0.1	2.0	1.9	1.4000	0.00031	0.00032	0.0005	0.0005	0.003	0.0	2.4	4.3	-7.04	-2.58	0.73				-6.192	-1.095	0.373	3.307			
2015	Q4	Reference (FR_UFR1)	0.00	0.01	0	217.00	0.1	0.6	1.0	0.2200	0.00045	0.00045	0.0005	0.0005	0.003	0.0	2.3	6.1	-4.30	-5.00	0.70				-3.801	-3.867	-0.131	4.630			
2015	Q2	Reference (GH_ER2)	0.00	0.01	0	181.00	0.1	1.4	5.9	4.1000	0.00077	0.00079	0.0005	0.0006	0.003	0.0	2.9	2.4	-4.99	-1.56	1.51				-4.177	-0.152	0.389	4.265			
2015	Q4	Reference (GH_ER2)	0.00	0.01	0	176.00	0.1	0.6	1.3	0.3700	0.00074	0.00075	0.0005	0.0005	0.003	0.0	2.4	2.3	-4.35	-3.80	1.92				-3.737	-2.842	0.501	4.134			
2016	Q2	Reference (FR_UFR1)	<0.0001	<0.01	<0.01	147.00	0.1	2.0	1.5	0.8200	0.00032	0.00033	<0.0005	0.0005	<0.003	<0.003	1.5	3.9	-7.05	-3.51	0.52				-6.443	-1.897	0.658	1.465			
2016	Q4	Reference (FR_UFR1)	<0.0001	<0.01	<0.01	197.00	0.1	1.3	<1	0.6900	0.00043	0.00045	<0.0005	0.0005	<0.003	<0.00375	1.4	4.0	-5.12	-4.29	0.38				-4.706	-2.961	0.407	1.112			
2016	Q2	Reference (GH_ER2)	<0.0001	<0.01	0	180.00	0.1	1.6	10.0	2.8000	0.00075	0.00077	<0.0005	0.0008	<0.003	<0.003	1.9	1.5	-5.17	-1.69	1.11				-4.224	-0.190	0.243	1.607			
2016	Q4	Reference (GH_ER2)	<0.0001	<0.01	<0.01	181.00	0.1	0.7	<1	0.3600	0.00077	0.00078	<0.0005	<0.0005	0.0034	0.0	1.4	1.4	-4.20	-4.64	1.45				-3.824	-3.467	0.761	2.015			
2017	Q4	Reference (CM_MC1)	<0.0001	<0.01	<0.01	171.00	0.1	1.2	1.3	0.4800	0.00022	0.00023	<0.0005	<0.0005	<0.003	<0.003	1.2	4.3													
2017	Q2	Reference (FR_UFR1)	<0.0001	<0.01	<0.01	131.00	0.1	2.9	10.0	6.0000	0.00027	0.0003	<0.0005	0.0008	0.001	0.0	2.2	3.9	-9.80	1.05	-3.70				-8.663	3.696	-1.083	1.876			
2017	Q4	Reference (FR_UFR1)	<0.0001	<0.01	<0.01	235.00	0.1	0.8	1.0	0.3700	0.00052	0.00049	<0.0005	<0.0005	<0.003	<0.003	1.2	1.2													
2017	Q2	Reference (GH_ER2)	<0.0001	<0.01	0	166.00	0.2	4.1	79.0	42.0000	0.00069	0.00083	<0.0005	0.0033	<0.0026	0.0	5.0	2.2	-8.46	6.33	-3.34				-6.620	9.604	-1.873	3.206			
2017	Q4	Reference (GH_ER2)	<0.0001	<0.01	<0.01	192.00	0.2	0.7	1.5	0.7300	0.00077	0.00075	<0.0005	<0.0005	<0.003	<0.003	1.3	1.2													
2018	Q2	Reference (CM_MC1)	<0.0001	<0.01	<0.01	104.00	0.1	3.5	12.0	5.9000	0.00013	0.00013	<0.0006	0.0009	<0.0012	0.0	3.1	4.6	-9.28	2.10	4.26				-7.528	3.487	6.590	-2.011			
2018	Q4	Reference (CM_MC1)	<0.0001	<0.01	<0.01	153.00	0.2	1.7	<1	0.3100	0.00023	0.00023	<0.0005	<0.0005	0.001	<0.003	1.1	4.5	-4.82	-3.85	2.85				-4.232	-3.415	1.992	-1.097			
2018	Q2	Reference (FR_UFR1)	<0.0001	<0.01	<0.01	123.00	0.1	2.7	9.6	3.9000	0.0003	0.00031	<0.0005	0.0009	<0.001	0.0	2.1	3.2	-8.39	-0.18	0.26				-7.311	1.960	0.844	-0.774			
2018	Q4	Reference (FR_UFR1)	<0.0001	<0.01	<0.01	209.00	0.1	0.7	<1	0.2300	0.0005	0.0005	<0.0005	<0.0005	<0.001	<0.003	1.3	1.2	-3.85	-5.61	0.37				-3.502	-4.393	0.041	1.383			
2018	Q2	Reference (GH_ER2)	<0.0001	<0.01	<0.01	161.00	0.3	3.7	72.0	48.0000	0.00066	0.00079	<0.0005	0.0036	<0.001	0.0	5.7	2.1	-6.56	5.03	0.83				-4.678	7.586	-0.216	-0.655			
2018	Q4	Reference (GH_ER2)	<0.0001	<0.01	<0.01	171.00	0.1	<0.5	1.2	0.3800	0.00075	0.00077	<0.0005	<0.0005	<0.001	<0.003	1.3	1.3	-3.98	-5.00	1.92				-3.581	-4.010	0.960	0.818			
2018	Q2	Reference (LC_SLC)	<0.0001	<0.01	<0.01	135.00	0.1	2.5	4.8	1.8000	0.00065	0.00067	<0.0005	0.0006	0.002	0.0	1.6	5.7	-7.33	-2.22	0.46				-6.589	-0.185	1.981	0.507			
2018	Q4	Reference (LC_SLC)	<0.0001	<0.01	<0.01	224.00	0.1	0.9	1.6	0.2200	0.0018	0.0018	<0.0005	<0.0005	0.0014	0.0	1.6	1.3	-2.25	-4.86	0.53				-1.983	-3.701	0.415	1.417			
2019	Q2	Reference (CM_MC1)	<0.0001	<0.01	<0.01	122.20	0.1	4.6	5.7	4.0300	0.00015	0.00016	<0.0005	0.0006	<0.001	<0.003	2.3	3.3	-8.53	-0.19	1.82				-7.220	1.010	2.066	-2.556			
2019	Q4	Reference (CM_MC1)	<0.0001	<0.01	<0.01	157.40	<0.05	0.8	<1	0.2300	0.00023	0.00025	<0.0005	<0.0005	<0.001	<0.003	1.6	2.1	-4.78	-4.86	2.88				-4.464	-4.592	1.066	-1.575			
2019	Q2	Reference (FR_UFR1)	<0.0001	<0.01	<0.01	137.20	0.1	1.5	3.34	1.6800	0.00034	0.00035	<0.0005	0.0003	<0.001	<0.003	2.0	2.3	-6.93	-3.36	0.60				-6.210	-1.842	1.464	-0.558			
2019	Q4	Reference (FR_UFR1)	0.00	<0.01	<0.01	197.60	0.3	1.2	6.62	0.7020	0.00051	0.0005	<0.0005	0.0004	0.0008	0.0	1.5	2.7	-4.60	-3.85	-0.68				-3.844	-2.371	-0.622	-1.524			
2019	Q2	Reference (GH_ER2)	<0.0001	<0.01	<0.01	161.80	0.2	1.2	29.8	14.0180	0.00074	0.00076	<0.0005	0.0011	<0.001	0.0	3.1	2.0	-5.65	-0.77	0.78				-4.520	1.032	-0.016	0.027			
2019	Q4	Reference (GH_ER2)	<0.0001	<0.01	<0.01	170.40	0.0	0.3	1.5	0.6440	0.00075	0.00076	<0.0005	<0.0005	0.0006	0.0	2.7	1.6	-3.90	-5.65	1.97				-3.517	-4.625	0.654	0.732			
2019	Q2	Reference (LC_SLC)	<0.0001	<0.01	<0.01	148.80	0.1	2.0	1.98	1.0340	0.00087	0.00088	<0.0005	0.0003	0.0019	0.0	1.8	3.1	-5.68	-4.14	0.29				-5.256	-2.384	1.299	0.984			
2019	Q4	Reference (LC_SLC)	<0.0001	<0.01	<0.01	225.40	0.0	0.7	<1	0.2280	0.00171	0.00175	<0.0005	<0.0005	0.0019	<0.003	2.1	3.7	-2.18	-5.53	0.71				-1.990	-4.473	0.644	0.869			
2020	Q2	Reference (CM_MC1)	<0.000100	<0.0100	<0.0100	139.00	0.1	3.5	9.12	5.6500	0.00015	0.00018	<0.00050	0.0008	0.0006	0.0	2.2	1.3	-8.17	0.13	1.80				-7.000	1.398	1.229	-3.216			
2020	Q4	Reference (CM_MC1)	<0.000100	<0.0100	<0.0100	162.00	0.1	1.6	<1.00	0.2300	0.00023	0.00023	<0.00050	<0.00050	<0.00100	<0.0030	1.0	1.4	-4.75	-4.09	2.84				-4.231	-3.717	1.950	-1.731			
2020	Q2	Reference (FR_UFR1)	<0.000100	<0.0100	<0.0100	142.00	0.2	2.6	16.56	4.8100	0.00033	0.00034	<0.00050	0.0009	0.0007	0.0	1.7	4.6	-7.86	-1.68	-0.67				-6.802	0.434	-0.556	-1.402			
2020	Q4	Reference (FR_UFR1)	<0.000100	<0.0100	<0.0100	211.00	<0.050	0.7	<1.00	0.2080	0.00048	0.00049	<0.00050	<0.00050	<0.00100	<0.0030	1.1	1.6	-4.25	-5.81	0.02				-3.904	-4.481	-0.273	0.557			
2020	Q2	Reference (GH_ER2)	<0.000100	<0.0100	0	195.00	0.4	2.9	88.6	48.4500	0.00072	0.00082	<0.00050	0.0027	<0.00100	0.0	4.6	2.2	-5.88	3.92	0.39				-4.241	6.383	-1.188	-1.994			
2020	Q4	Reference (GH_ER2)	<0.000100	<0.0100	<0.0100	185.00	0.0	0.4	3.5	0.6760	0.00072	0.00074	<0.00050	<0.00050	0.0017	<0.0030	1.6	1.0	-3.93	-4.82	1.34				-3.404	-3.601	-0.142	0.484			
2020	Q2	Reference (LC_SLC)	<0.000100	<0.0100	<0.0100	159.00	0.1	2.4	4.18	1.4700	0.00086	0.00082	<0.00050	0.0003	0.0028	0.0	1.3	5.5	-5.49	-3.63	0.43				-4.931	-1.994	0.752	-0.253			
2020	Q4	Reference (LC_SLC)	<0.000100	<0.0100	<0.0100	233.00	0.1	1.0	<1.00	<0.100	0.00154	0.00161	<0.00050	<0.00050	0.0019	0.0	1.4	4.1	-2.16	-5.81	0.56				-1.911	-4.739	0.434	0.806			
2021	Q2	Reference (CM_MC1)	<0.0001	0.00	0	122.20	0.2	5.4	8.52	5.2520	0.00013	0.00015	<0.0005	0.0009	0.0036	0.0	3.4	3.4	-9.30	1.48	2.37	-11.05	0.98	-2.98	-7.864	3.174	2.768	-3.993	-10.457	2.097	2.258
2021	Q4	Reference (CM_MC1)	0.00	0.00	0	153.80	0.1	1.7	1.0	0.2460	0.00022	0.00022	0.0005	0.0005	0.001	0.0	2.1	2.0	-4.76	-3.89	3.02	-6.10	-5.10	-4.86	-4.159	-3.444	2.208	-3.213	-5.808	-4.987	3.764
2021	Q2	Reference (FR_UFR1)	<0.0001	<0.0003	0	130.60	0.1	2.5	7.68	2.9260	0.00031	0.00032	<0.0005	0.0006	0.0015	0.0	2.5	2.4	-7.62	-2.09	0.53	-8.84	-2.63	-0.46	-6.714	-0.207	1.304	-2.657	-8.463	-1.484	-0.499
2021	Q4	Reference (FR_UFR1)	0.00	<0.0003	<0.0003	207.40	0.0	0.5	0.56	0.0860	0.00049	0.00052	<0.0005	<0.0005	0.0001	0.0	2.3	2.3	-3.35	-8.84	-2.07	-4.16	-10.23	2.00	-3.222	-7.060	-1.608	-3.044	-4.009	-9.516	-3.945
2021	Q2	Reference (GH_ER2)	<0.0001	<0.0003	0	156.80	0.2	2.6	78.68	33.6800	0.00067	0.00079	<0.0005	0.0029	0.0013	0.0	5.7	5.7	-6.43	4.18	0.93	-8.08	3.76	1.37	-4.568	6.712	0.336	-2.573	-7.291	6.328	-0.010
2021	Q4	Reference (GH_ER2)	<0.0001	<0.0003	0	179.60	<0.05	0.8	3.68	0.4360	0.00073	0.00078	<0.0005	0.0007	0.0012	0.0	3.2	3.1	-4.20	-2.77	1.57	-5.16	-3.49	-0.47	-3.437	-1.322	0.700	-2.004	-4.638	-2.334	-0.115
2021	Q2	Reference (LC_SLC)	<0.0001	<0.0003	0	130.60	0.1	2.6	2.66	1.3880	0.00062	0.00066	<0.0005	0.0005	0.003	0.0	3.0	2.9	-7.04	-3.15	0.17	-8.00	-3.96	-0.50	-6.387	-1.061	1.546	-1.734	-7.790	-2.451	-1.389
2021	Q4	Reference (LC_SLC)	<0.0001	<0.0003	<0.0003	228.40	0.1	0.9	1.38	<0.1	0.0017	0.00192	<0.0005	<0.0005	0.0021	0.0	4.7	4.6	-1.01	-5.45	0.46	-1.88	-5.89	-0.79	-0.746	-4.418	0.596	-0.990	-1.715	-4.987	-0.013
Tests categorized as no adverse response (2015 -																															
2015	Q2	CM_MC2	0.00	0.01	0	316.00	0.2	1.9	29.0	15.0000	0.0011	0.0011	0.0014	0.0023	0.0058	0.0	7.2	7.0	-0.69	9.85	11.97										
2015	Q2	EV_HC1	0.00	0.01	0	241.00	0.1	1.3	2.2	1.3000	0.0013	0.0013	0.0005	0.0006	0.003	0.0	2.7	2.7	-3.54	-1.47	-0.13										
2015	Q4	EV_HC1	0.00	0.01	0	519.00	0.1	1.2	1.1	0.6900	0.0027	0.0028	0.0005	0.0005	0.003	0.0	3.2	5.8	2.21	-1.99	-0.10										
2015	Q2	EV_MC2	0.00	0.01	0	208.00	0.3	3.6	57.0	15.0000	0.00062	0.00067	0.0005	0.0029	0.003	0.0	5.8	5.8	-4.33	5.99	0.28										
2015	Q4	EV_MC2	0.00	0.01	0	387.00	0.2	1.6	3.1	2.5000	0.0014	0.0014	0.0005	0.0007	0.003	0.0	4.2	3.7	2.50	0.75	0.76										
2015	Q2	FR_FRCP1	0.00	0.01	0	382.00	0.1	1.8	5.2	1.4000	0.0016	0.0017	0.0005	0.0005	0.003	0.0	5.9	4.1	1.44	-0.12	-1.76				2.226	0.770	-1.351	4.201			
2015	Q2	GH_ERC	0.00	0.01	0	192.00	0.1	1.7	17.0	6.9000	0.0008	0.00081	0.0005	0.0011	0.003	0.0	3.2	2.9	-4.68	0.24	1.15										
2015	Q4	GH_ERC	0.00	0.01	0	211.00	0.1	0.6	3.2	0.5000	0.00082	0.00084	0.0005	0.0005	0.003	0.0	2.5	2.4	-3.22	-3.90	2.05										
2015	Q2	GH_FR1	0.00	0.01	0	399.00	0.1	1.6	4.1	1.8000	0.0016	0.0016	0.0005	0.0005	0.003	0.0	5.7	3.2	1.26	-0.63	-0.90				2.069	-0.081	-1.146	3.695			
2015	Q2	LC_LCDSSLCC	0.00	0.01	0	280.00	0.1	1.3	5.3	1.7000	0.0016	0.0017	0.0005	0.0006	0.0052	0.0	5.1	3.9	-0.53	0.21	-0.32										
2015	Q4	LC_LCDSSLCC	0.00	0.01	0	651.00	0.1	0.8	1.0	0.4500	0.0040	0.0042	0.0005	0.0005	0.0085	0.0	9.8	3.8	6.78	-0.27	0.30										
2016	Q2	EV_HC1	<0.0001	0.011	0	351.00	0.1	1.7	3.1	1.7000	0.0019	0.0020	<0.0005	0.0006	<0.003	<0.003	2.2	7.4	-0.50	-1.61	-0.84										
2016	Q4	EV_MC2	<0.0001	<0.01	<0.01	261.00	0.2	2.4	3.6	2.9000	0.00083	0.00084	<0.0005	0.0008	<0.003	<0.003	2.6	2.6	-1.52	0.24	0.04										
2016	Q2	FR_FRCP1	<0.0001	0.011	0	377.00	0.2	2.0	6.0	0.9800	0.0017	0.0017	<0.0005	0.0005	<0.003	0.0	5.1	3.2	0.98	-0.37	-2.07				1.659	0.770	-0.852	2.360			
2016	Q2	GH_ERC	<0.0001	<0.01	0	189.00	0.1	1.6	16.0	3.4000	0.00083	0.00082	<0.0005	0.001	<0.003	0.0	2.4	1.9	-4.51	-0.45	0.82										
2016	Q4	GH_ERC	<0.0001	<0.01	<0.01	202.00	<0.05	0.7	1.7	0.5500	0.00084	0.00084	<0.0005	<0.0005	<0.003	<0.003	1.6	1.4	-3.34	-4.44	1.64										
2017	Q2	CM_MC2	0.00	<0.01	<0.01	348.00	0.2	2.6	37.0	23.0000	0.0013	0.0013	<0.0005	0.0016	0.0071	0.0	8.7	2.9	-2.51	9.08	-1.72										
2017	Q2	EV_HC1	<0.0001	<0.01	<0.01	290.00	0.2	3.4	13.0	12.0000	0.0014	0.0014	<0.0005	0.0014	<0.003	0.0	3.0	8.3	-5.54	3.71	-5.24										
2017	Q2	EV_MC2	<0.0001	<0.01	0	178.00	0.3	5.1	66.0	38.0000	0.00049	0.00057	<0.0005	0.0043	<0.003	0.0	7.0	7.0	-8.02	8.99	-3.97										
2017	Q2	FR_FRCP1	<0.0001	<0.01	<0.01	362.00	0.6	2.7	27.0	13.0000	0.0015	0.0016	<0.0005	0.0013	0.0023	0.0	6.4	4.5	-2.97	5.21	-6.31				-1.671	7.809	-2.673	2.827			
2017	Q2	GH_FR1	<0.0001	<0.01	<0.01	331.00	0.4	4.2	34.0	17.0000	0.0015	0.0015	<0.0005	0.0018	0.0027	0.0	6.1	7.3	-3.81	5.85	-6.05				-2.391	8.480	-2.783	3.638			
2017	Q2	LC_LCDSSLCC	<0.0001	<0.01	<0.01	327.00	0.6	1.9	3.5	1.9000	0.0017	0.0019	<0.0005	<0.0005	0.011	0.0	4.9	4.9	-1.54	2.25	-5.62										
2018	Q2	CM_MC2	<0.0001	<0.01	0	302.00	0.2	2.9	29.0	27.0000	0.0012	0.0012	<0.0006	0.0024	0.0047	0.0	9.1	2.8	-0.05	8.48	4.06										
2018	Q4	CM_MC2	<0.0001	<0.01	<0.01	715.00	0.2	1.1	1.3	0.6700	0.0039	0.0039	<0.0005	<0.0005	0.003	0.0	13.0	2.2	9.44	3.15	6.16										
2018	Q2	EV_HC1	<0.0001	<0.01	<0.01	302.00	0.1	3.0	13.0	7.4000	0.0016	0.0016	<0.0005	0.0011	<0.001	0.0	2.8	9.0	-2.16	1.14	-0.46										

Year	Quarter	Sample ID	TIN-T-mg/l	TITANIUM-D-mg/l	TITANIUM-T-mg/l	TOTAL DISSOLVED SOLIDS (RESIDUE FILTERABLE)-N-mg/l	TOTAL KJELDAHL NITROGEN-N-mg/l	TOTAL ORGANIC CARBON-T-mg/l	TOTAL SUSPENDED SOLIDS LAB-N-mg/l	TURBIDITY LAB-N-ntu	URANIUM-D-mg/l	URANIUM-T-mg/l	VANADIUM-D-mg/l	VANADIUM-T-mg/l	ZINC-D-mg/l	ZINC-T-mg/l	∑TU-WQGs	∑TU-WQGs/Benchmarks	PC1_allyrs	PC2_allyrs	PC3_allyrs	PC1_2021	PC2_2021	PC3_2021	PC1_allyrs_UFR	PC2_allyrs_UFR	PC3_allyrs_UFR	PC4_allyrs_UFR	PC1_2021_UFR	PC2_2021_UFR	PC3_2021_UFR
2018	Q4	EV_HC1	<0.0001	<0.01	<0.01	525.00	0.2	1.0	1.6	0.5100	0.0027	0.0028	<0.0005	0.0005	<0.001	<0.003	2.4	12.3	2.08	-2.37	-0.21										
2018	Q2	EV_MC2	<0.0001	<0.01	0	156.00	0.2	4.9	55.0	29.0000	0.00048	0.00054	0.00065	0.0039	0.0014	0.0	7.9	8.1	-5.88	8.47	2.85										
2018	Q4	EV_MC2	<0.0001	<0.01	<0.01	433.00	0.2	1.1	1.8	0.4600	0.0016	0.0017	<0.0005	<0.0005	0.0012	0.0	3.2	2.8	3.55	-1.33	0.84										
2018	Q2	FR_FRCP1	<0.0001	<0.01	<0.01	344.00	0.5	2.8	36.0	12.0000	0.0018	0.0018	<0.0005	0.0018	0.0018	0.0	6.8	5.0	-0.31	4.54	-2.29				1.094	6.746	-1.332	0.472			
2018	Q2	GH_ERC	<0.0001	<0.01	0	175.00	0.3	3.3	132.0	56.0000	0.00077	0.00094	<0.0005	0.0053	<0.001	0.0	8.5	1.6	-5.63	6.99	0.66										
2018	Q4	GH_ERC	<0.0001	<0.01	<0.01	190.00	0.1	0.7	1.4	0.4600	0.0008	0.00082	<0.0005	0.0006	<0.001	<0.003	1.6	1.5	-3.16	-4.10	1.37										
2018	Q2	GH_FR1	<0.0001	<0.01	0	347.00	0.4	3.4	28.0	28.0000	0.0016	0.0016	<0.0005	0.0013	0.0013	0.0	5.7	8.6	-0.15	3.72	-1.67				1.193	5.372	-1.122	0.121			
2018	Q2	LC_LCDSSLCC	<0.0001	<0.01	<0.01	334.00	0.4	1.6	4.3	1.5000	0.0020	0.0020	<0.0005	0.0006	0.011	0.0	4.9	5.1	1.61	0.70	-1.41										
2018	Q4	LC_LCDSSLCC	<0.0001	<0.01	<0.01	577.00	0.2	0.7	1.1	0.2700	0.0036	0.0037	<0.0005	<0.0005	0.0054	0.0	6.0	3.6	7.08	-1.32	-0.10										
2019	Q2	CM_MC2	<0.0001	<0.01	<0.01	338.80	0.3	2.2	18.24	10.3920	0.00128	0.00132	<0.0005	0.0008	0.0031	0.0	5.7	2.1	-0.10	3.93	1.60										
2019	Q2	EV_HC1	<0.0001	<0.01	<0.01	313.80	0.1	1.7	3.66	1.8900	0.00167	0.00176	<0.0005	0.0003	<0.001	<0.003	2.2	5.5	-1.31	-2.72	-0.34										
2019	Q4	EV_HC1	<0.0001	<0.01	<0.01	525.60	0.3	0.6	1.66	0.6680	0.00277	0.00283	<0.0005	<0.0005	0.001	<0.003	2.4	1.5	1.71	-3.43	-0.67										
2019	Q2	EV_MC2	<0.0001	<0.01	<0.01	166.00	0.2	2.8	17.96	9.8280	0.00048	0.0005	<0.0005	0.0012	<0.001	0.0	3.0	3.0	-5.28	1.77	0.46										
2019	Q4	FR_FRABCH	0.00	<0.01	<0.01	766.40	<0.05	0.7	7.6	1.0920	0.00306	0.00313	<0.0005	<0.0005	0.0006	0.0	8.9	7.1	4.54	-2.08	-0.45				4.976	-2.125	-0.417	-1.354			
2019	Q2	FR_FRCP1	<0.0001	<0.01	<0.01	418.40	0.2	1.2	11.6	4.2420	0.00202	0.00211	<0.0005	0.0005	0.0006	0.0	5.8	4.0	1.58	-0.32	-2.43				2.331	1.005	-1.298	0.814			
2019	Q4	FR_FRCP1	0.00	<0.01	<0.01	1086.00	<0.05	1.0	1.1	0.3860	0.00586	0.00594	<0.0005	<0.0005	0.0018	0.0	12.0	3.1	8.79	-0.85	-1.51				9.147	-0.949	-0.303	0.146			
2019	Q2	GH_ERC	<0.0001	<0.01	<0.01	180.80	0.2	1.1	44.78	17.3980	0.00082	0.00085	<0.0005	0.0016	<0.001	0.0	4.4	1.8	-4.95	1.03	0.59										
2019	Q4	GH_ERC	0.00	<0.01	<0.01	201.80	0.2	0.3	4.4	0.3840	0.00085	0.00085	<0.0005	<0.0005	0.0009	<0.003	2.9	5.1	-2.56	-5.76	0.07										
2019	Q2	LC_DCDS	<0.0001	<0.01	<0.01	234.00	0.5	3.1	4.36	2.7620	0.00089	0.00082	0.00108	0.0014	0.001	0.0	5.5	3.7	0.45	1.61	-2.30										
2019	Q2	LC_LC3	<0.0001	<0.01	<0.01	517.80	0.2	0.6	1.36	0.8560	0.00314	0.00327	<0.0005	<0.0005	0.0104	0.0	9.5	5.6	5.52	0.19	-0.48										
2019	Q4	LC_LC3	0.00	<0.01	<0.01	902.80	<0.05	0.7	1.04	0.3960	0.00564	0.00585	<0.0005	<0.0005	0.0083	0.0	11.6	8.0	9.46	0.38	0.40										
2019	Q2	LC_LC5	0.00	<0.01	<0.01	394.40	0.4	1.7	14.54	4.3060	0.00173	0.0018	<0.0005	0.0005	<0.001	0.0	4.8	7.2	2.01	-1.04	-1.85				2.741	-0.307	-1.110	-0.135			
2019	Q2	LC_LCDSSLCC	<0.0001	<0.01	<0.01	365.60	0.3	1.1	2.18	1.0920	0.00207	0.00214	<0.0005	0.0003	0.0047	0.0	4.8	3.6	1.98	-1.40	-1.43										
2019	Q4	LC_LCDSSLCC	<0.0001	<0.01	<0.01	652.20	0.0	0.4	0.66	0.2660	0.00382	0.0040	<0.0005	<0.0005	0.0042	0.0	7.7	3.2	6.55	-2.49	-0.40										
2020	Q2	CM_MC2	<0.000100	<0.0100	0	441.00	0.4	2.4	26.0	16.2000	0.00164	0.00172	<0.00050	0.0015	0.0078	0.0	7.9	7.6	1.97	6.36	3.34										
2020	Q4	CM_MC2	<0.000100	<0.0100	<0.0100	816.00	0.3	1.4	1.0	0.8980	0.00324	0.00326	<0.00050	0.0003	0.002	0.0	9.3	8.5	8.76	2.17	6.29										
2020	Q2	EV_HC1	<0.000100	<0.0100	<0.0100	346.00	0.2	2.4	6.56	4.5300	0.00173	0.00171	<0.00050	0.0007	0.0006	0.0	17.6	1.7	-1.36	-0.88	-1.19										
2020	Q4	EV_HC1	<0.000100	<0.0100	<0.0100	485.00	0.2	1.3	3.6	0.5420	0.00244	0.00253	<0.00050	0.0003	0.0008	<0.0030	5.6	1.1	1.31	-2.95	-0.39										
2020	Q2	EV_MC2	<0.000100	<0.0100	0	183.00	0.4	3.8	55.6	25.5000	0.00056	0.00062	<0.00050	0.0032	<0.00100	0.0	5.1	5.1	-4.96	5.80	-0.03										
2020	Q4	EV_MC2	<0.000100	<0.0100	<0.0100	354.00	0.3	1.5	1.34	0.8040	0.00106	0.00111	<0.00050	0.0003	<0.00100	<0.0030	2.0	1.9	1.20	-3.20	-0.29										
2020	Q2	FR_FRABCH	<0.000100	<0.0100	<0.0100	533.00	0.2	2.4	27.08	10.4300	0.0025	0.00247	<0.00050	0.0017	0.0024	0.0	8.8	5.4	2.18	4.41	-2.72				3.546	6.288	-2.479	-0.138			
2020	Q2	FR_FRCP1	<0.000100	<0.0100	<0.0100	500.00	0.2	1.9	21.02	7.3800	0.00243	0.00238	<0.00050	0.0011	0.0042	0.0	8.2	3.6	2.70	2.68	-3.15				3.837	4.419	-2.339	0.015			
2020	Q2	GH_ERC	<0.000100	<0.0100	0	204.00	0.4	2.4	93.2	48.2000	0.00082	0.00095	<0.00050	0.0033	0.0008	0.0	5.8	3.6	-5.40	4.76	0.36										
2020	Q4	GH_ERC	<0.000100	<0.0100	<0.0100	199.00	0.1	0.9	2.12	1.2100	0.00077	0.0008	<0.00050	<0.00050	0.0009	<0.0030	1.8	3.5	-3.09	-4.72	1.45										
2020	Q2	GH_FR1	<0.000100	<0.0100	<0.0100	423.00	0.2	2.8	15.92	8.9300	0.00182	0.00186	<0.00050	0.001	0.0022	0.0	5.3	5.8	1.42	1.17	-2.23				2.292	2.280	-2.123	-0.847			
2020	Q2	LC_DCDS	<0.000100	<0.0100	<0.0100	279.00	0.4	4.9	10.84	17.8900	0.00091	0.00096	0.00118	0.0024	0.0115	0.0	8.2	17.5	0.38	6.30	-1.99										
2020	Q4	LC_DCDS	<0.000100	<0.0100	<0.0100	720.00	0.0	1.5	0.72	0.3000	0.0025	0.0027	0.0010	0.0013	0.0073	0.0	18.9	5.4	8.05	2.15	-0.10										
2020	Q2	LC_LC5	<0.000100	<0.0100	<0.0100	391.00	0.3	4.0	29.9	7.5600	0.00176	0.00178	<0.00050	0.0012	0.0026	0.0	5.7	7.4	0.28	3.64	-2.31				1.657	4.905	-2.078	-0.561			
2020	Q4	LC_LC5	<0.000100	<0.0100	<0.0100	571.00	<0.050	0.9	1.88	0.2780	0.00231	0.00237	<0.00050	<0.00050	0.0014	<0.0030	5.1	6.9	3.76	-3.75	-0.35				3.936	-3.890	-0.924	0.396			
2020	Q2	LC_LCDSSLCC	<0.000100	<0.0100	<0.0100	373.00	0.1	1.7	3.18	0.8380	0.00216	0.00212	<0.00050	0.0004	0.0263	0.0	4.6	4.1	2.51	-0.48	-1.77										
2021	Q2	CM_MC2	<0.0001	<0.0003	0	326.50	0.3	2.4	26.13	13.8125	0.00133	0.00137	<0.0005	0.0012	0.0062	0.0	7.7	7.4	0.49	5.88	3.25	-1.52	5.63	-1.89							
2021	Q4	CM_MC2	<0.0001	<0.0003	0	728.20	0.3	1.3	2.66	0.7900	0.00292	0.00295	<0.0005	<0.0005	0.0014	<0.003	6.3	5.6	6.57	0.18	3.60	5.10	-0.11	-3.05							
2021	Q2	EV_HC1	<0.0001	<0.0003	0	280.20	0.2	3.2	8.08	6.7300	0.00139	0.00139	<0.0005	0.0008	<0.001	0.0	3.5	3.3	-2.18	0.13	-0.66	-3.42	-0.18	0.87							
2021	Q4	EV_HC1	<0.0001	<0.0003	0	492.00	0.1	1.0	1.0	0.4660	0.00265	0.00272	<0.0005	<0.0005	0.0011	0.0	3.9	3.7	1.79	-2.62	-0.28	0.89	-3.03	0.18							
2021	Q2	EV_MC2	0.00	<0.0003	0	193.20	0.4	3.8	120.48	52.6720	0.00049	0.00073	<0.0005	0.0059	0.0011	0.0	9.9	9.8	-5.24	9.93	0.92	-7.67	9.61	0.80							
2021	Q4	EV_MC2	<0.0001	<0.0003	0	347.40	0.2	2.1	2.24	0.5840	0.00124	0.00126	<0.0005	<0.0005	0.0015	0.0	2.9	2.9	2.33	-1.76	0.84	0.94	-1.69	-2.09							
2021	Q2	FR_FR2	<0.0001	<0.0003	0	263.00	0.4	2.4	13.94	4.8700	0.00121	0.0012	<0.0005	0.0009	0.0019	0.0	5.8	4.8	-1.15	1.59	-1.72	-2.47	1.35	1.71	-0.057	3.397	-0.331	-1.696	-2.09	2.81	-1.24
2021	Q4	FR_FR2	<0.0001	<0.0003	<0.0003	710.60	0.2	1.0	1.86	0.3880	0.00367	0.00377	<0.0005	<0.0005	0.002	0.0	13.6	8.4	8.65	0.59	0.38	7.16	0.51	-0.09	9.768	0.411	1.241	-1.689	7.74	0.53	0.20
2021	Q2	FR_FR4	<0.0001	<0.0003	0	326.60	0.3	2.7	22.02	8.5820	0.00161	0.00161	<0.0005	0.0014	0.0033	0.0	7.4	5.8	-0.24	3.46	-1.68	-1.79	3.36	1.51	1.013	5.458	-0.468	-1.337	-1.50	5.18	-0.47
2021	Q4	FR_FR4	<0.0001	<0.0003	0	971.00	0.2	1.1	3.06	0.5680	0.00528	0.0054	<0.0005	0.0005	0.0083	0.0	14.9	9.0	10.77	2.17	-0.44	9.08	2.14	-0.20	11.967	2.209	0.413	-0.615	9.72	2.55	0.46
2021	Q2	FR_FRABCH	<0.0001	<0.0003	0	456.40	0.3	2.4	44.22	10.2580	0.00227	0.00227	<0.0005	0.0011	0.0033	0.0	9.0	5.7	1.67	2.84	-2.20	0.19	2.84	1.95	2.774	4.369	-0.932	-1.262	0.43	4.19	-0.02
2021	Q4	FR_FRABCH	<0.0001	<0.0003	0	877.40	0.1	0.9	1.26	0.1960	0.00376	0.00416	<0.0005	<0.0005	0.0018	0.0	11.7	5.2	7.27	-2.49	-1.51	6.44	-3.30	2.85	7.570	-4.018	-2.748	-4.422	6.57	-4.48	2.68
2021	Q2	FR_FRCP1	<0.0001	<0.0003	0	396.60	0.3	2.1	18.44	5.6960	0.00206	0.00207	<0.0005	0.0009	0.0026	0.0	8.2	5.7	1.59	2.24	-2.08	0.07	2.13	1.69	2.649	3.835	-0.667	-1.584	0.40	3.40	-0.64
2021	Q2	FR_FRRD	0.00	<0.0003	0	513.40	0.1	2.7	16.1	7.6780	0.00263	0.00261	<0.0005	0.0012	0.0021	0.0	10.3	6.0	2.48	2.55	-1.72	0.83	2.62	2.01	3.541	3.909	-0.827	-1.854	1.14	3.84	0.31
2021	Q4	FR_FRRD	<0.0001	<0.0003	<0.0003	937.80	0.3	0.7	1.68	0.1240	0.00485	0.00495	<0.0005	<0.0005	0.0021	0.0	14.5	6.5	7.86	-2.65	0.63	6.38	-2.35	0.10	7.863	-3.362	0.859	-2.997	5.97	-2.93	4.13
2021	Q2	FR_MULTIPLATE	<0.0001	<0.0003	0	244.60	0.4	2.5	11.34	4.1620	0.00112	0.00111	<0.0005	0.0007	0.0032	0.0	5.5	4.5	-1.65	0.56	-1.68	-2.92	0.34	1.32	-0.757	2.258	0.002	-1.719	-2.70	1.61	-1.06
2021	Q4	FR_MULTIPLATE	<0.0001	<0.0003	<0.00036	704.60	0.4	0.9	3.1	0.4220	0.00358	0.00366	<0.0005	<0.0005	0.003	0.0	13.5	7.6	7.12	-2.00	-7.88	6.55	-2.33	7.39	8.891	-1.599	-5.999	-4.116	7.75	-1.74	-7.34
2021	Q2	GH_ERC	<0.0001	<0.0003	0	169.40	0.2	2.5	93.38	40.1600	0.00072	0.00086	<0.0005	0.0039	0.0014	0.0	7.2	7.1	-5.96	5.40	0.92	-7.83	5.04	1.76							
2021	Q4	GH_ERC	<0.0001	<0.0003	<0.0003	190.20	0.1	0.6	3.68	0.6320	0.00081	0.00085	<0.0005	<0.0005	<0.001	<0.003	3.2	3.1	-2.71	-4.94	1.41	-3.49	-5.66	-0.67							
2021	Q2	GH_FR1	0.00	0.00	0	377.20	0.2	2.8	21.8	8.5880	0.00165	0.0017	0.0005	0.0008	0.0013	0.0	6.6	4.8	0.49	1.36	-1.63	-1.01	1.32	1.79	1.522	2.621	-0.615	-1.938	-0.60	2.35	-0.26
2021	Q4	GH_FR1	0.00	0.00	0	652.80	0.3	0.7	1.66	0.3220	0.0028	0.0029	0.0005	0.0005	0.0012	0.0	8.7	4.8	5.15	-2.83	-0.73	4.04	-2.78	1.14	5.545	-2.928	-0.925	-1.989	4.19	-2.82	1.37
2021	Q2	LC_DCDS	<0.0001	<0.0003	0	319.00	0.1	3.7	10.86	7.4200	0.00093	0.00103	0.00137	0.0021	0.0076	0.0	9.3	6.6	2.80	5.93	-0.30	-0.04	5.65	-1.83							
2021	Q4	LC_DCDS	<0.0001	<0.0003	<0.0003	731.80	0.2	2.3	1.58	0.2700	0.00308	0.00327	0.00116	0.0013	0.0096	0.0	22.6	9.2	9.91	3.14	-0.53	7.61	2.78	-2.88							
2021	Q2	LC_LC3	0.00	0.00	0	449.60	0.1	1.1	11.88	0.4880	0.00275	0.00296	0.0005	0.0005	0.0168	0.0	9.0	6.5	5.10	0.73	-0.55	3.53	0.65	-2.39							
2021	Q4	LC_LC3	0.00	0.00	0	819.60	0.3	1.4	1.54	0.2720	0.00476	0.0049	0.0005	0.0005	0.0102	0.0	11.6	8.3	9.85	2.01	0.31	8.01	2.30	-3.90							
2021	Q2	LC_LC5	<0.0001	<0.0003	0	349.00	0.5	1.9	27.1	5.0700	0.00161	0.00171	<0.0005	0.001	0.0025	0.0	6.9	5.3	0.52	2.26	-1.73	-0.99	2.08	1.97	1.826	3.748	-1.168	-1.633	-0.43	3.55	-0.31
2021	Q4	LC_LC5	<0.0001	<0.0003	<0.00042	573.40	0.2	1.2	1.3	0.1820	0.00259	0.0026	<0.0005	<0.0005	0.0014	0.0	7.8	4.8	4.57	-2.69	-0.66	3.54	-2.52	0.15	5.111	-2.612	-0.979	-1.230	3.83	-2.28	1.80
2021	Q2	LC_LCDSSLCC	<0.0001	<0.0003	0	304.60	0.3	1.9	2.3	0.9620	0.00171	0.00182	<0.0005	<0.0005	0.0079	0.0	5.7	4.5	1.48	-0.22	-1.22	0.28	-0.40	-1.09							
2021	Q4	LC_LCDSSLCC	<0.0001	<0.0003	<0.0003	649.20	0.3	1.2	1.34	0.1420	0.00357	0.00371	<0.0005	<0.0005	0.006	0.0	8.5	6.0	7.91	-0.83	0.04	6.49	-0.76	-2.33							

Year	Quarter	Sample ID	TIN-T-mg/l	TITANIUM-D-mg/l	TITANIUM-T-mg/l	TOTAL DISSOLVED SOLIDS (RESIDUE FILTERABLE)-N-mg/l	TOTAL KJELDAHL NITROGEN-N-mg/l	TOTAL ORGANIC CARBON-T-mg/l	TOTAL SUSPENDED SOLIDS LAB-N-mg/l	TURBIDITY LAB-N-ntu	URANIUM-D-mg/l	URANIUM-T-mg/l	VANADIUM-D-mg/l	VANADIUM-T-mg/l	ZINC-D-mg/l	ZINC-T-mg/l	∑TU-WQGs	∑TU-WQGs/Benchmarks	PC1_allyrs	PC2_allyrs	PC3_allyrs	PC1_2021	PC2_2021	PC3_2021	PC1_allyrs_UFR	PC2_allyrs_UFR	PC3_allyrs_UFR	PC4_allyrs_UFR	PC1_2021_UFR	PC2_2021_UFR	PC3_2021_UFR
Tests categorized as possible or likely adverse re																															
2016	Q4	CM_MC2	<0.0001	<0.01	<0.01	482.00	0.1	1.9	4.2	2.2000	0.0018	0.0019	<0.0005	<0.0005	0.0032	0.0	5.3	2.1	3.17	1.85	2.98										
2019	Q4	LC_LC5	<0.0001	<0.01	<0.01	511.80	<0.025	0.6	1.16	0.3000	0.00229	0.00232	<0.0005	<0.0005	0.0009	<0.003	5.5	7.7	3.67	-4.29	-0.58				3.76	-4.34	-0.81	0.72			
2020	Q2	LC_LC3	<0.000100	<0.0100	<0.0100	525.00	0.1	1.1	1.6	0.4880	0.00325	0.00316	<0.00050	<0.00050	0.089	0.0	8.8	5.9	5.80	2.23	1.24										
Tests categorized as possible or likely adverse re																															
2018	Q4	FR_FRABCH	<0.0001	<0.01	<0.01	800.00	0.2	0.7	1.0	0.3500	0.0034	0.0034	<0.0005	<0.0005	<0.001	<0.003	8.6	3.5	5.95	-2.60	-0.10				6.05	-3.10	-0.22	-0.12			
2020	Q4	LC_LC3	<0.000100	<0.0100	<0.0100	929.00	0.0	0.6	0.64	0.3280	0.00499	0.00517	<0.00050	<0.00050	0.0088	0.0	9.9	7.7	10.02	0.53	0.13										
Tests categorized as possible or likely adverse re																															
2015	Q4	FR_FRCP1	0.00	0.011	0	836.00	0.1	0.9	1.1	0.3700	0.0042	0.0043	0.0005	0.0005	0.003	0.0	10.3	5.9	6.63	-0.47	-0.88				7.07	-0.63	-0.74	4.52			
2015	Q4	CM_MC2	0.00	0.011	0	571.00	0.1	1.4	4.1	2.0000	0.0024	0.0023	0.0005	0.0005	0.003	0.0	6.5	2.9	4.68	1.72	3.74										
2016	Q4	FR_FRCP1	<0.0001	<0.01	<0.01	626.00	0.1	1.4	1.4	1.2000	0.0031	0.0032	<0.0005	<0.0005	<0.003	<0.0045	7.2	4.0	5.03	-0.98	-1.69				5.45	-0.59	-1.05	2.01			
2016	Q2	GH_FR1	<0.0001	0.011	0	394.00	0.2	1.8	4.4	1.4000	0.0016	0.0016	<0.0005	0.0005	<0.003	<0.003	4.7	2.4	1.15	-0.89	-1.34				1.85	-0.16	-1.00	1.97			
2016	Q4	GH_FR1	<0.0001	<0.01	<0.01	553.00	0.2	1.8	2.2	0.7900	0.0023	0.0023	<0.0005	<0.0005	<0.003	<0.003	5.7	1.6	3.79	-1.66	-1.01				4.28	-1.53	-0.45	1.31			
2016	Q2	CM_MC2	<0.0001	0.012	0	366.00	0.2	1.8	14.0	6.6000	0.0014	0.0014	<0.0005	0.0009	0.0059	0.0	7.9	2.1	1.34	5.17	3.17										
2016	Q4	EV_HC1	<0.0001	<0.01	<0.01	478.00	0.1	1.4	1.4	1.2000	0.0026	0.0026	<0.0005	<0.0005	<0.003	<0.003	2.3	4.7	1.65	-2.23	-0.65										
2016	Q2	EV_MC2	<0.0001	<0.01	0	173.00	0.2	3.0	23.0	8.2000	0.00058	0.0006	<0.0005	0.0018	<0.003	0.0	3.9	4.0	-4.81	3.70	0.01										
2016	Q2	LC_LCDSSLCC	<0.0000875	0.008	0	362.00	0.2	1.5	1.1	0.5500	0.0022	0.0023	<0.0005	<0.0005	0.0088	0.0	5.2	2.9	3.20	-0.48	-0.96										
2016	Q4	LC_LCDSSLCC	<0.0001	<0.01	<0.01	525.00	0.1	0.9	1.3	1.1000	0.0033	0.0033	<0.0005	0.0006	0.006	0.0	6.4	3.2	5.23	-0.35	-1.03										
2017	Q4	FR_FRCP1	<0.0001	<0.01	<0.01	1058.00	0.4	1.0	1.3	0.6300	0.0058	0.0057	<0.0005	0.0005	<0.003	0.0	9.8	5.6													
2017	Q4	GH_FR1	<0.0001	<0.01	<0.01	672.00	0.4	1.3	8.3	9.3000	0.0029	0.0029	<0.0005	<0.0005	<0.003	<0.003	6.1	1.4													
2017	Q4	CM_MC2	<0.0001	<0.01	<0.01	748.00	0.4	1.0	2.8	1.3000	0.0030	0.0032	<0.0005	<0.0005	<0.003	<0.003	7.3	2.1													
2017	Q4	EV_HC1	<0.0001	<0.01	<0.01	494.00	0.1	1.0	1.2	0.3000	0.0027	0.0027	<0.0005	<0.0005	<0.003	<0.003	2.3	6.2													
2017	Q4	EV_MC2	0.00	<0.01	<0.01	413.00	0.2	1.0	1.3	0.4700	0.0011	0.0012	<0.0005	<0.0005	<0.003	<0.003	2.7	2.4													
2017	Q2	GH_ERC	<0.0001	<0.01	0	184.00	0.3	4.4	104.0	55.0000	0.00077	0.00093	<0.0005	0.0039	<0.0026	0.0	7.3	5.6	-7.90	7.79	-3.73										
2017	Q4	GH_ERC	0.00	<0.01	<0.01	202.00	0.1	0.7	1.3	0.5500	0.00083	0.00081	<0.0005	<0.0005	<0.003	0.0	1.4	1.3													
2017	Q4	LC_LCDSSLCC	<0.0001	<0.01	<0.01	677.00	0.4	0.9	1.0	0.4400	0.0041	0.0040	<0.0005	<0.0005	0.0061	0.0	7.1	3.3													
2018	Q4	GH_FR1	<0.0001	<0.01	<0.01	622.00	0.2	0.7	1.2	0.3900	0.0027	0.0027	<0.0005	<0.0005	<0.001	<0.003	5.6	1.6	4.97	-3.11	-0.59				5.26	-3.25	-0.95	1.26			
2019	Q2	FR_FRABCH	0.00	<0.01	<0.01	547.40	0.2	1.3	11.02	4.6320	0.00227	0.00237	<0.0005	0.0006	0.0011	0.0	7.2	4.1	1.98	0.43	-2.48				3.08	1.88	-1.22	0.45			
2019	Q2	GH_FR1	<0.0001	<0.01	<0.01	439.20	0.3	1.3	11.8	3.3940	0.00204	0.0020	<0.0005	0.0007	0.0012	0.0	5.4	4.4	1.76	-0.24	-1.48				2.44	0.67	-1.27	0.51			
2019	Q4	GH_FR1	0.00	<0.01	<0.01	596.40	<0.05	0.8	2.1	0.3920	0.0025	0.00246	<0.0005	<0.0005	0.0011	0.0	5.8	2.9	3.52	-4.12	-1.55				3.63	-4.21	-2.71	-0.76			
2019	Q4	CM_MC2	0.00	<0.01	<0.01	769.80	0.3	0.8	4.62	1.7340	0.0032	0.00341	<0.0005	0.0003	0.0021	0.0	8.6	7.7	6.74	2.00	4.82										
2019	Q4	EV_MC2	<0.0001	<0.01	<0.01	368.40	0.3	0.6	0.84	0.3060	0.00137	0.00136	<0.0005	<0.0005	0.0011	<0.003	2.5	2.3	1.99	-3.41	0.55										
2019	Q4	LC_DCDS	0.00	<0.01	<0.01	556.60	<0.025	1.9	0.8	0.4420	0.00199	0.00212	0.00107	0.0012	0.0042	0.0	12.7	2.2	6.39	0.34	-1.63										
2020	Q4	FR_FRCP1	<0.000100	<0.0100	<0.0100	942.00	0.0	1.2	4.02	1.5600	0.00484	0.00481	<0.00050	<0.00050	0.0051	0.0	10.7	3.5	9.26	0.73	-0.57				10.11	0.76	0.08	0.85			
2020	Q4	GH_FR1	<0.000100	<0.0100	<0.0100	636.00	0.0	0.4	13.3	4.3100	0.00261	0.00257	<0.00050	0.0005	0.0009	0.0	7.0	1.7	3.69	-2.83	-1.55				4.31	-2.41	-2.45	-0.16			
2020	Q4	LC_LCDSSLCC	<0.000100	<0.0100	<0.0100	678.00	<0.050	0.5	<1.00	0.1080	0.00348	0.00359	<0.00050	<0.00050	0.0047	0.0	5.8	2.5	6.95	-2.36	-0.16										
Tests categorized as possible or likely adverse re																															
2015	Q4	GH_FR1	0.00	0.01	0	545.00	0.1	0.7	1.0	0.2700	0.0020	0.0021	0.0005	0.0005	0.003	0.0	6.5	2.5	3.68	-2.57	-0.14				4.07	-2.71	-0.86	4.37			
Tests categorized as possible or likely adverse re																															
2020	Q4	FR_FRABCH	<0.000100	<0.0100	<0.0100	853.00	<0.050	0.7	1.66	0.4380	0.00349	0.00351	<0.00050	<0.00050	0.001	<0.0030	10.0	6.5	6.27	-2.76	-0.54				6.18	-3.29	-1.24	-0.28			
Tests categorized as possible or likely adverse re																															
2018	Q4	FR_FRCP1	<0.00014	<0.01	<0.01	3220.00	0.4	1.8	27.0	9.6000	0.0200	0.0220	<0.001	<0.0007	<0.002	<0.0042	26.3	18.1	13.05	5.11	8.79				15.04	4.46	22.46	1.86			
Tests categorized as possible or likely adverse re																															
2021	Q4	FR_FRCP1	<0.0001	<0.0003	<0.0003	977.40	0.4	1.3	1.22	0.3380	0.00519	0.00552	<0.0005	<0.0005	0.0078	0.0	15.7	9.5	10.92	1.40	-0.68	9.30	1.33	-0.10	11.89	1.31	0.43	-0.72	9.76	1.59	0.35

Notes:
"-D-" = dissolved concentration; "-T-" = total concentrat

Screening
Concentrations of parameters in 2021 tests categorize

Year	Quarter	Sample ID	Mean Hatch (control normalized)	Mean Survival (Control Normalized)	Mean Biomass (Control Normalized)	Mean Length (Control Normalized)	Mean Normal Development (Control Normalized)	ACIDITY TO pH 8.3 (As CaCO3)-N-mg/l	ALKALINITY BICARBONATE (As CaCO3) lab measured.-N-mg/l	ALKALINITY CARBONATE (As CaCO3) lab measured.-N-mg/l	ALKALINITY HYDROXIDE (As CaCO3) lab measured.-N-mg/l	ALKALINITY TOTAL (As CaCO3) lab measured.-N-mg/l	ALUMINUM-D-mg/l	ALUMINUM-T-mg/l	ANTIMONY-D-mg/l	ANTIMONY-T-mg/l	ARSENIC-D-mg/l	ARSENIC-T-mg/l	BARIUM-D-mg/l	BARIUM-T-mg/l	BERYLLIUM-D-mg/l	BERYLLIUM-T-mg/l	BISMUTH-D-mg/l	BISMUTH-T-mg/l	BORON-D-mg/l	BORON-T-mg/l	BROMIDE-D-mg/l	CADMIUM-D-mg/l	CADMIUM-T-mg/l	CALCIUM-D-mg/l	CALCIUM-T-mg/l	CARBON DISSOLVED ORGANIC-D-mg/l	CHLORIDE-D-mg/l	CHROMIUM-D-mg/l	CHROMIUM-T-mg/l	COBALT-D-mg/l	COBALT-T-mg/l	CONDUCTIVITY LAB-N-us/cm	COPPER-D-mg/l	COPPER-T-mg/l	FLUORIDE-D-mg/l
Reference (2015 - 2021)																																									
2016	Q1	Reference (FR_UFR1)	-	-	-	-	-	<1	138	2.6	<1	139	0.0072	0.024	<0.0001	<0.0001	<0.0001	0.0001	0.075	0.075	<0.0001	<0.0001	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000065	0.0000094	55	56	0.6	0.77	0.00011	0.0002	<0.0001	<0.0001	353	<0.0005	0.021	0.15
2016	Q2	Reference (FR_UFR1)	100	104	95	95	98	<1	116	<1	<1	116	0.0056	0.059	<0.0001	<0.0001	0.0001	0.00012	0.042	0.044	<0.000036	<0.000036	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.000006	0.000012	38	39	1.7	0.1	0.00012	0.00021	<0.0001	<0.0001	245	0.00061	0.011	0.16
2016	Q3	Reference (FR_UFR1)	107	96	100	102	100	<1	154	3.4	<1	156	<0.003	0.0063	<0.0001	<0.0001	<0.0001	0.00011	0.076	0.077	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000079	0.00001	50	51	0.8	0.14	0.0001	0.00016	<0.0001	<0.0001	341	<0.0005	0.011	0.17
2016	Q4	Reference (FR_UFR1)	100	58	58	97	102	<1	139	2.2	<1	141	0.0073	0.038	<0.0001	<0.0001	<0.0001	0.00012	0.063	0.063	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000063	0.0000089	48	48	1.1	0.19	0.00011	0.00018	<0.0001	<0.0001	318	<0.0005	0.011	0.16
2017	Q1	Reference (FR_UFR1)	97	100	91	107	100	-	-	-	-	139	0.0014	0.0076	<0.0001	0.00013	<0.0001	0.00011	0.074	0.082	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000084	0.000011	-	50	0.68	<0.5	0.0001	0.00014	<0.0001	<0.0001	333	<0.0002	<0.0005	0.14
2017	Q2	Reference (FR_UFR1)	100	98	111	98	100	-	-	-	-	116	0.026	0.13	<0.0001	0.00011	0.00013	0.00018	0.046	0.046	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.000011	0.000022	-	32	2.9	<0.5	0.00012	0.00049	<0.0001	0.00012	238	0.0003	0.00059	0.11
2017	Q2	Reference (GH_ER2)	100	98	105	100	98	-	-	-	-	150	0.0035	0.27	<0.0001	<0.0001	0.00012	0.00027	0.047	0.049	<0.00002	0.000028	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000078	0.000043	-	50	1.3	0.4	0.0002	0.00082	<0.0001	0.00018	301	<0.0005	0.00068	0.15
2017	Q3	Reference (FR_UFR1)	98	98	130	84	100	-	-	-	-	147	0.0027	0.0057	<0.0001	0.0001	<0.0001	0.00012	0.075	0.073	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000083	0.000012	-	50	1.3	0.27	0.0001	0.0002	<0.0001	<0.0001	333	<0.00044	<0.0005	0.15
2017	Q3	Reference (GH_ER2)	100	83	130	85	100	-	-	-	-	140	0.0029	0.014	<0.0001	0.00012	0.00011	0.00012	0.048	0.047	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000068	0.0000085	-	45	0.83	0.35	0.00021	0.00024	<0.0001	<0.0001	282	<0.00044	<0.0005	0.13
2017	Q3	Reference (CM_MC1)	100	92	128	82	100	-	-	-	-	142	0.0029	0.012	<0.0001	0.0001	0.00021	0.00022	0.052	0.052	<0.00002	<0.00002	<0.00005	<0.00005	0.016	0.015	<0.05	0.0000099	0.000012	-	40	1.4	<0.5	0.00012	0.00025	<0.0001	<0.0001	270	<0.00044	<0.0005	0.053
2017	Q4	Reference (FR_UFR1)	105	98	98	93	100	-	-	-	-	144	<0.003	0.0033	<0.0001	<0.0001	<0.0001	0.00011	0.074	0.073	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	0.052	0.0000068	0.0000098	-	51	0.71	<0.5	0.0001	0.00018	<0.0001	<0.0001	334	<0.0005	<0.0005	0.11
2017	Q4	Reference (GH_ER2)	103	96	85	92	100	-	-	-	-	147	<0.003	0.0068	<0.0001	<0.0001	<0.0001	0.00011	0.048	0.047	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000052	0.0000075	-	43	0.63	<0.5	0.00025	0.00028	<0.0001	<0.0001	280	<0.0005	<0.0005	0.13
2017	Q4	Reference (CM_MC1)	100	78	91	97	100	-	-	-	-	136	<0.003	0.0067	<0.0001	<0.0001	0.00015	0.00018	0.051	0.051	<0.00002	<0.00002	<0.00005	<0.00005	0.013	0.014	<0.09	0.0000077	0.0000086	-	41	1.2	1.1	0.00018	0.00019	<0.0001	<0.0001	275	<0.0005	<0.0005	0.093
2018	Q1	Reference (FR_UFR1)	102	89	98	96	100	1.3	143	5.2	<1	148	0.0063	0.011	<0.00012	<0.0001	0.00012	0.00012	0.08	0.071	<0.000028	<0.00002	<0.00006	<0.00005	<0.012	<0.01	<0.05	0.0000077	0.000011	53	52	0.75	<0.5	<0.00012	0.0002	<0.00012	<0.0001	359	0.00052	<0.0005	0.12
2018	Q1	Reference (GH_ER2)	100	77	86	109	102	1.3	151	4.6	<1	156	<0.003	0.0045	<0.0001	0.0001	<0.0001	0.00021	0.051	0.05	<0.00002	<0.00002	<0.00006	<0.00005	<0.01	<0.01	<0.05	0.0000056	0.00001	49	50	0.56	0.27	0.00021	0.00026	<0.0001	<0.0001	324	<0.0005	<0.0005	0.16
2018	Q1	Reference (CM_MC1)	100	100	86	88	102	1.7	154	3.7	<1	157	<0.003	0.0038	<0.0001	<0.0001	0.00015	0.00016	0.054	0.053	<0.00002	<0.00002	<0.00005	<0.00005	0.013	0.014	<0.05	0.0000067	0.0000081	42	43	0.89	0.55	0.00015	0.0002	<0.0001	<0.0001	305	<0.0005	<0.0005	0.054
2018	Q2	Reference (FR_UFR1)	100	6.1	19	150	107	1.0	102	<1	<1	102	0.0071	0.16	<0.0001	<0.0001	0.00013	0.00021	0.039	0.038	<0.00002	0.000021	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000082	0.000024	30	30	2.2	<0.5	0.00011	0.00041	<0.0001	0.00014	206	<0.0005	0.0011	0.12
2018	Q2	Reference (GH_ER2)	97	39	59	120	96	<1	134	3.4	<1	137	0.005	0.71	<0.0001	0.00013	0.00015	0.00066	0.041	0.054	<0.00002	0.000064	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000085	0.00014	41	49	1.8	0.51	0.00015	0.0019	<0.0001	0.00047	265	<0.0005	0.0015	0.15
2018	Q2	Reference (CM_MC1)	98	116	97	100	107	1.8	92	<1	<1	92	0.025	0.33	<0.00012	<0.0001	0.00023	0.00037	0.028	0.029	<0.000024	0.000023	<0.00006	<0.00005	<0.012	0.01	<0.05	0.000012	0.000033	25	25	3.3	<0.5	0.00022	0.00057	<0.00012	0.00014	176	<0.0005	0.00077	0.046
2018	Q3	Reference (FR_UFR1)	102	102	87	98	100	<1	147	5.4	<1	152	<0.003	0.0045	<0.0001	<0.0001	0.0001	0.00012	0.075	0.072	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.09	0.0000073	0.000011	50	48	0.99	0.75	0.00011	0.00011	<0.0001	<0.0001	329	<0.0005	<0.0005	0.16
2018	Q3	Reference (GH_ER2)	98	69	54	94	100	<1	135	2.8	<1	137	<0.003	0.19	<0.0001	<0.0001	0.0001	0.00026	0.043	0.045	<0.00002	0.000029	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000065	0.000039	43	44	0.89	0.42	0.0002	0.00063	<0.0001	0.00018	268	<0.0005	0.00065	0.17
2018	Q3	Reference (CM_MC1)	98	106	93	93	100	<1	143	2.7	<1	146	0.003	0.014	<0.0001	<0.0001	0.00018	0.00021	0.059	0.054	<0.00002	<0.00002	<0.00005	<0.00005	0.015	0.016	<0.05	0.00001	0.00001	42	41	1.1	0.44	0.00018	0.00024	<0.0001	<0.0001	274	<0.0005	0.0005	0.078
2018	Q4	Reference (FR_UFR1)	100	109	97	104	100	<1	145	5.7	<1	150	<0.003	0.0031	<0.0001	<0.0001	<0.0001	0.00011	0.071	0.071	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000076	0.0000089	52	51	0.76	<0.5	0.0001	0.00017	<0.0001	<0.0001	340	<0.0005	<0.0005	0.15
2018	Q4	Reference (GH_ER2)	100	104	100	106	100	<1	146	1.6	<1	147	<0.003	0.0055	<0.0001	<0.0001	<0.0001	0.00011	0.047	0.047	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000055	0.0000064	47	47	0.5	<0.5	0.00024	0.00026	<0.0001	<0.0001	293	<0.0005	<0.0005	0.17
2018	Q4	Reference (CM_MC1)	98	93	79	99	100	1.2	137	2.8	<1	139	0.0033	0.0071	<0.0001	<0.0001	0.00017	0.00018	0.048	0.047	<0.00002	<0.00002	<0.00005	<0.00005	0.013	0.013	<0.05	0.000008	0.0000092	40	39	1.5	0.5	0.00017	0.00021	<0.0001	<0.0001	279	<0.0005	<0.0005	0.069
2019	Q1	Reference (FR_UFR1)	100	86	82	96	100	0.9	147	<1.0	<1.0	147	0.032	0.17	<0.0001	<0.0001	0.00009	0.00012	0.068	0.067	<0.00002	0.000013	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.000011	0.00002	49	48	1.5	<0.5	0.00015	0.00041	<0.0001	0.000078	340	<0.0005	0.00036	0.11
2019	Q1	Reference (GH_ER2)	100	82	86	103	100	<1.0	148	<1.0	<1.0	148	0.0023	0.014	<0.0001	<0.0001	<0.0001	0.000094	0.049	0.048	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000055	0.0000077	48	50	0.63	<0.5	0.00025	0.0003	<0.0001	<0.0001	301	<0.0005	<0.0005	0.14
2019	Q1	Reference (CM_MC1)	100	60	64	102	100	1.4	159	<1.0	<1.0	159	<0.003	0.0052	<0.0001	<0.0001	0.00014	0.00016	0.056	0.056	<0.00002	<0.00002	<0.00005	<0.00005	0.013	0.013	<0.05	0.0000095	0.0000083	43	43	0.38	0.7	0.00017	0.00023	<0.0001	<0.0001	304	<0.0005	<0.0005	0.065
2019	Q1	Reference (LC_SLC)	100	89	82	93	94	1.3	146	<1.0	<1.0	146	<0.003	<0.003	<0.0001	<0.0001	0.00012	0.000074	0.049	0.048	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.00001	0.000013	56	58	0.63	0.69	0.00015	0.00016	<0.0001	<0.0001	407	<0.0005	<0.0005	0.39
2019	Q3	Reference (FR_UFR1)	100	88	98	101	100	<1.0	144	3.8	<1.0	148	0.0018	0.006	<0.0001	<0.0001	0.000074	0.000094	0.067	0.065	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000079	0.00001	49	51	0.88	<0.5	0.00012	0.00016	<0.0001	<0.0001	319	<0.0005	<0.0005	0.16
2019	Q3	Reference (GH_ER2)	98	69	89	104	100	2.1	137	1.4	<1.0	138	<0.003	0.012	<0.0001	<0.0001	0.000084	0.00013	0.043	0.041	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000062	0.000012	44	44	0.62	<0.5	0.00022	0.00026	<0.0001	<0.0001	279	<0.0005	<0.0005	0.17
2019	Q3	Reference (CM_MC1)	98	76	96	104	100	<1.0	143	3.8	<1.0	147	<0.003	0.0076	<0.0001	<0.0001	0.0002	0.00021	0.053	0.053	<0.00002	0.000013	<0.00005	<0.00005	0.016	0.016	<0.05	0.00001	0.000013	41	41	0.86	<0.5	0.00019	0.00024	<0.0001	<0.0001	285	<0.0005	<0.0005	0.078
2019	Q3	Reference (LC_SLC)	100	63	68	95	100	0.7	139	0.86	<1.0	139	<0.003	0.0022	<0.0001	<0.0001	0.00011	0.00011	0.04	0.04	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.000012	0.000017	47	48	0.59	<0.5	0.00016	0.0002	<0.0001	<0.0001	339	<0.0005	<0.0005	0.32
2020	Q1	Reference (FR_UFR1)	100	102	90	95	96	0.84	144	<1.00	<1.00	144	<0.0030	0.0029	<0.000100	<0.000100	0.00006	0.00006	0.072	0.07	<0.000020	<0.000020	<0.000050	<0.000050	<0.0100	<0.0100	<0.050	0.0000094	0.000012	52	51	0.52	<0.50	0.0001	0.00011	<0.000100	<0.000100	351	0.00017	<0.00050	0.12
2020	Q1	Reference (GH_ER2)	95	102	103	106	108	0.7	151	2.2	<1.00	152	<0.0030	0.0066	<0.000100	<0.000100	0.00006	0.000086	0.048	0.047	<0.000020	<0.000020	<0.000050	<0.000050	<0.0100	<0.0100	<0.050	0.0000074	0.0000076	47	49	0.53	<0.50	0.00026	0.00029	<0.000100	<0.000100	305	0.00017	<0.00050	0.15
2020	Q1	Reference (CM_MC1)	100	78	66	97	103	0.62	147	<1.00	<1.00	147	<0.0030	0.0062	<0.000100	<0.000100	0.00016	0.00019	0.05	0.048	<0.000020	<0.000020	<0.000050	<0.000050	0.014	0.015	<0.050	0.0000084	0.0000086	42	41	0.91	0.47	0.00017	0.00016	<0.000100	<0.000100	280	0.00015	<0.00050	0.058
2020	Q1	Reference (LC_SLC)	100	98	84	107	106	0.64	147	1.2	<1.00	148	<0.0030	0.0047	<0.000100	<0.000100	0.000086	0.00012	0.047	0.045	<0.000020	<0.000020	<0.000050	<0.000050	<0.0100	<0.0100	<0.050	0.000017	0.000014	57	56	0.76	0.64	0.00014	0.00018	<0.000100	<0.000100	394	0.00021	<0.00050	0.31
2020	Q3	Reference (FR_UFR1)	100	98	92	96	100	<1.00	61	0.92	90	151	0.002	0.061	<0.000100	<0.000100	0.000088	0.00013	0.072	0.076	<0.000020	<0.000020	<0.000050	<0.000050	<0.0100	<0.0100	<0.050	0.000012	0.000025	52	52	0.34	0.33	0.00006	0.00021	<0.000100	0.00007	325	<0.00020	0.00032	0.16
2020	Q3	Reference (GH_ER2)	101	93	109	98	100	<1.00	110	1.6	28	139	0.0033	0.027	<0.000100	<0.000100	0.000086	0.00015	0.043	0.046	<0.000020	<0.000020	<0.000050	<0.000050	<0.0100	<0.0100	<0.050	0.0000084	0.000012	45	45	<0.50	0.31	0.00018	0.00028	<0.000100	<0.000100	270	0.0003	<0.00050	0.17
2020	Q3	Reference (CM_MC1)	95	37	26	85	100	<1.00	147	<1.00	<1.00	147	<0.0030	0.007	<0.000100	<0.000100	0.00019	0.00022	0.056	0.055	<0.000020	<0.000020	<0.000050	<0.000050	0.017	0.019	<0.050	0.000011	0.000011	43	42	0.49	0.32	0.00017	0.0002	<0.000100	<0.000100	274	0.00012	<0.00050	0.078
2020	Q3	Reference (LC_SLC)	98	89	95	95	100	<1.00	29	<1.00	116	145	<0.0030	0.0046	<0.000100	<0.000100	0.00008	0.00012	0.042	0.044	<0.000020	<0.000020	<0.000050	<0.000050	<0.0100	<0.0100	<0.050	0.000012	0.000012	51	50	<0.50	0.29	0.00013	0.00016	<0.000100	<0.000100	334	<0.00020	<0.00050	0.3
2021	Q1	Reference (FR_UFR1)	100	104	96	93	102	2.0	125	1.5	<1	117	0.011	0.25	<0.0001	<0.0001	0.00014	0.00019	0.057	0.061	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.000012	0.000026	40	42	2.8	0.24	0.00014	0.00056	<0.0001	0.0001	267	0.00039	0.0006	0.12
2021	Q1	Reference (GH_ER2)	100	34	55	102	87	2.2	161	4.0	<1	158	0.0017	0.047	<0.0001	<0.0001	0.0001	0.00012	0.052	0.051	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000053	0.0000094	51	50	0.53	0.35	0.00029	0.00039	<0.0001	<0.0001	308	<0.0002	0.0013	0.15
2021	Q1	Reference (CM_MC1)	100	56	66	98	79	2.1	153	2.1	<1	155	0.001	0.0077	<0.0001	<0.0001	0.00015	0.00016	0.056	0.056	<0.00002	<0.00002	<0.00005	<0.00005	0.015	0.015	<0.05	0.0000069	0.000014	44	46	1.2	0.66	0.00018	0.00019	<0.0001	<0.0001	292	0.0002	<0.0005	0.066
2021	Q1	Reference (LC_SLC)	100	94	83	104	100	1.3	146	1.2	<1	146	<0.0026	0.0037	<0.0001	<0.0001	0.00011	0.00013	0.048	0.049	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.000012	0.000012	60	60	0.54	0.57	0.00013	0.00015	<0.0001	<0.0001	392	<0.0002	<0.0005	0.31
2021	Q3	Reference (FR_UFR1)	98	74	83	90	106	<2	151	2.4	<1	148	0.0012	0.026	<0.0001	<0.0001	0.000018	0.00009	0.067	0.067	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.000009	0.000019	48	49	2.5	0.16	0.00007	0.00012	<0.0001	0.000054	314	0.000084	<0.0005	0.16
2021	Q3	Reference (GH_ER2)	97	95	90	90	100	<2	131	1.9	<1	133	0.0011	0.053	<0.0001	<0.0001	0.0001	0.00016	0.043	0.045	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000061	0.000015	41	42	2.3	0.26	0.0002	0.00031	<0.0001	<0.0001	263	<0.0002	<0.0005	0.14
2021	Q3	Reference (CM_MC1)	91	88	78	89	97	<2	148	1.5	<1	148	0.002	0.013	<0.0001	<0.0001	0.00019	0.00021	0.051	0.052	<0.00002	<0.00002	<0.00005	<0.00005	0.017	0.017	<0.05	0.00001	0.00001	41	40	1.5	0.35	0.00017	0.0002	<0.0001	<0.0001	273	0.00021	<0.0005	0.066
2021	Q3	Reference (LC_SLC)	96	121	108	96	100	<2	132	3.3	<1	135	0.0012	0.014	<0.0001	<0.0001	0.00011	0.00013	0.038	0.04	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.000012	0.000013	46	47	1.9	0.26	0.00014	0.00017	<0.0001	<0.0001	316	<0.0002	<0.0005	0.29
Tests categorized as no adverse response (2015 - 2021)																																									
2016	Q1	FR_FRCP1	-	-	-	-	-	1.3	233	1.7	<1	234	0.0032	0.0048	0.00026	0.00028	<0.0001	0.0001	0.084	0.085	<0.0001	<0.0001	<0.00005	<0.00005	0.011	0.012	<0.3	0.000022	0.000055	180	183	0.76	2.8	0.0001	0.0009	<0.0001	<0.0001	1412	<0.0005	0.021	0.18
2016	Q1	GH_FR1	-	-	-	-	-	1.1	198	2.5	<1	200	<0.003	0.0094	0.00014	0.00016	<0.0001	0.00012	0.12	0.12	<0.0001	<0.0001	<0.00005	<0.00005	<0.01	<0.01	<0.25	0.000015	0.000018	119	120	0.62	2.7	0.00011	0.00014	<0.0001	<0.0001	897	<0.0005	0.021	0.18
2016	Q1	CM_MC2	-	-	-	-	-	<1	203	6.8	<1	210	<0.003	0.018	0.00021	0.00022	0.00016	0.00019	0.077	0.076	<0.0001	<0.0001	<0.00005	<0.00005	0.025	0.027	<0.25	0.000015	0.000016	118	121	0.68	4.9	0.00016	0.00025	0.00093	0.001	922	0.00052	0.021	0.12
2016	Q2	FR_FRCP1	98	104	86	96	100	<1	153	3.0	<1	155	<0.003	0.064	0.00017	0.00022	<0.0001	0.00013	0.058	0.059	<0.000036	<0.000036	<0.00005	0.000051	<0.01	<0.01	<0.05	0.000027	0.000044	75	76	1.5	0.51	0.0001	0.00023	<0.0001	0.0001	570	0.00061	0.011	0.21
2016	Q2	GH_FR1	97	100	91	99	100	<1	165	3.6	<1	168	<0.003	0.065	0.00016	0.00019	0.0001	0.00015	0.079	0.08	<0.000036	<0.000036	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.00002	0.000033	80	80	1.4	0.98	0.00012	0.00023	<0.0001	<0.0001	603	<0.0005	0.011	0.19
2016	Q2	CM_MC2	100	107	100	97	100	1.0	142	3.0	<1	144	0.0062	0.34	0.00015	0.00016	0.00017	0.00028	0.044	0.045	<0.000036	0.000039	<0.00005	<0.00005	0.016	0.017	<0.05	0.000059	0.000096	68	68	1.4	1.3	0.00018	0.00058	0.002	0.0027	532	<0.0005	0.011	0.1
2016	Q3	FR_FRCP1	105	92	111	105	100	1.5	198	3.3	<1	201	<0.003	0.015	0.00021	0.00024	<0.0001	0.00011	0.077	0.077	<0.00002	<0.00002	<0.00005	<0.00005	0.011	0.011	<0.25	0.00002	0.000051	105	113	0.94	1.7	<0.0001	0.00013	0.0001	0.00011	909	<0.0005	0.011	0.2
2016	Q3	GH_FR1	107	102	89	101	100	<1	195	4.3	<1	199	<0.003	0.0072	0.00013	0.00015	0.0001	0.00013	0.11	0.11	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	0.01	<0.25	0.000015	0.000018	94	95	0.85	1.6	0.00011	0.00017	<0.0001	<0.0001	744	<0.00052	0.011	0.19
2016	Q4	FR_FRCP1	97	87	95	103	102	<1	192	5.3	<1	197	0.0036	0.023	0.00019	0.0002	<0.0001	0.00013	0.075	0.075	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.25	0.000044	0.000052	110	110	1.0	1.4	<0.0001	0.00015	<0.0001	<0.0001	855	<0.0005	0.011	0.2
2016	Q4	GH_FR1	98	89	92	101	102	1.2	193	1.8	<1	194	<0.003	0.01	0.00016	0.00022	0.0001	0.00014	0.1	0.099	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.25	0.000016	0.000019	98	100	0.85	1.6	0.00011	0.00015	<0.0001	<0.0001	763	<0.0005	0.011	0.17
2016	Q4	CM_MC2	100	105	92	103	102	<1	173	1.7	<1	174	0.0065	0.1	0.00021	0.00022	0.00024	0.00028	0.053	0.056	<0.000036	<0.000036	<0.00009	<0.00009	0.025	0.026	<0.09	0.000029	0.000037	82	83	1.6	1.8	0.00023	0.00037	0.0011	0.0013	648	<0.0006	0.011	0.11
2017	Q1	FR_FRCP1	102	81	72	115	100	-	-	-	-	250	0.0011	0.011	0.00026	0.00037	<0.0001	0.00013	0.077	0.077	<0.00002	<0.00002	<0.00005	<0.00005	0.01	0.011	<0.25	0.000045	0.000061	-	186	1.2	2.8	<0.0001	0.00025	<0.0001	0.0001	1482	<0.0002	<0.0005	0.15
2017	Q1	GH_FR1	102	115	106	99	100	-	-	-	-	204	<0.003	0.012	0.00012	0.00013	<0.0001	0.00011	0.12	0.12	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.25	0.000017	0.000019	-	118	0.87	2.1	0.0001	0.00014	<0.0001	<0.0001	876	<0.0005	<0.0005	0.14
2017	Q1	CM_MC2	98	113	103	94	100	-	-	-	-	196	0.0032	0.036	0.00031	0.00041	0.00015	0.0002	0.068	0.07	<0.00002	<0.00002	<0.00005	<0.00005	0.03	0.031	<0.17	0.000037	0.000044	-	120	1.0	3.5	0.00014	0.00027	0.0039	0.0041	923	<0.00044	<0.0005	0.13
2017	Q2	FR_FRCP1	100	98	97	99	98	-	-	-	-	175	0.006	0.22	0.00019	0.00023	0.00012	0.00027	0.067	0.069	<0.00002	0.000025	<0.00005	<0.00005	<0.01	0.01	<0.05	0.000057	0.00011	-	82	2.1	0.64	0.0001	0.0006	<0.0001	0.00022	678	0.00026	0.0008	0.15
2017	Q2	CM_MC2	100	95	111	100	100	-	-	-	-	170	0.005	0.31	0.00023	0.00026	0.00017	0.00036	0.055	0.058	<0.00002	0.00003	<0.00005	<0.00005	0.023	0.025	<0.05	0.000071	0.00012	-	82	1.9	1.6	0.00013	0.00062	0.0029	0.0039	652	0.00022	0.00082	0.098
2017	Q3	FR_FRCP1	102	83	98	103	100	-	-	-	-	204	0.0026	0.0056	0.00024	0.00027	<0.00012	0.00012	0.074	0.073	<0.000024	<0.00002	<0.00006	<0.00005	0.013	0.011	<0.21	0.000019	0.000049	-	130	1.4	1.6	0.00012	0.00026	<0.00012	<0.0001	1015	<0.00044	<0.0005	0.19
2017	Q3	GH_FR1	100	92	117	90	100	-	-	-	-	194	0.0027	0.0067	0.00016	0.00018	<0.0001	0.00011	0.11	0.1	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.13	0.000019	0.000019	-	99	1.0	1.3	0.00011	0.00014	<0.0001	<0.0001	766	<0.00044	<0.0005	0.16
2017	Q3	CM_MC2	102	96	119	96	100	-	-	-	-	190	0.003	0.029	0.00031	0.00036	0.00019	0.00024	0.067	0.066	<0.00002	<0.00002	<0.00005	<0.00005	0.032	0.033	<0.09	0.0000061	0.000019	-	113	1.4	1.6	0.00014	0.00024	0.0016	0.0027	893	<0.00044	0.00052	0.11
2017	Q4	FR_FRCP1	100	96	109	101	100	-	-	-	-	190	<0.003	0.016	0.00024	0.00026	<0.0001	0.00013	0.074	0.075	<0.00002	<0.00002	<0.00005	<0.00005	0.011	0.011	0.29	0.000012	0.000056	-	151	0.97	<2.5	<0.0001	0.00018	<0.0001	0.00011	1174	<0.0005	<0.0005	0.11
2017	Q4	GH_FR1	97	94	101	98	100	-	-	-	-	181	<0.003	0.0055	0.00017	0.00019	0.0001	0.00012	0.11	0.11	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	0.05	0.000017	0.00002	-	106	1.1	1.3	0.00012	0.00015	<0.0001	<0.0001	826	<0.0005	<0.0005	0.13
2017	Q4	CM_MC2	98	82	95	97	100	-	-	-	-	202	<0.003	0.0081	0.00025	0.00028	0.00017	0.0002	0.079	0.077	<0.00002	<0.00002	<0.00005	<0.00005	0.033	0.035	0.099	0.000012	0.000014	-	121	1.1	4.4	0.00012	0.00019	0.0011	0.0012	919	<0.0005	<0.0005	0.09
2018	Q1	FR_FRCP1	93	84	107	100	100	2.7	250	1.3	<1	250	0.0033	0.0062	0.00024	0.00026	<0.00012	0.00016	0.084	0.08	<0.000028	<0.000028	<0.00006	<0.00007	0.013	0.015	<0.09	0.000034	0.000083	179	194	1.3	2.5	<0.00012	0.00027	0.00014	0.00016	1502	0.0005	<0.0007	0.14
2018	Q1	GH_FR1	93	91	102	99	100	1.0	202	5.8	<1	208	0.0062	0.0061	0.00017	0.00018	0.0001	0.00014	0.12	0.12	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.25	0.000017	0.000021	108	116	0.97	2.4	<0.0001	0.00023	<0.0001	<0.0001	924	0.0005	<0.0005	0.16
2018	Q1	CM_MC2	93	98	121	96	100	1.2	226	6.2	<1	232	<0.003	0.012	0.00023	0.00025	0.00017	0.00019	0.077	0.075	<0.00002	<0.00002	<0.00005	<0.00005	0.031	0.035	<0.05	0.000023	0.000023	132	136	1.0	5.3	0.00011	0.00021	0.00098	0.0011	1067	<0.0005	<0.0005	0.11
2018	Q2	FR_FRCP1	93	104	93	97	101	<1	154	4.9	<1	158	0.0038	0.37	0.00019	0.00022	0.00011	0.00033	0.048	0.057	<0.00002	0.00004	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.000055	0.00014	67	70	1.7	0.51	0.00011	0.0007	<0.0001	0.00036	527	<0.0005	0.0011	0.17
2018	Q2	GH_FR1	97	94	98	105	103	1.0	154	6.1	<1	160	0.0041	0.24	0.00019	0.00023	0.00014	0.00029	0.065	0.068	<0.00002	0.000041	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.00003	0.000086	66	66	2.3	0.86	0.0001	0.00085	<0.0001	0.00025	521	0.00053	0.00088	0.18
2018	Q2	CM_MC2	100	113	105	100	103	1.1	137	5.0	<1	141	0.0094	1.1	0.00016	0.00018	0.00017	0.00064	0.05	0.055	<0.000024	0.000067	<0.00006	<0.00005	0.016	0.017	<0.05	0.000077	0.00015	61	58	2.0	1.7	0.00016	0.0014	0.0013	0.0027	486	<0.0005	0.0015	0.085
2018	Q3	GH_FR1	95	92	89	103	100	<1	192	3.6	<1	195	<0.003	0.015	0.00015	0.00016	0.00011	0.00013	0.11	0.1	<0.00002	<0.00002	<0.00005	<0.00005	0.01	<0.01	<0.09	0.000023	0.000025	99	96	0.94	1.5	0.0001	0.00017	<0.0001	<0.0001	773	<0.0005	0.00062	0.18
2018	Q4	GH_FR1	100	96	81	95	100	<1	200	7.0	<1	206	<0.003	0.0066	0.00013	0.00013	<0.0001	0.00013	0.12	0.11	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.25	0.000016	0.000021	115	112	0.66	<2.5	0.00012	0.00023	<0.0001	<0.0001	867	<0.0005	<0.0005	0.17
2018	Q4	CM_MC2	100	91	91	96	100	1.2	209	5.7	<1	215	<0.003	0.012	0.00036	0.00037	0.00017	0.00019	0.073	0.073	<0.00002	<0.00002	<0.00005	<0.00005	0.046	0.047	<0.21	0.000018	0.000027	130	129	0.97	4.0	0.00015	0.00019	0.0042	0.0045	1011	<0.0005	<0.0005	0.14
2019	Q1	GH_FR1	103	106	125	98	95	1.8	209	<1.0	<1.0	209	0.0021	0.03	0.00015	0.00016	0.000082	0.00013	0.11	0.11	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.085	0.000021	0.000026	117	121	1.1	1.6	0.000076	0.00015	0.000092	0.00011	931	<0.0005	<0.0005	0.13
2019	Q1	CM_MC2	103	98	119	96	98	1.8	222	1.3	<1.0	223	<0.003	0.0096	0.00029	0.00029	0.0002	0.00023	0.079	0.082	<0.00002	<0.00002	<0.00005	<0.00005	0.029	0.031	<0.105	0.000026	0.000028	141	144	0.56	7.2	0.00014	0.00018	0.00095	0.0011	1106	<0.0005	<0.0005	0.093
2019	Q1	EV_MC2	100	98	91	88	96	1.7	186	<1.0	<1.0	186	<0.003	0.025	0.000082	0.000082	0.00014	0.00017	0.11	0.1	<0.00002	<0.00002	<0.00005	<0.00005	0.01	0.01	0.093	0.000021	0.000024	80	79	1.1	3.8	0.00011	0.00017	<0.0001	<0.0001	631	<0.0005	<0.0005	0.13

Year	Quarter	Sample ID	Mean Hatch (control normalized)	Mean Survival (Control Normalized)	Mean Biomass (Control Normalized)	Mean Length (Control Normalized)	Mean Normal Development (Control Normalized)	ACIDITY TO pH 8.3 (As CaCO3)-N-mg/l	ALKALINITY BICARBONATE (As CaCO3) lab measured.-N-mg/l	ALKALINITY CARBONATE (As CaCO3) lab measured.-N-mg/l	ALKALINITY HYDROXIDE (As CaCO3) lab measured.-N-mg/l	ALKALINITY TOTAL (As CaCO3) lab measured.-N-mg/l	ALUMINUM-D-mg/l	ALUMINUM-T-mg/l	ANTIMONY-D-mg/l	ANTIMONY-T-mg/l	ARSENIC-D-mg/l	ARSENIC-T-mg/l	BARIUM-D-mg/l	BARIUM-T-mg/l	BERYLLIUM-D-mg/l	BERYLLIUM-T-mg/l	BISMUTH-D-mg/l	BISMUTH-T-mg/l	BORON-D-mg/l	BORON-T-mg/l	BROMIDE-D-mg/l	CADMIUM-D-mg/l	CADMIUM-T-mg/l	CALCIUM-D-mg/l	CALCIUM-T-mg/l	CARBON DISSOLVED ORGANIC-D-mg/l	CHLORIDE-D-mg/l	CHROMIUM-D-mg/l	CHROMIUM-T-mg/l	COBALT-D-mg/l	COBALT-T-mg/l	CONDUCTIVITY LAB-N-us/cm	COPPER-D-mg/l	COPPER-T-mg/l	FLUORIDE-D-mg/l
2019	Q1	EV_HC1	100	95	86	91	94	1.3	191	<1.0	<1.0	191	<0.003	0.013	0.000064	0.000062	0.00016	0.00019	0.078	0.075	<0.00002	<0.00002	<0.00005	<0.00005	0.006	0.0062	0.043	0.000019	0.00002	88	85	0.85	2.1	0.00014	0.00019	<0.0001	<0.0001	712	<0.0005	<0.0005	0.17
2019	Q1	LC_DCDS	100	100	91	89	97	1.1	171	<1.0	<1.0	171	0.0022	0.034	0.00051	0.00052	0.00038	0.00035	0.22	0.22	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.000085	0.000091	72	72	1.8	7.4	0.000064	0.00011	0.00011	0.00016	557	<0.0005	<0.0005	0.084
2019	Q1	LC_LC3	100	86	95	96	100	3.5	210	<1.0	<1.0	210	<0.003	0.099	0.00026	0.00029	0.00008	0.000092	0.062	0.064	<0.00002	0.000012	<0.00005	<0.00005	0.015	0.015	<0.25	0.00013	0.00015	148	150	0.8	33	0.00013	0.00031	0.00022	0.00027	1212	<0.0005	0.00046	0.14
2019	Q1	LC_LC5	100	72	68	89	100	1.1	196	1.3	<1.0	197	<0.003	0.023	0.000066	0.000076	0.0001	0.00006	0.1	0.099	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.000013	0.00002	102	105	0.71	4.5	0.00013	0.00017	<0.0001	0.000076	778	<0.0005	<0.0005	0.2
2019	Q1	LC_LCDSSLCC	100	89	91	90	98	1.5	199	1.1	<1.0	200	<0.003	0.0063	0.00017	0.00017	0.000084	0.000078	0.085	0.079	<0.00002	<0.00002	<0.00005	<0.00005	0.012	0.012	<0.25	0.000082	0.000088	122	124	0.62	17	0.00014	0.00016	<0.0001	<0.0001	946	<0.0005	<0.0005	0.16
2019	Q3	FR_FRABCH	98	74	93	107	100	1.4	228	2.4	<1.0	230	<0.003	0.0038	0.00015	0.00017	<0.0001	0.000096	0.092	0.089	<0.00002	<0.00002	<0.00005	<0.00005	0.012	0.012	<0.085	0.000033	0.000036	119	123	0.58	1.2	0.00012	0.00021	0.00014	0.00014	913	<0.0005	0.00048	0.19
2019	Q3	GH_FR1	98	86	95	102	100	<1.0	191	6.3	<1.0	197	<0.003	0.0068	0.00014	0.00015	0.00011	0.000096	0.096	0.091	<0.00002	<0.00002	<0.00005	<0.00005	0.0064	0.0072	<0.05	0.000017	0.000022	94	93	0.92	1.3	0.00011	0.00023	0.00006	<0.0001	740	<0.0005	<0.0005	0.18
2019	Q3	GH_ERC	98	80	105	105	100	<1.0	146	1.3	<1.0	148	<0.003	0.0066	<0.0001	<0.0001	0.00007	0.00011	0.051	0.05	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000064	0.000010	46	47	0.47	0.3	0.00021	0.00027	<0.0001	<0.0001	307	<0.0005	<0.0005	0.17
2019	Q3	EV_MC2	98	78	89	104	100	<1.0	167	3.7	<1.0	171	<0.003	0.016	0.000096	0.00011	0.00019	0.0002	0.11	0.11	<0.00002	<0.00002	<0.00005	<0.00005	0.01	0.011	0.032	0.000019	0.000032	67	69	0.99	2.6	0.00014	0.0002	<0.0001	0.000066	512	<0.0005	<0.0005	0.15
2019	Q3	EV_HC1	100	83	85	101	100	<1.0	188	4.6	<1.0	193	<0.003	0.014	<0.0001	0.000072	0.00017	0.00019	0.06	0.059	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.000012	0.00002	79	79	0.91	1.1	0.00015	0.00019	<0.0001	<0.0001	660	<0.0005	<0.0005	0.22
2019	Q3	LC_DCDS	98	76	77	98	100	<1.0	130	4.6	<1.0	134	<0.003	0.019	0.00049	0.00051	0.0003	0.00034	0.21	0.22	<0.00002	<0.00002	<0.00005	<0.00005	0.006	0.0086	<0.05	0.000029	0.000055	74	74	2.1	7.8	0.000072	0.00014	0.00012	0.00015	595	<0.0005	0.0003	0.098
2019	Q3	LC_LC3	100	95	95	105	100	3.7	213	<1.0	<1.0	213	<0.003	0.0034	0.00027	0.00029	<0.0001	0.000074	0.052	0.052	<0.00002	<0.00002	<0.00005	<0.00005	0.016	0.016	<0.085	0.0003	0.00034	118	118	0.44	18	0.000088	0.00019	0.000098	0.00015	967	<0.0005	<0.0005	0.21
2019	Q3	LC_LC5	100	90	84	97	100	<1.0	183	4.8	<1.0	188	<0.003	0.011	0.00012	0.00013	0.000062	0.000076	0.089	0.091	<0.00002	<0.00002	<0.00005	<0.00005	0.0064	0.0074	<0.05	0.000016	0.00003	84	86	0.68	2.8	0.00012	0.0002	<0.0001	<0.0001	665	<0.0005	<0.0005	0.21
2019	Q3	LC_LCDSSLCC	100	64	74	104	100	0.7	186	2.0	<1.0	188	<0.003	0.0038	0.00019	0.00019	0.000076	0.000072	0.06	0.06	<0.00002	<0.00002	<0.00005	<0.00005	0.012	0.013	<0.05	0.00015	0.00017	91	94	0.59	9.1	0.00013	0.00022	<0.0001	<0.0001	733	<0.0005	<0.0005	0.24
2020	Q1	FR_FRABCH	98	92	85	96	100	2.1	246	1.4	<1.00	247	<0.0030	0.019	<0.000100	0.000068	<0.000100	0.000084	0.11	0.1	<0.000020	<0.000020	<0.000050	<0.000050	0.0082	0.01	0.065	0.000032	0.000042	150	148	0.46	1.5	0.00012	0.00017	0.00015	0.00017	1078	<0.00020	0.00038	0.11
2020	Q1	FR_FRCP1	100	104	95	95	98	2.0	250	1.6	<1.00	251	<0.0030	0.072	0.00033	0.00036	0.000096	0.00015	0.085	0.086	<0.000020	<0.000020	<0.000050	<0.000050	0.0096	0.011	0.085	0.000067	0.0001	179	180	1.4	2.1	0.00015	0.0004	0.00012	0.00017	1370	0.00049	0.00083	0.14
2020	Q1	GH_FR1	100	102	91	95	98	0.86	215	3.3	<1.00	218	<0.0030	0.0086	0.0001	0.00012	0.000086	0.000092	0.12	0.11	<0.000020	<0.000020	<0.000050	<0.000050	<0.0100	<0.0100	<0.050	0.000024	0.000022	114	118	0.53	2.0	0.00013	0.00016	<0.000100	<0.000100	888	0.00038	0.00033	0.14
2020	Q1	GH_ERC	100	87	79	101	99	411	153	1.8	<1.00	155	0.002	0.0036	<0.000100	<0.000100	<0.000100	0.000064	0.062	0.06	<0.000020	<0.000020	<0.000050	<0.000050	<0.0100	<0.0100	<0.050	0.0000074	0.0000064	52	54	0.32	<0.50	0.00026	0.00027	<0.000100	<0.000100	94	<0.00020	<0.00050	0.13
2020	Q1	CM_MC2	98	96	84	95	98	<1.00	218	1.9	<1.00	219	<0.0030	0.015	0.00026	0.00027	0.00016	0.00018	0.065	0.064	<0.000020	<0.000020	<0.000050	<0.000050	0.036	0.038	0.045	0.000027	0.000027	138	138	0.6	3.3	0.00014	0.00017	0.0039	0.0042	1013	0.00017	<0.00050	0.11
2020	Q1	RG_MIDAG	100	107	86	105	108	1.4	191	0.96	<1.00	192	<0.0030	0.006	0.00014	0.00014	0.00019	0.0002	0.08	0.081	<0.000020	<0.000020	<0.000050	<0.000050	0.017	0.019	<0.050	0.000022	0.000028	100	106	0.67	3.0	0.0002	0.00023	0.00035	0.00038	751	0.00013	<0.00050	0.16
2020	Q1	EV_MC2	95	88	84	98	94	0.84	177	1.4	<1.00	178	0.0018	0.011	0.00012	0.00013	0.00015	0.00017	0.12	0.12	<0.000020	<0.000020	<0.000050	<0.000050	0.0098	0.012	0.038	0.000026	0.000029	76	75	1.1	4.6	0.00012	0.00018	<0.000100	<0.000100	572	0.00022	<0.00050	0.11
2020	Q1	EV_HC1	100	95	92	95	96	<1.00	202	2.1	<1.00	204	0.0019	0.0092	<0.000100	<0.000100	0.00015	0.00019	0.067	0.066	<0.000020	<0.000020	<0.000050	<0.000050	<0.0100	<0.0100	<0.050	0.000017	0.000019	86	86	0.78	1.3	0.00015	0.0016	<0.000100	0.000064	721	0.00019	<0.00050	0.18
2020	Q1	LC_LC3	100	96	84	96	100	3.0	220	<1.00	<1.00	220	<0.0030	0.0037	0.00025	0.00027	<0.000100	0.000078	0.063	0.062	<0.000020	<0.000020	<0.000050	<0.000050	0.015	0.016	0.065	0.00016	0.00015	158	161	0.55	38	0.0001	0.00014	0.00026	0.00027	1276	0.0005	0.00031	0.16
2020	Q1	LC_LC5	100	102	87	94	96	0.64	192	3.2	<1.00	195	<0.0030	0.0068	<0.000100	0.000076	<0.000100	0.000068	0.098	0.094	<0.000020	<0.000020	<0.000050	<0.000050	<0.0100	<0.0100	<0.050	0.000014	0.000029	100	102	0.61	5.4	0.00013	0.00017	<0.000100	<0.000100	770	0.00021	<0.00050	0.16
2020	Q1	FR_FR4	100	98	91	95	100	1.0	250	1.8	<1.00	251	<0.0030	0.0078	0.00032	0.00034	0.00008	0.00012	0.084	0.082	<0.000020	<0.000020	<0.000050	<0.000050	0.0084	0.01	0.085	0.000074	0.00008	184	180	0.86	2.2	0.000062	0.0001	0.00012	0.00013	1386	0.00021	0.00053	0.14
2020	Q3	FR_FRABCH	97	86	88	105	102	1.0	222	<1.00	<1.00	222	<0.0030	0.033	0.00011	0.00013	0.000072	0.0001	0.11	0.1	<0.000020	<0.000020	<0.000050	<0.000050	0.012	0.013	<0.25	0.000037	0.000045	142	140	0.49	1.6	0.0001	0.00018	0.00006	0.00012	999	<0.00020	<0.00050	0.13
2020	Q3	FR_FRCP1	115	96	82	91	100	<1.00	172	9.1	43	223	<0.0030	0.018	0.00028	0.0003	0.000088	0.00012	0.083	0.082	<0.000020	<0.000020	<0.000050	<0.000050	0.012	0.011	<0.25	0.00011	0.00013	139	136	0.58	1.7	0.000084	0.00014	<0.000100	0.000074	1035	0.00019	0.00031	0.19
2020	Q3	GH_FR1	98	92	92	99	100	<1.00	80	1.6	121	201	0.0019	0.019	0.00012	0.00013	0.000072	0.00016	0.1	0.11	<0.000020	<0.000020	<0.000050	<0.000050	<0.0100	0.0082	<0.050	0.000021	0.000027	102	101	0.36	1.6	0.000074	0.00015	<0.000100	<0.000100	763	0.00017	<0.00050	0.17
2020	Q3	GH_ERC	101	102	93	97	100	<1	145	1.6	<1.00	146	0.002	0.016	<0.000100	<0.000100	0.000088	0.00015	0.054	0.055	<0.000020	<0.000020	<0.000050	<0.000050	<0.0100	<0.0100	<0.050	0.000006	0.00001	49	48	<0.50	0.4	0.00019	0.00026	<0.000100	<0.000100	98	0.00014	0.00035	0.17
2020	Q3	RG_MIDAG	95	101	91	94	100	<1.00	109	1.5	75	184	<0.0030	0.012	0.00018	0.00019	0.00024	0.00027	0.082	0.083	<0.000020	<0.000020	<0.000050	<0.000050	0.031	0.032	<0.050	0.000021	0.000023	101	96	0.6	1.2	0.00014	0.00017	0.00037	0.00049	737	<0.00020	<0.00050	0.17
2020	Q3	EV_MC2	98	94	88	94	100	<1.00	36	1.0	145	181	<0.0030	0.0039	0.000072	0.0001	0.00015	0.0002	0.12	0.12	<0.000020	<0.000020	<0.000050	<0.000050	0.013	0.014	<0.050	0.000025	0.000026	76	74	0.56	3.3	0.00012	0.00014	<0.000100	<0.000100	545	0.00021	0.00033	0.15
2020	Q3	EV_HC1	113	82	70	91	98	<1.00	37	1.1	149	185	<0.0030	0.011	<0.000100	0.00006	0.00017	0.00021	0.058	0.06	<0.000020	<0.000020	<0.000050	<0.000050	<0.0100	<0.0100	<0.050	0.000015	0.000017	79	77	0.52	0.94	0.00014	0.00018	<0.000100	<0.000100	621	<0.00020	<0.00050	0.21
2020	Q3	LC_DCDS	113	99	69	86	100	<1.00	108	<1.00	29	136	0.0018	0.012	0.00053	0.00055	0.00032	0.00036	0.23	0.23	<0.000020	<0.000020	<0.000050	<0.000050	0.0082	0.011	<0.25	0.00017	0.00017	111	110	1.8	15	<0.000100	0.000064	0.00037	0.00041	853	0.00023	<0.00050	0.084
2020	Q3	LC_LC3	92	73	98	104	94	<1.00	92	1.5	136	228	<0.0030	0.0023	0.00032	0.00034	0.000068	0.00012	0.058	0.058	<0.000020	<0.000020	<0.000050	<0.000050	0.018	0.02	<0.25	0.0003	0.00031	140	138	0.61	24	0.000096	0.00013	0.00017	0.00021	1060	0.00027	<0.00050	0.17
2020	Q3	LC_LC5	97	99	91	92	100	<1.00	36	1.6	150	187	<0.0030	0.035	0.00012	0.00014	0.000072	0.00013	0.095	0.09	<0.000020	<0.000020	<0.000050	<0.000050	0.0096	0.012	<0.050	0.000023	0.00006	94	94	0.36	3.7	0.00013	0.00017	<0.000100	0.000076	674	0.00017	<0.00050	0.2
2020	Q3	LC_LCDSSLCC	100	96	87	90	100	<1.00	80	1.7	121	202	<0.0030	<0.0030	0.00022	0.00022	0.00006	0.00011	0.066	0.067	<0.000020	<0.000020	<0.000050	<0.000050	0.014	0.015	<0.050	0.00014	0.00016	111	108	0.39	12	0.00017	0.00013	<0.000100	<0.000100	801	-0.0002	<0.00050	0.21
2021	Q1	FR_FRABCH	103	94	90	94	97	3.1	258	2.4	<1	249	0.0012	0.011	0.00012	0.00012	0.0001	0.00012	0.1	0.11	<0.00002	<0.00002	<0.00005	<0.00005	0.012	0.012	<0.25	0.000043	0.000046	171	172	0.79	3.5	0.00011	0.00014	0.00011	0.00012	1220	<0.0002	<0.0005	0.13
2021	Q1	GH_FR1	97	106	97	95	96	2.4	217	1.5	1.0	217	0.003	0.02	0.00012	0.00013	0.0001	0.00011	0.12	0.12	0.00002	0.00002	0.00005	0.00005	0.01	0.01	0.17	0.000023	0.000027	128	131	0.93	3.1	0.00013	0.00023	0.0001	0.0001	927	0.00032	0.0005	0.15
2021	Q1	GH_ERC	100	95	104	98	85	2.2	160	3.3	<1	157	0.0011	0.006	<0.0001	<0.0001	<0.0001	0.0001	0.063	0.063	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000063	0.000008	54	55	<0.5	0.47	0.00025	0.00031	<0.0001	<0.0001	348	<0.0002	<0.0005	0.14
2021	Q1	CM_MC2	103	112	88	90	99	2.4	243	2.0	<1	244	0.001	0.014	0.00015	0.00016	0.00016	0.00018	0.076	0.076	<0.00002	<0.00002	<0.00005	<0.00005	0.041	0.043	<0.25	0.000021	0.000024	150	156	1.0	4.2	0.00015	0.00019	0.00084	0.00097	1125	<0.0002	<0.0005	0.12
2021	Q1	RG_MIDAG	100	88	79	97	95	4.6	193	3.0	<1	195	0.0015	0.0093	0.0001	0.0001	0.00018	0.00021	0.082	0.079	<0.00002	<0.00002	<0.00005	<0.00005	0.019	0.022	<0.09	0.000021	0.000023	98	103	0.91	4.3	0.00018	0.0002	0.0001	0.00011	715	0.00023	<0.0005	0.14
2021	Q1	EV_MC2	100	97	85	96	100	2.1	192	4.9	<1	197	0.001	0.018	<0.0001	0.0001	0.00014	0.00018	0.11	0.11	<0.00002	<0.00002	<0.00005	<0.00005	0.013	0.013	0.18	0.000027	0.000034	84	82	0.82	7.5	0.00013	0.00023	0.00015	0.00017	633	<0.0002	<0.0005	0.14
2021	Q1	EV_HC1	102	96	94	95	100	<2	201	4.4	<1	205	0.0012	0.046	<0.0001	0.0001	0.00015	0.00019	0.062	0.063	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.13	0.000015	0.000021	88	87	1.1	1.5	0.00014	0.00029	<0.0001	<0.00009	707	<0.0002	<0.0005	0.2
2021	Q1	LC_DCDS	89	100	90	100	98	1.4	148	<1	<1	148	0.012	0.16	0.0007	0.00072	0.00029	0.00042	0.23	0.27	<0.00002	<0.00002	<0.00005	<0.00005	0.01	0.011	<0.13	0.000089	0.00018	96	102	1.8	12	<0.0001	0.00027	0.00036	0.00047	715	0.00026	0.00067	0.095
2021	Q1	LC_LC3	105	104	89	96	98	3.1	220	2.9	1.0	222	0.0028	0.0058	0.00033	0.00034	0.00011	0.00015	0.057	0.058	0.00002	0.00002	0.00005	0.00005	0.017	0.019	0.25	0.00019	0.00019	165	165	0.59	35	0.00011	0.00013	0.00022	0.00024	1214	0.00025	0.00053	0.18
2021	Q1	LC_LC5	103	104	94	99	102	<1.2	199	1.4	<1	200	<0.0026	0.02	0.0001	0.00011	0.0001	0.00013	0.1	0.11	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	0.01	<0.05	0.000016	0.000025	118	122	0.58	5.7	0.00012	0.00016	<0.0001	<0.0001	851	<0.0002	<0.0005	0.16
2021	Q1	LC_LCDSSLCC	105	104	90	96	100	1.3	204	2.8	<1	207	<0.0026	0.0035	0.00022	0.00024	0.00011	0.00013	0.079	0.079	<0.00002	<0.00002	<0.00005	<0.00005	0.013	0.016	<0.28	0.00012	0.00012	134	137	0.56	20	0.00013	0.00013	<0.0001	<0.0001	997	0.0002	<0.0005	0.25
2021	Q1	FR_FR4	103	76	86	99	102	<1.4	229	5.4	<1	233	0.0028	0.099	0.00038	0.00039	0.00012	0.00019	0.085	0.091	<0.00002	<0.00002	<0.00005	<0.00005	0.013	0.014	<0.25	0.0001	0.00013	169	171	1.1	3.3	<0.0001	0.00026	0.00038	0.0005	1222	0.00029	0.00063	0.16
2021	Q1	FR_MULTIPLATE	103	92	100	97	102	1.7	193	<1	<1	193	0.0047	0.092	0.00039	0.00038	0.00013	0.00016	0.099	0.1	0.0000080000	0.0000080000	<0.00005	<0.00005	0.011	0.012	<0.21	0.000046	0.000045	150	146	1.1	2.9	0.00011	0.00025	0.000082	0.000082	1042	0.00033	0.00058	0.14
2021	Q1	FR_FRRD	98	89	100	96	98	2.6	287	<1	<1	287	0.0023	0.032	0.00016	0.00015	0.0001	0.00013	0.098	0.11	<0.00002	<0.00002	<0.00005	<0.00005	0.014	0.016	<0.25	0.000066	0.000074	200	205	0.69	3.8	0.00015	0.00021	0.00015	0.00019	1386	0.0002	<0.0005	0.14
2021	Q3	FR_FRABCH	97	99	101	90	106	2.3	241	1.5	<1	242	0.001	0.029	0.00014	0.00015	<0.0001	0.00015	0.087	0.087	<0.00002	<0.00002	<0.00005	<0.00005	0.013	0.014	<0.25	0.000043	0.000053	131	135	2.2	1.8	0.0001	0.00017	<0.0001	0.00012	1029	0.00051	0.00073	0.2
2021	Q3	FR_FRCP1	102	106	94	83	101	<2	214	9.0	<1	222	0.0016	0.065	0.00029	0.00031	0.00011	0.00018	0.07	0.073	<0.00002	0.000023	<0.00005	<0.00005	0.014	0.014	<0.21	0.0001	0.00013	119	119	2.1	2.0	0.0001	0.00022	0.00024	0.00033	962	0.00021	0.00061	0.2
2021	Q3	GH_FR1	102	108	96	85	100	2.0	188	10	1.0	198	0.0021	0.076	0.00013	0.00014	0.0001	0.00019	0.098	0.1	0.00002	0.000022	0.00005	0.00005	0.01	0.01	0.05	0.000022	0.000042	97	97	2.9	1.6	0.00013	0.00028	0.0001	0.00015	773	0.00049	0.00088	0.16
2021	Q3	GH_ERC	97	79	93	102	99	<2	137	2.3	<1	139	0.0023	0.035	<0.0001	<0.0001	0.0001	0.00015	0.049	0.05	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.01	<0.05	0.0000069	0.000016	44	44	2.2	0.29	0.0002	0.00027	<0.0001	0.0001	283	<0.0002	<0.0005	0.14
2021	Q3	CM_MC2	103	90	87	96	106	<2	226	1.8	<1	227	0.0014	0.027	0.00023	0.00023	0.00018	0.00021	0.068	0.068	<0.00002	<0.00002	<0.00005	<0.00005	0.053	0.055	<0.21	0.000017	0.000022	127	126	1.1	3.4	0.00013	0.00019	0.00069	0.00097	1015	0.00021	<0.0005	0.13
2021	Q3	RG_MIDAG	100	112	99	90	93	2.2	153	5.6	<1	159	0.0016	0.013	0.00012	0.00012	0.00028	0.00032	0.055	0.055	<0.00002	<0.00002	<0.00005	<0.00005	0.02	0.021	<0.05	0.000014	0.000019	69	73	0.93	0.81	0.00019	0.00021	0.00012	0.00016	536	<0.0002	<0.0005	0.18
2021	Q3	EV_MC2	102	112	99	83	98	2.1	168	5.4	<1	173	0.0014	0.049	0.00011	0.00012	0.00018	0.00024	0.1	0.1	<0.00002	<0.00002	<0.00005	<0.00005	0.013	0.014	0.052	0.000022	0.000034	65	66	1.8	3.4	0.00016	0.00021	0.0001	0.00014	503	0.00025	0.00051	0.14
2021	Q3	EV_HC1	93	76	79	94	104	2.2	183	6.5	<1	190	0.003	0.16	<0.0001	0.00011	0.00018	0.00029	0.059	0.06	<0.00002	0.000026	<0.00005	<0.00005	<0.01	<0.01	0.05	0.000013	0.000029	73	75	2.5	0.85	0.00014	0.00037	<0.0001	0.00018	633	0.00033	0.00071	0.2
2021	Q3	LC_DCDS	105	89	94	95	100	2.5	144	1.5	<1	144	0.0037	0.012	0.00069	0.00076	0.0003	0.00034	0.21	0.22	<0.00002	<0.00002	<0.00005	<0.00005	0.011	0.012	<0.21	0.0002	0.00023	118	123	2.5	15	<0.0001	0.0001	0.0001	0.00012	933	0.00026	<0.0005	0.096
2021	Q3	LC_LC3	105	91	102	94	102	2.6	208	5.3	1.0	213	0.001	0.006	0.00032	0.00033	0.0001	0.00012	0.05	0.05	0.00002	0.00002	0.00005	0.00005	0.019	0.019	0.17	0.00035	0.00034	117	116	1.8	29	0.0001	0.00012	0.00011	0.00012	934	0.00037	0.00051	0.18
2021	Q3	LC_LC5	103	90	97	97	104	<2	175	8.9	<1	184	0.0013	0.023	0.00013	0.00013	0.0001	0.00014	0.088	0.089	<0.00002	<0.00002	<0.00005	<0.00005	0.011	0.011	<0.05	0.000026	0.000044	87	89	1.6	3.4	0.00011	0.00015	<0.0001	<0.0001	690	<0.0002	<0.0005	0.17
2021	Q3	LC_LCDSSLCC	102	76	87	93	104	<2	182	8.0	<1	189	0.001	0.0047	0.00022	0.00023	0.00011	0.00013	0.055	0.056	<0.00002	<0.00002	<0.00005	<0.00005	0.014	0.014	<0.05	0.00017	0.00019	92	92	2.0	9.0	0.00011	0.00014	<0.0001	<0.0001	731	0.00023	<0.0005	0.21
2021	Q3	FR_FR4	100	95	90	86	97	2.2	212	15	<1	227	0.0016	0.22	0.0003	0.00033	0.00011	0.00024	0.064	0.071	<0.00002	0.00003	<0.00005	<0.00005	0.014	0.016	<0.17	0.00013	0.00016	118	126	1.9	1.3	0.00011	0.00043	0.00031	0.00048	976	0.00025	0.0021	0.18
2021	Q3	FR_FR2	102	113	105	87	104	2.7	194	4.7	1.0	198	0.0012	0.11	0.00026	0.00028	0.00011	0.00017	0.068	0.069	<0.00002	0.000023	<0.00005	<0.00005	0.014	0.015	<0.05	0.000034	0.000053	98	102	1.8	1.0	0.00011	0.00027	0.00035	0.00046	766	<0.0002	0.00059	0.19
2021	Q3	FR_MULTIPLATE	93	104	85	85	104	2.2	164	5.5	<1	169	0.0012	0.089	0.00021	0.00022	0.0001	0.00016	0.069	0.07	<0.00002	0.000021	<0.00005	<0.00005	0.01	0.011	<0.05	0.000033	0.000044	88	92	1.3	0.51	0.0001	0.00026	<0.0001	0.00015	692	0.0002	0.00059	0.18
2021	Q3	FR_FRRD	103	115	105	84	104	3.7	274	3.4	<1	276	<0.001	0.0073	0.00013	0.00013	0.0001	0.00011	0.091	0.089	<0.00002	<0.00002	<0.00005	<0.00005	0.016	0.017	<0.21	0.000042	0.000045	137	145	1.4	4.2	0.00011	0.00013	<0.0001	<0.0001	1084	0.0019	<0.0005	0.15
Tests categorized as possible or likely adverse response for biomass (2015 to 2020)																																										
2020	Q3	CM_MC2	113	86	67	87	98	0.6	188	0.8	47	234	0.0021	0.0048	0.00031	0.00034	0.00017	0.00023	0.063	0.063	<0.000020	<0.000020	<0.000050	<0.000050	0.06	0.063	<0.25	0.000015	0.000019	141	138	0.67	2.2	0.00011	0.00014	0.0026	0.0028	1104	<0.00020	<0.00050	0.18
Tests categorized as possible or likely adverse response for survival (2015 to 2020)																																										
2016	Q3	CM_MC2	95	73	89	106	100	1.0	197	4.0	<1	200	0.0034	0.012	0.00026	0.00029	0.00025	0.00026	0.077	0.076	<0.000036	<0.000036	<0.00009	<0.00009	0.033	0.034	<0.21	0.00001	0.000012	110	113	1.0	3.2	0.00021	0.00024	0.00037	0.00047	896	0.00062	0.011	0.11
2018	Q3	CM_MC2	100	45	62	114	100	<1	195	<1	<1	195	<0.0038	0.029	0.00053	0.00055	0.00021	0.00023	0.071	0.069	<0.00002	<0.00002	<0.00005	<0.00005	0.053	0.059	<0.25	0.0000082	0.000019	143	143	1.0	3.2	0.00012	0.00018	0.0057	0.0072	1072	<0.0005	<0.0005	0.17
2019	Q1	FR_FRABCH	103	78	94	98	98	2.9	237	<1.0	<1.0	237	<0.003	0.012	0.000064	0.000066	<0.0001	0.000074	0.11	0.1	<0.00002	<0.00002	<0.00005	<0.00005	0.0096	0.011	<0.11	0.000034	0.000039	151	149	0.8	1.4	0.00011	0.00018	0.00026	0.00025	1140	<0.0005	<0.0005	0.094
2019	Q3	FR_FRCP1	100	64	85	109	100	0.66	194	3.4	<1.0	197	<0.003	0.0046	0.00026	0.00028	0.000098	0.00012	0.078	0.075	<0.00002	<0.00002	<0.00005	<0.00005	0.0086	0.01	<0.05	0.00004	0.000045	102	105	0.84	0.86	0.000062	0.00014	<0.0001	<0.0001	777	<0.0005	<0.0005	0.21
2019	Q1	GH_ERC	98	51	36	94	100	1.4	154	<1.0	<1.0	154	<0.003	0.0026	<0.0001	<0.0001	<0.0001	0.000066	0.057	0.058	<0.00002	<0.00002	<0.00005	<0.00005	<0.01	<0.002	<0.05	0.000005	0.000007	51	52	0.47	0.31	0.00024	0.00027	<0.0001	<0.0001	338	<0.0005	<0.0005	0.14
Tests categorized as possible or likely adverse response for survival and biomass (2015 to 2020)																																										
2017	Q2	GH_FR1	100	64	84	106	100	-	-	-	-	175	0.0046	0.36	0.00018	0.00022	0.00013	0.00031	0.078	0.085	<0.00002	0.000028	<0.00005	<0.00005	<0.01	<0.01	<0.13	0.000028	0.000075	-	78	2.5	1.3	<0.0001	0.00077	<0.0001	0.00027	601	<0.0005	0.00096	0.15
2018	Q3	FR_FRCP1	100	1.8	5.8	140	100	<1	210	3.4	<1	213	<0.003	0.012	0.00028	0.0003	0.0001	0.00014	0.086	0.08	<0.00002	<0.00002	<0.00005	<0.00005	0.011	0.012	0.17	0.000031	0.000053	125	125	1.2	1.7	<0.0001	0.00013	0.00011	0.00011	1009	<0.0005	<0.0005	0.2
2018	Q4	FR_FRABCH	100	62	59	99	100	2.3	244	2.2	<1	246	<0.003	0.0036	<0.0001	0.00011	<0.0001	0.00011	0.11	0.11	<0.00002	<0.00002	<0.00005	<0.00005	0.012	0.012	<0.25	0.000034	0.000037	142	141	0.66	<2.5	0.00011	0.00015	0.0001	0.0001	1056	<0.0005	<0.0005	0.16
2019	Q1	FR_FRCP1	95	18	50	129	94	8.4	327	<0.5	<0.5	327	0.0019	0.037	0.00039	0.0004	0.00012	0.00016	0.043	0.043	<0.000014	<0.000014	<0.000035	<0.000035	0.008	0.0092	<0.11	0.000023	0.000036	304	305	1.7	4.6	<0.00007	0.00029	0.00012	0.00014	2456	<0.00025	0.0004	0.095
2019	Q3	CM_MC2	98	28	56	127	100	<1.0	203	6.9	<1.0	210	<0.003	0.012	0.00021	0.00021	0.00019	0.0002	0.069	0.069	<0.00002	<0.00002	<0.00005	<0.00005	0.029	0.029	<0.065	0.000012	0.000021	123	125	0.77	2.4	0.00015	0.00017	0.00055	0.00092	967	<0.0005	<0.0005	0.13
2020	Q1	LC_DCDS	100	64	58	95	100	0.72	150	1.1	<1.00	150	0.0023	0.011	0.00044	0.00046	0.00034	0.00036	0.26	0.25	<0.000020	<0.000020	<0.000050	<0.000050	<0.0100	<0.0100	0.085	0.00013	0.00013	97	96	1.6	13	0.00007	0.000068	<0.000100	0.000078	731	0.00026	<0.00050	0.073
2020	Q1	LC_LCDSSLCC	98	39	51	117	112	0.68	198	2.7	<1.00	201	<0.0030	0.0035	0.00017	0.00018	<0.000100	0.00008	0.078	0.077	<0.000020	<0.000020	<0.000050	<0.000050	0.011	0.012	<0.050	0.000082	0.000085	126	127	0.42	21	0.00012	0.00015	<0.000100	<0.000100	981	0.00028	<0.00050	0.17
Tests categorized as possible or likely adverse response for survival, biomass, and length (2015 to 2020)																																										
2018	Q4	FR_FRCP1	98	1.8	3.1	31	100	12	353	<1	<1	353	<0.003	0.0043	0.00049	0.0005	<0.0002	0.00021	0.016	0.018	<0.00004	<0.000024	<0.0001	<0.00006	<0.02	0.012	<0.25	0.000011	0.000013	405	417	1.7	6.4	<0.0002	0.00015	<0.0002	<0.00012	3280	<0.0005	<0.0006	0.12
Tests categorized as possible or likely adverse response for survival (2021)																																										

Year	Quarter	Sample ID	Mean Hatch (control normalized)	Mean Survival (Control Normalized)	Mean Biomass (Control Normalized)	Mean Length (Control Normalized)	Mean Normal Development (Control Normalized)	ACIDITY TO pH 8.3 (As CaCO3)-N-mg/l	ALKALINITY BICARBONATE (As CaCO3) lab measured.--N-mg/l	ALKALINITY CARBONATE (As CaCO3) lab measured.--N-mg/l	ALKALINITY HYDROXIDE (As CaCO3) lab measured.--N-mg/l	ALKALINITY TOTAL (As CaCO3) lab measured.--N-mg/l	ALUMINUM-D-mg/l	ALUMINUM-T-mg/l	ANTIMONY-D-mg/l	ANTIMONY-T-mg/l	ARSENIC-D-mg/l	ARSENIC-T-mg/l	BARIUM-D-mg/l	BARIUM-T-mg/l	BERYLLIUM-D-mg/l	BERYLLIUM-T-mg/l	BISMUTH-D-mg/l	BISMUTH-T-mg/l	BORON-D-mg/l	BORON-T-mg/l	BROMIDE-D-mg/l	CADMIUM-D-mg/l	CADMIUM-T-mg/l	CALCIUM-D-mg/l	CALCIUM-T-mg/l	CARBON DISSOLVED ORGANIC-D-mg/l	CHLORIDE-D-mg/l	CHROMIUM-D-mg/l	CHROMIUM-T-mg/l	COBALT-D-mg/l	COBALT-T-mg/l	CONDUCTIVITY LAB-N-us/cm	COPPER-D-mg/l	COPPER-T-mg/l	FLUORIDE-D-mg/l
2021	Q1	FR_FRCP1	103	58	73	100	98	<2	248	4.8	<1	244	0.0027	0.059	0.00039	0.00041	0.00013	0.0002	0.085	0.091	<0.00002	<0.00002	<0.00005	<0.00005	0.013	0.014	<0.25	0.0001	0.00012	172	173	1.3	3.6	0.00013	0.0002	0.00036	0.00044	1286	0.00031	0.00071	0.15

Year	Quarter	Sample ID	Hardness Total or Dissolved CaCO3-N-mg/l	IRON-D-mg/l	IRON-T-mg/l	LEAD-D-mg/l	LEAD-T-mg/l	LITHIUM-D-mg/l	LITHIUM-T-mg/l	MAGNESIUM-D-mg/l	MAGNESIUM-T-mg/l	MAJOR ANION SUM-N-meq/l	MAJOR CATION SUM-N-meq/l	MANGANESE-D-mg/l	MANGANESE-T-mg/l	MERCURY-D-mg/l	MERCURY-T-mg/l	MOLYBDENUM-D-mg/l	MOLYBDENUM-T-mg/l	NICKEL-D-mg/l	NICKEL-T-mg/l	NITRATE NITROGEN (NO3) AS N-N-mg/l	NITRITE NITROGEN (NO2) AS N-N-mg/l	NITROGEN AMMONIA (AS N)-N-mg/l	ORTHO-PHOSPHATE-N-mg/l	OXIDATION-REDUCTION POTENTIAL LAB-N-mv	pH LAB-N-ph units	PHOSPHORUS-N-mg/l	POTASSIUM-D-mg/l	POTASSIUM-T-mg/l	SELENIUM-D-mg/l	SELENIUM-T-mg/l	SILICON-D-mg/l	SILICON-T-mg/l	SILVER-D-mg/l	SILVER-T-mg/l	SODIUM-D-mg/l	SODIUM-T-mg/l	STRONTIUM-D-mg/l	STRONTIUM-T-mg/l
Reference (2015 - 2021)																																								
2016	Q1	Reference (FR_UFR1)	193	<0.01	0.017	<0.00005	<0.00005	0.0015	0.0016	14	14	3.8	3.9	0.00021	0.00045	<0.000005	0.00000062	0.00057	0.00059	<0.0005	<0.0005	0.15	<0.001	<0.005	0.0031	296	8.3	0.0047	0.39	0.39	0.00081	0.0008	1.8	1.8	<0.00001	<0.00001	0.7	0.7	0.088	0.09
2016	Q2	Reference (FR_UFR1)	134	<0.01	0.043	<0.00005	0.000052	0.0011	0.0013	9.7	10	2.6	2.7	0.00031	0.0016	<0.000005	0.00000096	0.00063	0.00065	<0.0005	<0.0005	0.016	<0.001	<0.005	0.0026	295	8.3	0.0047	0.33	0.36	0.00051	0.00055	1.8	1.9	<0.00001	<0.00001	0.63	0.65	0.066	0.068
2016	Q3	Reference (FR_UFR1)	178	<0.01	0.011	<0.00005	<0.00005	0.0018	0.0015	13	14	3.9	3.6	0.00019	0.00066	<0.000005	<0.0000005	0.00061	0.00062	<0.0005	<0.0005	0.041	<0.001	<0.005	0.0026	328	8.3	0.0048	0.45	0.45	0.0006	0.00065	2.1	2.1	<0.00001	<0.00001	0.69	0.74	0.096	0.098
2016	Q4	Reference (FR_UFR1)	172	<0.01	0.017	<0.00005	<0.00005	0.0013	0.0015	13	13	3.6	3.5	0.00016	0.00052	<0.000005	0.00000056	0.00057	0.00058	<0.0005	<0.0005	0.1	<0.001	<0.005	0.0023	315	8.3	0.0044	0.36	0.37	0.00067	0.00067	1.7	1.9	<0.00001	<0.00001	0.68	0.68	0.089	0.09
2017	Q1	Reference (FR_UFR1)	177	<0.01	0.011	<0.00005	<0.00005	0.0016	0.0016	-	15	-	-	<0.0001	0.00034	<0.000005	<0.0000005	0.00058	0.00062	<0.0005	<0.0005	0.21	0.0012	<0.005	0.0064	-	8.2	0.015	-	0.43	0.001	0.00095	-	-	<0.00001	<0.00001	-	0.85	0.093	0.096
2017	Q2	Reference (FR_UFR1)	122	0.02	0.14	<0.00005	0.00011	0.0011	0.0012	-	9.1	-	-	0.00064	0.0054	<0.000005	0.0000024	0.00049	0.00052	0.0005	0.0006	0.078	0.0019	0.0066	0.0072	-	8.3	0.022	-	0.39	0.00068	0.00064	-	-	<0.00001	0.000012	-	0.58	0.064	0.063
2017	Q2	Reference (GH_ER2)	171	<0.01	0.34	<0.00005	0.00023	0.0016	0.0021	-	12	-	-	0.00078	0.021	<0.000005	0.0000018	0.00091	0.00094	<0.0005	0.0009	0.12	<0.001	<0.005	0.0012	-	8.3	0.026	-	0.48	0.00084	0.00087	-	-	<0.00001	0.000012	-	0.77	0.2	0.21
2017	Q3	Reference (FR_UFR1)	180	<0.01	0.01	<0.00005	<0.00005	0.0018	0.0017	-	13	-	-	0.00023	0.00071	<0.000005	<0.0000005	0.00063	0.00067	<0.0005	<0.0005	0.014	<0.001	0.0061	0.0026	-	8.4	0.0043	-	0.46	0.00054	0.00058	-	-	<0.00001	<0.00001	-	0.68	0.097	0.096
2017	Q3	Reference (GH_ER2)	155	<0.01	0.019	<0.00005	<0.00005	0.0017	0.0018	-	10	-	-	0.0022	0.0038	<0.000005	0.00000052	0.00099	0.001	<0.0005	<0.0005	0.043	<0.001	0.0061	0.0014	-	8.2	0.0037	-	0.38	0.00065	0.00066	-	-	<0.00001	<0.00001	-	0.61	0.21	0.21
2017	Q3	Reference (CM_MC1)	146	<0.01	0.015	<0.00005	<0.00005	0.0049	0.0045	-	11	-	-	0.00012	0.00052	<0.000005	0.00000054	0.00089	0.0009	<0.0005	<0.0005	0.018	<0.001	0.0063	0.005	-	8.3	0.018	-	0.5	0.00018	0.00022	-	-	<0.00001	<0.00001	-	2.4	0.15	0.15
2017	Q4	Reference (FR_UFR1)	184	<0.01	<0.01	<0.00005	<0.00005	0.0017	0.0017	-	14	-	-	0.00012	0.00047	<0.000005	<0.0000005	0.00057	0.00059	<0.0005	<0.0005	0.031	0.001	0.0052	0.0015	-	8.4	0.0028	-	0.39	0.00059	0.00061	-	-	<0.00001	<0.00001	-	0.69	0.099	0.099
2017	Q4	Reference (GH_ER2)	155	<0.01	0.011	<0.00005	<0.00005	0.0019	0.0017	-	11	-	-	0.00044	0.0015	<0.000005	<0.0000005	0.0011	0.001	<0.0005	<0.0005	0.05	<0.001	0.0069	<0.001	-	8.4	0.0017	-	0.36	0.00084	0.00081	-	-	<0.00001	<0.00001	-	0.7	0.21	0.2
2017	Q4	Reference (CM_MC1)	144	<0.01	<0.01	<0.00005	<0.00005	0.0046	0.0047	-	11	-	-	0.00013	0.00026	<0.000005	0.00000053	0.00085	0.00088	<0.0005	<0.0005	0.068	0.0018	0.007	0.0035	-	8.2	0.0033	-	0.5	0.0002	0.00022	-	-	<0.00001	<0.00001	-	3.0	0.16	0.16
2018	Q1	Reference (FR_UFR1)	190	<0.012	0.018	<0.00006	<0.00005	0.0015	0.0015	14	14	4.0	3.8	0.00015	0.0005	<0.000005	0.00000052	0.00057	0.00061	<0.0006	<0.0005	0.19	<0.001	0.0084	0.0033	343	8.3	0.0043	0.4	0.37	0.00088	0.00087	1.9	1.9	<0.000012	<0.00001	0.78	0.77	0.097	0.092
2018	Q1	Reference (GH_ER2)	171	<0.01	0.012	<0.00005	<0.00005	0.0016	0.0016	12	11	3.6	3.5	0.0011	0.0016	<0.000005	<0.0000005	0.00094	0.001	<0.0005	0.00061	0.1	<0.001	<0.005	0.0011	283	8.2	0.0039	0.31	0.32	0.001	0.0011	1.8	1.9	<0.00001	<0.00001	0.75	0.73	0.21	0.22
2018	Q1	Reference (CM_MC1)	152	<0.01	<0.01	<0.00005	<0.00005	0.0046	0.0049	11	11	3.5	3.2	<0.0001	0.00017	<0.000005	<0.0000005	0.00087	0.00092	<0.0005	<0.0005	0.048	<0.001	0.0081	0.003	402	8.2	0.004	0.45	0.45	0.00028	0.00028	2.1	2.2	<0.00001	<0.00001	3.4	3.4	0.16	0.17
2018	Q2	Reference (FR_UFR1)	112	<0.01	0.19	<0.00005	0.00014	0.0011	0.0013	8.7	8.4	2.3	2.3	0.00059	0.0083	<0.000005	0.000002	0.00059	0.00056	<0.0005	0.00066	0.052	<0.001	0.0082	0.0052	301	8.2	0.023	0.34	0.41	0.00049	0.00047	1.8	2.1	<0.00001	0.000015	0.53	0.52	0.063	0.06
2018	Q2	Reference (GH_ER2)	142	<0.01	1.0	<0.00005	0.00075	0.0014	0.0022	9.7	11	3.0	2.9	0.00077	0.065	<0.000005	0.0000039	0.00089	0.00089	<0.0005	0.0022	0.1	0.0011	0.009	0.003	271	8.3	0.13	0.38	0.68	0.00068	0.00074	1.8	2.9	<0.00001	0.000023	0.65	0.66	0.19	0.19
2018	Q2	Reference (CM_MC1)	93	0.02	0.31	<0.00006	0.00025	0.0021	0.0025	7.2	7.1	1.9	1.9	0.00099	0.0092	0.0000052	0.0000025	0.00051	0.00057	<0.0006	0.00075	0.007	<0.001	0.008	0.0038	281	8.0	0.021	0.34	0.44	0.00018	0.00018	2.1	2.6	<0.000012	<0.00001	1.2	1.2	0.078	0.074
2018	Q3	Reference (FR_UFR1)	183	<0.01	<0.01	<0.00005	<0.00005	0.0018	0.0018	14	13	3.8	3.7	0.00023	0.00059	<0.000005	<0.0000005	0.00064	0.00065	<0.0005	<0.0005	0.014	<0.0018	0.023	0.0022	367	8.4	0.005	0.46	0.44	0.00059	0.00058	2.0	2.0	<0.00001	<0.000012	0.72	0.68	0.1	0.097
2018	Q3	Reference (GH_ER2)	150	<0.01	0.28	<0.00005	0.00024	0.0017	0.0019	10	10	3.1	3.0	0.00058	0.018	<0.000005	0.00000074	0.001	0.00096	<0.0005	0.00085	0.035	0.0022	0.018	0.002	344	8.3	0.0085	0.36	0.42	0.0007	0.00067	1.6	2.0	<0.00001	0.000011	0.66	0.62	0.21	0.2
2018	Q3	Reference (CM_MC1)	152	<0.01	0.012	<0.00005	<0.00005	0.0049	0.005	12	11	3.2	3.2	0.00018	0.00063	<0.000005	<0.0000005	0.00094	0.00092	<0.0005	0.00054	0.018	<0.001	0.014	0.0047	359	8.3	0.0063	0.57	0.49	0.00018	0.00019	2.3	2.3	<0.00001	<0.00001	3.1	2.9	0.16	0.16
2018	Q4	Reference (FR_UFR1)	187	<0.01	<0.01	<0.00005	<0.00005	0.0015	0.0016	14	14	3.9	3.8	0.00013	0.00031	<0.000005	<0.0000005	0.00058	0.00057	<0.0005	<0.0005	0.1	<0.001	0.047	0.0024	393	8.4	0.0026	0.37	0.36	0.00076	0.00081	1.6	1.6	<0.00001	<0.00001	0.69	0.72	0.096	0.098
2018	Q4	Reference (GH_ER2)	165	<0.01	0.013	<0.00005	<0.00005	0.0018	0.0019	12	11	3.4	3.3	0.00037	0.00099	<0.000005	<0.0000005	0.001	0.001	<0.0005	<0.0005	0.086	<0.001	0.017	0.002	314	8.3	0.0028	0.34	0.34	0.00091	0.00093	1.8	1.8	<0.00001	<0.00001	0.71	0.72	0.22	0.21
2018	Q4	Reference (CM_MC1)	145	<0.01	<0.01	<0.00005	<0.00005	0.0042	0.0042	11	11	3.1	3.0	0.00011	0.00028	<0.000005	0.00000056	0.00086	0.00087	<0.0005	<0.0005	0.021	<0.001	0.026	0.0046	372	8.3	0.0042	0.42	0.42	0.00023	0.00023	2.0	2.1	<0.00001	<0.00001	3.1	3.1	0.14	0.14
2019	Q1	Reference (FR_UFR1)	178	0.021	0.082	<0.00005	0.000073	0.0015	0.0017	14	13	3.9	3.6	0.0002	0.0019	<0.000005	0.0000014	0.00052	0.0005	<0.0005	0.00044	0.22	0.0011	0.017	0.0076	416	8.2	0.012	0.38	0.4	0.00092	0.00079	1.9	2.1	0.0000072	0.000016	0.71	0.67	0.092	0.092
2019	Q1	Reference (GH_ER2)	167	<0.01	0.011	<0.00005	<0.00005	0.0017	0.0018	12	12	3.5	3.4	0.00045	0.0011	<0.000005	0.00000031	0.001	0.001	<0.0005	<0.0005	0.11	0.0007	0.004	0.00098	454	8.2	0.0046	0.33	0.34	0.0012	0.0011	1.7	1.7	<0.00001	<0.00001	0.74	0.74	0.21	0.21
2019	Q1	Reference (CM_MC1)	155	<0.01	0.0074	<0.00005	<0.00005	0.0045	0.0045	11	12	3.6	3.3	0.00013	0.00028	<0.000005	<0.0000005	0.00087	0.00086	<0.0005	<0.0005	0.061	0.00062	0.008	0.0032	409	8.2	0.0037	0.45	0.44	0.00029	0.0003	2.1	2.1	<0.00001	<0.00001	3.4	3.4	0.16	0.16
2019	Q1	Reference (LC_SLC)	217	<0.01	<0.01	<0.00005	<0.00005	0.0046	0.0046	19	18	4.6	4.4	<0.0001	0.000076	<0.000005	<0.0000005	0.0013	0.0013	<0.0005	<0.0005	0.14	0.00062	0.024	0.0035	429	8.1	0.0038	0.39	0.41	0.0018	0.0017	2.2	2.2	<0.00001	<0.00001	1.2	1.2	0.19	0.19
2019	Q3	Reference (FR_UFR1)	180	<0.01	<0.01	<0.00005	<0.00005	0.0017	0.0017	14	14	3.6	3.6	0.00023	0.00058	0.000003	0.00000034	0.00064	0.00067	<0.0005	<0.0005	0.01	<0.001	0.012	0.0012	413	8.4	0.0018	0.43	0.4	0.00071	0.00067	1.9	2.0	<0.00001	<0.00001	0.72	0.69	0.099	0.1
2019	Q3	Reference (GH_ER2)	153	<0.01	0.025	<0.00005	<0.00005	0.0017	0.0017	11	10	3.1	3.1	0.00059	0.0034	<0.000005	<0.0000005	0.00096	0.00097	<0.0005	0.00033	0.037	<0.001	0.014	<0.001	448	8.3	0.0029	0.35	0.34	0.0008	0.00077	1.8	1.7	<0.00001	<0.00001	0.65	0.62	0.21	0.22
2019	Q3	Reference (CM_MC1)	151	<0.01	<0.01	<0.00005	<0.00005	0.0049	0.0048	12	12	3.2	3.2	0.00017	0.00049	<0.000005	0.0000003	0.00097	0.00094	<0.0005	<0.0005	0.02	0.0021	0.0031	0.0043	348	8.4	0.0042	0.52	0.5	0.00021	0.00018	2.4	2.4	<0.00001	<0.00001	3.1	3.1	0.15	0.15
2019	Q3	Reference (LC_SLC)	180	<0.01	<0.01	<0.00005	<0.00005	0.0028	0.0029	15	15	3.8	3.6	<0.0001	0.00016	<0.000005	<0.0000005	0.0012	0.0012	<0.0005	<0.0005	0.1	0.0007	0.0056	0.0016	362	8.3	0.0015	0.36	0.35	0.0015	0.0013	2.0	2.1	<0.00001	<0.00001	0.78	0.78	0.14	0.14
2020	Q1	Reference (FR_UFR1)	190	<0.0100	0.0092	<0.000050	<0.000050	0.0017	0.0016	15	14	3.9	3.9	<0.000100	0.00027	<0.0000050	<0.00000050	0.00055	0.00054	<0.00050	<0.00050	0.24	<0.00100	0.069	0.0043	382	8.2	0.0047	0.39	0.37	0.00088	0.00087	2.0	2.0	<0.0000100	<0.0000100	0.75	0.73	0.1	0.097
2020	Q1	Reference (GH_ER2)	167	<0.0100	0.0092	<0.000050	<0.000050	0.0019	0.0018	12	12	3.6	3.4	0.00043	0.00088	<0.0000050	<0.00000050	0.0011	0.0011	<0.00050	<0.00050	0.093	<0.00100	0.027	0.0022	459	8.3	0.0012	0.37	0.33	0.0012	0.0011	1.8	1.8	<0.0000100	<0.0000100	0.76	0.75	0.23	0.22
2020	Q1	Reference (CM_MC1)	152	<0.0100	<0.0100	<0.000050	<0.000050	0.0044	0.0048	11	11	3.3	3.2	<0.000100	0.00019	<0.0000050	0.0000004	0.00085	0.00087	<0.00050	<0.00050	0.034	<0.00100	0.0053	0.0046	428	8.2	0.0046	0.47	0.43	0.00029	0.00027	2.1	2.3	<0.0000100	<0.0000100	3.5	3.4	0.16	0.16
2020	Q1	Reference (LC_SLC)	217	<0.0100	0.0072	<0.000050	<0.000050	0.0042	0.0042	18	18	4.5	4.4	<0.000100	0.00016	<0.0000050	<0.00000050	0.0022	0.0013	<0.00050	<0.00050	0.13	<0.00100	0.0093	0.004	422	8.2	0.0024	0.4	0.4	0.0018	0.0017	2.2	2.2	<0.0000100	<0.0000100	1.3	1.2	0.18	0.18
2020	Q3	Reference (FR_UFR1)	186	<0.0100	0.06	<0.000050	0.000082	0.0022	0.0019	14	14	3.9	3.8	0.00031	0.0049	<0.0000050	0.0000007	0.00064	0.00065	<0.00050	0.00033	0.012	<0.00100	0.019	0.0032	379	8.3	0.0046	0.45	0.46	0.00061	0.00062	2.0	2.2	<0.0000100	<0.0000100	0.67	0.65	0.11	0.1
2020	Q3	Reference (GH_ER2)	152	0.0062	0.045	<0.000050	0.000045	0.0018	0.0018	10	10	3.1	3.1	0.0017	0.0038	<0.0000050	0.00000032	0.001	0.001	<0.00050	<0.00050	0.039	<0.00100	0.0091	0.0026	357	8.3	0.0014	0.35	0.37	0.00072	0.00072	1.7	1.9	<0.0000100	<0.0000100	0.62	0.63	0.22	0.21
2020	Q3	Reference (CM_MC1)	154	<0.0100	<0.0100	<0.000050	<0.000050	0.0052	0.0053	11	12	3.3	3.2	0.00015	0.0003	<0.0000050	<0.00000050	0.00092	0.00094	<0.00050	<0.00050	0.022	<0.00100	0.0069	0.0042	429	8.2	0.0039	0.53	0.52	0.00022	0.00022	2.4	2.4	<0.0000100	<0.0000100	3.1	3.1	0.17	0.17
2020	Q3	Reference (LC_SLC)	191	<0.0100	<0.0100	<0.000050	0.000035	0.0034	0.0034	15	16	3.9	3.9	<0.000100	0.00013	<0.0000050	<0.00000050	0.0012	0.0013	<0.00050	<0.00050	0.081	<0.00100	0.0053	0.0023	444	8.4	0.0022	0.37	0.38	0.0013	0.0013	2.2	2.2	<0.0000100	<0.0000100	0.88	0.89	0.15	0.15
2021	Q1	Reference (FR_UFR1)	145	0.019	0.12	<0.00005	0.0001	0.0013	0.0016	11	11	3.1	2.9	0.00067	0.0017	<0.000005	0.0000026	0.0005	0.00054	<0.0005	0.00067	0.29	0.0024	0.013	0.0098	389	8.2	0.014	0.38	0.44	0.0009	0.00083	1.9	2.4	0.00001	0.000021	0.62	0.62	0.072	0.074
2021	Q1	Reference (GH_ER2)	177	<0.01	0.059	<0.00005	0.000068	0.0016	0.0018	12	12	3.7	3.6	0.0013	0.0032	<0.000005	<0.0000005	0.00097	0.001	<0.0005	<0.0005	0.21	0.0013	0.017	0.0015	425	8.2	0.0029	0.36	0.36	0.0012	0.001	1.8	1.9	<0.00001	<0.00001	0.72	0.72	0.22	0.22
2021	Q1	Reference (CM_MC1)	159	<0.01	0.011	<0.00005	<0.00005	0.0047	0.0048	12	12	3.5	3.4	0.00015	0.00035	<0.000005	<0.0000005	0.00086	0.00089	<0.0005	<0.0005	0.05	0.001	0.0074	0.0032	373	8.1	0.0026	0.48	0.47	0.00034	0.00034	2.1	2.2	<0.00001	<0.00001	3.9	3.8	0.17	0.17
2021	Q1	Reference (LC_SLC)	226	<0.01	<0.01	<0.00005	<0.00005	0.0042	0.0043	19	19	4.5	4.6	<0.0001	0.00012	<0.000005	0.00000054	0.0013	0.0013	<0.0005	<0.0005	0.12	<0.001	0.0059	0.0019	395	8.2	<0.002	0.42	0.41	0.0016	0.0018	2.2	2.3	<0.00001	<0.00001	1.2	1.2	0.19	0.19
2021	Q3	Reference (FR_UFR1)	173	<0.01	0.022	<0.00005	0.0000028	0.0017	0.0018	13	13	3.8	3.5	0.00052	0.0041	<0.000005	0.00000023	0.00065	0.00069	<0.0005	0.00027	0.023	<0.001	0.0068	0.0026	394	8.3	0.013	0.45	0.44	0.00068	0.00066	2.0	2.1	<0.00001	<0.00001	0.64	0.64	0.098	0.1
2021	Q3	Reference (GH_ER2)	144	<0.01	0.083	<0.00005	0.00011	0.0016	0.0018	9.9	9.8	3.0	2.9	0.0019	0.0063	<0.000005	0.00000087	0.001	0.001	<0.0005	<0.0005	0.038	<0.001	0.0064	<0.001	348	8.3	0.017	0.37	0.38	0.00067	0.00071	1.7	1.9	<0.00001	<0.00001	0.61	0.6	0.21	0.2
2021	Q3	Reference (CM_MC1)	147	<0.01	0.013	<0.00005	0.000054	0.0051	0.0051	11	11	3.3	3.1	0.00022	0.001	<0.000005	0.00000073	0.00093	0.00093	<0.0005	<0.0005	0.018	<0.001	0.0065	0.0045	426	8.2	0.0059	0.52	0.52	0.00021	0.0002	2.3	2.3	<0.00001	<0.00001	3.0	3.0	0.16	0.15
2021	Q3	Reference (LC_SLC)	170	<0.01	0.019	<0.00005	<0.00005	0.0027	0.0027	13	14	3.6	3.4	0.00011	0.00052	<0.000005	0.00000064	0.0011	0.0012	<0.0005	<0.0005	0.13	0.0011	0.0059	0.0017	380	8.3	0.004	0.37	0.37	0.0014	0.0014	2.0	2.1	<0.00001	<0.00001	0.7	0.71	0.13	0.13
Tests categorized as no adverse response (2015 - 2021																																								
2016	Q1	FR_FRCP1	863	<0.01	0.023	<0.00005	<0.00005	0.058	0.06	100	103	18	17	0.0073	0.0093	<0.000005	<0.0000005	0.0016	0.0017	0.0089	0.0093	25	0.0063	<0.005	<0.001	309	8.3	0.0027	2.3	2.4	0.14	0.14	1.9	1.9	<0.00001	<0.00001	2.4	2.5	0.2	0.2
2016	Q1	GH_FR1	504	<0.01	0.013	<0.00005	<0.00005	0.015	0.015	51	52	10	10	0.0012	0.0017	<0.000005	<0.0000014	0.00091	0.00091	0.0017	0.0017	13	0.0054	<0.005	<0.001	324	8.3	0.0031	1.2	1.2	0.051	0.05	2.1	2.2	<0.00001	<0.00001	2.4	2.4	0.16	0.16
2016	Q1	CM_MC2	499	<0.01	0.016	<0.00005	<0.00005	0.014	0.014	49	51	11	11	0.0059	0.0071	<0.000005	<0.0000023	0.0011	0.0011	0.01	0.01	3.0	0.026	0.01	0.0012	339	8.3	0.0022	1.6	1.6	0.0055	0.0055	2.2	2.3	<0.00001	<0.00001	13	13	0.33	0.34
2016	Q2	FR_FRCP1	312	<0.01	0.082	<0.00005	0.000072	0.018	0.019	30	31	6.2	6.3	0.0022	0.0074	<0.000005	0.00000086	0.0011	0.0011	0.0019	0.0024	8.3	0.0026	0.0057	0.0015	328	8.3	0.0086	1.1	1.2	0.03	0.031	1.6	1.7	<0.00001	<0.00001	1.1	1.1	0.099	0.1
2016	Q2	GH_FR1	336	<0.01	0.091	<0.00005	0.000073	0.014	0.014	33	33	6.6	6.8	0.00082	0.0047	<0.000005	0.0000012	0.001	0.001	0.0018	0.002	7.6	0.0027	0.0052	0.0012	329	8.3	0.0089	1.1	1.1	0.029	0.03	1.8	1.9	<0.00001	<0.00001	1.5	1.5	0.11	0.11
2016	Q2	CM_MC2	278	<0.01	0.36	0.000053	0.00023	0.0088	0.0092	26	26	5.8	5.8	0.011	0.023	<0.000005	0.00000096	0.00086	0.00089	0.015	0.016	1.9	0.008	0.02	0.002	312	8.3	0.018	1.0	1.1	0.0043	0.0042	2.0	2.5	<0.00001	<0.00001	6.1	6.0	0.19	0.19
2016	Q3	FR_FRCP1	497	<0.01	0.029	<0.00005	<0.00005	0.037	0.037	57	57	11	10	0.0044	0.0077	<0.000005	<0.0000005	0.0013	0.0013	0.0055	0.0058	13	0.0065	0.0056	0.0013	320	8.3	0.0051	1.8	1.7	0.068	0.067	1.9	2.0	<0.00001	<0.00001	1.8	1.8	0.15	0.15
2016	Q3	GH_FR1	406	<0.01	0.015	<0.00005	<0.00005	0.018	0.018	41	42	8.7	8.2	0.00087	0.0018	<0.000005	<0.00000095	0.00095	0.00097	0.0016	0.0017	10	0.0056	<0.005	0.001	343	8.3	0.0041	1.3	1.2	0.039	0.04	2.1	2.2	<0.00001	<0.00001	1.9	2.0	0.14	0.14
2016	Q4	FR_FRCP1	489	<0.01	0.032	<0.00005	<0.00005	0.033	0.034	52	52	10	9.9	0.0069	0.0087	<0.000005	<0.0000005	0.0013	0.0013	0.0051	0.0054	13	<0.005	<0.005	<0.001	322	8.3	0.0036	1.6	1.6	0.06	0.059	1.7	1.8	<0.00001	<0.00001	1.6	1.6	0.15	0.15
2016	Q4	GH_FR1	429	<0.01	0.018	<0.00005	<0.00005	0.018	0.018	45	46	9.1	8.7	0.00096	0.0017	<0.000005	<0.0000014	0.0011	0.0011	0.0024	0.0025	9.6	<0.005	0.0053	0.0011	343	8.3	0.01	1.3	1.3	0.043	0.043	2.1	2.2	<0.00001	<0.00001	2.0	2.1	0.14	0.15
2016	Q4	CM_MC2	349	<0.018	0.1	<0.00009	0.0001	0.011	0.011	35	36	7.6	7.3	0.009	0.014	<0.000005	0.00000086	0.00092	0.00095	0.011	0.012	2.1	0.0096	0.012	0.0015	307	8.3	0.0071	1.3	1.3	0.0054	0.0055	2.2	2.4	<0.000018	<0.000018	7.4	7.6	0.24	0.24
2017	Q1	FR_FRCP1	926	<0.01	0.032	<0.00005	0.00005	0.059	0.059	-	113	-	-	0.0071	0.0089	<0.000005	0.00000055	0.0018	0.0018	0.011	0.011	22	0.011	0.0059	0.0043	-	8.2	0.015	-	2.5	0.17	0.17	-	-	<0.00001	<0.00001	-	2.4	0.2	0.2
2017	Q1	GH_FR1	507	<0.01	0.015	<0.00005	<0.00005	0.017	0.017	-	50	-	-	0.0014	0.0019	<0.000005	0.00000052	0.00084	0.00087	0.0015	0.0015	13	<0.005	0.0056	0.002	-	8.3	0.0036	-	1.2	0.053	0.053	-	-	<0.00001	<0.00001	-	2.4	0.17	0.17
2017	Q1	CM_MC2	504	<0.01	0.036	<0.00005	0.000054	0.019	0.019	-	51	-	-	0.019	0.021	0.00000057	0.000005	0.0016	0.0016	0.029	0.03	4.1	0.019	0.042	0.0026	-	8.3	0.0057	-	1.9	0.0066	0.0062	-	-	<0.00001	<0.00001	-	15	0.41	0.42
2017	Q2	FR_FRCP1	362	0.012	0.31	<0.00005	0.00023	0.027	0.027	-	37	-	-	0.0038	0.018	<0.000005	0.0000025	0.0012	0.0013	0.0037	0.0047	11	0.0038	0.013	0.0023	-	8.3	0.033	-	1.5	0.051	0.044	-	-	<0.00001	0.000014	-	1.4	0.12	0.12
2017	Q2	CM_MC2	327	<0.01	0.42	<0.00005	0.00027	0.013	0.013	-	34	-	-	0.017	0.033	<0.000005	0.0000017	0.0011	0.0012	0.017	0.02	2.3	0.0092	0.045	0.0021	-	8.3	0.042	-	1.5	0.0066	0.006	-	-	<0.00001	<0.00001	-	10	0.28	0.29
2017	Q3	FR_FRCP1	601	<0.012	0.023	<0.00006	<0.00005	0.037	0.035	-	70	-	-	0.0051	0.0088	<0.000005	<0.0000005	0.0013	0.0014	0.0068	0.007	11	0.0062	0.0063	0.0013	-	8.3	0.0037	-	2.0	0.091	0.091	-	-	<0.000012	<0.00001	-	1.6	0.15	0.15
2017	Q3	GH_FR1	436	<0.01	0.011	<0.00005	<0.00005	0.019	0.019	-	45	-	-	0.001	0.0021	<0.000005	0.0000005	0.00097	0.00099	0.0025	0.0026	10	0.0067	0.0058	0.001	-	8.3	0.0035	-	1.3	0.052	0.049	-	-	<0.00001	<0.00001	-	1.9	0.14	0.14
2017	Q3	CM_MC2	502	<0.01	0.044	<0.00005	0.00007	0.018	0.018	-	55	-	-	0.0017	0.01	<0.000005	0.00000069	0.0015	0.0015	0.026	0.027	3.5	0.018	0.015	0.0011	-	8.4	0.011	-	1.8	0.0086	0.0084	-	-	<0.00001	<0.00001	-	12	0.38	0.39
2017	Q4	FR_FRCP1	745	0.01	0.049	<0.00005	0.000057	0.041	0.04	-	94	-	-	0.0075	0.013	<0.000005	<0.0000005	0.0013	0.0014	0.0086	0.0092	15	0.0067	0.0063	<0.001	-	8.2	0.0022	-	2.2	0.14	0.13	-	-	<0.00001	<0.00001	-	2.0	0.18	0.18
2017	Q4	GH_FR1	497	<0.01	0.013	<0.00005	<0.00005	0.017	0.017	-	57	-	-	0.0013	0.002	<0.000005	0.0000011	0.0011	0.0011	0.0026	0.0028	10	0.0056	0.0068	<0.001	-	8.4	0.0019	-	1.3	0.065	0.063	-	-	<0.00001	<0.00001	-	2.2	0.16	0.16
2017	Q4	CM_MC2	532	<0.01	0.012	<0.00005	<0.00005	0.018	0.019	-	59	-	-	0.0043	0.0054	<0.000005	<0.0000005	0.0013	0.0014	0.016	0.017	3.9	0.014	0.02	<0.001	-	8.3	0.0029	-	1.9	0.0084	0.0079	-	-	<0.00001	<0.00001	-	14	0.41	0.41
2018	Q1	FR_FRCP1	891	0.014	0.031	<0.00006	<0.00007	0.054	0.056	107	107	19	18	0.01	0.015	<0.000005	<0.0000005	0.0017	0.0018	0.009	0.0094	20	0.0051	0.0099	<0.001	344	8.2	0.0022	2.6	2.4	0.16	0.16	2.2	2.2	<0.000012	<0.000014	2.6	2.6	0.21	0.21
2018	Q1	GH_FR1	463	<0.01	0.014	<0.00005	<0.00005	0.015	0.017	47	51	11	9.4	0.00068	0.0016	<0.000009	<0.0000005	0.0015	0.0017	0.0014	0.0017	12	<0.005	0.0055	0.0014	290	8.3	0.0049	1.1	1.2	0.058	0.061	2.1	2.4	<0.00001	<0.00001	2.3	2.4	0.16	0.19
2018	Q1	CM_MC2	577	<0.01	0.017	<0.00005	<0.00005	0.017	0.018	60	61	13	12	0.0053	0.0072	<0.000005	<0.0000005	0.0013	0.0014	0.015	0.015	4.1	0.017	0.014	0.0014	340	8.2	0.0032	1.8	1.8	0.0092	0.0089	2.3	2.4	<0.00001	<0.00001	16	16	0.43	0.44
2018	Q2	FR_FRCP1	288	<0.01	0.6	<0.00005	0.00044	0.019	0.018	29	28	5.9	5.8	0.0015	0.033	<0.000005	0.0000029	0.0011	0.0011	0.0024	0.004	8.1	0.0021	0.01	0.0017	309	8.3	0.051	1.2	1.3	0.035	0.033	1.6	2.2	<0.00001	0.000016	1.1	1.1	0.098	0.095
2018	Q2	GH_FR1	285	0.01	0.37	<0.00005	0.0003	0.013	0.013	29	28	5.9	5.8	0.00074	0.018	<0.000005	0.0000029	0.0012	0.0012	0.0022	0.0035	5.6	0.0029	0.0088	0.004	300	8.4	0.042	1.1	1.1	0.029	0.027	2.0	2.4	<0.00001	0.000013	1.4	1.4	0.1	0.098
2018	Q2	CM_MC2	252	0.012	1.3	<0.00006	0.00082	0.0081	0.0091	25	24	5.4	5.3	0.01	0.05	<0.000005	0.0000023	0.00084	0.00093	0.011	0.014	1.3	0.0036	0.024	0.0037	273	8.3	0.061	0.95	1.3	0.0046	0.0046	2.0	3.5	<0.000012	0.00001	6.5	5.9	0.19	0.19
2018	Q3	GH_FR1	457	<0.01	0.025	0.0001	0.00015	0.02	0.02	51	47	9.1	9.3	0.0011	0.0027	<0.000005	<0.0000005	0.0013	0.0013	0.0018	0.002	9.9	0.0076	0.024	0.0017	349	8.3	0.0043	1.5	1.3	0.053	0.05	2.2	2.3	<0.00001	<0.00001	2.3	2.1	0.15	0.14
2018	Q4	GH_FR1	521	<0.01	0.016	<0.00005	<0.00005	0.019	0.019	57	57	10	11	0.00084	0.0016	<0.000005	<0.0000005	0.0012	0.0012	0.0015	0.0018	10	0.005	0.015	0.0019	339	8.4	0.0025	1.4	1.4	0.065	0.062	2.2	2.3	<0.00001	<0.00001	2.4	2.5	0.17	0.16
2018	Q4	CM_MC2	581	<0.01	0.015	<0.00005	0.000055	0.024	0.024	62	59	12	12	0.014	0.018	<0.000005	<0.0000005	0.0024	0.0024	0.035	0.034	3.3	0.023	0.083	0.0028	335	8.3	0.0029	2.0	2.0	0.0078	0.0075	2.3	2.4	<0.00001	<0.00001	17	16	0.55	0.54
2019	Q1	GH_FR1	527	<0.01	0.02	<0.00005	0.000031	0.017	0.017	57	58	11	11	0.0018	0.0027	<0.000005	0.00000051	0.0017	0.0016	0.002	0.0022	11	0.0046	0.013	0.0025	435	8.2	0.0051	1.3	1.3	0.073	0.064	2.4	2.5	<0.00001	<0.00001	2.5	2.6	0.17	0.17
2019	Q1	CM_MC2	608	<0.01	0.009	<0.00005	<0.00005	0.018	0.019	62	66	13	13	0.0062	0.0077	<0.000005	<0.0000005	0.0026	0.0025	0.014	0.015	3.8	0.011	0.016	0.002	416	8.2	0.0048	1.9	1.9	0.0091	0.0087	2.4	2.5	<0.00001	<0.00001	15	16	0.46	0.45
2019	Q1	EV_MC2	346	<0.01	0.022	<0.00005	0.000034	0.012	0.013	35	33	7.1	7.1	0.0037	0.0043	<0.000005	0.00000039	0.00093	0.00097	0.0013	0.0013	2.1	0.0029	0.025	0.0053	384	8.2	0.0073	0.97	0.95	0.023	0.021	2.3	2.4	<0.00001	<0.00001	3.6	3.5	0.18	0.18

Year	Quarter	Sample ID	Hardness Total or Dissolved CaCO3-N-mg/l	IRON-D-mg/l	IRON-T-mg/l	LEAD-D-mg/l	LEAD-T-mg/l	LITHIUM-D-mg/l	LITHIUM-T-mg/l	MAGNESIUM-D-mg/l	MAGNESIUM-T-mg/l	MAJOR ANION SUM-N-meq/l	MAJOR CATION SUM-N-meq/l	MANGANESE-D-mg/l	MANGANESE-T-mg/l	MERCURY-D-mg/l	MERCURY-T-mg/l	MOLYBDENUM-D-mg/l	MOLYBDENUM-T-mg/l	NICKEL-D-mg/l	NICKEL-T-mg/l	NITRATE NITROGEN (NO3) AS N-N-mg/l	NITRITE NITROGEN (NO2) AS N-N-mg/l	NITROGEN AMMONIA (AS N)-N-mg/l	ORTHO-PHOSPHATE-N-mg/l	OXIDATION-REDUCTION POTENTIAL LAB-N-mv	pH LAB-N-ph units	PHOSPHORUS-N-mg/l	POTASSIUM-D-mg/l	POTASSIUM-T-mg/l	SELENIUM-D-mg/l	SELENIUM-T-mg/l	SILICON-D-mg/l	SILICON-T-mg/l	SILVER-D-mg/l	SILVER-T-mg/l	SODIUM-D-mg/l	SODIUM-T-mg/l	STRONTIUM-D-mg/l	STRONTIUM-T-mg/l
2019	Q1	EV_HC1	404	<0.01	0.016	<0.00005	<0.00005	0.0071	0.0075	45	43	8.1	8.2	0.0026	0.0033	<0.000005	0.0000003	0.00092	0.00094	0.00053	0.00065	1.2	0.0012	0.016	0.0069	391	8.2	0.0081	0.85	0.85	0.038	0.034	2.1	2.2	<0.00001	<0.00001	2.2	2.1	0.15	0.15
2019	Q1	LC_DCDS	289	<0.01	0.021	<0.00005	0.000034	0.012	0.012	27	25	6.4	5.9	0.0025	0.0047	<0.000005	0.000001	0.0036	0.0035	0.0037	0.0038	15	0.015	0.029	0.031	411	8.2	0.031	2.2	2.1	0.023	0.02	2.6	2.8	<0.00001	<0.00001	1.7	1.6	0.1	0.1
2019	Q1	LC_LC3	688	<0.01	0.2	<0.00005	0.000081	0.049	0.048	77	75	15	14	0.042	0.045	<0.000005	0.00000067	0.0055	0.0055	0.0064	0.0068	11	0.0062	0.014	0.0013	412	8.1	0.0082	2.0	2.0	0.043	0.037	2.1	2.3	<0.00001	<0.00001	14	14	0.25	0.25
2019	Q1	LC_LC5	436	<0.01	0.023	<0.00005	0.000031	0.019	0.018	44	43	9.2	8.9	0.0004	0.0016	<0.000005	0.00000031	0.0013	0.043	0.0007	0.00075	9.5	0.0032	0.02	0.0012	400	8.2	0.004	1.1	1.1	0.051	0.043	2.3	2.3	<0.00001	<0.00001	3.5	3.5	0.19	0.18
2019	Q1	LC_LCDSSLCC	536	<0.01	0.013	<0.00005	<0.00005	0.036	0.035	56	54	12	11	0.0029	0.0036	<0.000005	<0.0000005	0.0029	0.0029	0.0032	0.0031	9.1	0.0062	0.02	0.0016	423	8.2	0.0028	1.4	1.3	0.043	0.037	2.3	2.3	<0.00001	<0.00001	9.0	8.9	0.24	0.23
2019	Q3	FR_FRABCH	529	<0.01	0.013	<0.00005	0.000037	0.032	0.033	57	56	11	11	0.0036	0.0044	<0.000005	0.00000072	0.00096	0.001	0.0013	0.0014	16	0.0063	0.02	0.00078	452	8.3	0.0013	1.9	1.8	0.077	0.065	2.2	2.2	<0.00001	<0.00001	2.1	2.1	0.15	0.16
2019	Q3	GH_FR1	419	<0.01	0.018	<0.00005	<0.00005	0.02	0.019	45	45	8.5	8.5	0.0012	0.0025	<0.000005	0.0000003	0.0011	0.0011	0.001	0.0013	8.9	0.0058	0.014	0.0007	428	8.4	0.0021	1.3	1.3	0.049	0.043	2.2	2.3	<0.00001	<0.00001	2.1	2.1	0.14	0.14
2019	Q3	GH_ERC	165	<0.01	0.011	<0.00005	<0.00005	0.0026	0.0027	12	12	3.5	3.3	0.00062	0.0016	<0.000005	<0.0000005	0.0011	0.0011	<0.0005	0.00033	0.32	0.00086	0.0092	0.00064	341	8.3	0.0019	0.4	0.39	0.0017	0.0016	1.9	1.9	<0.00001	<0.00001	0.81	0.79	0.21	0.22
2019	Q3	EV_MC2	279	<0.01	0.023	<0.00005	0.000032	0.01	0.01	27	26	5.7	5.8	0.00068	0.0027	<0.000005	0.00000031	0.00088	0.00086	0.00094	0.0011	1.3	0.0018	0.015	0.0021	429	8.3	0.0045	0.89	0.86	0.013	0.012	2.3	2.3	<0.00001	<0.00001	3.3	3.1	0.16	0.17
2019	Q3	EV_HC1	383	<0.01	0.025	<0.00005	<0.00005	0.007	0.0068	45	43	7.7	7.7	0.0034	0.0063	<0.000005	0.00000031	0.00096	0.00093	0.00057	0.00069	0.63	0.0011	0.0086	0.002	405	8.4	0.009	0.96	0.92	0.038	0.032	2.2	2.1	<0.00001	<0.00001	1.6	1.5	0.12	0.12
2019	Q3	LC_DCDS	304	<0.01	0.022	<0.00005	0.000031	0.016	0.016	29	30	6.3	6.3	0.0003	0.0019	<0.000005	0.0000013	0.0037	0.0038	0.0064	0.007	18	0.058	0.05	0.0011	371	8.4	0.039	2.1	2.2	0.039	0.036	1.6	1.7	<0.00001	<0.00001	2.5	2.6	0.11	0.11
2019	Q3	LC_LC3	534	<0.01	0.072	<0.00005	<0.00005	0.041	0.041	58	60	11	11	0.016	0.029	<0.000005	<0.0000005	0.0038	0.0038	0.0085	0.009	9.1	<0.0017	0.0091	0.0017	284	8.2	0.0023	1.6	1.6	0.038	0.035	2.2	2.3	<0.00001	<0.00001	8.8	9.1	0.21	0.2
2019	Q3	LC_LC5	361	<0.01	0.017	<0.00005	0.000041	0.02	0.02	37	38	7.6	7.4	0.0002	0.0023	<0.000005	<0.0000005	0.0012	0.033	0.00084	0.00097	7.7	0.0037	0.0081	0.0006	322	8.4	0.0014	1.2	1.2	0.037	0.033	2.2	2.3	<0.00001	<0.00001	2.7	2.8	0.15	0.15
2019	Q3	LC_LCDSSLCC	395	<0.01	0.018	<0.00005	<0.00005	0.028	0.028	40	41	8.3	8.2	0.0023	0.0064	<0.000005	<0.0000005	0.0022	0.0022	0.004	0.0043	6.4	0.001	0.01	0.0012	270	8.3	0.0044	1.2	1.2	0.029	0.026	2.3	2.4	<0.00001	<0.00001	5.8	6.0	0.19	0.19
2020	Q1	FR_FRABCH	653	0.014	0.059	0.000037	0.000064	0.033	0.032	68	67	13	13	0.0072	0.0084	<0.0000050	0.00000069	0.00069	0.00073	0.00041	0.00059	22	0.0029	0.015	0.0014	414	8.2	0.0085	1.7	1.7	0.096	0.092	2.4	2.4	<0.0000100	<0.0000100	2.7	2.6	0.19	0.18
2020	Q1	FR_FRCP1	879	0.018	0.18	<0.000050	0.00014	0.057	0.057	105	105	18	18	0.0089	0.015	<0.0000050	0.00000063	0.003	0.003	0.01	0.011	21	0.03	0.087	0.0078	425	8.2	0.00098	2.9	2.9	0.15	0.15	2.1	2.3	<0.0000100	0.000006	2.7	2.6	0.2	0.2
2020	Q1	GH_FR1	513	<0.0100	0.016	<0.000050	0.000041	0.019	0.018	55	56	11	10	0.0009	0.0014	<0.0000050	<0.00000050	0.00086	0.00089	0.0012	0.0012	12	0.0026	0.018	<0.0020	428	8.3	0.0017	1.4	1.3	0.065	0.062	2.4	2.5	<0.0000100	<0.0000100	2.5	2.5	0.17	0.17
2020	Q1	GH_ERC	188	<0.0100	<0.0100	<0.000050	<0.000050	0.0034	0.0034	14	15	4.1	3.8	0.00015	0.00027	<0.0000050	<0.00000050	0.00099	0.001	<0.00050	<0.00050	0.83	<0.00100	0.0086	0.001	351	8.2	0.0016	0.4	0.38	0.0034	0.003	1.8	1.8	<0.0000100	<0.0000100	1.2	1.2	0.21	0.21
2020	Q1	CM_MC2	585	<0.0100	0.017	<0.000050	<0.000050	0.022	0.023	59	59	13	12	0.017	0.019	<0.0000050	<0.00000050	0.0014	0.0014	0.034	0.035	2.8	0.014	0.04	0.0031	417	8.3	0.0022	2.0	1.9	0.0071	0.0065	2.3	2.5	<0.0000100	<0.0000100	16	16	0.5	0.52
2020	Q1	RG_MIDAG	407	<0.0100	0.0062	0.00014	<0.000050	0.011	0.012	38	39	8.9	8.6	0.0013	0.0017	<0.0000050	<0.00000050	0.00098	0.001	0.0071	0.0075	1.7	0.0015	0.034	0.0033	412	8.2	0.0029	1.1	1.1	0.0049	0.0047	1.9	2.1	<0.0000100	<0.0000100	9.7	9.9	0.33	0.34
2020	Q1	EV_MC2	312	0.0062	0.017	<0.000050	<0.000050	0.014	0.015	30	30	6.6	6.5	0.0011	0.0015	<0.0000050	0.00000034	0.001	0.0011	0.0016	0.0017	2.1	0.0015	0.012	0.0048	417	8.2	0.0041	0.98	1.0	0.016	0.015	2.4	2.5	<0.0000100	<0.0000100	4.4	4.3	0.21	0.21
2020	Q1	EV_HC1	410	<0.0100	0.21	<0.000050	<0.000050	0.0066	0.0069	47	48	8.6	8.3	0.0039	0.0047	<0.0000050	0.00000037	0.00097	0.00099	0.00036	0.0011	1.0	0.00072	0.008	0.011	410	8.3	0.0074	0.87	0.91	0.042	0.039	2.1	2.2	<0.0000100	<0.0000100	1.8	1.8	0.14	0.14
2020	Q1	LC_LC3	744	0.0064	0.12	<0.000050	<0.000050	0.051	0.051	85	84	16	16	0.058	0.06	<0.0000050	<0.00000050	0.0063	0.0064	0.0077	0.0077	12	0.002	0.013	0.0054	383	8.1	0.0016	2.0	1.9	0.048	0.046	2.1	2.2	<0.0000100	<0.0000100	14	14	0.25	0.25
2020	Q1	LC_LC5	434	<0.0100	0.013	<0.000050	<0.000050	0.018	0.019	45	44	9.0	8.9	0.00024	0.00061	<0.0000050	<0.00000050	0.0012	0.0013	0.0006	0.0007	9.4	0.0017	0.0065	<0.0020	417	8.3	0.0006	1.1	1.1	0.045	0.042	2.2	2.3	<0.0000100	<0.0000100	3.8	3.7	0.18	0.19
2020	Q1	FR_FR4	892	0.019	0.037	<0.000050	<0.000050	0.056	0.057	105	105	18	18	0.011	0.012	<0.0000050	<0.00000050	0.003	0.003	0.01	0.011	21	0.027	0.083	0.0015	384	8.2	0.00092	2.8	2.8	0.15	0.15	2.0	2.1	<0.0000100	<0.0000100	2.5	2.5	0.2	0.2
2020	Q3	FR_FRABCH	617	<0.0100	0.07	<0.000050	0.000061	0.038	0.037	64	65	12	13	0.0043	0.0074	<0.0000050	0.00000052	0.00088	0.00088	0.00083	0.001	21	0.0045	0.036	0.00078	448	8.2	0.0016	2.0	2.0	0.095	0.089	2.2	2.4	<0.0000100	0.000006	2.5	2.5	0.18	0.17
2020	Q3	FR_FRCP1	640	0.0096	0.048	<0.000050	0.000044	0.04	0.038	71	74	13	13	0.0043	0.0077	<0.0000050	0.00000042	0.0027	0.0028	0.0068	0.0071	15	0.0095	0.011	0.0042	368	8.4	0.00076	2.2	2.2	0.10	0.099	2.0	2.1	<0.0000100	<0.0000100	1.7	1.8	0.17	0.17
2020	Q3	GH_FR1	442	0.0064	0.032	<0.000050	0.000036	0.021	0.023	46	47	9.2	9.0	0.0018	0.0028	<0.0000050	0.00000077	0.0011	0.0011	0.001	0.0011	11	0.0072	0.01	0.011	348	8.4	<0.00100	1.4	1.4	0.052	0.053	2.2	2.5	<0.0000100	<0.0000100	2.2	2.3	0.15	0.15
2020	Q3	GH_ERC	170	<0.0100	0.022	<0.000050	<0.000050	0.0028	0.0028	12	12	3.5	3.4	0.0011	0.0023	<0.0000050	0.00000033	0.0011	0.0011	<0.00050	<0.00050	0.4	0.00066	0.012	0.0054	302	8.3	0.0006	0.42	0.44	0.0016	0.0016	1.9	2.1	<0.0000100	<0.0000100	0.86	0.9	0.22	0.21
2020	Q3	RG_MIDAG	405	<0.0100	0.016	<0.000050	<0.000050	0.018	0.019	37	38	8.8	8.9	0.0021	0.0034	<0.0000050	<0.00000050	0.001	0.001	0.0093	0.0099	1.4	0.0037	0.014	0.0017	392	8.3	0.0016	1.3	1.3	0.0054	0.0051	1.9	2.0	<0.0000100	<0.0000100	17	17	0.39	0.37
2020	Q3	EV_MC2	311	<0.0100	0.0074	<0.000050	<0.000050	0.012	0.013	29	29	6.5	6.5	0.0016	0.0021	<0.0000050	<0.00000050	0.00086	0.00087	0.00075	0.00085	1.7	0.0028	0.0071	0.0012	437	8.4	0.00094	0.95	0.98	0.014	0.014	2.2	2.4	<0.0000100	<0.0000100	5.0	4.8	0.19	0.19
2020	Q3	EV_HC1	371	<0.0100	0.018	<0.000050	<0.000050	0.0069	0.0073	43	42	7.6	7.5	0.0049	0.0058	<0.0000050	0.00000041	0.0009	0.00094	0.00056	0.00067	0.59	0.001	0.0089	0.0057	432	8.4	0.0021	0.89	0.92	0.034	0.034	2.1	2.3	<0.0000100	<0.0000100	1.5	1.5	0.12	0.12
2020	Q3	LC_DCDS	447	<0.0100	0.013	<0.000050	<0.000050	0.029	0.028	41	43	9.6	9.2	0.0032	0.0042	<0.0000050	0.000001	0.0042	0.0044	0.015	0.016	37	0.053	0.029	0.027	410	8.3	0.021	2.6	2.6	0.066	0.065	2.4	2.5	<0.0000100	<0.0000100	4.9	5.0	0.17	0.17
2020	Q3	LC_LC3	629	<0.0100	0.11	<0.000050	<0.000050	0.055	0.056	68	69	13	13	0.028	0.032	<0.0000050	<0.00000050	0.0045	0.0046	0.0099	0.01	11	0.0035	0.013	0.0034	460	8.3	0.0021	1.9	1.9	0.044	0.044	2.2	2.4	<0.0000100	<0.0000100	11	11	0.24	0.24
2020	Q3	LC_LC5	396	<0.0100	0.056	<0.000050	0.000063	0.023	0.025	39	40	8.1	8.1	0.00037	0.0058	<0.0000050	<0.00000050	0.0013	0.0015	0.0009	0.0016	9.3	0.0049	0.0083	0.0071	459	8.3	0.00092	1.3	1.3	0.041	0.038	2.3	2.5	<0.0000100	0.000006	3.2	3.7	0.17	0.18
2020	Q3	LC_LCDSSLCC	469	<0.01000	0.012	<0.000050	<0.000050	0.037	0.038	46	48	9.7	9.7	0.0042	0.0051	<0.0000050	<0.00000050	0.0025	0.0025	0.0045	0.0046	8.1	0.0021	0.01	0.0017	438	8.4	0.0014	1.3	1.4	0.034	0.036	2.3	2.5	<0.0000100	<0.0000100	6.9	7.0	0.21	0.21
2021	Q1	FR_FRABCH	744	<0.01	0.029	<0.00005	0.000058	0.043	0.042	77	79	16	15	0.0061	0.0067	<0.000005	<0.0000005	0.00088	0.00093	0.0014	0.0015	29	0.011	0.0073	0.0014	407	8.2	0.0023	2.0	2.0	0.13	0.11	2.3	2.4	<0.00001	<0.00001	3.1	3.1	0.21	0.21
2021	Q1	GH_FR1	556	0.01	0.029	0.00005	0.000052	0.023	0.025	57	61	12	11	0.0018	0.0026	0.000005	0.00000051	0.00098	0.001	0.0012	0.0013	16	0.008	0.04	0.0016	354	8.2	0.0025	1.5	1.5	0.079	0.073	2.4	2.5	0.00001	0.00001	2.8	2.8	0.18	0.18
2021	Q1	GH_ERC	197	<0.01	0.012	<0.00005	<0.00005	0.0036	0.0037	15	15	4.0	4.0	0.00022	0.00059	<0.000005	<0.0000005	0.001	0.001	<0.0005	<0.0005	0.59	0.0012	0.07	0.0015	367	8.1	<0.002	0.41	0.41	0.0035	0.0033	1.8	1.8	<0.00001	<0.00001	1.1	1.2	0.22	0.22
2021	Q1	CM_MC2	672	<0.01	0.018	<0.00005	<0.00005	0.025	0.025	72	72	15	14	0.0061	0.0076	<0.000005	<0.0000005	0.00094	0.00098	0.013	0.014	3.0	0.0068	0.012	0.0026	344	8.1	0.0029	2.0	1.9	0.011	0.01	2.3	2.4	<0.00001	<0.00001	22	22	0.52	0.54
2021	Q1	RG_MIDAG	400	<0.01	0.012	<0.00005	<0.00005	0.012	0.012	38	38	8.6	8.6	0.00081	0.0013	<0.000005	<0.0000005	0.00079	0.00083	0.0024	0.0026	1.3	0.0023	0.0058	0.0041	390	8.2	0.0032	1.0	1.0	0.006	0.0057	1.9	2.0	<0.00001	<0.00001	13	13	0.34	0.34
2021	Q1	EV_MC2	345	<0.01	0.02	<0.00005	<0.000046	0.019	0.018	33	33	7.4	7.2	0.0029	0.0035	<0.000005	0.0000005	0.0013	0.0014	0.0015	0.0016	1.6	0.0025	0.014	0.0022	392	8.2	0.0036	1.1	1.1	0.014	0.014	2.3	2.5	0.000011	<0.00001	6.3	6.5	0.2	0.2
2021	Q1	EV_HC1	417	<0.01	0.055	<0.00005	0.000064	0.0067	0.0068	48	48	8.6	8.4	0.0036	0.005	<0.000005	0.00000054	0.00087	0.00092	0.00057	0.0007	0.94	0.0028	0.013	0.0064	384	8.3	0.0074	0.88	0.92	0.04	0.04	2.0	2.2	<0.00001	<0.00001	1.7	1.7	0.13	0.13
2021	Q1	LC_DCDS	379	<0.01	0.18	<0.00005	0.00018	0.018	0.019	34	37	8.2	7.8	0.044	0.048	<0.000005	0.0000023	0.0035	0.0036	0.0042	0.0055	31	0.081	0.016	0.015	330	8.1	0.024	2.3	2.5	0.045	0.046	2.6	3.0	<0.00001	0.000012	3.3	3.6	0.13	0.14
2021	Q1	LC_LC3	743	0.012	0.086	0.00005	0.00005	0.063	0.066	80	82	16	16	0.043	0.047	0.000005	0.0000005	0.0043	0.0045	0.0086	0.0089	13	0.005	0.0062	0.0014	375	8.1	0.0028	2.2	2.2	0.054	0.053	2.1	2.3	0.00001	0.00001	15	15	0.26	0.27
2021	Q1	LC_LC5	502	<0.01	0.024	<0.00005	0.000051	0.024	0.025	51	53	10	10	0.0004	0.002	<0.000005	0.00000053	0.0012	0.0013	0.00084	0.00098	13	0.0034	<0.005	0.0013	375	8.2	0.0021	1.2	1.3	0.058	0.057	2.2	2.4	<0.00001	<0.00001	4.0	4.1	0.2	0.21
2021	Q1	LC_LCDSSLCC	591	<0.01	0.021	<0.00005	<0.00005	0.047	0.049	62	63	12	12	0.0051	0.0077	<0.000005	<0.0000005	0.0026	0.0027	0.0042	0.0045	11	0.0059	0.0075	0.0014	378	8.2	<0.002	1.6	1.6	0.048	0.049	2.2	2.4	<0.00001	<0.00001	11	10	0.24	0.25
2021	Q1	FR_FR4	778	0.01	0.13	<0.00005	0.00012	0.069	0.072	86	91	16	16	0.017	0.025	<0.000005	0.000001	0.0032	0.0033	0.011	0.012	23	0.029	0.036	0.0012	396	8.3	0.006	2.8	2.8	0.12	0.11	2.1	2.4	<0.00001	<0.00001	3.4	3.4	0.22	0.21
2021	Q1	FR_MULTIPLATE	636	0.01	0.056	<0.00005	0.00016	0.075	0.076	63	65	13	13	0.0035	0.0042	<0.000005	0.00000095	0.002	0.002	0.01	0.011	28	0.025	0.079	0.0016	405	8.2	0.0042	2.5	2.4	0.083	0.079	2.0	2.2	<0.00001	0.00001	3.2	3.1	0.21	0.2
2021	Q1	FR_FRRD	880	<0.01	0.06	<0.00005	0.000068	0.056	0.059	92	97	18	18	0.0028	0.0056	<0.000005	0.0000007	0.0011	0.0011	0.0027	0.003	39	0.014	0.019	0.0022	394	8.2	0.0077	2.8	2.8	0.16	0.15	2.3	2.5	<0.00001	<0.00001	3.8	3.8	0.23	0.22
2021	Q3	FR_FRABCH	585	<0.01	0.067	<0.00005	0.00008	0.043	0.045	63	63	13	12	0.0051	0.0079	<0.000005	0.00000091	0.0012	0.0013	0.0018	0.0021	22	0.0072	0.027	0.0011	413	8.3	0.011	2.1	2.1	0.091	0.087	2.2	2.3	<0.00001	<0.00001	2.6	2.7	0.17	0.17
2021	Q3	FR_FRCP1	555	0.011	0.12	<0.00005	0.00013	0.047	0.047	63	64	12	11	0.0091	0.014	0.0000055	0.0000011	0.0025	0.0025	0.0074	0.008	14	0.01	0.018	0.0011	411	8.3	0.013	2.3	2.3	0.077	0.074	2.0	2.2	<0.00001	0.00001	2.0	2.0	0.16	0.17
2021	Q3	GH_FR1	432	0.011	0.16	0.00005	0.00016	0.025	0.024	46	46	9.2	8.8	0.0021	0.0093	0.000005	0.00000073	0.0012	0.0011	0.0011	0.0016	12	0.005	0.022	0.0011	392	8.3	0.0071	1.5	1.5	0.055	0.052	2.2	2.4	0.00001	0.000011	2.3	2.3	0.15	0.15
2021	Q3	GH_ERC	156	<0.01	0.046	<0.00005	0.000091	0.0023	0.0024	11	11	3.3	3.2	0.0012	0.0079	<0.000005	0.00000077	0.001	0.001	<0.0005	0.00052	0.21	0.001	0.0087	0.001	419	8.3	0.0084	0.41	0.4	0.0016	0.0016	1.8	1.9	<0.00001	<0.00001	0.77	0.76	0.2	0.2
2021	Q3	CM_MC2	567	<0.01	0.034	<0.00005	0.000055	0.028	0.028	61	62	13	12	0.0031	0.0064	<0.000005	0.00000072	0.0011	0.0011	0.02	0.021	2.1	0.013	0.02	0.001	390	8.3	0.0045	2.1	2.2	0.0092	0.0086	2.0	2.1	<0.00001	<0.00001	23	23	0.55	0.53
2021	Q3	RG_MIDAG	275	<0.01	0.015	<0.00005	<0.00005	0.011	0.011	25	26	6.2	5.9	0.0017	0.0027	<0.000005	0.00000063	0.00082	0.00082	0.004	0.0045	0.65	0.0016	0.011	0.0014	393	8.3	0.0038	0.91	0.91	0.0034	0.0035	1.6	1.7	<0.00001	<0.00001	7.7	7.9	0.26	0.26
2021	Q3	EV_MC2	267	<0.01	0.057	0.000051	0.000091	0.012	0.012	25	25	5.8	5.6	0.0018	0.0044	<0.000005	0.00000086	0.0016	0.0015	0.0017	0.002	0.79	0.0022	0.013	0.0016	430	8.3	0.0081	1.0	1.0	0.0073	0.0076	2.1	2.3	<0.00001	<0.00001	4.2	4.3	0.18	0.18
2021	Q3	EV_HC1	354	<0.01	0.2	<0.00005	0.00019	0.0069	0.0069	41	41	7.5	7.2	0.004	0.009	<0.000005	0.0000017	0.00091	0.00092	0.00056	0.00096	0.53	0.0015	0.018	0.0034	441	8.3	0.022	0.94	0.98	0.03	0.032	2.0	2.4	<0.00001	0.000012	1.5	1.5	0.12	0.12
2021	Q3	LC_DCDS	477	<0.01	0.013	<0.00005	<0.00005	0.032	0.033	44	48	11	9.9	0.0027	0.0036	<0.000005	0.00000098	0.007	0.0076	0.01	0.011	41	0.04	0.012	0.017	404	8.2	0.024	2.8	2.9	0.076	0.08	2.2	2.3	<0.00001	<0.00001	6.4	6.9	0.18	0.2
2021	Q3	LC_LC3	522	0.01	0.037	0.00005	0.00005	0.054	0.055	56	56	11	11	0.016	0.017	0.000005	0.00000054	0.0034	0.0034	0.0095	0.0097	9.5	0.0035	0.006	0.0014	415	8.2	0.0034	1.9	1.8	0.038	0.037	2.1	2.3	0.00001	0.00001	9.5	9.5	0.21	0.21
2021	Q3	LC_LC5	372	<0.01	0.033	<0.00005	0.000063	0.025	0.025	37	39	7.9	7.6	0.00054	0.0024	<0.000005	0.00000071	0.0013	0.0013	0.0012	0.0014	9.3	0.0032	0.012	<0.001	422	8.3	0.0059	1.3	1.3	0.038	0.039	2.2	2.4	<0.00001	<0.00001	3.3	3.3	0.16	0.16
2021	Q3	LC_LCDSSLCC	391	<0.01	0.014	<0.00005	<0.00005	0.036	0.037	39	40	8.4	8.1	0.003	0.0043	<0.000005	0.00000052	0.0021	0.0022	0.0048	0.0051	6.8	0.0011	0.0081	<0.001	387	8.3	0.0023	1.3	1.3	0.03	0.03	2.2	2.3	<0.00001	<0.00001	6.4	6.5	0.19	0.19
2021	Q3	FR_FR4	563	0.012	0.25	<0.00005	0.00027	0.047	0.049	65	66	12	11	0.012	0.019	<0.000005	0.00000081	0.0026	0.0027	0.0087	0.0098	14	0.015	0.017	<0.001	393	8.4	0.019	2.3	2.4	0.079	0.075	2.0	2.4	<0.00001	0.000014	2.0	2.0	0.16	0.17
2021	Q3	FR_FR2	432	0.013	0.13	<0.00005	0.00012	0.045	0.046	46	46	9.2	8.8	0.017	0.022	<0.000005	0.00000075	0.0015	0.0015	0.0053	0.0058	12	0.013	0.017	0.0014	393	8.3	0.011	2.1	2.1	0.039	0.037	2.0	2.2	<0.00001	0.00001	1.9	1.9	0.16	0.16
2021	Q3	FR_MULTIPLATE	374	<0.01	0.091	<0.00005	0.00012	0.035	0.036	37	37	8.1	7.6	0.0011	0.0036	<0.000005	0.00000065	0.0015	0.0013	0.0042	0.0046	13	0.013	0.0091	<0.001	402	8.3	0.0028	1.5	1.5	0.043	0.039	1.9	2.0	<0.00001	0.00001	1.4	1.4	0.14	0.14
2021	Q3	FR_FRRD	622	<0.01	0.013	0.000087	<0.00005	0.054	0.056	68	67	14	13	0.0012	0.0017	<0.000005	0.00000051	0.0011	0.0011	0.0011	0.0011	24	0.0052	0.0073	0.0023	419	8.3	0.0043	2.6	2.5	0.1	0.092	2.2	2.2	<0.00001	<0.00001	3.3	3.3	0.16	0.16
Tests categorized as possible or likely adverse respon																																								
2020	Q3	CM_MC2	626	<0.0100	0.019	<0.000050	<0.000050	0.039	0.039	66	69	14	14	0.0062	0.008	<0.0000050	<0.00000050	0.0014	0.0015	0.037	0.039	3.1	0.0079	0.017	0.0015	448	8.3	0.00062	2.4	2.4	0.01	0.0098	2.0	2.1	<0.0000100	<0.0000100	33	34	0.6	0.61
Tests categorized as possible or likely adverse respon																																								
2016	Q3	CM_MC2	489	<0.018	0.019	<0.00009	<0.00009	0.016	0.017	52	54	10	10	0.00069	0.002	<0.000005	<0.0000005	0.0012	0.0012	0.014	0.014	3.0	0.0064	<0.005	0.001	324	8.2	0.0056	1.8	1.8	0.0063	0.0065	1.9	2.1	<0.000018	<0.000018	11	11	0.35	0.35
2018	Q3	CM_MC2	628	<0.01	0.028	<0.00005	0.000052	0.03	0.031	66	66	14	14	0.011	0.021	<0.000005	<0.0000005	0.0027	0.0027	0.055	0.056	4.5	0.036	0.045	0.0016	309	8.2	0.0043	2.6	2.5	0.0087	0.0088	2.0	2.2	0.000011	<0.00001	20	20	0.61	0.63
2019	Q1	FR_FRABCH	663	<0.01	0.027	<0.00005	0.00003	0.033	0.033	70	66	14	13	0.0051	0.0061	<0.000005	0.00000035	0.00065	0.00065	0.00056	0.00065	21	0.0059	0.066	0.0019	438	8.1	0.0051	1.7	1.6	0.11	0.091	2.3	2.4	<0.00001	<0.00001	2.7	2.6	0.19	0.19
2019	Q3	FR_FRCP1	451	<0.01	0.016	<0.00005	<0.00005	0.028	0.028	47	47	9.1	9.1	0.003	0.0047	<0.000005	<0.0000005	0.0015	0.0016	0.0037	0.0038	9.1	0.014	0.041	0.0009	416	8.3	0.0023	1.8	1.7	0.059	0.051	1.9	2.0	<0.00001	<0.00001	1.5	1.4	0.14	0.15
2019	Q1	GH_ERC	180	<0.01	<0.01	<0.00005	<0.00005	0.003	0.0031	13	13	3.8	3.6	0.00017	0.0003	<0.000005	<0.0000005	0.001	0.001	<0.0005	<0.0005	0.55	0.00078	0.023	0.0011	418	8.1	0.00098	0.34	0.37	0.0024	0.0022	1.7	1.7	<0.00001	<0.00001	0.97	0.97	0.2	0.21
Tests categorized as possible or likely adverse respon																																								
2017	Q2	GH_FR1	344	0.011	0.41	<0.00005	0.00033	0.014	0.014	-	35	-	-	0.0015	0.016	<0.000005	0.0000063	0.0011	0.0011	0.0022	0.0034	6.5	0.0033	<0.005	0.0033	-	8.3	0.024	-	1.3	0.033	0.032	-	-	<0.00001	0.000015	-	1.8	0.12	0.12
2018	Q3	FR_FRCP1	614	<0.01	0.033	<0.00005	<0.00005	0.035	0.035	73	71	13	12	0.0053	0.0077	<0.000005	<0.0000005	0.0015	0.0015	0.0075	0.0077	12	0.0085	0.022	0.0013	394	8.3	0.0041	2.2	2.0	0.095	0.092	2.0	2.1	<0.00001	<0.00001	1.7	1.6	0.16	0.15
2018	Q4	FR_FRABCH	628	<0.01	0.015	<0.00005	<0.00005	0.034	0.034	66	67	13	13	0.0043	0.0049	<0.000005	<0.0000005	0.0007	0.0007	0.00051	0.00055	19	0.0053	0.018	0.0021	428	8.3	0.003	1.8	1.8	0.093	0.09	2.3	2.4	<0.00001	<0.00001	2.5	2.6	0.18	0.18
2019	Q1	FR_FRCP1	1795	<0.007	0.049	<0.000035	0.000067	0.061	0.063	251	231	35	36	0.0051	0.0071	<0.0000025	0.00000083	0.0025	0.0024	0.025	0.024	23	0.012	0.013	0.0021	435	8.1	0.0058	3.6	3.5	0.45	0.37	2.4	2.5	<0.000007	<0.000007	2.1	2.0	0.22	0.22
2019	Q3	CM_MC2	557	<0.01	0.016	<0.00005	0.000036	0.017	0.017	61	62	12	12	0.0019	0.006	<0.000005	<0.0000005	0.0011	0.0011	0.018	0.019	2.7	0.0051	0.0059	0.00062	353	8.4	0.0017	1.9	1.9	0.0096	0.0086	2.0	2.1	<0.00001	<0.00001	11	11	0.38	0.39
2020	Q1	LC_DCDS	390	0.0062	0.007	<0.000050	<0.000050	0.014	0.014	36	35	8.0	8.0	0.0011	0.0015	<0.0000050	0.00000074	0.0038	0.0039	0.0043	0.0044	26	0.016	0.021	0.034	370	8.2	0.035	2.3	2.3	0.046	0.045	2.6	2.7	<0.0000100	<0.0000100	2.2	2.1	0.13	0.13
2020	Q1	LC_LCDSSLCC	554	<0.01000	0.014	<0.000050	<0.000050	0.035	0.036	58	58	12	12	0.0038	0.0054	<0.0000050	<0.00000050	0.0033	0.0034	0.0032	0.0033	9.6	0.001	0.019	<0.0020	434	8.3	0.0011	1.4	1.3	0.043	0.041	2.2	2.3	<0.0000100	<0.0000100	9.1	8.9	0.23	0.24
Tests categorized as possible or likely adverse respon																																								
2018	Q4	FR_FRCP1	2494	<0.02	<0.012	<0.0001	<0.00006	0.076	0.079	361	372	49	50	0.00023	0.00027	<0.000005	<0.0000005	0.0027	0.0027	0.041	0.042	29	0.0056	0.043	0.0012	355	7.9	0.0023	4.8	5.0	0.59	0.62	2.6	2.8	<0.00002	<0.000012	2.0	2.2	0.23	0.25
Tests categorized as possible or likely adverse respon																																								

Year	Quarter	Sample ID	Hardness Total or Dissolved CaCO3-N-mg/l	IRON-D-mg/l	IRON-T-mg/l	LEAD-D-mg/l	LEAD-T-mg/l	LITHIUM-D-mg/l	LITHIUM-T-mg/l	MAGNESIUM-D-mg/l	MAGNESIUM-T-mg/l	MAJOR ANION SUM-N-meq/l	MAJOR CATION SUM-N-meq/l	MANGANESE-D-mg/l	MANGANESE-T-mg/l	MERCURY-D-mg/l	MERCURY-T-mg/l	MOLYBDENUM-D-mg/l	MOLYBDENUM-T-mg/l	NICKEL-D-mg/l	NICKEL-T-mg/l	NITRATE NITROGEN (NO3) AS N-N-mg/l	NITRITE NITROGEN (NO2) AS N-N-mg/l	NITROGEN AMMONIA (AS N)-N-mg/l	ORTHO-PHOSPHATE-N-mg/l	OXIDATION-REDUCTION POTENTIAL LAB-N-mv	pH LAB-N-ph units	PHOSPHORUS-N-mg/l	POTASSIUM-D-mg/l	POTASSIUM-T-mg/l	SELENIUM-D-mg/l	SELENIUM-T-mg/l	SILICON-D-mg/l	SILICON-T-mg/l	SILVER-D-mg/l	SILVER-T-mg/l	SODIUM-D-mg/l	SODIUM-T-mg/l	STRONTIUM-D-mg/l	STRONTIUM-T-mg/l
2021	Q1	FR_FRCP1	783	0.01	0.087	<0.00005	0.000098	0.073	0.071	86	92	16	16	0.016	0.021	<0.000005	0.00000095	0.0034	0.0036	0.012	0.013	25	0.034	0.038	0.0013	392	8.3	0.0048	2.8	2.9	0.13	0.12	2.1	2.3	<0.00001	0.00001	3.3	3.4	0.21	0.22

Year	Quarter	Sample ID	SULFATE (AS SO4)-D-mg/l	THALLIUM-D-mg/l	THALLIUM-T-mg/l	TIN-D-mg/l	TIN-T-mg/l	TITANIUM-D-mg/l	TITANIUM-T-mg/l	TOTAL DISSOLVED SOLIDS (RESIDUE FILTERABLE)-N-mg/l	TOTAL KJELDAHL NITROGEN-N-mg/l	TOTAL ORGANIC CARBON-T-mg/l	TOTAL SUSPENDED SOLIDS LAB-N-mg/l	TURBIDITY LAB-N-ntu	URANIUM-D-mg/l	URANIUM-T-mg/l	VANADIUM-D-mg/l	VANADIUM-T-mg/l	ZINC-D-mg/l	ZINC-T-mg/l	∑TU-WQGs	∑TU-WQGs/Benchmarks	PC1_allyrs	PC2_allyrs	PC3_allyrs	PC4_allyrs	PC1_2021	PC2_2021	PC3_2021	PC1_allyrs_UFR	PC2_allyrs_Ufr	PC3_allyrs_UFR	PC1_2021_UFR	PC2_2021_UFR	PC3_2021_UFR
Reference (2015 - 2021)																																			
2016	Q1	Reference (FR_UFR1)	48	<0.00001	<0.00001	<0.0001	<0.0001	0.01	0.01	231	0.058	0.64	<1	0.48	0.00045	0.0005	<0.0005	0.00051	<0.003	<0.003	4.5	4.5													
2016	Q2	Reference (FR_UFR1)	15	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	147	0.081	2.0	1.7	0.89	0.00033	0.00034	<0.0005	0.0005	<0.003	<0.003	3.3	3.4	-6.60	-5.69	-0.86	2.05				-5.03	-5.60	0.39			
2016	Q3	Reference (FR_UFR1)	39	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	221	0.068	0.92	1.6	0.29	0.00044	0.00044	<0.0005	<0.0005	<0.003	<0.003	2.6	2.6	-5.23	-4.18	-3.14	0.19				-3.83	-3.95	-2.45			
2016	Q4	Reference (FR_UFR1)	38	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	198	0.063	1.3	<1	0.65	0.00043	0.00044	<0.0005	0.0005	<0.003	<0.0036	2.8	2.8													
2017	Q1	Reference (FR_UFR1)	46	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	196	0.069	0.71	<1	0.33	0.00045	0.00049	<0.0005	<0.0005	<0.001	0.0035	1.2	1.2	-6.70	-4.89	1.12	-4.18				-5.16	-4.67	0.31			
2017	Q2	Reference (FR_UFR1)	16	<0.00001	0.000011	0.0001	<0.0001	<0.01	<0.01	143	0.12	3.1	6.5	4.2	0.0003	0.00033	0.00051	0.00079	0.0011	<0.003	2.4	2.4	-7.86	-5.55	5.22	0.71				-6.07	-5.42	5.69			
2017	Q2	Reference (GH_ER2)	18	<0.00001	0.000016	<0.0001	<0.0001	<0.01	<0.01	180	0.13	2.5	24	11	0.00078	0.00082	<0.0005	0.0014	<0.003	0.0046	2.6	2.6	-6.63	-3.34	6.37	0.27				-5.11	-3.02	6.30			
2017	Q3	Reference (FR_UFR1)	37	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	204	0.06	1.4	1.1	0.28	0.00044	0.00042	<0.0005	<0.0005	<0.0026	<0.003	1.2	1.2	-6.95	-5.08	1.64	-3.78				-5.39	-4.81	1.09			
2017	Q3	Reference (GH_ER2)	16	<0.00001	<0.00001	0.0001	<0.0001	<0.01	<0.01	164	0.063	0.86	1.2	0.6	0.00064	0.00065	<0.0005	<0.0005	<0.0026	<0.003	1.2	1.2	-6.60	-4.89	1.91	-3.71				-5.06	-4.71	0.89			
2017	Q3	Reference (CM_MC1)	13	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	163	0.061	1.1	1.0	0.38	0.00022	0.00022	<0.0005	<0.0005	<0.0026	<0.003	1.2	1.2	-7.09	-5.36	2.36	-2.87				-5.46	-4.98	1.49			
2017	Q4	Reference (FR_UFR1)	46	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	235	0.075	0.8	1.0	0.37	0.00052	0.00049	<0.0005	<0.0005	<0.003	<0.003	1.2	1.2	-6.70	-5.16	1.05	-4.66				-5.18	-4.85	0.24			
2017	Q4	Reference (GH_ER2)	19	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	192	0.16	0.66	1.5	0.73	0.00077	0.00075	<0.0005	<0.0005	<0.003	<0.003	1.3	1.3	-6.43	-4.87	1.49	-4.53				-4.98	-4.63	0.31			
2017	Q4	Reference (CM_MC1)	28	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	171	0.11	1.2	1.3	0.48	0.00022	0.00023	<0.0005	<0.0005	<0.003	<0.003	1.2	1.2	-6.61	-5.08	1.68	-3.82				-5.02	-4.65	0.57			
2018	Q1	Reference (FR_UFR1)	48	<0.000012	<0.00001	<0.00012	<0.0001	<0.01	<0.01	212	0.086	0.87	<1	0.28	0.00052	0.00049	<0.0006	0.00053	<0.003	<0.003	1.3	1.3	-5.04	-3.94	-2.89	0.25				-3.69	-3.65	-2.36			
2018	Q1	Reference (GH_ER2)	23	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	191	<0.05	0.51	1.0	0.15	0.0007	0.00077	<0.0005	<0.0005	<0.003	<0.003	1.3	1.3	-4.99	-3.90	-3.06	-0.44				-3.76	-3.68	-2.85			
2018	Q1	Reference (CM_MC1)	18	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	190	0.18	0.93	<1	0.15	0.00025	0.00025	<0.0005	<0.0005	<0.003	<0.003	1.1	1.1	-5.05	-3.96	-3.41	-0.06				-3.69	-3.36	-3.57			
2018	Q2	Reference (FR_UFR1)	9.9	<0.00001	0.000012	<0.0001	<0.0001	<0.01	<0.01	123	0.11	2.7	9.6	3.9	0.0003	0.00031	<0.0005	0.0009	<0.001	0.0031	2.1	2.1													
2018	Q2	Reference (GH_ER2)	13	<0.00001	0.000036	<0.0001	<0.0001	<0.01	<0.01	161	0.3	3.7	72	48	0.00066	0.00079	<0.0005	0.0036	<0.001	0.0093	5.7	5.7													
2018	Q2	Reference (CM_MC1)	5.1	<0.000012	0.000024	<0.00012	<0.0001	<0.01	<0.01	104	0.1	3.5	12	5.9	0.00013	0.00013	<0.0006	0.00088	<0.0012	0.0032	3.1	3.2	-7.23	-5.82	2.13	6.26				-5.48	-5.58	3.75			
2018	Q3	Reference (FR_UFR1)	37	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	222	0.096	1.2	<1	0.64	0.00048	0.00046	<0.0005	<0.0005	<0.001	<0.003	1.2	1.2	-5.14	-3.81	-2.97	0.30				-3.70	-3.45	-2.44			
2018	Q3	Reference (GH_ER2)	17	<0.00001	0.000014	<0.0001	<0.0001	<0.01	<0.01	170	0.069	0.94	3.6	0.71	0.00067	0.0007	<0.0005	0.0011	<0.001	0.0039	2.3	2.3	-5.29	-3.63	0.33	2.71				-3.87	-3.34	1.21			
2018	Q3	Reference (CM_MC1)	13	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	175	0.054	1.1	1.2	0.51	0.00024	0.00024	<0.0005	<0.0005	0.001	0.0033	1.2	1.2	-5.24	-4.06	-2.56	1.17				-3.84	-3.59	-2.49			
2018	Q4	Reference (FR_UFR1)	44	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	212	0.11	0.71	<1	0.24	0.0005	0.0005	<0.0005	<0.0005	<0.001	<0.003	1.3	1.3	-5.26	-4.08	-3.30	-0.56				-3.84	-3.76	-2.91			
2018	Q4	Reference (GH_ER2)	22	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	172	0.062	<0.5	1.2	0.44	0.00075	0.00077	<0.0005	<0.0005	<0.001	<0.003	1.3	1.3	-5.00	-4.12	-3.15	-0.81				-3.68	-3.94	-3.28			
2018	Q4	Reference (CM_MC1)	14	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	158	0.17	1.5	<1	0.3	0.00023	0.00023	<0.0005	<0.0005	0.001	<0.003	1.2	1.2	-5.53	-4.27	-2.66	0.90				-4.06	-3.75	-2.56			
2019	Q1	Reference (FR_UFR1)	44	<0.00001	0.000008	<0.0001	<0.0001	<0.01	0.0074	211	0.12	1.6	2.3	2.6	0.00047	0.00045	0.00031	0.0008	0.00072	0.0045	2.6	2.7	-5.42	-3.50	-0.42	2.71				-4.02	-3.36	0.55			
2019	Q1	Reference (GH_ER2)	24	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	185	0.12	0.51	1.6	0.81	0.00081	0.00078	<0.0005	<0.0005	<0.001	<0.003	2.4	2.4	-5.21	-3.81	-2.53	-0.65				-3.94	-3.63	-2.56			
2019	Q1	Reference (CM_MC1)	17	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	182	0.03	0.38	1.4	0.56	0.00024	0.00024	<0.0005	<0.0005	<0.001	<0.003	2.7	2.7	-4.95	-4.22	-3.78	-0.57				-3.59	-3.62	-4.12			
2019	Q1	Reference (LC_SLC)	79	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	260	0.073	0.63	<1	0.53	0.0017	0.0018	<0.0005	<0.0005	0.0015	<0.003	2.7	2.7	-3.66	-2.15	-4.26	-1.31				-2.54	-1.75	-4.37			
2019	Q3	Reference (FR_UFR1)	32	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	232	0.12	0.92	0.9	0.31	0.00049	0.00047	<0.0005	<0.0005	0.00086	0.0018	1.9	1.9													
2019	Q3	Reference (GH_ER2)	18	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	165	0.066	0.63	2.8	0.87	0.00069	0.00068	<0.0005	<0.0005	<0.001	<0.003	2.4	2.4	-5.42	-4.11	-2.06	0.21				-4.08	-3.78	-1.95			
2019	Q3	Reference (CM_MC1)	14	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	160	0.062	0.87	0.78	0.24	0.00024	0.00024	<0.0005	<0.0005	<0.001	<0.003	1.9	1.9	-5.21	-4.25	-3.13	0.57				-3.85	-3.76	-3.02			
2019	Q3	Reference (LC_SLC)	47	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	214	0.051	0.6	<1	0.2	0.0016	0.0015	<0.0005	<0.0005	0.0019	0.0024	2.6	2.6	-4.54	-3.51	-3.87	-1.46				-3.38	-3.30	-3.54			
2020	Q1	Reference (FR_UFR1)	50	<0.0000100	<0.0000100	<0.000100	<0.000100	<0.0100	<0.0100	222	0.11	0.53	<1.00	0.14	0.0005	0.0005	<0.00050	<0.00050	0.00094	<0.0030	1.3	1.3	8.44	-11.25	0.79	0.90				11.97	-10.06	0.37			
2020	Q1	Reference (GH_ER2)	25	<0.0000100	<0.0000100	0.000094	<0.000100	<0.0100	<0.0100	190	0.077	0.53	0.96	0.24	0.00082	0.0008	<0.00050	<0.00050	0.00082	<0.0030	1.4	1.4	7.58	-11.18	0.70	0.53				10.93	-10.00	0.00			
2020	Q1	Reference (CM_MC1)	15	<0.0000100	<0.0000100	<0.000100	<0.000100	<0.0100	<0.0100	180	0.045	1.0	<1.00	0.12	0.00025	0.00025	<0.00050	<0.00050	0.0014	<0.0030	1.0	1.0	6.77	-10.83	2.01	2.65				10.13	-9.52	1.70			
2020	Q1	Reference (LC_SLC)	74	<0.0000100	<0.0000100	<0.000100	<0.000100	<0.0100	<0.0100	254	0.031	0.49	1.1	0.09	0.0017	0.0017	<0.00050	<0.00050	0.0016	<0.0030	1.6	1.6	9.50	-9.74	0.73	0.66				12.70	-8.51	0.31			
2020	Q3	Reference (FR_UFR1)	39	<0.0000100	0.0000066	<0.000100	<0.000100	<0.0100	<0.0100	214	0.11	0.47	7.4	0.95	0.00047	0.00047	<0.00050	0.00045	<0.00100	0.002	1.4	1.4	4.94	-9.40	1.86	1.88				7.80	-7.82	2.44			
2020	Q3	Reference (GH_ER2)	16	<0.0000100	<0.0000100	<0.000100	<0.000100	<0.0100	<0.0100	168	0.15	<0.50	2.4	0.77	0.00065	0.0007	<0.00050	0.00046	0.0006	<0.0030	2.5	2.5	5.57	-10.46	2.70	2.45				8.74	-9.19	2.50			
2020	Q3	Reference (CM_MC1)	15	<0.0000100	0.0000064	<0.000100	<0.000100	<0.0100	<0.0100	170	0.054	0.56	<1.00	0.19	0.00022	0.00024	<0.00050	0.00033	<0.00100	<0.0030	1.2	1.2													
2020	Q3	Reference (LC_SLC)	49	<0.0000100	<0.0000100	<0.000100	<0.000100	<0.0100	<0.0100	215	<0.050	<0.50	<1.00	0.12	0.0014	0.0014	<0.00050	<0.00050	0.0023	0.0021	1.5	1.5	8.63	-10.08	2.48	1.41				11.77	-8.71	2.67			
2021	Q1	Reference (FR_UFR1)	37	<0.00001	0.000012	<0.0001	<0.0001	0.00055	0.0066	167	0.07	2.9	1.9	3.3	0.00038	0.0004	<0.0005	0.0014	<0.001	0.0031	3.3	3.2	-6.16	-3.97	0.52	4.34	-9.90	8.08	-1.51	-4.74	-3.84	1.97	-9.39	6.72	-5.45
2021	Q1	Reference (GH_ER2)	26	<0.000012	<0.00001	<0.0001	<0.0001	<0.0003	<0.00102	177	0.08	1.1	1.6	0.3	0.00077	0.0008	<0.0005	0.00062	0.0015	0.0039	3.4	3.3													
2021	Q1	Reference (CM_MC1)	18	<0.00001	<0.00001	<0.0001	<0.0001	<0.0003	<0.0003	165	0.057	1.1	<1	<0.1	0.00025	0.00026	<0.0005	<0.0005	0.0047	0.0032	2.0	1.9													
2021	Q1	Reference (LC_SLC)	75	<0.00001	<0.00001	<0.0001	<0.0001	<0.00806	<0.00806	252	0.34	0.53	<1	<0.1	0.0017	0.0017	<0.0005	<0.0005	0.0018	<0.003	4.6	4.5	-3.70	-2.12	-4.21	-1.61	-6.81	-3.62	-1.48	-2.66	-1.68	-4.07	-6.73	-3.81	-2.76
2021	Q3	Reference (FR_UFR1)	38	<0.00001	<0.00001	<0.0001	<0.0001	<0.0003	0.000088	200	0.081	2.3	4.1	2.1	0.00044	0.00045	<0.0005	0.00027	0.00004	<0.003	2.4	2.3	-6.87	-2.85	-1.63	2.34	-10.60	-1.09	2.09	-5.44	-2.54	-0.66	-10.41	-0.96	5.35
2021	Q3	Reference (GH_ER2)	16	<0.00001	<0.00001	<0.0001	<0.0001	<0.0003	0.00077	156	0.065	2.5	3.6	2.1	0.00064	0.00064	<0.0005	0.00055	0.0014	<0.003	2.7	2.7	-6.47	-3.37	0.02	2.67	-10.14	1.89	-0.12	-5.10	-3.16	0.72	-9.16	3.11	0.60
2021	Q3	Reference (CM_MC1)	14	<0.00001	<0.00001	<0.0001	<0.0001	<0.0003	<0.00036	170	0.056	1.6	4.2	0.6	0.00023	0.00022	<0.0005	<0.0005	0.0011	<0.003	2.0	1.9	-5.90	-3.54	-2.11	1.80	-9.55	0.01	-3.78	-4.54	-3.02	-1.89	-8.56	-0.33	-1.90
2021	Q3	Reference (LC_SLC)	41	<0.00001	<0.00001	<0.0001	<0.0001	<0.0003	0.00041	195	0.093	2.1	1.1	0.6	0.0015	0.0015	<0.0005	<0.0005	0.0029	0.003	3.9	3.8	-5.62	-2.64	-2.25	1.01	-9.09	-0.87	1.01	-4.46	-2.37	-1.38	-8.80	0.10	1.02
Tests categorized as no adverse response (2015 - 2021																																			
2016	Q1	FR_FRCP1	533	0.000012	0.000014	<0.0001	<0.0001	0.014	0.015	1159	0.13	0.9	1.0	0.33	0.006	0.0061	<0.0005	<0.0005	<0.003	<0.003	17	9.8													
2016	Q1	GH_FR1	250	<0.00001	<0.00001	<0.0001	<0.0001	0.012	0.012	625	0.098	0.89	<1	0.53	0.0023	0.0023	<0.0005	<0.0005	<0.003	<0.003	9.2	5.7													
2016	Q1	CM_MC2	292	0.000011	0.000015	<0.0001	<0.0001	0.011	0.011	650	0.12	0.8	1.1	0.65	0.0026	0.0026	<0.0005	<0.0005	<0.003	<0.003	8.5	7.8													
2016	Q2	FR_FRCP1	119	<0.00001	0.000011	<0.0001	<0.0001	0.011	0.011	377	0.15	1.9	6.3	1.0	0.0017	0.0018	<0.0005	0.00052	<0.003	0.0031	6.0	4.2	-2.46	1.11	0.80	1.59				-1.70	1.33	1.68			
2016	Q2	GH_FR1	130	<0.00001	0.00001	<0.0001	<0.0001	0.01	0.011	401	0.18	1.8	15	2.6	0.0017	0.0017	<0.0005	0.00052	<0.003	0.003	5.8	4.0	-2.39	1.45	0.73	1.98				-1.61	1.77	1.42			
2016	Q2	CM_MC2	132	0.000012	0.000021	<0.0001	<0.0001	0.011	0.015	365	0.19	1.8	12	5.9	0.0014	0.0014	<0.0005	0.00082	0.0054	0.0099	8.5	8.1	-1.44	0.96	2.85	4.31									
2016	Q3	FR_FRCP1	284	<0.00001	0.00001	<0.0001	<0.0001	<0.01	<0.01	700	0.14	1.1	2.1	1.8	0.0033	0.0034	<0.0005	<0.0005	<0.003	<0.003	8.7	5.2	-0.10	3.59	-0.65	-0.15				0.33	4.01	-0.59			
2016	Q3	GH_FR1	190	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	522	0.13	1.1	<1	0.36	0.0021	0.0021	<0.0005	0.00051	<0.003	<0.003	6.7	4.0	-1.06	1.92	-2.16	-0.79				-0.46	2.35	-2.13			
2016	Q4	FR_FRCP1	256	0.000011	<0.00001	<0.0001	<0.0001	<0.01	<0.01	636	0.095	1.3	1.3	1.1	0.0031	0.0032	<0.0005	<0.0005	<0.003	<0.0042	8.4	5.0	-0.33	3.27	-0.42	-0.07				0.14	3.65	-0.18			
2016	Q4	GH_FR1	214	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	562	0.2	1.6	2.0	0.71	0.0023	0.0023	<0.0005	<0.0005	<0.003	<0.003	6.7	4.2	-0.94	2.29	-1.37	-0.31				-0.39	2.67	-1.39			
2016	Q4	CM_MC2	187	0.000019	0.000022	<0.00018	<0.00018	<0.01	<0.01	462	0.14	1.9	4.6	2.9	0.0017	0.0018	<0.0009	<0.0009	0.0035	0.0062	7.0	6.4	-0.37	1.36	1.43	2.49									
2017	Q1	FR_FRCP1	620	0.000014	0.000015	<0.0001	<0.0001	<0.01	<0.01	1231	0.29	1.3	1.3	1.1	0.0067	0.0069	<0.0005	0.00052	0.002	0.0031	13	7.1	-0.94	4.06	5.33	-5.42				-0.49	4.30	3.71			
2017	Q1	GH_FR1	238	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	623	0.095	1.1	1.1	0.77	0.0024	0.0024	<0.0005	<0.0005	<0.003	<0.003	6.3	2.9	-2.80	0.86	3.16	-5.90				-1.97	1.22	1.46			
2017	Q1	CM_MC2	320	0.000016	0.00002	<0.0001	<0.0001	<0.01	<0.01	668	0.14	1.1	1.9	1.2	0.0034	0.0033	<0.0005	<0.0005	0.0041	0.0048	12	10	-0.96	1.61	5.73	-4.33									
2017	Q2	FR_FRCP1	172	0.00001	0.000018	<0.0001	<0.0001	<0.01	<0.01	462	0.6	2.7	17	10	0.002	0.0021	<0.0005	0.0016	0.0024	0.0066	7.5	4.9	-3.47	1.43	8.10	-0.45				-2.53	1.74	8.02			
2017	Q2	CM_MC2	188	0.000013	0.000031	<0.0001	0.00012	<0.01	<0.01	448	0.22	2.5	19	12	0.0018	0.0018	<0.0005	0.001	0.0063	0.011	9.0	8.5	-2.60	0.94	8.74	-0.14									
2017	Q3	FR_FRCP1	359	0.000013	0.000011	<0.00012	<0.0001	<0.01	<0.01	817	0.48	1.6	1.4	0.55	0.0041	0.004	<0.0006	<0.0005	<0.0026	<0.003	7.7	4.6	-1.98	2.18	4.68	-5.21				-1.38	2.37	3.37			
2017	Q3	GH_FR1	208	<0.00001	<0.00001	0.0001	<0.0001	<0.01	<0.01	571	0.36	1.2	1.5	0.38	0.0023	0.0023	<0.0005	<0.0005	<0.0026	<0.003	5.9	3.2	-3.07	0.67	3.25	-5.76				-2.24	0.99	1.81			
2017	Q3	CM_MC2	319	0.00002	0.000021	<0.0001	<0.0001	<0.01	<0.01	653	0.26	1.2	3.2	1.2	0.003	0.003	<0.0005	<0.0005	<0.0026	0.0037	10	9.2	-1.89	1.02	5.66	-4.26									
2017	Q4	FR_FRCP1	515	0.000011	0.000012	<0.0001	<0.0001	<0.01	<0.01	1058	0.38	0.98	1.3	0.63	0.0058	0.0057	<0.0005	0.00052	<0.003	0.0032	9.8	5.6	-1.40	2.87	4.71	-5.68				-0.87	3.11	3.11			
2017	Q4	GH_FR1	267	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	672	0.36	1.3	8.3	9.3	0.0029	0.0029	<0.0005	<0.0005	<0.003	<0.003	6.1	3.3	-3.10	1.35	4.32	-4.98				-2.30	1.68	2.75			
2017	Q4	CM_MC2	334	0.000014	0.000015	<0.0001	<0.0001	<0.01	<0.01	748	0.38	0.99	2.8	1.3	0.003	0.0032	<0.0005	<0.0005	<0.003	<0.003	7.3	6.2	-1.54	1.45	4.58	-5.59									
2018	Q1	FR_FRCP1	583	0.000015	0.000015	<0.00012	<0.00014	<0.01	<0.01	1211	0.24	1.2	1.1	0.7	0.0067	0.0066	<0.0006	<0.0007	<0.003	0.0048	12	6.5	1.78	6.11	-0.68	-0.39				1.71	6.62	-0.88			
2018	Q1	GH_FR1	278	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	666	0.23	0.99	1.9	0.42	0.0022	0.0025	<0.0005	<0.0005	<0.003	<0.003	6.4	4.1	-0.64	2.94	-1.95	-0.64				-0.13	3.50	-2.02			
2018	Q1	CM_MC2	370	0.000014	0.000012	<0.0001	<0.0001	<0.01	<0.01	799	0.29	0.94	1.1	0.62	0.0039	0.0038	<0.0005	<0.0005	<0.003	0.003	7.2	6.3	1.10	4.14	-1.40	-0.48									
2018	Q2	FR_FRCP1	104	<0.00001	0.000021	<0.0001	<0.0001	<0.01	<0.01	344	0.49	2.8	36	12	0.0018	0.0018	<0.0005	0.0018	0.0018	0.0079	6.8	5.0	-2.58	2.04	3.93	5.21				-1.77	2.35	5.70			
2018	Q2	GH_FR1	110	<0.00001	0.000016	<0.0001	<0.0001	<0.01	0.0086	347	0.43	3.4	28	28	0.0016	0.0016	<0.0005	0.0013	0.0013	0.0057	5.7	5.1	-2.78	1.83	3.31	5.27				-1.91	2.24	4.92			
2018	Q2	CM_MC2	118	0.000013	0.00004	<0.00012	<0.0001	<0.01	0.015	302	0.19	2.9	29	27	0.0012	0.0012	<0.0006	0.0024	0.0047	0.015	9.1	9.0	-1.71	1.29	4.62	6.94									
2018	Q3	GH_FR1	216	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	572	0.52	1.1	2.5	0.37	0.0025	0.0025	<0.0005	<0.0005	0.0011	<0.003	5.8	3.9	-0.73	2.94	-1.45	-0.05				-0.18	3.43	-1.38			
2018	Q4	GH_FR1	256	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	637	0.18	0.65	2.1	0.63	0.0026	0.0028	<0.0005	<0.0005	<0.001	<0.003	5.7	3.6	-0.45	3.03	-2.40	-0.73				0.03	3.52	-2.63			
2018	Q4	CM_MC2	356	0.000019	0.00002	<0.0001	<0.0001	<0.01	<0.01	739	0.22	1.1	1.3	0.59	0.0039	0.0039	<0.0005	<0.0005	0.0023	0.0038	12	11	2.13	4.22	-0.86	-0.31									
2019	Q1	GH_FR1	286	<0.00001	0.0000064	<0.0001	<0.0001	<0.01	<0.01	699	0.2	1.2	2.2	1.5	0.0029	0.0029	<0.0005	<0.0005	<0.0006	<0.003	6.8	3.8	-0.58	3.70	-1.49	0.08				-0.14	4.28	-1.63			
2019	Q1	CM_MC2	404	0.000012	0.000013	<0.0001	<0.0001	<0.01	<0.01	828	0.29	0.59	1.1	0.75	0.0037	0.0038	<0.0005	<0.0005	0.0018	0.0018	8.2	7.1	1.68	4.39	-1.62	-1.12									
2019	Q1	EV_MC2	151	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	428	0.25	1.1	1.2	1.0	0.0017	0.0017	<0.0005	<0.0005	<0.001	<0.003	3.2	2.8	-1.52	1.97	-1.45	0.27									

Year	Quarter	Sample ID	SULFATE (AS SO4)-D-mg/l	THALLIUM-D-mg/l	THALLIUM-T-mg/l	TIN-D-mg/l	TIN-T-mg/l	TITANIUM-D-mg/l	TITANIUM-T-mg/l	TOTAL DISSOLVED SOLIDS (RESIDUE FILTERABLE)-N-mg/l	TOTAL KJELDAHL NITROGEN-N-mg/l	TOTAL ORGANIC CARBON-T-mg/l	TOTAL SUSPENDED SOLIDS LAB-N-mg/l	TURBIDITY LAB-N-ntu	URANIUM-D-mg/l	URANIUM-T-mg/l	VANADIUM-D-mg/l	VANADIUM-T-mg/l	ZINC-D-mg/l	ZINC-T-mg/l	∑TU-WQGs	∑TU-WQGs/Benchmarks	PC1_allyrs	PC2_allyrs	PC3_allyrs	PC4_allyrs	PC1_2021	PC2_2021	PC3_2021	PC1_allyrs_UFR	PC2_allyrs_Ufr	PC3_allyrs_UFR	PC1_2021_UFR	PC2_2021_UFR	PC3_2021_UFR
2019	Q1	EV_HC1	200	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	493	0.22	0.82	1.4	0.91	0.0024	0.0025	<0.0005	<0.0005	<0.001	0.0079	3.0	2.8	-1.95	1.67	-1.95	-0.06									
2019	Q1	LC_DCDS	80	0.0000098	0.000012	<0.0001	<0.0001	<0.01	<0.01	368	0.34	1.8	1.4	2.3	0.0016	0.0016	0.0011	0.0013	0.0028	0.0031	7.9	6.4	-0.71	3.03	0.54	2.08									
2019	Q1	LC_LC3	443	<0.00001	0.00001	<0.0001	<0.0001	<0.01	0.0076	925	0.29	1.5	4.3	11	0.0049	0.0051	<0.0005	0.00053	0.0042	0.0062	9.3	6.3	1.99	6.86	1.04	1.38									
2019	Q1	LC_LC5	215	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	567	0.3	0.63	2.2	1.4	0.0024	0.0023	<0.0005	<0.0005	<0.001	0.0018	6.0	3.5	-0.75	3.44	-2.56	-1.06				-0.31	4.02	-3.17			
2019	Q1	LC_LCDSSLCC	314	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	706	0.21	0.55	2.1	0.71	0.0037	0.0038	<0.0005	<0.0005	0.003	0.0028	7.1	4.7	1.09	4.64	-2.14	-1.47									
2019	Q3	FR_FRABCH	239	<0.00001	<0.00001	<0.0001	0.00016	<0.01	<0.01	682	0.12	0.58	3.9	0.95	0.0031	0.0031	<0.0005	<0.0005	0.00092	0.0021	9.0	4.7													
2019	Q3	GH_FR1	186	<0.00001	<0.00001	<0.0001	0.000064	<0.01	<0.01	520	0.18	1.1	2.4	0.7	0.0023	0.0023	<0.0005	<0.0005	0.00084	<0.003	5.8	3.5	-1.50	2.53	-2.13	-0.14				-0.92	2.95	-2.02			
2019	Q3	GH_ERC	25	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	183	0.12	1.3	0.84	0.76	0.00075	0.00075	<0.0005	<0.0005	<0.001	<0.003	2.9	2.9	-4.89	-3.33	-2.72	-0.69									
2019	Q3	EV_MC2	104	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	337	0.59	0.97	2.2	0.72	0.0012	0.0011	<0.0005	<0.0005	0.0011	<0.003	2.8	2.7	-2.52	0.99	-1.54	0.54									
2019	Q3	EV_HC1	179	<0.00001	<0.00001	<0.0001	0.000062	<0.01	<0.01	460	0.33	0.96	0.84	0.92	0.0023	0.0022	<0.0005	<0.0005	<0.001	<0.003	2.6	2.5	-2.36	1.28	-1.74	0.49									
2019	Q3	LC_DCDS	101	0.000015	0.000015	<0.0001	<0.0001	<0.01	<0.01	397	0.55	3.2	1.5	0.97	0.0014	0.0014	0.0011	0.0014	0.0022	0.0019	10	7.9	-1.26	3.12	1.21	1.34									
2019	Q3	LC_LC3	283	0.000012	0.000012	<0.0001	0.00008	<0.01	<0.01	726	0.085	0.54	0.98	0.4	0.004	0.004	<0.0005	<0.0005	0.012	0.014	9.3	7.1	1.71	5.01	-1.61	-1.03									
2019	Q3	LC_LC5	152	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	465	0.12	0.77	1.2	0.36	0.002	0.002	<0.0005	<0.0005	0.00072	<0.003	5.3	3.5	-1.28	2.48	-2.97	-1.15				-0.80	3.00	-3.23			
2019	Q3	LC_LCDSSLCC	185	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	519	0.094	0.66	0.7	0.21	0.0029	0.0028	<0.0005	<0.0005	0.0055	0.0069	6.2	4.7													
2020	Q1	FR_FRABCH	330	<0.0000100	<0.0000100	<0.000100	<0.000100	<0.0100	<0.0100	870	0.067	0.78	8.5	3.6	0.0032	0.0033	<0.00050	<0.00050	0.0027	0.0032	9.8	3.9	7.09	-0.12	-0.47	0.36				8.28	1.24	-0.86			
2020	Q1	FR_FRCP1	550	0.000014	0.000016	<0.000100	0.000064	<0.0100	<0.0100	1206	0.067	1.6	2.1	0.99	0.0061	0.0063	<0.00050	0.0004	0.0078	0.012	14	8.3	6.72	3.71	0.87	0.98				7.38	4.74	0.82			
2020	Q1	GH_FR1	261	<0.0000100	<0.0000100	<0.000100	<0.000100	<0.0100	<0.0100	704	0.13	0.62	0.9	0.23	0.0027	0.0027	<0.00050	<0.00050	0.0013	0.0023	6.8	3.6	9.18	-3.46	-1.78	-1.10				11.06	-2.30	-2.41			
2020	Q1	GH_ERC	43	<0.0000100	<0.0000100	<0.000100	<0.000100	<0.0100	<0.0100	230	0.17	0.31	0.74	<0.100	0.00086	0.0009	<0.00050	<0.00050	<0.00100	<0.0030	1.7	1.7	9.15	-10.31	1.14	1.23									
2020	Q1	CM_MC2	387	0.000014	0.000014	<0.000100	<0.000100	<0.0100	<0.0100	819	0.36	0.67	1.0	0.51	0.0036	0.0037	<0.00050	<0.00050	0.0032	0.0032	11	11	9.14	-0.55	-0.48	-1.01									
2020	Q1	RG_MIDAG	233	0.0000062	0.000009	<0.000100	0.0001	<0.0100	<0.0100	556	0.29	0.69	1.3	0.14	0.0022	0.0022	<0.00050	<0.00050	0.0018	<0.0030	4.0	3.6	6.86	-2.44	-1.30	-1.53									
2020	Q1	EV_MC2	134	<0.0000100	<0.0000100	<0.000100	0.000062	<0.0100	<0.0100	391	0.44	1.1	0.96	0.4	0.0014	0.0014	<0.00050	<0.00050	0.0011	0.0022	2.5	2.3	5.66	-3.08	-0.90	0.03									
2020	Q1	EV_HC1	213	<0.0000100	<0.0000100	<0.000100	<0.000100	<0.0100	<0.0100	523	0.26	0.84	1.1	0.45	0.0028	0.0027	<0.00050	<0.00050	0.00066	<0.0030	5.1	4.9	8.02	-5.37	1.44	2.31									
2020	Q1	LC_LC3	458	<0.0000100	<0.0000100	<0.000100	<0.000100	<0.0100	<0.0100	1002	0.2	0.65	1.2	0.46	0.0055	0.0055	<0.00050	<0.00050	0.0052	0.0057	10	7.1	10.40	1.91	-0.63	-1.38									
2020	Q1	LC_LC5	204	<0.0000100	<0.0000100	<0.000100	0.000076	<0.0100	<0.0100	549	0.25	1.1	0.74	0.23	0.0024	0.0024	<0.00050	<0.00050	0.011	<0.0030	5.2	2.8	10.29	-4.99	-1.28	-1.10				12.44	-3.49	-1.95			
2020	Q1	FR_FR4	560	0.000015	0.000014	0.00006	<0.000100	<0.0100	<0.0100	1198	0.1	1.1	1.0	0.52	0.0062	0.0064	<0.00050	<0.00050	0.0043	0.0039	13	7.6	8.32	2.66	-0.58	-1.22				9.31	3.75	-0.64			
2020	Q3	FR_FRABCH	296	<0.0000100	<0.0000100	<0.000100	<0.000100	<0.0100	<0.0100	801	0.092	0.64	1.8	0.99	0.0036	0.0035	<0.00050	0.00032	0.0011	0.0026	9.7	4.0	7.28	-0.12	-1.02	-0.70				8.54	1.14	-1.23			
2020	Q3	FR_FRCP1	374	0.0000062	0.0000094	<0.000100	<0.000100	<0.0100	<0.0100	834	0.18	0.98	2.1	0.7	0.0041	0.0041	<0.00050	0.00031	0.005	0.0063	9.5	5.6	7.34	1.22	-0.07	-0.52				8.49	2.53	0.22			
2020	Q3	GH_FR1	206	<0.0000100	<0.0000100	<0.000100	<0.000100	<0.0100	<0.0100	577	0.13	0.39	12	1.7	0.0023	0.0024	<0.00050	0.0004	0.00094	<0.0030	6.3	3.4	7.26	-2.65	1.11	1.26				9.15	-1.38	1.15			
2020	Q3	GH_ERC	26	<0.0000100	<0.0000100	<0.000100	<0.000100	<0.0100	<0.0100	189	0.43	0.34	3.3	1.1	0.00071	0.00076	<0.00050	0.00032	0.0007	0.0022	1.8	1.8	5.54	-9.59	1.12	1.23									
2020	Q3	RG_MIDAG	240	0.000022	0.000023	<0.000100	<0.000100	<0.0100	<0.0100	546	0.42	0.62	<1.00	0.5	0.0021	0.0021	<0.00050	0.00031	0.0011	0.011	4.5	4.2	7.91	-2.73	-0.62	-1.71									
2020	Q3	EV_MC2	129	<0.0000100	<0.0000100	0.00007	0.000092	<0.0100	<0.0100	382	0.26	0.66	0.68	0.36	0.0013	0.0013	<0.00050	<0.00050	<0.00100	<0.0030	2.3	2.1	7.60	-4.58	-0.75	-1.74									
2020	Q3	EV_HC1	182	<0.0000100	<0.0000100	<0.000100	<0.000100	<0.0100	<0.0100	448	0.26	0.8	<1.00	0.68	0.0022	0.0023	<0.00050	<0.00050	0.00068	<0.0030	3.2	3.1	8.99	-6.66	0.47	0.31									
2020	Q3	LC_DCDS	185	0.000019	0.000021	<0.000100	<0.000100	<0.0100	<0.0100	681	0.085	1.9	1.7	1.1	0.0022	0.0023	0.0012	0.0014	0.0087	0.0084	18	8.5	7.82	0.62	1.25	0.88									
2020	Q3	LC_LC3	353	0.000011	0.000012	<0.000100	<0.000100	<0.0100	<0.0100	839	0.065	0.59	<1.00	0.33	0.0046	0.0048	<0.00050	<0.00050	0.013	0.014	9.5	6.8	10.42	0.83	-0.16	-1.34									
2020	Q3	LC_LC5	173	<0.0000100	<0.0000100	<0.000100	<0.000100	<0.0100	<0.0100	500	0.085	0.35	3.8	0.31	0.0021	0.0023	<0.00050	0.00037	0.001	0.0035	5.5	3.2	7.42	-2.67	-1.15	-1.10				9.12	-1.26	-1.29			
2020	Q3	LC_LCDSSLCC	227	<0.0000100	<0.0000100	<0.000100	<0.000100	<0.0100	<0.0100	599	0.17	0.45	<1.00	0.18	0.0032	0.0033	<0.00050	<0.00050	0.0062	0.0063	5.5	3.5	10.75	-2.30	-0.15	-0.90									
2021	Q1	FR_FRABCH	409	<0.00001	<0.00001	<0.0001	<0.0001	<0.0003	0.00034	963	0.11	0.85	1.5	0.47	0.004	0.0042	<0.0005	0.00054	0.0013	0.0032	14	6.2	0.49	5.53	-2.18	-0.65	3.12	-3.67	1.06	0.60	6.14	-2.56	2.61	-5.46	0.93
2021	Q1	GH_FR1	285	0.00001	0.00001	0.0001	0.0001	0.0003	0.00048	693	0.17	1.3	3.5	1.2	0.0028	0.0029	0.0005	0.0005	0.0049	0.0049	11	6.2	-0.43	4.32	-1.57	0.28	1.40	-1.55	0.18	-0.09	4.92	-1.79	1.15	-3.92	-1.17
2021	Q1	GH_ERC	38	<0.00001	<0.00001	<0.0001	<0.0001	<0.0003	<0.0003	204	0.23	<0.5	<1	0.1	0.00089	0.00093	<0.0005	<0.0005	<0.001	0.0034	3.4	3.3	-4.46	-2.04	-3.70	-0.87	-8.01	-3.39	-1.13						
2021	Q1	CM_MC2	452	0.000012	0.000012	<0.0001	<0.0001	<0.0003	0.00039	844	0.28	1.1	1.4	0.32	0.0035	0.0035	<0.0005	<0.0005	0.0024	0.0048	8.0	7.0	1.16	4.83	-1.80	-0.65	4.60	-4.68	-3.48						
2021	Q1	RG_MIDAG	214	<0.00001	0.00001	<0.0001	<0.0001	<0.00224	<0.00224	523	0.41	1.0	1.5	0.22	0.002	0.002	<0.0005	<0.0005	0.003	<0.003	4.5	4.1	-1.11	2.29	-2.34	-0.85	-1.10	-4.39	-2.37						
2021	Q1	EV_MC2	150	<0.00001	<0.00001	<0.0001	<0.00009	<0.0003	0.00042	427	0.34	0.87	4.0	0.76	0.0015	0.0015	<0.0005	0.00051	0.0011	<0.003	3.7	3.6	-1.43	2.89	-1.70	0.62	-0.88	-1.94	-0.82						
2021	Q1	EV_HC1	211	<0.00001	<0.00001	<0.0001	<0.00009	<0.0003	0.00097	491	0.28	1.1	2.4	0.64	0.0026	0.0027	<0.0005	0.00053	0.0011	<0.003	4.3	3.9	-2.36	2.05	-1.02	1.34	-2.40	-0.56	1.80						
2021	Q1	LC_DCDS	130	0.000013	0.00002	<0.0001	<0.0001	<0.00806	0.0091	581	<0.05	2.0	9.4	9.0	0.0019	0.002	0.0013	0.0021	0.0034	0.0068	16	7.8	0.73	4.48	2.65	3.85	5.00	9.74	-6.93						
2021	Q1	LC_LC3	440	0.00001	0.00001	0.0001	0.0001	0.0081	0.0081	902	0.24	0.63	1.1	0.35	0.0049	0.005	0.0005	0.0005	0.0075	0.0079	12	7.7	2.74	6.64	-1.21	-0.87	6.59	-3.28	-1.10						
2021	Q1	LC_LC5	239	<0.00001	<0.00001	<0.0001	<0.0001	<0.00806	0.0082	613	0.28	0.62	2.0	0.99	0.0026	0.0027	<0.0005	<0.0005	0.0011	<0.003	8.1	4.8	-0.69	3.40	-2.41	-1.07	-0.01	-2.87	-0.26	-0.31	4.03	-2.84	-0.09	-4.87	-2.09
2021	Q1	LC_LCDSSLCC	310	<0.00001	<0.00001	<0.0001	<0.0001	<0.00806	<0.00806	722	0.14	0.55	1.3	0.14	0.0038	0.004	<0.0005	<0.0005	0.0044	0.0044	9.5	6.2	1.59	5.08	-2.52	-1.75	3.76	-4.08	-1.00						
2021	Q1	FR_FR4	443	0.000014	0.000017	<0.0001	<0.0001	<0.00612	0.0063	982	0.27	1.3	7.1	3.8	0.0052	0.0053	<0.0005	0.00074	0.0047	0.0074	16	9.7	2.09	6.81	1.43	1.86	7.46	2.20	0.82	2.33	7.57	1.52	7.99	2.13	-1.17
2021	Q1	FR_MULTIPLATE	347	0.000011	0.000014	<0.0001	<0.0001	<0.00612	0.0062	798	0.24	1.2	2.7	2.9	0.0043	0.0042	<0.0005	0.00078	0.0055	0.0069	16	8.7	1.12	5.45	0.57	0.74	4.96	1.22	-1.01	1.44	6.14	0.29	5.09	-0.29	-4.49
2021	Q1	FR_FRRD	457	<0.00001	<0.00001	<0.0001	<0.0001	<0.00612	0.0063	1124	0.086	0.73	5.4	0.92	0.0054	0.0056	<0.0005	0.0005	0.0015	0.0036	15	7.2	1.68	6.33	-1.05	0.06	5.37	-2.26	0.15	1.72	6.91	-1.55	5.07	-4.11	-1.53
2021	Q3	FR_FRABCH	303	<0.00001	<0.00001	<0.0001	<0.0001	<0.0003	0.00064	792	0.33	2.3	4.2	1.7	0.0036	0.0037	<0.0005	0.00053	0.0018	0.0033	13	6.5	-0.18	5.44	0.20	1.35	2.77	-0.24	2.97	0.06	5.98	0.43	2.69	-1.15	1.92
2021	Q3	FR_FRCP1	316	0.000011	0.000013	<0.0001	<0.0001	<0.0003	0.001	724	0.32	4.0	5.5	6.5	0.0036	0.0038	<0.0005	0.00075	0.0058	0.0073	11	7.1	0.20	5.78	1.76	2.97	4.28	2.57	3.27	0.54	6.42	2.48	4.68	3.25	2.55
2021	Q3	GH_FR1	208	0.00001	0.00001	0.0001	0.0001	0.0003	0.0012	566	0.21	3.2	3.6	1.4	0.0025	0.0025	0.0005	0.00077	0.0011	0.0037	8.1	5.0	-1.69	3.93	0.32	2.81	0.09	2.20	3.24	-1.23	4.39	0.92	0.38	0.95	1.04
2021	Q3	GH_ERC	21	<0.00001	<0.00001	<0.0001	<0.0001	<0.0003	<0.00054	173	0.064	2.3	6.0	2.9	0.00069	0.00072	<0.0005	0.00053	0.0015	0.0034	2.8	2.7	-5.90	-2.54	-0.21	2.42	-9.21	1.60	0.10						
2021	Q3	CM_MC2	400	0.000019	0.000019	<0.0001	<0.0001	<0.0003	0.00067	783	0.2	1.1	16	1.5	0.0033	0.0033	<0.0005	<0.0005	0.0012	<0.003	9.2	8.5	0.72	4.54	-0.21	0.31	4.46	-2.63	-2.87						
2021	Q3	RG_MIDAG	141	0.000024	0.000024	<0.0001	<0.0001	<0.0003	0.00031	358	0.14	0.99	1.0	0.52	0.0014	0.0014	<0.0005	0.00052	0.0012	<0.003	4.5	4.3	-2.73	0.58	-1.55	0.07	-3.36	-2.06	-2.41						
2021	Q3	EV_MC2	103	<0.00001	0.000011	<0.0001	<0.0001	<0.0003	0.00084	287	0.2	1.6	2.7	2.6	0.0012	0.0013	<0.0005	0.00063	0.0021	<0.003	3.4	3.3	-2.67	1.80	-0.29	2.05	-2.83	0.98	-0.38						
2021	Q3	EV_HC1	176	<0.00001	0.000015	<0.0001	<0.0001	<0.0003	0.0013	442	0.15	3.2	7.7	9.1	0.0022	0.0022	<0.0005	0.00093	0.0012	0.004	4.4	4.2	-3.07	2.01	1.12	4.12	-2.37	5.12	2.74						
2021	Q3	LC_DCDS	210	0.00002	0.00002	<0.0001	<0.0001	<0.0003	0.00036	711	0.62	2.5	3.1	1.3	0.0024	0.0025	0.0012	0.0014	0.0082	0.0084	20	8.3	1.24	6.19	1.09	1.29	5.66	3.87	-5.85						
2021	Q3	LC_LC3	271	0.000013	0.000014	0.0001	0.0001	0.0003	0.00036	682	0.28	1.8	1.3	0.53	0.0038	0.0038	0.0005	0.0005	0.015	0.015	10	6.7	1.05	5.93	-0.47	0.42	4.54	-2.58	0.65						
2021	Q3	LC_LC5	166	<0.00001	<0.00001	<0.0001	<0.0001	<0.0003	0.00054	488	0.28	2.2	2.8	2.2	0.0022	0.0022	<0.0005	<0.0005	0.0018	0.0032	6.8	4.4	-1.98	3.44	-0.96	1.25	-1.33	-0.56	2.01	-1.46	4.08	-0.77	-1.04	-1.41	1.59
2021	Q3	LC_LCDSSLCC	185	<0.00001	<0.00001	<0.0001	<0.0001	<0.0003	<0.0003	517	0.25	1.9	1.2	0.35	0.0028	0.0028	<0.0005	<0.0005	0.0077	0.014	7.5	5.4	-0.64	4.18	-1.38	0.35	1.06	-2.71	1.37						
2021	Q3	FR_FR4	330	0.000011	0.00002	<0.0001	<0.0001	<0.0003	0.0052	748	0.51	2.0	16	17	0.0038	0.0039	<0.0005	0.0014	0.0065	0.01	12	8.3	0.48	5.87	2.90	4.12	5.31	6.02	4.55	0.87	6.58	3.90	6.22	7.15	1.88
2021	Q3	FR_FR2	209	<0.00001	0.000012	<0.0001	<0.0001	<0.0003	<0.00306	560	0.38	1.9	8.7	7.8	0.0027	0.0027	<0.0005	0.00089	0.0015	0.0036	9.7	6.6	-0.83	4.27	1.65	2.94	2.03	2.63	2.68	-0.33	4.79	2.21	2.56	3.30	1.84
2021	Q3	FR_MULTIPLATE	182	<0.00001	0.000012	<0.0001	<0.0001	<0.0003	0.0025	494	0.22	1.7	7.4	6.8	0.0023	0.0023	<0.0005	0.00078	0.0018	0.0038	9.5	6.3	-1.89	3.04	0.81	2.16	-0.52	1.73	3.03	-1.30	3.51	1.46	-0.19	2.21	1.60
2021	Q3	FR_FRRD	294	<0.00001	<0.00001	<0.0001	<0.0001	<0.0003	0.00032	831	0.23	1.6	1.1	0.41	0.0042	0.0042	<0.0005	<0.0005	0.0024	<0.003	15	8.0	0.05	5.27	-2.05	-0.69	2.30	-4.17	2.42	0.10	5.86	-2.28	1.70	-5.39	2.20
Tests categorized as possible or likely adverse respon																																			
2020	Q3	CM_MC2	456	0.000027	0.000029	<0.000100	<0.000100	<0.0100	<0.0100	907	0.25	0.67	<1.00	0.53	0.0038	0.004	<0.00050	0.00034	0.001	0.0021	12	11	9.66	-0.34	-0.87	-2.54									
Tests categorized as possible or likely adverse respon																																			
2016	Q3	CM_MC2	295	0.000023	0.000022	<0.00018	<0.00018	<0.01	<0.01	674	0.2	1.1	1.5	0.51	0.0027	0.0028	<0.0009	<0.0009	<0.0034	<0.0054	7.3	6.4	0.64	2.29	-1.07	-0.50									
2018	Q3	CM_MC2	452	0.00003	0.000028	<0.0001	<0.0001	<0.01	<0.01	879	0.31	1.2	1.7	0.53	0.0046	0.0045	0.0005	0.00052	0.001	0.0032	18	17	2.40	4.48	-0.11	-0.63									
2019	Q1	FR_FRABCH	349	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	862	0.17	0.8	1.5	0.99	0.0031	0.0031	<0.0005	<0.0005	<0.001	<0.003	11	4.8													
2019	Q3	FR_FRCP1	214	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	574	0.3	0.87	0.92	0.35	0.0029	0.0028	<0.0005	<0.0005	0.001	0.0018	7.1	4.7													
2019	Q1	GH_ERC	33	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	217	0.095	0.25	0.64	0.26	0.00085	0.00086	<0.0005	<0.0005	<0.001	<0.003	2.2	2.2	-4.46	-3.32	-4.35	-2.33									
Tests categorized as possible or likely adverse respon																																			
2017	Q2	GH_FR1	133	<0.00001	0.000018	<0.0001	<0.0001	<0.01	<0.011	404	0.31	4.4	22	16	0.0018	0.0018	<0.0005	0.0017	<0.003	0.0059	6.3	4.7	-3.93	0.77	8.26	-0.05				-2.88	1.19	8.25			
2018	Q3	FR_FRCP1	358	0.000011	0.000011	<0.0001	<0.0001	<0.01	<0.01	815	0.44	1.3	1.2	1.1	0.0044	0.0043	<0.0005	<0.0005	0.0012	0.003	8.2	5.0	0.45	4.54	-0.63	-0.09				0.75	4.90	-0.54			
2018	Q4	FR_FRABCH	312	<0.00001	<0.00001	<0.0001	<0.0001	<0.01	<0.01	807	0.19	0.76	1.1	0.4	0.0033	0.0034	<0.0005	<0.0005	<0.001	<0.003	8.6	3.5	0.29	4.20	-2.70	-1.23				0.54	4.77	-3.03			
2019	Q1	FR_FRCP1	1314	0.000024	0.000028	<0.00007	<0.00007	<0.005	<0.005	2389	0.2	1.7	4.8	3.9	0.014	0.013	<0.00035	0.00046	0.0011	0.0035	19	12	2.17	8.65	0.10	0.92				1.80	9.17	-0.01			
2019	Q3	CM_MC2	346	0.000016	0.000016	<0.0001	<0.0001	<0.01	<0.01	718	0.4	0.78	1.0	0.53	0.003	0.003	<0.0005	<0.0005	<0.001	<0.003	7.8	7.0													
2020	Q1	LC_DCDS	133	0.000011	0.00001	<0.000100	0.000074	<0.0100	<0.0100	513	0.054	1.6	0.66	0.28	0.0022	0.0021	0.0011	0.0012	0.016	0.0043	12	4.7	6.36	-0.41	0.20	0.75									
2020	Q1	LC_LCDSSLCC	309	<0.0000100	<0.0000100	<0.000100	<0.000100	<0.0100	<0.0100	742	0.045	0.45	0.74	0.11	0.0039	0.004	<0.00050	<0.00050	0.0028	0.0032	6.1	3.5	11.18	-1.88	-2.17	-2.21									
Tests categorized as possible or likely adverse respon																																			
2018	Q4	FR_FRCP1	1896	0.000042	0.000044	<0.0002	<0.00012	<0.01	<0.01	3272	0.31	1.7	20	5.5	0.02	0.022	<0.001	<0.0006	<0.002	<0.0036	26	18	3.72	8.75	-1.52	0.23				3.17	8.97	-2.04			
Tests categorized as possible or likely adverse respon																																			

Year	Quarter	Sample ID	SULFATE (AS SO4)-D-mg/l	THALLIUM-D-mg/l	THALLIUM-T-mg/l	TIN-D-mg/l	TIN-T-mg/l	TITANIUM-D-mg/l	TITANIUM-T mg/l	TOTAL DISSOLVED SOLIDS (RESIDUE FILTERABLE)-N-mg/l	TOTAL KJELDAHL NITROGEN-N-mg/l	TOTAL ORGANIC CARBON-T-mg/l	TOTAL SUSPENDED SOLIDS LAB-N-mg/l	TURBIDITY LAB-N-ntu	URANIUM-D-mg/l	URANIUM-T mg/l	VANADIUM-D-mg/l	VANADIUM-T-mg/l	ZINC-D-mg/l	ZINC-T-mg/l	∑TU-WQGs	∑TU-WQGs/Benchmarks	PC1_allyrs	PC2_allyrs	PC3_allyrs	PC4_allyrs	PC1_2021	PC2_2021	PC3_2021	PC1_allyrs_UFR	PC2_allyrs_Ufr	PC3_allyrs_UFR	PC1_2021_UFR	PC2_2021_UFR	PC3_2021_UFR
2021	Q1	FR_FRCP1	465	0.000016	0.000018	<0.0001	<0.0001	<0.0003	0.0012	1008	0.14	1.5	5.6	3.7	0.0054	0.0057	<0.0005	0.00069	0.0057	0.0079	17	10	1.92	7.09	1.03	1.66	7.28	1.68	0.88	2.04	7.81	0.98	7.77	1.78	-0.18

APPENDIX E

Principal Components Analyses

Dataset	2015 to 2021 Dataset			2021 Dataset		
Principal Component	**PC1**	**PC2**	**PC3**	**PC1**	**PC2**	**PC3**
Percent of Total Variance Explained	27.4	14.7	7.9	37.3	20.4	6.4
Water Quality Parameter						
ACIDITY_TO_PH_8_3__AS_CACO3__N_MG_L	0.254	0.136	-0.095	0.117	-0.138	0.113
ALKALINITY_BICARBONATE__AS_CACO3__LAB_MEASURED	0.191	0.014	-0.318	0.829	-0.205	0.135
ALKALINITY_CARBONATE__AS_CACO3__LAB_MEASURED	0.248	-0.078	0.05	0.601	-0.049	-0.076
ALKALINITY_HYDROXIDE__AS_CACO3__LAB_MEASURED	0.051	-0.124	0.123	n/a	n/a	n/a
ALKALINITY_TOTAL__AS_CACO3__LAB_MEASURED	0.761	-0.368	-0.079	0.848	-0.203	0.115
ALUMINUM_D_MG_L	-0.299	0.548	-0.003	-0.603	0.59	0.039
ALUMINUM_T_MG_L	-0.23	0.783	0.285	-0.587	0.675	0.035
ANTIMONY_D_MG_L	0.734	0.255	-0.036	0.63	0.431	-0.181
ANTIMONY_T_MG_L	0.717	0.344	0.032	0.54	0.62	-0.145
ARSENIC_D_MG_L	0.093	0.528	-0.248	-0.207	0.385	0.391
ARSENIC_T_MG_L	0.004	0.853	0.061	-0.541	0.743	0.247
BARIUM_D_MG_L	0.382	-0.05	0.035	0.619	0.038	0.014
BARIUM_T_MG_L	0.365	0.122	0.068	0.4	0.34	0.069
BERYLLIUM_D_MG_L	-0.014	0.2	-0.588	n/a	n/a	n/a
BERYLLIUM_T_MG_L	-0.054	0.436	-0.478	-0.519	0.68	0.206
BISMUTH_D_MG_L	0.06	0.146	-0.643	n/a	n/a	n/a
BISMUTH_T_MG_L	0.049	0.179	-0.621	-0.257	0.451	0.185
BORON_D_MG_L	0.452	0.129	-0.366	0.436	-0.025	0.781
BORON_T_MG_L	0.48	0.143	-0.338	0.439	0.058	0.792
BROMIDE_D_MG_L	0.604	-0.119	-0.059	0.667	0.132	-0.066
CADMIUM_D_MG_L	0.705	0.148	0.198	0.741	0.432	-0.218
CADMIUM_T_MG_L	0.59	0.48	0.306	0.235	0.868	-0.17
CALCIUM_D_MG_L	0.427	-0.055	-0.314	0.972	0.079	0.015
CALCIUM_T_MG_L	0.928	-0.169	-0.014	0.942	0.178	0.024
CARBON_DISSOLVED_ORGANIC_D_MG_L	-0.044	0.638	0.268	-0.32	0.506	-0.196
CHLORIDE_D_MG_L	0.759	-0.052	0.05	0.741	0.245	0.121
CHROMIUM_D_MG_L	-0.273	0.017	-0.524	-0.386	-0.436	0.442
CHROMIUM_T_MG_L	-0.326	0.722	0.079	-0.72	0.557	0.15
COBALT_D_MG_L	0.395	0.261	-0.125	0.243	0.332	0.532
COBALT_T_MG_L	0.326	0.58	0.04	-0.258	0.799	0.395
CONDUCTIVITY_LAB_N_US_CM	0.94	-0.168	0.027	0.971	0.131	-0.025
COPPER_D_MG_L	-0.042	0.158	-0.328	-0.031	0.256	-0.107
COPPER_T_MG_L	0.022	0.764	-0.102	-0.452	0.629	0.077
FLUORIDE_D_MG_L	0.2	-0.322	-0.061	0.213	-0.229	-0.366
HARDNESS_TOTAL_OR_DISSOLVED_CACO3_N_MG_L	0.931	-0.178	-0.005	0.969	0.108	-0.009
IRON_D_MG_L	0.047	0.424	-0.424	0.07	0.223	-0.128
IRON_T_MG_L	-0.037	0.79	0.325	-0.484	0.773	-0.019
LEAD_D_MG_L	0.15	0.235	-0.57	n/a	n/a	n/a
LEAD_T_MG_L	-0.101	0.853	0.129	-0.621	0.719	0.045
LITHIUM_D_MG_L	0.931	-0.014	0.127	0.906	0.28	-0.06
LITHIUM_T_MG_L	0.933	0.019	0.135	0.88	0.358	-0.043
MAGNESIUM_D_MG_L	0.618	-0.069	-0.261	0.955	0.147	-0.037
MAGNESIUM_T_MG_L	0.931	-0.117	0.03	0.941	0.203	-0.028
MAJOR_ANION_SUM_N_MEQ_L	0.717	-0.118	-0.242	0.97	0.118	-0.001
MAJOR_CATION_SUM_N_MEQ_L	0.722	-0.114	-0.25	0.97	0.114	0.02
MANGANESE_D_MG_L	0.617	0.205	0.294	0.517	0.62	-0.007
MANGANESE_T_MG_L	0.377	0.55	0.456	-0.073	0.865	-0.025
MERCURY_D_MG_L	0.103	-0.023	-0.091	n/a	n/a	n/a
MERCURY_T_MG_L	-0.155	0.486	-0.106	-0.204	0.415	-0.025
MOLYBDENUM_D_MG_L	0.703	-0.018	0.096	0.695	0.216	-0.206
MOLYBDENUM_T_MG_L	0.603	-0.05	0.084	0.681	0.248	-0.181
NICKEL_D_MG_L	0.833	0.186	0.041	0.722	0.445	0.151
NICKEL_T_MG_L	0.808	0.347	0.105	0.475	0.75	0.182
NITRATE_NITROGEN__NO3__AS_N_N_MG_L	0.866	0.041	0.188	0.79	0.428	-0.27
NITRITE_NITROGEN__NO2__AS_N_N_MG_L	0.73	0.133	0.165	0.652	0.415	-0.177
NITROGEN_AMMONIA__AS_N__N_MG_L	0.188	0.198	0.183	0.005	0.279	0.008
ORTHO_PHOSPHATE_N_MG_L	-0.187	0.273	0.128	-0.301	0.234	0.008
OXIDATION_REDUCTION_POTENTIAL_LAB_N_MV	0.157	-0.022	-0.322	0.35	-0.387	0.019
PH_LAB_N_PH_UNITS	0.105	-0.275	0.219	0.643	-0.267	-0.067
PHOSPHORUS_N_MG_L	-0.199	0.746	0.198	-0.601	0.591	0.059
POTASSIUM_D_MG_L	0.893	0.086	0.119	0.902	0.354	-0.035
POTASSIUM_T_MG_L	0.93	0.206	0.15	0.786	0.566	0.006
SELENIUM_D_MG_L	0.841	-0.017	0.158	0.82	0.335	-0.327
SELENIUM_T_MG_L	0.842	-0.005	0.157	0.807	0.359	-0.333
SILICON_D_MG_L	0.276	-0.022	-0.28	0.284	-0.236	0.306
SILICON_T_MG_L	0.203	0.316	-0.138	-0.374	0.616	0.25
SILVER_D_MG_L	0.152	0.335	-0.754	n/a	n/a	n/a
SILVER_T_MG_L	0.046	0.64	-0.228	-0.255	0.543	0.102
SODIUM_D_MG_L	0.693	-0.047	-0.102	0.653	0.142	0.624
SODIUM_T_MG_L	0.712	-0.031	0.004	0.651	0.148	0.62
STRONTIUM_D_MG_L	0.471	-0.279	-0.107	0.572	-0.232	0.658

Dataset	2015 to 2021 Dataset			2021 Dataset		
Principal Component	**PC1**	**PC2**	**PC3**	**PC1**	**PC2**	**PC3**
Percent of Total Variance Explained	27.4	14.7	7.9	37.3	20.4	6.4
STRONTIUM_T_MG_L	0.476	-0.251	-0.109	0.542	-0.158	0.692
SULFATE__AS_SO4__D_MG_L	0.918	-0.146	0.054	0.923	0.196	-0.016
THALLIUM_D_MG_L	0.424	0.348	-0.512	0.28	0.331	0.276
THALLIUM_T_MG_L	0.199	0.788	-0.116	-0.386	0.803	0.257
TIN_D_MG_L	0.147	0.333	-0.759	n/a	n/a	n/a
TIN_T_MG_L	0.119	0.308	-0.696	-0.1	-0.16	0.181
TITANIUM_D_MG_L	-0.119	-0.12	-0.192	-0.268	0.075	0.038
TITANIUM_T_MG_L	-0.175	0.198	-0.074	-0.55	0.703	-0.088
TOTAL_DISSOLVED_SOLIDS__RESIDUE_FILTERABLE__N-	0.938	-0.161	0.028	0.96	0.159	-0.014
TOTAL_KJELDAHL_NITROGEN_N_MG_L	0.222	0.35	0.359	-0.169	0.445	-0.075
TOTAL_ORGANIC_CARBON_T_MG_L	-0.048	0.724	0.308	-0.392	0.665	-0.235
TOTAL_SUSPENDED_SOLIDS_LAB_N_MG_L	-0.126	0.757	0.306	-0.596	0.678	-0.038
TURBIDITY_LAB_N_NTU	-0.091	0.791	0.362	-0.493	0.756	-0.103
URANIUM_D_MG_L	0.893	-0.173	0.054	0.916	0.134	-0.133
URANIUM_T_MG_L	0.894	-0.128	0.066	0.879	0.246	-0.109
VANADIUM_D_MG_L	0.138	0.443	-0.534	0.089	0.346	-0.099
VANADIUM_T_MG_L	-0.061	0.884	-0.012	-0.514	0.793	0.007
ZINC_D_MG_L	0.428	0.138	-0.035	0.463	0.414	-0.22
ZINC_T_MG_L	0.325	0.583	0.082	-0.121	0.805	-0.053

Notes:

% = percent; $CaCO_3$ = calcium carbonate; "-D-" = dissolved concentration; mg/l = milligrams per litre; ntu = nephelometric turbidity units; PC = principle component; "-T-" = total concentration; µg/l = micrograms per litre.

n/a = parameter not included in analysis because concentrations were the same in all samples.

PCA scores for each test are provided in Appendix D.

Shaded value = component loading not between -0.8 and 0.8.

Dataset	2015 to 2021 Dataset		2021 Dataset	
Principal Component	**PC1**	**PC2**	**PC1**	**PC2**
Percent of Total Variance Explained	27.6	15.0	36.2	23.3
Water Quality Parameter				
ACIDITY_TO_PH_8_3__AS_CACO3__N_MG_L	0.256	0.145	0.218	0.171
ALKALINITY_BICARBONATE__AS_CACO3__LAB_MEASURED	0.216	-0.055	0.738	-0.278
ALKALINITY_CARBONATE__AS_CACO3__LAB_MEASURED	0.176	-0.073	0.424	-0.159
ALKALINITY_HYDROXIDE__AS_CACO3__LAB_MEASURED	0.038	-0.149	n/a	n/a
ALKALINITY_TOTAL__AS_CACO3__LAB_MEASURED	0.74	-0.376	0.782	-0.252
ALUMINUM_D_MG_L	-0.229	0.54	-0.422	0.566
ALUMINUM_T_MG_L	-0.182	0.793	-0.407	0.813
ANTIMONY_D_MG_L	0.745	0.232	0.658	0.332
ANTIMONY_T_MG_L	0.737	0.322	0.603	0.561
ARSENIC_D_MG_L	0.158	0.55	0.039	0.491
ARSENIC_T_MG_L	0.093	0.856	-0.286	0.896
BARIUM_D_MG_L	0.383	-0.018	0.613	0.048
BARIUM_T_MG_L	0.375	0.15	0.436	0.388
BERYLLIUM_D_MG_L	0.017	0.217	n/a	n/a
BERYLLIUM_T_MG_L	-0.005	0.457	-0.381	0.799
BISMUTH_D_MG_L	0.08	0.155	n/a	n/a
BISMUTH_T_MG_L	0.07	0.189	-0.207	0.519
BORON_D_MG_L	0.471	0.132	0.489	-0.01
BORON_T_MG_L	0.5	0.142	0.502	0.073
BROMIDE_D_MG_L	0.612	-0.146	0.726	0.049
CADMIUM_D_MG_L	0.701	0.107	0.771	0.305
CADMIUM_T_MG_L	0.613	0.441	0.342	0.824
CALCIUM_D_MG_L	0.402	-0.075	0.96	0.002
CALCIUM_T_MG_L	0.92	-0.199	0.941	0.103
CARBON_DISSOLVED_ORGANIC_D_MG_L	-0.031	0.651	-0.264	0.548
CHLORIDE_D_MG_L	0.794	-0.091	0.86	0.158
CHROMIUM_D_MG_L	-0.26	0.053	-0.409	-0.363
CHROMIUM_T_MG_L	-0.252	0.737	-0.525	0.733
COBALT_D_MG_L	0.425	0.234	0.335	0.296
COBALT_T_MG_L	0.379	0.555	-0.071	0.869
CONDUCTIVITY_LAB_N_US_CM	0.932	-0.205	0.976	0.042
COPPER_D_MG_L	0.018	0.176	0.106	0.303
COPPER_T_MG_L	0.1	0.765	-0.255	0.749
FLUORIDE_D_MG_L	0.2	-0.357	0.206	-0.3
HARDNESS_TOTAL_OR_DISSOLVED_CACO3_N_MG_L	0.923	-0.212	0.965	0.01
IRON_D_MG_L	0.046	0.468	-0.155	0.35
IRON_T_MG_L	0.018	0.778	-0.295	0.851
LEAD_D_MG_L	0.184	0.298	0.123	-0.076
LEAD_T_MG_L	-0.021	0.85	-0.414	0.851
LITHIUM_D_MG_L	0.928	-0.062	0.932	0.162
LITHIUM_T_MG_L	0.931	-0.028	0.91	0.254
MAGNESIUM_D_MG_L	0.594	-0.103	0.953	0.048
MAGNESIUM_T_MG_L	0.925	-0.156	0.946	0.105
MAJOR_ANION_SUM_N_MEQ_L	0.692	-0.152	0.969	0.021
MAJOR_CATION_SUM_N_MEQ_L	0.697	-0.147	0.966	0.01
MANGANESE_D_MG_L	0.622	0.149	0.605	0.514
MANGANESE_T_MG_L	0.417	0.504	0.119	0.859
MERCURY_D_MG_L	0.103	-0.035	n/a	n/a
MERCURY_T_MG_L	-0.106	0.485	-0.443	0.832
MOLYBDENUM_D_MG_L	0.711	-0.053	0.749	0.098
MOLYBDENUM_T_MG_L	0.609	-0.084	0.747	0.129
NICKEL_D_MG_L	0.849	0.126	0.797	0.306
NICKEL_T_MG_L	0.836	0.295	0.578	0.699
NITRATE_NITROGEN__NO3__AS_N_N_MG_L	0.867	-0.017	0.846	0.298
NITRITE_NITROGEN__NO2__AS_N_N_MG_L	0.739	0.091	0.709	0.319
NITROGEN_AMMONIA__AS_N__N_MG_L	0.159	0.165	-0.136	0.2
ORTHO_PHOSPHATE_N_MG_L	-0.145	0.287	-0.133	0.297
OXIDATION_REDUCTION_POTENTIAL_LAB_N_MV	0.134	-0.045	0.407	-0.627
PH_LAB_N_PH_UNITS	0.029	-0.259	0.414	-0.344
PHOSPHORUS_N_MG_L	-0.136	0.753	-0.402	0.721
POTASSIUM_D_MG_L	0.894	0.056	0.935	0.265
POTASSIUM_T_MG_L	0.939	0.165	0.842	0.499
SELENIUM_D_MG_L	0.841	-0.062	0.847	0.227
SELENIUM_T_MG_L	0.843	-0.051	0.838	0.25
SILICON_D_MG_L	0.205	-0.053	0.458	-0.077
SILICON_T_MG_L	0.239	0.282	-0.097	0.745
SILVER_D_MG_L	0.179	0.35	n/a	n/a
SILVER_T_MG_L	0.062	0.731	-0.297	0.715
SODIUM_D_MG_L	0.718	-0.088	0.778	0.106
SODIUM_T_MG_L	0.746	-0.073	0.79	0.108
STRONTIUM_D_MG_L	0.469	-0.29	0.581	-0.232

Dataset	2015 to 2021 Dataset		2021 Dataset	
Principal Component	**PC1**	**PC2**	**PC1**	**PC2**
Percent of Total Variance Explained	27.6	15.0	36.2	23.3
STRONTIUM_T_MG_L	0.477	-0.262	0.563	-0.144
SULFATE__AS_SO4__D_MG_L	0.909	-0.195	0.934	0.073
THALLIUM_D_MG_L	0.48	0.34	0.472	0.336
THALLIUM_T_MG_L	0.267	0.79	-0.195	0.911
TIN_D_MG_L	0.175	0.349	n/a	n/a
TIN_T_MG_L	0.155	0.331	n/a	n/a
TITANIUM_D_MG_L	-0.025	-0.152	0.226	-0.096
TITANIUM_T_MG_L	-0.046	0.158	-0.191	0.65
TOTAL_DISSOLVED_SOLIDS__RESIDUE_FILTERABLE__N-	0.931	-0.196	0.966	0.076
TOTAL_KJELDAHL_NITROGEN_N_MG_L	0.289	0.314	0.058	0.521
TOTAL_ORGANIC_CARBON_T_MG_L	-0.007	0.721	-0.258	0.7
TOTAL_SUSPENDED_SOLIDS_LAB_N_MG_L	-0.054	0.759	-0.396	0.819
TURBIDITY_LAB_N_NTU	-0.029	0.788	-0.32	0.867
URANIUM_D_MG_L	0.881	-0.215	0.908	0.026
URANIUM_T_MG_L	0.884	-0.172	0.878	0.15
VANADIUM_D_MG_L	0.184	0.45	0.241	0.318
VANADIUM_T_MG_L	0.023	0.889	-0.286	0.909
ZINC_D_MG_L	0.435	0.113	0.511	0.308
ZINC_T_MG_L	0.377	0.563	0.068	0.859

Notes:

% = percent; $CaCO_3$ = calcium carbonate; "-D-" = dissolved concentration; mg/l = milligrams per litre; ntu = nephelometric turbidity units; PC = principle component; "-T-" = total concentration; µg/l = micrograms per litre.

n/a = parameter not included in analysis because concentrations were the same in all samples.

PCA scores for each test are provided in Appendix D.

Shaded value = component loading not between -0.8 and 0.8.

Endpoint	Survival							Dry Weight						
Dataset	2015 to 2021 Dataset				2021 Dataset			2015 to 2021 Dataset				2021 Dataset		
Principal Component	PC1	PC2	PC3	PC4	PC1	PC2	PC3	PC1	PC2	PC3	PC4	PC1	PC2	PC3
Percent of Total Variance Explained	25.0	22.0	10.3	6.9	35.3	19.1	6.4	25.4	22.8	8.2	6.9	38.8	13.2	8.0
Water Quality Parameter														
ACIDITY_TO_PH_8_3__AS_CACO3__N_MG_L	0.313	-0.087	-0.297	-0.266	-0.007	0.064	-0.006	0.394	-0.057	0.027	-0.247	0.004	0.149	-0.035
ALKALINITY_BICARBONATE__AS_CACO3__LAB_MEASURED	0.275	0.119	-0.037	-0.934	0.831	-0.168	-0.017	0.278	0.137	0.348	-0.864	0.746	-0.235	0.145
ALKALINITY_CARBONATE__AS_CACO3__LAB_MEASURED	0.237	0.232	0.018	-0.326	0.504	-0.233	0.021	0.193	0.273	-0.088	-0.45	0.37	0.288	0.262
ALKALINITY_HYDROXIDE__AS_CACO3__LAB_MEASURED	-0.237	0.709	0.193	-0.02	n/a	n/a	n/a	-0.306	0.681	0.177	0.04	n/a	n/a	n/a
ALKALINITY_TOTAL__AS_CACO3__LAB_MEASURED	0.845	0.029	0.247	0.06	0.836	-0.19	-0.005	0.845	0.085	0.181	0.133	0.757	-0.215	0.182
ALUMINUM_D_MG_L	-0.357	0.627	0.027	0.026	-0.438	0.697	-0.208	-0.4	0.604	0.015	0.026	0.055	0.538	-0.512
ALUMINUM_T_MG_L	-0.312	0.388	-0.788	0.001	-0.479	0.75	0.234	-0.304	0.455	-0.704	-0.257	-0.041	0.852	0.188
ANTIMONY_D_MG_L	-0.068	0.615	0.148	0.07	0.711	0.268	0.065	-0.14	0.599	0.14	0.126	0.774	0.019	-0.037
ANTIMONY_T_MG_L	-0.085	0.7	0.157	0.079	0.703	0.363	0.069	-0.162	0.681	0.155	0.141	0.794	0.022	-0.036
ARSENIC_D_MG_L	0.031	0.171	-0.198	0.073	0.023	0.366	-0.532	0.046	0.18	-0.171	0.017	0.228	0.177	-0.598
ARSENIC_T_MG_L	-0.126	0.348	-0.658	0.059	-0.207	0.812	-0.204	-0.092	0.396	-0.565	-0.137	0.273	0.576	-0.417
BARIUM_D_MG_L	0.491	-0.108	0.242	0.106	0.62	-0.066	-0.169	0.496	-0.113	0.105	0.142	0.553	-0.223	-0.219
BARIUM_T_MG_L	0.472	-0.08	0.116	0.1	0.541	0.093	-0.169	0.49	-0.084	0.041	0.115	0.553	-0.21	-0.199
BERYLLIUM_D_MG_L	-0.288	0.875	0.246	-0.052	n/a	n/a	n/a	-0.379	0.844	0.228	0.02	n/a	n/a	n/a
BERYLLIUM_T_MG_L	-0.209	0.726	0.18	-0.06	-0.353	0.736	-0.042	-0.275	0.698	0.217	0.013	0.159	0.769	0.204
BISMUTH_D_MG_L	-0.266	0.896	0.239	-0.045	n/a	n/a	n/a	-0.355	0.867	0.234	0.033	n/a	n/a	n/a
BISMUTH_T_MG_L	-0.272	0.896	0.239	-0.043	-0.191	0.462	-0.093	-0.361	0.865	0.236	0.036	n/a	n/a	n/a
BORON_D_MG_L	-0.16	0.799	0.219	0.035	0.383	0.019	-0.664	-0.242	0.779	0.18	0.097	0.335	-0.012	-0.471
BORON_T_MG_L	-0.147	0.794	0.208	0.036	0.195	0.1	-0.693	-0.228	0.774	0.172	0.095	0.193	0.111	-0.561
BROMIDE_D_MG_L	0.262	0.729	0.281	0.066	0.775	-0.008	-0.154	0.192	0.755	0.228	0.156	0.788	-0.266	-0.075
CADMIUM_D_MG_L	0.617	0.328	-0.257	0.02	0.745	0.346	0.039	0.61	0.399	-0.172	-0.043	0.856	-0.044	-0.111
CADMIUM_T_MG_L	0.449	0.408	-0.547	0.029	0.437	0.708	0.107	0.494	0.494	-0.377	-0.095	0.827	0.07	-0.062
CALCIUM_D_MG_L	0.442	0.169	-0.014	-0.866	0.975	-0.028	0.03	0.429	0.198	0.336	-0.798	0.954	-0.204	0.082
CALCIUM_T_MG_L	0.937	0.125	0.123	0.14	0.966	0.021	0.025	0.926	0.191	0.067	0.18	0.95	-0.207	0.084
CARBON_DISSOLVED_ORGANIC_D_MG_L	-0.197	0.397	-0.625	0.03	-0.307	0.552	0.075	-0.161	0.46	-0.534	-0.15	0.124	0.581	-0.192
CHLORIDE_D_MG_L	0.738	0.261	0.061	0.079	0.755	0.243	-0.308	0.717	0.316	0.032	0.091	0.779	-0.143	-0.375
CHROMIUM_D_MG_L	-0.129	0.143	0.024	-0.044	-0.147	0.178	-0.5	-0.131	0.134	0.027	-0.039	-0.039	0.231	-0.48
CHROMIUM_T_MG_L	-0.325	0.213	-0.695	0.027	-0.52	0.746	0.049	-0.315	0.242	-0.604	-0.184	-0.171	0.783	0.057
COBALT_D_MG_L	-0.215	0.776	0.136	0.075	0.242	0.353	-0.274	-0.294	0.754	0.101	0.108	0.472	0.276	0
COBALT_T_MG_L	-0.057	0.542	-0.171	0.133	-0.012	0.802	-0.108	-0.087	0.54	-0.114	0.101	0.497	0.486	0.025
CONDUCTIVITY_LAB_N_US_CM	0.95	0.075	0.068	0.146	0.978	0.045	0.055	0.94	0.143	0.015	0.166	0.962	-0.168	0.094
COPPER_D_MG_L	0.118	-0.162	0.056	0.099	0.247	0.338	-0.082	0.102	-0.157	-0.121	0.035	0.417	0.122	-0.134
COPPER_T_MG_L	-0.216	0.594	0.049	-0.037	-0.296	0.727	0.06	-0.258	0.568	0.132	0.012	0.115	0.576	0.19
FLUORIDE_D_MG_L	0.282	-0.089	0.109	-0.124	0.32	-0.128	0.398	0.264	-0.066	0.092	-0.117	0.228	0.178	0.374
HARDNESS_TOTAL_OR_DISSOLVED_CACO3_N_MG_L	0.938	0.138	0.107	0.146	0.974	0.011	0.063	0.925	0.208	0.043	0.176	0.957	-0.159	0.119
IRON_D_MG_L	-0.251	0.691	0.176	-0.011	0.228	0.139	0.037	-0.317	0.664	0.162	0.043	0.342	0.048	0.196
IRON_T_MG_L	-0.166	0.411	-0.831	0.012	-0.331	0.821	0.251	-0.137	0.503	-0.732	-0.25	0.236	0.778	0.315
LEAD_D_MG_L	-0.291	0.849	0.227	-0.038	-0.005	0.055	0.011	-0.375	0.818	0.218	0.035	n/a	n/a	n/a
LEAD_T_MG_L	-0.199	0.248	-0.828	0.008	-0.354	0.835	0.091	-0.162	0.318	-0.734	-0.25	0.196	0.805	0.037
LITHIUM_D_MG_L	0.908	0.208	-0.063	0.118	0.925	0.157	0.138	0.893	0.28	-0.046	0.115	0.931	-0.122	0.123
LITHIUM_T_MG_L	0.907	0.219	-0.088	0.109	0.922	0.186	0.134	0.892	0.29	-0.052	0.103	0.929	-0.142	0.124
MAGNESIUM_D_MG_L	0.635	0.198	-0.009	-0.727	0.962	0.059	0.099	0.613	0.242	0.293	-0.671	0.952	-0.113	0.154
MAGNESIUM_T_MG_L	0.938	0.165	0.061	0.146	0.963	0.064	0.086	0.92	0.236	0.018	0.169	0.948	-0.14	0.148
MAJOR_ANION_SUM_N_MEQ_L	0.737	0.181	0.03	-0.62	0.975	0.025	0.034	0.713	0.231	0.284	-0.564	0.958	-0.159	0.093
MAJOR_CATION_SUM_N_MEQ_L	0.741	0.185	0.034	-0.611	0.975	0.021	0.038	0.715	0.235	0.278	-0.56	0.959	-0.158	0.094
MANGANESE_D_MG_L	0.62	0.313	-0.329	0.196	0.621	0.498	0.06	0.613	0.374	-0.317	0.094	0.75	0.265	0.13
MANGANESE_T_MG_L	0.271	0.417	-0.689	0.14	0.042	0.834	0.199	0.328	0.503	-0.584	-0.043	0.57	0.462	0.189
MERCURY_D_MG_L	-0.275	0.895	0.243	-0.04	0.128	0.105	0.1	-0.364	0.864	0.24	0.041	n/a	n/a	n/a
MERCURY_T_MG_L	-0.202	0.268	-0.551	-0.024	-0.455	0.799	0.102	-0.176	0.297	-0.455	-0.196	0.138	0.741	-0.214
MOLYBDENUM_D_MG_L	0.701	0.166	-0.017	0.067	0.725	0.174	-0.058	0.686	0.22	-0.021	0.062	0.72	0.076	-0.235
MOLYBDENUM_T_MG_L	0.619	0.102	0.027	0.037	0.729	0.175	-0.072	0.599	0.142	0.024	0.045	0.717	0.049	-0.243
NICKEL_D_MG_L	0.356	0.654	0.002	0.214	0.741	0.349	-0.06	0.285	0.685	-0.039	0.211	0.828	0.047	-0.089
NICKEL_T_MG_L	0.583	0.395	-0.236	0.237	0.647	0.575	-0.054	0.563	0.446	-0.228	0.171	0.849	0.094	-0.088
NITRATE_NITROGEN__NO3__AS_N_N_MG_L	0.868	0.246	-0.109	0.122	0.849	0.285	0.279	0.852	0.318	-0.078	0.109	0.908	-0.09	0.166
NITRITE_NITROGEN__NO2__AS_N_N_MG_L	0.355	0.562	0.04	0.188	0.728	0.274	0.154	0.299	0.594	-0.012	0.196	0.817	0.074	0.171
NITROGEN_AMMONIA__AS_N__N_MG_L	0.297	0.084	-0.118	-0.038	0.335	0.214	0.284	0.297	0.106	-0.066	-0.067	0.395	0.143	0.375
ORTHO_PHOSPHATE_N_MG_L	-0.333	0.472	-0.019	-0.063	-0.153	0.251	-0.39	-0.37	0.45	0.046	-0.051	-0.025	-0.115	-0.628
OXIDATION_REDUCTION_POTENTIAL_LAB_N_MV	0.167	0.139	-0.057	-0.949	0.412	-0.396	0.193	0.175	0.151	0.351	-0.881	0.052	-0.367	0.223
PH_LAB_N_PH_UNITS	0.025	0.235	0.275	0.074	0.474	-0.375	0.274	-0.136	0.293	-0.115	-0.033	0.179	0.334	0.463
PHOSPHORUS_N_MG_L	-0.16	0.054	-0.735	0.03	-0.406	0.657	-0.008	-0.11	0.068	-0.65	-0.204	-0.104	0.56	-0.267
POTASSIUM_D_MG_L	0.875	0.197	-0.055	0.157	0.945	0.193	0.074	0.854	0.264	-0.089	0.135	0.963	-0.079	0.061
POTASSIUM_T_MG_L	0.903	0.261	-0.178	0.166	0.918	0.316	0.063	0.889	0.334	-0.165	0.121	0.969	-0.089	0.058
SELENIUM_D_MG_L	0.86	0.229	-0.066	0.091	0.863	0.214	0.334	0.841	0.299	-0.032	0.094	0.898	-0.05	0.263
SELENIUM_T_MG_L	0.853	0.224	-0.062	0.088	0.858	0.21	0.33	0.834	0.293	-0.026	0.093	0.887	-0.067	0.262
SILICON_D_MG_L	0.326	0.113	0.02	-0.861	0.337	-0.082	-0.48	0.327	0.131	0.349	-0.795	0.249	-0.116	-0.429
SILICON_T_MG_L	0.204	0.222	-0.31	-0.815	-0.078	0.641	-0.274	0.243	0.245	0.123	-0.854	0.336	0.13	-0.303
SILVER_D_MG_L	-0.277	0.895	0.242	-0.039	n/a	n/a	n/a	-0.365	0.864	0.24	0.042	n/a	n/a	n/a
SILVER_T_MG_L	-0.218	0.79	0.198	-0.046	-0.276	0.632	-0.03	-0.289	0.762	0.23	0.035	0.182	0.692	0.193
SODIUM_D_MG_L	0.627	0.176	0.001	-0.154	0.667	0.138	-0.577	0.612	0.216	0.074	-0.153	0.649	-0.206	-0.522
SODIUM_T_MG_L	0.634	0.172	0.001	0.118	0.666	0.13	-0.584	0.62	0.214	-0.028	0.112	0.644	-0.231	-0.527
STRONTIUM_D_MG_L	0.518	0.016	0.151	0.164	0.518	-0.08	-0.527	0.519	0.041	0.026	0.184	0.423	-0.043	-0.441
STRONTIUM_T_MG_L	0.518	0.026	0.147	0.163	0.516	-0.052	-0.534	0.519	0.05	0.036	0.187	0.436	-0.076	-0.45
SULFATE__AS_SO4__D_MG_L	0.929	0.157	0.053	0.147	0.94	0.083	0.102	0.912	0.224	0.005	0.16	0.928	-0.124	0.171
THALLIUM_D_MG_L	-0.276	0.797	0.241	-0.022	0.081	0.176	-0.601	-0.356	0.763	0.24	0.062	0.137	0.135	-0.625
THALLIUM_T_MG_L	-0.157	0.506	0.06	-0.004	-0.164	0.782	-0.355	-0.191	0.483	0.135	0.051	0.39	0.383	-0.485
TIN_D_MG_L	-0.281	0.874	0.221	-0.032	0.152	-0.065	-0.093	-0.367	0.843	0.211	0.039	n/a	n/a	n/a
TIN_T_MG_L	-0.271	0.898	0.237	-0.034	0.132	0.32	-0.06	-0.358	0.867	0.234	0.046	n/a	n/a	n/a
TITANIUM_D_MG_L	-0.251	0.584	0.448	0.15	-0.222	-0.12	-0.289	-0.394	0.597	0.198	0.212	-0.253	-0.023	-0.266
TITANIUM_T_MG_L	-0.304	0.64	0.229	0.136	-0.368	0.787	0.203	-0.379	0.608	0.157	0.195	0.201	0.838	0.162
TOTAL_DISSOLVED_SOLIDS__RESIDUE_FILTERABLE__N-	0.939	0.158	0.098	0.158	0.974	0.056	0.055	0.923	0.228	0.04	0.19	0.959	-0.152	0.107
TOTAL_KJELDAHL_NITROGEN_N_MG_L	0.354	0.198	-0.391	0.189	0.494	0.513	0.255	0.384	0.249	-0.365	0.075	0.797	0.103	0.141
TOTAL_ORGANIC_CARBON_T_MG_L	-0.182	0.415	-0.671	0.044	-0.287	0.637	0.161	-0.155	0.478	-0.593	-0.161	0.145	0.611	-0.108
TOTAL_SUSPENDED_SOLIDS_LAB_N_MG_L	-0.198	0.38	-0.801	-0.002	-0.328	0.794	0.202	-0.184	0.475	-0.68	-0.242	0.18	0.718	0.107
TURBIDITY_LAB_N_NTU	-0.198	0.417	-0.799	0.063	-0.371	0.8	0.238	-0.177	0.501	-0.719	-0.181	0.112	0.87	0.136
URANIUM_D_MG_L	0.907	0.19	0.047	0.131	0.922	0.059	0.196	0.887	0.263	0.018	0.153	0.913	-0.084	0.212
URANIUM_T_MG_L	0.908	0.191	0.019	0.129	0.915	0.098	0.188	0.889	0.262	0.005	0.147	0.909	-0.097	0.212
VANADIUM_D_MG_L	-0.267	0.887	0.238	-0.041	0.183	0.249	-0.257	-0.355	0.856	0.239	0.04	0.276	-0.02	-0.557
VANADIUM_T_MG_L	-0.052	0.287	-0.514	0.02	-0.206	0.877	0.008	-0.025	0.315	-0.382	-0.116	0.431	0.582	-0.22
ZINC_D_MG_L	0.139	0.392	-0.12	0.159	0.475	0.397	-0.016	0.108	0.422	-0.15	0.113	0.696	0.086	-0.165
ZINC_T_MG_L	-0.069	0.504	-0.269	-0.006	0.163	0.682	-0.138	-0.093	0.514	-0.133	-0.054	0.52	0.258	-0.279

Notes:

% = percent; $CaCO_3$ = calcium carbonate; "-D-" = dissolved concentration; mg/l = milligrams per litre; ntu = nephelometric turbidity units; PC = principle component; "-T-" = total concentration; µg/l = micrograms per litre.

Different scores were provided for dry weight and survival due to differing datasets resulting from a lab technician error in Q2 2021, see report section 3.3.1.3

n/a = parameter not included in analysis because concentrations were the same in all samples.

PCA scores for each test are provided in Appendix D.

Shaded value = component loading not between -0.8 and 0.8.

Dataset	2015 to 2021 Dataset			2021 Dataset		
Principal Component	**PC1**	**PC2**	**PC3**	**PC1**	**PC2**	**PC3**
Percent of Total Variance Explained	30.3	15.5	6.2	41.2	19.1	6.8
Water Quality Parameter						
ACIDITY_TO_PH_8_3__AS_CACO3__N_MG_L	0.217	0.12	0.138	n/a	n/a	n/a
ALKALINITY_BICARBONATE__AS_CACO3__LAB_MEASURED	0.41	-0.4	0.43	n/a	n/a	n/a
ALKALINITY_CARBONATE__AS_CACO3__LAB_MEASURED	0.384	-0.138	0.01	0.552	-0.164	-0.11
ALKALINITY_HYDROXIDE__AS_CACO3__LAB_MEASURED	-0.095	0.147	-0.115	n/a	n/a	n/a
ALKALINITY_TOTAL__AS_CACO3__LAB_MEASURED	0.833	-0.175	-0.019	0.868	-0.199	0.061
ALUMINUM_D_MG_L	-0.36	0.476	0.225	-0.38	0.664	-0.33
ALUMINUM_T_MG_L	-0.541	0.721	-0.056	-0.635	0.664	0.247
ANTIMONY_D_MG_L	0.686	0.331	-0.093	0.693	0.321	-0.051
ANTIMONY_T_MG_L	0.684	0.416	-0.151	0.674	0.421	-0.012
ARSENIC_D_MG_L	-0.082	0.487	0.319	-0.221	0.385	-0.696
ARSENIC_T_MG_L	-0.127	0.508	0.007	0.023	0.209	0.192
BARIUM_D_MG_L	0.515	-0.088	-0.203	0.663	-0.029	0.026
BARIUM_T_MG_L	0.458	0.041	-0.202	0.562	0.11	0.073
BERYLLIUM_D_MG_L	-0.04	0.007	0.236	n/a	n/a	n/a
BERYLLIUM_T_MG_L	-0.236	0.385	0.155	-0.47	0.613	0.147
BISMUTH_D_MG_L	0.034	0.243	0.479	n/a	n/a	n/a
BISMUTH_T_MG_L	0.007	0.244	0.428	n/a	n/a	n/a
BORON_D_MG_L	0.32	0.234	0.619	0.159	0.122	-0.688
BORON_T_MG_L	0.354	0.222	0.568	0.212	0.142	-0.689
BROMIDE_D_MG_L	0.705	-0.029	0.072	0.809	-0.002	-0.084
CADMIUM_D_MG_L	0.657	0.392	-0.242	0.708	0.438	-0.186
CADMIUM_T_MG_L	0.331	0.733	-0.29	0.304	0.813	-0.021
CALCIUM_D_MG_L	0.633	-0.306	0.356	0.963	-0.003	0.112
CALCIUM_T_MG_L	0.945	0.026	-0.05	0.965	0.044	0.108
CARBON_DISSOLVED_ORGANIC_D_MG_L	-0.355	0.616	-0.097	-0.443	0.64	-0.186
CHLORIDE_D_MG_L	0.743	0.187	0.037	0.758	0.299	-0.309
CHROMIUM_D_MG_L	-0.289	0.01	0.582	-0.256	0.104	-0.595
CHROMIUM_T_MG_L	-0.602	0.678	0.045	-0.664	0.629	0.178
COBALT_D_MG_L	0.283	0.398	0.459	0.273	0.323	-0.199
COBALT_T_MG_L	0.033	0.769	0.273	-0.158	0.783	0.05
CONDUCTIVITY_LAB_N_US_CM	0.934	0.052	-0.082	0.976	0.081	0.083
COPPER_D_MG_L	-0.155	0.159	0.104	-0.072	0.51	-0.569
COPPER_T_MG_L	-0.392	0.729	0.05	-0.461	0.626	0.11
FLUORIDE_D_MG_L	0.273	-0.33	-0.301	0.353	-0.171	0.223
HARDNESS_TOTAL_OR_DISSOLVED_CACO3_N_MG_L	0.954	0.028	-0.063	0.974	0.035	0.089
IRON_D_MG_L	0.023	0.235	0.232	0.162	0.189	-0.166
IRON_T_MG_L	-0.403	0.801	-0.093	-0.49	0.765	0.235
LEAD_D_MG_L	0.038	0.234	0.27	-0.192	0.145	-0.21
LEAD_T_MG_L	-0.445	0.779	-0.051	-0.602	0.713	0.146
LITHIUM_D_MG_L	0.907	0.199	-0.191	0.909	0.24	0.073
LITHIUM_T_MG_L	0.902	0.235	-0.195	0.906	0.267	0.086
MAGNESIUM_D_MG_L	0.816	-0.168	0.238	0.955	0.09	0.083
MAGNESIUM_T_MG_L	0.943	0.078	-0.092	0.963	0.084	0.098
MAJOR_ANION_SUM_N_MEQ_L	0.895	-0.145	0.18	0.972	0.037	0.094
MAJOR_CATION_SUM_N_MEQ_L	0.896	-0.149	0.184	0.972	0.037	0.041
MANGANESE_D_MG_L	0.561	0.487	-0.017	0.592	0.581	-0.021
MANGANESE_T_MG_L	-0.027	0.81	-0.114	-0.073	0.874	0.18
MERCURY_D_MG_L	0.039	-0.035	0.112	n/a	n/a	n/a
MERCURY_T_MG_L	-0.485	0.579	-0.064	-0.642	0.697	0.117
MOLYBDENUM_D_MG_L	0.749	0.118	-0.106	0.746	0.233	-0.195
MOLYBDENUM_T_MG_L	0.636	0.068	-0.106	0.745	0.24	-0.212
NICKEL_D_MG_L	0.738	0.473	0.094	0.724	0.438	-0.122
NICKEL_T_MG_L	0.631	0.68	0.05	0.572	0.68	-0.028
NITRATE_NITROGEN__NO3__AS_N_N_MG_L	0.84	0.272	-0.325	0.824	0.359	0.258
NITRITE_NITROGEN__NO2__AS_N_N_MG_L	0.706	0.282	-0.048	0.719	0.301	0.122
NITROGEN_AMMONIA__AS_N__N_MG_L	0.382	0.133	0.13	0.408	0.323	0.287
ORTHO_PHOSPHATE_N_MG_L	-0.197	0.326	-0.006	-0.155	0.233	-0.444
OXIDATION_REDUCTION_POTENTIAL_LAB_N_MV	0.277	-0.376	0.424	n/a	n/a	n/a
PH_LAB_N_PH_UNITS	0.157	-0.103	-0.212	0.545	-0.283	0.199
PHOSPHORUS_N_MG_L	-0.435	0.634	-0.099	-0.582	0.637	0.131
POTASSIUM_D_MG_L	0.88	0.321	-0.203	0.922	0.289	0.082
POTASSIUM_T_MG_L	0.866	0.424	-0.142	0.883	0.405	0.103
SELENIUM_D_MG_L	0.839	0.174	-0.352	0.857	0.253	0.272
SELENIUM_T_MG_L	0.838	0.171	-0.349	0.853	0.237	0.27
SILICON_D_MG_L	0.447	-0.225	0.433	n/a	n/a	n/a
SILICON_T_MG_L	0.234	0.122	0.505	-0.116	0.581	-0.009
SILVER_D_MG_L	0.07	0.267	0.519	n/a	n/a	n/a
SILVER_T_MG_L	-0.307	0.576	0.054	-0.383	0.551	0.159
SODIUM_D_MG_L	0.716	0.213	0.287	0.679	0.224	-0.484
SODIUM_T_MG_L	0.725	0.241	0.248	0.701	0.214	-0.473
STRONTIUM_D_MG_L	0.513	-0.011	0.405	0.602	-0.044	-0.224

Dataset	2015 to 2021 Dataset			2021 Dataset		
Principal Component	**PC1**	**PC2**	**PC3**	**PC1**	**PC2**	**PC3**
Percent of Total Variance Explained	30.3	15.5	6.2	41.2	19.1	6.8
Water Quality Parameter						
STRONTIUM_T_MG_L	0.509	0.006	0.398	0.589	-0.016	-0.219
SULFATE__AS_SO4__D_MG_L	0.928	0.1	-0.113	0.938	0.126	0.127
THALLIUM_D_MG_L	0.316	0.26	0.548	n/a	n/a	n/a
THALLIUM_T_MG_L	-0.008	0.341	-0.12	n/a	n/a	n/a
TIN_D_MG_L	0.064	0.225	0.268	n/a	n/a	n/a
TIN_T_MG_L	0.002	0.281	0.237	0.125	0.451	-0.141
TITANIUM_D_MG_L	-0.15	-0.041	0.066	-0.292	-0.194	-0.417
TITANIUM_T_MG_L	-0.28	0.164	0.091	-0.599	0.678	0.175
TOTAL_DISSOLVED_SOLIDS__RESIDUE_FILTERABLE__N-	0.959	0.071	-0.071	0.972	0.09	0.089
TOTAL_KJELDAHL_NITROGEN_N_MG_L	0.038	0.564	-0.16	0.316	0.581	0.27
TOTAL_ORGANIC_CARBON_T_MG_L	-0.288	0.561	-0.147	-0.48	0.681	-0.099
TOTAL_SUSPENDED_SOLIDS_LAB_N_MG_L	-0.416	0.757	-0.104	-0.493	0.745	0.291
TURBIDITY_LAB_N_NTU	-0.433	0.798	-0.075	-0.565	0.742	0.243
URANIUM_D_MG_L	0.906	0.057	-0.147	0.925	0.088	0.184
URANIUM_T_MG_L	0.901	0.084	-0.148	0.918	0.122	0.19
VANADIUM_D_MG_L	0.174	0.31	0.213	n/a	n/a	n/a
VANADIUM_T_MG_L	-0.363	0.796	-0.081	-0.454	0.758	0.165
ZINC_D_MG_L	0.392	0.336	-0.033	0.442	0.487	-0.317
ZINC_T_MG_L	0.071	0.663	0.054	-0.049	0.625	-0.505

Notes:

% = percent; $CaCO_3$ = calcium carbonate; "-D-" = dissolved concentration; mg/l = milligrams per litre; ntu = nephelometric turbidity units; PC = principle component; "-T-" = total concentration; µg/l = micrograms per litre.

n/a = parameter not included in analysis because concentrations were the same in all samples.

PCA scores for each test are provided in Appendix D.

Shaded value = component loading not between -0.8 and 0.8.

Dataset	2015 to 2021 Dataset				2021 Dataset		
Principal Component	**PC1**	**PC2**	**PC3**	**PC4**	**PC1**	**PC2**	**PC3**
Percent of Total Variance Explained	27.6	23.1	7.4	6.0	38.1	14.6	7.7
Water Quality Parameter							
ACIDITY_TO_PH_8_3__AS_CACO3__N_MG_L	0.039	0.251	-0.117	0.177	0.051	-0.264	0.147
ALKALINITY_BICARBONATE__AS_CACO3__LAB_MEASURED	0.318	0.214	-0.684	0.588	0.752	-0.344	0.198
ALKALINITY_CARBONATE__AS_CACO3__LAB_MEASURED	-0.088	0.249	-0.244	0.374	0.058	0.07	0.614
ALKALINITY_HYDROXIDE__AS_CACO3__LAB_MEASURED	0.496	-0.268	0.05	-0.024	n/a	n/a	n/a
ALKALINITY_TOTAL__AS_CACO3__LAB_MEASURED	0.465	0.704	-0.084	-0.233	0.768	-0.37	0.348
ALUMINUM_D_MG_L	0.648	-0.346	0.026	-0.03	0.115	0.605	-0.452
ALUMINUM_T_MG_L	-0.154	0.202	0.538	0.591	0.099	0.836	0.252
ANTIMONY_D_MG_L	0.561	-0.46	0.198	0.162	0.773	0.376	-0.206
ANTIMONY_T_MG_L	0.482	-0.432	0.247	0.175	0.757	0.38	-0.248
ARSENIC_D_MG_L	0.345	-0.082	-0.017	-0.02	0.25	0.277	-0.589
ARSENIC_T_MG_L	-0.128	0.18	0.425	0.408	0.191	0.623	-0.419
BARIUM_D_MG_L	0.245	0.344	-0.022	-0.133	0.537	0.231	-0.348
BARIUM_T_MG_L	0.24	0.374	0.016	-0.094	0.547	0.278	-0.342
BERYLLIUM_D_MG_L	0.847	-0.456	0.03	0.004	-0.147	-0.058	0.067
BERYLLIUM_T_MG_L	0.845	-0.455	0.046	0.016	-0.032	0.172	0.296
BISMUTH_D_MG_L	0.849	-0.454	0.029	0	n/a	n/a	n/a
BISMUTH_T_MG_L	0.849	-0.454	0.028	-0.001	n/a	n/a	n/a
BORON_D_MG_L	0.563	-0.464	0.125	0.081	0.333	-0.426	-0.261
BORON_T_MG_L	0.567	-0.447	0.127	0.08	0.447	-0.385	-0.249
BROMIDE_D_MG_L	0.78	-0.139	0.084	-0.101	0.799	-0.151	-0.105
CADMIUM_D_MG_L	0.441	0.618	0.176	0.147	0.828	0.086	0.026
CADMIUM_T_MG_L	0.332	0.633	0.314	0.228	0.786	0.25	0.065
CALCIUM_D_MG_L	0.462	0.314	-0.629	0.523	0.952	-0.179	0.068
CALCIUM_T_MG_L	0.508	0.797	0.037	-0.218	0.95	-0.195	0.077
CARBON_DISSOLVED_ORGANIC_D_MG_L	-0.408	0.282	0.446	0.44	-0.208	0.637	0.25
CHLORIDE_D_MG_L	0.515	0.637	-0.028	-0.15	0.791	-0.227	-0.258
CHROMIUM_D_MG_L	0.044	-0.145	-0.023	0.043	-0.444	-0.213	-0.288
CHROMIUM_T_MG_L	-0.304	-0.109	0.447	0.414	-0.228	0.621	0.149
COBALT_D_MG_L	0.705	-0.479	0.142	0.07	0.55	0.163	-0.176
COBALT_T_MG_L	0.627	-0.432	0.176	0.072	0.608	0.233	-0.123
CONDUCTIVITY_LAB_N_US_CM	0.429	0.826	0.045	-0.198	0.961	-0.171	0.124
COPPER_D_MG_L	0.332	-0.221	0.014	-0.029	0.29	0.061	0.177
COPPER_T_MG_L	0.664	-0.41	0.057	0.078	0.258	0.561	0.447
FLUORIDE_D_MG_L	0.156	0.109	-0.181	-0.07	-0.009	-0.25	0.572
HARDNESS_TOTAL_OR_DISSOLVED_CACO3_N_MG_L	0.504	0.8	0.058	-0.2	0.951	-0.187	0.14
IRON_D_MG_L	0.706	-0.479	0.028	-0.004	-0.083	0.431	0.021
IRON_T_MG_L	0.071	0.102	0.572	0.568	0.308	0.734	0.377
LEAD_D_MG_L	0.826	-0.455	0.039	0.007	0.068	-0.199	0.159
LEAD_T_MG_L	0.694	-0.359	0.089	0.039	0.325	0.574	0.122
LITHIUM_D_MG_L	0.479	0.816	0.095	-0.107	0.943	-0.122	0.157
LITHIUM_T_MG_L	0.477	0.819	0.096	-0.099	0.945	-0.116	0.151
MAGNESIUM_D_MG_L	0.516	0.461	-0.548	0.442	0.926	-0.199	0.207
MAGNESIUM_T_MG_L	0.494	0.806	0.078	-0.183	0.948	-0.159	0.175
MAJOR_ANION_SUM_N_MEQ_L	0.546	0.547	-0.491	0.356	0.951	-0.189	0.136
MAJOR_CATION_SUM_N_MEQ_L	0.548	0.552	-0.48	0.352	0.945	-0.199	0.128
MANGANESE_D_MG_L	0.528	0.254	0.346	0.144	0.773	0.288	0.049
MANGANESE_T_MG_L	0.183	0.576	0.452	0.224	0.644	0.387	0.129
MERCURY_D_MG_L	0.846	-0.455	0.022	0.003	n/a	n/a	n/a
MERCURY_T_MG_L	0.655	-0.317	0.02	-0.081	0.111	0.84	-0.201
MOLYBDENUM_D_MG_L	0.44	0.553	0.053	-0.009	0.671	0.225	-0.156
MOLYBDENUM_T_MG_L	0.338	0.512	-0.023	-0.046	0.675	0.216	-0.172
NICKEL_D_MG_L	0.589	-0.057	0.341	0.078	0.847	0.027	-0.149
NICKEL_T_MG_L	0.583	0.013	0.359	0.081	0.871	0.086	-0.132
NITRATE_NITROGEN__NO3__AS_N_N_MG_L	0.457	0.786	0.137	-0.082	0.904	0.057	0.12
NITRITE_NITROGEN__NO2__AS_N_N_MG_L	0.519	-0.007	0.326	0.137	0.827	0.374	-0.134
NITROGEN_AMMONIA__AS_N__N_MG_L	0.29	0.246	-0.007	0.162	0.358	0.287	0.067
ORTHO_PHOSPHATE_N_MG_L	0.326	-0.254	-0.004	0.079	-0.114	0.365	-0.597
OXIDATION_REDUCTION_POTENTIAL_LAB_N_MV	0.361	0.101	-0.677	0.603	-0.097	-0.159	0.339
PH_LAB_N_PH_UNITS	-0.038	-0.199	0.174	-0.041	-0.087	0.282	0.698
PHOSPHORUS_N_MG_L	-0.334	0.145	0.453	0.447	-0.046	0.808	0.036
POTASSIUM_D_MG_L	0.398	0.793	0.149	-0.07	0.975	0.039	0.053
POTASSIUM_T_MG_L	0.441	0.842	0.206	-0.051	0.975	0.07	0.043
SELENIUM_D_MG_L	0.451	0.77	0.106	-0.067	0.883	0.034	0.291
SELENIUM_T_MG_L	0.45	0.77	0.107	-0.069	0.882	0.037	0.286
SILICON_D_MG_L	0.425	0.217	-0.652	0.524	0.41	-0.037	-0.245
SILICON_T_MG_L	0.404	0.23	-0.563	0.631	0.471	0.281	-0.14
SILVER_D_MG_L	0.849	-0.453	0.029	-0.001	n/a	n/a	n/a
SILVER_T_MG_L	0.801	-0.476	0.045	0.012	-0.192	0.641	-0.082
SODIUM_D_MG_L	0.462	0.477	-0.234	0.005	0.646	-0.444	-0.398
SODIUM_T_MG_L	0.416	0.506	-0.008	-0.18	0.645	-0.438	-0.41
STRONTIUM_D_MG_L	0.367	0.295	-0.065	-0.3	0.42	-0.574	-0.356

Dataset	2015 to 2021 Dataset				2021 Dataset		
Principal Component	**PC1**	**PC2**	**PC3**	**PC4**	**PC1**	**PC2**	**PC3**
Percent of Total Variance Explained	27.6	23.1	7.4	6.0	38.1	14.6	7.7
Water Quality Parameter							
STRONTIUM_T_MG_L	0.361	0.307	-0.07	-0.306	0.429	-0.578	-0.367
SULFATE__AS_SO4__D_MG_L	0.508	0.782	0.081	-0.195	0.922	-0.18	0.169
THALLIUM_D_MG_L	0.691	-0.518	0.054	0.055	0.342	0.066	-0.464
THALLIUM_T_MG_L	0.686	-0.485	0.07	0.059	0.39	0.48	-0.272
TIN_D_MG_L	0.797	-0.42	0.035	0.019	n/a	n/a	n/a
TIN_T_MG_L	0.759	-0.445	0.056	0.018	n/a	n/a	n/a
TITANIUM_D_MG_L	0.714	-0.481	0.073	-0.162	0.328	-0.059	-0.332
TITANIUM_T_MG_L	0.743	-0.472	0.1	-0.101	0.359	0.319	-0.099
TOTAL_DISSOLVED_SOLIDS__RESIDUE_FILTERABLE__N-	0.513	0.799	0.071	-0.202	0.964	-0.138	0.111
TOTAL_KJELDAHL_NITROGEN_N_MG_L	0.154	0.428	0.254	-0.01	0.486	-0.205	0.207
TOTAL_ORGANIC_CARBON_T_MG_L	-0.363	0.328	0.481	0.455	-0.143	0.654	0.317
TOTAL_SUSPENDED_SOLIDS_LAB_N_MG_L	-0.178	0.28	0.539	0.505	0.248	0.617	0.168
TURBIDITY_LAB_N_NTU	-0.225	0.374	0.573	0.477	0.18	0.826	0.304
URANIUM_D_MG_L	0.512	0.763	0.074	-0.177	0.899	-0.194	0.243
URANIUM_T_MG_L	0.515	0.762	0.079	-0.173	0.9	-0.188	0.24
VANADIUM_D_MG_L	0.831	-0.458	0.026	-0.004	0.226	0.467	-0.604
VANADIUM_T_MG_L	0.671	-0.381	0.062	0.042	0.315	0.829	-0.205
ZINC_D_MG_L	0.288	0.044	0.199	-0.054	0.633	0.054	-0.083
ZINC_T_MG_L	0.507	-0.381	0.157	0.156	0.626	0.214	0.035

Notes:

% = percent; $CaCO_3$ = calcium carbonate; "-D-" = dissolved concentration; mg/l = milligrams per litre; ntu = nephelometric turbidity units; PC = principle component; "-T-" = total concentration; µg/l = micrograms per litre.

n/a = parameter not included in analysis because concentrations were the same in all samples.

PCA scores for each test are provided in Appendix D.

Shaded value = component loading not between -0.8 and 0.8.

APPENDIX F

Spearman Rank Correlation Analyses

Parameter	Reproduction R_s[1]		Is parameter greater than the chronic WQG or lowest L1 benchmark from EVWQP in at least one test categorized as possible or likely?[2]	Retain Parameter for Graphical Analysis?[3]
	2015 to 2021 Dataset	2021 Dataset		
ACIDITY TO pH 8.3 (As CaCO3)-N-mg/l	-0.018	-0.047	-	-
ALKALINITY BICARBONATE (As CaCO3)-N-mg/l	**-0.26**	**-0.496**	No WQG	No - parameter assessed as TDS/MIT
ALKALINITY CARBONATE (As CaCO3)-N-mg/l	-0.113	**-0.404**	No WQG	No - parameter assessed as TDS/MIT
ALKALINITY HYDROXIDE (As CaCO3)-N-mg/l	-0.0135	-	-	-
ALKALINITY TOTAL (As CaCO3)-N-mg/l	**-0.311**	**-0.506**	No WQG	No - parameter assessed as TDS/MIT
ALUMINUM-D-mg/l	-0.038	0.331	-	-
ANTIMONY-T-mg/l	**-0.36**	**-0.501**	No	No
ARSENIC-T-mg/l	-0.1	0.238	-	-
BARIUM-T-mg/l	-0.11	**-0.403**	No	No
BERYLLIUM-T-mg/l	0.129	0.324	-	-
BISMUTH-T-mg/l	0.021	-0.080	-	-
BORON-T-mg/l	**-0.262**	**-0.455**	No	No
BROMIDE-D-mg/l	**-0.204**	**-0.477**	No WQG	Low detection frequency[4]
CADMIUM-D-mg/l	**-0.271**	**-0.460**	No	No
CALCIUM-T-mg/l	**-0.368**	**-0.639**	No WQG	No - parameter assessed as TDS/MIT
CARBON DISSOLVED ORGANIC-D-mg/l	-0.058	0.147	-	-
CHLORIDE-D-mg/l	**-0.235**	**-0.424**	No	No
CHROMIUM-T-mg/l	0.085	0.455	-	-
COBALT-T-mg/l	**-0.343**	-0.056	No	No
CONDUCTIVITY LAB-N-us/cm	**-0.395**	**-0.625**	No WQG	No - parameter assessed as TDS/MIT
COPPER-D-mg/l	-0.066	-0.025	-	-
FLUORIDE-D-mg/l	0.018	-0.006	-	-
Hardness Total or Dissolved CaCO3-N-mg/l	**-0.3707**	**-0.629**	No WQG	No - parameter assessed as TDS/MIT
IRON-D-mg/l	**-0.154**	-0.153	No	No
IRON-T-mg/l	-0.122	0.191	-	-
LEAD-T-mg/l	-0.076	0.340	-	-
LITHIUM-T-mg/l	**-0.38**	**-0.606**	No	No
MAGNESIUM-T-mg/l	**-0.3682**	**-0.618**	No WQG	No - parameter assessed as TDS/MIT
MAJOR ANION SUM-N-meq/l	**-0.345**	**-0.616**	No WQG	No - parameter assessed as TDS/MIT
MAJOR CATION SUM-N-meq/l	**-0.343**	**-0.632**	No WQG	No - parameter assessed as TDS/MIT
MANGANESE-T-mg/l	**-0.2508**	0.016	No	No
MERCURY-T-mg/l	0.09	0.246	-	-
MOLYBDENUM-T-mg/l	**-0.302**	**-0.451**	No	No
NICKEL-T-mg/l	**-0.416**	**-0.437**	Yes	Yes
NITRATE NITROGEN (NO3) AS N-N-mg/l	**-0.351**	**-0.534**	Yes	Yes
NITRITE NITROGEN (NO2) AS N-N-mg/l	**-0.361**	**-0.510**	Yes	Yes
NITROGEN AMMONIA (AS N)-N-mg/l	-0.12076	0.054	-	-
ORTHO-PHOSPHATE-N-mg/l	0.072	0.126	-	-
OXIDATION-REDUCTION POTENTIAL LAB-N-mv	-0.088	-0.196	-	-
PHOSPHORUS-N-mg/l	-0.001	0.355	-	-
POTASSIUM-T-mg/l	**-0.405**	**-0.636**	No WQG	No - parameter assessed as TDS/MIT
SELENIUM-T-mg/l	**-0.31**	**-0.512**	Yes	Yes
SILICON-T-mg/l	-0.1	0.257	-	-
SILVER-T-mg/l	-0.067	0.146	-	-
SODIUM-T-mg/l	**-0.284**	**-0.385**	No WQG	No - parameter assessed as TDS/MIT
STRONTIUM-D-mg/l	**-0.247**	**-0.356**	No	No
SULFATE (AS SO4)-D-mg/l	**-0.394**	**-0.615**	No	No
THALLIUM-T-mg/l	**-0.324**	-0.059	No	No
TIN-T-mg/l	-0.032	-0.010	-	-
TITANIUM-T-mg/l	0.004	0.310	-	-
TOTAL DISSOLVED SOLIDS-N-mg/l	**-0.387**	**-0.627**	No WQG	Yes
TOTAL KJELDAHL NITROGEN-N-mg/l	**-0.1473**	0.099	No WQG	Yes
TOTAL ORGANIC CARBON-T-mg/l	-0.08	0.262	-	-
TOTAL SUSPENDED SOLIDS LAB-N-mg/l	-0.07	0.281	-	-
TURBIDITY LAB-N-ntu	-0.1112	0.283	-	-
URANIUM-T-mg/l	**-0.381**	**-0.638**	No	No
VANADIUM-T-mg/l	-0.042	0.298	-	-
ZINC-T-mg/l	**-0.205**	-0.048	No	No
∑TU-WQGs	**-0.408**	**-0.576**	No WQG	Yes
∑TU-WQGs/Benchmarks	**-0.410**	**-0.465**	No WQG	Yes
PC1_allyears	**-0.423**	-	No WQG	Yes
PC2_allyears	**-0.146**	-	No WQG	Yes
PC3_allyears	-0.059	-	-	-
PC1_2021	-	**-0.653**	No WQG	Yes
PC2_2021	-	-0.157	-	-
PC3_2021	-	-0.062	-	-

Notes:

(1) Statistical significance is based on one-tailed comparisons. Significant negative correlations for combined dataset ($\alpha < 0.005$; $r_s < -0.131$) and 2021 dataset ($\alpha < 0.005$; $r_s < -0.286$) are bolded. Strong negative correlations ($r_s < -0.6$) are shaded. - = r_s could not be calculated because parameter concentration was the same in all tests or parameter was not applicable to the dataset.

(2) Parameters are screened against WQGs in Appendix C.

(3) Parameters were retained for graphical analysis if they met one of the following conditions: 1) significant negative correlation and concentration was greater than the chronic BC WQG, or 1) significant negative correlation and there is no chronic BC WQG.

(4) Out of 80 tests in 2021, bromide was only detected once and was not detected in any test with possible or likely adverse effects.

% = percent; $CaCO_3$ = calcium carbonate; "-D-" = dissolved concentration; mg/l = milligrams per litre; "-T-" = total concentration; µg/l = micrograms per litre; WQG = water quality guideline; EVWQP: Elk Valley Water Quality Plan; MIT: Multi-Ion Toxicity.

Parameter	Cell Yield R_s[1]		Is parameter greater than the chronic WQG or lowest L1 benchmark from EVWQP in at least one test categorized as possible or likely?[2]	Retain Parameter for Graphical Analysis?[3]
	2015 to 2021 Dataset	2021 Dataset		
ACIDITY TO pH 8.3 (as CaCO3)-N-mg/l	**-0.45**	-0.128	No WQG	Yes
ALKALINITY BICARBONATE (As CaCO3)-N-mg/l	**-0.36**	-0.015	No WQG	No - assess as TDS
ALKALINITY CARBONATE (As CaCO3)-N-mg/l	0.049	0.068	-	-
ALKALINITY HYDROXIDE (As CaCO3)-N-mg/l	0.0259	-	-	-
ALKALINITY TOTAL (As CaCO3)-N-mg/l	**-0.155**	-0.054	No	No
ALUMINUM-D-mg/l	0.238	-0.134	-	-
ANTIMONY-T-mg/l	-0.06	**-0.345**	No	No
ARSENIC-T-mg/l	0.07	**-0.332**	No	No
BARIUM-T-mg/l	0.01	0.006	-	-
BERYLLIUM-T-mg/l	0.023	-0.326	-	-
BISMUTH-T-mg/l	-0.079	-0.064	-	-
BORON-T-mg/l	**-0.16**	-0.045	No	No
BROMIDE-D-mg/l	-0.094	-0.083	-	-
CADMIUM--D-mg/l	-0.127	**-0.332**	No	No
CALCIUM-T-mg/l	**-0.182**	-0.151	No WQG	No - assess as TDS
CARBON DISSOLVED ORGANIC-D-mg/l	-0.022	**-0.379**	No WQG	Yes
CHLORIDE-D-mg/l	-0.089	-0.155	-	-
CHROMIUM-T-mg/l	0.108	-0.219	-	-
COBALT-T-mg/l	**-0.144**	**-0.433**	No	No
CONDUCTIVITY LAB-N-us/cm	**-0.158**	-0.146	No WQG	No - assess as TDS
COPPER-D-mg/l	0.111	**-0.333**	No	No
FLUORIDE-D-mg/l	-0.023	0.103	-	-
Hardness Total or Dissolved CaCO3-N-mg/l	**-0.1547**	-0.096	No WQG	No - assess as TDS
IRON-D-mg/l	0.003	-0.133	-	-
IRON-T-mg/l	0.046	**-0.592**	No	No
LEAD-T-mg/l	0.03	**-0.432**	No	No
LITHIUM-T-mg/l	**-0.19**	-0.225	No	No
MAGNESIUM-T-mg/l	**-0.1653**	-0.147	No WQG	No - assess as TDS
MANGANESE-T-mg/l	-0.0857	**-0.573**	No	No
MERCURY-T-mg/l	0.15	**-0.534**	No	No
MOLYBDENUM-T-mg/l	-0.136	-0.021	-	-
NICKEL-T-mg/l	**-0.154**	**-0.467**	Yes	Yes
NITRATE NITROGEN (NO3) AS N-N-mg/l	**-0.154**	-0.253	Yes	Yes
NITRITE NITROGEN (NO2) AS N-N-mg/l	-0.0879	-0.113	-	-
NITROGEN AMMONIA (AS N)-N-mg/l	**-0.15325**	-0.044	No	No
ORTHO-PHOSPHATE-N-mg/l	0.071	0.140	-	-
OXIDATION-REDUCTION POTENTIAL LAB-N-mv	**-0.398**	0.242	No WQG	No - not a direct toxicant[4]
PHOSPHORUS-N-mg/l	0.041	-0.288	-	-
POTASSIUM-T-mg/l	**-0.169**	-0.293	No WQG	No - assess as TDS
SELENIUM-T-mg/l	**-0.15**	-0.229	Yes	Yes
SILICON-T-mg/l	**-0.32**	-0.294	No WQG	Yes
SILVER-T-mg/l	-0.054	-0.254	-	-
SODIUM-T-mg/l	-0.122	-0.145	-	-
STRONTIUM-D-mg/l	-0.072	0.083	-	-
SULFATE (AS SO4)-D-mg/l	-0.137	-0.130	-	-
THALLIUM-T-mg/l	-0.10	**-0.403**	No	No
TIN-T-mg/l	-0.094	-	-	-
TITANIUM-T-mg/l	0.293	-0.325	-	-
TOTAL DISSOLVED SOLIDS-N-mg/l	**-0.158**	-0.157	No WQG	Yes
TOTAL KJELDAHL NITROGEN-N-mg/l	-0.0235	-0.311	-	-
TOTAL ORGANIC CARBON-T-mg/l	0.0	**-0.443**	No WQG	Yes
TOTAL SUSPENDED SOLIDS LAB-N-mg/l	0.06	**-0.512**	No WQG	Yes
TURBIDITY LAB-N-ntu	0.0859	**-0.523**	No WQG	Yes
URANIUM-T-mg/l	**-0.186**	-0.181	Yes	Yes
VANADIUM-T-mg/l	-0.026	**-0.408**	No	No
ZINC-T-mg/l	**-0.198**	**-0.508**	No	No
∑TU-WQGs	**-0.296**	-0.310	No WQG	Yes
∑TU-WQGs/Benchmarks	**-0.251**	**-0.361**	No WQG	Yes
PC1_allyears	**-0.220**	-	No WQG	Yes
PC2_allyears	0.064	-	-	-
PC1_2021	-	-0.119	-	-
PC2_2021	-	**-0.560**	No WQG	Yes

Notes:

(1) Statistical significance is based on one-tailed comparisons. Significant negative correlations for combined dataset ($\alpha < 0.005$; $r_s < -0.137$) and 2021 dataset ($\alpha < 0.005$; $r_s < -0.33$) are bolded. "-" = r_s could not be calculated because parameter concentration was the same in all tests or parameter was not applicable to the dataset.

(2) Parameters are screened against WQGs in Appendix C.

(3) Parameters were retained for graphical analysis if they met one of the following conditions: 1) significant negative correlation and concentration was greater than the chronic BC WQG, or 1) significant negative correlation and there is no chronic BC WQG.

(4) Oxidation-reduction potential is not a direct toxicant to aquatic life but refers to the tendency of a water body to undergo oxidizing or reducing process upon introduction of a new substance (US EPA 2017b), and therefore was not expected to explain observed toxicity.

% = percent; $CaCO_3$ = calcium carbonate; "-D-" = dissolved concentration; mg/l = milligrams per litre; "-T-" = total concentration; µg/l = micrograms per litre; WQG = water quality guideline; EVWQP: Elk Valley Water Quality Plan.

Parameter	Survival Rs[1]		Dry Weight R_s[1]		Is parameter greater than the chronic WQG or lowest L1 benchmark from EVWQP in at least one test categorized as possible or likely?[2]		Retain Parameter for Graphical Analysis?[3]	
ACIDITY TO pH 8.3 (As CaCO3)-N-mg/l	0.224	0.007	-0.049	-0.096	-	-	-	-
ALKALINITY BICARBONATE (As CaCO3)-N-mg/l	-0.085	0.067	-0.12	0.0065	-	-	-	-
ALKALINITY CARBONATE (As CaCO3)-N-mg/l	0.161	0.033	0.14	-0.021	-	-	-	-
ALKALINITY HYDROXIDE (As CaCO3)-N-mg/l	-0.043	-	0.018	-	-	-	-	-
ALKALINITY TOTAL (As CaCO3)-N-mg/l	-0.153	0.087	**-0.2**	0.0065	-	No WQG	-	No - parameter assessed as TDS
ALUMINUM-D-mg/l	-0.096	0.086	-0.0073	-0.034	-	-	-	-
ANTIMONY-T-mg/l	-0.11	-0.124	**-0.22**	-0.13	-	No	-	No
ARSENIC-T-mg/l	0.05	-0.039	-0.1	-0.3	-	-	-	-
BARIUM-T-mg/l	-0.09	-0.029	-0.082	-0.045	-	-	-	-
BERYLLIUM-T-mg/l	0.069	0.032	-0.082	-0.36	-	-	-	-
BISMUTH-T-mg/l	-0.049	0.020	-0.086	-	-	-	-	-
BORON-T-mg/l	-0.158	-0.004	**-0.23**	-0.12	-	No	-	No
BROMIDE-D-mg/l	-0.06	0.053	-0.11	0.033	-	-	-	-
CADMIUM-D-mg/l	0.037	0.022	-0.099	-0.13	-	-	-	-
CALCIUM-T-mg/l	**-0.196**	0.048	**-0.27**	-0.063	No WQG	No WQG	No - assessed as TDS	No - assessed as TDS
CARBON DISSOLVED ORGANIC-D-mg/l	0.331	-0.106	0.053	**-0.55**	-	No WQG	-	Yes
CHLORIDE-D-mg/l	**-0.194**	0.045	**-0.3**	-0.12	No	No	No	No
CHROMIUM-T-mg/l	0.037	0.008	-0.12	-0.24	-	-		-
COBALT-T-mg/l	-0.047	-0.057	**-0.24**	-0.17	-	No	-	No
CONDUCTIVITY LAB-N-us/cm	**-0.188**	0.045	**-0.26**	-0.05	No WQG	No WQG	No - assessed as TDS	No - assessed as TDS
COPPER-D-mg/l	**-0.184**	0.080	-0.048	-0.17	No	-	No	-
FLUORIDE-D-mg/l	0.099	0.115	0.033	-0.27	-	-	-	-
Hardness Total or Dissolved CaCO3-N-mg/l	**-0.1908**	0.041	**-0.25**	-0.038	No WQG	No WQG	No - assessed as TDS	No - assessed as TDS
IRON-D-mg/l	0.052	-0.008	0.026	-0.073	-	-	-	-
IRON-T-mg/l	0.241	-0.023	0.055	-0.28	-	-	-	-
LEAD-T-mg/l	0.206	0.045	-0.025	**-0.49**	-	No	-	No
LITHIUM-T-mg/l	-0.05	-0.003	-0.16	-0.081	-	-	-	-
MAGNESIUM-T-mg/l	-0.1729	0.062	**-0.24**	-0.021	-	No WQG	-	No - assessed as TDS
MAJOR ANION SUM-N-meq/l	-0.1054	0.049	-0.16	-0.051	-	-	-	-
MAJOR CATION SUM-N-meq/l	-0.12	0.039	-0.16	-0.043	-	-	-	-
MANGANESE-T-mg/l	0.1102	-0.037	-0.086	-0.16	-	-	-	-
MERCURY-T-mg/l	0.16	-0.087	0.0047	**-0.61**	-	No	-	No
MOLYBDENUM-T-mg/l	**-0.182**	-0.140	**-0.27**	-0.13	No	No	No	No
NICKEL-T-mg/l	-0.141	-0.076	**-0.24**	-0.11	-	Yes	-	Yes
NITRATE NITROGEN (NO3) AS N-N-mg/l	-0.075	-0.032	**-0.19**	-0.16	-	Yes	-	Yes
NITRITE NITROGEN (NO2) AS N-N-mg/l	-0.1082	-0.171	**-0.28**	-0.18	-	Yes	-	Yes
NITROGEN AMMONIA (AS N)-N-mg/l	-0.13817	-0.155	**-0.24**	-0.24	-	No	-	No
ORTHO-PHOSPHATE-N-mg/l	0.129	0.235	0.17	0.32	-	-	-	-
OXIDATION-REDUCTION POTENTIAL LAB-N-mv	0.189	0.219	0.086	0.66	-	-	-	-
pH LAB-N-ph units	0.03	-0.099	0.17	-0.0048	-	-	-	-
PHOSPHORUS-N-mg/l	0.118	-0.086	0.028	-0.32	-	-	-	-
POTASSIUM-T-mg/l	-0.123	-0.068	**-0.22**	-0.13	-	No WQG	-	No - assessed as TDS
SELENIUM-T-mg/l	-0.05	0.062	-0.13	-0.068	-	-	-	-
SILICON-T-mg/l	0.02	-0.075	-0.0084	-0.28	-	-	-	-
SILVER-T-mg/l	0.124	-0.054	0.0025	**-0.46**	-	No	-	No
SODIUM-T-mg/l	**-0.213**	0.053	**-0.25**	0.02	No WQG	No WQG	No - assessed as TDS	No - assessed as TDS
STRONTIUM-D-mg/l	**-0.279**	-0.091	**-0.33**	0.02	No	No	No	No
SULFATE (AS SO4)-D-mg/l	**-0.204**	0.043	**-0.27**	-0.041	No	No	No	No
THALLIUM-T-mg/l	0.06	-0.013	-0.15	-0.26	-	-	-	-
TIN-T-mg/l	0.024	-0.122	-0.093	-0.093	-	-	-	-
TITANIUM-T-mg/l	**-0.303**	-0.006	-0.13	**-0.39**	No	No	No	No
TOTAL DISSOLVED SOLIDS-N-mg/l	**-0.194**	0.048	**-0.26**	-0.066	No WQG	No WQG	Yes	Yes
TOTAL KJELDAHL NITROGEN-N-mg/l	0.0934	-0.053	-0.096	-0.11	-	-	-	-
TOTAL ORGANIC CARBON-T-mg/l	0.32	-0.077	0.092	**-0.58**	-	No WQG	-	Yes
TOTAL SUSPENDED SOLIDS LAB-N-mg/l	0.24	-0.111	0.04	**-0.46**	-	No WQG	-	Yes
TURBIDITY LAB-N-ntu	0.1168	-0.190	-0.14	**-0.64**	-	No WQG	-	Yes
URANIUM-T-mg/l	-0.139	0.056	**-0.24**	-0.063	-	No	-	No
VANADIUM-T-mg/l	0.141	-0.034	-0.069	**-0.46**	-	No	-	No
ZINC-T-mg/l	0.102	0.117	0.02	-0.13	-	-	-	-
∑TU-WQGs	-0.087	-0.062	**-0.24**	-0.18	-	No WQG	-	Yes
∑TU-WQGs/Benchmarks	-0.088	-0.083	**-0.26**	-0.2	-	No WQG	-	Yes
PC1_allyrs	-0.143	-	**-0.23**	-	-	No WQG	-	Yes
PC2_allyrs	-0.030	-	**-0.20**	-	-	No WQG	-	Yes
PC3_allyrs	**-0.233**	-	0.014	-	No WQG	-	Yes	-
PC4_allyrs	-0.107	-	**-0.22**	-	-	No WQG	-	Yes
PC1_2021	-	0.014	-	-0.162	-	-	-	-
PC2_2021	-	-0.036	-	**-0.5**	-	No WQG	-	Yes
PC3_2021	-	-0.007	-	-0.01	-	-	-	-

Notes:

(1) Statistical significance is based on one-tailed comparisons. Significant negative correlations for the combined survival combined dataset ($\alpha < 0.005$; $r_s < -0.177$); combined dry weight dataset ($\alpha < 0.005$; $r_s < -0.185$); 2021 survival dataset ($\alpha < 0.005$; $r_s < -0.317$) and 2021 dry weight dataset ($\alpha < 0.005$; $r_s < -0.38$) are bolded. Strong negative correlations ($r_s < -0.6$) are shaded. - = r_s could not be calculated because parameter concentration was the same in all tests or parameter was not applicable to the dataset.

(2) Parameters are screened against WQGs in Appendix C.

(3) Parameters were retained for graphical analysis if they met one of the following conditions: 1) significant negative correlation and concentration was greater than the chronic BC WQG, or 1) significant negative correlation and there is no chronic BC WQG.

% = percent; $CaCO_3$ = calcium carbonate; "-D-" = dissolved concentration; mg/l = milligrams per litre; "-T-" = total concentration; µg/l = micrograms per litre; WQG = water quality guideline; EVWQP: Elk Valley Water Quality Plan; MIT: Multi-Ion Toxicity.

Parameter	Survival R_s[1]		Is parameter greater than the chronic WQG or lowest L1 benchmark from EVWQP in at least one test categorized as possible or likely?[2]	Retain Parameter for Graphical Analysis?[3]
	2015 to 2021 Dataset	2021 Dataset		
Mean Survival (Control Normalized)	1	1	-	-
ACIDITY TO pH 8.3 (As CaCO3)-N-mg/l	0.241	-0.011	-	-
ALKALINITY BICARBONATE (As CaCO3)-N-mg/l	**-0.328**	-0.053	No WQG	No - parameter assessed as TDS
ALKALINITY CARBONATE (As CaCO3)-N-mg/l	-0.195	-0.165	-	-
ALKALINITY HYDROXIDE (As CaCO3)-N-mg/l	0.1046	-	-	-
ALKALINITY TOTAL (As CaCO3)-N-mg/l	**-0.334**	-0.114	No WQG	No - parameter assessed as TDS
ALUMINUM-D-mg/l	-0.079	-0.078	-	-
ANTIMONY-T-mg/l	-0.18	-0.282	-	-
ARSENIC-T-mg/l	0.09	-0.142	-	-
BARIUM-T-mg/l	**-0.28**	0.005	No	No
BERYLLIUM-T-mg/l	-0.143	-0.161	-	-
BISMUTH-T-mg/l	-0.135	0.068	-	-
BORON-T-mg/l	-0.074	0.043	-	-
BROMIDE-D-mg/l	**-0.299**	-0.091	No WQG	Low detection frequency[4]
CADMIUM-D-mg/l	-0.083	-0.247	-	-
CALCIUM-T-mg/l	**-0.403**	-0.222	No WQG	No - parameter assessed as TDS
CARBON DISSOLVED ORGANIC-D-mg/l	0.245	-0.059	-	-
CHLORIDE-D-mg/l	**-0.271**	-0.019	No	No
CHROMIUM-T-mg/l	0.153	-0.205	-	-
COBALT-T-mg/l	-0.027	-0.381	-	-
CONDUCTIVITY LAB-N-us/cm	**-0.403**	-0.233	No WQG	No - parameter assessed as TDS
COPPER-D-mg/l	-0.172	0.042	-	-
FLUORIDE-D-mg/l	-0.163	-0.256	-	-
Hardness Total or Dissolved CaCO3-N-mg/l	**-0.3974**	-0.238	No WQG	No - parameter assessed as TDS
IRON-D-mg/l	-0.023	-0.267	-	-
IRON-T-mg/l	0.078	-0.382	-	-
LEAD-T-mg/l	0.061	-0.266	-	-
LITHIUM-T-mg/l	**-0.26**	-0.263	No	No
MAGNESIUM-T-mg/l	**-0.3845**	-0.262	No WQG	No - parameter assessed as TDS
MAJOR ANION SUM-N-meq/l	**-0.3628**	-0.226	No WQG	No - parameter assessed as TDS
MAJOR CATION SUM-N-meq/l	**-0.371**	-0.212	No WQG	No - parameter assessed as TDS
MANGANESE-T-mg/l	0.0022	-0.322	-	-
MERCURY-T-mg/l	0.04	-0.142	-	-
MOLYBDENUM-T-mg/l	-0.148	-0.063	-	-
NICKEL-T-mg/l	-0.177	-0.327	-	-
NITRATE NITROGEN (NO3) AS N-N-mg/l	**-0.345**	-0.326	Yes	Yes
NITRITE NITROGEN (NO2) AS N-N-mg/l	**-0.3825**	-0.379	No	No
NITROGEN AMMONIA (AS N)-N-mg/l	-0.02378	**-0.515**	No	No
ORTHO-PHOSPHATE-N-mg/l	0.255	0.411	-	-
OXIDATION-REDUCTION POTENTIAL LAB-N-mv	0.104	-0.128	-	-
PHOSPHORUS-N-mg/l	0.057	-0.033	-	-
POTASSIUM-T-mg/l	**-0.294**	-0.270	No WQG	No - parameter assessed as TDS
SELENIUM-T-mg/l	**-0.36**	-0.299	Yes	Yes
SILICON-T-mg/l	-0.05	0.053	-	-
SILVER-T-mg/l	0.057	-0.166	-	-
SODIUM-T-mg/l	-0.148	0.050	-	-
STRONTIUM-D-mg/l	-0.133	0.085	-	-
SULFATE (AS SO4)-D-mg/l	**-0.385**	-0.261	No	No
THALLIUM-T-mg/l	0.067	-0.186	-	-
TIN-T-mg/l	0.031	-0.272	-	-
TITANIUM-T-mg/l	**-0.324**	-0.303	No	No
TOTAL DISSOLVED SOLIDS-N-mg/l	**-0.391**	-0.251	No WQG	Yes
TOTAL KJELDAHL NITROGEN-N-mg/l	0.0663	**-0.540**	No WQG	Yes
TOTAL ORGANIC CARBON-T-mg/l	0.18	-0.205	-	-
TOTAL SUSPENDED SOLIDS LAB-N-mg/l	0.1	-0.365	-	-
TURBIDITY LAB-N-ntu	0.0063	-0.381	-	-
URANIUM-T-mg/l	**-0.331**	-0.232	No	No
VANADIUM-T-mg/l	0.054	-0.167	-	-
ZINC-T-mg/l	0.128	-0.208	-	-
∑TU-WQGs	-0.045	0.062	-	-
∑TU-WQGs/Benchmarks	0.058	0.033	-	-
PC1_allyrs	**-0.324**		No WQG	Yes
PC2_allyrs	-0.028		-	-
PC3_allyrs	0.109			
PC1_2021	-	-0.177	-	-
PC2_2021	-	-0.323	-	-
PC3_2021	-	0.393		

Notes:

(1) Statistical significance is based on one-tailed comparisons. Significant negative correlations for combined dataset ($\alpha < 0.005$; $r_s < -0.202$) and 2021 dataset ($\alpha < 0.005$; $r_s < -0.413$) are bolded. Strong negative correlations ($r_s < -0.6$) are shaded. - = r_s could not be calculated because parameter concentration was the same in all tests or parameter was not applicable to the dataset.

(2) Parameters are screened against WQGs in Appendix C.

(3) Parameters were retained for graphical analysis if they met one of the following conditions: 1) significant negative correlation and concentration was greater than the chronic BC WQG, or 1) significant negative correlation and there is no chronic BC WQG.

(4) Out of 38 tests in 2021, bromide was only detected in five samples and was not detected in any test with possible or likely adverse effects.

% = percent; $CaCO_3$ = calcium carbonate; "-D-" = dissolved concentration; mg/l = milligrams per litre; "-T-" = total concentration; µg/l = micrograms per litre; WQG = water quality guideline; EVWQP: Elk Valley Water Quality Plan; MIT: Multi-Ion Toxicity.

Table F-5: Spearman Rank Order Correlation for *P. promelas* Survival

Parameter	Survival R_s[1]		Is parameter greater than the chronic WQG or lowest L1 benchmark from EVWQP in at least one test categorized as possible or likely?[2]	Retain Parameter for Graphical Analysis?[3]
	2015 to 2021 Dataset	2021 Dataset		
ACIDITY TO pH 8.3 (As CaCO3)-N-mg/l	0.052	0.230	-	-
ALKALINITY BICARBONATE (As CaCO3)-N-mg/l	-0.07	-0.070	-	-
ALKALINITY CARBONATE (As CaCO3)-N-mg/l	0.134	0.150	-	-
ALKALINITY HYDROXIDE (As CaCO3)-N-mg/l	0.016	-	-	-
ALKALINITY TOTAL (As CaCO3)-N-mg/l	-0.076	0.047	-	-
ALUMINUM-D-mg/l	0.004	-0.188	-	-
ANTIMONY-T-mg/l	-0.02	-0.065	-	-
ARSENIC-T-mg/l	0.06	-0.059	-	-
BARIUM-T-mg/l	0.07	0.049	-	-
BERYLLIUM-T-mg/l	0.141	0.109	-	-
BISMUTH-T-mg/l	0.018	-	-	-
BORON-T-mg/l	0.056	0.030	-	-
BROMIDE-D-mg/l	-0.035	-0.081	-	-
CADMIUM-D-mg/l	0.089	-0.043	-	-
CALCIUM-T-mg/l	-0.069	-0.038	-	-
CARBON DISSOLVED ORGANIC-D-mg/l	0.10	-0.073	-	-
CHLORIDE-D-mg/l	-0.056	-0.016	-	-
CHROMIUM-T-mg/l	0.051	0.063	-	-
COBALT-T-mg/l	0.117	0.070	-	-
CONDUCTIVITY LAB-N-us/cm	-0.083	-0.033	-	-
COPPER-D-mg/l	-0.116	-0.015	-	-
FLUORIDE-D-mg/l	-0.011	0.160	-	-
Hardness Total or Dissolved CaCO3-N-mg/l	-0.0812	-0.037	-	-
IRON-D-mg/l	0.119	0.095	-	-
IRON-T-mg/l	0.082	0.021	-	-
LEAD-T-mg/l	0.104	-0.007	-	-
LITHIUM-T-mg/l	-0.08	-0.064	-	-
MAGNESIUM-T-mg/l	-0.0866	-0.036	-	-
MAJOR ANION SUM-N-meq/l	-0.0636	-0.003	-	-
MAJOR CATION SUM-N-meq/l	-0.059	0.013	-	-
MANGANESE-T-mg/l	0.0513	-0.126	-	-
MERCURY-T-mg/l	0.23	-0.156	-	-
MOLYBDENUM-T-mg/l	-0.152	-0.034	-	-
NICKEL-T-mg/l	0.044	-0.058	-	-
NITRATE NITROGEN (NO3) AS N-N-mg/l	-0.031	0.005	-	-
NITRITE NITROGEN (NO2) AS N-N-mg/l	0.0396	-0.010	-	-
NITROGEN AMMONIA (AS N)-N-mg/l	0.02333	-0.098	-	-
ORTHO-PHOSPHATE-N-mg/l	0.183	0.021	-	-
OXIDATION-REDUCTION POTENTIAL LAB-N-mv	-0.077	-0.075	-	-
pH LAB-N-ph units	0.056	0.015	-	-
PHOSPHORUS-N-mg/l	0.057	-0.147	-	-
POTASSIUM-T-mg/l	-0.055	-0.107	-	-
SELENIUM-T-mg/l	-0.07	-0.015	-	-
SILICON-T-mg/l	0.05	0.033	-	-
SILVER-T-mg/l	0.02	-0.034	-	-
SODIUM-T-mg/l	0.015	0.008	-	-
STRONTIUM-D-mg/l	-0.117	-0.144	-	-
SULFATE (AS SO4)-D-mg/l	-0.072	-0.044	-	-
THALLIUM-T-mg/l	-0.005	-0.129	-	-
TIN-T-mg/l	0.02	-	-	-
TITANIUM-T-mg/l	-0.018	0.013	-	-
TOTAL DISSOLVED SOLIDS-N-mg/l	-0.085	-0.038	-	-
TOTAL KJELDAHL NITROGEN-N-mg/l	-0.0096	0.005	-	-
TOTAL ORGANIC CARBON-T-mg/l	0.1	-0.061	-	-
TOTAL SUSPENDED SOLIDS LAB-N-mg/l	0.08	-0.324	-	-
TURBIDITY LAB-N-ntu	0.0496	-0.154	-	-
URANIUM-T-mg/l	-0.108	-0.059	-	-
VANADIUM-T-mg/l	0.039	0.033	-	-
ZINC-T-mg/l	0.111	-0.157	-	-
∑TU-WQGs	-0.018	-0.048	-	-
∑TU-WQGs/Benchmarks	0.022	-0.065	-	-
PC1_allyears	-0.042	-	-	-
PC2_allyears	-0.064	-	-	-
PC3_allyears	0.107	-	-	-
PC4_allyears	0.106			
PC1_2021	-	-0.101	-	-
PC2_2021	-	-0.117	-	-
PC3_2021	-	0.084	-	-

Notes:
(1) Statistical significance is based on one-tailed comparisons. Significant negative correlations for combined dataset ($\alpha < 0.005$; $\xi < -0.21$) and 2021 dataset ($\alpha < 0.005$; $\xi < -0.413$) are bolded. Strong negative correlations ($r_s < -0.6$) are shaded. - = r_s could not be calculated because parameter concentration was the same in all tests or parameter was not applicable to the dataset.

(2) Parameters are screened against WQGs in Appendix C.
(3) Parameters were retained for graphical analysis if they met one of the following conditions: 1) significant negative correlation and concentration was greater than the chronic BC WQG, or 1) significant negative correlation and there is no chronic BC WQG.
(4) Out of 80 tests, bromide was only detected once and was not detected in any test with possible or likely adverse effects.
% = percent; $CaCO_3$ = calcium carbonate; "-D-" = dissolved concentration; mg/l = milligrams per litre; "-T-" = total concentration; µg/l = micrograms per litre; WQG = water quality guideline; EVWQP: Elk Valley Water Quality Plan; MIT: Multi-Ion Toxicity.

APPENDIX G

Temporal Plots

Comparison of 2021 Results to Previous Years

Mean results for 2015 through 2021 inclusive were plotted to evaluate potential temporal patterns in responses. As outlined in Section 2.3.5, mean results were control normalized prior to plotting to standardize responses across years. An example plot is provided in Figure 2.3-3. Per the recommendation in the 2020 regional report (Golder 2021c), the normal ranges developed in 2021 (see Section 2.3.3) were used to re-assign historical test results from the regional program (2015 to 2020) into narrative categories of no, possible, or likely adverse response.

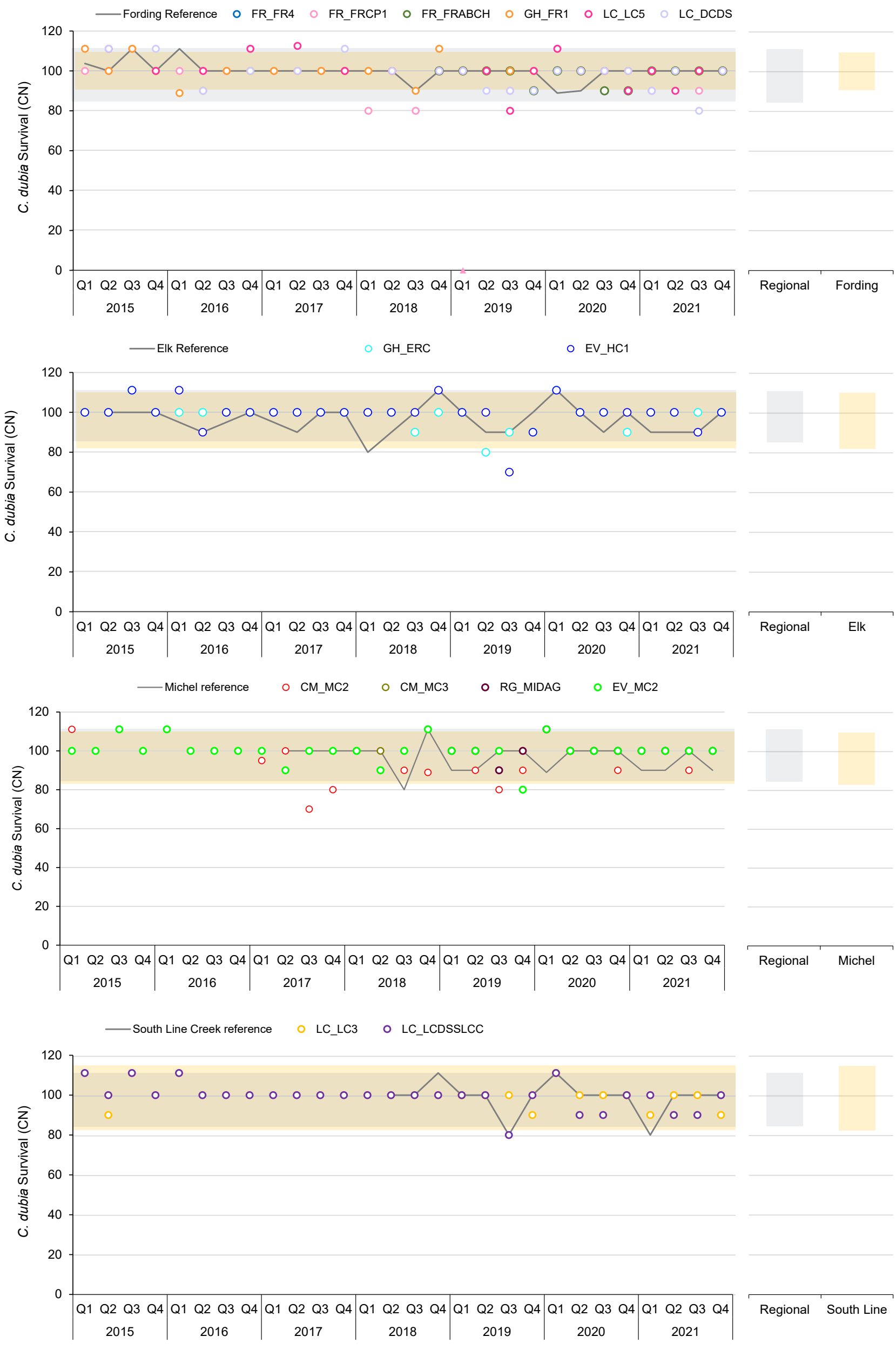
Briefly, figures are interpreted as follows:

- Symbol colour corresponds to an individual test site or reference location.
- Symbol type corresponds to the response category (circle [○] = no adverse response; diamond [◇] = possible adverse response; triangle [△] = likely adverse response).
- Open symbols [○] indicate test sites with a mean response statistically equivalent to all references tested in that batch. Filled symbols [●] indicate test sites with a mean response significantly lower than one or more references tested in that batch.
- Local and regional NRs are provided on the plot to illustrate the range of responses in reference waters.

Mean results are plotted in the following figures:

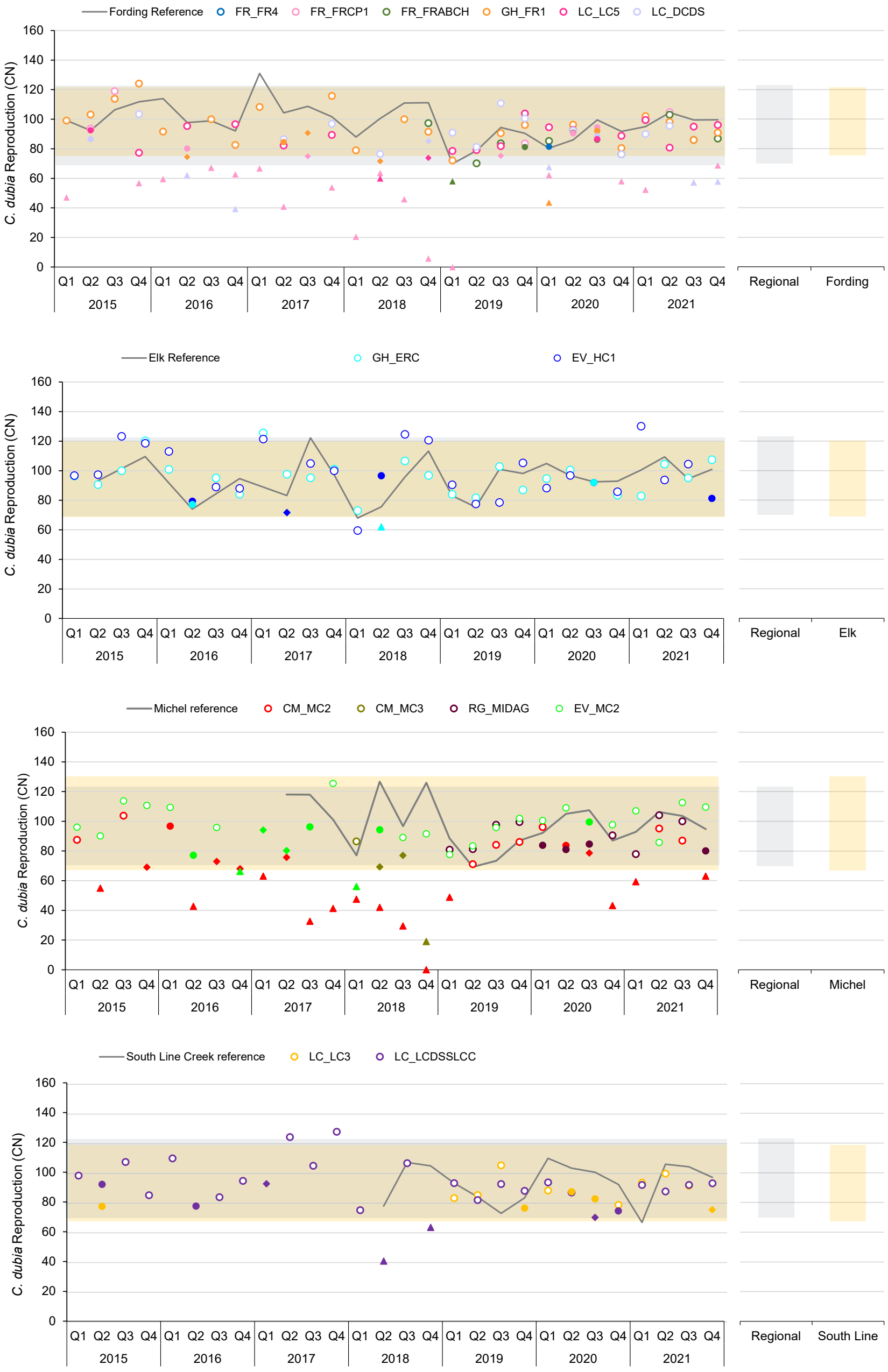
- *C. dubia* survival (Figures G-1) and reproduction (Figure G-2)
- *P. subcapitata* cell yield (Figure G-3)
- *H. azteca* survival (Figure G-4) and dry weight (Figure G-5)
- *O. mykiss* survival (Figure G-6), viability (Figure G-7), length (Figure G-8), and weight (Figure G-9)
- *P. promelas* hatch (Figure G-10), survival (Figure G-11), biomass (Figure G-12), length (Figure G-13), and development (Figure G-14)

Figure G-1: Mean results for *C. dubia* survival in the Fording River reference and its paired test site waters (top left panel), the Elk River reference and its paired test site waters (second left panel), the Michel Creek reference and its paired test site waters (third left panel), and the South Line Creek reference and its paired test site waters (bottom left panel). Regional and local normal ranges (2.5th to 97.5th percentile) are shown as bars (right panels).



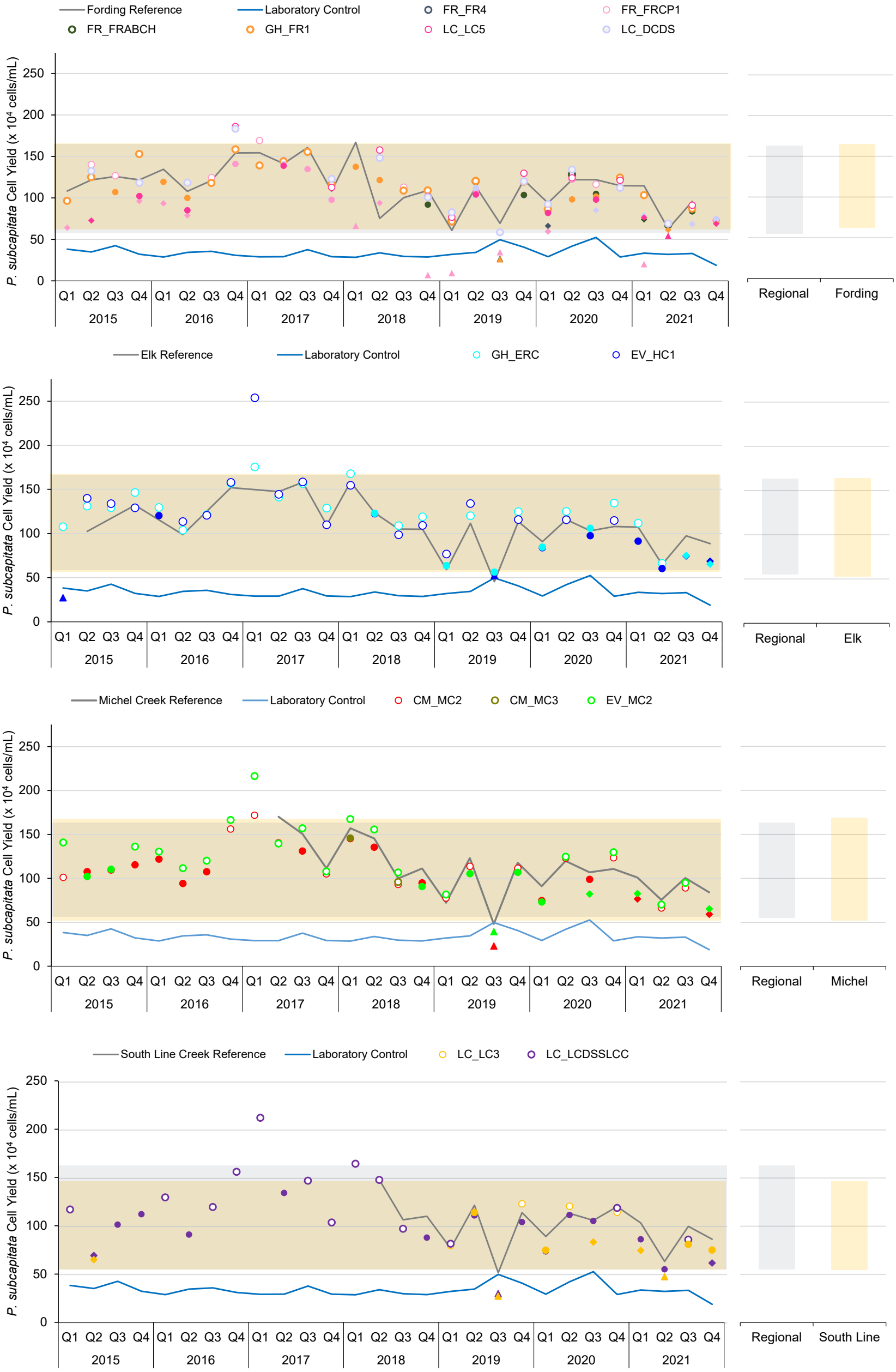
Note: See Figure 2.3-3 for description of lines and symbols. Test sites were compared to their paired local NR (Section 2.3.3).

Figure G-2: Mean results for *C. dubia* reproduction in the Fording River reference and its paired test site waters (top left panel), in the Elk River reference and its paired test site waters (middle left panel), the Michel Creek reference and its paired test site waters (third left panel), and the South Line Creek reference and its paired test site waters (bottom left panel). Regional and local normal ranges (2.5th to 97.5th percentile) are shown as bars (right panels).



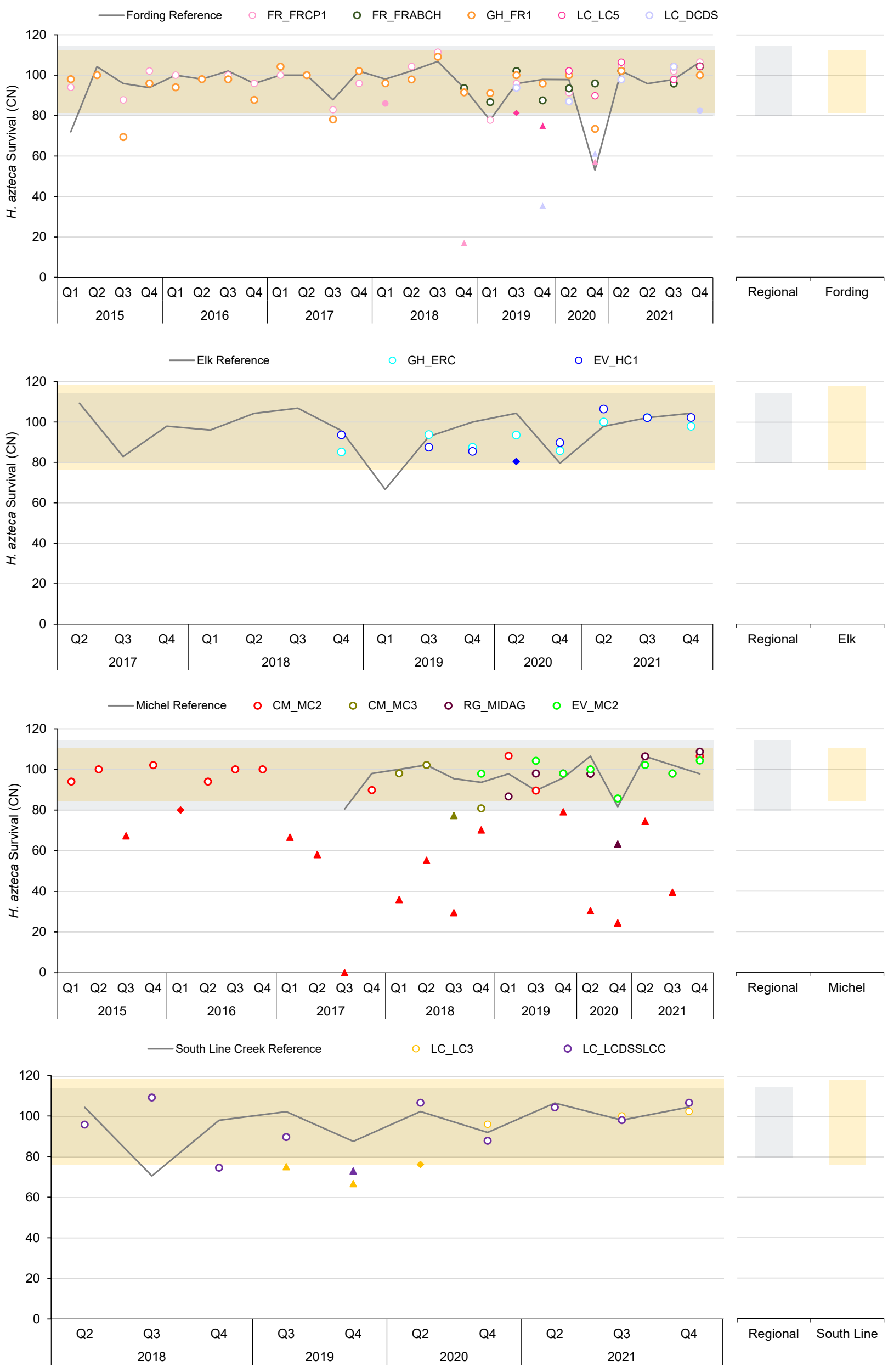
Note: See Figure 2.3-3 for description of lines and symbols. Test sites were compared to their paired local NR (Section 2.3.3).

Figure G-3: Mean results for *P. subcapitata* cell yield in the Fording River reference and its paired test site waters (top left panel), the Elk River reference and its paired test site waters (second left panel), the Michel Creek reference and its paired test site waters (third left panel), and the South Line Creek reference and its paired test site waters (bottom left panel). Regional and local normal ranges (2.5th to 97.5th percentile) are shown as bars (right panels).



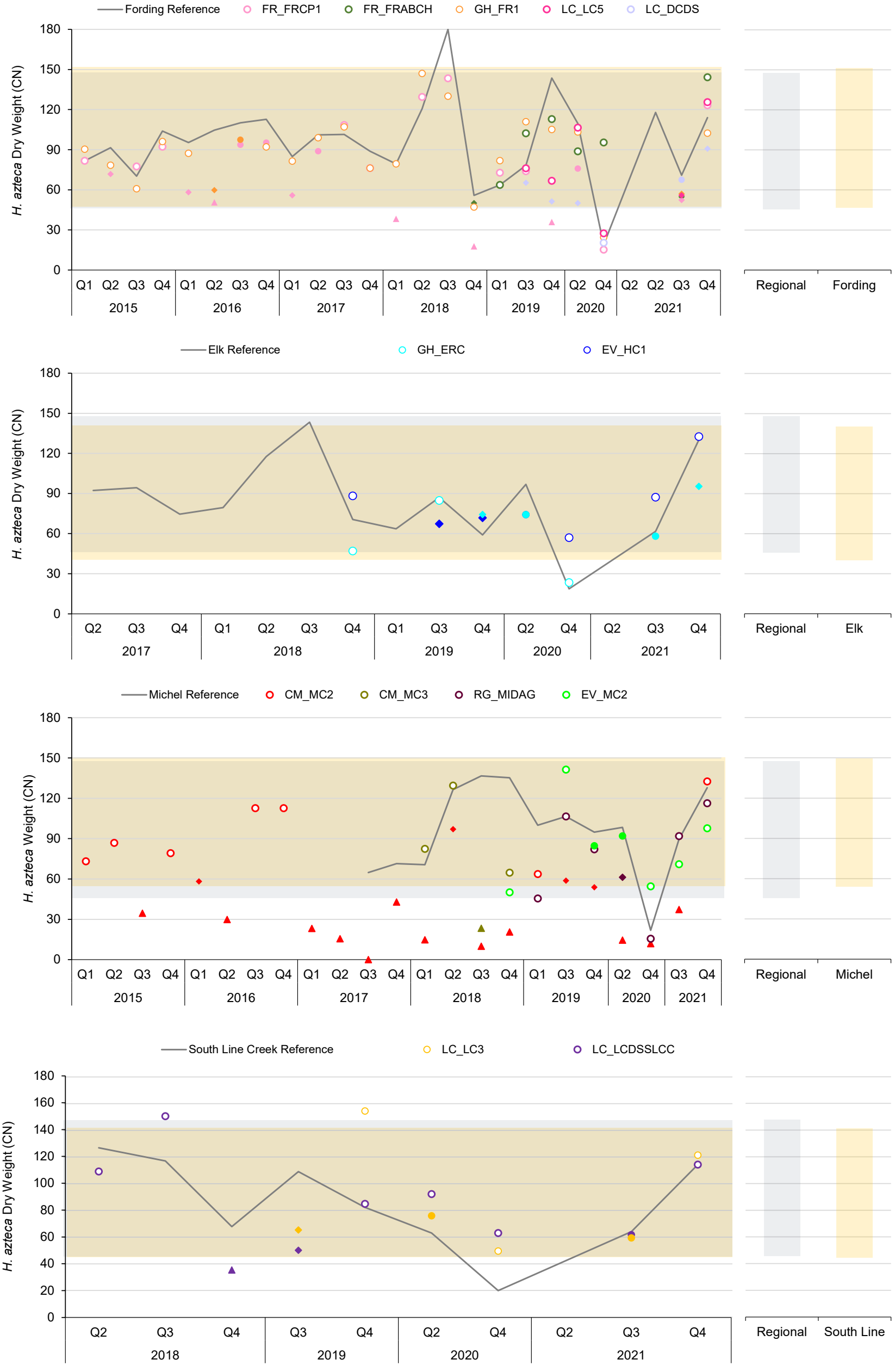
Note: See Figure 2.3-3 for description of lines and symbols. Test sites were compared to their paired local NR (Section 2.3.3).

Figure G-4: Mean results for *H. azteca* survival in the Fording River reference and its paired test site waters (top left panel), the Elk River reference and its paired test site waters (second left panel), the Michel Creek reference and its paired test site waters (third left panel), and the South Line Creek reference and its paired test site waters (bottom left panel). Regional and local normal ranges (2.5th to 97.5th percentile) are shown as bars (right panels).



Note: See Figure 2.3-3 for description of lines and symbols. Test sites were compared to their paired local NR (Section 2.3.3). Due to a lab technician error, Q2 *H. azteca* tests were disposed prior to the measurement of dry weight (see Section 3.1). Tests were repeated in Q2 for the Fording River reference, and then repeated for all stations in Q3 resulting in the Fording reference being re-tested in both Q2 and Q3. Results in the second Q2 of this figure are from the Q2 re-test.

Figure G-5: Mean results for *H. azteca* dry weight in the Fording River reference and its paired test site waters (top left panel), the Elk River reference and its paired test site waters (second left panel), the Michel Creek reference and its paired test site waters (third left panel), and the South Line Creek reference and its paired test site waters (bottom left panel). Regional and local normal ranges (2.5th to 97.5th percentile) are shown as bars (right panels).

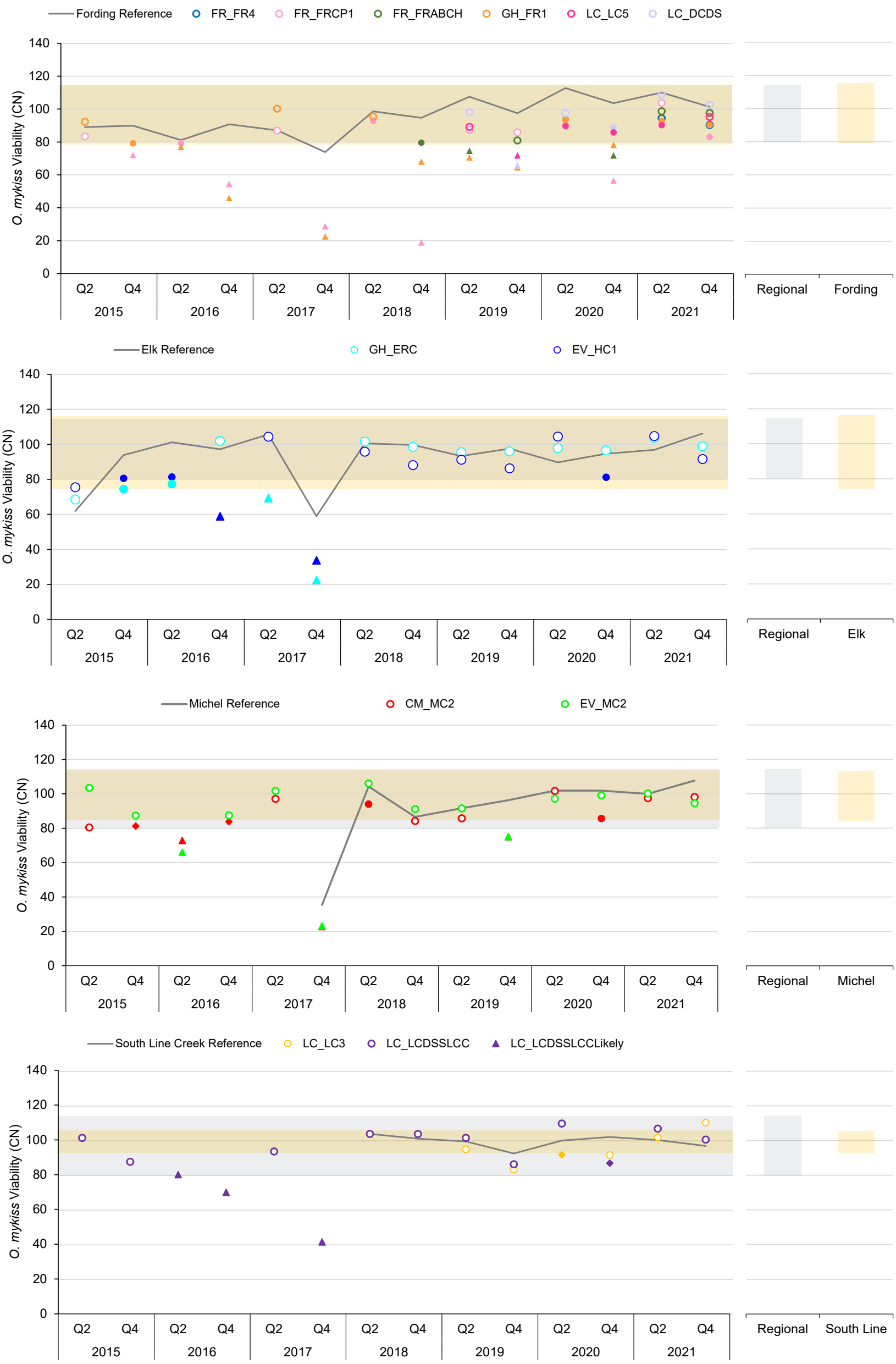


Note: See Figure 2.3-3 for description of lines and symbols. Test sites were compared to their paired local NR (Section 2.3.3). Due to a lab technician error, Q2 *H. azteca* tests were disposed prior to the measurement of dry weight (see Section 3.1). Tests were repeated in Q2 for the Fording River reference, therefore dry weight results in Q2 of this figure are from the Q2 re-test. All stations were re-tested in Q3.

Figure G-6: Mean results for *O. mykiss* survival in the Fording River reference and its paired test site waters (top left panel) and the Elk River reference and its paired test site waters (second left panel), the Michel Creek reference and its paired test site waters (third left panel), and the South Line Creek reference and its paired test site waters (bottom left panel). Regional and local normal ranges (2.5th to 97.5th percentile) are shown as bars (right panels).

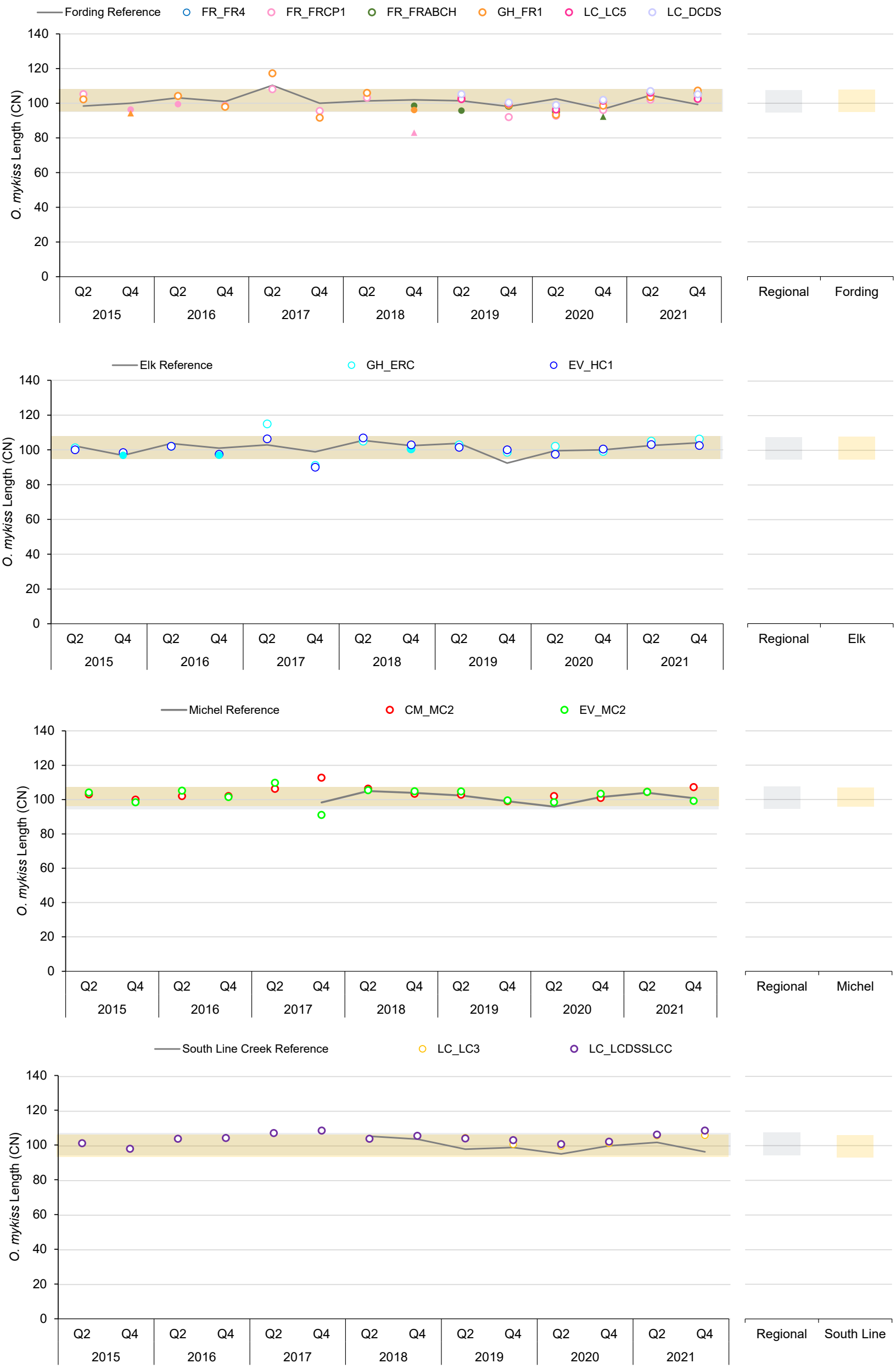
Note: See Figure 2.3-3 for description of lines and symbols. Test sites were compared to their paired local NR (Section 2.3.3). Evidence of microbes were observed in Q2 FR_UFR1, GH_ER2, CM_MC1, LC_SLC, FR_FRABCH, GH_FR1, LC_LC5, LC_DCDS, GH_ER2, CM_MC2, EV_MC2, and LC_LC3, and Q4 FR_FRCP1, FR_FRABCH, GH_FR1, LC_DCDS, GH_ERC, and CM_MC2 *O. mykiss* tests (Section 3.1).

Figure G-7: Mean results for *O. mykiss* viability in the Fording River reference and its paired test site waters (top left panel) and the Elk River reference and its paired test site waters (second left panel), the Michel Creek reference and its paired test site waters (third left panel), and the South Line Creek reference and its paired test site waters (bottom left panel). Regional and local normal ranges (2.5th to 97.5th percentile) are shown as bars (right panels).



Note: See Figure 2.3-3 for description of lines and symbols. Test sites were compared to their paired local NR (Section 2.3.3). Evidence of microbes were observed in Q2 FR_UFR1, GH_ER2, CM_MC1, LC_SLC, FR_FRABCH, GH_FR1, LC_LC5, LC_DCDS, GH_ER2, CM_MC2, EV_MC2, and LC_LC3, and Q4 FR_FRCP1, FR_FRABCH, GH_FR1, LC_DCDS, GH_ERC, and CM_MC2 *O. mykiss* tests (Section 3.1).

Figure G-8: Mean results for *O. mykiss* length in the Fording River reference and its paired test site waters (top left panel) and the Elk River reference and its paired test site waters (second left panel), the Michel Creek reference and its paired test site waters (third left panel), and the South Line Creek reference and its paired test site waters (bottom left panel). Regional and local normal ranges (2.5th to 97.5th percentile) are shown as bars (right panels).

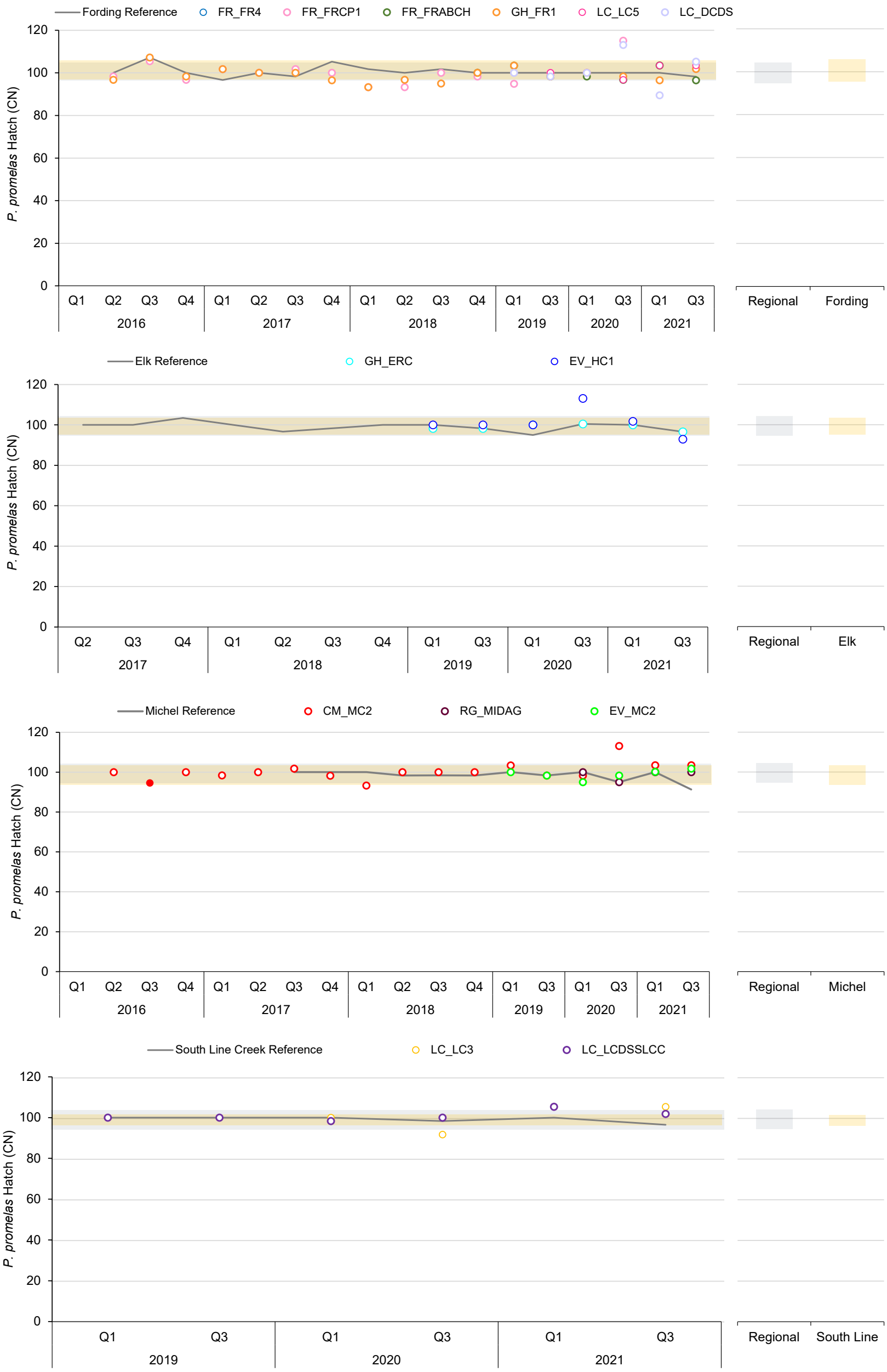


Note: See Figure 2.3-3 for description of lines and symbols. Test sites were compared to their paired local NR (Section 2.3.3). Evidence of microbes were observed in Q2 FR_UFR1, GH_ER2, CM_MC1, LC_SLC, FR_FRABCH, GH_FR1, LC_LC5, LC_DCDS, GH_ER2, CM_MC2, EV_MC2, and LC_LC3, and Q4 FR_FRCP1, FR_FRABCH, GH_FR1, LC_DCDS, GH_ERC, and CM_MC2 *O. mykiss* tests (Section 3.1).

Figure G-9: Mean results for *O. mykiss* weight in the Fording River reference and its paired test site waters (top left panel) and the Elk River reference and its paired test site waters (second left panel), the Michel Creek reference and its paired test site waters (third left panel), and the South Line Creek reference and its paired test site waters (bottom left panel). Regional and local normal ranges (2.5th to 97.5th percentile) are shown as bars (right panels).

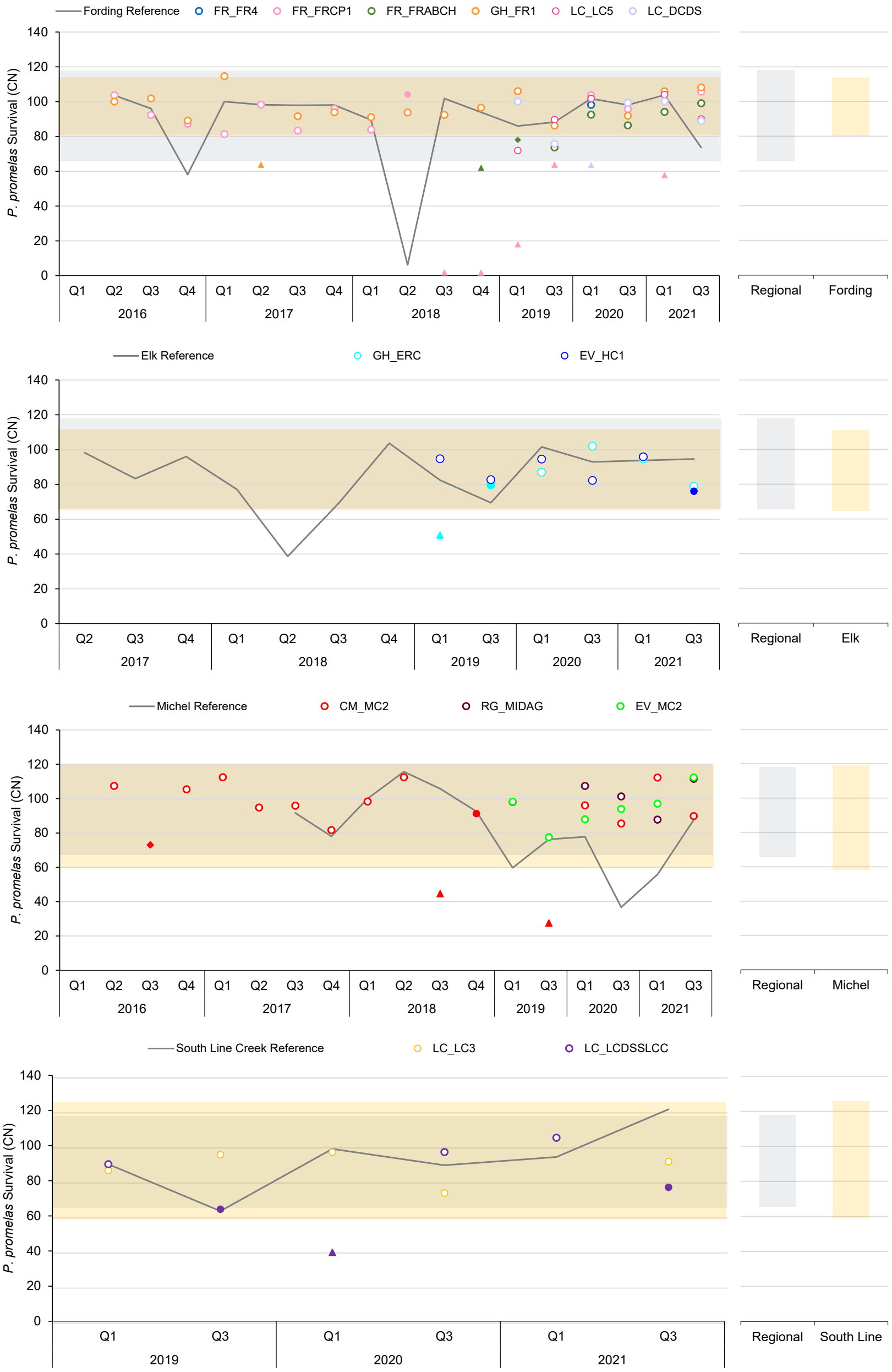
Note: See Figure 2.3-3 for description of lines and symbols. Test sites were compared to their paired local NR (Section 2.3.3). Evidence of microbes were observed in Q2 FR_UFR1, GH_ER2, CM_MC1, LC_SLC, FR_FRABCH, GH_FR1, LC_LC5, LC_DCDS, GH_ER2, CM_MC2, EV_MC2, and LC_LC3, and Q4 FR_FRCP1, FR_FRABCH, GH_FR1, LC_DCDS, GH_ERC, and CM_MC2 *O. mykiss* tests (Section 3.1).

Figure G-10: Mean results for *P. promelas* hatch in the Fording River reference and its paired test site waters (top left panel) and the Elk River reference and its paired test site waters (middle left panel), and the Michel Creek reference and its paired test site waters (bottom left panel). Regional and local normal ranges (2.5th to 97.5th percentile) are shown as bars (right panels).



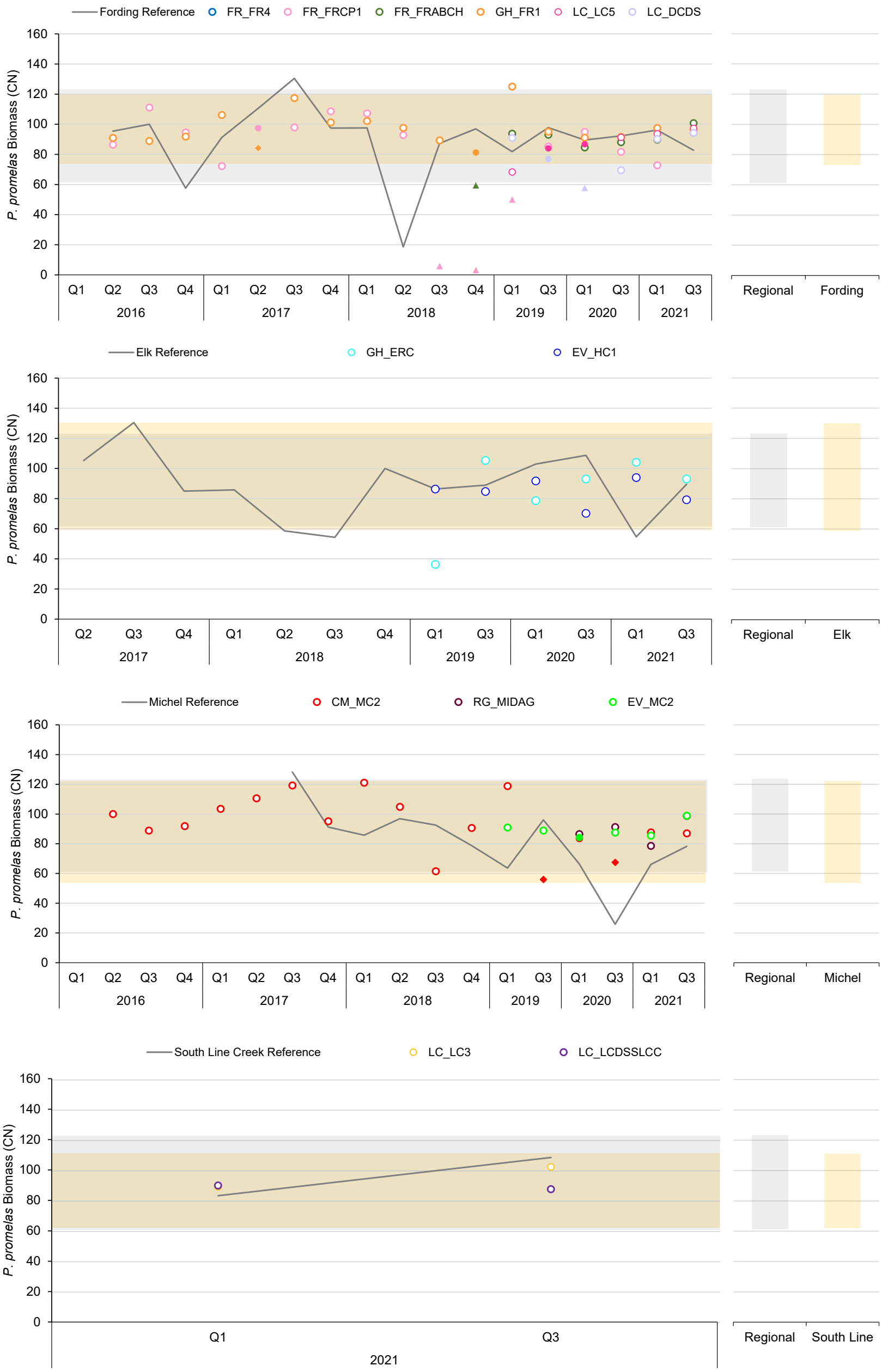
Note: See Figure 2.3-3 for description of lines and symbols. Test sites were compared to their paired local NR (Section 2.3.3). Evidence of microbes were observed in Q1 FR_FRABCH, EV_MC2, and LC_LCDSSLCC, and Q3 GH_ER2, FR_FRABCH, and CM_MC2 *P. promelas* tests (Section 3.1).

Figure G-11: Mean results for *P. promelas* survival in the Fording River reference and its paired test site waters (top left panel) and the Elk River reference and its paired test site waters (middle left panel), and the Michel Creek reference and its paired test site waters (bottom left panel). Regional and local normal ranges (2.5th to 97.5th percentile) are shown as bars (right panels).



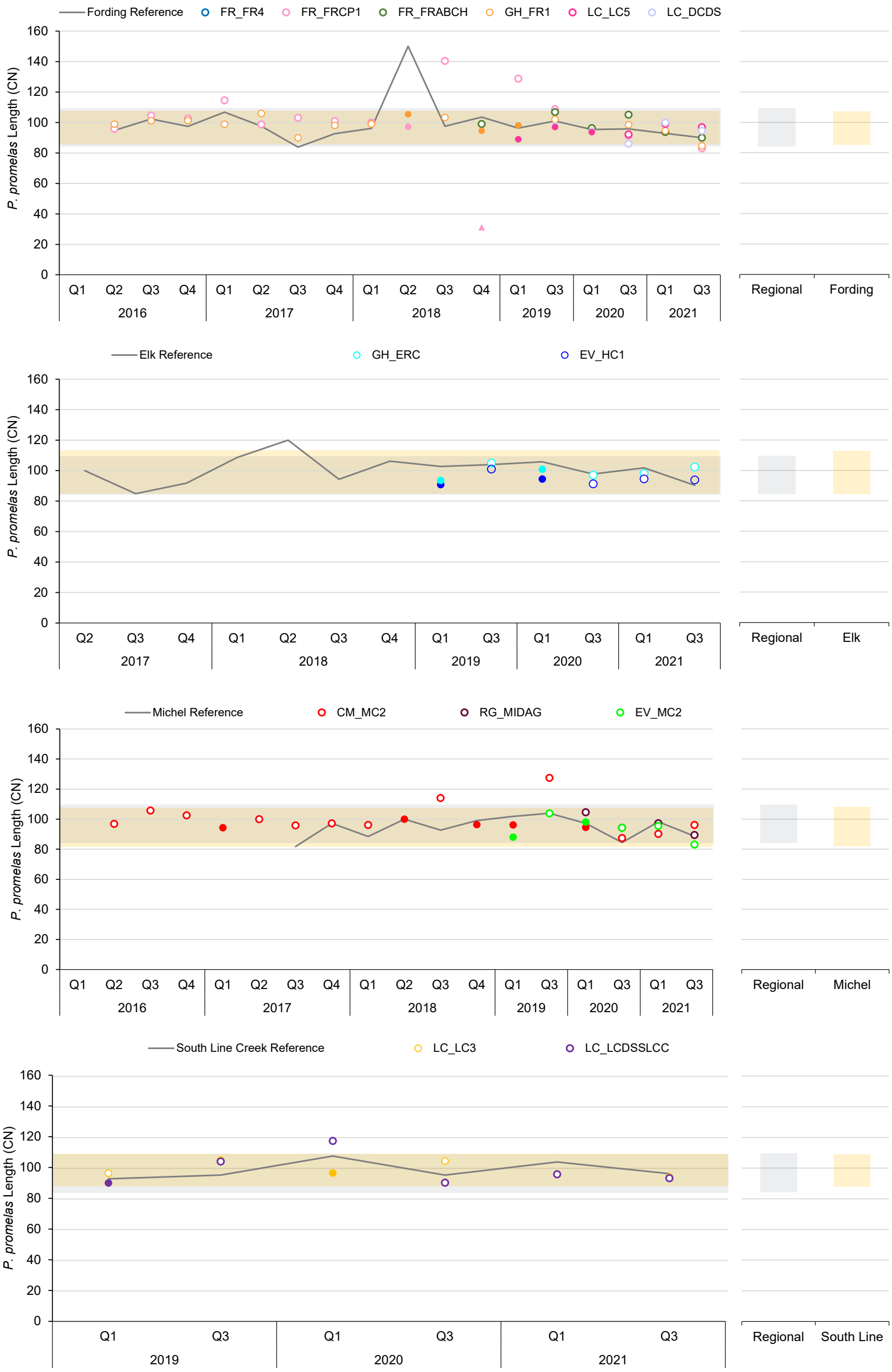
Note: See Figure 2.3-3 for description of lines and symbols. Test sites were compared to their paired local NR (Section 2.3.3). Evidence of microbes were observed in Q1 FR_FRABCH, EV_MC2, and LC_LCDSSLCC, and Q3 GH_ER2, FR_FRABCH, and CM_MC2 *P. promelas* tests (Section 3.1).

Figure G-12: Mean results for *P. promelas* biomass in the Fording River reference and its paired test site waters (top left panel) and the Elk River reference and its paired test site waters (middle left panel), and the Michel Creek reference and its paired test site waters (bottom left panel). Regional and local normal ranges (2.5th to 97.5th percentile) are shown as bars (right panels).



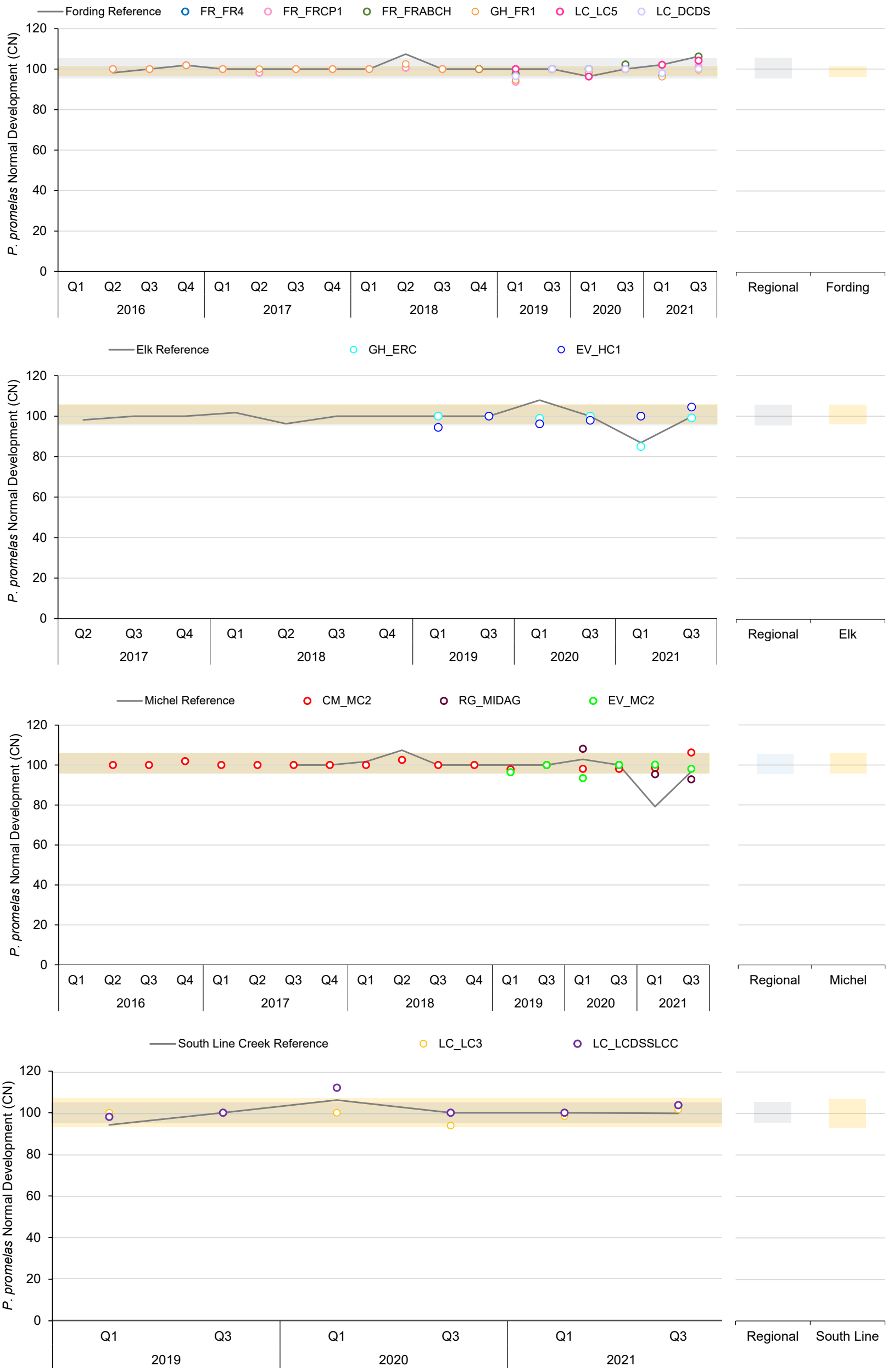
Note: See Figure 2.3-3 for description of lines and symbols. Test sites were compared to their paired local NR (Section 2.3.3). Evidence of microbes were observed in Q1 FR_FRABCH, EV_MC2, and LC_LCDSSLCC, and Q3 GH_ER2, FR_FRABCH, and CM_MC2 *P. promelas* tests (Section 3.1).

Figure G-13: Mean results for *P. promelas* length in the Fording River reference and its paired test site waters (top left panel) and the Elk River reference and its paired test site waters (middle left panel), and the Michel Creek reference and its paired test site waters (bottom left panel). Regional and local normal ranges (2.5th to 97.5th percentile) are shown as bars (right panels).



Note: See Figure 2.3-3 for description of lines and symbols. Test sites were compared to their paired local NR (Section 2.3.3). Evidence of microbes were observed in Q1 FR_FRABCH, EV_MC2, and LC_LCDSSLCC, and Q3 GH_ER2, FR_FRABCH, and CM_MC2 *P. promelas* tests (Section 3.1).

Figure G-14: Mean results for *P. promelas* normal development in the Fording River reference and its paired test site waters (top left panel) and the Elk River reference and its paired test site waters (middle left panel), and the Michel Creek reference and its paired test site waters (bottom left panel). Regional and local normal ranges (2.5th to 97.5th percentile) are shown as bars (right panels).



Note: See Figure 2.3-3 for description of lines and symbols. Test sites were compared to their paired local NR (Section 2.3.3). Evidence of microbes were observed in Q1 FR_FRABCH, EV_MC2, and LC_LCDSSLCC, and Q3 GH_ER2, FR_FRABCH, and CM_MC2 *P. promelas* tests (Section 3.1).

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